Everyday Science

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MCQs + Subjective Part

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SOLVED PAPERS

EVERYDAY SCIENCE 1994

Note: Attempt TEN questions. All questions carry Equal marks. Draw diagram where necessary.

Q.1. Which of the following statements are true and which are false.

(a) Bacteria are parasites.

Ans. True.

(b) Ruby is an oxide of aluminium.

Ans. True.

(c) In the Australian continent, days are longer than nights in June.

Ans. False.

(d) Gypsum is hydrated calcium carbonate chemically.

Ans. False.

(e) Twenty-three moons revolve around Saturn.

Ans. False.

(f) Pluto is the coldest planet.

Ans. True.

(g) Chromite ore contains chromium oxide.

Ans. True.

(h) Mica is non-conductor of electricity.

Ans. True.

(i) Sun is the biggest star in the universe.

Ans. False.

Q. The earth completes one rotation about its axis in 365.25 days.

Ans. False.

Q.2. Write short notes on any two of the following:

(i) Structure of cell (animal)

Ans. A living cell is composed of a nucleus at the centre and the surrounding cytoplasm. The nucleus contains chromosomes which are composed of DNA and protein. DNA is the heredity material which transmits all the information for the development and characters of the offsprings. The nucleus is surrounded by nuclear envelope.

The cell is surrounded by a cell membrane. The cell membrane controls all the chemicals and water which enter or leave the cell. The cytoplasm of the cell contains many organelles. These are mitochondria, golgi apparatus, lysosomes, endoplasmic reticulum, ribosomes and microfilaments or microtubules.

Mitochondria are energy transducers. They provide the cell with energy in the form of ATP or other energy rich molecules.

Golgi apparatus is a membranous or vesicular structure related with secretions of the cell.

Lysosomes are membrane bound granules having hydrolytic enzymes important in digestion of particles inside the cell.

Endoplasmic reticulum is an extensive system of membranes inside the cytoplasm for transport or processing of materials.

Ribosomes are granules inside the cell which are important in protein synthesis.

Microfilaments form a supporting network inside the cell while microtubules are important in cell division or cilia and flagella of cells.

(ii) Hovering Satellite

Ans. A satellite moving around the earth maintains its orbital velocity which is about 23000 km per hour. The time taken by a satellite to complete one round around earth is called period. It is 2 hours at a height of

1500 km. It is 24 hours at an altitude of 35900 km. So if a satellite is launched over the equator at a height of 35900 km and in the same direction as the earth is moving it will take the same time to circle around the earth as the earth take to complete one rotation. In this way it will remain synchronous with the movement of earth and will not change position relative to the earth. To an observer on the surface of the earth the satellite would appear as fixed in the sky. Such satellites are called hovering satellites.

(iii) Water Pollution

Ans. Water pollution is caused by dumping of toxic and hazardous materials in fresh water as a result of urban and industrial activities. Streams, rivers and the oceans have been used as natural sinks or diluents for dumping various kinds of wastes.

Many forms of pollutants are present in water. Disease causing bacteria come in urban or hospital wastes. An estimated 25,000 people are killed each day due to water borne diseases.

Untreated sewage and industrial wastes are heavily polluting waters. Industrial wastes contain toxic metals, toxic chemicals, acids, pesticides, hazardous organic chemicals and petroleum products. Domestic wastes contain waste foods, oil, soaps, detergents, pesticides, cleaning solvents and disease causing micro-organisms. Radioactive substances are also coming in water where radioactivity is dumped in waters.

Q.3. Describe briefly any five of the following terms.

(i)	Ecosystem	(ii)	Laser
(iii)	Alloy	(iv)	Polymer
(v)	Diffusion	(vi)	Balanced diet

Ans. (i) Ecosystem: A natural habitat or system where living organisms and physical components of their environment interact with one another and exchange materials so as to achieve a functional stability is called an ecosystem.

An ecosystem is a basic unit of ecology of living organisms. An ecosystem may be natural like a pond, lake, stream, river, ocean or a forest. It may be artificial like an aquarium, an artificial pond or an agricultural field.

An ecosystem is a dynamic system where organisms living in the system are always interacting with one another and their environment. Similarly environmental physical factor influence the living organisms. The functioning of the ecosystem depends upon acquisition of energy. The green plants in the ecosystem perform photosynthesis to synthesize energy rich compounds. Plants are called the producers of the ecosystem. Animals depend a plants for their food. They are called consumers.

(ii) Laser: Laser stands for light amplification by stimulated emission of radiation. These are high energy radiations used in various operations and research.

An amplifying material such as a gas, crystal or liquid is placed in a long tube between appropriate mirrors. Photons from a light beam repeatedly pass through it stimulating more and thus increasing their number with each pass. An enhancing or emplifying coil enhances the photons. The additional photons all have the same frequency, phase and direction. A mirror placed at the emerging end of the tube focusses the beam. This external beam can be continuous or pulsed.

Three prominent characteristics of laser are monochromacity, spatial coherence and collimation. Monochromacity means that laser is of a single colour. Spatial coherence means that troughs and crests of all the waves are at the same position and collimation means that rays are nearly parallel to one another and diverge only slightly as they travel. Thus a laser beam of 1 feet diameter when thrown on the surface of the moon in 1962 spread on an area of 2 miles diameter. A beam of ordinary light would have spread on an area of 25000 miles diameter.

(iii) Alloy: An alloy consists of two or more elements, at least one of which is a metal. It is formed by mixing the base metal with an alloying element or elements to give required degree of strength, malleability and other properties. Alloys have many applications, from high strength and high-resistance steel to light, magnesium based alloys used in the construction of aircraft.

In practice very few metals are used in the pure state. Metals are characterized by their density, strength, thermal and electrical conductivity and malleability (the easeness by which metals can be shaped into various structures). Sometimes there qualities are not according to the requirements. Sometimes extraordinary strength, light weight and resistance to chemical action is required. No single metal can fulfil these requirements and thus alloys are used which express combination of properties.

(iv) Polymer: Polymers are composed of very large molecules formed by linking together many smaller, more simple units called monomers. The process of linking together the monomers and making

polymers is called polymerization.

A polymer may contain as few as five or as many as several thousand monomer units. Typical examples of polymers are plastics, polyethylene film, a transparent material used in packing, polyurethane foam made into cushions and mattresses, and nylon and polyester fibers used in textiles. Synthetic resins for paints and adhesive are also polymers.

Rubber is a natural polymer isolated from tree native to South America, but now grown mostly in Asia. More than half of the rubber used nowadays is synthetic. Cellulose and starch are natural polymers of glucose. Proteins are polymers of amino acid and DNA is polymer of nucleotides.

(v) Diffusion: Diffusion is defined as the movement of molecules or ions of a substance from an area of higher concentration to the area of lower concentration. In a system with free movement it continues until the molecules or ions of solute or a gas are evenly distributed throughout the solution. In a system where two solutions are separated by a membrane barrier the movement of water molecules compensates for the movement of solute molecules. Water molecules move from a hypotonic solution to hypertonic (higher concentration of solute molecules) solution.

Diffusion is important in many biological processes like absorption of water by plants, uptake of CO_2 or O_2, and transpiration of water vapors. Cells take water through the process of diffusion. Similarly sugar is dissolved in water to give a syrup through the process of diffusion.

(vi) Balanced Diet: Our food consists mainly of proteins, carbohydrates, lipids, vitamins and minerals. The value of a food is expressed by dietitians in the form of their heat values by the unit calorie. A calorie is the amount of heat required to raise the temperature of 1 gram of water by 1 degree centrigrade. When metabolized inside human body 1 gram of protein produces 4.1 calories, carbohydrates give 4.1 calories and fats give 9.3 calories.

While prescribing a standard or balanced diet it should be taken into consideration that a balanced diet must contain a minimum amount of energy, i.e. about 3000 calories for a man of moderate work. (ii) A variety of food must be included in proper portion; (iii) age, sex, work and conditions of health of the persons concerned and climate of the living place should be taken into account. (iv) Tastes and desires of the person should be considered.

Q.4. Fill in the blanks.

(i) The capacity to do work is called ———.

Ans. Energy.

(ii) The energy possessed by a body due to its position is called ———.

Ans. Potential energy.

(iii) Kitab-al-Manazir is a publication by a famous Muslim scientist about ———.

Ans. Optics.

(iv) ——— usually lies in the centre of an animal cell.

Ans. Nucleus.

(v) Calcium and ——— are the essential elements of bones.

Ans. Phosphorus.

(vi) Proteins are formed by combination of ———.

Ans. Amino acids.

(vii) Rain water dissolves sulphur dioxide to form ———.

Ans. Sulphuric Acid.

(viii) The set of instructions given to a computer is called ———.

Ans. Command.

(ix) Chemicals such as penicillin which act on ——— are called antibiotics.

Ans. Bacteria/Micro-organisms.

(x) Comet Shoemaker-Levy 9 hit the planet ——— in July this year.

Ans. Jupiter.

Q.5. Name the three major parts of human brain and the functions they control. Make a rough diagram of the brain.

Ans. Human Brain Human brain is contained in the skull. It has three major parts:

i) The cerebrum or bigger brain.

II) The cerebellum or the smaller brain.

iii) Medulla oblongata or the spinal card.

The cerebrum constitute the major volume of brain. It consists of two large masses of nervous material known as cerebral hemispheres. Human consciousness, thought, emotions, sight, will, hearing, sensation of pain, memory and speech are centered in the cerebrum. Some parts of it also control motor nerves, operating the arms and legs.

The cerebellum or the smaller brain is related with the coordination of action of nerves and muscles. In this way movements of body are managed. Medulla oblongata or hind brain contains the centres for reflex actions in addition to automatic movements such as breathing and walking.

Q.6. Explain what is meant by "Non-Conventional sources of energy". Describe any three of these.

Ans. Non-Conventional Sources of Energy Non-conventional sources of energy are those sources which are not in common use at this time but are being considered or explored to bring to routine use in the future. With the exhausion of conventional sources of energy the search for non-conventional sources of energy has been intensified.

Conventional sources of energy are coal, gas, oil, wood and electricity. These sources are in routine use nowadays.

Non-conventional sources of energy are solar energy, geothermal energy, wind energy, tidal power and ocean thermal gradients.

Solar Energy:

The energy of the sun is called solar energy. It has been estimated that on the average 180,000 kilowatts solar energy is falling per square kilometer of the earth. Solar energy is utilized in two ways. A solar furnace contain thousands of mirrors to focus the sun rays. In this way solar heaters produce heat used in industry or houses. The heaters heat up water or air. Solar energy can also be used indirectly. Solar cells made up of panels of semiconductors (usually silicon) are used which when illuminated by sun generated electricity. These kind of cells have frequently been used in space probe. They have not become popular in domestic use due to high cost.

Wind Energy:

Wind mills can be used for generation of electricity. Previously the wind mills were used for grinding of grains. The rotating wings of a wind mill can be attached to a magnet which give an electric current with rotation. Low power, high cost and uncertainties of weather had not made power generation through wind popular.

Geothermal Energy:

Geothermal energy is the heat energy produced inside the earth usually due to radioactivity. Geothermal electricity plant changes the geothermal energy into electricity. Hot water of springs is being used for power generation particularly in USA. Hot springs however are used as geysers for heating the houses.

Q.7. Give brief answers for any five of the following.

(i) Name the two proteins found in milk.

Ans. Casein and Lactalbumin.

(ii) What organ of human body controls the amount of water and salt in blood.

Ans. Kidney.

(iii) Drugs are classified into five major groups name any two.

Ans. Analgesics, Antiblotics, Sedatives, Vaccines.

(iv) How do chromosomes in a male and female enter in a human body.

Ans. Male XY Female XX

(v) Which two gases do you exhale more than you inhale.

Ans. Carbon dioxide, water vapours.

(vi) Name any two glands which secrete hormones in human body.

Ans. Pituitary, Adrenal, Thyroid,

Q.8 Explain any two of the following phenomena:

(i) Lunar Eclipse. (ii) Photosynthesis (iii) Formation of a rainbow.

Ans. Lunar Eclipse

The partial or complete obscuration of light of moon for an observer on the earth is called lunar eclipse.

Lunar eclipse takes place when the earth takes up a position between the sun and the moon. In this way the shadow of the earth is cast on the moon and the moon does not get sunlight in this position.

Lunar eclipse occurs only when there is full moon. But this does not happen on every full moon because of inclination of the axis of earth to its orbit.

Photosynthesis

Photosynthesis is the process in which green plants by using their green pigment chlorophyll trap sunlight to synthesize energy rich glucose in the presence of water and carbon dioxide. The equation for photosynthesis is written as follows:

$$6CO_2 + 6H_2O \xrightarrow{\text{Sunlight}} C_6H_{12}O_6 \text{ (glucose)} + 6O_2$$

Photosynthesis is the only source of food for all the plants and animals. In this process food or glucose is produced by using the energy of the sun. The process is also a photochemical process. During photosynthesis water and carbon dioxide are used. Oxygen is also produced during photosynthesis. Oxygen is necessary for the life of animals and plants as it is used in respiration. Photosynthesis is more frequent in oceans and fresh water due to presence of algae. About 90% of photosynthesis takes place in water.

(iii) Formation of a Rainbow

Formation of a rainbow is a coordinated phenomenon involving refraction, dispersion and internal reflection of sun light by drops of rain suspended in the air. Rain drops function like large number of glass prisms splitting up the composite entering them. Visible sun light is composed of rays of seven colours.

Rainbow is always visible in a direction opposite to the A ray of light enters a drop of water where refraction and dispersion take place. Unequal refraction separates the rays into seven colour. Reflection (internal) takes place at the back of the drop and dispersion is increased when light emerges out of the drop. After emerging from the drop the light split into its constituent colours. Reflection in the di-op reverses the order of colours so that violet occurs on the inner side of rainbow and red on the outside. Since the position of all those drops which send minimum deviated and hence most concentrated rays to the eye of an observer are situated on arcs of-circles, the rainbow appears in the form of a bow.

Q.9. Differentiate between any five of the following pairs:

Ans. (i) Veins and arteries

Veins are the blood vessels which carry blood from all parts of the body to heart. Veins contain blood which is deficient in oxygen but carry carbon dioxide except the pulmonary veins or the veins which carry oxygenated blood from lungs to the heart. Blood contained in veins is called deoxygenated blood. Veins are wider as compared with arteries and have valves to prevent back flow of blood. Wall of the veins are non-elastic.

Arteries

Arteries are the blood vessels which carry blood from the heart to all parts or organs of the body. They carry oxygenated blood except the pulmonary arteries which carry deoxygenated blood to lungs. Arteries have thick elastic walls and have no valves.

(ii) PNP and NPN Transistor

Transistor are made from crystals of a semi-conductor material like silicon or germanium. The conduction of these materials is between the two conductors like copper or silver and non-conductors like wood. Semi-conductor can be imparted peculiar electrical properties by adding some impurities in the semi-conductors. In this procedure electrons can be added to the semi-conductors to start a current or electrons can be removed to cause the holes in semi-conductors.

When electrons are added by mixing an impurity to constitute a current an N type semi-conductor is produced. When electrons are removed from a semi-conductor a p type semiconductor is produced.

Certain combinations of N-type and P-type semi-conductors give transistors the rectifying or amplifying properties of valves. They are made up of three layers, N-P-N (a p sandwiched between two N-types) or P-N-P (an N sandwiched between two P types).

Electronic is based on integrated circuits which are made from various types of semi-conductors.

(iii) **Electronic Current and Static Electricity**

Electric current is a constant flow of electrons in one direction only. This type of current is produced in a battery. The electrons flow from cathode to anode.

Alternating current is the type of electricity in which flow of current or electrons is not in one direction but alternates. Most of today's electricity is alternating current (AC) generated by AC generators.

Static electric charges do not flow through wires. They are caused by electron being pulled from one surface to other. A comb rubbed on hair sometimes give crackling sounds. This is due to jumping of electrons or electric charge produced by transfer of electrons.

The charges are associated with negative charges on electrons and positive charges on protons. The force of attraction between opposite charges and repulsion between similar charges in called electric force.

(iv) **Concave and Convex Lenses**

A concave lens is thinner at the centre and thicker at the rim. It disperses the coming light and are also called diverging lenses.

A convex lens is thicker at the centre and thinner at the rim. These kinds of lenses converge light rays at the focal point are also called the converging lenses.

(v) **Fats and Oils**

Fats are triglycerides. They are esters made up of glycerol (a kind of alcohol) and residues of three fatty acids. Esters are a class of compounds produced by reaction between acids and alcohols with the elimination of water. Fatty acids are long chain organic acids. Fats are usually solid at room temperature. Fat is also made by saturating fatty acids.

An oil is simply a fat that is liquid at room temperature. The only difference between a fat and an oil is the melting point.

(vi) **Absorption and Adsorption**

Absorption is a process in which a substance take up another substance, such as a blotting paper (solid) absorbing water (a liquid). Or a process in which a substance takes up radiation of a characteristic wavelength.

Adsorption is a process in which a substance adheres to the surface of another substance. Adsorption is important in some types of catalysis, notably where gases adsorb on metal surfaces. The reaction is then made easier by a consequent lowering of activation energy.

Q.10. Describe in detail the impact of scientific inventions on agriculture.

Ans. Agriculture and Scientific Inventions

Agriculture has been revolutionized by scientific inventions. This impact is called the green revolution. Before the scientific era the most prominent problems for the farmers were uncertain supply of water, storms, change of weather, drought, insects, pests, locusts, plant diseases, viral-or fungal attack on plants, slow cultivation, slow harvesting and destruction of foods after storage. Today science has overcome many of these problems through many inventions and technology.

1. **Control on Droughts:** Extensive irrigation systems have been developed throughout the world. There are systems of dams, canals and water channels which provide water for the crops and save agriculture from droughts and shortage of rains.
2. **Fertilizers:** Fertilizer or manures which supply nutrients to the plants and crops have increased the crop yield tremendously. Fertilizers have made agriculture possible in those areas where it was not possible due to shortage of some vital minerals or nutrients.
3. **Agricultural Machinery:** Agricultural machinery like tractors, sowing machines, combine harvesters and thrashers have made the agriculture very quick and efficient. Machines have made agriculture possible in vast areas. Cutting, harvesting, husking and storage have been made safe, quick and efficient.
4. **Pesticides:** A large number of pesticides available in the markets through the development of science has made possible to save crops from the attack of pests.

Insects and locust were a very big danger for crops. Millions of tons of crops were destroyed by insects. Now a vast variety of insecticides have saved the crops from the attack of insects.

Herbicides kills unwanted herbs from crops and save energy of the farmers. Rodenticides kill mice and rats which are major destroyers of stored grains.

5. **Improved Seeds:** A variety of very efficient and high yielding seeds have been prepared by plant breeding and genetical techniques. There seeds have tremendously increased the yields of crops.

6. **Disease Free Plants:** Many varieties of plants have been got or improved by genetic or other techniques which can combat the diseases caused by fungus or viruses.

7. **More Crops and Rotation:** A new machine has been introduced by Japan which performs multiple functions. It prepares land immediately after cutting one crop for the second crop, drops seed and mixes manure. All these activities are performed simultaneously and the farmers don't have to wait for many days.

8. **Transport of Agricultural Goods:** Recent means of transportations have greatly helped the farmers to transport agricultural products to the factories or market. It has reduced damage by storage or slow transport.

9. **New Varieties:** Many new wit-ties of plants or crops have been produced. These varieties show many desirable characters like high yield and more resistance to weather.

10. **Genetic Engineering:** Genetic engineering of places have produced many new plants with very high or desirable qualities. These qualities are high yield, low cost, quick growth, resistance against insects, resistant against drought, resistant against fungal or viral diseases and good quality of food produced.

Q.11. What are viruses? Describe their structure. Which of the following diseases are caused by virus and which are caused by bacteria?

(i)	Polio	(ii)	Diphtheria
(iii)	AIDS	(iv)	Tetanus
(v)	Smallpox	(vi)	Measles

Ans. Virusos are the micro-organisms which are strict or obligate parasites of animal or plant cells. Many of the viruses also parasities on bacteria. A large number of viruses cause diseases in plants and animals.

A virus consists of two components, a protein coat of the virus particle and a core of a nucleic acid which is either DNA or RNA. DNA viruses are called adenoviruses and RNA viruses are called retroviruses. The shape of a virus is due to its protein coat. Viruses are of many shapes i.e. rods, spheres, with hexagonal sides or icosahedral. Sometimes their shape is complicated.

Viruses replicate inside a living cell and many viruses are synthesized along with their protein coats and nucleic acid. The nucleic acid contains instructions for the shape of the virus.

i) Polio is caused by a virus. ii) Diphtheria is not caused by a virus.
iii) AIDS is caused by a virus. iv) Tetanus is not caused by a virus.
v) Smallpox is caused by a virus. vi) Measles is caused by a virus.

Q.12. Describe the principle, construction and working of telephone.

Ans. The working of a telephone is based on Faraday's induced current. It consists of coils of fine insulated wire wound round the poles of a permanent horse shoe magnet. A soft iron sheet called diaphragm is positioned near the end of this magnet. The magnetic lines of force crossed in this disc and in this way their rearrangement takes place around the magnet. When this diaphragm is put to vibration by human vocal sound this vibration changes the number of lines of forces passing through the coil. In this way fluctuating induced current is passed.

If the terminals of the coil wound over the poles of another horse shoe magnet with a diaphragm in front, these varying currents produce similar variations in its magnetic field with the result that the disc in front vibrates exactly as does the disc at transmitting end thus sound is faithfully reproduced.

If the stations are very far apart, the electric currents are weakened. Then variations are imposed on an electric current from a battery. In one type of transmitter the voice is delivered in front of a thin flexible carbon plate supported round its edge. Behind this is a small cavity loosely packed with carbon granules and a fixed carbon plate at the back. The two carbonplates are connected to a battery and the receiver at the distant station. Under the influence of voice or music the carbon granules are compressed or decompressed varying the circuit resistance and thus the current. These variations in current passing through the coil produce the required variations in the current operating the distant telephone.

Q.13. Which part of a plant do they belong to:

(i) Ginger (ii) Reddish (iii) Potato (iv) Cinnamon
(v) Peanut (vi) Saffron (vii) Almond (viii) Chillies
(ix) Spinach (x) Tomato

Ans: i) Stem ii) Root iii) Stem
iv) Bark of Stem v) Seed vi) Stigma/flower
vii) Fruit viii) Fruit ix) Leaves
x) Fruit

Q.14. Which field of study do the following branches of science represent?
(i) Haematology (ii) Cytology (iii) Morphology
(iv) Psychology (v) Geology.

Ans: i) Study of blood and its constituent cells.
ii) Study of the cells.
iii) Study of the structure of organs of organisms.
iv) Study of nature, function and phenomenon of human mind.
v) Study of features and properties of earth and its constituent rocks.

Q.15. Fill in the blanks with the correct choice.

(i) In a heat engine, heat energy is changed into ——— (mechanical energy, magnetic energy light energy):

Ans. Mechanical energy.

(ii) Frequency of audible sound in Hertz (Hz) is ——— (20-20,00Hz, 20,000-30,00011z, 30,000-40,00011z)

Ans. 20-20,000Hz.

(iii) Deficiency of Vitamin B causes ——— (rickets, beriberi, night, blindness)

Ans. Beriberi.

(iv) Cheapest source of producing electricity is ——— (coal, natural gas, water).

Ans. Water.

(v) The smallest unit of measurement of wavelength is ——— (micrometer, angstrom, manometer).

Ans. Angstrom.

(vi) The chemical generally used in refrigerators is ——— (ethylene, glycol, freon, methyl alcohol).

Ans. Freon.

(vii) The unit "TON" to specify air conditioners is equal to ——— (10,000 BTU/hour, 12000 BTU/hour, 16000 BTU/hour).

Ans. 12000 BTU/hour.

(viii) Unit of electricity 'Kilowatt Hour' is the unit of ———, (force, work, power).

Ans. Work.

(ix) Period of famous Muslim scientists is ——— (3rd-5th century, 6th century, 7th-13th century).

Ans. 7th-13th century.

(x) Heat radiation travels at a speed equal to ———(half the speed of light, speed of light, speed of sound).

Ans. Speed of light.

SOLUTION

EVERYDAY SCIENCE 1995

Note: Attempt any TEN questions. All questions carry equal marks. Draw diagrams where necessary. Negative marking would be done for incorrect answers in Question No. 1 and 14.

Q.1. Which of the following statements are true and which are false? (1/2 each)

(a) Cryptogams are non-flowering plants:

Ans. True.

(b) Reserve food material is usually stored as glycogen in plants:

Ans. False, stored as starch.

(c) Streptococcus is a gram negative bacteria.

Ans. False, Gram positive.

(d) Spinach is a good source of Vitamin-K:

Ans. True.

(e) Insulin is a hormone secreted by the spleen:

Ans. False, secreted by pancreas.

(f) Femur is a bone of forearm:

Ans. False, bone of thigh.

(g) The moon has no atmosphere.

Ans. True.

(h) Excessive burning of fossil fuels cause acid rain.

Ans. True.

(i) Twenty first of June is the longest day of the year in the northern hemisphere.

Ans. True.

(j) Electricity is a secondary source of energy.

Ans. True, coal, petroleum and gas are primary sources.

Q.2. Define any five of the following scientific terms (1 each).

(a) Doping (b) Immunization (c) Pasteurization
(d) Modulation (e) Catabolism (f) Reprocessing of reactor fuel.

Ans. **Doping:** The introduction of impurities (or various materials) into a crystal lattice, giving altered electrical or other properties to the crystal.

Immunization: Any process that develops resistance (immunity) to a specific disease in a host.

Pasteurization: The process of heating a liquid food or beverage to a controlled temperature to enhance the keeping quality and destroy harmful micro-organisms.

Modulation: The process of changing the frequency or pitch of signal carrying waves to match the pattern of the signals in radio transmission.

Catabolism: The type of metabolism or the biochemical pathways by which large organic molecules are broken down by enzymes into their simpler constituents for acquisition of energy.

Reprocessing of Reactor Fuel: The process in which uranium from a reactor is recovered, purified and reused (recycled) in the reactor again or for making nuclear weapons.

Q.3. What do you understand by the term "Deforestation"? Discuss its ill effects on mankind?

Ans. Deforestation: It is the process of destruction of the forests. A number of agents are responsible for removal of forests. These are fires, drought or animals. The principal agent of deforestation is the man himself. Humans are cutting forests to colonize the forest areas or to establish cities. Forests are cut to prepare more agricultural lands or for getting wood.

1. Deforestation has many bad effects on human life. With destruction of the forest the process of cleaning of air and production of oxygen is badly affected.
2. Forests are major agents of evaporation and rainfall. With deforestation rain fall is decreased.
3. With cutting of forests, pollution is increasing as the hazardous gases are not completely absorbed by plants.
4. With deforestation carbon dioxide is increasing which is causing global warming.
5. With reduction in area of forest, soil erosion is taking place resulting in floods which destroy crops and human life.
6. Deforestation has badly damaged wild life and reduced recreation sites.

Q.4. Fill in the blanks:

(a) The largest planet of the solar system is ———.
Ans: Jupiter.
(b) The outermost layer of the earth is called ———.
Ans: Crust of the earth.
(c) Newton is the unit of ———.
Ans: Force.
(d) Radium was discovered by ———.
Ans: Marie Curi in 1898.
(e) The memory of the computer is expressed in ———.
Ans: Bytes.
(f) Quartz is a crystalline form of ———.
Ans: SiO_2 (Silica).
(g) AIDS is caused by ———.
Ans: HIV virus (Human Immune deficiency virus).
(h) Chemical name of gypsum is ———.
Ans: Calcium Sulfate.
(i) Molten superhot material present inside a volcano is called ———.
Ans. Magma.
(j) Richter scale measures the severity of ———.
Ans. Earthquakes.

Q.5. What is the composition of blood? Describe six main functions of blood.

Ans. Blood is a tissue which contains various types of cells. About 55% of the blood is plasma while 45% are the blood cell Red blood cells are biconcave discs containing the protei hemoglobin. Haemoglobin is very important in transporting oxygen to all the cells of the body. There are approximately million blood cells in 1 nuns of blood. Red blood cells have a average life span of 120 days. The white blood cells or buccocyte are fewer in number (8000 per mm3) as compared with red blood cells. The third type of cells or cell products are the platelets These are important in clotting of blood.

Functions of Blood:

1. Blood is important in transport of oxygen to all parts of the body.
2. Blood also transport carbon dioxide from tissue to body lungs.
3. Blood is responsible for taking digested food from alimentary canal (gut) to all the cells of the body.
4. Blood contains Immunoglobins or antibodies which combat against antigens and disease causing micro organisms.
5. All endocrine glands pour their hormones into blood which are then taken by blood to all parts of the body.
6. Blood maintains the vital salt and water balance of the tissues and cells and also keeps osmotic pressure, maintained.
7. Insulin present in blood helps the cells to take up glucose and use it.
8. The waste products of the body like urea, excessive salts metabolites and drugs are taken by blood to kidneys front where they are excreted.
9. Blood circulation provides pressure for the kidneys to filter out harmful and surplus substances of the body.
10. Blood contains proteins for clotting of the blood.
11. White blood cells engulf or eat up damaged cells, bacteria and other foreign particles.
12. White blood cells help in healing of the wounds.

Q.6 Write short notes (not more than 150 words) on any two of the following.
(a) Semi-conductors. (b) Pesticides. (c) Laser.

Ans. Semiconductors: Tiny electronic devices were made possible by the use of semi-conductors which form integrated circuits. Semi-conductor is a material having properties between a true conductor like

copper and a true non-conductor like glass. Semi-conductors have peculiar electrical properties because of the presence of trace amount of certain impurities. With one kind of impurity some free electrons are produced which constitute an electric current. This type of semi-conductor is called n-type semi conductor. With another kind of impurity some electrons are removed from the semi-conductor or holes are produced. This type of semi-conductor is called a p-type semi-conductor.

Combination of n-type and p-type semi-conductors give semi-conductors rectifying properties or amplification properties like valves. They are constructed in an arrangement of p-n-p or n p-n. Germanium and silicon are materials used for semiconductors.

Pesticides: Pesticides are usually the chemicals or synthetic substances which are used to control pests. Some famous pests are the insects, rodents, herbs, mites, fungus, nematodes and some mammals.

Insects damage crops, agricultural products, cloths, wood, furniture and stored grain. Pesticides used to kill insects are called insecticides. Many kinds of insecticides are used to control insects. Some of the insecticides are called chlorinated insecticides, some are called phosphorylated insecticides while still others are called pyrethroids and carbamates.

Herbs are damaging for the crops belonging to the family graminae like wheat, maize and sugar cane. Herbicides are the chemicals which kill the herbs.

Rodents like rats and mice destroy foods, crops and other structures. Rodenticides are the chemicals or agents which are used to control or kill rodents.

Mites and ticks are harmful arthropods which act as carriers of disease causing micro-organisms. Miticides kill mites.

Fungi damage plants, crops, wood, fabrics and other materials. Fungicides are the chemicals which kill fungi.

Nematodes cause diseases in human beings and also damage plants. Nematicides kill nematodes.

Laser: Laser stands for light amplification by stimulated emission of radiation. These are high energy radiations used in various operations and research.

An amplifying material such as a gas, crystal or liquid is placed in a long tube between appropriate mirrors. Photons from a light beam repeatedly pass through it stimulating more photons and thus increasing their number with each pass. An enhancing or amplifying coil enhances the photons. The additional photons all have the same frequency, phase and direction. A mirror placed at the emerging end of the tube focusses the beam. This external beam can be continuous or pulsed.

Three prominent characteristics of lasers are monochromacity, spatial coherence and collimation. Monochromacity means that laser is of a single colour. Spatial coherence means that troughs and crests of all waves are at the same position and collimation means that rays are nearly parallel to one another and diverge only slightly as they travel. So a laser beam of 1 foot diameter when sent to the Moon in 1962 fell on an area of 2 miles diameter. A beam of ordinary light would have spread on an area of 25000 miles diameter.

Q.7. Write short notes (not more than 100 words) on the life and works of any two of the following scientists.

(a) Ibn Al-Baitar. (b) Al-Beruni. (c) Ibn Al-Haitham.

Ans. Ibn Al-Baitar

Zia-ud-Din Ibn Al-Baitar was a renowned botanist and pharmacopist of middle ages. He lived in the 13th century A.D. He travelled extensively and discovered many plants. He classified the plants and listed the properties of the plants in his books. He was author of a number of books.

Al-Beruni (973-1048 A.D.)

Al-Beruni was one of the most famous scientists of the Islamic world. He wrote more than 150 book on various subjects like mathematics, physics, geography, astronomy, cosmology, archaeology, history, biology, geology, comparative religion, chemistry, culture and civilization. He discussed the behaviour of earth, moon, sun and planets in his book "Qanoon Almasudi." He elaborated a method for determination of longitude and latitude of a place on earth. He was born in Afghanistan.

Ibn-Al-Haitham (965-1039 A.D.)

Abdul Ali, Hassan Ibn-al-Haitham was a great scholar of iphysics, mathematics, medicine, engineering, astronomy and optics. His famous book "Kitab-ul-Manazir" describes the nature of light and the phenomenon of vision. He described the function of eye. He gave a formal definition of a ray of light. He was

the first scientist to elaborate two laws of reflection of light. He was born in Basra.

Q.8. Give brief explanations for any five of the following:

(a) The earth bulges out at the equator.

Ans. The earth is not a true sphere but an elliproid. Its equatorial diameter is 12756.274 km while polar diameter is 12713.505 km. There is a difference of about 43 kilometres. The rotation of the earth on its axis produced a centrifugal force which increased its equatorial diameter.

(b) The sun appears red at the sunset and sunrise.

Ans. At sunset or sunrise the sun appears red due to scattering of light by small particles of dust or smoke near the surface of the earth. In this situation light rays have to travel a greater distance. Dust and other particles scatter other colours like blue and violet but don't scatter red light. Red light travels relatively unhindered and thus the sun appears red.

(c) Ozone layer in the upper atmosphere is necessary for our survival.

Ans. Ozone (O_3) layer is formed in the upper atmosphere under the influence of sun rays (UV radiations). This ozone layer is a good absorber of UV radiation coming from the sun. It acts as a shield or screen against these radiations. UV radiations are injurious, for life. They can kill some organisms and cause malfunctioning in others. In human beings they cause skin cancer or blinding of eyes. In this way ozone layer is necessary which protects us from dangerous effects of UV radiations.

(d) The sky when viewed from the moon appears completely black.

Ans. The sky looks blue while standing on the earth during the day. There are two reasons for that. It is the air or atmosphere of the earth, which reflects blue light. Moreover our eye is more sensitive to blue light and thus we see the sky as blue. If there had been no atmosphere of the earth we would always have seen the sky black. The moon has no atmosphere, so the sky look black or dark even during the day.

(e) Australian continent has winter season when we have summer season in Pakistan.

Ans. The earth on its axis is not at a vertical angle to its orbit. It is inclined at an angle of about 23.5 degree from the plane of the orbit. In this way when the northern hemisphere of the earth is inclined to the sun and getting direct sun rays, southern hemisphere is inclined away from the sun and getting less direct rays. Thus the northern hemisphere has summer season and southern hemisphere has winter season. Pakistan is in the northern hemisphere while Australia is in the southern hemisphere. So when there is winter season in Australia there is summer season in Pakistan.

(f) Roads are bent inward on curves.

Ans. When an object turns in a circle it is influenced by a centrifugal force which pushes it away from the center of the circle. When vehicles turn on a road they fall outside under the influence of centrifugal force. In this way there is danger of falling or slipping out of the road at a turn. Roads are made in a way that these bent inward at the turns to avoid falling outside and to prevent accidents.

Q.9. Write an essay (not more than 200 words) on 'variation of apparent moon size.' Draw diagram to support your description.

Ans. Moon is a satellite which orbits around the earth. It completes its round in 27.3 days. it always keeps the same face towards the earth. This kind of motion is called synchronous rotation. During this cycle the moon rotates along its axis in the same, time as it completes one round around the earth. We can see only 59% of the surface of the moon iron earth.

The moon does not have its own of light. Thus it shines due to reflected sunlight. We sea various stages of moon due to reflection from various surface regions of moon. The stages are called various phases of moon.

The phases of the moon are apparent phases which appear due to the position or angle of the observer standing on the surface of the earth. Otherwise about half of the moon is always bright due to the light coming from the sun.

Q.10. Classify the following animals as reptiles, mammals, birds and fish.

(a) Blue whale	(b) Cobra	(c) Panda	(d) ostrich
(e) Penguin	(f) Kiwi	(g) Shark	(h) Alligator
(i) Dolphin	(j) tortoise		

Ans: (a) Mammal (b) reptile (c) Mammal (d) Bird

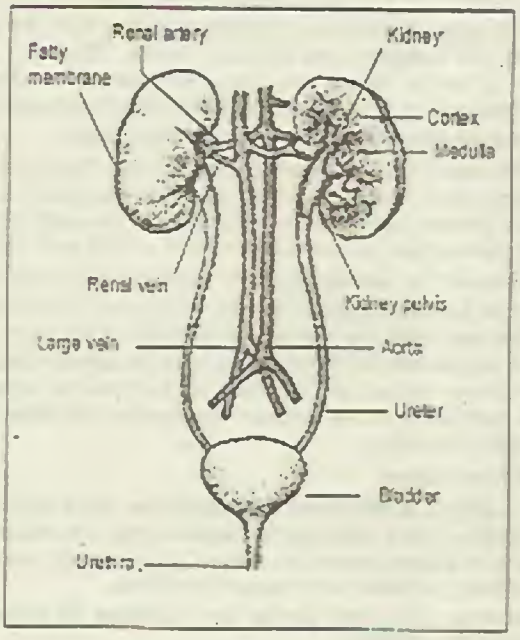
(e) Bird (f) Bird (g) Fish (h) Reptile

(i) Mammal (j) Reptile

Q.11. Name all the organs of the excretory system of the human body. Draw a labelled diagram and explain the function of each organ.

Ans. The excretory organs of human body are the: kidney which is associated with ureter and urinary bladder with urethra.

Sweat glands present on the skin are other secretory organs. Sebaceous glands associated with the roots of hair are also excretory in nature. Kidneys are important in keeping balance of salts and water inside human body. They also excrete toxic substances of the body. The chief toxic substance of the body is urea which is produced by degradation of protein. Urea is secreted by kidneys. Blood enters the kidney under pressure and filtered for removal of toxic substances. Sweat glands secrete water and salts while sebaceous gland secrete oily secretion near hair on the skin.



Q.12. Differentiate between the following:

(a) Hypoglycemia and Hyperglycemia.

Ans. Hypoglycemia: Hypoglycemia is a physiological condition in which glucose level (amount of glucose) in blood decreased from normal glucose level.

Hyperglycemia: Hyperglycemia is the condition in which blood glucose level increases than the normal level.

(b) Epidemic and Endemic.

Ans. Epidemic: Epidemic is a disease which has many Oases in a particular geographic region within a short time period.

Endemic: Endemic is a disease having low incidence but constantly present in a particular geographic region.

(c) Herbivores and Carnivores.

Ans. Herbivores: Herbivores are those animals which eat plants or plant materials like, grass leaves or vegetables. Examples are goats, cows, deers and giraffes.

Carnivores: Carnivores are those animals which hunt other animals or eat flash like lions, cats and wolves.

(d) Photosynthesis and respiration.

Ans. **Photosynthesis:** Photosynthesis is the photochemical process in which green plants synthesize food or sugar by using sunlight in the presence of carbon dioxide, water and chlorophyll present in green parts of the plant. Light energy is changed to biochemical energy of sugar or other organic compound and oxygen is released during this process.

Respiration: Respiration is the process in which living organisms or cells break down energy rich organic compounds like glucose using oxygen to get energy for various activities of the cells. In this process glucose is broken down and carbon dioxide is produced.

(e) **Pollination and Fertilization.**

Ans. **Pollination:** Pollination is the process of the transfer of pollen from male to female parts in seed plants. It is the transfer from anthers to stigma of ovary.

Fertilization: Fertilization is the process which involves union of male gamete or sperm with the female gamete or ovum to produce a zygote. This is essential for sexual reproduction. A zygote gets genetic material and characters from both parents.

Q.13. **How do our domestic and industrial activities pollute water? Explain with reference to two important industries of Pakistan.**

Ans. **Water Pollution:**

Everyday, we use water and release wastes in our environment. Similarly the industries release their wastes which contain huge quantity of hazardous and toxic substances. All these wastes ultimately reach to natural water bodies like ponds, lakes, streams and rivers. The most prominent example is of river Ravi which has been changed into a virtual cesspool near Lahore.

Domestic wastes contain soaps, detergents, oils, plastics, cleaning solvents and pesticides. All these toxic chemicals or waste food materials pollute natural waters in our environment. A large number of disease causing bacteria, viruses and other organisms are also released in urban wastes. The estimated death rate due to disease causing organisms throughout the world is 25000 per day.

Pesticides used in agriculture are a big source of pollution of water. These pesticides particularly the insecticides are reaching water and contaminating it. One of the biggest source of water pollution is the tanning and leather industry. The industry uses toxic chromium metal and many other toxic chemicals. These toxins are released in natural waters. Effluents of this industry have polluted ground water and water of nearby rivers. This industry is frequent in Kasur and Sialkot area.

Pesticide industry in Kala Shah Kaku near Lahore releases huge quantity of acids, pesticides and other dangerous wastes. These wastes are getting entry into a stream flowing nearby. The water of the stream is dangerously polluted. This water ultimately goes to the rivers.

Q.14. **Fill in the blanks with correct choice:**

(a) **pH of blood is (4.3-4.4, 7.3-7.4, 9.3-9.4)**

Ans. 7.3-7.4.

(b) **One of the countries through which equator passes is (Kenya, Pakistan, Malaysia).**

Ans. Kenya.

(c) **Purest form of Iron is (pig iron, wrought iron, cast iron).**

Ans. Wrought iron.

(d) **Hypo is a solution of (Sodium chloride, Silver nitrate, Sodium thiosulfate).**

Ans. Sodium Thiosulphate.

(e) **Cod liver oil contains (Vitamin K, Vitamin E, Vitamin D). Vitamin D.**

Ans. Vitamin D.

(f) **Aorta is an organ of (nervous system, circulatory system, digestive system).**

Ans. Circulatory system.

(g) **Planet Mars has (one, two, four) moons.**

Ans. Two.

(h) **Bauxite is an ore of (Boron, Aluminium, Aluminium, Magnesium).**

Ans. Aluminium.

(i) **Circular aperture which appears as a dark spot in the eye is called (iris, pupil, lens).**

Ans. Pupil.

(j) **The most distant planet in the solar system is (Mars, Pluto, Jupiter).**

Ans. Pluto.

Q.15. Match the scientists and their discoveries/inventions given in Column (a) and (b);

(a)	(b)
Einstein	Neutron
Roentgen	laws of heredity
Charles Darwin	X-rays
Chadwick	Theory of evolution
Mendel	Mass energy conversion equation

Ans:

(a)	(b)
Einstein	Mass energy conversion equation
Roentgen	X-rays
Charles Darwin	Theory of evolution
Chadwick	Neutron
Mendel	Laws of heredity

SOLUTION

EVERYDAY SCIENCE 1996

Note: Attempt any ten questions. All questions carry equal marks'. Draw diagram where necessary. Negative marking would be done for incorrect answers in Question No. 1 and 2.

Q.1. Which of the following statements are true.

(a) Jabir-Ibne Ilayyan was the author of the book Kitab Al-Manazir.

Ans. False, Ibn-al-Haitham was the author of Kitab AlManazir.

(b) Abul Qasim Al-Zahravi was a famous Muslim mathematician.

Ans. False, Abul Qasim was famous in surgery and medicine.

(c) The speed of light is nearly 300,000 km/sec.

Ans. True.

(d) Ideally water can be used as a car fuel after electrolysis.

Ans. Yes, Oxygen and hydrogen can recombine to release energy.

(e) A machine help us do more work with less force.

Ans. Yes, due to less friction.

(f) Our eye is very sensitive to blue light.

Ans. False.

(g) We can receive TV sound signal on our FM radio-sets.

Ans. False.

(h) Sound can travel through vacuum.

Ans. No, it requires material medium.

(i) Famous Muslim botanist Ibn-Al-Baitar lived during the period 700-900 A.D.

Ans. False, he lived in 13th century A.D.

(j) A ceramic engine would have greater efficiency.

Ans. Yes, due to less loss of energy.

Q.2. Fill in the blanks with the correct choice.

(a) Al Beruni died in ——— A.D. (848, 1048, 1248)

Ans. 1048.

(b) Abu Ali Sina was born in———. (Iraq, Turkey, Spain)

Ans. Turkey. He was actually born in modern Uzbekistan, Central Asia, at that time in Turkish influence.

(c) ——— colour has shortest wavelength. (Blue, Yellow, Green)

Ans. Blue.

(d) ——— metal has the highest electrical conductivity. (Silver, Tungsten, Copper)

Ans. Silver.

(e) Light travels fastest in ———. (glass, vacuum, plastic)

Ans. Vacuum.

(f) Our solar system has about ——— satellites. (Thirty-five, fifty, ninety six)

Ans. Fifty

(g) The universe is ———. (contracting, expanding, stationary)

Ans. Expanding.

(h) The disease, haemophilia is caused by the deficiency of vitamin ——— (A, K, D)

Ans. K, actually it is a genetic disease but also occurs due to deficiency of Vitamin K.

(i) ——— is a natural polymer. (Glucose, Protein, Polyethylene)

Ans. Protein.

(j) ——— cannot be nominated for the Nobel Prize. (Physicists, Economists, Astronomers)

Ans. Astronomers.

Q.3. Define any five of the following terms.

(a) Biogas:

Biogas is the gas which is produced by the activity of micro-organisms on wasted organic matter. Its main constituents are methane and CO_2.

(b) Geothermal Energy:

The energy produced by or got from molten lava present under the crust of earth and also got from hot springs and geysers.

(c) Vaccines:

A preparation of killed or attenuated (weakened) microorganisms, or their components, or their products that is used to induce active immunity against a disease.

(d) Antibiotic:

A substance of microbial origin that has antimicrobial activity in very small amount.

(e) Ceramics:

A group of substances in which a combination of two or more metals with oxygen confer special and certain desirable qualities like hardness and resistance to temperature and chemicals.

(f) Light year:

A light year is a unit of distance used to measure distances between planets and stars. It is equal to the distance travelled by light in one year. A light year is approximately 94.61000 million km (5875000 million miles).

Q.4. Briefly discuss classification of plants giving suitable example of each type.

Ans. The plant kingdom is divided into two sub-kingdoms. One sub-kingdom contains five phyla of algae. All algae contain the green pigment chlorophyll. They may also contain other pigments that distinguish the kinds of algae from one another. Algae are used as food for animals that live in water. Clamydomonas, Kelp, Ulva and Chara are some names of algae.

The other sub-kingdom of the plant kingdom is divided into two phyla, the bryophytes and tracheophytes. The bryophyte phylum includes the mosses and liverworts. Bryophytes grow in all parts of the world on moist land along river banks, on rocks near water falls, and on damp forest floors.

The tracheophyte phylum contains the vascular plants. Tracheophytes have vessels, or tubes that carry food and water hroughout the plant. Examples of tracheophytes are ferns, cone- bearing plants and flowering plants.

Tracheophytes include Pteridiophytes which are ferns and jclubmosses. Ferns are spore-bearing, non flowering plants. Their leaves are called fronds. Dryopterus is a common fern. Clubmosses are allied to ferns. They have a larger spore-bearing generation with conducting vessels which alternates with a small underground sexual generation. Lycopodium clavatum is a common clubmoss.

Gymnosperms: Gymnosperms are the plants in which seeds are naked. They are common to everyone in the form of pines, cyprus and spruce. Gymnosperms include conifers. These are trees or shrubs

with leaves that are needles or scales. The flowers are male and female cones and pollen is distributed by wind. Pines, firs or spruce are common in Murree Hills. Cycads are primitive flowering plants superficially resembling a fern or palm but belonging the gymnosperm group. Cycas rivuluta is a common cycad grown in lawns for decoration.

Angiosperms: Angiosperms are flowering plants in which the seeds are enclosed within an ovary which later forms fruit. Most of the herbs, grasses, bushes and trees in the world belong to angiosperms. They are divided into two groups, the monocotyledons and dicotyledons.

Monocotyledons are those angiosperms which have only one cotyledon in their seed. Cotyledon is a larger part of the seed which stores food for the growing seed and sometimes forms first leaf of the young plant. Monocotyledons have narrow leaves with parallel veins and hollow or soft stems. The flower parts are arranged in group of threes. Most are small plants like grasses, wheat, sugar cane, bamboo and maize but some are larger like palms.

Dicotyledons are flowering plants in which seeds have two cotyledons. Their leaves are broad, usually divided into two equal parts. They include herbs, shrubs and most of the trees. This group include largest number of plants we see around us like rose, mango tree or maple tree etc.

Lichens: Lichens are a close association of a fungus and an alga and have dual nature. The alga produces and provides food through photosynthesis while the fungus absorbs water and minerals from soil or rocks. Lichens are plants of extreme environmental conditions and grow on rocks.

Q.5. What are endocrine glands? Name any two. From which part of the body are the following secreted: insulin, Thyroxin, Adrenalin, oestrogen, Testosterone, Cortisol.

Ans. Endocrine Glands: Endocrine glands are secretary tissues (glands) which secrete hormones directly into the blood stream. They are also called ductless glands. Hormones are chemicals that cause certain changes in the body, they are carried by blood and help regulate proper functioning of the body. Hormones have a very important role in metabolism and development of animal and human body. Pituitary gland is a very important gland which secretes a growth hormone in addition to other hormones. Less production or absence of growth hormone leads to dwarfism while excessive production causes gigantism or tallness. Similarly thyroid gland is another important gland which secretes thyroid hormone.

	Name of Hormone	Part of body from where secreted
1.	Insulin	Endocrine pancreas
2.	Thyroxin	Thyroid gland
3.	Adrenalin	Adrenal gland
4.	Oestrogen	Ovaries
5.	Testosterone	Testes
6.	Cortisol	Adrenal gland

Q.6. What does LASER stand for? Describe four different applications clearly stating their principle.

Ans. LASER stands for Light Amplification by Stimulated Emission of Radiation. it is an intensified beam of rays.

A gas, crystal or refractive material is placed between appropriate mirrors. Photons from a beam of light successively pass through the material, generating more and more photons. The photons produced in this way have the same frequency, phase and direction. One of the mirror is adjusted in such a way that a high energy beam come out of it. This beam is either continuous or pulsed. The beam can be focussed on very small areas with high intensity.

The most prominent features of LASER are that it is monocromatic or single coloured light; it is spatially coherent so the crests and troughs of the waves are at same position and it is .collimate which means that the rays are nearly parallel to one another and diverge only slightly as they travel. Laser has got application in physics, chemistry, photography, telecommunication, surveying and ranging medicine and nuclear reactions.

as the result of the action of a force of 1 newton acting in the direction of motion.

1 J = 1 Nm.

Electrical Energy changed into ⟶		Name of devices.
1.	Heat	Electric heater, Iron (press)
2.	Light	Bulb, tube light, flash light, car head light etc.

3.	Sound	Radio, electrical piano, T.V. etc.
4.	Machanical Energy	Electrical motor, fan, juicer, etc.

Q.8. What do the following abbreviations stand for?

(a)	LPG	(b)	TNT	(c)	RNA
(d)	CNG	(e)	ATP	(f)	RBC
(g)	ECG	(h)	PVC	(i)	RAM
(j)	CFC				

Ans. (a) LPG: Liquefied Petroleum Gas.
(b) TNT: Trinitrotoluene.
(c) RNA: Ribonucleic Acid
(d) CNG: Compressed Natural Gas.
(e) ATP: Adenosine.Triphosphate.
(f) RBC: Red Blood Cell.
(g) ECG: Electrocardiogram.
(h) PVC: Polyvinyl Chloride.
(i) RAM: Random Access Memory.
(j) CFC: Chlorofluorocarbon.

Q.9. Write short notes on any two of the following.
(a) Arid Rain, (b) Greenhouse effect, (c) Ozone depletion:

Ans. Acid Rain: Precipitation (rain, vapors) mixed with acidic chemicals of the atmosphere lower the pH of rain water and thus cause acid rain. Acid rain is a hazard for life on the earth.

Burning of coal, gas automobile exhausts and other industrial processes release sulfur dioxide and nitrogen oxides in the air. These gases when mixed with atmospheric moisture or water cause acid rain. Acid rain contains sulfuric acid or nitric acid. Lightning during rain also produces nitric oxides which add to acid rain.

Atmospheric industrial pollutants are the main cause of acid rain. Acid rain is damaging forests, plants and agriculture, raising the acid level in lakes and ponds, killing fish and aquatic life and damaging human health.

The most prominent dispute between USA and Canada is due to acid rain. Canada claims that somehow US industrial pollutants are drifting to Canada and are causing acid rain in Canada. This acid rain has made many Canadian lakes acidic and caused killing of fish and disorders of the ecological system. Similarly killing of fish by acid rain has been reported in Norway, Sweden and north eastern United States.

Pure rain water has a pH of about 5.6. This is because the rain combines with the carbon dioxide in the air. Carbon dioxide is a waste product of burning and other life processes. Water and carbon dioxide form an acid called carbonic acid. But pollutants make water more acidic. In the last 25 years the average pH of rain in the north eastern United States has dropped to 4.1. On occasions the pH has been as low as 3..

Acid rain is commonly found in large cities, areas of large population and in industrialized areas. This is because these areas usually have more air pollution. But wind can carry pollutant far from their source. Thus acid rain can fall in any area of the country or world.

Besides the health hazards to many forms of life, acid rain causes other problems. It corrodes, or wears away, metal, painted surfaces, and even stone buildings and monuments. Sculptures built in Germany as early as 1702 showed no corrosion in 1908 photographs. Photographs taken in 1969 showed noticeable corrosion.

As the energy crisis continues, more and more coal is burned for energy. So the problem of air pollution continues to become more serious. Some environmentalists believe that acid rain would continue to be a major environmental problem for many years to come.

Greenhouse Effect: Global weather monitoring scientists have reported that the temperature of the atmosphere of the earth is rising gradually. This increase in temperature is due to greenhouse effect. The name of the phenomenon is derived from a glass built house or enclosure in which plants are grown. Sun rays pass through glass shields to reach the plants (for photosynthesis) but the heat coming from sun cannot come out of the greenhouse and thus the temperature of the greenhouse rises. Recently it is

reported that the temperature of the atmosphere of the earth has risen by 1 degree centigrade. This trend of temperature rise is called global warming.

Greenhouse effect is mainly caused by an increase in the amount of greenhouse gases. There gases are carbon dioxide, nitrous oxide, methane, chlorofluorocarbons and benzene in the atmosphere. Scientists have estimated that the concentration of carbon dioxide in the atmosphere before the industrial revolution was between 275 and 285 parts per million and after it by 1980 it had risen to 338 parts per million. This increase is due to burning of fossil fuel and destruction of forests.

Even a small amount of carbon dioxide produces an important greenhouse effect. Much of the solar radiation that reaches the surface of the earth is absorbed in the ground. As a result the surface is heated up and in turn emits its own radiation of very long wavelength. Atmospheric carbon dioxide acts as a shield to these heat waves, so that some of the outgoing radiation is trapped, causing the earth's surface to heat up still further. It has been estimated that the greenhouse effect warms the earth's surface by as much as 15 degree centigrade.

Almost all of the radiation is sent back into space and temperature does not rise. Actually the earth is in a state of thermal equilibrium which keeps the surface temperature fairly constant. This equilibrium is, however, disturbed by the gradual increase of atmospheric carbon dioxide as a result of industrialization. It is noticeable that the highest intensity of greenhouse effect is discovered on the planet Venus. The planet is wrapped in a thick blanket of carbon dioxide. It is not the planet nearest to the sun. Mercury is the planet nearest to the sun but it is not the hottest planet. Venus is the hottest planet with its surface temperature 400°C. This high temperature is due to the greenhouse effect on the planet caused by very high concentration of carbon dioxide in its atmosphere.

Carbon dioxide is not the only gas to cause greenhouse effect. Chlorofluorocarbons (CFCs) trap heat 10,000 times as dioxide. They are mostly used in replaceable luxuries like air conditioners perfumes and fast food containers. They ore of are also leading destroyer of ozone layer in the upper atmosphere the earth. Alarmed by a series of droughts and heat waves, a ban has been suggested on CFC production by the end of the century. It would probably cut greenhouse warming — after a lag — by up to 15%.

Ozone Depletion

The composition of the atmosphere is fairly constant up to Ozone Depletion about 30 miles above the earth's surface with the exception of ozone which is concentrated in an atmospheric layer called stratosphere. This layer extends between 10 to 33 miles above the earth.

Ozone is a derivative of oxygen. In the upper atmosphere molecules of oxygen (O_2)one is a derivative were broken down by ultraviolet radiation (coming from the sun) into single atoms (O), and some of these atoms combined with molecules of oxygen (O_2) to form Ozone (O_3). Ozone is an unstable gas. Its molecules are good absorbers of ultraviolet radiation. In thecules (O_2) process, they are usually broken down again into oxygen mole and single atoms (0). This reversible reaction continues with variable rate depending on amount of ultraviolet light.

The quantity of ultraviolet light in turn depends on sunspot activity, the season and presence of day or night. Sunspot is an activity on the surface of the sun associated with sudden bursts of energy.

It came unexpectedly and suddenly. In 1985, British atmospheric scientists surveying in Antarctica announced a more than 40 per cent decrease in the amount of atmospheric ozone over Halley Bay between 1977 and 1984. The first report was confirmed by other investigators and it was shown that the region of ozone depletion was wider than the continent of Antarctica at the south pole of the earth. It extended roughly from 12 to 24 kilometres in altitude 10 to 30 miles). Later it was mentioned as an ozone hole in the polar atmosphere.

The discovery upset the scientists and the public alike as it suggested that stratospheric layer of ozone surrounding the earth might be in greater danger than atmospheric models were predicting. An accelerated decline of the ozone concentration would be disastrous. It was announced on 7-10-98 that the ozone hole which was 19 million km^2 has expanded to 26 million km^2.

Ozone depletion studies have concluded that pollutants are eroding the ozone layer. The pollutants are chlorofluorocarbons, nitrogen dioxide, methane and other industrial gases containing chlorine.

Ozone acts as a shield against dangerous ultreviolet radiation coming from the sun. High energy UV is absorbed by ozone present in upper layers of the atmosphere. With the thinning of ozone, UV is reaching the surface of the earth and damaging life on the earth and in ponds, lakes or other water bodies.

Q.10. What are the three components of the CPU in computer? What is the function of each?

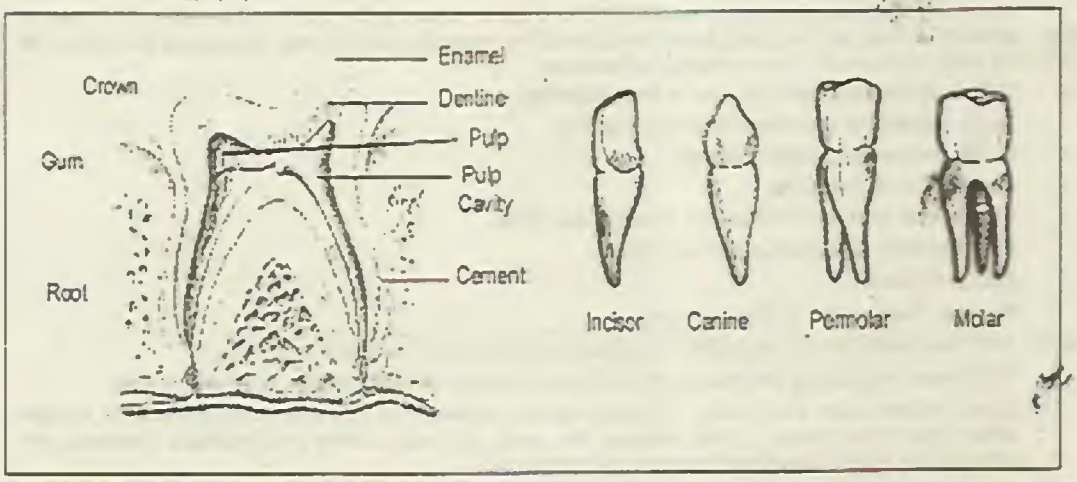
Ans. Central Processing Unit (CPU) is the part of computer which records and read programmes, reads data and performs operations on data according to the programmes. It has the following components.

1. ALU (Arithmetic and logic unit). ALU contains the fundamental operations or the instructions which are applied to process data.
2. Electronic Clock: Electronic clock coordinates the functions of CPU through its pulses.
3. Programme Counter: It monitors the programme being executed.
4. Control Unit: It organizes or manages the processing of data, the programmes and operations.
5. Registers: These are the components which assort and arrange the results and categorize, the data.

Q.11. Draw clearly the vertical section of a human tooth indicating various parts. How are adult human teeth classified.

Ans. There are 32 teeth, 16 in the upper jaw and 16 in the lower jaw. The formula of human teeth is written as follows:

$$\frac{2, 1, 2, 3}{2, 1, 2, 3}$$



Upper jaw has 4 incisors in the front, 2 canines, 4 premolars, two on each side and 6 molars, 3 an each side. It is the same for lower jaw.

Q.12. Briefly describe the principle and function of a camera. Mention its essential parts along with brief comparison with an eye.

Ans. Camera: A camera is an instrument used to preserve images of illuminated objects. It is a light tight box with a convex lens at the front or at the back of the aperture and an arrangement for holding a sensitive screen or film at the back. The aperture at the anterior side can be opened or closed with the help of a shutter. It has an adjustment for focussing the image by changing the position of the, he lens. When the shutter is opened, reflected light passes through the lens and an image is formed on the photographic film. This image is real and inverted. The time of exposure is varied to adjust light or it is instantaneous. The photograph is black and white or in colours depending upon the nature of the film.

Camera and Human Eye: The structure and functioning of camera is similar to the function of an eye with some differences.

1. The eye has a lens and so the camera, with similar functions.
2. The pupil of the eye is similar to the aperture of camera in function.
3. Eye has also chamber like casing of camera.
4. The retina of the eye has photosensitive cells like the photographic film. Both are at the back side.
5. Image formation in eye is on retina and in camera on the film. However image is adjusted in the brain and human beings see the objects in their right posture.

Q.13. Explain briefly, the formation of day and night. How do seasonal variations occur on our

earth?

Ans. Formation of Day and Night:

All the celestial bodies are in state of motion. The sun with its family of planets is constantly moving around the centre of the Milky Way galaxy. The earth is moving around the sun and the moon is moving around the earth. The earth undergoes two kinds of motions, rotation on the axis and orbital motion along the orbit around the sun. The earth rotates from west to east on its (imaginary) axis. This gives the impression that the sun and stars travel from east to west. The hemisphere- of the earth facing the sun has the day while the hemisphere facing away from sun has night. In this way half of the earth always has day and half has night.

The earth completes its rotation in 24 hours.

Formation of Seasons:

The earth revolves around the sun in an elliptical orbit. It completes its revolution in 365 1/4 days. The axis of the earth is tilted towards the plane of its orbit at an angle of 23 1/2 degree. The axis always points towards the same fixed point in space --the pole star. Due to these arrangements seasons are formed and the length of days and nights vary alternately.

The axis of rotation of earth remains inclined 23.5° towards the plane of its orbit. This axis of rotation remains inclined at the same angle throughout the revolution. In this way direct rays of the sun fall on different parts of the earth cause change of seasons.

Q.14. Differentiate between any five of the following:

(a) Thermoplastics and thermosetting plastics.

(b) Lunar eclipse and solar eclipse.

(c) Asteroid and meteorite.

(d) Renewable and non-renewable energy resources.

(e) Endothermic and exothermic reactions.

(f) Star and planet.

(g) Nuclear fission and nuclear fusion.

Ans: (a) Thermoplastics can be repeatedly softened by heating and hardened by cooling.

Thermosetting plastics are shaped by heat only once and then cannot be softened by heat.

(b) Luhar eclipse takes place when the earth comes between the sun and moon while solar eclipse takes place when moon comes between the earth and sun. During lunar surface becomes dim while during solar eclipse sun's surface becomes dim.

(c) Asteroids are minor planets which are only a few metres in diameter. They orbit mainly between Mars and Jupiter.

Meteorite is a meteoroid consisting of broken fragments originating from either comets and asteroids penetrate the surface of the earth.

(d) Renewable energy resources are the resources which are regenerated and used again and again like agricultural products or forests.

Non-renewable energy resources are used only once and cannot be reused like coal, gas and petroleum.

(e) Endothermic reaction is that reaction which uses or consumes heat energy while exothermic reaction is that reaction which releases heat energy.

(f) Stars glow with their own (intrinsic) light or heat energy while planets glow by the reflected light coming from sun. Stars are larger in size while planets are smaller.

(g) Nuclear fission is breaking of atomic nucleus with release of nuclear energy while nuclear fusion is combination of nuclei with release of nuclear energy.

Q.15. Fill in the blanks with correct scientific term.

(a) ——— are biological catalysts which have multiple functions in the body.

Ans. Enzymes.

(b) The difference between electrical charges at the two ends of a conductor is called ———.

Ans. Potential difference.

(c) The branch of Zoology which deals with the study of insects is called ———.

Ans. Entomology.

(d) Electric current is measured by an ———.

Ans. Ammeter.

(e) Dry ice is solid ———.

Ans. Carbon dioxide.

(f) Fuels fanned from animal and plant matter that lived thousands of years ago are known as ———.

Ans. Fossil fuels.

(g) Light with larger wavelength than that of the red colour is called ———.

Ans. Infrared.

(h) Penicillin was discovered by ———.

Ans. Alexander Fleming.

(i) Medulla Oblongata connects the ——— with the spinal cord.

Ans. Cerebellum (smaller brain).

(j) The pH of normal human blood is ———.

Ans. 7.38.

SOLUTION

EVERYDAY SCIENCE 1997

Note: Attempt any TEN questions. All questions carry equal marks. Draw diagram where necessary. Negative marking would be done for incorrect answer in Question No. 13 & 14.

Q.1. Discuss the role and achievements of Muslims physicists during the 10th century.

Ans: (See Muslim Scientists)

Q.2. Explain the structure of earth and its atmosphere.

Ans: External Structure Earth is an oval sphere structure but not a complete ball. Earth at the poles is flattened and bulges out at the equator.

Internal Structure

Earth is an almost spherical body about 3,960m (6,370 km) is equatorial radius. The centre is occupied by a core, which is a spherical and has radius of about 2,160m (3,475 km).

The upper part of earth on which we live consists of three types of rocks:

a. Igneous rocks. b. Sedimentary rocks. c. Metamorphic rocks.

Internal part of the earth is very hot and in molten form. This molten material is known as "Magma" when it comes on the upper surface and cools down and results in the formation of igneous rocks.

Atmosphere of Earth

Outer atmosphere is divided into four divisions.

a. Troposphere b. Stratosphere c. Mesosphere d. Thermosphere/Ionosphere

Composition of Atmosphere

N_2 (78%), O_2 21%,

Ar (0.09%), CO_2 (0.03%)

and other trace components like O_3, H_2O, CO, Xe, Ne, He etc.

Troposphere extends from surface of earth to an altitude of 40,000 ft. All storms and practically all clouds are restricted to troposphere.

Stratosphere

It is from 20-30 km above the earth surface. Environment conditions in this area are such that there is no movement or very small movements. Ozone layer is present in this part.

Mesosphere

As is present in between the thermosphere and stratosphere.

Ionosphere/Thermosphere

Extend from 50-250 miles above the surface of earth, ions are present here that is why called ionosphere.

Q.3. Write a short note on any two of the following:
Solar Eclipse, Thermoplastic, Non-renewable Energy Resource.

Ans: Solar Eclipse (See Solar Systems)

Thermoplastic

Material, which is plastic or mouldable when heated, is known as thermoplastic. By using dye we can give any shape to this material.

Non-renewable Energy Resources

Those energy resources, which cannot be renewed, are called non-renewable energy resources.

Example: Petroleum, coal, biogas, water, winds and nuclear resources cannot be renewed and are known as non-renewable resources.

Q.4. What are pesticides? Discuss their classification commonly use in the agronomists.

Ans: (See pesticides)

Q.5. Differentiate between the following:
Bite Byte, ROM, C.V, ALU, and Hardware/ Software.

Ans: (See Computer)

Q.6. Explain any five of the following terms. (Not more than four lines each):
Osmosis, Glycolysis, Photo Taxis, Transpiration and Sponification:

Ans: Osmosis

Movement of solvent molecules from the less concentration to high concentration through semi-permeable membrane (such as egg membrane) is known as osmosis.

Glycolysis

The process by which glucose is oxidised non-oxydatively (without oxygen) into 2 molecules of pyruvic acid is known as glycolysis.

Photo Taxis

The rotation of the earth causes the sunrays to move constantly. The plants are in direct need of sunlight for their food. Hence they change their direction in order to have optional amount of sunlight during photosynthesis. This is called photo taxis.

Transpiration

Loss of water through the surface of heat through stomata is known as transpiration.

Sponification

Sponification is a process by which animal fat react with caustic soda (Na_2CO_3). It is known sponification.

Emulsion

It is a dispersed system in which both the dispersed phase and dispersion medium are liquids; milk is a naturally occurring emulsion.

Q.7. Fill in the blanks.

Ans: a. A sheet of muscles called diaphragm separates the chest from abdomen.
b. In human body, blood-clotting factor is produced by the platelets.
c. Human blood is able to carry large amount of oxygen because of chemical haemoglobin.
d. Living part of plant cell is composed of a nucleus and cytoplasm.
e. The pattern for building protein molecule is stored in the nucleic acid.
f. Anvil and stirrup are the name of bones present in the ear.
g. The front of the eye is covered with a tough transparent material called cornea.
h. The young plant inside a grain of wheat is called the Embryo plant.
i. Inborn behaviour that involves only one part of the body is called reflex action.
J. The smallest branches of artery lead into tiny blood vessels called capillaries.

Q.8. What are the Ekocline glands? Give name of any two along' with name of their secretions.

Ans. These ordinary glands release their secretions by means of duct for transmitting their secretions. These are known as ductless gland.

a.	Glands	Secretion
b.	Sebaceous Glands	Sebum
c.	Lacrimal Glands	Tears
d.	Salivary Glands	Saliva
e.	Sweat Glands	Sweat

Q.9. What quantity of following unit measures?

Ans:

	Unit	Quantity
a.	Volt	Voltage
b.	Coulomb	Charge of electricity
c.	Watt	Power
d.	Ohm	Resistance
te	Ampere	Current
f.	Dyne	Force
g.	Joule	Energy
h.	Calorie	Heat

Q.10. Give the scientific reasons for the following:

Ans. **a. Meat takes longer to cook on mountain:**

Because of low pressure at mountains as a result boiling temperature also decreases that is why meat takes more time to cook on mountain.

b. **Water remains cool in earth pitches.**

In earthen pot pore are present. Water gets evaporated through pores. In doing so it gets more heat from water and gets cooled in turn. Metal or glass container has no pores and therefore does not permit the evaporation of water, which does not get so cooled.

c. **Ice and salt mixture is used as a freezing agent by making ice cream.**

Salt reduces the temperature of ice by decreasing its freezing point.

d. **It is not advisable to sleep under trees during night.**

As plants release CO_2 and take up oxygen at night, it is dangerous for health.

e. **Green house operators also paint their roof white in summer.**

As white absorb less light as compared to other colours.

Q.11. Which part organ of the human body does the following belongs.

Ans:

	Name	Parts
a.	Eustachian tube	Ear
b.	Cartilage	Connective tissue
c.	Auricle	Heart
d.	Tendon	Muscle
e.	Dendrites	Neurone

Q.12. Briefly describes the solar system. Name its members, outline main characteristics of any two.

Ans: (See Solar System)

Q.13. Fill in the blanks with correct choice.

Ans:

(i) Insulin is produced in the human body by the pancreas. (Liver, gall bladder, pancreas).

(ii) In an animal cell protein is synthesised in the ribosome. (nucleus, mitochondria, ribosome)

(iii) Chemically fingernails are made up of protein. (carbohydrates, protein, minerals).

(iv) Muscle stiffness is symptom caused by the disease tetanus. (polio, tetanus, rabies).

(v) Animals, which obtain their food from dead organism, are called scavenger. (carnivores,

scavenger, saprophytes)

(vi) Riboflavin is not affected by cooking. (ascorbic, acid, thiamine, riboflavin).

(vii) Rickets is caused by the deficiency of vitamin D. (A, D, K)

(viii) The number of chromosome in the spermatozoa is 23. (22, 23, 46)

(ix) The fat in our food is digested by the enzyme lipase. (lipase, lactose, trypsin)

(x) The most abundant element in the human body is oxygen. (carbon, hydrogen, oxygen).

Q.14. Which of the following statements is false and which is true?

Ans:

(a)	Sound is a form of energy.	(true)
(b)	A fraction of sunlight is refracted when it enters the earth's atmosphere.	(true)
(c)	The energy possessed by a waterfall is kinetic energy.	(false)
(d)	Rainbows are produced by the reflection of light through raindrops.	(false)
(e)	Light switches in our homes are connected in parallel series.	(true)
(f)	Generators convert mechanical energy into electricity.	(true)
(g)	Modern incandescent bulbs contain filaments made of copper.	(false)
(h)	A steam engine cannot be powered by fossil fuels.	(false)
(i)	Nucleus energy is cheap source of abundant electricity.	(true)
(j)	Oil burns cleaner and less damaging to the environment than coal as a fuel.	(true)

Q.15. Match words of list of with List b.

Ans:

List A	List B
Protein	Amino acid
Carotene	Vitamin A
Bauxite	Aluminium
Hematite	Iron
Casein	Milk
Pancreas	Fat
Quartz	Silicon
Chlorofluorocarbon	ozone
Urea	Nitrogen.

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Note: Attempt any TEN questions. All questions carry equal marks.

Q.1 Earthquakes have helped a great deal in describing the internal structure of the earth. Comment on these statements.

Ans: The earth is never free from earthquakes for long and more than 50,000 of them are recorded annually. Minor earth tremors caused by gentle waves of vibration within the earth's crust occur every few minutes. Major earthquakes, usually caused by movement along faults, can be very disastrous particularly in densely populated areas. Earthquakes themselves may cause only restricted damage in the regions of occurrence, but their after-effects can be very catastrophic. They produce gigantic tidal waves, called tsunamis by the Japanese, which flood towns and drown thousands of people. Fire break out beyond control as gas mains are shattered and buildings collapse. In severe earthquakes, fissures gape open, and the ground writhes and undulates in the passage of the 'surface waves'. A wave height of 7 mm (a quarter of an inch) in the upheaval is sufficient to bring down most ordinary buildings. Roads, railways and bridges are buckled and twisted; telecommunications are cut when the cables are snapped. Hills are so shaken that landslides are widespread. As the vibration thins out at the edges like the series of waves set up by a stone thrown into the water, damage is greatly reduced. Only the highly sensitive seismograph can record the movements of earthquake waves.

Q.2. Describe in precise statements various instruments, which are being used in exploring the Universe.

Ans. (See paper 1999)

Q.3. Discuss in detail the fission and fusion processes, which of these processes is source of Solar Energy.

Ans. Fusion process is source of Solar Energy. (See paper 2001)

Q.4. Describe Global warming and its possible effects on life. What measures have been taken by various nations to tackle this problem?

Ans. (See Global Warming)

Q.5. Give chemical name of one nitrogenous and one phosphorus containing fertilisers. What is the role of nitrogen, phosphorus and potash in growth and development of various parts of a plant?

Ans: (See Fertilisers)

Q.6. Write a short note on the following:

Conductor, Resistor, Semi-Conductor, Thermistor, Transistor.

Ans: **Conductor**

A substance, which conducts electricity, is known as conductor. Substances having comparatively greater thermal or electrical conductivity are called good conductors of heat or electricity. While those having less conductivity are called bad conductors. Those substances, which do not conduct electricity or heat, are called non-conductor.

Resistor

It is metallic wire, which offers resistance to the flow of electricity.

Semi-Conductor

It is crystalline material in which the electrical conductivity increases with temperature. Silicon is a semi-conductor most widely used.

Thermistor

P.N. Junction uses this device to increase or decrease the electrical current. Current increases when transistor is forward bias and decreases when it is reversed bias.

Transistor

This device is used to amplify the current and for performing other function performed by the thermionic wave.

Q.7. Write short notes on five of the following:

Antibody, Blood, Carbon cycle, Nitrogen cycle, Scavengers, Reaction Time, Photosynthesis, Star fish.

Ans:

a. Antibody — See blood

b. Blood — See blood

c. Carbon cycle — See carbon cycle.

d. Nitrogen cycle — See Nitrogen cycle.

e. **Scavengers**

Animals, which obtain their food from dead organisms.

f. **Reaction Time**

It is indication of reaction to reach the Equilibrium State.

g. **Photosynthesis**

The process by which plant synthesised their food is known as photosynthesis. For this purpose four things are required:

(a) Carbon-dioxide

(b) Water

(c) Sunlight

(d) Chlorophyll

h. **Star fish**

This sea animal belongs to phylum echinodermeta. It has spiny skin and they have five arms and

give the appearance of star that is why called as starfish. It has remarkable ability of regeneration.

Q.8. Which of the following statements is True and False?

Ans.

a.	Trout is a fish	(False)
b.	Epiphytes are a plant that grows upon another plant.	(True)
c.	Hepatitis is inflammation of membrane surrounding brain.	(False)
d.	Meningitis is inflammation of liver.	(False)
e.	Equinox is the time when sun appears vertically overhead a noon at the equator.	(True)
f.	Drought is a long period of rain.	(False)
g.	Joseph Aspdin is the inventor of cement.	(True)
h.	Neurology is science of Nervous System.	(True)
i.	Biometry is application of statistics in the study of biology	(True)
j.	Aviculture is science of rearing animals.	(False)

Q.9. Name the quantities, which are measured by following units.

Ans:

	Units	Quantity
a.	Newton	Force
b.	Joule	Works, energy
c.	Watt	Power
d.	Volt	Electricity
e.	Light year	Distance travelled by light in one year.
f.	Angstrom	Wavelength
g.	Acre-foot	Volume
h.	Becquerd	Radioactivity
i.	Hertz	Frequency
j.	Cusecs	Rate of flow of water

Q.10. Match the causes of disease.

Ans:

Disease	Cause
Rickets	Deficiency of vitamin D
Goitre	Iodine deficiency
Typhoid	Salmonella
Marasmus	Protein deficiency

Q.11. What are the functions of each of the following in a motor car?
Gear Box, Battery, Carburettor, Radiator.

Ans: **Gear Box**

Gearbox has 4 to 5 gears, which are used to decrease or increase the speed of motorcar. High gear transmits less and lows gear high force.

Battery

Battery produces electrical powers to spin a motor, which then rotates, and start an engine. All the lights and other systems are provided with electricity from battery.

Carburettor

This chamber in motor car sucks petrol (gas) and clear air and mixes it in proper portion and conveys it to combustion chambers and cylinders. It then burns the petrol and causes motion that rotates the crane shaft of engine.

Radiator

It is a system of pipes of water that run through engine to cool it down with the help of fan. It dissipates heat produced by the engine.

Q.12. Explain the following:

a. Blood Groups **b. Short Circuit**

Ans: a. Blood Groups

(See Blood)

b. Short Circuit

If the current flows directly between two points maintaining a potential difference between themselves the circuit between these two points is said to be short circuit.

Short Sightedness

This is an eye defect in which a person cannot see clearly the distant object. It is produced due to unusually elongated eyeball, which causes the image of distant object to be formed before retina, and hence the object is missed by retina and can be overcome by the use of concave lens.

International Data Line

It is an imaginary line around longitude 180 — west. When travellers cross this line from west to east, they gain a day, crossing from west to east they lose a day.

Plaster of Paris

Calcium sulphate is when mixed with water it forms a paste, which solidifies and dries it cannot re-dissolve in water. It is used to make models and designs.

Q.13. Answer the following:

a. Of what lead pencils are made of?

Ans: Graphite

b. Why is our breath visible in cold but not in hot weather?

Ans: Owing to condensation of water vapours present in breath. It is visible in cold weather.

c. What is chemical composition of diamond?

Ans: Pure carbon

d. Name the vaccine that protects against tuberculosis.

Ans: B.C.G.

f. Name the disease of liver that causes the patient to turn yellow.

Ans: Jaundice

Q.14. Fill in the blanks.

Ans: a. Black-hole is a hypothetical region of space having a gravitational pull so great that no matter or radiation can escape from it.

b. Fungicides are used against moulds and fungi.

c. The science, which deals with heredity, is known as Genetics.

d. Insulin is used for the treatment of diabetes.

e. Yurigagrin is first space man.

f. Pluto is the farthest from the sun in solar system.

g. The distance between earth and sun is called ashonomical unit (AU).

h. Study of chemical process of a living organism is called biochemistry.

i. The first computer virus invented by two Pakistani brothers is called Brain virus.

j. Severe deficiency of vitamin C results in scurvy.

Q.15. Differentiate between any five of the following:

Artery & Vein, Hardware & Software, E Mail & Snail Mail, Apes & Monkeys, Hydrostatistics & Hydrodynamics, Comet & Meteor, Barrage & Dam, Isobar & Isotopes, Autopsy & Biopsy.

Ans: Artery/Vein

(See paper 2001)

Hardware/Software

(See paper 2001)

E Mail

E-Mail represents electronic purposes.

Snail Mail

This term is used for ordinary mail that usually sends through other slow media.

Apes/Monkeys

APES	MONKEYS
Semi-arboreal	Arboreal
Shout is protected with flat-nose	Face somewhat flat with slightly raised nose.
Brow ridges are heavy and protected.	Brow ridges thin and not protected
Forehead and skull is flat	Forehead is rounded and domes shaped skull.
Head movement is limited	Head movement is of wide range.
Forelimbs longer than hind limbs.	Hind's limbs are longer than fore limbs.

Hydrostatics

Study of physical behaviour of liquid is called hydrostatics.

Hydrodynamics

Study of physical behaviour of liquid in motion is called hydrodynamics.

Comet and Meteor

(See Solar System)

Barrage/Dam

(See Paper 2001)

Electron

Negatively charged particles move in outer orbit of an atom.

Isobar/isotopes

(See Paper 2001)

Autopsy

It is the post mortem examination of body organ.

Biopsy

It is a surgical procedure in which a surgeon removes a suspected part of body for study.

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Note: Attempt any TEN questions. All questions carry equal marks.

Q.1. **Discuss in brief, the contribution of Muslim Scientists in the field of Biological-Sciences.**

Ans: (See Muslim Scientists)

Q.2. **Describe, in precise statements, various instruments, which are being used in exploring the Universe.**

Ans: **Microscope:** It is used to magnify minute objects by sense system.

Sextant: This instrument is used for measuring sun altitudes and altitudes of other inaccessible heavenly bodies.

Telescope: It is used for observing distant objects.

Spectrometer: It is used to discover new elements.

Seismometer: It is used for recording earthquake shocks.

Barograph: It is used for recording atmosphere pressure.

Cameras: It is used for getting photographs of different heavenly bodies.

Hydrometer: It is used for measuring specific gravity of liquid.

Hydrophone: It is used for recording sound under water.

Hydrometer: It is used for measuring humidity in air.

PCR: It is used for the study of DNA structure.

Gravimeter: It is used for recording measurement under water and to determine the presence of oil deposits and water.

Q.3. **Explain the solar system and unifying characteristics, which the sun and its plant have.**

Ans: (See Solar System)

Q.4. How solar and lunar eclipses are caused?

Ans: (See Solar and Lunar Eclipses)

Q.5. What is ozone sphere? Discuss the human technologies, which are causing its depletion. What harm to man this depletive state would cause?

Ans: (See Ozone deletion)

Q.6. Describe the principal and make up of a Television.

Ans: (See Television)

Q.7. What is Escape Velocity? How Satellites are launched and what are their uses.

Ans: Escape Velocity

Escape velocity means the velocity needs to through a satellite away from earth's orbit. Satellite are used for a variety of purposes.

For global communication purposes the satellites launched into an orbit around the earth must be synchronous. It means that they must keep their position static relative to the earth. This is possible when the orbital velocity of the satellite matches with the spinning velocity of the earth. The satellites which appears to hover motionless above the same point on earth are called hovering satellites, and their orbits are termed geostationary orbits. These are several hundred of communication and weather satellites in geostationary orbits at various locations around the earth 36000 km above the equator.

Modern communication satellites are often powered by solar cells which convert the sun's radiant energy into electricity. Nuclear energy is also utilized to provide power to operate communication satellites. These in are equipped with necessary sophisticated electronic equipment and circuitry for the reception and transmission of thousands of telephone conversations simultaneously. They are also designed for TV transmissions to cover the entire world.

High-power, high-directive, land-based transmitters send wide band microwave signals to the communication satellite above the transmitter. They receive the transmission, amplify it, and re-transmit it to a narrow region on the earth below. In fact three geostationary communication satellites placed in equatorial orbit at 120° from one another can cover partially the whole populated land of the world.

Q.8. Explain Earthquakes and volcanoes. how volcanoes help in the formation of earth crust?

Ans: Earthquakes:

A sudden rolling, shaking or trembling of the earth's crust, caused by the breaking and movement of rocks or by volcanic action. Most earthquakes take place along belts where new mountains and volcanoes have been formed. The longest of these belts is the circum-Pacific belt. Another major belt is the Alpine belt, which runs through southern Europe and Asia. The majority of earthquakes occur under the ocean.

Volcanoes:

An opening in the earth's crust through which magma is forced up. to the surface. The magma that flows out is called lava. As the volcanic materials pile up around the vent a typical conical hill is formed. An active volcano is one that erupts regularly, an extinct volcano is one that has not erupted since the beginning of recorded history and is consequently regarded as dead a dormant volcano is one that has been quiet for a long period but may still be active.

It is generally believed that volcanic activity is due largely to the conversion or rocks in the deeper layers of the Earth's crust from the solid to a molten state. These rocks are forced up through cracks or fissures under presage, reaching the surface as lava, ashes, hot gases and steam. As more lava comes to the surface, it piles up to form a hill or volcano.

Q.9. How characters are transmitted from parents to offspring?

Ans: Heredity is the passing on of characteristics for parents to offspring. It controls the development of individual organisms and determines how well they adapt to their environment.

How Characteristics are inherited. Hereditary characteristics are carried by tiny particles called chromosomes. Chromosomes , are in the nuclei of cells and carry large numbers of genes, which are segments of a substance called deoxyribonucleic acid (DNA). DNA contains the coded information that determines the various characteristics of the organism. Among animals and higher plants, each body cell has an identical double set of chromosomes. Offspring inherit the set of chromosomes from each parent. The chromosomes are transmitted during sexual reproduction. Egg cells and sperm cells are formed in a special way and have only one set of chromosomes. A sperm fertilizes an egg during the reproductive

process, and the fertilized egg then constrains two sets of chromosomes.

As the fertilized egg, cell beings to grow, each chromosome in the nucleus of the cell duplicates itself. The chromosome and its duplicate lie next to each other in pairs. When the cell divides into two cells, one of each pair of chromosomes goes into each of the new cells. Thus, the two cells, contain chromosonies that are identical with those in the original cell. This process of growth through cell division continues until it has produced all the cells that make up an organism.

Q.10. Describe the function of kidneys in the human body?

Ans: See in Q.11 Paper 1995.

Q.11. What are the deficiency effects of the following nutrients in the human body:

(a) Iron (b) Iodine (c) Flourine (d) Vitamin A (e) Vitamin D

Ans: (See Balanced diet)

Q.12. What are the constituent of human blood and their characteristics?

Ans: (See blood).

Q.13. Differentiate between the following:

Neurones and Neutron, Mitosis and Meiosis, and

Climate and weather, Heavy Water and Hard Water.

Ans: Neurons

Neurons are structural and functional units of nervous system. Neurons are of three types:

1. Sensory neuron 2. Motor neuron 3. Associative neuron

Neutron

Subatomic particle of about the same sizes and masses as proton but having no electrical charge.

Heavy Water/Hard Water

(See Paper 2001)

Mitosis

Type of cell division in which a cell divide in such a way that from a single cell two cells are produced which have same number of chromosome as in the parental cell.

It takes place in somatic cell. It is important for growth and also for healing of wounds.

Meiosis

Types of cell division in which from single cell four cells are produced which have half number of chromosome as compared to parental cell.

It occurs in planets during spore formation and in animals during gametes formation. It is important in:

1. Maintaining chromosome number constant generation after generation.
2. Produce genetic variability.

Climate

Climate is neither general conditions nor a fairly large area of the earth surface, observed during a period of a year.

a. Rainfall b. Altitude c. Sunshine etc.

Weather

Day to day or hour-to-hour condition of an atmosphere of any particular area is called weather; temperature, precipitation, cloud, wind, visibility etc.

Q.14. Fill in the blanks.

Ans:

1. Plant cells manufacture their food due to presence of chlorophyll (chlorophyll, vacuole, cell walls)
2. The mitochondria's in a cell are constituent of cytoplasm. (nucleus, cytoplasm, cell membrane).
3. Mitosis is a type of cell division where in the number of chromosome in daughter cells are same. (same, half, double).
4. Blood cells are of three types. (two, three, four).
5. The ultraviolet rays cause sunburn and suntan. (ultraviolet rays, alpha particles, gamma

radiations)

Q.15. Which of the following statement is true and which are false?

Ans:

1.	Xylem and phloem are conducting tissues.	(True)
2.	Carbohydrates are cheapest and most ready source of energy.	(True)
3.	Enzymes are responsible for chemical digestion of food.	(True)
4.	Plasma is fluid part of blood in which cells are suspended.	(True)
5.	Haemoglobin combines with oxygen and transport to different cells of the body.	(True)
6.	Neutron is negative charged particle in atoms.	(False)
7.	Helium is lightest noble gas. (But Lightest gas is hydrogen)	(True)
8.	Venus is the smallest planet of solar system.	(False)
9.	Image of an object is formed on the retina of the eye.	(True)
10.	Barometer is used for measuring the current.	(False)

SOLUTION

EVERYDAY SCIENCE 2000

Q.1. Write a comprehensive note on a3ty two of the following:

(a) Contribution of Muslim Scientists in the field of biology.

(b) Water pollution.

(c) Semiconductors.

Ans. (a) See in Chapter Muslim Contribution in Biology.

(b) See In Chapter Pollution.

(c) 1995 Q. No.6.

Q.2 Describe the various type of movements of the earth. What are the effects of these movements? Draw simple diagrams to illustrate your answer.

Ans. See in Chapter of earth.

Q.3. Explain the following using suitable examples:

(a) Feed back mechanism of human system.

(b) Eco-system.

(c) Troposphere.

(d) Carbon Cycle.

(e) Meningitis.

Ans. Feed Back Mechanism of Human System

A balance in human body is partly maintained by the feed back 'effect of hormones. i.e. a system whereby 'information' is led back' to a source 'feeling it' about events in the body and so enabling it to adjust its output accordingly. A pituitary hormone stimulates the thyroid to produce thyroxine, but thyroxine production is kept in check by the fact that when thyroxine reaches the pituitary via the circulation production of thyroid- stimulating hormone is suppressed. The feed back of thyroxine to the pituitary regulates the output of the later. The ovarian follicles are stimulated to produce estrogen by follicle stimulating hormone (FSH) from the pituitary, but when the estrogen in the blood reaches a certain level it suppresses the secquation of FSH by the pituitary.

A delay in the feed back effect leads to rhythemic. changes. For example, it may take two weeks for the level of estrogen in the blood to affect the pituitary, by which time the uterus lining has thickened and the ovum has been released from the follicle. The output of follicle stimulating hormone is diminished as a result of increasing estrogen and this in turn reduces the output of estrogen from the ovary which, in the absence of fertilization and the development of the carpus luteum, leades to the break down of the uterine lining; characteristic of menstruation.

ECO-SYSTEM

Troposphere is the lowest portion of the almosphere and its average height above the surface of the earth is supposed to be 7f miles. But the height of this portion is more at the equator than at the poles. At the equator this division extends to a height of 10 miles but at the poles its extent is only about four miles.

Midway between the two, at the latitude of 45° it is about 6 miles.

Within this region the temperature falls as the elevation increases. For every elevation of 1,000 feet. The temperature falls by 8.3°F. Within the troposphere vertical air currents are formed and it is heated as well as cooled by conduction, radiation and convection. However, convection process is the most dominant and, therefore, it is also known as the convectional zone. It is in this very portion that diurnal and seasonal changes of temperature are experienced.

At a certain altitude two rising and cooling air currents arrive at a temperature which is the same as that of the air above. This level is known as the "Tropopause" or the ceiling of the Troposphere. This is the boundary line above which is the second region of the atmosphere stratosphere, storm roaring clouds, lightning and such other atmospherics are limited to the troposphere. As we cross the tropopause; the disturbances are no longer visible.

Carbon Cycle, 1999/8

(e) Meningists:

This is inflammation of the meanings, the covering which, like a layer of plastics, lies over the brain and the spinal cord. Various germs may cause meningitis.

Q.4. What is excretion? Name the excretory organs in man. Describe the structure and function of human kidney for the excretion of urine.

Ans. See in Q.1 1 Paper 1995.

Q.5. Describe the Principle, construction and working of a telephone.

Ans. (See Telephone)

Q.6. What are latitudes and longitudes? How can the central line of latitude and longitude be used to find the location of a place?

Ans. In order to understand the relations between different places on the earth and their exact location, we have to understand their position their distance from any fixed point as also their exact direction. In order to understand the position, direction and direction east and west; or north and south a set of imaginary lines has been adopted. The surface of the earth has been supposed to be crossed and recrossed by lines or curves east to west and again from north to south. These are known_- as lines of latitudes and longitudes.

Latitudes are small circles that separate the sphere into two unequal part. These run parallel to the equator that cut the sphere of the earth into two hemisphere — the northern half and the southern half. They are called parallel of latitude and .represent the angular distance north and south of equator. This north latitude is north of equator and south latitude is south of it on the other hand, longitudes are great circles that divide the sphere into two equal parts. These pass ground the earth through the poles. The full circles but those half circles lying between the poles are known as meridians of longitude.

For the latitude the irling point was the equator while for arriving at the meridians of Lngitude, we have to establish a starting point. The meridian passing through Green which England is generally accepted as the starting point. It is known as Prime Meridian. This angular distance earth or west of this meridian is known as longitude. East longitude means east wards from the prime meridian and west longitude means west ward from it.

Q.7. Differentiate between:

(a) Cardiac Muscles and Skeletal Muscles.

(b) Haze and smog.

(c) Enzyme and Hormone.

(d) Sedimentary Rocks and Igneous Rocks.

(e) Producers and Consumers.

Ans. Cardiac Muscles:

These tissues are different from both voluntary and involuntary muscles. Its rhythmic contraction can take place without nervous stimulation although the heart beat is under the control of the central nervous system. All muscle fibres can conduct this property is of particular importance since the majority of cells have no direct contract with nerves. The impulse that Cruces the muscle cells to contract in unison is conducted by the cells themselves.

The Skeletal Muscles:

The skeletal muscles must be attached to the limb bones at one end in order to produce movement

but in addition; they must have a rigid attachment at the other end so that only one part of the limb moves when the muscle contracts sometimes the 'stationary' end is attached to the upper part of the limb' e.g. the extensor muscles which extend the foot are attached to the top of the tibia or lower end of the femur. The muscles that move the femur, however attached to the pelvic girdle. Bones frequently have projections or ridges where muscles are attached.

(b) Haze and Smog.

Haze:

A cloud of dust smoke, salt, or other particles that reduces visibility close to the earth's surface. A haze is said to exist when visibility is less than 1.25 miles (2 km) but more than 0.6 miles (1 km).

Smog:

Particulates are tiny particles of solid or liquid matter. One of the most common forms of air pollution is smog, that is mixture of smoke and fog.

(c) Enzyme and Hormone.

(See scientific terms distinguished).

(d) Sedimentary Rocks and Igneous Rocks:

Sedimentary Rocks: The rocks have been formed by the agency of water wind and ice. These agents break and erode the igneous rocks, transport these broken fragments and deposit them at certain places. The deposit of two lime material often occurs in the form of layers or states and therefore, they are known as sedimentary rocks.

Igneous Rocks:

Are those which have been formed by the cooling of the molten matter of the earth. This molten matter is formed in the interior of the earth and igneous rocks are formed when the molten matter either cools down on reaching the surface of the earth.

(e) Producers and Consumers 1981.

See in Q.5 Paper 1989.

Q.8. Define the following terms:

(a) RAM	(b) Byte	(c) Icons	(d) Mouse
(e) Software	(f) Control Unit	(g) LAN	(h) Modem
(i) ALU	(j) Registers.		

Ans. See in Chapter Computer.

Q.9. Discuss the structure of a typical animal cell in detail.

Ans. See Cell.

Q.10. Fill in the blanks with appropriate words:

(a) Monomer of proteins are Amino Acids.

(b) Water transport in plants occurs with in xylem.

(c) Underground horizontal stems are called Rhizomes.

(d) In the eye only Retina contains receptors for light energy.

(e) Plant Harmones control plant responses to environmental stimuli.

(f) Mitochondria are often called the powerhouses of the cell.

(g) The rate at which a current changes direction is called its frequency.

(h) The energy of electrons at the negative terminal of a battery is called electrical potential.

(i) Diamond is an allotropic form of the element Carbon.

Q.11. What are plastics? Name their different types and processes by which they are manufactured. Discuss the impact of the use of plastics on the environment.

Ans. See Plastics

Q.12. Which of the following statements are False and which are True:

(a) In the circulatory system two pulmonary arteries take blood from the left ventricle to the lungs.(False)

(b) Anaphase is the state of mitosis during which the daughter chromosomes move towards the opposite poles. (True)

(c) The Motor neurons carry nerve impulses from the central nervous system to the effectors: (True)

(d) Cochlea is a part of the middle ear. (False)
(e) Tides happen due to the moon's gravitational pull. (True)
(f) Heavy water contains salts a Calcium and Magnesium. (False)
(g) All non-metals exist in gaseous state. (False)
(h) A parachute can be used by a spaceman to help in landing on the moon. (False)
(i) The gem stones ruby and Sapphires are composed of Aluminium Oxide. (True)
(j) In a chemical battery chemical energy is directly converted into mechanical energy. (False)

Q.13. Choose the correct answers. Don't reproduce the questions:

(i) Speed of the wind is measured by: Anemometer
(a) Barometer (b) Hygromete (c) Perimeter (d) Anemometer
(e) None of these.

(ii) Ligament connects the muscle with the bone.
(a) Cartilage (b) Ligament (c) Tendon (d) Disc
(e) None of these.

(iii) Pollo is caused by-a: Virus
(a) Bacteria (b) Virus (c) Fungs (d) Deficiency of vitamin
(e) None of these.

(iv) The coldest planet of the solar system is Pluto
(a) Earth (b) Venus (c) Mars (d) Pluto
(e) None of these.

(v) None of these is a vitamin.
(a) Citric acid (b) Tartaric acid (c) Carbon (d) Protein
(e) None of these.

(vi) An egg shell is composed of None of these
(a) Iron (b) (b) Starch (c) Ascorbic acid (d) 'Acetic acid
(e) None of these.

(vii) The most abundant element in earth's crust is: Oxygen
(a) Nitrogen (b) Silicon (c) Carbon (d) Oxygen
(e) None of these.

(viii) The main constituent of Biogas is Methane
(a) Methane (b) Hydrogen (c) Oxygen (d) Carbondioxide
(e) None of these

(ix) Stalagmites are deposits of Calcium carbonate
(a) Calcium oxide (b) Calcium sulphate
(c) Calcium hydroxide (d) Calcium carbonate (e) Mixture of all salts.

(x) Gigantism is the reslitt of a Hyper pituitarism
(a) Hypothyroidism (b) Recessive gene
(c) Hyper pituitarism (d) Vitamin D deficiency
(e) None of these

Q.13. What are the causes of Earth Quakes? How have Earth Quakes helped in decipherıng the internal structure of the earth?

Ans. Whenever an earthquake occurs, wave start to travel in all directions from the source of the disturbance. These are generally three main types of waves in earthquakes. The primary or P wave makes the particles along it path move along the path forwards and backwards. This type of wave is the fastest to travel and therefore in the first to arrive at any place. The secondary or S waves make the particles move perpendicular to the path of the ray. Similar to waves on the surface of water and travel a little slower compared to P waves. The S waves, therefore, each a place after the P waves the third type of waves are the surface waves and as the name indicates, they travel along the surface of the earth. These are the slowest waves and reach a place last of all. All these waves can -be easily identified an a seismograph

record and by measuring the difference of arrival times of these waves it is possible to estimate the distance of the source from the observing place. Combining similar estimates from a number of places the exact location of the earthquakes can be determined. It is in this manner that the mapping of the earthquake belth has been made from instrument.

In addition to the three main types of waves mentioned above, the seismographs also record a large number of other waves by which arrive at the place after either reflection or refraction at one or more discontinuities inside the earth. A study, of these waves enables us to determine the depth and nature of these discontinuities. The study of seismograph records has thus enables us to infer the conditions inside the earth.

Q.14. What is the endocrine system? Write the names and function of any eight endocrine glands.

Ans: See Endocrine system.

SOLUTION

EVERYDAY SCIENCE 2001

Q.1. (a) What were the special characteristics of Muslim Scientists?

(b) What were the contributions of the following Muslim Scientists:

(i) Umar Al-Khayyam

(ii) Abu Ali Sina

(iii) Jabir Ibn Hayyan

(iv) Ibn al-Baitar

(v) Zakariya Al-Razi.

Ans. (See Muslim Scientists)

Q.2. (a) Differentiate clearly between Cyclone, Hurricane and Tornado.

(b) (I) Name two minerals which are exported from Pakistan.

(ii) Name some gem-minerals used in Jewellery,

(iii) What is dead sea.

(iv) Why does the Sun appears orange-red at the time of Sunrise and Sunset.

(v) Why does the total Eclipse can happen only at time of the new Moon.

Ans. (a) Cyclone:

A region of low atmospheric pressure in which winds spiral inward towards the center of lowest pressure. In the Northern Hemisphere the winds blow anticlockwise. In temperate regions cyclones are called depressions, in tropical regions they are more violent, and a are called typhoons or hurricanes.

Hurricane:

A severe tropical cyclone that blows occasionally over the West Indies and the Gulf of Mexico. Hurricanes originate in mid-Atlantic, and generally move first westwards and then north—eastwards. (2) A wind Force 12 or more on the Beaufort Wind Scale.

TORNADO:

A small, extremely violent whirlwind moving destructively across country at 20 to 40 mph (30 to 60 kph). At its center, the wind has a velocity of more than 200 mph (320 kph). The tornado forms a heavy black cloud from which a twisting funnel stretches down to the ground. Tornadoes occur most frequently in the Middle Western United States.

(b) (II) Chromite, Gypsum, Salt

Name some gem minerals used in jewellery.

Ans. Diamond, Emerald.

Ruby, Opal, Sapphire, Topaz, Garnet

(iii) What is dead Sea?

Ans. This is a salty water lake present on the borders of Jordan and Israel. It is so salty that no living thing can live in it. Its up thrust is so huge that no body can even drown in it.

(Iv) Why does the Sun appears orange-red at the time of Sunrise and Sunset.

Ans. At the time of sun rise and sun set the sun appears red because the red colour waves have long

wave length. Thus the short wavelength waves fail to pass through the thickness of air and these rays of long wavelength scatter through that atmosphere and it looks red both at the time of sun rise and sunset.

(v) Why does the total Eclipse can happen only at time of the new Moon.

Ans. The total Eclipse can happen at the time of new moon because the sun the moon and the earth are lined up in a straight wave the moon comes between the earth and the sun and this presence between earth and the sun for the time being blocks sun rays and results in the total Eclipse.

Q.3. (a) Name popular forms of Energy. Write five various scientific devices used to convert one type of energy into another form of energy.

(b) Write meaning of the following units:

(i) Barrel (ii) Joule (iii) Btu

(iv) KWh (v) Newton.

Ans.

(a) (i) Coal, (ii) Petroleum, (iii) Natural gas (iv) Geothermal energy (v) Solar energy (vi) Hydrcelectric (vii) Nuclear energy (viii) Wind energy (ix) Electricity.

The scientific devices that can change one type of energy to another.

(i) Battery (ii) Generator, (iii) Turbines, (iv) Windmills and (v) Electric Furnace etc.

(b) Write meaning of the following units:

(i) Barrel (ii) Joule (iii) Btu

(iv) KWh (v) Newton.

Ans. (I) Barrel: This is the unit to measure petroleum and it is equal to 306 pounds.

(ii) Joule: It is a unit of energy or work.

(iii) Btu: (British thermal unit of energy).

(iv) KWh: Kilowatt—hour. Practical unit of Electric Power.

1 KWh = 3.6×10^6 Joules.

(v) Newton: Unit of force.

Q.4. Write short notes on any THREE of the following:

(i) Synthetic Polymers (ii) Laser

(iii) Pesticides (iv) Fission and Fusion

(v) Paramagnetism and Diamagnetism

Ans.

(i) Synthetic Polymers

It is chemical union of two or more molecules of the same compound to form larger molecules resulting in the formation of a new compound of the same empirical formula but of greater molecular weight. Many important products, such as plastics and textile fabrics consist of polymeric substances.

(ii) Laser

(See Laser)

(iii) Pesticides

(See Pesticides)

(iv) Fission and Fusion

Q.14 Paper 1995.

(v) Paramagnetism and Diamagnetism

Paramagnetism:

It is a process whereby weakly attracted substances orient themselves toward the zone where the magnetic field is most intense.

Diamagnetism:

It is a process whereby diamagnetic substances (those repelled by magnetic force) orient themselves perpendicular to the force lines when placed in a magnetic field.

Q.5. Write difference between:

(i) Microcomputer and Minicomputer

(ii) Main frame and Super computer

(iii) Hardware and Software

(iv) Byte and Word

(v) Ram and Cache memory.

Ans.

(i) Microcomputer and Minicomputer

Microcomputer:

Micro computer is also known as Personal Computer (PC) or single user computer or Desktop computer. These are most common type of computers, also easily affordable for a user. IBM made the first microcomputer in 1980. These are having a limited processing speed sand storage capacity. Around 90% people are working with microcomputers. These machines are used in small business, organizations, and also at homes. These systems are available in variety of sizes and shapes.

Minicomputer:

These computers are same as mainframes, but smaller in size having less cost, less speed and less capacity than mainframes. These systems introduced by DEC (Digital Electronics Corporation) in mid 1960s. These have less number of users comparatively smallorganizations and companies install it. The market of mini ram computers has diminished because buyers moved towards less expensive but increasingly powerful personal computers. The prices of these computers are few thousands dollars to 1 million dollars depending upon the size of the computer.

Major manufacturers of mini frame computers are DEC, IBM (International Business Machines), NCR, NEC (National Electronics Corporation), HP (Hewlett Packard), ICL, Sun Microsystems, Fujitsu, Texas Instruments and many more.

(ii) Main frame and Super computer

Main Frame:

Very large and expensive computer are called mainframe computers. These are capable of processing data at very high speed usually measured in MIPS (Million Instructions Per Second) and have access to billions of characters, of data. The price of these large systems can vary from several hundred thousand to many millions of dollars. Their principle use of these systems is processing vast amount of data quickly, so some of the customers are big Organizations, Bands, Airlines, Insurance Companies, Sophisticated Reservations Systems, Information Agencies and Nuclear Research Centers etc.

These computers are generally found in computer rooms where environmental factors such as temperature, humidity and dust are closely monitored. Proper backup power supply arrangements must be made. These can process hundreds of different programs and control the data of more than 1000 users.

Super Computer:

The fastest, most powerful and most expensive computers used for very special purposes are called super computer. These can process billions of instructions per second or in Pico second (10^{-12}).

Rich federal government, worldwide weather forecasting departments, oil exploration agencies and weapon research companies that required much more accurate, reliable and sensitive result, use these computes.

These are multiprocessor machines means that more than more processor used for the processing of data. Thousands of users can access the machine simultaneously. Large amount of memory is needed in these machines normally goes up to 5 GB in some advanced supercomputers.

Its price ranges from 3 million dollars to 40 million dollars depending upon the size of the computer. Major manufacturers in America are Gray Research, Good-year Aerospace, Floating Point systems, Inc. and IBM. Japanese manufacturers NEC, Hitachi are also involved to manufacturers quality machines.

(iii) Hardware and Software

(See Scientific Terms distinguished)

(iv) Byte and Word

Byte:

It is a single unit Information handled by a computer, usually, 8 bits.

Word:

A computer word is a group of bits the length varies from machine to machine. Its length may be as

long as 60 bits or as short as 8 bits.

(v) Ram and Cache memory.

Ram: RAM is the temporary storage of computer that holds instructions and data for use. These are Read-Write chips. The data can be accessed in an easy and speedy manner. When power is shut off the data is lost.

Cache Memory: Caching is a technique that uses a relatively small amount of semiconductor memory called a cache, to speed up the performance of a disk.

Q.6. Describe briefly the principle and working of any TWO of the following:

(i) Pressure cooker (ii) Television (iii) Microwave Oven (iv) Radar

(vi) Tape recorder.

Ans.

(i) Pressure Cooker

In a pressure cooker, on account of increase of pressure, the boiling point is raised, so the food gets cooked quicker than in an ordinary vessel. A pressure cooker is very useful on high mountains where, on account of low pressure and hence low boiling point, the vegetables cannot be cooked properly.

(ii) Television

In a television network images of objects, whether moving or stationary, are transmitted along with sound over electromagnetic carrier waves from one place and are received at another distant place. Television technology has now been standardized and finds an increasing use in the realm of entertainment, education, industry and space exploration.

Working:

For picture transmission, a TV camera is focused on the object or the scene to be televised. The convex lens of the camera produces an image of the object/scene on a thin photo—sensitive plate called the mosaic, in the camera tube. The material of the mosaic screen has the ability to emit electrons when light strikes it. Where the light is strongest more electrons are given off making the material positive at that location. A beam of electrons from an electron gun in the camera tube is made to scan the rare surface of the mosaic screen along successive horizontal lines on it Fig. This is achieved by means of a special magnetic deflection system incorporated in the camera tube. When the beam hits on area with high positive charge, few of the negative electrons are repelled. When there is only a little positive charge, more of the electrons are repelled. These electrons are collected, and converted into voltage pulses. This is how a picture is converted into voltage pulses, called video signals. Sound is also converted into electric pulses, known as audio signals. Amplified video and audio signals are used to modulate very high frequency carrier signals before being radiated through an antenna in the form of electromagnetic waves.

When the modulated electromagnetic waves sent by a TV station strike the antenna of the TV set, they induce fluctuating alternating currents in it. The electronic circuits in the TV set separate the audio and video signals, such as then amplified. The audio signals are sent to the loudspeaker which changes them back into sound waves. Video signals are sent to the electron gun of the picture tube to produce a weak electron beam for darker parts and a stronger beam for brighter parts of the televised picture. The screen of the picture tube is coated with a fluorescent material which emits light when electron hit it. In this way we can see the picture on the TV set along with the sound.

(iii) Microwave Oven

Cooks food by using short radio waves that penetrate, the food and make its molecules vibrate. Friction among the moving molecules produces heat which cooks the food. Microwaves pass through glass paper and most kinds of China without heating them. Therefore, containers made of those materials may be used to hold food in a microwave oven.

This is electronic vacuum tube called a magnetron that produces microwaves travel through a metal tube to the metal blades of a stirrer a device similar to an electric fan. The moving blades, scatter the microwaves into the oven; which has metal wals the waves bounce from wall to wall until they enter the food in the oven. It takes less time for cooking.

(iv) Radar

Q.10 Paper 1986.

(vi) Tape Recorder

It is an instrument which converts sound waves into electrical impulses which are recorded as a

wavy groove on the tape. In a tape recorder, the tape is passed across the face of recording head, which consists of a small electromagnet. The electrical signal from the microphone is passed to the coil of this electromagnet, causing a varying magnetic field. The alignment of the particle of the passing tape alter to match the varying magnetic field.

To hear the recording, the recorded tape is drawn past a playback head, similar to the recording head (on head may sometime serve both functions). The magnetic "pattern" in the aligned oxide particles on the tape induces an electrical signal in the coil of the playback head. The signal is amplified and fed to a loudspeaker, which reproduces the original sound.

Q.7. Differentiate between:

(i) DNA and RNA **(ii) Brass and Bronze**
(iii) Blood and Lymph **(iv) Hard water and Heavy water**
(v) Small pox & Measles **(vi) Pig Iron and Stainless Steel.**
(vii) Alloy and Amalgam **(viii) Isotopes and Isobars**
(ix) Artery and Vein **(x) Barrage and Dam.**

Ans.

(i) **DNA and RNA**

DNA and RNA: (See Scientific terms Distinguished)

RNA Chapter of Cell

(ii) **Brass and Bronze**

Brass; an alloy of copper and zinc.

Bronze; an alloy of copper and tin.

(iii) **Blood and Lymph**

(See Scientific terms Distinguished)

(iv) **Small pox & Measles**

(See Scientific terms Distinguished)

(v) **Pig iron and Stainless Steel.**

Pig Iron: (See Scientific terms Distinguished)

Stainless Steel: (See Scientific terms Distinguished)

(vi) **Alloy and Amalgam**

(See Scientific terms Distinguished)

(vii) **Isotopes and Isobars**

Isotopes: A form of an element distinguished by the nuclear mass of its atoms through chemically identical with other forms. Hence, atoms of the same element which differ in forms. Hence, atoms of the same element which differ in mass number are known as isotopes of that element.

Isobars: Any two or more atomic species having the same atomic weight. They may or may not have the same atomic number.

(viii) Artery and Vein:

Artery:

Arteries are the blood vessels which transport blood away from the heart to the various parts of the body Arteries have thick muscular wall. Arteries carry oxygenated blood with the exception of pulmonary, artery. The inside bore of lumen of arteries is narrow. The biggest artery is aorta with a diameter of an inch the smallest artery is called arteriole about 0.2 mm in diameter. Walls of arteries are elastic and made up of three layers. Outer layer is thick coat of fibrous connective tissue. Middle layer is made up a smooth muscles and elastic tissue. The inner layer consists of elastic endothelial lining.

Veins:

Veins carry blood from body tissue back to heart. Veins carry deoxygenated blood with the exception of pulmonary vein. The walls of vein are much thinner than the arteries although these are also composed of same three layers. Infact the middle layer of smooth muscle is less developed and lack elastic membrane. The flow of the blood in veins is facilitated by valves movement of body, breathing movement and the pressure of blood.

(x) **Barrage and Dam.**

Q.15 Paper 1998.

Q.8. Explain the scientific reasons for the following:

(i) It is not advisable to sleep under trees during the night.

(ii) Water boils quicker on mountains.

(iii) Rainbow is produced in the sky after rain fall and sunlight.

(iv) Water remains cool in a Earthenware pitcher.

(v) Milk is considered as an ideal food.

Ans.

(i) It is not advisable to sleep under trees during the night.

Ans. The trees issue carbon dioxide at the night time and oxygen at the day time. During night the carbon dioxide that is issued by the tree might dangerous for the persons sleeping under it. Thus it is advisable not to sleep under the trees at night time. Human being are in need of oxygen instead of carbon dioxide.

(ii) Water boils quicker on mountains.

Ans. Water boils quicker on mountains because atmospheric pressure on the mountains is comparatively low as compared to plains. Thus where there is low pressure there will be the quick boiling of water.

(iii) Rainbow is produced in the sky after rain fall and sunlight.

Ans. (See Scientific reasoning)

(iv) Water remains cool in a Earthenware pitcher.

Ans. An earthem vessel has small pores form which water oozes out. It evaporates quickly as in summer the air is dry and hot. Heat is, therefore, absorbed from the surface of the poot thus causing cooling effect.

(v) Milk is considered as an ideal food.

Ans. Milk is believed as an ideal food because it satisfies a person's nutritional needs and contributes to a person's overall fitness.

Milk is nature's perfect food for babies due to the following reasons:

1. The mother's contains well balanced amounts of fats, proteins and carbohydrates.
2. It is rich in vitamin A and D but is present in small amount vitamin C.
3. It is rich in mineral salts particularly those of calcium and magnesium.
4. The mother's milk contains antibodies which protect the infants from infections disease.
5. Mother's milk is free from harmful organisms.

For adults however, it is satisfactory because of its high water content and lack of iron.

Q.9. Which of the following statements are true or false. Only write "True" or "False" in the answer book. Do not reproduce the statement

(i) Urea is a phosphate fertilizer.

(ii) Cellulose is a natural polymer.

(iii) Magnetite is the ore of copper.

(iv) Malaria is caused by drinking polluted water.

(v) The instrument used to measure velocity of wind is Barometer.

(vi) Our eye is very sensitive to blue light.

(vii) Sound can not travel through vacuum.

(viii) Enzymes are biological catalyst.

(ix) Leprosy is a disorder of Nervous System.

(x) Mica is a nonconductor of electricity.

Ans. (i) False (ii) True (iii) False (iv) False (v) False (vi) False (vii) True (viii) True (ix) True (x) True

Q.10. What are Endocrine glands? Name any four. From which part of the body are the followings secreted:

(i) Insulin (ii) Thyroxin (iii) Adrenaline (iv) Oestrogen (v) Testosterone and (iv) Cortisol.

Ans. (See Endocrine system)

Q.11 (a) Name the important parts of a Flower.

(b) Explain the Pollination and Fertilization processes.

Ans.

(a) Flower

The flower is the chief reproductive organ of the flowering plants. The flower is commonly born on an axis which is made up of two regions—Pedicel and Thalamus. The Pedicel is the stalk of the flower. The thalamus or receptacle is the swollen end of the axis. The floral leaves are arranged in whorl on the thalamus. The whorls and their component of typical flower are as follows:

1. Calyx:

The calyx is the outer most or first whorl of the flower. The calyx consists of sepals, which are usually green and small.

2. Corolla:

The corolla is the second whorl of the flower. The corolla consists of Petals which are usually brightly coloured.

3. Androecium:

Androecium is the third whorl of the flower. The androecium consists of stamens which are the male reproductive organs of the flower.

4. Gynaecium:

Gynaecium is the forth and innermost whorl of flower. Gynaecium consists of carpels. The carpel is the female reproductive organ of the flower. The carpel or pistil is made up of following there parts:

1. Stigma 2. Style 3. Ovary

1. Stigma:

The stigma is a knob like structure at the top of the carpel and receives pollens.

2. Style:

The style is a stalk like structure which supports stigma.

3. Ovary:

The ovary is a flask-shaped structure at the base of the style. it contains ovules. The ovules has an embryo sac in the center.

The Stamens and carpels are the essential reproductive parts as they take part directly in reproduction.

(b) (See previous papers)

Q.12. Write short notes on any FIVE of the following:

(i) Ecosystem (ii) C NG (iii) PVC
(Iv) Hormones (v) Antibiotics (vi) Ceramics
(vii) Green House Effect (viii) Photosynthesis (ix) Pasteurization
(x) Vaccine

Ans.

(I) Ecosystem: See in the Chapter of Biology.

(ii) CNG

It stands for compressed natural gas and it is used for fuel purposes it reduces pollution hazards thus believed to be the best fuel for motor cars and the allied auto mobiles.

(iii) PVC

PVC or polyvinyl chloride can be found every where and in various varieties. Different kinds of articles contain, table cloths. It is coated on to fabric is given the so-called leather coat used for making seat covers, hand bags, dresses etc. Some shoes are moulded from PVC: the "uppers" are embossed to look like real leather and long-lasting. Washable floor tiles and plastic garden hoses are PVC. Similarly, electric wires and cables are made of PVC as PVC is a good insulator. .Gramophone recorders and tapes for tape recorders and also made from PVC. By addition of a plasticizer of PVC it becomes soft and durable.

Polythene and polyproplene are same times mistaken with PVC because they also do the same functions as PVC do.

(iv) Hormones

These are the internal, secretions of the ductless glands like pituitary, pancreas, Adrenal and

thyroid which are passed directly into the blood inside vessels within the gland itself These hormones exert a great influence upon health and development of the body. Pancreas manufactures a hormone called Insulin which assists in the assimilation of sugar thus preventing a disease called diabetes. Adrenalin, a secretion of Adrenal glands controls blood pressure and tones the nerves. Thyroxine produced by thyroid gland controls the growth as a whole whereas the secretion of the pituitary glands exerts a powerful influence on the development of skeletal structures.

(v) **Antibiotics**

These drugs are medicines derived from moulds used for killing micro—organisms carrying disease in the body e.g., chloromycetin, tetracyclin and streptomycin.

A defensive substance produced in an organism in response to the action of a foreign body such as the toxin of a parasite. Antibodies are important in resistance against disease, in allergy and in blood transfusion.

(vi) **Ceramics:** Q.3 Paper 1998.

(vii) **Green House Effect:** Q.5 Paper 1998.

(viii) **Photosynthesis:** Q.9 Paper 1997.

(ix) **Pasteurization:** (See past cerization)

(x) **Vaccine:** Q.3 Paper 1996.

Q.13. What are the factors of water pollution? What type of diseases are transmitted by using polluted water? Explain the methods to control pollution of water.

Ans. See in the Chapter of Pollution.

Q.14. Fill in the blanks with appropriate words:

(i) The purpose of computer is ————.

(ii) Polio is caused by ————.

(iii) The stalagmite is deposit of ————.

(iv) Bauxite is one of ————.

(v) The chemical name of washing soda is ————.

(vi) The main constituent of Sui gas is ————.

(vii) ———— colour has the shortest wave length.

(viii) Glass is a ———— liquid.

(ix) Monomers of protein are ————.

(x) Ascorbic acid is vitamin ————.

(xi) The solar system is ———— planets.

(xii) Aids is caused by ————.

(xiii) In a normal resting person the rate of heart beat is ————.

(xiv) The science which deals with heredity IS known as ————.

(xv) In Pakistan Copper mineral is found in————.

(xvi) The most abundant element in the earth crust is ————.

(xvii) ———— is an apparatus used for measuring the pressure of gases.

(xviii) The smallest branches of an artery lead into tiny blood vessels are called ————.

(xix) The living part of a plant cell is composed of a nucleus and————.

(xx) The fastest revolving planet is ————.

Ans. (i) Information and Processing (ii) Virus (iii) Calcium Carbonate (iv) The ore of Aluminium (v) Sodium Carbonate (vi) Methane (vii) Valet (viii) Super cooled (ix) Amino Acids (x) Vitamin C (xi) Eight Planets (xii) Virus (Human Immunodeficiency Virus) (xiii) 60 – 80 bmp (xiv) Genetics (xv) Rekodig (xvi) Oxygen (xvii) Baro meter (xviii) Capillaries (xix) Cytoplasm (xx) Jupiter.

SOLUTION
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Note: Attempt any TEN questions. All questions carry equal marks.

Q.1. Write short notes on any two of the following:

a) Acid Rain b) Pesticides c) Endocrine System

Ans: a) **Acid Rains:** Due to the presence of fumes of SO_2, CO_x, NO_x in atmosphere discharged by vehicles and factories by the burning process, water H_2O with these compounds to form, H_2SO_3, (Sulphurous Acid) H_2CO_3, (Carbonic Acid) and HNO_3 (Nitric Acids). These acids then come along with the fumes resulting in acid rains.

Effects: Acid rain spoils crops, buildings, statues, tarnishes metal, marble.

b) **Pesticides:** The chemicals used to kill the insects, fungi and bacteria that damages the crops are called pesticides.

- Pest (Causing disease on crops)
- Cide (To kill)

Pesticides are useful but their excessive use can also harm the human beings and other animals.

c) **Endocrine System:** The system made up of 7 ductless glands is known as Endocrine System. These glands secrete certain hormones that control the different activities of body specially the growth.

The names of these glands are:

1) Pituitary 2) Thyroid 3) Parathyroid
4) Adrenal 5) Pancreas 6) Ovary/Testes
7) Gastric

Q.2. Differentiate between any FIVE of the following pairs:

a) Rotation and Revolution of Earth
b) Monocot and Dicot Plants
c) Pollination and Fertilization
d) Umbra and Penumbra
e) Nucleus and Nucleolus
f) Heavy water and hard water

Ans:

a) **Rotation** is the movement of earth anti-clock wise about its own axis causing days and nights in 24 hours.

Revolution is the movement of earth around the sun in 365 days in its orbit in the Solar System.

b) **Monocot plants** have one cotyledon (seed leaf) e.g. rice, maize, grass.

Dicot Plants have two cotyledons, secondary growth, tap roots, e.g. pea, gram etc.

c) **Pollination:** it is the transfer of stamens from anther to the stigma of carpel.

Fertilization: is the fusion of the male and female sex cells.

d) **Umbra:** it is the region of the shadow of moon from where full solar eclipse is seen.

Penumbra: is the area on both side of this belt of umbra from where faint, partial eclipse can be seen.

e) **Nucleus:** It is the basic part of all Eukaryotic cells having chromosomes on which genes/DNA is located to control all the living processes.

Nucleolus: the structure found inside nucleus is nucleclus. It is involved in protein, synthesis as it makes ribosomes.

f) **Heavy Waters:** the water molecule having an isotope of hydrogen Deuterium D_2O is known as heavy water. Deuterium has Atomic No.1. Atomic mass 2 with 1 proton and 1 neutron in nucleus.

Hard Water: The water having salts of bicarbonates of calcium, and magnesium Ca^{++}, Mg^{++} and sulphates SO_4.

Q.3. Draw a labeled diagram of human eye, indicating all essential parts. Discuss its working.

Ans: Eye (anatomy) (See Human eye) Page (280-82)

Q.4. Fill in the blanks with suitable words:

a) Heavenly objects, which resemble stars and emit radio waves are called ———.

b) ——— are hot springs that erupt hot water and steam from time to time.

c) Hot liquid rock beneath the earth's surface is called———.

d) The first simple microscope was invented by———.

e) ——— is the powerhouse of the cell.

f) Ability of the air to absorb long heat waves from the earth after allowing the short waves from sun to pass through it is known as ———.

g) Computer works on the principle introduced by the Muslim Scientist———.

h) Coldest planet of the solar system is———.

i) The rupture of red blood cells is called———.

j) Muslim Scientist Ali-Ibn-Al-Tabari is famous for his work on———.

Ans:

a) Pulsars b) Geyser
c) Magma d) Robert Hook
e) Mitochondria f) Greenhouse Effect
g) Alkhawarazmi h) Pluto
i) Ertholysis or Hemolysis j) Medicine

Q.5. What is the Solar System? Indicate the position of planet Pluto in it. State the characteristics that classify it as:

a) a planet b) an asteroid

Ans: Solar System See Solar System Page No. 85)

Q.6. Which quantities are measured by the following SI units?

a) Watt b) Coulomb c) Pascal d) Ohm
e) Kelvin f) Joule g) Meter h) Faraday
i) Hertz j) Ampere

Ans:

a) Power b) Charge of Electricity c) Pressure
d) Resistance e) Temperature f) Energy/Work
g) Length h) Capacitance i) (Frequency)
j) Current

Q.7. What are minerals? For most of the part minerals are constituted of eight elements, name any six of them. State the six characteristics that are used to identify minerals.

Ans: **Minerals:** The salts found inside the earth crust are known as minerals. Minerals are salts of elements like, Na, Ca, K, P, Cl, Mg, and C.

Characteristics: Mineral salts are hidden or buried inside soil formed by the process of weathering of rocks. They are mostly hard. They possess magnetic and electrical properties some of them show the phenomenon of luminescence. They often found in beautiful crystals, can be identified by their colour, geological position etc.

Q.8. Define any FIVE of the following terms using suitable examples:

a) Polymerization b) Ecosystem
c) Antibiotic d) Renewable Energy Resources
e) Gene f) Software

Ans: a) **Polymerization:** The process of formation of long chains of carbon molecules is known as polymeri-zation. Monomers or biners combine to form polymers.

b) **Ecosystem:** A system made up by the interaction of living beings and their surroundings (non-living factors) is known as Ecosystem.

c) **Antibiotics:** The medicines used to kill the germs active inside living beings are known as

antibiotics.

d) **Renewable Energy Resources:** Those resources of ecosystem that can be recycled in resources, e.g. oxygen, carbon, water H_2O.

e) **Gene:** It is the unit of hereditary that is located on chromosome; it is DNA which controls every character of living being.

f) **Software:** It is the non-physical component of computer which cannot be touched. These are in fact computer programs, which can be:

1) Operating System 2) Language 3) Software applications

Q.9. What do you understand by the term "Balanced Diet"? What are its essential constituents? State the function of each constituent.

Ans: **Balanced Diet:** A diet which contains all the nutrients in moderate/required amount is known as balanced diet for the normal growth of body.

If the diet is lacking any one of the required components the condition is Malnutrition. When diet is deficient in all aspects the condition is under-nutrition.

Essential Constituents: Proteins, Fats, Vitamins, Carbohydrates, Lipids, Minerals, Roughage, Water

Function: Carbohydrates: are the immediate source of energy. 1 kg yield 4 k calories/mole of energy.

Proteins: Make up cells, tissues, body growth, 1 kg yield 4.8 calories/mole of energy.

Fats: These are digested at the last. Storing nutrient as it stores energy in the forms of glycogen. 1 kg yield 9 k calories/mole of energy.

Vitamins: Essential amino acids required for the normal growth. There are different vitamins A, B, C, D, E, K. The deficiency of each constituent results in certain disease.

Q.10. Which of the following statements are true and which are false: 1 each)

(a)	Haploid cells result from the process of mitosis.	False
(b)	All stars are of the same colour.	False
(c)	The left lung has two lobes while the right lung has three lobes.	True
(d)	The pulmonary veins return oxygenated blood to the right atrium.	False
(e)	Muslim Scientist Ibn-Haitham is famous for his work on planets.	False
(f)	Our galaxy milky way is shaped like a large thick concave lense with a large central bulge.	True
(g)	DNA has a double helix structure while the RNA does not have a double helix structure.	True
(h)	The normal temperature of Human blood is 37°C (98.6F).	True
(i)	The liver is a part of gastrointestinal tract.	True
(j)	Movement of tectonic plates may cause eruption of a volcano.	True

Q.11. What do the following scientific abbreviations stand for? (1 each)

(a)	LASER	(b)	RADAR	(c)	LPG
(d)	PVC	(e)	CFC	(f)	AIDS
(g)	ROM	(h)	LAN	(i)	WWW
	DNA				

(a)	LASER	Light amplification by stimulated emission of radiation.
(b)	RADAR	Radio Detection and ranging.
(c)	LPG	Liquefied petroleum gas.
(d)	PVC	Poly vinyl chloride.
(e)	CFC	Chloroflouro carbons.
(f)	AIDS	Acquired immune deficiency syndrome.
(g)	ROM	Read only memory.
(h)	LAN	Local area network.
(i)	WWW	World wide web.

(j) DNA Deoxyribose nucleic acid.

Q.12. Give brief scientific reasons for any five of the following statements: (2 each)

(a) Lunar eclipse lasts much longer than solar eclipse.

Ans: In case of lunar eclipse, the Earth lies exactly between the sun and the moon, it throws a shadow on the moon producing eclipse the mass of the earth is bigger than the mass of moon that comes in direct line between the sun and the earth. That is the reason that lunar eclipse lasts longer often solar eclipse.

(b) Goiter is common in people living in hilly areas.

Ans: There is dearth of iodine is the water in hilly area. That causes goiter.

(c) Mixture of ice and salt (sodium chloride) is used as a freezing mixture.

Ans: Salt lowers down the temperature of ice by decreasing it freezing point. That is why ice and salt mixture is used as freezing agent.

(d) Detergents are better cleaning agents compared to soap.

Ans. (See Scientific Reasoning).

(e) Decomposers are important for life on land and water.

Ans: Decomposers:

The decomposers are organisms derive their energy by decomposing dead remains of animals and plants in an ecosystem. Bacteria and fungi are the chief decomposers. The decomposers decompose the complex organic molecules manufactured by plants and animals in the result of which simple inorganic molecules and elements are released and are reused by plants. The action of decomposers is vital, because if it did not occur, all the nutrients would remain tied up in dead bodies and no new life would be produced, temperature influences greatly the rate of decomposition as the rate of break down is rapid in the summer than the winter.

(f) Places near the sea are cooler in summer and warmer in winter than places farther inland.

Ans: The sea water does not get hot or cold suddenly this takes time. Thus places near sea are cooler in summer and warmed in winter.

Q.13. Name: (1 each)

(a) A disease caused by deficiency of vitamin C.

(b) The major fossil fuel impurity.

(c) The instrument used to measure degree of humidity.

(d) An ore of Zinc.

(e) Two most abundant elements present in the sun.

(f) The metal atom present, in chlorophyll.

(g) The gland responsible for the secretion of the hormone estrogen.

(h) An elements used in the doping of silicon for the preparation of a p-type semiconductor.

(i) A synthetic fibre which is a poly amide.

(j) Major consitutuent of Biogas.

Ans.

(a) A disease caused by deficiency of vitamin C.

Ans. Scurvy.

(b) The major fossil fuel impurity.

Ans. Sulphur

(c) The instrument used to measure degree of humidity.

Ans. Hygrometer.

(d) An ore of zinc.

Ans. Zinc Blende.

(e) Two most abundant element present in the sun.

Ans. Hydrogen, Helium

(f) The metal atom present in chlorophyll.

Ans. Magnesium.

(g) The gland responsible for secretion of hormone estrogen.

Ans. Ovary.

(h) An element used in doping of silicon the preparation of a p-type semiconductor.

Ans. Boron.

(i) A synthetic fibre which is a polyamido.

Ans. Nylon, 6

(j) Major constituent of biogas:

Ans. CH_4 or methane gas.

Q.14. What are Fertilizers? What do you understand by the term NPK Fertilizer? How do Fertilizers contribute to water pollution? (3.1.6)

Ans. Fertilizers:

Fertilizers are materials added to soil to nourish plants.

NPK fertilizers:

N for nitrogen, P for phosphorus and K For potassium. These three are most necessary minerals for the growth of plants. Fertilizers which contain these three minerals are called NPK fertilizers. Other minerals are also required for plant growth but in small amount. There are calcium, magnesium, sulphur, iron and few less important minerals. Fertilizers may be organic (from living organisms) such as form yary manure or bone meal, or they may be inorganic (non living) chemicals such as sodium nitrate.

How do fertilizers contribute to water pollution:

Ans: See chapter fertilizers.

Q.15. Choose the one alternative that best completes the statements or answers the question: (1 each)

1. Glycogen is an example of:
   (a) carbohydrate (b) peptide
   (c) lipid (d) steroids
2. The cells structure that controls movements of material into and out of the cell is the:
   (a) mitochondria (b) cell membrane
   (c) centriole (d) golgi body
3. The unit that co-ordinates different devices of the computer system is:
   (a) ALU (b) register
   (c) control unit (d) logical instructions
4. ——— manages and controls various functions of the computer:
   (a) in put/out put device (b) main memory
   (c) operating system (d) both a & b
5. The number of natural satellite orbiting around the planet Mars:
   (a) 1 (b) 2 (c) 5 (d) 14
6. ——— is an example of mechanical digestion:
   (a) glycolysis (b) hydrolysis
   (c) mastication (d) defecation
7. Botanically a fruit is a/an:
   (a) ripened ovule (b) mature stigma
   (c) ripened ovary (d) fully mature
8. The Vocal Folds are part of the:
   (a) nasal cavity (b) larynx
   (c) trachea (d) laryngopharyn
9. Blood glucose is raised by all of the following except:
   (a) glycogen (b) Insulin

(c) cortisol (d) epinephrine

10. The famous book Al-Qanoon was written by the Muslim scientist:
(a) Jabir-Ibn-Hayyan (b) Zakariya Al-Razi
(c) Abu-Ali-Sina (d) Abul-Qasim Majreeti

Ans: 1 (a) Carbohydrate
2 (b) Cell membrane
3 (c) Control unit
4 (d) Operating system
5 (e) 2
6 (f) Mastication
7 (g) Ripened ovary
8 (h) Larynx
9 (i) Insulin
10 (j) Abu-Ali-Sina

SOLUTION

EVERYDAY SCIENCE 2003

Q.1. Write short notes on any TWO of the following: (5,5
(a) Microwave Oven (b) Optic Fiber (c) Biotchnology

Ans. (a) Microwave oven

See Q-6 paper 2001

Ans. (b) Optic fiber

Also spelled Fiber Optics, the science of transmitting data, voice/and images by the passage of light through thin, transparent fibers. In • telecommunications, fiber optic technology has virtually replaced copper wire in long-distance telephone lines, and it is used to link computers within local area networks. Fiber optics is also the basis of the fibrescopes used in examining internal parts of the body (endoscopy) or inspecting the interiors of manufactured structural products.

The basic medium of fiber optics in a hair-thin fiber that is sometimes made of plastic but most often of glass. A typical glass optical fiber has a diameter of 125 micrometers (Um), or 0.125 mm (0.005 inch). This is actually the diameter, of the cladding, or outer reflecting 'layer, the core, or inner transmitting cylinder, may have a diameter as small as 10 um. Through a process known as total internal reflection, light rays beamed into the fiber can propagate within the core for great distance with remarkably little attenuation. The degree of attenuation over distance varies according to the wavelength of the light and to the composition of the fiber. When glass fibers of core/cladding design were introduced in the early 1950s, the presence of impurities restricted their employment to the short lengths sufficient for endoscopy. In 1966, electrical engineers K.C. Kao and G.A Hockham, working in England, suggested using fibers for telecommunication and within two decades silica glass fibers were being produced with sufficient purity that infrared light signals could travel through them for 100 km (60miles) or more without having to be boosted by repeaters. Plastic fibers, usually made of polymethylmethacrylate, polystyrene, or polycarbonate, are cheaper to produce and more flexible than glass fibers, but their greater attenuation of light restricts their use to much shorter links within buildings or automobiles.

Optical telecommunication is usually conducted with infrared light in the wavelength ranges of 0.8-0.9 um or 1.3- 1.6 um –wavelengths that are efficiently generated by light emitting diodes or semiconductor lasers and that suffer least attenuation in glass fibers. Fiberscope inspection in endoscopy or industry in conducted in the visible wavelengths, one bundle of fibers being used to illuminate the examined area with light and another bundle serving as an elongated lens for transmitting the image to the human eye or a video camera.

Ans. (c) Bio-technology

Biotechnology, is the manipulation of biological organisms to make products that benefit human beings. Biotechnology contributes to such diverse areas as food production, waste disposal, mining, and medicine. Although biotechnology has existed since ancient times, some of its most dramatic advances have come in more recent years. Modern achievements include the transfer of a specific gene from one

organism to another (my means of a set of genetic engineering techniques known as transgenic). The maintenance and growth of genetically uniform plant and animal cell cultures, called clones, and the fusing of different types of cells to produce beneficial medical products such as monoclonal antibodies, which are designed to attack a specific type of foreign substance.

Q.2. Give names of the members of the solar system. Briefly write down main characteristics of (a) Mars (b)Venus: (2,4,4)

Ans.

1.	Sun	2.	Mercury	3.	Venus
4.	Earth	5.	Mars	6.	Jupiter 581
7.	Saturn	8.	Uranus	9.	Neptune
10.	Pluto				

(a) **Mars: (See Solar System) (Page No. 85)**

Q.3. Name (1 each)

(a) The instrument used for the measurement of Blood Pressure.

(b) A mammal which can fly.

(c) A disease which is more common in men than women and is hereditary in character.

(d) One endangered animal species of Pakistan.

(e) An ore of mercury.

(f) A Cyano bacterium

(g) A hormone secreted by pancreas.

(h) The nuclear reaction taking place on the surface of sun

(i) The scientist who discovered Sulfuric Acid

(j) The constituent elements of brass.

Ans. Sphygmomanometer.

(b) A mammal which can fly

Ans. Bat.

(c) A disease which is more common is men than in women and is hereditary in character.

Ans. Colourblindness / Haemophilia.

(d) One endangered animals species of Pakistan.

Ans. Snow leopard, Chiltan Markhor

(e) One ore of mercury.

Ans. Cinnabar.

(f) A cyanobacterium.

Ans. Nostoc.

(g) A hormone secreted by pancreas.

Ans. Insulin.

(h) The nuclear reaction taking place on the surface of sun.

Ans. Nuclear fusion.

(i) The scientist who discovered sulphuric acid.

Ans. Jabir Bin Hayan.

(j) The constituent elements of brass.

Ans. Copper and Zinc.

Q.4. What do the following scientific abbreviations stand for: (1.each)

(a) SONAR (b) SARS (c) NTP (d) RQ
(e) PVC (f) NPN (g) WAN (h) ECG
(i) CPU (j) BCG

(a)	SONAR	Sound navigation and ranging

(b)	SARS	Sever acute respiratory syndoom
(c)	NTP	Nuclear side tri phosphate / Network Time Protocol, normal temp. and pressured
(d)	RQ	Respiratory Quotient
(e)	PVC	Poly Vinyl Chloride
(f)	NPN	(negative Positive negative Junction)
(g)	WAN	Wide Area Network
(h)	ECG	Electro-Cardio-Gram
(i)	CPU	Central processing Unit
(j)	BCG	Bacillus Calmette Guerin

Q.5. What are pesticides? Discuss their classification commonly in use with agronomists. (2,8)

Ans. (See Pesticides)

Q.6. Define any five of the following:

(a) Acoustics (b) Quartz (c) Cross pollination
(d) Allele (e) Optical illusion (f) Ovulation
(g) Aqua Regia

Ans. (a) (See Acoustics)

(b) (See Quartz)

(c) Cross pollination.

When pollen grains from a male reproductive part of a flower or stamens fall on another flower's female reproductive part or stigma is called cross pollination.

(d) Allele:

Alternative from of a gene pair is called allele.

(e) Optical illusion:

An erroneous perception of, reality. After the result of misinterpretation by the brain of information received by the senses. It may has external comes like REFRACTION.

(f) Ovulation:

Process of production of ova in the femme reproductive organs of an organism or ovaries is called ovulation.

(g) Aqua Regia:

A mixture of concentrated nitric acid and hydrochloric ' acid in the ratio 1 : 3 is called Aqua Regia.

Q.7. Which physical quantities are measured by the following units: (1 each)

(a) Pascal (b) Torr (c) Curie (d) Angstrom
(e) Light Year (f) Dioptse (g) Horse Power (h) Radian
(I) Candela (k) Mole

Ans:

Units	Physical Quantities
(a)Pascal	Pressure
(b)Torr	Pressure (atmosphere)
(c)Curie	Radioactivity
(d)Angstrom	Length = 0.1 nm
(e)Light year	Distance
(f)Dioptre	Optical power of lense or current mirror
(g)Horse power	Power
(h)Radian	Angular measurement
(i)Candela	Luminous intensity
(j)Mole	Amount of a substance

Q.8. Explain the structure of Earth and its atmosphere. (5,5)

Ans. See chapter of earth.

Q.9. Fill in the blanks.

(a) The conversion of non-diffusible substances into diffusible ones by the action of enzymes

is called ————.

(b) Diamond is the purest naturally occurring crystalline form of————.

(c) Caustic soda is extensively used for making————.

(d) When a person can see nearer objects but not the distant ones he is said to be suffering from ————.

(e) Marble is ————rock.

(f) Curie is a unit of————.

(g) The brown colour of rust is because of————.

(h) The movement of food through esophagus is by the muscular action known a————.

(i) Granite is a form of————rock.

(j) ————is the main chemical substance in the plant cell wall.

(k) ———— was first discovered by Robert Brown.

Answers:

(a) The conversion of non diffusible substance into diffusible ones by the action of enzymes is called digestion.

(b) Diamond is the purest naturally occurring crystalline form of Carbon.

(c) Caustic soda is extensively used for making Soap.

(d) When a person can see nearer objects but not the distant once he is said to be suffering from Myopia.

(e) Marble is Metamorphic rock.

(f) Curie is a unit of Radioactivity.

(g) The brown colour of rust is because of Ironoxide.

(h) The movement of food through esophagus is by the muscular action known as Peristalsis

(i) Granite is a form of Igneous rock.

(j) Cellulose is the main chemical substance in the plant cell wall.

(k) Cell Nucleus was first discovered by Robert Brown.

Q.10. What are endocrine Glands? Name any two. From which part of the body are the following secreted. Insulin, Thyroxin, Adrenaline, Estrogen, Testosterone, Cortisol. (2,2,6)

Ans. Endocrine Glands:

Are those glands which pour their secretions directly into the blood stream. These are also called ductless glands as they have no ducts. Their secretions are called hormones which are actually protein in nature.

Name of two endocrine glands:

1. Pitutary gland. 2. Thyroid gland.

From which part of the body are the following recreted.

Secretions	Glands
Insulin	Pancreas
Thyroxin	Thyroid gland
Adrenaline	Adrenal medulla
Estrogen	Ovaries
Testosterone	Testis
Contirol	Adrenal cortex.

Q.11. Chose the best choice in the following statements: (1 each)

(1) Enzymes are organic catalysts made up of:

(a) Carbonhydrates (b) Proteins

(c) Fats (d) Nucleic Acids

(2) A nanometer is:

(a) 10^{-3} meters (b) 10^{-6} meters

(c) 10-9 meters (d) 10^{-12} meters

(3) The minimum speed of a Pentium II computers is:

(a) 133 MHz (b) 233 MHz

(c) 333 MHz (d) 433MHz

(4) According to recent classifications the living organisms are divided into number of kingdoms:

(a) 2 (b) 3

(c) 4 (d) 5

(5) Glycolysis is a process of:

(a) Photosynthesis (b) Reproduction

(c) Transpiration (d) Respiration

Q.12. Different between the following pairs:

(a) Lava & Magma (b) Ultraviolet and Infra-red

(c) Fault and Fold (d) Caustic soda and Caustic Potash

(e) S.E M (Scanning electronic Microscope) and T.E M (transmission electronic Microscope)

Ans. (a) Lava & Magma

Lava, molten or partially molten rock that erupts at the earth's surface. When lava comes to the surface, it is red-hot, reaching temperatures as high as 1200 C (2200 F). some lava can be as thick and viscous as toothpaste, while other lava can be as thin and fluid as warm syrup and flow rapidly down the sides of a volcano. Molten rock that has not yet erupted is called magma. Once lava hardens it forms igneous rock. Volcanoes build up where lava erupts from a central vent. Flood basalt forms where lava erupts from huge fissures. The eruption of lava is the principal mechanism whereby new crust is produced. Since lava is generatld at depth, its chemical and physical characteristics provide indirect information about the chemical composition and physical properties of the rocks 50 to 150 km (30 to 90 mi) below the surface.

Magma, molten or partially molten rock beneath the earth's surface. Magma is generated when rock deep underground melts due to the high temperatures and pressures inside the earth. Because magma is lighter than the surrounding rock, it tends to rise. As it moves upward, the magma encounters colder rock and begins to cool. If the temperature to the magma drops low enough, the magma will crystallize underground to form rock; rock that forms in this way is called intrusive, or plutonic igneous rock, as the magma has formed by intruding the surrounding rocks. If the crust through which the magma passes is sufficiently shallow, warm, or fractured and if the magma is sufficiently hot and fluid, the magma will erupt at the surface of the earth, possibly forming volcanoes. Magma that erupts is called lava.

(b) Ultraviolet rays and Infra-red rays

Sunlight is composed of several colours such as red, orange, yellow, green, blue, Indigo and violet. Below this violet colour there exist other rays known as ultra violet rays these rays possess a short wavelength but nigh frequency. Their main source is mercury vapour lamp.

As we know that Sunlight is composed of several colours such as red, orange, yellow, green, blue, indigo and violet. Beyond this red rays there exist other rays known as infra-red rays, which is invisible. These rays correspond to long but low frequency.

(c) Fault and Fold

Fault: When the earth's crust bends folding occurs, but when it cracks faulting takes place.

Fold: Fold is a process that is caused by large scale earth movement, when stresses are set up in earth's crust. Such stress may be due to the increased load of the overlying rocks, flow movements in the mantle, magmatic instructions into the crust, or the expansion or contraction of initiated the rocks are subjected to compressive forces that produce folding.

(d) Caustic soda and Caustic Potash

Caustic soda is NaOH. It is used in textile industry.

(e) S.E.M (Scanning electronic Microscope) and T.E.M (Transmission Electronic Microscope)

(See Electron Microscopy)

(g) Guava contains more vitamins C than orange.

(h) A light year is a unit of time.

(i) Mercury is heavier than Lead.

(j) Movement of tectonic plates may cause eruption of volcano.

Ans:

(a)	True	(b)	False	(c)	True
(d)	False	(e)	False	(f)	False
(g)	True	(h)	False	(i)	False
(j)	True				

Q.14. Give scientific reason of the following. (2 each)

(a) Colour blindness is more common in men than in women.

(b) Light coloured clothes are generally worn in summer.

(c) A person is hurt more when he falls on hard ground than on soft ground.

(d) Deforestation causes more floods.

(e) The man-hole coves are generally round.

Ans: (a) Colourblindness is more common is men than in women.

Colourblinness is a hereditary disease and gene controlling the disease present on x-chromosome. In female there are two x chromosomes in 23 pair of chromosome. If a women having a single gene of colourblindness present on one x, would be carrier by not diseased XcX. But if a women having two recessive gene for the disease will be colour blind XcXc. But chances for two c genes in a women are small as the two genes must come from parents. One from mother and one from father. On the other hand in males chances of colour blindness are more as he only requires single 'C' gene from only one member of his parents and always from mother.

For colour blind daughter both parents must have a gene 'C' for colour blindness.

(b) Light coloured clothes are generally worn in summer.

Light coloured clothes reflect light rays and remain cool on the other hand dark coloured clothes absorb light and remain warm. That is why light coloured clothes are worn in summer.

(c) A person is hurt more when he falls on hard ground than on soft ground.

Because of greater force of friction on hard ground a person is hurt more. On other hand on soft ground there is less force of friction so a person is hurt less.

(d) Deforestation causes more floods.

Deforestation cause more floods as the trees and forest act as natural barriers in the way of flowing water. Speed of water is also decreased by trees. But when trees are cut and deforestation occurs there natural barriers are finished and more flooding occurs.

(e) The man-hole veins are generally round.

A round structure are supposed to be strong as compared to square.

Q.15. What does LASER stand for? Describe its four different applications clearly stating their principle. (2,8)

Ans. Laser:

Light amplification by stimulated emission of radiation.

Applications:

1. Laser light can be focused very accurately on a point as laser can generate "well organized" light or COHERENT light. So this can cut steel and surgeons
2. Laser can be used in eye-surgery where it works as a welding machine. A retina of an eye can be welded back into place using a laser beam. It is done in case of can use laser light to perform delicate operations separated or detached retina from the back of the eye.
3. Laser sources allow reproduction of the dimensional images. This technique is called holography. Holographs of different things are produced for different purposes.
4. Laser light being a COHERENT light can be used to utilize thermonuclear reactions which occur only at a very high temperature

SOLUTION

EVERYDAY SCIENCE 2004

Note: Attempt TEN questions. All questions carry EQUAL marks. Draw diagrams where necessary and write clearly.

Q.1. Write short notes on Two of the following: (5 each)

a) Superconductivity b) Night Vision Technology

c) Seismograph

Ans:

a) **Superconductivity:** Superconductivity, phenomenon is displayed by certain conductors that demonstrate no resistance to the flow of an electric current. Superconductors also exhibit strong diamagnetism; that is, they are repelled by magnetic fields. Superconductivity is manifested only below a certain critical temperature TT and a critical magnetic field H_c which vary with the material used. Before 1955, the highest T_c was 23.2 K (-249.8° C/- 417.6°F) in niobium-germanium compounds. Temperatures this low were achieved by use of liquid helium, an expensive, inefficient coolant. Ultra low temperature operation places a severe constraint on the overall efficiency of a super conducting machine. Thus, large-scale operation of such machines was not considered practical.

b) **Night Vision Technology:** A scientific experiment has managed to reduce the speed of light by a factor of 20 million, creating the opportunity for a variety of futuristic advances in everything from computers to night-vision devices. The development was reported in the February 18, 1999, issue of the journal Nature.

Scientists used a special high-density clump of atoms known as a Bose-Einstein condensate chilled to a tiny fraction of a degree above absolute zero in order to slow a beam of light to just 61 km/h (38 mph). Absolute zero is the lowest temperature theoretically possible, approximately -273.16°C (-459.69°F). The speed of light in a vacuum is 299,792,458 meters per second (about 186,000 miles per second).

The scientists then fired two laser light beams through the condensate. The first beam created a quantum mechanical system combining the atoms in the condensate and the laser light. This system is hugely refractive, so that when the second light beam was shot through at right angles to the first, the second beam was slowed dramatically. Hau said the team's next goal was to use improved laser beam technology to slow the speed of light to a crawl, 1 cm (about 0.4 in) per second.

The scientists cited optical computing as a potential future application of the discovery, in which single photons of light would replace the electronic pulses used in current computers. Because optical computing promises the possibility of much tinier switches that generate less heat, it would revolutionize the speed and size of computing technology. In addition, new types of laser and night-vision devices would need many times less power than currently required. Hau suggested that such developments could be ten years away or less if research is stepped up.

c) **Seismograph:** Seismologists measure earthquakes to learn more about them and to use them for geological discovery. They measure the pattern of an earthquake with a machine called a seismograph. Using multiple seismographs around the world, they can accurately locate the epicenter of the earthquake, as well as determine its magnitude, or size, and fault slip properties.

Q.2. Briefly write down characteristics of: (5 each)

a) Mercury b) Pluto

Ans: a) Mercury: See Solar system (Page No. 85)

Q.3. Name: (1 each)

a) The desert mammal which does not drink water.

b) The mixture which can dissolve Platinum.

c) The constituent elements of Bronze.

d) The vitamin whose deficiency causes Beri Beri.

e) The electrical device which transform voltage.

f) A nuclear reaction in which two or more than two lighter nuclei are fused together to form a relatively heavier one.

g) Purest naturally occurring crystalline form of carbon.

h) The hormone secreted by adrenal cortex.

i) The three colours combination which produces the sensation of white light.
j) The defect of vision because of which a person cannot see distant objects clearly.

Ans:

a) Kangaroo Rat
b) Aqua Regia
c) Bronze (Copper 90%, Tin 10%)
d) Vitamin B1
e) Electric Transformer
f) Fusion
g) Diamond
h) Adrenaline
i) Blue, Green, Red
j) Myopia

Q.4. What are fertilizers? What do you understand by the term NPK Fertilizer? How do fertilization contribute to the pollution? (2,2,6)

Ans: See Question No. 14 Paper 2002.

Q.5. Write briefly about any FIVE of the following: (2 each)

a) Nuclear Radiation b) Theodolite
c) Dialysis d) Enrichment of Uranium
e) Richter Scale f) Aqua Regia
g) Iodized Salt

Ans:

a) **Nuclear Radiation:** The emission of radiations from the nucleus of heavy elements is known as radiation. Three types of rays, a, p and r are produced (alpha, beta and gamma rays), a double positive charge having mass equal to helium nucleus mass 2 a. m.u, p having negative charge like electrons, and r neutral.

b) **Theodolite:** An instrument used by the surveyors for surveying the hilly areas for laying down of sewerage or drainage pipes. Horizontal linear measurements are made with calibrated ruler or tapes and sometimes by electronically timing the travel of light or radio waves between points. Vertical linear measurements are made with a graduated vertical rod to find differences of elevation and heights above sea level. The so-called engineer's level, a tripod-mounted telescope equipped with a spirit bubble and a cross wire, is used to sight the graduations on the rod. The horizontal or vertical angles are measured by a transit or theodolite, a tripod-mounted telescope with cross wires, the graduated circles of which indicate angles in degrees, minutes, and seconds.

c) **Dialysis:** The process by which the nitrogenous wastes are removed artificially by the body of patients whose- both the kidneys are nonfunctioning called Dialysis. Dialysis are of two types, abdominal and renal. Abdominal Dialysis is the process which is required two times in a month. It takes 4 — 5 hours, in this process, blood is taken out from a person and filtered by a dialyzer. The purified blood is then pumped back. Kidneys function to remove the nitrogenous wastes in the form of urea. Their failure can be proved dangerous. As the accumulation of these wastes can be proved poisonous for body.

d) **Enrichment of Uranium:** This process is basically used for the production of Atomic Bomb but also can be used in the process of acquiring the strength of producing power generation.

e) **Richter Scale:** Richter scale is used for the measurement of earthquake.

f) **Aqua Regia:** 1 HNO_3, 3 HCl; it is a mixture of 3 parts of HC1 and 1 part of nitric acid HNO3. It is very powerful combination that can dissolve gold and even platinum.

g) **Iodized Salt:** Iodine is required for the normal functioning of thyroid gland. Whose secretion thyroxine is required for normal metabolism of body. In hilly areas, the soil is not rich with iodine and its deficiency can even cause Goiter. Iodized salt is artificially synthesized to compensate for the deficiency of iodine in drinking water.

Q.6. Which physical quantities are measured by the following unit? (1 each)

a) Rutherford b) Ton c) Fermi d) Henry
e) SVED BERG Unit f) dioptre g) Mho h) Maxwell
i) Becquerel j) Kilo Watt Hour

Ans:

a) Rutherford: (Radioactivity).
b) Ton: Weight, Torr: Atmosphere Pressure
c) Fermi: Length
d) Henry: Inductance
e) Sved Berg Unit: Time
f) Dioptre: optical power of the lens;
g) Mho: conductance
h) Maxwell: Magnetic Flux
i) Becquerel: Radioactivity
j) Kilo watt hour: Energy/Work

Q.7. What are the various sources of energy? How does energy is produced in the surface of the sun? What will be the future of the sun? (4,4,2)

Ans:

Sources of Energy: Light, heat and electricity are the forms of energy. Energy is produced by different sources; Sun — Fusion, Bulbs — Flow of Electrons (Chemical Reactions), Heater – Electricity. Oven — Burning of Gas, CH_4, Coal. In these reactions C, eacts with oxygen to form Co, Coe etc. Thus by exothermic reactions or by the conduction of electricity energy is produced. Water is also a source of generating electricity e.g. hydro power plant.

Future of Sun: Sun will become cold one day. As in fusion small atoms combine to form a large nuclei. These small nuclei will one day be destroyed completely. Thus, it will not be able to produce any more energy.

Q.8. Mark the following statements True and False? (1 each)

a) A six feet tall lady can see her full image in a three feet Plane Mirror.
b) Vanadium, a steel gray corrosion resistant metal occur naturally in oxide state.
c) Fibre Optics Cable carries data in the form of light.
d) Blue flame is hotter than red flame.
e) Falling of yellow leaves during Autumn is the seasonal time for plants to get rid of accumulated wastes.
f) Friction is necessary force agent.
g) There are 9.5×10^{15} m in one light year.
h) The velocity of a moving object is least where the pressure is greatest.
i) Heat reaches earth from sun by means of convection.
j) Meningitis is the inflammation of liver.

a) True b) True
c) True d) True
e) True f) True
g) True h) True
i) False j) False

Q.9. Differentiate between the following: (2 each)

a) Periscope & Pyrometer b) Cell & Battery
c) Perimeter & Altimeter d) Pelage & Plumage
e) Smog and Smoke

Ans.

a) **Periscope:** Periscope, optical instrument for conducting observations from a concealed or protected position. A simple periscope consists essentially of reflecting mirrors or prisms at opposite ends of a tube with the reflecting surfaces parallel to each other, and at a 45° angle to the axis of the tube. The so-called field or tank periscope has been commonly used in trenches, behind parapets and earthworks, and in tanks to provide protected vision for the user. The submarine periscope is a larger and more complex instrument. It consists of reflecting prisms at top and bottom of the vertical periscope tube, with two telescopes and several lenses between them, and an eyepiece at the lower end (see Prism; Telescope). The submarine periscope is contained in a strong, thick casing tube, 10 to 15 cm (4 to 6 in) in diameter, to stand the pressure of the water at great depths. The only part of the outer tube that turns is the head, and this is attached to the inner tube, which can be turned by means of a lever or a crank and gearing. The field of a simple periscope is small, but several recent improvements have extended it somewhat. The magnification of distant objects is from 1.5 to 6 diameters. See Optics; Submarine. Periscopes are also used as viewing devices in military aircraft, in nuclear physics laboratories to observe radioactive reactions, and in particle accelerators.

Pyrometer: Pyrometer, thermometer that measures high temperatures. The optical pyrometer is used to measure temperatures of solid objects at temperatures above 700°C (about 1300°F), where most other thermometers would melt. At such high temperatures, solid objects radiate sufficient energy in the visual range to permit optical measurement by exploiting the so- called glow color phenomenon. The color at which hot objects glow changes from dull red through yellow to nearly white at about 1300°C (about 2400°F). The pyrometer contains a light bulb type of filament controlled by a rheostat (dimmer switch) that is calibrated so that the colors* at which the filament glows correspond to specific temperatures. The temperature of a glowing object can be measured by viewing the object through the pyrometer and adjusting the rheostat until the filament blends into the image of the object. At this point the temperatures of the filament and the object are equal and can be read from the calibrated rheostat.

b) **Cell:** Cell is the battery which can not be recharged. Granite is burnt in it (chemically reacts till it is completely used):

Battery: In batteries, recycling takes place and it can be recharged.

c) **Perimeter:** Perimeter, or boundary, the line drawn around the edge of an area or shape. For example, the perimeter of a rectangle is the sum of its four sides; the perimeter of a circle is known as its circumference.

Altimeter: Altimeter, mechanical or electronic device commonly used in aircraft to measure vertical height above the surface of the earth. Two main types of altimeter exist: pressure and radio. The more common pressure altimeter operates on the principle that atmospheric pressure decreases with an increase in altitude. Pointers on the graduated face of the altimeter dial connect through a system of gears and levers to an aneroid capsule, a hollow, metallic disk partially evacuated of air that expands and contracts slightly with changes in atmospheric pressure, that is, with altitude (see Barometer). Radioaltimeters, radar devices modified to measure vertical distance only, beam a pulse of electromagnetic radiation downward from the aircraft. A receiving antenna on the craft then detects the radio waves reflected by the surface of the earth. By measuring the time difference (t) between sending and receiving the pulse, the altitude (h) can be computed in the equation

$$h = \frac{tc}{2}$$

where c is the speed of light.

d) **Pelage and Plumage:**

Feather (bird anatomy), horny outgrowth of skin peculiar to the bird but similar in structure and origin to the scales of fish and reptiles and analogous to the hair of mammals. Feathers serve as protection against water and cold, as an aid in flight, and as sex differentiators.

A feather consists of two principal parts, the axis, or spinelike central structure, and the barb, or side branch of the stem. The axis is divided into a bare, hollow portion known as the quill and - a barb-bearing, solid part called the shaft. The base of the quill is rooted in a small sac of the skin and has a tiny opening for the entrance of the nutritive pulp, which feeds the feather while it is growing. The barbs, which all together form the vane or fringe, are linked to each other by pointed barbules, or smaller barbs, which may be again interlocked by minute hooks.

The most conspicuous feathers on a bird, the contour feathers, or pennae, make up the large feathers of the wings and tail. Another type, called down feathers, consists of long, loose, soft plumes. About the base of the contour feathers are found small growths of a third type called filoplumes, which are small, simple, hairlike feathers with a long shaft and a rudimentary brush of barbs. Powder down feathers are stunted feathers that dry up and disintegrate, leaving a dry, waxy powder that spreads over the rest of the plumage.

The feathers of the male bird may be different in appearance from those of the female bird of the same species. These differences are due mainly to the sex hormone produced by the ovary or testes. In most birds, as in the indigo bunting, genes determine plumage, and in others, as the pheasant, the difference results from a combination of genetic and endocrine factors. Elaborate feathers, such as those in a peacock's tail, evolve due to female preference when choosing mates and to competition between males for mates.

e) Smog and Smoke: It song is the combination of smoke and fog. And Smoke is produced when coal burns incompletely. It releases unburnt compounds of carbon.

Q.10. Fill in the blanks: (1 each)

a) The largest planet of the solar system is ————.

b) The temperature of the dead human body on Celsius Scale is————.

c) For a large span of a long jump, two things are taken into account — viz (i) angle with which one jumps and (ii) ————.

d) The number of Spinal Nerves in man is ———— pairs.

e) A primary cell can ———— be charged again.

f) Halos around the moon are formed because of the phenomenon of————.

g) Scattering of light ———— the duration of the day.

h) Muscle stiffness is caused by a disease called ————.

i) Oil rises in a wick of oil lamp on account of a property of matter called ————.

j) Muslim scientist Ali-al-Tabari is famous for his work on ————.

Ans:

a) Jupiter
b) Dead body has temperature of atmosphere
c) Angle of projection
d) 31
e) Not
f) Refraction of light.
g) Determines
h) Telanus
i) Viscosity
j) Medicine

Q.11. Give scientific reason for the following: (2 each)

a) Rain water is more fertile than water from tubewell.

b) The manhole covers are generally round.

c) Clothes of a moving dancer bulge.

d) Peoples are advised not to stand near a fast moving train.

e) The image of a tree looks inverted on the bank of a lake.

Ans:

a) Rain water dissolves different compounds e.g. nitrates, from air. Thus it is more fertile than tubewell.

b) Because of circular body has reduced friction and is easy to maintain the shape.

c) Due to circular rotation, the centripetal force is balanced by centrifugal force to give the clothes a bulging appearance.

d) Due to inertia of earth near fast moving train, it will make a man standing on it unstable to lose his balance.

e) As, a real image is always inverted, so, our image in the water looks inverted.

Q.12. Why are the scientists worried about the increase of carbon dioxide gas in the atmosphere? Is there any possible benefit for the mankind in case of global warming? (8,2)

Ans:

CO_2 gas in atmosphere is increasing daily by cutting trees. As CO_2 is recycled in environment by green plants in photosynthesis.

$$(6\ CO_2 + 6\ H_2) \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2$$

Thus, plants take in CO_2 and give out O_2. Greater the number of plants, more will be the reduction in CO_2.

But, in respiration, CO2 is continuously produced by all living beings.

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6\ H_2O + \text{Energy}$$

CO_2 has the capacity to trap the heat energy. Thus the increased amount of CO_2, will warm the environment i.e. greenhouse effect this process is causing global warming.

Global Warming

Global Warming, increase in the average temperature of the atmosphere, oceans, and landmasses of Earth. The planet has warmed (and cooled) many times during the 4.65 billion years of its history. At present Earth appears to be facing a rapid warming, which most scientists believe results, at least in part, from human activities. The chief cause of this warming is thought to be the burning of fossil fuels, such as coal, oil, and natural gas, which releases into the atmosphere carbon dioxide and other substances known as greenhouse gases. As the atmosphere becomes richer in these gases, it becomes a better insulator, retaining more of the heat provided to the planet by the Sun.

The average surface temperature of Earth is about 15°C (59°F). Over the last century, this average has risen by about 0.6 Celsius degree (1 Fahrenheit degree). Scientists predict further warming of 1.4 to 5.8 Celsius degrees (2.5 to 10.4 Fahrenheit degrees) by the year 2100. This temperature rise is expected to melt polar ice caps and glaciers as well as warm the oceans, all of which will expand ocean volume and raise sea level by an estimated 9 to 100 cm (4 to 40 in), flooding some coastal regions and even entire islands. Some regions in warmer climates will receive more rainfall than before, but soils will dry out faster between storms. This soil desiccation may damage food crops, disrupting food supplies in some parts of the world. Plant and animal species will shift their ranges toward the poles or to higher elevations seeking cooler temperatures, and species that cannot do so may become extinct. The potential consequences of global warming are so great that many of the world's leading scientists have called for international cooperation and immediate action to counteract the problem.

The Greenhouse Effect

The energy that lights and warms Earth comes from the Sun. Most of the energy that floods onto our planet is short-wave radiation, including visible light. When this energy strikes the surface of Earth, the energy changes from light to heat and warms Earth. Earth's surface, in turn, releases some of this heat as long- wave infrared radiation.

Much of this long-wave infrared radiation makes it all the way back out to space, but a portion remains trapped in Earth's atmosphere. Certain gases in the atmosphere, including water vapor, carbon dioxide, and methane, provide the trap. Absorbing and reflecting infrared waves radiated by Earth, these gases conserve heat as the glass in a greenhouse does and are thus known as greenhouse gases. As the concentration of these greenhouse gases in the atmosphere increases, more heat energy remains trapped below. All life on Earth relies on this greenhouse effect—without it, the planet would be colder by about 33 Celsius degrees (59 Fahrenheit degrees), and ice would cover Earth from pole to pole. However, a growing excess of greenhouse gases in Earth's atmosphere threatens to tip the balance in the other direction—toward continual warming.

Types of Greenhouse Gases

Greenhouse gases occur naturally in the environment and also result from human activities. By far the most abundant greenhouse gas is water vapor, which reaches the atmosphere through evaporation from oceans, lakes, and rivers.

Carbon dioxide is the next most abundant greenhouse gas. It flows into the atmosphere from many natural processes, such as volcanic eruptions; the respiration of animals, which breathe in oxygen and exhale carbon dioxide; and the burning or decay of organic matter, such as plants. Carbon dioxide leaves the atmosphere when it is absorbed into ocean water and through the photosynthesis of plants, especially trees. Photosynthesis breaks up carbon dioxide, releasing oxygen into the atmosphere and incorporating the carbon into new plant tissue.

Humans escalate the amount of carbon dioxide released to the atmosphere when they burn fossil

fuels, solid wastes, and wood and wood products to heat buildings, drive vehicles, and generate electricity. At the same time, the number of trees available to absorb carbon dioxide through photosynthesis has been greatly reduced by deforestation, the long-term destruction of forests by indiscriminate cutting of trees for lumber or to clear land for agricultural activities.

Ultimately, the oceans and other natural processes absorb excess carbon dioxide in the atmosphere. However, human activities have caused carbon dioxide to be released to the atmosphere at rates much faster than that at which Earth's natural processes can cycle this gas. In 1750 there were about 281 molecules of carbon dioXide per million molecules of air (abbreviated as parts per million, or ppm). Today atmospheric carbon dioxide concentrations are 368 ppm, which reflects a 31 percent increase. Atmospheric carbon dioxide concentration increases by about 1.5 ppm per year. If current predictions prove accurate, by the year 2100 carbon dioxide will reach concentrations of more than 540 to 970 ppm. At the highest estimation, this concentration would be triple the levels prior to the Industrial Revolution, the widespread replacement of human labor by machines that began in Britain in the mid-18th century and soon spread to other parts of Europe and to the United States.

Methane is an even more effective insulator, trapping over 20 times more heat than does the same amount of carbon dioxide. Methane is emitted during the production and transport of coal, natural gas, and oil. Methane also comes from rotting organic waste in landfills, and it is released from certain animals, especially cows, as a byproduct of digestion. Since the beginning of the Industrial Revolution in the mid-1700s, the amount of methane in the atmosphere has more than doubled.

Nitrous oxide is a powerful insulating gas released primarily by burning fossil fuels and by plowing farm soils. Nitrous oxide traps about 300 times more heat than does the same amount of carbon dioxide. The concentration of nitrous oxide in the atmosphere has increased 17 percent over pre-industrial levels. In addition, greenhouse gases are produced in many manufacturing processes. Per-fluorinated compounds result from the smelting of aluminum. Hydro fluorocarbons form during the manufacture of many products, including the foams used in insulation, furniture, and car seats. Refrigerators built in some developing nations still use chlorofluorocarbons as coolants. In addition to their ability to retain atmospheric heat, some of these synthetic chemicals also destroy Earth's high-altitude ozone layer, the protective layer of gases that shields Earth from damaging ultraviolet radiation. For most of the 20th century these chemicals have been accumulating in the atmosphere at unprecedented rates. But since 1995, in response to regulations enforced by the Montreal Protocol on Substances that Deplete the Ozone Layer and its amendments, the atmospheric concentrations of many of these gases are either increasing more slowly or decreasing.

Scientists are growing concerned about other gases produced from manufacturing processes that pose an environmental risk. In 2000 scientists identified a substantial rise in atmospheric concentrations of a newly identified synthetic compound called trifluoromethyl sulfur pentafluoride. Atmospheric concentrations of this gas are rising quickly, and although it still is extremely rare in the atmosphere, scientists are concerned because the gas traps heat more effectively than all other known greenhouse gases. Perhaps more worrisome, scientists have been unable to confirm the industrial source of the gas.

Measuring Global Warming

As early as 1895 scientists suggested that burning fossil fuels might change the composition of the atmosphere and that an increase in global average temperature might result. The first part of this hypothesis was confirmed in 1957, when researchers working in the global research program called the International Geophysical Year sampled the atmosphere from the top of the Hawaiian volcano Mauna Loa. Their instruments indicated that carbon dioxide concentration was indeed rising. Since then, the composition of the atmosphere has been carefully tracked. The data collected slow undeniably that the concentrations of greenhouse gases in the atmosphere are increasing.

Scientists have long suspected that the global climate, the longterm average pattern of temperature, was also growing warmer, but they were unable to provide conclusive proof. Temperatures vary widely all the time and from place to place. It takes many years of climate observations to establish a trend. Records going back to the late 1800s did seem to show a warming trend, but these statistics were spotty and untrustworthy. Early weather stations often were located near cities, where temperature measurements were affected by the heat emitted from buildings and vehicles and stored by building materials and pavements.

Since 1957, however, data have been gathered from more reliable weather stations, located far away from cities, and from satellites. These data have provided new, more accurate measurements, especially for the 70 percent of the planetary surface that is ocean water (see Satellite, Artificial). These

more accurate records indicate that a surface warming trend exists and that, moreover, it has become more pronounced. Looking back from the end of the 20th century, records show that the ten warmest years of the century all occurred after 1980, and the three hottest years occurred after 1990, with 1998 being the warmest year of all. Greenhouse gas concentrations are increasing. Temperatures are rising. But does the gas increase necessarily cause the warming, and will these two phenomena continue to occur together? In 1988 the United Nations Environment Program and the World Meteorological Organization established a panel of 200 leading scientists to consider the evidence. In its Third Assessment Report, released in 2001, this Intergovernmental Panel on Climate Change (IPCC) concluded that global air temperature had increased 0.6 Celsius degree (1 Fahrenheit degree) since 1861. The panel agreed that the warming was caused primarily by human activities that add greenhouse gases to the atmosphere. The IPCC predicted in 2001 that the average global temperature would rise by another 1.4 to 5.8 Celsius degrees (2.5 to 10.4 Fahrenheit degrees) by the year 2100.

The IPCC panel cautioned that even if greenhouse gas concentrations in the atmosphere ceased growing by the year 2100, the climate would continue to warm for a period after that as a result of past emissions. Carbon dioxide remains in the atmosphere for a century or more before nature can dispose of it. If greenhouse gas emissions continue to increase, experts predict that carbon dioxide concentrations in the atmosphere could rise to more than three times pre-industrial levels early in the 22nd century, resulting in dramatic climate changes. Large climate changes of the type predicted are not unprecedented; indeed, they have occurred many times in the history of Earth. However, human beings would face this latest climate swing with a huge population at risk.

Effects of Global Warming

Scientists use elaborate computer models of temperature, precipitation patterns, and atmosphere circulation to study global warming. Based on these models, scientists have made several predictions about how global warming will affect weather, sea levels, coastlines, agriculture, wildlife, and human health.

Weather

Scientists predict that during global warming, the northern regions of the Northern Hemisphere will heat up more than other areas of the planet, northern and mountain glaciers will shrink, and less ice will float on northern oceans. Regions that now experience light winter snows may receive no snow at all. In temperate mountains, snowlines will be higher and snowpacks will melt earlier. Growing seasons will be longer in some areas. Winter and nighttime temperatures will tend to rise more than summer and daytime ones.

The warmed world will be generally more humid as a result of more water evaporating from the oceans. Scientists are not sure whether a more humid atmosphere will encourage or discourage further warming. On the one hand, water vapor is a greenhouse gas, and its increased presence should add to the insulating effect. On the other hand, more vapor in the atmosphere will produce more clouds, which reflect sunlight back into space, which should slow the warming process (see Water Cycle).

Greater humidity will increase rainfall, on average, about 1 percent for each Fahrenheit degree of warming. (Rainfall over the continents has already increased by about 1 percent in the last 100 years.) Storms are expected to be more frequent and more intense. However, water will also evaporate more rapidly from soil, causing it to dry out faster between rains. Some regions might actually become drier than before. Winds will blow harder and perhaps in different patterns. Hurricanes, which gain their force from the evaporation of water, are likely to be more severe. Against the background of warming, some very cold periods will still occur. Weather patterns are expected to be less predictable and more extreme.

Sea Levels

As the atmosphere warms, the surface layer of the ocean warms as well, expanding in volume and thus raising sea level. Warming will also melt much glacier ice, especially around Greenland, further swelling the sea. Sea levels worldwide rose 10 to 25 cm (4 to 10 in) during the 20th century, and IPCC scientists predict a further rise of 9 to 88 cm (4 to 35 in) in the 21st century.

Sea-level changes will complicate life in many coastal regions. A 100-cm. (40-in) rise could submerge 6 percent of The Netherlands, 17.5 percent of Bangladesh, and most or all of many islands. Erosion of cliffs, beaches, and dunes will increase. Storm surges, in which winds locally pile up water and raise the sea, will become more frequent and damaging. As the sea invades the mouths of rivers, flooding from runoff will also increase upstream. Wealthier countries will spend huge amounts of money to protect their shorelines, while poor countries may simply evacuate low-lying coastal regions.

Even a modest rise in sea level will greatly change coastal ecosystems. A 50-cm (20-in) rise will

submerge about half of the present coastal wetlands of the United States. New marshes will form in many places, but not where urban areas and developed landscapes block the way. This sea-level rise will cover much of the Florida Everglades.

Agriculture

A warmed globe will probably produce as much food as before, but not necessarily in the same places. Southern Canada, for example, may benefit from more rainfall and a longer growing season. At the same time, the semiarid tropical farmlands in some parts of Africa may become further impoverished. Desert farm regions that bring in irrigation water from distant mountains may suffer if the winter snow pack, which functions as a natural reservoir, melts before the peak growing months. Crops and woodlands may also be afflicted by more insects and plant diseases.

Animals and Plants

Animals and plants will find it difficult to escape from or adjust to the effects of warming because humans occupy so much land. Under global warming, animals will tend to migrate toward the poles and up mountainsides toward higher elevations, and plants will shift their ranges, seeking new areas as old habitats grow too warm. In many places, however, human development will prevent this shift. Species that find cities or farmlands blocking their way north or south may die out. Some types of forests, unable to propagate toward the poles fast enough, may disappear.

Human Health

In a warmer world, scientists predict that more people will get sick or die from heat stress, due less to hotter days than to warmer nights (giving the sufferers less relief). Diseases now found in the tropics, transmitted by mosquitoes and other animal hosts, will widen their range as these animal hosts move into regions formerly too cold for them. Today 45 percent world's people live where they might get bitten by a mosquito carrying the parasite that causes malaria; that percentage may increase to 60 percent if temperatures rise. Other tropical diseases may spread similarly, including dengue fever, yellow fever, and encephalitis. Scientists also predict rising incidence of allergies and respiratory diseases as warmer air grows more charged with pollutants, mold spores, and pollens.

By cutting of forests, more CO_2 is retained which increases the temperature largely. Global warming can change the face of the earth entirely. It can cause the polar ice/glaciers to melt.

Q.13. Following scientific abbreviations stand for? (1 each)

a) STP b) ATP c) PNP d) LAN e) KWh f) BTU
g) LDL h) ROM i) MAF j) SONAR

Ans:

a) STP: Standard Temperature and Pressure.
b) ATP: Adenosine Triphosphate
c) PNP: Positive Negative Positive
d) LAN: Local Area Network
e) KWh: Kilo watt hour
f) BTU: British Thermal unit
g) LDL: Low Density Lipoproteins.
h) ROM: Read Only Memory

7. Match the columns A and B but write the answers serial wise in Column C: (1 each)

	Column A	Column B	Column C
i)	Frank Whittle	Fission	i)
ii)	Addison	Electric lamp	ii)
iii)	Hahn	Genetics	iii)
iv)	Mendel	Lightening Conductor	iv)
v)	Benjamin Franklin	Semi Conductor	v)
vi)	Bardeen & Brattin	Uncertainty Principle	vi)
vii)	Heisenberg	Jet Engine	vii)
viii)	Fermi	Cyclotron	viii)
ix)	Lawrence	Electro Magnetic Wave	ix)

x) Maxwell Hertz Fusion Length Steam Engine x)

Ans:

i) Jet Engine ii) Electric. Lamp iii) Fission
iv) Genetic v) Lightining Conductor vi) Semi Conductor
vii) Uncertainty principle viii) Length ix) Cyclotron
x) Electro Magnetic Waves

Q.15. Choose the best choice in following statements: (1 each)

a) The three elements needed for healthy growth of plants are:
(i) N, P, K (ii) N, C, P (iii) N, K, C (iv) N, S, P.

b) The most abundant element in the human body is:
(i) Carbon (ii) Hydrogen (iii) Oxygen (iv) Nitrogen

c) Ammonium Nitrate is not used for ———— Crop:
(i) Rice (ii) Wheat (iii) Sugarcane (iv) Cotton

d) Sea divers use a mixture of gases for breathing during diving. The mixture is:
(i) 80% He & 20% O_2 (ii) 80% N_2 & 20% 0_2
(iii) 20% O_2 & 40% N_2 40% CO_2 (iv) 50% He & 50% O_2

e) Which one of the following is not a water soluble Vitamin:
(i) Niacin (ii) Ascorbic Acid (iii) Trypsin (iv) Riboflavin

f) Which of the following enzymes bring about hydrolysis of fats?
(i) Urease (ii) Zymase (iii) Maltase (iv) Lipase

g) The solution of which acid is used for seasoning of food:
(i) Formic Acid (ii) Acetic Acid (iii) Benzoic Acid (iv) Botanic Acid

h) Influenza is caused by:
(i) Fungi (ii) Bacteria (iii) Virus (iv) Protozoa

i) The blood glucose level is raised by the following except:
(i) Carbohydrates (ii) Cholesterol (iii) Insulin (iv) Epinephrine

j) The energy possessed by water in a dam is:
(i) Electrical Energy (ii) Kinetic Energy (iii) Potential Energy
(iv) Mechanical Energy

Ans:

a) (i) b) (iii) c) (i) d) (ii) e) (iii)
f) (iv) g) (ii) h) (iii) i) (iii) j) (iii)

(SOLVED PAPER)

EVERYDAY SCIENCE PAPER 2005

NOTE: Attempt any TEN All questions carry EQUAL marks. Draw diagrams where necessary and write clearly.

Q.1. Write short notes on any TWO of the following: (5 each)
(a) Communication Satellite (b) Geo-thermal Energy (c) Ultrasonics

Ans. (a) Sco Satellite

(b) Geothermal Energy:

The source of geothermal energy is the molten lava in the interior of the Earth. In certain region of the Earth, this lava is present near the surface of Earth. Water deposits are also present around the lava and these water deposits are converted into steam. This steam is utilized to generate Electricity. In countries like Japan, Mexico, Russia, Italy and America plants have been installed to generate Electricity through steam.

(c) Ultrasonics

The sound waves having frequency greater than 20,000 Hz is inaudible and are called ultrasonics. A normal human ear can hear sound between the frequency of 20 – 20000 HZ. The wavelength of ultrasonic waves is small and their energy is greater. Due to this, these are used in medical and technical fields. Some of the applications of ultrasonic are:-

(1) Pathogens are destroyed through high intensity ultrasonics.
(2) The sex of baby prior to birth can be determined through ultrasonics.
(3) Depth of water in sea can be determined.
(4) Kidney stone can be crushed.
(5) Ultrasonics help to remove dirt and plague on teeth.

Q.2. Write short notes on the life and work of the following: (5 each)
(a) Al-Biruni (b) Ibn Al — Haitham

Ans. See Muslims Scientists

Q.3. Name: (1 each)

(a) The alloy which consists of copper and tin.
Ans. Cu 87 % + Sn 13 % = Bronze
(b) The device used to measure radioactivity.
Ans. Geiger Counter
(c) The organ in the human body which is responsible for the digestion of protein only.
Ans. Stomach
(d) The instrument used to measure very high temperature.
Ans. Pyrometer
(e) The scientist who designed the first internal combustion engine used to burn low grade fuel.
Ans. Carnot
(f) The scientist who asserted the earth to be a huge magnet.
Ans. Dr. Gilbert
(g) The metal known as quick silver.
Ans. Hg (Mercury)
(h) The device which converts the chemical energy into electrical energy.
Ans. "Cell" or "Battery"
(i) The first person to orbit the earth in space.
Ans. Y Urigagrine
(j) The scientist who discovered water.
Ans. Henry Cavendish

Q.4. Write briefly about any FIVE of the following: (teach)
(a) Shock Waves (b) Sound Barrier (c) Solar Cell
(d) Super Fluid (e) Tsunami (f) Photovoltaic Cell
(g) Hygrometer

(a) SHOCK WAVES

Shock waves are the strong pressure disturbances that build up around the aircraft. Jet aeroplanes sometimes fly at supersonic speeds. A plane flying faster than the speed of sound (320 m/s) creates pressure disturbances in the air. These disturbances result from air flowing around the plane's wings and fuselage (body).

(b) SOUND BARRIER

Sound Barrier is sharp rise in aerodynamic drag that occurs as an aircraft approaches the speed of sound and that was formerly an obstacle to supersonic flight. If an aircraft flies at somewhat less than sonic speed (about 1220 kph), the pressure waves (sound waves) it creates outspeed their sources and spread out ahead of it. Once the aircraft reaches sonic speed the waves are unable to get out of its way. Strong local shock waves form on the wings and body; airflow around the craft becomes unsteady, and severe buffeting may result, with serious stability difficulties and loss of control over flight characteristics. Generally, aircraft properly designed for supersonic flight have little difficulty in passing through the sound barrier, but

the effect upon those designed for efficient operation at subsonic speeds may become extremely dangerous.

(c) SOLAR CELLS

Solar cells, also called solar batteries or photovoltaic cells, are made of semiconductor materials. When light shines on a solar cell, electrons are given off. They produce a current in a circuit connected to the cell. A few power stations convert the sun's energy into electricity by means of devices called solar cells.

(d) SUPER FLUID

Various simplifications, or models, of fluids have been devised since the last quarter of the 18th century to analyze fluid flow. The simplest model, called a super, or ideal, fluid, is one that. Is unable to conduct heat or to offer drag on the walls of a tube or internal resistance to one portion flowing over another. Thus, a super fluid, even while flowing, cannot sustain a tangential force; that is, it lacks viscosity and is also referred to as an inviscid fluid. Some real fluids of low viscosity and heat conductivity approach this behaviour.

(e) TSUNAMI

An earthquake on the ocean floor can give a tremendous push to surrounding seawater and create one or more large, destructive waves called tsunamis, also known as seismic sea waves. Some people call tsunamis tidal waves, but scientists think the term is misleading because the waves are not caused by the tide. Tsunamis may build to heights of more than 30 metres,when they reach shallow water near shore. in the open ocean, tsunamis typically move at speeds of 800 to 970 kilometres per hour. They can travel great distances while diminishing little in size and can flood coastal areas thousands of kilometres from their source.

(f) PHOTOVOLTAIC CELLS

Photovoltaic cells, convert sunlight into electric energy. These cells power most artificial satellites and other spacecraft as well as many handheld calculators. Photovoltaic cells are made from semiconducting materials, usually specially treated silicon. Energy from the sun forces negative and positive charges in the semiconductor to separate. The charges will then flow through a conductor.

(g) HYGROMETER

Hygrometer is an instrument used to determine the relative humidity. Relative humidity is the amount of water vapour in the air compared with the amount required for saturation of the air at the same temperature. The most common hygrometers are the psychrometer and the hair hygrometer.

Q.5. Which physical quantities are measured by the following units? (1 each)

(a) Coluomb	(b) Weber	(c) Tesla	(d) Siemen
(e) Rutherford	(f) Faraday	(g) Angstrom	(h) Parsec
(I) Degree	(j) Steradian		

Ans:

(a) Coluomb	Deliuted
(b) Weber	Magnetic Flux
(c) Tesla	Flux Density
(d) Siemen	Conductance
(e) Rutherford	Radioactivity
(f) Faraday	Electrical charge
(g) Angstrom	Length
(h) Parsec	Length
(I) Degree	Angle
(j) Steradian	Solid Angle

Q.6. How do our domestic and industrial activities pollute water? Explain with reference to two important Industries of Pakistan. (5,5)

Ans. See water and industrial pollution.

Q.7. Which of the following statements are True and which are False: (1 each)

(a) To stay in the sunlight while circling the globe at the equator, one has to move with a speed of 1670 km/hour. True

(b) Infrared waves have more wavelengths than the red colour. True
(c) Liver produces bile which is involved in the breakdown of fats. True
(d) A secondary cell can be charged again. True
(e) Nucleic acids are responsible basically for protein synthesis in the human body. True
(f) The quality of gasoline is checked by its octane number. True
(g) Image in a plane mirror is not laterally inverted. False
(h) Horse power is the unit of mechanical energy. False
(i) Sound travels faster in vacuum than in water. False
(j) Nitrogen is the most occurring element in the human body. False

8. Differentiate between the following pairs. (2 each)
   (a) Radiotherapy & Chemotherapy
   (b) Penumbra & Umbra
   (c) Springtides & Neaptides
   (d) Vertebrates &. Invertebrates
   (e) Fluorescent light & Neon signs

Ans: (a) RADIOTHERAPY & CHEMOTHERAPY

Radiotherapy

The medical use of ionizing radiation as part of cancer treatment to control malignant cells is called Radiotherapy. It is used as palliative treatment or as therapeutic treatment.

Chemotherapy

Chemotherapy is the use of chemical substances for the treatment of diseases. In modern days, cataltonic drugs are used to treat cancer. Other uses of cytostatic chemotherapy agents are the treatment of autoimmune diseases.

(b) See scientific terms distinguished and previous solved papers.

(c) See Tides

(d) Vertebrates

Vertebrates are animal who contain backbone or spinal column made up of interlocking units called vertebrae. The strong and flexible structure supports the body and anchors the limbs. It also protects the nerves of the spinal cord. Examples are fish, amphibians, reptiles, birds and mammals.

Invertebrates

Invertebrates are these which lack backbone. There are 2 million species of invertebrates. These invertebrates comprise 98% of the animal kingdom.

(e) FLUORESCENT LIGHT & NEON SIGNS

Fluorescent light

The light emitted by a source made up of glass tube which is internally coated with fluorescent material and usually filled with mercury vapors is called as fluorescent light. Electrodes are fitted with tube. When high voltage is applied across the electrodes, an electron beam emits which strikes with Hg atoms which ultimately emits UV radiation.

Neon Signs

Neon signs are cathode ray tubes in which Neon gas is filled. When electricity is passed through Neon gas, it emits an orange red colour which is called as Neon sign.

Q.9. Fill in the blanks: (1 each)

(a) The variation in the blood flow can be heard with an instrument called stethoscope.
(b) There is a place in the retina where the light sensitive cells are interrupted by the presence of the optic nerve head. It is known as blind spot.
(c) The study of human population is called Demography.
(d) Human beings belong to species called Sapiens (Homosapiens).
(e) Defect of eye due to which nearly located objects are not clearly visible is called Hyperopia.
(f) About 70 % of the human body consists of water.
(g) All of the oxygen that you breathe has been produced by the splitting of water during

Photosynthesis.

(h) The important ore of Chromium is Confute.

(i) HNO_3 1HCl, H_2SO_4 acid was discovered by Jabbar bin Hayyan.

(j) The measurement of rainfall is made by an instrument known as Vdometer.

Q.10. What are the main reasons of water - logging in Pakistan? How does a tube-well reclaim a water logged soil? (5,5)

Ans. In Pakistan the canals and their distributions are not lined with concrete or bricks. A part of water carried by them keeps seeping in the ground. Added to this seepage is also most of the water given to the plants. Since only a fraction of the water given to plants is actually absorbed by them and a larger part of it passes into layers of the earth. The excess of water thus accumulated under the earth begins to raise surface of the soil in several canal-fed areas in thus water logged by the rising water table.

How a tube well reclaims a water-logged soil:

In order to lower the water table tubo wells are used. They pump it out the saline water from the affected areas.

Q.11. Give scientific reason of the following: (2 each)

(1) Pole star is always seen in the north.

(2) We never see birds urinating.

(3) Pasteurized milk has more nourishment than the ordinary boiled milk.

(4) Bees die when they sting human beings.

(5) Cloudy nights are usually warmer than the clear ones.

Ans. (1) Earth rotates about N — S axis. The rays of the sun fall at the equator. The equator passes from east to west and the earth rotates from west to east. The star at the north pole will always be seen at north because the earth rotates from west to east and not from south to north.

(2) The birds use less water as compared to animals. The birds usually absorb the surplus water by the digestive system and they excrete feaces instead of urine.

(3) During pasteurization milk is heated between 68 — 72°C for about 20 minutes. In this process harmful bacteria are destroyed but nature of food nutrients never change. During boiling at 97 — 100°C mot of useful bacteria are also lost. Therefore, pasteurized milk has more nourishment than boiled milk.

(4) During biting of bee, the pouch full of poison ruptures. This poison enters the body of the human being as well as of the bee. Due to its own poison the bee dies.

(5) During the cloudy nights CO_2 get accumulated beneath the clouds. During the night, energy radiated through earth is absorbed by CO_2 layer. Due to this reason, atmosphere becomes more warmer. This is same as that of green house effect.

Q.12. What are Nuclear reactors? How the Electrical energy is produced by Nuclear Power Plants? Name the devices which convert

(1) Mechanical energy into electrical energy

(2) Heat energy into mechanical energy

(3) Electrical energy into mechanical energy

(4) Electrical energy into sound energy

(5) Sound energy into electrical energy

Ans. See Nuclear Reactor and Energy.

Q.13: What do the following scientific abbreviations stand for: (1 each)

(a) HDL (b) MeV (c) UHF (d) LED (e) LCD

(f) BASIC (g) MASER (h) ETT (i) HST (j) DBS

Ans.

(a) HDL High Density Lipoprotein

(b) MeV Mega Electron Volt

(c) UHF Ultra High Frequency

(d) LED Light Emitting Diode

(e) LCD Liquid Crystal Display

(f) BASIC Beginner All purpose Symbolic Instruction Code
(g) MASER Microwave Amplification by Stimulated Emission of Radiation
(h) ETT Endo tracheal tube
(i) HST Hubble Space Telescope
(j) DBS Data Base System, Direct broadcast satellite.

Q.14. Compare the columns A and B and write the correct answer from the Column to the Column A (serial wise) in Column C.

Column A	Column B	Column C
1. Gunpowder	Sulphur dioxide	1
2. Marble	Fermi	2
3. Ozone	Aqua regia	3
4. Argon	Beta — Particle	4
5. Quartz	Frequency	5
6. Mirage	Calcium Carbonate	6
7. Gold	Dobson Units	7
8. Modulation	Silicon dioxide	8
9. Length	Total internal reflection	9
10. Solar Energy	Blue purple light	10
	Potassium Nitrate	
	Nuclear Fission reaction	

Ans.

Column A	Column B	Column C
1. Gunpowder	Sulphur dioxide	1. Potassium Nitrate
2. Marble	Fermi	2. Calcium Carbonate
3. Ozone	Aqua regia	3. Dobsan units
4. Argon	Beta — Particle	4. Blue purple
5. Quartz	Frequency	5. Silicon dioxide
6. Mirage	Calcium Carbonate	6.Total internal reflection
7. Gold	Dobson Units	7. Aqua regia
8. Modulation	Silicon dioxide	8. Frequency
9. Length	Total internal reflection	9. Fermi
10. Solar Energy	Blue purple light	10. Nuclear fussion reaction
	Potassium Nitrate	
	Nuclear Fussion reaction	

Q.15. Choose the best choice in the following statements.

(1) Select the correct association:

(a) Oxidation-Loss of an electron (b) Oxidation - gain of an electron
(c) Reduction - gain of a neutron (d) Reduction - loss of a neutron Ans. (a) Oxidation-Loss of an electron

(2) Radioactive isotope of Uranium used in Nuclear Bomb is:

(a) $_{92}U_{236}$ (b) $_{92}U^{234}$ (c) $_{92}U^{233}$ (d) $_{92}U^{238}$

Ans: (a) $_{92}U^{235}$

(3) Human population growth is greatest in developing countries because:

(a) the birth rate is high in developing countries
(b) the death rate is high in developing countries
(c) much of the population has already reached the child bearing age
(d) most of the world's population lives in industrialized countries

Ans. (a) the birth rate is high in developing countries

(4) Which woody raw material is used for the manufacture of paper pulp?
(a) Colton (b) Poplar (c) Bagasse (d) Rice straw

Ans. (b) Poplar

(5) Rectified spirit contains alcohol about:
(a) 80% (b) 95% (c) 70% (d) 85%

Ans. (b) 95%

(6) Which of the following elements is not present abundantly in earth's crust:
(a) Silicon (b) Radium (c) Aluminum (d) Carbon

Ans. (b) Radium

(7) The famous book; Al - Qanoun was written by the Muslim scientist:
(a) Jabar bin Hayyan (b) Zakariya Al - Razi
(c) Abu Ali Sina (d) Abdul Qasim Majreeti

Ans. (c) Abu Ali Sina

(8) Basic metals can be converted into gold by:
(a) heating (b) beating
(c) artificial nuclear radioactivity (d) chemical reaction

Ans. (c) artificial nuclear radioactivity

(9) A light year is a unit of:
(a) time (b) energy (c) length (d) mass

Ans. (c) length

(10) One of the main function of the eartk's ozone layer is to:
(a) prevent global warming (b) filter out ultraviolet rays
(c) absorb pollution (d) all of the above

Ans. (d) Filtered out roys

(SOLVED PAPER)
EVERYDAY SCIENCE PAPER 2006

TIME ALLOWED: THREE HOURS MAXIMUM MARKS: 100

NOTE: Attempt any TEN questions carry EQUAL marks. Draw diagrams where necessary and write clearly.

NOTE:

(i) Attempt ONLY TEN questions. All questions carry equal marks.

(ii) Extra attempt of any question or any part of the question will not be considered.

(iii) Draw diagrams where necessary and write clearly.

Q.1. Write short notes on only TWO of the following: (5 each)

(a) Magnetic Resonance Imaging (b) Tidal Energy (c) Supersonics

Ans. (a) MAGNETIC RESONANCE IMAGING

Magnetic Resonance imaging (MRI) is a technique which is used for producing images of tissues inside the body. Doctors use MRI to diagnose diseases disorders and injuries. This technique is an important diagnostic tool. MRI does not expose the patient to radiation, unlike tests that use x-rays. With the help of MRI doctors can see through bones and organs. MRI is a safe technique although it is not suitable for the people having metals implants.

(b) TIDAL ENERGY

Due to rushes of water cheap electricity can be generated. A dam is constructed at the mouth of a creek situated at the sea cost. At high tide the water is stored at the back of the dam. When water recedes at low tide the water in the dam is allowed to flow out through the dam. The outgoing water drives the turbines and turbines rotate generators to produce electricity.

(c) SUPERSONICS

The speed greater than the speed of sound is known as supersonic. Generally, speed of sound

refers to the speed at which sound travels in air at sea level. In dry air at 0°C the speed is 1225 km/hours. Supersonic aeroplanes are the latest developments in air transportation.

Q.2. What is Pollen Allergy? What preventive measures are to be taken to avoid it? (4, 6)

WHAT IS POLLEN ALLERGY?

Each spring, summer, and fall, tiny particles are released from trees, weeds, and grasses. These particles, known as pollen, hitch rides on currents of air. Although their mission is to fertilize parts of other plants, many never reach their targets.

Instead, they enter human noses and throats, triggering a type of seasonal allergic rhinitis called pollen allergy, which many people know as hay fever or rose fever (depending on the season in which the symptoms occur).

The signs and symptoms of pollen allergy are familiar to many:

- Sneezing, the most common, may be accompanied by a runny or clogged nose
- Itching eyes, nose, and throat
- Allergic shiners (dark circles under the eyes caused by restricted blood flow near the sinuses)
- The "allergic salute" (in a child, persistent upward rubbing of the nose that causes a crease mark on the nose)
- Watering eyes
- Conjunctivitis (an inflammation of the membrane that lines the eyelids, causing red-rimmed eyes).

AVOIDANCE

Complete avoidance of allergenic pollen means moving to a place where the offending plant does not grow and where its pollen is not present in the air. But even this extreme solution may offer only temporary relief since a person who is sensitive to one specific weed, tree, or grass pollen may often develop allergies to others after repeated exposure. Thus, persons allergic to ragweed may leave their ragweed-ridden communities and relocate to areas where ragweed does not grow, only to develop allergies to other weeds or even to grasses and trees in their new surroundings. Because relocating is not a reliable solution, allergy specialists strongly discourage this approach.

There are other ways to evade the offending pollen:

Remaining indoors in the morning, for example when the outdoor pollen levels are highest. Sunny, windy days can be especially troublesome. If persons with pollen allergy must work outdoors, they can wear face masks designed to filter pollen out of the air reaching their nasal passages. As another approach, some people take their vacations at the height of the expected pollinating period and choose a location where such exposure would be minimal. The seashore, for example, may be an effective retreat for many with pollen allergies.

Air conditioners and filters. Use of air conditioners inside the home or in a car can be quite helpful in reducing pollen levels. Also effective are various types of air-filtering devices made with fiberglass or electrically charged plates. These can be added to the heating and cooling systems in the home. In addition, there are portable devices that can be used in individual rooms.

An allergy specialist can suggest which kind of filter is best for the home of a particular patient. Before buying a filtering device, it is wise to rent one and use it in a closed room (the bedroom, for instance) for a month or two to see whether allergy symptoms diminish. The air flow should be sufficient to exchange the air in the room five or six times per hour; therefore, the size and efficiency of the filtering device should be determined in part by the size of the room.

Devices that may not work. Persons with allergies should be wary of exaggerated claims for appliances that cannot really clean the air. Very small air cleaners cannot remove dust and pollen - and no air purifier can prevent viral or bacterial diseases such as influenza, pneumonia, or tuberculosis. Buyers of electrostatic precipitators should compare the machine's ozone output with Federal standards. Ozone can irritate the nose and airways of persons with allergies, especially asthmatics, and can increase the allergy symptoms. Other kinds of air filters such as HEPA (high efficiency particulate air) filters do not release ozone into the air.

Avoiding Irritants. During periods of high pollen levels, people with pollen allergy should try to avoid unnecessary exposure to irritants such as dust, insect sprays, tobacco smoke, air pollution, and fresh tar or paint. Any of these can aggravate the symptoms of pollen allergy.

(1 each)

Q.3. Name.

1) The alloy consisting of metals copper, zinc and nickel. German silver
2) The instrument specially designed for recording earthquake waves. Seismograph
3) The electrical device which converts sound energy into electrical energy. Microphone (Transmitter)
4) The ore of mercury metal. Cinnabar
5) The device with which variation of blood flow can be heard. Stethoscope
6) The element, which is abundantly present in the human body. Oxygen
7) The scientist who discovered penicillin. Alexander Fleming
8) The astronaut who first landed on the surface of the moon. Neil Armstrong
9) The desert mammal, which does not drink water. Kangaroo rat
10) The mode of heat transfer from the sun to the earth. Radiation

Q.4. Write briefly (not more than four to five sentences) about only FIVE of the following: (2 each)

(a) Plaster of Paris (b) Theodolite (c) Bird Flu (d) Gene
(e) Thermistor (f) Thermostat (g) Pedometer

Ans.

PLASTER OF PARIS:

It is actually calcium sulphate ($CaSO_4$) when water is mixed with it forms a paste which solidifies and dries up. It can not redissolved in water. It is used to make models and designs.

THEODOLITE

Theodolite is an instrument that surveyors use to measure angles and directions. It is similar to the less commonly used transit. A theodolite gives more precise readings than does a transit. Some theodolites permit measurements to closer than one second of arc (a subdivision of a degree defined as 1/3,600 of a degree). Most theodolites are mounted on a tripod (three-legged stand). A theodolite has a telescope that permits accurate sighting in any direction. A horizontal plate below the telescope provides readings around the horizon in degrees, minutes, and seconds of arc. A vertical plate and scale, mounted to the left of the telescope, permit vertical readings.

BIRD FLU

Bird flu is an infection caused by avian (bird) influenza (flu) viruses. These flu viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, bird flu is very contagious among birds and can make some domesticated birds, including chickens, ducks, and turkeys, very sick and kill them.

GENE

Each chromosome consists of hundreds of molecules of nucleoproteins called genes. All characteristics of an individual are determined by the genes on the chromosomes.

THERMOSTAT

Thermostat is a device that helps control the temperature of an indoor area or of an appliance. Thermostats are used in many kinds of equipment, including air conditioners, heaters, electric blankets, ovens, and refrigerators.

PEDOMETER

Pedometer is a small instrument that measures the distance a person walks. It looks like a watch and is carried in the pocket. With each step, the motion of the body causes a small lever to move. This lever records the number of steps taken. To find out how far you have walked, you must find the average length of your step and multiply it by the number of steps recorded. In some pedometers, a mechanism accounts for the length of the step, and measures the distance walked.

Q.5. Which physical quantities are measured by the following, units? (1 each)

(a) Foot-Pound (b) Torr (c) Slug (d) Guass (e) Acre Foot
(f) Becquerel (g) Erg (h) Dyne (i) Gilbert (j) Dioptre

Ans.

(a)	Foot-Pound	Work/energy
(b)	Torr	Pressure
(c)	Slug	Mass (f.p.s. system)

(d)	Guass	Magnetic Flux Density (In C.G.S.)
(e)	Acre Foot	Volume
(f)	Becquerel	Radioactivity
(g)	Erg	Work or Energy
(h)	Dyne	Force (In C.G.S.)
(i)	Gilbert	Magneto motive force
(j)	Dioptre	Power of lens

Q.6. What is the difference between Dam and Barrage? What benefits are obtained by constructing a big dam? (2, 8)

Ans. Difference between Dam and Barrage

Barrage is a barrier built at the flow of river or channels to divert the flow of water into canals or smaller channels. It is usually at ground level in plains. Dam is meant to store water and produce electricity. Dams are usually built- at the flow of rivers or streams in hilly areas where there is a water fall after the drum.

Benefits of a big Dam

Dam stores the water, creating a lake or reservoir, and, raises the level of the water almost as high as the dam itself. The stored water is available for many uses. The dam also raises the water surface from the level of the original riverbed to a higher level. This permits water to be diverted by the natural flow of gravity to adjacent lands. The stored water also flows through hydraulic turbines, producing electric power that is used in homes and industries. Water released from the dam in uniform quantities guarantees water for fish and other wildlife in thetream below the dam. Otherwise, the stream would go dry there. Water released in larger quantities permits river navigation throughout the year. Where dams create large reservoirs, floodwaters can be held, back and released gradually over longer periods of time without overflowing riverbanks.

Reservoirs or lakes created by dams provide recreational areas for water sports and angling. They give refuge to wildlife. They help preserve farmlands by reducing soil erosion. Much soil erosion occurs when rivers flood their valleys, and swift floodwaters carry off the rich topsoils.

Q.7. Which of the following statements are True and which are False: (1 each)

1)	Pitch of the dog sound is greater than the pitch of the cat sound.	False
2)	Ultraviolet light is visible but infrared light is not visible.	False
3)	Earthquakes are the lamps illuminating the structure of the earth's exterior.	False
4)	Electricity does not move through the wire but through a field around the wire.	False
5)	A guava contains more vitamin C than an orange.	True
6)	Sound travels faster in iron than in air.	True
7)	Wheat Stone Bridge is the name of an electrical circuit.	True
8)	Morphine can cause constipation and lowering of blood pressure.	True
9)	A concave lens is used for the correction of the Hyperphobia.	False
10)	The nucleic acids are responsible for proteins synthesis in the human body.	True

Q.8. Differentiate between the following pairs: (2 each)

(a) Telemeter and Multimeter (b) Perimeter and Altimeter

(c) Periscope and Microscope (d) Nucleon and Photon

(e) Cusec and Comet

Ans. (a) Telemeter and Multimeter

Telemeter is an instrument to measure, transmit, and receive (data) automatically from a distant source, as from a spacecraft or an electric power grid.

A multimeter is an electronic measuring instrument that is used to, make various electrical measurements, such as AC and DC voltage, AC and DC current, and resistance. It is called a multimeter because it combines the functions of a voltmeter, ammeter, and ohmmeter. Multimeters may also have other functions, such as diode and continuity tests.

(b) Perimeter and Altimeter

The perimeter of a figure is the total distance around the edge of the figure. For example, a square

whose sides are 6 inches long has a perimeter of 6 x 4 = 24 inches because it has 4 sides 6 inches long. A rectangle whose length and width are 4 meters and 3 meters has a perimeter of 4 + 4 + 3 + 3 = 14 meters.

An altimeter is an active instrument used to measure the altitude of an object above a fixed level. Altimeters are widely used on aircraft. Mountain climbers, surveyors, and scientists also use them.

(c) Periscope and Microscope

Periscope is an apparatus which enables an observer to see over obstructions or from a concealed position. It is also used in directing submarines. In its simplest form it is a tube in each end of which are mirrors set parallel to each other and at an angle of 45° with respect to the line between them. A periscope may be used as a toy or for seeing over people's heads in a crowd. This form of periscope, with the addition of two simple lenses, was used for observation purposes in the trenches during World War I. Periscopes are also used in some gun turrets and armoured vehicles.

Microscope is an instrument which is used for magnifying minute objects by a lens system. The apparent size depends upon the size of image formed on the retina and consequently on the visual angle which the object subtends at the eye. This angle becomes greater as the object is brought nearer the eye, and decreases as it is taken away from the eye. The greater the angle, under which an object is observed the more magnified it appears, or by making the visual angle the body can be made to appear bigger.

(d) Nucleon and Photon

Protons and neutrons make up an atom's nucleus, and so they are called nucleons.

Photons are packets of radiation that can be considered as particles of light. When an electron jumps from an orbit of higher energy to one of lower energy, it gives off energy as light. This light is released in the form of a tiny bundle of energy called a quantum or photon. The energy of a photon corresponds to the difference in energy of the two orbits between which the jump occurs. An electron also can absorb a photon and jump from an orbit of lower energy to one of higher energy. In this way, quantum mechanics explains the process through which the atom gives off and absorbs light photons.

(e) Cusec and Comet

Cusec is a measure of flow rate and is shorthand for cubic foot per second (28.317 liters per second). In the U.S. it is generally used to measure river flow.

Comets are small bodies that move around the sun. Most comets have three parts: (1) a solid nucleus, or centre, made of frozen gases and dust; (2) a round coma, or head, that surrounds the nucleus and consists of dust particles mixed with gases; and (3) a long tail of dust and gases that escape from the head. Most comets stay near the outer edge of the solar system. Some come near the sun, where their bright heads and long, shining tails provide a spectacular sight.

Q.9. Fill in the blanks: (1 each)

1) The branch of zoology, which deals with the study of insects is called Entomology.
2) The disease Beri Beri is caused by the deficiency of Vitamin B1 (Thiamine).
3) Oil rises in a wick of oil lamp because of a property of matter, called Capillary Action.
4) The production of generally identical reproduction is called as Cloning.
5) Mercury is the fastest planet of the solar system.

Note: (In latest discoveries Pluto is expelled from the Solar System)

6) Mercury metal is 13.6 times heavier than water.
7) Relative density of milk is measured by an instrument known as Lactometer.
8) The temperature of a human body is measured by an instrument known as Mercury Thermometer.
9) Gold and silver are known as coinage metals.
10) The amount of ozone in the atmosphere is expressed in Dobsow units.

Q.10. What is global warming? Is there a sunny side to global warming? If yes, explain. (4, 6)

Ans. See Global Warming in detail.

Q.11. Give scientific reasons of the following: (2 each)

(a) Why do some people snore?
(b) Why do we sometimes sleep walk?
(c) Climber bends forward while climbing a mountain.

(d) The manhole covers are generally round.

(e) Roads are bent inwards on curves.

Ans. a) Why do some people snore?

Snoring is the act of breathing through the open mouth in such a way as to cause a vibration of the uvula and soft palate, thus giving rise to a sound which may vary from a soft noise to a loud unpleasant sound. This most commonly occurs during sleep. The cause of snoring is a blockage in the breathing passage. Those blockages can be of many kinds—here are just a few:

- Throat weakness causing the throat to close during sleep
- Mispositioned jaw, often caused by tension in muscles
- Fat gathering in, and around, the throat
- Obstruction in the nasal passageway

When the airflow in the breathing passage becomes irregular due to a blockage the soft palate may start flapping. This flapping of the soft palate is what makes the snoring sound. Snoring is usually an involuntary act, but may also be produced voluntarily.

b) Why do we sometimes sleep walk?

Ans. Sleep walking is possibly a combination of things. Anna Freud, Sigmund's daughter did a lot of investigative work on this subject and sleepwalking is a relatively "normal" finding in the pediatric population. There appears to be a genetic or inherited factor as it often runs in families, but as we age, the phenomena of sleep walking generally resolves. Psychologists and other investigators have shown that children who sleep walk are usually normal in every respect but a few studies have suggested that in some of the parasomnias some children may have inner conflicts that they are not able to verbalize. And in a few cases, family counseling and reassurance have been all the therapy necessary in patients with frequent parasomnias. So there appears to be a tendency for children to have this, a tendency for an inherited component, and especially as the patient becomes older, a possible psychological element.

c) Climber bends forward while climbing a mountain.

Ans.

Climber bends forward while climbing a mountain to maintain balance.

d) The manhole covers are generally round.

Ans. Reasons for the shape include:

(1) A round manhole cover cannot fall through its circular opening, whereas a square manhole cover may fall in if it were inserted diagonally in the aperture (A Reuleaux triangle or other curve of constant width would also serve this purpose, but round covers are much easier to manufacture.)

(2) Round tubes are the strongest and 'most material-efficient shape against the compression of the earth around them, and so it is natural that the cover of a round tube assume a circular shape.

(3) Cylindrical holes are easier to dig.

(4) The bearing surfaces of manhole frames and covers are machined to assure flatness and prevent them from becoming dislodged by traffic.

(5) Round castings are much easier to machine using horizontal boring mills.

(6) Circular covers do not need to be rotated to align them when covering a circular manhole.

(7) Human beings have a roughly circular cross-section.

(8) A round manhole cover can be more easily moved by being rolled.

(9) If an automobile rolls over a dislodged manhole of another shape, the sharp corners could puncture the automobile's tire, whereas a circle doesn't have corners.

(10) Tradition

(11) Aesthetics

It's true that MOST are round but square, rectangular and some triangular ones are also seen. Manhole covers are very heavy and made of Cast Iron or steel 4.which are extremely durable materials since their placement exposes them to wear.

e) Roads are bent inwards on curves.

Ans. Roads are bent inwards on curves to maintain the centre of gravity so that vehicle may not lose its

balance.

Q.12. What are vitamins and minerals? Which vitamins and minerals play major role in the development of bones? (4, 5)

Ans. See Balanced Diet.

Q.13. What do the following scientific abbreviations stand for? (1 each)

(1) CRO (2) SARS (3) BOT (4) AMU (5) EMF
(6) ADH (7) STP (8) GeV (9) NTP (10) CRT

Ans.

(1) CRO: Cathode Ray Oscilloscope
(2) SARS: Severe Acute Respiratory Syndrome
(3) BOT: Build-operate-transfer, British overseas
(4) AMU: Atomic Mass Unit
(5) EMF: Electro Motive Force
(6) ADH: Anti uretic Hormones
(7) STP: Standard Temperature and Pressure
(8) GeV: Giga Electron Volt
(9) NTP: Network Nucleoside tropcephere Protocol & Normal Temperature Pressure
(10) CRT: Cathode Ray Tube & Critical Room temperature

Q.14. Compare the columns A and B and write the correct answer from the column B corresponding to the column A (serial wise) in column C. (1 each)

Column A	Column B	Column C
(1) Geiger Muller Counter	Semi Conductor	(1)
(2) Newton	Magnet	(2)
(3) Addison	Electricity	(3)
(4) Bardeen and Brattin	Radioactivity	(4)
(5-) Weber Feltner's Law	E.M Induction	(5)
(6) Benjamin Franklin	Lightening Conductor	(6)
(7) Decibel	Gravitation	(7)
(8) Dr. Gilbert	Water	(8)
(9) Henry Cavendish	Sound	(9)
(10) Faraday	Non-conductor	(10)

Ans.

Column A	Column B	Column C
(1) Geiger Muller	Counter Semi Conductor	(1) Radioactivity
(2) Newton	Magnet	(2) Gravitation
(3) Addison	Electricity	(3) Electricity
(4) Bardeen and Brattin	Radioactivity	(4) Semi Conductor
(5) Weber Fehner-s Law	E.M Induction	(5) Non-conductor
(6) Benjamin, Franklin	-Lightening Conductor	(6) Lightening Conductor
(7) Decibel	Gravitation	(7) Sound
(8) Dr. Gilbert	Water	(8) Magnet
(9) Henry Cavendish	Sound	(9) Water
(10) Faraday	Non-conductor	(10) LM Induction

Q.15. Choose the best choice in the following statements:

1) One of the countries through -which equator passes is:

(a) Kenya (b) Malaysia (c) Malta (d) Pakistan

Ans. (a) Kenya

2) Copper can be converted into gold by:

(a) Artificial radioactivity (b) heating.
(c) Electroplating (d) Chemical reaction

Ans. (a) Artificial radioactivity

3) The three elements needed for healthy growth of plants are:
(a) N, P, K (b) N, C, P (c) N, K, C (d) N, S, P

Ans. (a) N, P, K

4) Clocks, which moves with the velocities compareable with the velocity of light, run:
(a) fast (b) slow (c) equal to the velocity of light
(d) with zero velocity

Ans. (c) equal to the velocity of light

5) Max Planck received the noble prize in Physics in 19184or his discovery of:
(a) electron (b) energy quanta
(c) photon (d) positron

Ans. (b) Energy quanta

6) Bronze medal is made up of metals:
(a) (copper, nickel) (b) (copper, tin)
(c) (copper, silver) (d) (copper, zinc)

Ans. (b) copper, tin

7) Addison's disease is caused by the excessive secretion-of:
(a) Antiduretic Harmone
(b) Luteinising Harmone
(c) Melanophore stimulating Harmone
(d) Adrenocorticotrophic Harmone

Ans. (d) adrenocorticotrophic Hormone

8) Development of calf muscles in ladies who wear high heels is a common example of:
(a) Natural Selection (b) inheritance of acquired character
(c) Use and disuse of organ (d) Artificial selection

Ans. (d) Artificial selection

9) Margalla Hill is a branch of:
(a) Karakorum range (b) Hindukash, range
(c) Himalaya range (d) Nanua Parbat range

Ans. (c) Himalaya range

10) Humming bird belongs to a category called:
(a) Elctotherm (b) Endotherm
(c) Exotherm (d) Heterotherm

Ans. (h) Endotherm

SOLUTION
EVERYDAY SCIENCE 2007

TIME ALLOWED: 100 MINUTES MAXIMUM MARKS: 50

NOTE: (i) Attempt ONLY Five questions. All questions carry EQUAL marks. Draw diagram where necessary and write clearly.

(ii) Extra attempt of any question or any part of the attempted question will not be considered.

(iii) Candidates must draw two straight lines (———) at the end to separate each question attempted in answer book.

1. Write short notes on any TWO of the following: (5,5)
(a) Laser (b) Nuclear reactor (c) Ceramics

Ans. (a) See Laser (b) See Nuclear reactor (c) See Ceramics

Q.2. Write briefly (not more than three to four sentences) about any five of the flowing: (2 each)

(a) Asteroids (b) black hole
(c) Aurora (d) Sedimentary rocks
(e) Epiphytes (f) Ionosphere

Asteroids

Astercids are small irregularly shaped bodies orbiting the sun. Asteroids are often present between the orbits of mars and Jupiter. About 30 asteroids have diameters greater than 120 miles.

(b) Black hole

Black Hole is the theoretical object having so strong gravitational field that nothing, including electromagnetic radiation, can escape from it. Due to this, it appears black. In 1994 astronomers found the first comincing evidence about existence of black hole, by using Hubble Teloscope.

(c) Aurora

The bright glow in the night sky, which can be observed in polar zone is called Aurora. Some times, it is called as polar aurora. In northern latitudes, it is known as the aurora Borealis.

(d) See Sedimentary rocks

(e) Epiphytes

An organism that grows upon or attached to a living plant is called as an Epiphyte. The term Epiphyte is commonly used for higher plants. The yare also sometimes called as air plants because they do not have roots in scil.

(f) See Atmosphere.

Q.3. Differentiate between the following pairs:

(a) BIT & BYTE
(b) RAM & ROM
(c) Epidemic & Endemic
(d) Photosynthesis & Respiration
(e) Herbivores & Carnivores

Ans. (a) See scientific terms distinguished.
(b) See scientific terms distinguished.
(c) See scientific terms distinguished.
(d) See scientific terms distinguished.

(e) Herbivores are those animals that can eat plants only. Herbivores are primary consumers in the food web. Horbivores are eaten by carnivores, which are considered as secondary or tertiary consumers. Some examples of herbivores are sheep, horses and elephant.

Carnivores are those animals that subsists mainly on the flesh of other animals. The carnivores are present at the top of the food chains. Carnivores usually live alone or in small groups and are not preyed upon except other carnivores.

Q.4. (i) What are the Endocrine glands? Name any two. (2+2)

Ans: See Endocrine system

Q.5. (a) Briefly discuss the classification of plants giving suitable examples

Ans: (a) See classification of plants.
(b)(1) See solved paper 2008
(2) See solved paper 2008
(3) See solar eclipse
(4) The reactions which are accompanied by release of heat are called exothermic reactions e.g., Burning of hydrocarbons is an exothermic process.

Q.6. Give scientific reasons of the following: (2 each)

(a) Why climbers get their food by climbing on the other trees?
(c) Vitamin D is the essential component of the body?

(d) The weight of the object is less at the equator than at the poles

(e) Why do some people snore?

Ans. (a) Climbers are the parasitic plant. These parasitic plants have a modified root, the haustorium, that penetrates the host plant and connects itself to xylem or phloem. They may or may not contain chlorophyll and partially or fully dependent upon other plants for their food.

(b) Vitamin D regulates calcium and phosphorus absorption and metabolism. Vitamin D is present in eggs, fish, liver, butter, milk and margarine. It can also be synthesized due to exposure of skin to sunlight. It's deficiency causes rickets in children and osteomalacia in adults.

(c) The acceleration due to gravity is inversely proportional to the square of the radius of the earth at the place. Our earth is flattened at the poles and bulges out at the Equator. The polar radius is 6357 kilometers and equatorial radius is 6378 kilometers. Therefore, the value of 'g' is less at the Equator than at the poles.

(d) Snoring is usually an involuntary act, but may also be produced voluntarily. Snoring is the vibration of respiratory structures and resulting sound, due to obstructed air movement during breathing while sleeping. The irregular airflow is caused by blockage due to allergies, throat weakness, disposition jaw or obstruction in nasal passage.

Q.7. Give description of different satellite and also give their function? (10)

Ans: See Satellite

Types of Satellites:

Engineers have developed many kinds of satellites, each designed to serve a specific purpose or mission. For instance the telecommunications and broadcasting industries use communications satellites to carry radio, television, and telephone signals over long distances without the need for cables or microwave relays. Navigational satellites pinpoint the location of objects on Earth, while weather satellites help meteorologists forecast the weather. The United States uses surveillance satellites to monitor military activities. Scientific satellites serve as space-based platforms for observation of Earth, the other planets, the Sun, comets, and galaxies, and are useful in a wide variety of other applications.

Communications Satellites:

Almost all of the earliest satellites included some communications equipment. The National Aeronautics and Space Administration (NASA) launched the first telephone and television satellite, AT&T's Telstar 1, in 1962. The U.S. Department of Defense launched Syncom 3 in 1964. Syncom 3 was the first communication satellite to use a geostationary orbit—that is, an orbit that keeps the satellite over the same spot above Earth's equator. Over 300 communications satellites have been launched since 1957. Today satellites in geostationary orbit provide voice, data, and television communications, including the direct broadcast of television to homes around the world.

Navigation Satellites:

Navigation satellites can help locate the position of ships, aircraft, and even automobiles that are equipped with special radio receivers. A navigation satellite sends continuous radio signals to Earth. These signals contain data that a special radio receiver on Earth translates into information about the satellite's position. The receiver further analyzes the signal to find out how fast and in what direction the satellite is moving and how long the signal took to reach the receiver. From this data, the receiver can calculate its own location. Some navigation satellite systems use signals from several satellites at once to provide even more exact location information. The U.S. Navy launched the first navigation satellite, Transit 1B, in 1960.

Weather Satellites:

Weather satellites carry cameras and other instruments pointed toward Earth's atmosphere. They can provide advance warning of severe weather and are a great aid to weather forecasting. NASA launched the first weather satellite, Television Infrared Observation Satellite (TIROS) 1, in 1960. TIROS 1 transmitted almost 23,000 photographs of Earth and its atmosphere.

Military Satellites:

Many military satellites are similar to commercial ones, but they send encrypted data that only a special receiver can decipher. Military surveillance satellites take pictures just as Other earth-imaging satellites do, but cameras on military satellites usually have a higher resolution.

Scientific Satellites:

Earth-orbiting satellites can provide data to map Earth, determine the size and shape of Earth, and

study the dynamics of the oceans and the atmosphere. Scientists also use satellites to observe the Sun, the Moon, other planets and their moons, comets, stars, and galaxies. The Hubble Space Telescope is a general-purpose observatory launched in 1990. Some scientific satellites orbit bodies other than Earth. The space probe Ulysses is in orbit around the Sun, studying the solar poles and the high latitudes of the Sun. The Galileo spacecraft has orbited the planet Jupiter since 1995, returning data about the planet and its moons.

Satellite Launches:

Placing a satellite into orbit requires a tremendous amount of energy, which must come from the launch vehicle, or device that launches the satellite. The satellite needs to reach an altitude of at least 200 km (120 mi) and a speed of over 29,000 km/h (18,000 mph) to lift into orbit successfully. Satellites receive this combination of potential energy (altitude) and kinetic energy (speed) from multistage rockets burning chemical fuels.

The first stage of a multistage rocket consists of rocket engines that provide a huge amount of force, or thrust. The first stage lifts the entire launch vehicle—with its load of fuel, the rocket body, and the satellite - off the launch pad and into the first part of the flight. After its engines LISQ all their fuel, the first stage portion of the rocket separates from the rest of the launch vehicle and falls to Earth. The second stage then ignites, providing the energy necessary to lift the satellite into orbit. It, too, then separates from the satellite and any remaining rocket stages.

The rest of the launch depends on the satellite's mission. For example, if the mission requires a geostationary orbit, which can be achieved only at a distance of about 35,000 km (22,000 mi) above Earth, a third rocket stage provides the thrust to lift the satellite to its final orbital altitude. After the satellite has reached the final altitude, another rocket engine fires and gives the satellite a circular orbit. All rocket-engine burns occur at a precise moment and last for a precise amount of time so that the satellite achieves its proper position in space.

Another method of launching satellites is to have astronauts launch them from the U.S. space shuttle. The space shuttle can carry large satellites and, because the shuttle is already in orbit when the satellite is launched, the astronauts can verify that the satellite has survived the rigors of launch. The space shuttle also brings satellites back to Earth for repair.

The Single Stage to Orbit (SSTO) is a launch vehicle that may lower the cost of launching satellites by decreasing the number of launch stages needed and increasing the reusability of launch vehicles. The SSTO would be a piloted vehicle like the space shuttle, but it would be designed to launch satellites more inexpensively and efficiently than the space shuttle can.

Power:

A satellite provides its own power for the duration of its mission, which can extend to ten years or more. The most common source of power for Earth-orbiting satellites is a combination of solar cells with a battery backup. Solar cells need to be large enough to provide the power that the satellite requires. For example, the solar array of the complex Hubble Space Telescope is about 290 sq m (about 3,120 sq ft) in area and generates about 5,500 watts of electricity, while the solar array of a smaller Global Positioning System satellite is about 4.6 sq m (about 50 sq ft) in area and generates about 700 watts of electricity. Solar cells are often mounted on winglike panels that unfold from the body of the satellite after it reaches its final orbit. Batteries provide power before the solar panels are deployed and when sunlight does not reach the solar panels.

Satellite Orbits:

The defining characteristics of an orbit are its shape, its altitude, and the angle it makes with Earth's equator. A satellite's controllers choose an orbit with a particular combination of shape, altitude, and angle that will best serve the satellite's mission. Most orbits are circular, but some satellites use elliptical orbits—that is, orbits in which the satellite's distance from Earth is not constant. The altitude of an orbit determines how long the satellite takes to circle Earth and how much of the planet is visible to the satellite at one time. Satellites pass over different ranges of Earth's latitude depending on the angle of their orbits with respect to the equator. Some satellites orbit along the equator. Satellites that pass over high northern and southern latitudes have orbits that form a large angle to the equator. Some satellites move clockwise around Earth as seen from the North Pole, but most satellites move counterclockwise around Earth.

The first artificial satellite to orbit Earth was Sputnik 1. Built by the Soviet Union and launched on October 4, 1957, Sputnik had an elliptical orbit, ranging in altitude from 225 to 950 km (140 to 590 mi). Sputnik broadcast a steady signal of beeps for 21 days and burned up in Earth's atmosphere upon reentry

on January 4, 1958.

The Soviet Union also launched the first living creature, a dog named Laika, into space on November 3, 1957. Laika flew inside a pressurized chamber aboard the satellite Sputnik-2. She died from overheating and panic after a few hours in orbit. Sputnik 2 reentered Earth's atmosphere and burned up on April 14, 1958.

Q.8. (a) What is balanced diet? (5)

(b) How are character transmitted from parents to offspring? (5)

Ans: (a) See Balanced Diet

(b) See DNA and RNA

SOLUTION

EVERYDAY SCIENCE 2008

TIME ALLOWED: 100 MINUTES MAXIMUM MARKS: 50

NOTE:

(i) Attempt ONLY Five questions. All questions carry EQUAL marks. Draw diagram where necessary and write clearly.

(ii) Extra attempt of any question or any part of the attempted question will not be considered.

(iii) Candidates must draw two straight lines (———) at the end to separate each question attempted in answer book.

Q.1. Write briefly about the life and the scientific contributions of the following Muslim Scientist: (5,5)

(a) Muhammad bin Musa Al-Khawarizimi (b) Abu Ali Sina

Ans. (a) See Muslim Scientists (b) See Muslim Scientists

Q.2. Differentiate clearly between the following pairs: (2 each)

(a) Fission and Fusion (b) Star and Planet

(c) Pollination and Fertilization (d) Telescope and Microscope

(e) Antibiotics and Vaccines

Ans. (a) See Scientific term distinguished.

(b) See Scientific term distinguished.

(c) See Scientific term distinguished and previous papers.

(d) Telescope is an instrument which magnifies distant objects. It is used for collecting and focusing light and other types of electromagnetic radiations. Telescope is used in research work, in astronomy and in other scientific fields. Tiny telescopes can also be used in cameras and rifles.

Microscope is an instrument which is used to observe tiny objects. All light microscopes utilize lenses to make the object bigger and clear. This process is called magnification ordinary microscope use bean of light for magnification, while electron microscope use bean of electrons instead of visible light. There are two main types of electron microscope, that is, transmission electronic microscope (TEM) and scanning electron microscope (SEM).

(e) Vaccines are medicines which are used for vaccination against particular disease. Vaccine contains either chemically killed pathogens or weakened living form of the organism which cannot cause disease.

Antibiotics are a drug that kill or hampers the growth of bacteria. Antibiotics belong to the Antimicrobial class which includes anti-fungal anti-viral and anti-parasitic class. Antibiotics are usually used to treat infectors. Antibiotics are not enzymes. Some of the antibiotics are derived from mould and belong to penicillin class.

Q.3. (a) Discuss briefly the solar system: (6)

(b) How are Earthquakes caused? (4)

Ans. (a) See Solar System:

(b) See Earthquake.

Q.4. Write briefly (not more than four to five sentences) about any five of the following: (2 each)

(a) Supernova (b) Radioactivity
(c) Laser (d) Semiconductors
(e) Geothermal energy (f) Computer Virus
(f) Pasteurization

Ans. (a) Supernova is a stellar explosion which can create an extremely luminous object. A supernova causes a burst of radiation which out shine its host galaxy before fading from view. A supernova can radiate as much energy as the sun could emit over its whole life.

(b) Radioactivity is the spontaneous emission of radiation, either directly or due to nuclear reaction. The radiations include alpha, beta and Gamma radiation. Uranium 238, a very unstable element, goes through 18 stages before converting into stable lead 206.

(c) See Laser

(d) See Semiconductors:

(e) The energy which is obtained due to trapping of the heat of the earth is called geothermal energy. Geothermal energy derives from the radioactive decay in the core of the earth, which heats the earth from inside. On small scales, geothermal heating can be used to heat buildings.

(f) A programme that can copy itself and infect a computer without permission or knowledge of the user is called compuler virus. A virus can corrupt data, display a message or do nothing. Viruses are disseminated by downloading unckecked files from bulletin Board system or via unregulated networks.

(g) Pasteurization is a process for partial sterilization of milk. This process was developed by Louis Pasteur for improving the storage qualities of wine and beer. During pasteurization milk is held at 72 — 85°C for 16 second. Disease – producing bacteria, usually those of causing tuberculosis are destroyed during pasteurization.

Q.5. (a) what are the hormones? Name four important hormones and describe their functions in the human body. (2+4)

(b) Explain the structure and function of the animal cell with a labeled diagram. (1/2 each)

Ans: (a) See Endocrine System

(b) See Structure of cell

Q.6. (a) What are the essential nutrients of the balanced diet? Describe one such (2+4)

(b) What do the following scientific abbreviations stand for? (1/2 each)

(a) PVC (b) BCG (c) ECG (d) CFC
(e) LPG (c) DNA (f) AIDS (g) TNT

Ans: (a) See Balanced Diet.

Q.7. (a) Define energy. Name four renewable sources of energy. How can our country comes out of energy crises? (1+2+3)

(b) Write a brief note on Ceramics. (4)

Ans: (a) See Energy

(b) See Ceramics

Q.8. (a) Describe very briefly the working of a camera. How does it resemble in its function with that of human eye? (3+3)

(b) What are plastics? Describe briefly their characteristics and limitations? (1+3)

Ans: (a) See Camera

(b) See Plastics.

SOLUTION

EVERYDAY SCIENCE 2009

Q.1. Select the best option/answer and fill in the appropriate Box on the Answer Sheet: (50)

(1) Persons with following blood group are considered to be universal recipient.
(a) A+ (b) B+ (c) AB+✓
(d) O+ (e) None of these

(2) Study of life in outer space is known as:
(a) Endobiology (b) Exobiology✓ (c) Enterobiology
(d) Neobiology (e) Micro Biology

(3) The name of the common mineral salt present in sweat is:
(a) Calcium Oxalate (b) Potassium Sulphate (c) Sodium Chloride✓
(d) Iron sulphide (e) None of these

(4) Sensitive layer of the eye is:
(a) Choroids (b) Sclerotic (c) Retina✓
(d) Cornea (e) None of these

(5) Laughing gas has chemical composition of following two elements:
(a) Nitrogen + Hydrogen (b) Nitrogen + Carbon
(c) Nitrogen + Oxygen✓ (d) Oxygen + Carbon
(e) None of these

(6) Dr. Abdus Salam of Pakistan was one of the contributors to the unification of:
(a) Electromagnetic force and gravitational force
(b) Electromagnetic force and weak nuclear force✓
(c) Gravitation force and weak nuclear force
(d) Weak nuclear force and strong nuclear force
(e) None of these

(7) Which triplet in DNA codes for valine:
(a) CTT (b) AGU (c) CAT
(d) AAT (e) None of these✓

(8) What is the chance of a diabetic baby born to parents both heterozygous normal?
(a) Zero (b) 1/4✓ (c) 1/2
(d) 3/4 (e) None of these

(9) Which of the following is not a part of Darwinism:
(a) Over production (b) Natural selection
(c) Inheritance for acquired characters✓ (d) Competition for survival
(e) None of these

(10) Role of biotechnology in the production of food is based on:
(a) Decomposition (b) Respiration (c) Digestion
(d) Fermentation✓ (e) None of these

(11) Which form of drug abuse involves most risk of infection with the HIV (AIDS) virus:
(a) Cigarette smoking (b) Using alcohol
(c) Injection of heroine✓ (d) Taking too much aspirin
(e) None of these

(12) Founder of modern astronomy was:
(a) Archimedes (b) William Gilbert (c) Nicolas Copernicus✓
(d) Michel Faraday (e) None of these

(13) The instrument which measures very high temperature is:
(a) Manometer (b) Thermostat (c) Chronometer
(d) Pyrometer✓ (e) None of these

(14) The science which deals with study of manners and customs of peoples is:
(a) Ethnology (b) Morphology (c) Ethics
(d) Genetics (e) None of these✓

(15) Chemicals used to kill rats and mice are:
(a) Insecticides (b) Rodenticides✓ (c) Fungicides
(d) Herbicides (e) None of these

(16) Dry ice is:
(a) Methane hydrate (b) Liquid Nitrogen (c) Solid Carbondioxide✓
(d) Frozen water (e) None of these

(17) Chemical name of vinegar is:
(a) Sodium Nitrate (b) Dilute acetic acid✓ (c) Chloride of lime
(d) Calcium (e) None of these

(18) Deficiency of following vitamin decreases hemoglobin production:
(a) Biotin (b) Thiamine (c) Niacin
(d) Pyridoxine✓ (e) None of these

(19) Hygrometer is used for measuring the:
(a) Speed of sound (b) Density of milk (c) Humidity of air✓
(d) Specific gravity of liquids (e) None of these

(20) Bronze is an alloy of:
(a) Copper and Zinc (b) Tin and Zinc (c) Copper and Tin✓
(d) Iron and Zinc (e) None of these

(21) Which of the following is most elastic?
(a) Steel✓ (b) Rubber (c) Glass
(d) Sponge (e) None of these

(22) Orbital period of the planet Mercury around the sun is:
(a) 88 days✓ (b) 355 days (c) 2 years
(d) 96 days (e) None of these

(23) The most splendid and the most magnificent constellation in the sky is:
(a) Orion✓ (b) Columba (c) Canis Major
(d) Taurus (e) None of these

(24) "Black Holes" refer to:
(a) Holes occurring in heavenly bodies (b) Bright spots on the sun
(c) Collapsing objects of high density✓ (d) Collapsing objects of low density
(e) None of these

(25) Eugenics is the study of:
(a) Altering human beings by changing their genetic components✓
(b) People of European origin (c) Different races of mankind
(d) Genetics of plants (e) None of these

(26) The position of earth in its orbit, when it is at its greatest distance from the sun causing northern summer is called:
(a) Aphelion✓ (b) Perihelion (c) Perigee
(d) Apogee (e) None of these

(27) Diamond is a very expensive ornament. It is composed of a single element.
(a) Carbon✓ (b) Gold (c) Silver
(d) Platinum (e) None of these

(28) Which of the following layers makes radio transmission possible?
(a) Troposhpere (b) Ionosphere✓ (c) Mesosphere
(d) Stratosphere (e) None of these

(29) Which of the following explains the reason why there is no total eclipse of the sun?
(a) Size of the earth in relation to that of moon
(b) Orbit of moon around earth
(c) Direction of rotation of earth around sun
(d) Area of the sun covered by the moon✓
(e) None of these

(30) Television signals are converted into light signals by:
(a) Optical fibre (b) Transistor (c) Decoder
(d) Photo diode (e) None of these✓

(31) Where do most of Asteroids lie?
(a) In asteroid belt between the orbits of Mars and Jupiter ✓
(B) In asteroid belt between the orbits of Mars and Venus
(c) In asteroid belt between the orbits of Jupiter and Venus
(d) Every where in the sky
(e) None of these

(32) The number of spark plugs needed in a diesel engine is:
(a) 2 (b) 3 (c) 0✓
(d) 4 (e) None of these

(33) The half life of a radioactive element is 8-days. How long will it take to reduce it from 10mg to 5mg?
(a) 4 days (b) 12 days (c) 15 days
(d) 8 days✓ (e) None of these

(34) The term "Blue Shift" is used to indicate.
(a) Doppler effect in which an object appears bluer when it is moving towards the observer or observer is moving towards the object✓
(b) Turning a star from white to blue
(c) In future sun would become blue
(d) Black hole was blue at its start.
(e) None of these

(35) Kilowatt-hour is a unit of:
(a) Power (b) Electric current (c) Energy✓
(d) Time (e) None of these

(36) Fuel used in Fast Breeder Reactor is
(a) Uranium Oxide (b) Uranium Plutonium carbide
(c) Uranium Plutonium Oxide✓ (d) Uranium thorium Oxide
(e) None of these

(37) Monsoon is caused by:
(a) Seasonal reversal of winds✓ (b) Revolution of earth
(c) Movement of the clouds (d) Rise in temperature
(e) None of these

(38) Which of the following atmospheric layers helps in radio communication?
(a) Exosphere (b) Ionosphere ✓ (c) Troposphere
(d) Stratosphere (e) Ozone layer

(39) A moderator is used in nuclear reactor in order to:
(a) Accelerate the neutrons
(b) Slow down the speed of the neutrons✓
(c) Increase the number of electrons
(d) Decrease the number of electrons

(e) None of these

(40) Sedimentary rocks are:
(a) Porous✓ (b) Hard (c) Rough
(d) Brittle (e) Volcanic

(41) Which one of the following is a non-metallic mineral?
(a) Maganese (b) Magnesium (c) Gypsum✓
(d) Bauxite (e) None of these

(42) Ozone layer prevents the following radiation from entering the atmosphere:
(a) Infra-red (b) Ultraviolet✓ (c) X-rays
(d) Gamma ryas (e) None of these

(43) The phenomenon of Aurora Borealis, the display of red and green lights in northern hemisphere is due to radiations from:
(a) Ionosphere✓ (b) Troposphere (c) Mesophere
(d) Stratosphere (e) None of these

(44) Yeast is used in making bread because it produces:
(a) Carbon dioxide✓ (b) Sugar (c) Bacteria
(d) Oxygen (e) None of these

(45) Oasis is associated with:
(a) Glaciers (b) Desert✓ (c) Islands
(d) Volcanoes (e) None of these

(46) Quartz crystal in quartz watches works on the principle called:
(a) Photoelectric effect (b) Stark effect
(c) Thermionic effect (d) Piezo-electric effect✓
(e) None of these

(47) The Fruits without seed, like banana, are called:
(a) Seedless fruits (b) Parthenogenesis fruits
(c) Parthenocarpic fruits✓ (d) Placental fruits
(e) Organic fruits

(48) Animal which captures and readily kills living animals for its food is called:
(a) Parasite (b) Scavenger (c) Predator✓
(d) Mammal (e) None of these

(49) In a railway track, two rails are joined end to end with a gap in between them because:
(a) Steel can be saved
(b) Accidents due to contraction in winter can be avoided
(c) Air gaps are necessary for bearing the weight of running train
(d) Accidents due to expansion in summer can be avoided✓
(e) None of these

(50) Name the famous book of Ibn-Sina in which he discussed human physiology and medicine:
(a) Al-Qanoon✓ (b) Al-Masudi (c) New Renaissance
(d) Tadhkira (e) None of these

Q.2. Write short note on the following by giving their exact life span and contributions to the field of science (Accurate facts will be appreciated). (5x2)
(a) Umer Al Khayam (b) Zakariya Al Razi

Ans: See Muslim Scientist

Q.3. Differentiate between ANY FIVE of the following pairs. (2x5)
(a) Umbra and Penumbra
(b) Heavy water and hard water (c) Smog and Smoke
(d) Myopia and Hypropia (e) Lava and Magma

(f) Periscope and perimeter (g) X-rays and Gamma rays

Ans: (a) See Solved Paper 2002

(b) See Scientific Terms distinguished

(c) See Previous Paper solved.

(d) The defect of eye in which a patient can see near objects clearly but distant objects not clearly is called as short sightedness or Myopia. It can be corrected by using concave lens.

While, the defect of eye in which a patient can see near objects not clearly but distant objects clearly is called long sightedness or Hypropia. It can be corrected by using convex lens of suitale power.

(e) See solved paper 2003

(f) See solved paper 2004

(g) See Scientific terms distinguished.

Q.4. Sun is a glorious star in our sky. Write down its characteristics with reference to the following data:

(a) Distance from earth
(b) Mean distance from centre of galaxy
(c) Velocity around centre of galaxy
(d) Revolution period around centre of galaxy
(e) Equatorial diameter
(f) Rotation period at the equator
(g) Core temperature
(h) Solar wind
(i) The lovely Diamond Ring effect
(j) Future of sun

Ans: See Solar System and sun in detail. (Page No. 85)

Q.5. Write briefly (not more than three to four sentences) about ANY FIVE of the following. (2x5)

(a) Allotropy (b) Nebula
(c) Enrichment of Uranium (d) Aqua Regia
(e) Greenhouse effect (f) Igneous rocks

Ans: (a) The existence of the same element in more than one crystalline forms is called Allotropy. e.g., carbon exists in the form of Diamond, graphite and Bucky balls.

(b) A region of interstellar dust and gas which appears as dark patch is called Nebule or nebulosity.

(c) The process of isotope separation through which the percentage composition of uranium – 235 is increased is called enrichment of uranium. Natural uranium is 99.284% $_{238}U$ isotope, while the relative abundance of $_{235}U$ is only 0.711%.

(d) See Aqua Regia

(e) See Green House Effect.

(f) See igneous Rocks

Q.6.(a) Define GENETIC ENGINEERING. In how many ways Genetic Engineering can be applied in different field of life? Does it benefit society? Discuss. (1+3+2)

(b) What do the following scientific abbreviations stand for? (1/2 each)

(i)	SONAR	(ii)	CNS	(iii)	PTFE
(iv)	LDL	(v)	SARS	(vi)	GUT
(vii)	BASIC	(viii)	BTU		

Ans: (a) See Genetic Engineering

(b) See Scientific Abbreviation

Q.7. (a) What are MINERALS? Discuss ANY TWO physical properties thereof. Also mention the names of four precious minerals of high commercial value.

(i) Amphibion (ii) Synchronous satellite
(iii) Big Dipper (iv) Fermentation
(v) Millennium Bug

Ans: (a) See Solved Paper 2002

(b) (i) Amphibitions are those animals which are cold-blood vertebrates who lead sometime of their life on land and some in water. Frogs, salamanders and toads are ampibians.

(ii) A synchronous satellite is that which always remains above the same point on the Equator that is, it has a period of Exactly 86400 seconds. It's orbit radius is equal to 42400 km.

(iii) The group of seven bright stars in the constellation ursa major which are arranged in the shape of a dipper is called Big Dipper. The group is also called the wagon, flow or wain.

(iv) A Biochemical process in which the larger molecules are converted into smaller molecules with the help of certain Enzymes secreted by yeast or bacteria is called fermentation. For example, the molasses and starch are converted into Ethyl alcohol through fermentation.

Q.8.(a) Define RECEPTORS in man. Name different receptor organs in human body.

Ans: See Receptors in man

(b) Give scientific reasons of the following.

(i) The dogs pant, the birds open their mouth and the elephants move rapidly their ears.

(ii) The manholes covers are generally round.

(iii) A geostationary satellite appears standstill to a viewer on the equator of earth.

(iv) We never see birds urinating.

(v) Pasteurized milk has more nourishment than the ordinary boiled milk.

Ans: See scientific reasoning and Previous Papers.

SOLUTION

EVERYDAY SCIENCE 2010

NOTE: (i) First attempt Part-I (MCQ) on separate Answer Sheet which shall be taken back after 80 minutes.

(ii) Overwriting/cutting of the operations/answers will not be given credit.

PART-1(MCQs)

COMPULSORY

1. Select the best option and fill in the appropriate Box on the answer sheet: (50 Marks)

1. Water is heated in a kettle. The inside water is heated by convection. A person sitting near the fire receives heat by:
a) Conduction b) Convection c) Radiation✓ d) Reflection
e) None of these

2. A time can come when we will be able to design a machine which can go on working for ever without the expenditure of energy. Is it possible?
a) No✓ b) Yes c) In due course time d) Very soon
e) None of these

3. The measurement of rainfall is made by an instrument known as:
a) Hydrometer b) Barometer
c) Hygrometer d) Pedometer e) None of these✓

4. Light year is a unit of:
a) Distance✓ b) Time Period c) Light intensity d) Time
e) none of these

5. Three elements needed for the healthy growth of plants are:
a) N,P,K✓ b) N,C,P c) N,K,C d) N,S,P
e) none of these

6. Copper can be converted into gold by:
a) Heating b) Artificial Radioactivity✓
c) Electroplating d) Chemical reaction
e) None of these

7. In winter an iron pipe feel colder than a wooden window . This is because wood is:
a) Conductor b) non-Conductor✓
c) Semi- Conductor d) Not a solid while iron is a solid
e) None of these

8. The echo (reflected sound) will be distinctly heard only at ordinary temperatures If the distance of the reflecting surfaces from the source of sound is at least:
a) 1120 ft b) 120 ft c) 56ft✓ d) 100 ft
e) None of these

9. It is possible to recognize a person in the dark by simply hearing his unique voice . It Is because of the:
a) pitch b) Frequency c) Time period d) Quality✓
e) None of these

10. When a ray of sunlight enters a dark room, its straight path become visible because of dust particles hanging in the air. It is because light is:
a) Visible b) Transparent c) Invisible✓ d) opaque
e) None of these

11. A six feet tall lady wants to see her full image in a plane mirror. The minimum length of the mirror will be:
a) 6 feet b) 12 feet c) 4 feet d) 3 feet ✓
e) None of these

12. The principle used In radar is the same as that of Sonar. In radar we use radio waves; whereas In sonar we use:
a) red waves b) Infrared waves c) Ultrasonic✓
d) super sonic e) None of these

13. In a fission nuclear reaction, a heavy nucleus breaks up into smaller nuclei whereas in another nuclear reaction two or more than two possibly nuclei are fused to form a heavy nucleus. This nuclear reaction is called:
a) Chemical Reaction b) Nuclear reaction
c) Fission nuclear reaction d) Fusion nuclear reaction✓
e) None of these

14. Parsec is a unit of:
a) Energy b) Time c) Power d) Distance✓
e) None of these

15. German Silver is an alloy of:
A) Zn + Ni b) Cu + Zn c) Cu + Ni✓ d) Cu + Sn
e) None of these

16. The Continent Antarctica lies at the:
a) North pole b) South pole✓ c) middle of the earth
d) Equator e) None of these

17. The temperature of the dead body is:
a) 0°C b) 37
c) room temperature d) temperature of the place where it is kept✓
e) None of these

18. Lactometer is a type of Hydrometer which is used to measure the specific gravity of:

a) Honey b) Water c) Milk✓ d) olive oil
e) None of these

19. Cusec is a unit of:
a) Area b) Time c) Distance d) mass
e) None of these✓

20. The deepest place on earth is:-
a) Trench b) Mariana Trench✓ c) Mangrove d) Groove
e) None of these

21. Twinkling of stars is caused by:
a) Reflection of light b) Polarization of light
c) refraction of light✓ d) Interference of light
e) None of these

22. Magnifying power of a simple microscope can be increased by:
a) increasing focal length of the lens b) Decreasing focal length of the lens✓
c) Lens of large aperture d) lens of short aperture
e) None of these

23. Bronze medal is made up of metal:
a) Copper, Zinc b) Copper, Nickle c) Coppe4r, Tin✓ d) Sopper, Silver

24. One of the countries through which equator passes is:
a) Kenya✓ B) Pakistan c) Malaysia d) Malta
e) None of these

25. A very important practical application of properties of matter is hoeing or "godi" practiced by the farmers. This property of matter is called:
a) Elasticity b) Stress c) Capillarity✓ d) Strain
e) None of these

26. It is observed that the total pressure exerted by air on the man of average siz is around 14.7 lb wt. per square inch. But the man feels quite comfortable. It is because of:
a) An equal and opposite pressure acts from inside✓
b) of the height of a man
c) of gravity
d) Earth pulls the man upward
e) None of these

27) A nuclear reactor is a device used to carry out controlled nuclear reaction whereas GM counter is a device used to detect:
a) Current b) Voltage c) nuclear Radiation✓ d) power
e) None of these

28. A body can escape the gravitational pull of the earth if it is thrown up with a velocity of:
a) 25 miles per sec b) 60 miles per sec
c) 7 miles per sec✓ d) 10 miles per sec
e) None of these

29. Night vision is possible with the help of:
a) Red light b) Violet light
c) Infrared Rays✓ d) Ultra violet Light
e) None of these

30. Myopia is a defect of human eye. It can be corrected by using a lens called:
a) Convex lens b) Concave lens✓
c) Cylindrical lens d) Plano convex lens

c) None of these

31. Walnuts can be broken in the hand by squeezing two together but not one. It is because of:
a) Work done✓ b) Power c) Energy d) Volume
e) None of these

32. The instrument which specially design for recording earth quake wave is called seismograph which measure earth quake waves on a
a) Diatonic scale b) Fahrenheit Scale
c) Richter scale✓ d) Celsius Scale
e) None of these

33. The planet Mercury completes one rotation around the sun is
a) 88 days✓ b) 365 days
c) 98 days d) 60 days
e) None of these

34. Fossils found in the lowest geological strata are generally most:
a) Advance b) Complex
c) Primitive✓ d) Specialized
e) None of these

35. Evolution can be described as:
a) A continuing process✓ b) A catastrophic event in the past
c) Static d) The attaining of an ideal type
e) None of these

36. What is the only source of new alleles?
a) Crossing over b) Independent assortment
c) Mutation✓ d) Fertilization
e) None of these

37. Polygenic characteristic are controlled by:
a) Dominant genes b) Recessive genes
c) Multiple genes✓ d) Mutated genes
e) None of these

38. Which of the following, lists the four stages of food processing in order?
a) ingestion, digestion, absorption, elimination✓
b) digestion, ingestion, absorption, elimination
c) Ingestion, absorption, elimination, digestion
d) absorption, digestion, ingestion, elimination
e) None of these

39. In humans, most nutrient molecules are absorbed by the:
a) small intestine✓ b) stomach
c) liver d) large intestine
e) None of these

40. The energy needed to fuel essential body process is called:
a) Essential nutrient level b) Basal metabolism✓
c) None of these d) recommended daily allowance
e) Optimum energy intake

41. Which of the following is an organic molecule needed by the body in small amounts?
a) Protein b) Vitamin C✓ c) Zinc d) Monosaccharide
e) None of these

42. Inhaled air passes through which of the following in the last?
a) Bronchiole✓ b) Larynx c) Pharynx d) Trachea
e) None of these

43. Which of the following is a form of sexual reproduction?
a) Hermaphroditism✓ b) Fission c) Fragmentation d) Budding
e) None of these

44. Cobalt is a material which is:
a) Strongly attracted by a magnet✓ b) Not attracted by a magnet
c) not a magnet d) Weakly attracted by a magnet
e) None of these

45. Laughing gas has chemical composition of the following two elements which are:
a) Nitrogen + Hydrogen b) Nitrogen + Carbon
c) Nitrogen + oxygen✓ d) Oxygen + Carbon
e) None of these

46. Hepatitis A is transmitted to different individuals by:
a) Water b) Sneezing c) Spit d) Feces✓
e) None of these

47. The unit that coordinates different devices of the computer system is:
a) ALU b) Register c) Control unit✓
d) Logical instruction e) None of these

48. The most abundant element present is in the human body is:
a) Nitrogen b) Oxygen✓ c) Carbon d) Hydrogen
e) None of these

49. Cancer can be treated by:
a) Antibiotics and vaccines b) Radiotherapy and antibodies
c) Chemotherapy and radiotherapy✓ d) Antibodies and chemotherapy
e) None of these

50. Animals obtain carbon dioxide mainly from:
a) Starch b) Sucrose c) Glucose d) Glycogen
e) None of these✓

Part - II

Attempt only five questions. All questions carry equal marks. (50 Marks)

2. Write shot note on the following by giving their exact life span and contributions to the field of science. (Accurate fact will be appreciated) (10)

Ans: (See Muslim Scientists)
a) Al- Beruni b) Ibn- al – Haitham

3. What do you know about hereditary disease? Comment how they are transferred from parents to offsprings? (10)

Ans: (Genetics)

4. Write briefly any five of the following: (Answer in three or four sentences) (10)
a) Plaster of Paris b) Reflex Action
c) Pace Maker d) Swine flue
e) Microwave oven f) Internet
g) Voltage Stabilizer

Ans: (See Scientific terms)

5.A) What is global warming? Is there any a sunny side to global warming? If yes, explain. (5)

B) What makes the seasons happen? (5)

Ans: (See Global Warming)

6. A) In which organ these parts are present in animals or human body? (5)
B) Describe the function of each briefly: (5)
1. Coronary artery
2. Sino- Auricular Node
3. Aortic valve
4. Auricle

Ans: (See Human circulatory system)

7. Differentiate between the following pairs:
a) Hydrometer and Hygrometer
b) Perimeter and Telemeter
c) Isotopes and Isomers
d) Flying mammal and Bird
e) Vertebrates and Invertebrates

Ans: (See scientific terms distinguished)

8.A) What are pesticides? Explain how these are dangerous to human beings?
B) What do the following scientific abbreviations stand for?

1) STP	2) LORAN
3) SONAR	4) MAF
5) MeV	6) MASER
7) AWACS	8) CCTV

Ans: (See scientific abbreviations)

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NOTE: (i) First attempt Part-I (MCQ) on separate Answer Sheet which shall be taken back after 80 minutes.
(iii) Overwriting/cutting of the operations/answers will not be given credit.

PART-1 (MCQs) COMPULSORY

1. The planet of the solar system which has maximum numbers of Moon is
a) Jupiter✓ b) Venus c) Saturn d) Uranus e) None of these

2. Sun is a
a) Planet b) Comet c) Satellite d) Aurora e) None of these✓

3. The age of Solar System is
a) 4.5 billion years✓ b) 5.5 billion years c) 6.5 billion years
d) 7.5 billion years e) None of those

4. A unit of length equal to the average distance between the earth and sun is called
a) Light year b) Astronomical unit✓ c) Parsec d) Parallax
e) None of these

5. An eclipse of the sun occurs when
a) The moon is between the sun and the earth✓
b) The sun is between the earth and the moon
c) The earth is between the sun and the moon
d) The earth casts its shadow on the moon
e) None of these

6. The ozone layer protects the earth from rays sent by the sun:
a) Ultraviolet rays✓ b) Infrared rays c) Gamma rays
d) Radioactive rays e) None of these

7. The ozone layer is present about 30miles (50km) in atmosphere above earth. The stratum (layer) of atmosphere in which ozone layer lies is called as:

a) Exosphere b) Mesosphere c) Stratosphere✓ d) Ionosphere
e) Troposphere

8. Which rocks are formed by the alteration of pre-existing rocks by great heat or pressure
a) Igneous rocks b) Sedimentary rocks c) Metamorphic rocks✓
d) Acid rocks e) Basic rocks

9. The most abundant natural iron oxides are
a) Magnetite and Pyrite b) Magnetite and Bauxite
c) Hematite and Pyrite d) Hematite and Magnetite✓
e) Hematite and Bauxite

10. The most abundant elements in sea water are
a) Sodium and Potassium b) Sodium and Calcium
c) Sodium and Chlorine✓ d) Chlorine and Iodine
e) Magnesium and Sulphur

11. An electric current can produce
a) Chemical effect b) Magnetic effectc) Heating effect
d) All of these three✓ e) None of these

12. The unit of home electricity energy consumption is:
a) Watt hour b) Kilowatt hour✓ c) Joule hour
d) Kilojoule hour e) None of these

13. The magnet always points in the same direction, if move freely i.e. towards north and south poles, because of:
a) Gravitational field
b) A lot of metals deposits on north and south poles
c) Due to attraction of north pole and repulsion of Western pole
d) Earth is a huge magnet✓
e) None of these

14. When sound is reflected from floor, ceiling or a wall, it mixes with the original sound and change its complexion, it is called as
a) Sound b) Echo c) Reverberation✓ d) Noise
e) None of these

15. The speed of sound in dry air at 20°C is about
a) 130 meters per second b) 230 meters per second
c) 330 meters per second✓ d) 430 meters per second
e) None of these

16. The speed of light in vacuum is about
a) 300 Million meters per second✓ b) 300 Million meters per hour
c) 300 Million kilometers per second d) 300 Million kilometers per hour
e) None of these

17. The time light takes from Sun to reach Earth is:
a) 8 minutes✓ b) 25 minutes c) 45 minutes d) 60 minutes
e) None of these

18. Light from Sun travels a distance before it reaches Earth:
a) 50 Million Km b) 100 Million Km c) 150 Million Km✓
d) 200 Million Km e) None of these

19. The most suitable thermometer for measuring the boiling point of water is:
a) Mercury thermometer✓ b) Alcohol thermometer
c) Bimetallic thermometer d) Liquid crystal thermometer
e) None of these

20. The density of water is greatest at:
a) 32°C b) 0°C c) 4°C✓ d) 100°C e) None of these

21. Which one of the following statements is true:
a) Gases do not conduct heat b) The best conductors are non-metals
c) Conduction currents occur only in liquids d) A vacuum can not conduct heat
e) None of the statements is true✓

22. Ice can be changed to water by:
a) Adding more water molecules
b) Changing the motion of the water molecules✓
c) Rearranging the atoms in water molecules
d) Destroying the atoms in water molecules
e) None of these

23. The building blocks of elements are called:
a) Atoms✓ b) Molecules c) Compounds d) Isotopes
e) None of these

24. Boiling of an egg is a change which is:
a) Physical b) Chemical✓ c) Physiological d) Morphological
e) None of these

25. The temperature of liquid nitrogen is:
a) -32°C b) -80°C c) -100°C d) -196°C✓
e) None of these

26. Which one of the following is an Alkali?
a) Water b) Vinegar c) Lemon juice d) Slaked lime✓
e) None of these

27. If an Alkali is slowly added to an acidic solution, the pH of the acidic solution will:
a) Increase b) Decrease c) Increase to 7 and then decrease✓
d) Decrease to 7 and then increase e) Will remain same

28. The usual raw material for ceramics, generally found beneath the top soil is?
a) Sand b) Slit c) Clay ✓ d) Plaster of Parise) Melamine

29. Polyamides are synthetic polymers commonly known as:
a) Synthetic rubber b) Nylon✓ c) Cellulose d) Protein
e) None of these.

30. Telephone was invented in 1876 in America by:
a) Marconi b) Galileo c) John Beard d) Edison
e) Graham Bell✓

31. Information can be sent over long distances in the form of:
a) Electrical signals through wires b) Light signals through optical fibres
c) Radio waves through air d) Any combination of these three✓
e) None of these

32. Information can be stored in:
a) Audio and video cassettes b) Floppy and compact discs
c) Hard disks d) Laser and optical disks
e) All of these four✓

33. Computers can:
a) Add and subtract information only.
b) Add subtract and sort information only✓
c) Add subtract sort and classify information.
d) Add and subtract but cannot sort information.

c) Add subtract and sort but cannot classify information

34. IBM stands for:
a) International Business Machines✓ b) International Big Machines
c) Interrelated Business Machines d) Interrelated Big Machines
e) None of these.

35. Chemicals used to kill weeds are called as:
a) Insecticides b) Fungicides c) Herbicides✓
d) Fumigants e) None of these.

36. The cytoplasm consists of several types of structures, which are called:
a) Protoplasm b) Nucleus c) Cytochromes
d) Organelles e) None of these✓

37. The structure of DNA was elaborated by Watson and Crick in:
a) 1909 b) 1923 c) 1945
d) 1953✓ e) None of these.

38. In a DNA molecules, the rule for base pairing is:
a) Adenine always bound with thymine and cytosine with guanine✓
b) Adenine always bound with cytosine and thymine with guanine
c) Adenine always bound with guanine and cytosine with thymine
d) Adenine always bound with uracil and cytosine with guanine
e) None of these.

39. Man belongs to the family:
a) Felidae b) Hominidae✓ c) Mammalia
d) Primataceae e) None of these.

40. Deficiency of vitamin C in human body causes a deficiency disease called:
a) Beriberi b) Night blindness c) Rickets d) Scurvy✓
e) None of these.

41. To measure the specific gravity of milk, the instrument used is:
a) Hygrometer✓ b) Barometer c) Lactometer d) Hydrometer
e) None of these.

42. One of the fundamental characteristics of living organisms is:
a) Photosynthesisb) Digestion c) Excretion
d) Metabolism✓ e) None of these.

43. Plants growing on other plants are called as:
a) Saprophytes b) Parasites c) Epiphytes✓
d) Pathogens e) None of these.

44. As per eating habit, squirrels are:
a) Frugivorous b) Herbivorous✓ c) Carnivorous
d) Omnivorous e) Insectivorous.

45. Water loss from leaves through stomata is called as:
a) Evaporation b) Transpiration✓ c) Evapo-Transpiration
d) Respiration e) None of these.

46. The study of how plants and animals interact with one another and with the non-living environment is called as:
a) Ecosystem b) Sociology c) Ecology✓
d) Habitat e) None of these.

47. The number of bones in human body is:
a) 200 b) 202 c) 204 d) 206 e) None of these✓

48. Nervous system in human consists of:

a) Brain and spinal cord. b) Brain and nerves.
c) Spinal cord and nerves. d) Brain, spinal cord and nerves✓
e) None of these.

49. In human eye, the light sensitive layer made of specializes nerve cells, rods and cones is called as:
a) The pupil b) The cornea c) The sclera d) The iris
e) The retina✓

50. Erythrocytes are also called as:
a) Red blood cells✓ b) White blood cells c) Platelets d) Plasma
e) None of these

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1. RAM is the abbreviation of:
a) Random Access Memory✓ b) Read and Memorize
c) Reading Access memory d) None of these

2. Which of the following is an infectious disease?
a) Baldness b) Deafness
c) Blindness d) None of these✓

3. Arachnophobia is fear of:
a) Snake b) Spider✓
c) Cockroach d) Rats

4. One light year is equal to:
a) Distance travelled by light in one of our solar year✓
b) Mean distance between the Sun and the Earth
c) Mean distance between the Moon and the Earth
d) Mean distance between the Sun and any planet

5. Electricity and Magnetism are:
a) Two aspects of same force b) Completely opposite in direction
c) Both a & b✓ d) None of the above

6. Richest source of omega 3 acids is:
a) Fish oil✓ b) Sunflower
c) Soyabean d) None of the above

7. Which of the following is a mammal?
a) Whale b) Dolphin
c) Tuna d) Both a & b✓

8. Which one of the following reaction happens on Sun?
a. Nuclear fission of uranium and plutonium b. Nuclear fission of hydrogen into helium
c. Nuclear fusion of hydrogen into helium✓ d. Nuclear fusion of helium into hydrogen

9. Atmospheric pressure at sea level is:
a. 1 psi b. 14.7 psi✓
c. 32 psi d. None of the above

10. Weight on the moon is:
a. Same as that on the earth b. Double as that on the earth
c. One sixth as that on the earth✓
d. One half as that on the earth

11. Ibn Zuhr writer of Al-Taisir was famous for his contribution in:

a. Surgery✓ b. Calculus
c. Astronomy d. None of the above

12. In his book 'Kitab Al-jabr wal-Muqabla' Al-Khawarizmi
a. Solved Ptolemy's hypothesis
b. Solved linear and quadratic equation✓
c. Solved nth root solutions to mathematical equations by graphical method
d. Laid the foundations for optics

13. "Truth is sought for itself but the truths, are immersed in uncertainties and the scientific authorities not immune from error" which famous scholar of 11th century said that:
a. Plato b. Ibn Al Haitham✓
c. Aristotle d. None of the above

14. What is the correct sequence of inner planets of our solar system
a. Jupiter, satum, uranus, neptune b. Mercury, mars, earth, venus
c. Mercury, venus, earth, mars✓ d. None of the above

15. Sun is a:
a. Blue giant b. Yellow dwarf✓
c. Supernova d. None of the above

16. Galileo was persecuted for his belief that:
a. Earth revolves around the Sun✓
b. Center of universe is the Earth
c. All heavenly bodies revolve around the Earth
d. None of the above

17. Newton and Leibniz are considered father of
a. Calculus✓ b. General theory of relativity
c. Astronomy d. Physics

18. The energy and matter in a closed system:
a. are conserved b. changed from one form to another
c. both a and b✓ d. none of the above

19. Father transfers Y chromosome to
a. Son✓ b. Daughter
c. Both of these d. None of these

20. An ovum is:
a. Diploid b. Haploid✓
c. Triploid d. None of the above

21. Prokaryotic cell contains
a. Nucleaus b. Ribosome✓
c. Vacuole d. Chloroplast

22. Vitamin D is:
a. Fat soluble✓ b. Water soluble
c. Both a&b d. None of the above

23. Chromosomes are found in:
a. Centricles b. Nucleoplasm✓
c. Nucleolus d. Mitochondria

24. Which among the following has the highest calorie count in a given quantity?
a. Proteins b. Carbohydrates
c. Fats✓ d. Vitamins

25. The deficiency of Iodine causes the following disease:
a. Dental Caries b. Scurvy
c. Goiter✓ d. Rickets

26. Which amongst the following is known as the 'Brain of computer'?
a. Memory Unit
b. Arithmatic and Logic Unit
c. Control Unit✓
d. None of the above

27. The largest asteroid is:
a. Ceres✓
b. Eris
c. Phobos
d. Sedna

28. Which amongst the following cannot pass through space?
a. Light
b. Radiation
c. Heat
d. Sound✓

29. The Average distance between Sun and Earth is known as:
a. Angstrom
b. Astronomical Unit
c. Apogee
d. Aphelion

30. Which of the following is a 'Green House Gas'?
a. Sulphur Dioxide
b. Nitrous Oxide✓
c. Nitrogen
d. Oxygen

31. Gymnophobia is the fear of:
a. Closed spaces
b. Height
c. Nudity✓
d. Trees

32. What are the Places experiencing equal impact of an earthquake called?
a. Seismic lines✓
b. Seismic belts
c. Snow lines
d. Isobars

33. The Great Barrier Reef is a:
a. Hill range
b. Coral formation✓
c. Man-made wall
d. Tidal bore

34. What is shape of Earth's orbit around the sun?
a. Elliptical✓
b. Circular
c. Hyperbolic
d. Parabolic

35. Day and night are the result of:
a. Earth's rotation around its axis✓
b. Earth's revolution
c. Earth's rotation accompanied by its revolution
d. None of these

36. The layer of atmosphere close to the Earth's surface is called:
a. Exosphere
b. Ionosphere
c. Stratosphere
d. Troposhpere✓

37. Earthquakes are caused by:
a. Tectonism✓
b. Denudation
c. Earth's revolution
d. Earth's rotation

38. The greatest mass of ice on the Earth is found in:
a. Canada
b. Siberia
c. Antarctica✓
d. Greenland

39. The oceans cover approximately _____ of the Earth's surface
a. 50%
b. 60%
c. 70%✓
d. 80%

40. Monsoon is caused by:
a. Seasonal reversal of winds✓
b. Revolution of Earth
c. Movement of clouds
d. Rise in temperature

41. Excluding the moon, the celestial object which appear brightest in the sky:
a. Venus
b. Jupiter
c. Polestar✓
d. Sirus

42. Tides in the ocean are caused by:
a. Attraction of the Moon
b. Spherical surface of the Earth
c. Gravitation of the Earth
d. Gravitational attraction of the Sun and Moon✓

43. The motor neurons relay messages with brain and:
a. Receptors
b. Effectors✓
c. Stimulus
d. Sensors

44. Gigantism and dwarfism is caused by the following hormone:
a. GH✓
b. ADH
c. LH
d. FSH

45. _____ is a clear yellowish fluid portion of blood which contains fibrin and other soluble clotting elements:
a. Serum
b. Plasma✓
c. Lymph
d. None of the above

46. Veins differ from arteries in having:
a. Thicker walls
b. Strong walls
c. Valves✓
d. All of the above

47. The process of breaking down food in living cells to release a small amount of energy in the absence of oxygen is termed as:
a. Aerobic respiration
b. Anaerobic respiration
c. Metabolism
d. None of the above✓

48. Ribosomes, the sites of protein synthesis, are found:
a. In cytoplasm
b. Attached to Rough Endoplasmic Reticulum
c. Both a & b✓
d. None of the above

49. In a DNA molecule:
a. Adenine always bound with thymine✓
b. Thymine always bound with guanine
c. Cytosine always bound with thymine
d. Guanine always bound with Cytosine

50. Uracil base is found in:
a. RNA✓
b. DNA
c. Both a & b
d. None of the above

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CSS Solved MCQs - Everyday Science 2013

1. Who proposed the concept "All motion is relative"?
a. Albert Einstein
b. John Kepler
c. Galileo Galilie
d. None

2. The field of specialization of famous Muslim scientist Abu Usman Aljahiz was:
a. Botany
b. Zoology
c. Astronomy
d. None

3. Albatros is:
a. A sea bird
b. A beetle
c. A fruit
d. None

4. The sunlight can reach a depth of …….. meters in the ocean:
a. 100
b. 80
c. 120
d. None

5. The biggest planet in our solar system is:
a. Venus
b. Pluto
c. Jupiter
d. None

6. The biggest species of the cat family is:
a. Tiger
b. Lion
c. Leopard
d. None

7. Which group of animals has heterogametic females?
a. Domestic fowl
b. Earthworm
c. Rabbit

d. None

8. The dominant phase of life cycle in these organism is haploid:
a. Mosses
b. Bacteria
c. Protoza
d. None

9. The atmosphere of moon consists of:
a. 90% Hydrogen, 10% Nitrogen
b. 80%Nitrogen, 20% Hydrogen
c. 60% Nitrogen, 40%inert gases
d. None

10. The chemical name of quartz is:
a. Silicon Dioxide
b. Stannous Oxide
c. Aluminium Oxide
d. None

11. Which month of calendar year can lack a new moon?
a. December
b. February
c. May
d. None

12. Deuterium differs from Hydrogen in having:
a. Different atomic number but same atomic weight
b. Different atomic number and different atomic weight
c. Same atomic number and different atomic weight
d. None

13. One of the following is a water soluble vitamin:
a. Vitamin A
b. Vitamin D
c. Vitamin K
d. None (Vitamin B and C)

14. Coulomb is the scientific unit to measure:
a. Velocity
b. Temperature
c. Mass
d. None

15. Equator passes through one of these countries:
a. Saudi Arabia
b. Italy
c. Japan
d. None

16. Anti Diuretic hormone is secreted by one of the following glands:
a. Pituitary
b. Pancreas
c. Thyroid
d. None

17. Basha Dam is to be constructed on:
a. River Sutlaj
b. River Jhelum
c. River Chenab
d. None (On Indus River)

18. UV light falls in the category of:
a. Ionizing Radiations
b. Non Ionizing Radiation
c. Visible light
d. None

19. The earth's .....is divided into 15 major plates of various sizes:
a. Mesosphere
b. Stratosphere
c. Lithosphere
d. None

20. One of these scientists formulated basic laws of Geometry:
a. Pythagorus
b. Archimedes
c. Aristotle
d. None

21. Phosphorus is an essential component of one of the following biological molecules:
a. Amino acids
b. Nucleic acids
c. Carbohydrates
d. None

22. He was the first scientist to prove that plants move around the sun:
a. Archimedes
b. Galileo Galilei
c. John Kepler
d. None

23. Atom is made up of ..... different kinds of subatomic particles:
a. Three
b. Two
c. Four
d. None

24. Uranium is best used as nuclear fuel in one of the following forms:
a. U 235
b. U 237
c. U 238
d. None

25. The alpha particles are compact clusters of:
a. Electron and Proton
b. Two Protons and two Neutrons
c. Three protons and three Neutrons
d. None

26. The Beta particles are fast moving
a. Protons
b. Electrons
c. Neutrons
d. None

27. One of the following countries produces maximum energy from atomic reactors:
a. France (80% from its Nuclear Reactors)
b. USA
c. UK
d. none

28. The unit to measure the quantity of Ozone in atmosphere is
a. Dobson
b. Dalton
c. Cuolomb
d. none

29. The severity of 2005 earthquake in Pakistan on Richter scale was
a. 6.9
b. 7.6
c. 7.1
d. none

30. Geiger-Muller counter is used to detect:
a. Protons
b. Neutrons
c. Photons
d. none

31. Vacuum tubes have been replaced by:
a. Conductors
b. Diodes
c. Transistors

32. Dacron is
a. Polyethylene
b. Epoxy
c. Polyamide
d. none

33. It is a secondary plant nutrient:
a. Nitrogen
b. Phosphorus
c. Sulphur
d. none

34. An area of microbiology that is concerned with the occurence of disease in human population is
a. Immunology
b. Paracitology
c. Epidemiology
d. none

35. The number of electrons of a neutral atom is automatically known if one knows the:
a. Atomic number
b. Atomic weight
c. Number of orbitals
d. none

36. Which of the following is not an enzyme?
a. Chemotrypsin
b. Secretin
c. Pepsin
d. none

37. It is impossible for a type of O+ baby to have a type of ..... mother:
a. AB-
b. O-
c. O+
d. none

38. Serum if blood plasma minus its:
a. Calcium ions
b. Clotting proteins
c. Globulins
d. none

39. The autonomic nervous system innervates all of these except:
a. Cardiac muscles
b. Skeletal muscles
c. Smooth muscles
d. none

40. The damage to the ..... nerve could result in the defect of the eye movement:
a. Optic
b. Trigeminal
c. Abducens
d. none

41. Which of these is not a region of the spinal cord?
a. Thoracic
b. Pelvic
c. Lumbar
d. none

42. The shape of the external ear is due to:
a. Elastic cartilage
b. Fibrocartilage
c. Articular cartilage
d. none

43. The external surface of the stomach is covered by
a. Mucosa
b. Serosa
c. Parietal peritoneum
d. none

44. Which of the following is not a human organ system?
a. Integumentary
b. Muscular
c. Epithelical
d. none

45. Which of the following does not vary predictably with the depth of the aquatic environment?
a. Salinity
b. Temperature
c. Penetration by sunlight
d. none

46. The quantity of available nutrients .....from the lower levels of the energy pyramids to the higher ones.
a. Increases
b. decreases
c. remains stable
d. none

47. Which of the following is not a major sub division of the biosphere?
a. Hydrosphere
b. Stratosphere
c. Lithosphere
d. none

48. Vaccination is synonomyous with ..... immunity.
a. Natural active
b. Artificial passive
c. Artificial active
d. none

49. When a patient's immune system becomes reactive to a drug, this is an example of:
a. Super infection
b. Drug resistance
c. Allergy
d. none

50. What is the smallest unit of heredity?
a. Chromosomes
b. Gene
c. Nucleotides
d. none