Everyday Science

SOLVED CSS PAPERS

Every Day Science Paper - 1991
Partial Solution

9. (a) Write response on the following:

(i) The method by which men provides for his everyday needs and desires is called (Technology, Engineering, **Versatility**)

(ii) Of all the flying machines, man has made only (Balloon Jet Air Craft, **Rockets**) are suitable for space flight.

(iii) Transistors do not need a warm up period because they have no (Plate, Grid, **Filament**)

(iv) If an object gives off its own light, it is said to be (transparent, illuminated, **luminous**)

(v) An electric heater would be most likely to produce (X-rays, Ultra Violet, **I R Radiations**)

(b) Fill in the blanks:

(i) If the mass/volume ratio of a box containing stones is equal to the mass volume ratio of a box containing feather than the box containing **stones** has smaller volume of material in it.

(ii) In any one kind of atom, the number of proton, electrons is the same, it is the number of **neutrons** which may change from atom to atom of the same element.

(iii) The **Kelvin** scale of temperature is called the absolute scale.

(iv) The type of radiation hat is unaffected by magnetic field is called **alpha.**

(v) If we know the mass of an object and the force applied on it, it is possible to calculate **acceleration** of the object.

11. Match the following pairs from list I & list II

List I…….. ……. **List II**

Kidney…….. ……. Frog
Proteins…….. ….. Antibody

Photosynthesis……	Hepatitis
Heredity…….…..….	Bleeding disease
Neuron…… .. …….	Heart
Hemophilia…….……..	Nerve cell
Pace Maker…… …….	Chromosomes
Virus…….……..	Plant
Antigen…….……..	Amino acid
Amphibian……..…..….	Nephron

Answers:

List I…….…….. …..	**List II**
Kidney…….……..	.Nephron
Proteins……..	Amino acid
Photosynthesis….	.Plant
Heredity……..	Chromosomes
Hemophilia……..	Bleeding disease
Neuron…….. .	Nerve cell
Pace Maker…….. .	Heart
Virus…….……..	Hepatitis
Antigen…….. …	Antibody
Amphibian…….. .	Frog

14. (a) Name the organs responsible for the following functions present in either elements, plants or human.

a) Vision
b) Reproduction
c) Hormone secretion
d) Blood pumping
e) Food storage

Answers:

a) Eye
b) Gonades
c) Glands
d) Heart
e) Stem and stomach

(b) Fill in the blanks:

(i) Active transport in animals and plants required metabolic energy and **concentration gradient** to carry the substances across cell membranes electrical gradient.

(ii) Diseases that spread through air are called **air born disease.**

(iii) Large trees give off **aerial roots** for the support of their heavy spreading branches. **(iv)**

When iron is less in body the quantity of **hemoglobin** in cell decreases.

(v) Arteries become hard due to deposition of **fats** in them.

Every Day Science Paper - 1992
Partial Solution

4. Attempt any five of the following

(a) The solar system has:

(i) 9 planets
(ii) 12 planets
(iii) 16 planets

Ans. Now there are 8 major and several dwarf planets. (b)

The science of study of old age is called:

(i) Gerontology
(ii) Carcinology
(iii) Nephrology

Ans. (i) Gerontology

(c) The instrument used for measuring the velocity of air:

(i) Barometer
(ii) Anemometer
(iii) Potometer

Ans. (ii) Anemometer

(d) The science which deals with the bird is called:

(i) Entomology
(ii) Ornithology
(iii) Herpetology

Ans. (ii) Ornithology

(e) The function of the thermostat in a refrigerator is:
(i) To increase the freezing point
(ii) To Lower the temperature
(iii) To maintain the temperature

Ans. (iii) To maintain the temperature

(f) Blotting paper absorbs ink because:

(i) It has a chemical affinity for ink
(ii) The action of capillary
(iii) The force of gravitation acts between blotting paper and ink.

Ans. (ii) The action of capillary

(g) Mirage is an example of:

(i) Reflection of light
(ii) Refraction and internal reflection of light
(iii) Polarization of light

Ans. (i) Reflection of light

6. Where are the following animals found? Answer any five.

a) Kangaroo
b) Kiwi
c) Llama
d) Ibex
e) Panda
f) Snow Leopard
g) Penguin

Answer:

a) Australia
b) New Zealand
c) South America
d) Himalaya, Abyssinia
e) North India
f) Central Asian Mountains
g) Cooler waters and along the coastlines in Southern Hemisphere

7. Name the sources of any five of the following biological products.

a) Musk
b) Codeine
c) Cocaine
d) Quinine
e) Colchicines
f) Digilain

Answer:

a) Abdominal gland of male musk deer
b) From opium
c) Cocaine
d) Bark of cinchona
e) From colchicum
f) Leaves from the purple foxglove; a plant

9. Differentiate between any five of the following:

a) DNA and RNA
b) Alloy and Amalgam
c) Blood and Lymph
d) Stars and Planets
e) Gas and Vapour
f) Brass and Bronze

Answers:

a) DNA & RNA

RNA:

It is single stranded molecule
Contains Ribose sugar
contains adanine, guanine ,cytosine, & uracil bases
generally located in cytoplasm
is of three kinds

DNA:

Double stranded
deoxyribose
contains adanine, guanine cytosine and thymine bases

is of one kind

b) Alloy and Amalgam:

Alloy:

Substance composed of two or more metals. Alloys, like pure metals, possess metallic luster and conduct heat and electricity well, although not generally as well as do the pure metals of which they are formed. Compounds that contain both a metal or metals and certain nonmetals, particularly those containing carbon, are also called alloys. The most important of these is steel. Simple carbon steels consist of about 0.5 percent manganese and up to 0.8 percent carbon, with the remaining material being iron.

Amalgam:

Amalgam is an alloy of mercury with one or more metals.

d) Stars and Planets:

Stars:

Heavenly bodies that shine by its own light and remains relatively fixed in position among the other bodies in the universe.light and energy is generated in a star by the conversion of hydrogen into helium.

Planet:

Opaque bodies revolving around the sun in its own orbit & also rotating on its own axis, shines by reflection of the light of other stars(such as sun).

e) Gas and Vapour:

The terms vapor and gas can be used interchangeably, although in practice, vapor is used for a substance that is normally in liquid or solid state, such as water, benzene, and iodine. It has been proposed that the use of the term vapor be restricted to a gaseous substance below its critical point; the temperature at which it may be liquefied by the application of sufficient pressure) and the term gas should be used above the critical temperature when the existence of the substance in the liquid or solid state is impossible. This usage is essentially arbitrary because all gaseous substances follow a similar behavior both above and below the critical point.

f) Brass and Bronze:

Brass: an alloy of copper and zinc
Bronze: an alloy of copper and tin

13. Name two diseases caused by following groups of micro-organisms.

a) Bacteria
b) Viruses
c) Protozoa
d) Fungi

Answers:

a) Tuberculosis, Typhoid, Cholera
b) Poliomyelitis, Influenza
c) Sleeping sickness, Amoebic dysentery
d) Ringworm, Actinomycosis

Every Day Science Paper - 1993
Partial Solution

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

a) Urea is a phosphorous fertilizer
False

b) Ibn Baitar was a renowned Muslim Botanist
True

c) Penicillin was discovered by Edward Jenner
False

d) Cellulose is a natural polymer
True

e) Vitamin A and D are water soluble.
False

f) Amoeba is a unicellular animal
True

g) Solar eclipse occurs in full moon
False

h) Water is a bad conductor of electricity
False

i) Leprosy is a disorder of the nervous system
False

j) Chlorofluorocarbons cause decomposition of ozone
True

4. Fill in the blanks with correct choice.

1. Quartz is chemically a **silicate.**

2. Chicken egg is composed of **one cell.**

3. Visible light energy has the wavelength range of **400 to 700**.

4. The particles with positive charge but having mass equal to that of electron is called **proton.**

5. Gas in children's play-balloons going upward is **Helium.**

6. Standard pressure is **760 mm.**

7. Iron corrodes due to the formation of **Iron Oxide**

8. Explain in detail what is a balanced diet; name a nutrient present in each of the following food:

1. Apple
2. Bread
3. Meat
4. Butter
5. Orange
6. Egg
7. Milk
8. Spinach

Answers:

1. Vitamin C
2. Starch
3. Vitamin A
4. Vitamin A
5. Vitamin C
6. Vitamin D
7. Vitamin A, C, D
8. Vitamin K

12. Name the instruments used for measuring each of the following:

(i) Pressure
(ii) Voltage
(iii) Purity of milk
(iv) Temperature
(v) Velocity of wind

Answers:

(i). Barometer
(ii). Voltmeter
(iii). Lactometer
(iv). Thermometer
(v). Anemometer

15. Fill in the blanks:

(i) Starch is a polymer of **glucose.**

(ii) A big astronomical observatory known as the **Royal Greenwich, London** was established during the reign of Caliph Mamoon.

(iii) Adrenalin is secreted by the Adrenal **gland.**

(iv) **Mars** planet is nearest to the earth.

(v) CFC is the abbreviation of **Chlorofluorocarbon.**

(vi) The process of conversion of a material from solid state directly to gaseous state is called **sublimation.**

(vii) A junction diode is formed by PWP semiconductor pieces whereas junction transistor is a **sandwich** made up of PNP transistor.

Every Day Science Paper - 1994
Partial Solution

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

a) Bacteria are parasites
True

b) Ruby is an Oxide of Aluminum
True

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

d) Gypsum is hydrated calcium carbonate chemically.
False

e) Twenty-three moons revolve around Saturn
False

f) Pluto is the coldest planet
True - provided that if we consider it a planet.

g) Chromite ore contains chromium oxide.
True

h) Mica is a nonconductor of electricity.
True

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

j) The earth completes one rotation about its axis in 365.25 days.
False

4. Fill in the blanks:

(i) The capacity to do work is called **energy.**

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

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

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

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

(vi) Proteins are formed by combination of **amino acids.**

(vii) Rainwater dissolves sulphur dioxide to form **sulphuric acid.**

(viii) The set of instructions given to a computer is called **command.**
(ix) Chemicals such as penicillin which act on **bacteria** are called antibiotics.

(x) Comet Shoemaker Levy 9 hit the planet **Mars** in July this year (collision took place in July 1994)

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

(i) Name the two proteins found in milk.

Ans. albumin, globulin and casein

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

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

Antibiotics
Antiparasitic
Antiviral
Antiprotozoal
Hormonal

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

Male XY
Female XX

(v) Which two gases do you exhale more than you inhale?
Ans. Carbon dioxide and oxygen

(vi) Name any two glands which secretes hormones in human body
Ans. Thyroid and Pituitary , Pancreas

9. Differentiate between any five of the following pairs. (i)

Veins and arteries:

Veins: carry deoxygenated blood to heart from body parts
and **arteries** carry oxygenated blood from body parts to heart.
Veins are thin and less elastic than arteries.

(ii) PNP and NPN transistor:

PNP transistors is the one in which one N, type semiconductor is sandwiched in between two P type or accepter diodes while **NPN transistor** is the one in which two N type semiconductors are fitted on the both sides of p-type semiconductor to allow to pass current from them.

(iii) Electronic current and static electricity:

Electricity occurs in two forms: static electricity and electric current. Static electricity consists of electric charges that stay in one place. An electric current is a flow of electric charges between objects or locations:

(iv) Concave and convex lens:

A convex lens curves outward; it has a thick center and thinner edges. Light passing through a convex lens is bent inward, or made to converge;

Concave lens: A diverging, or concave, lens is curved inward, with a thin center and thicker edges. Light passing through a concave lens bends outward, or diverges

(v) Fats and oils:

Fats are soft and greasy at ordinary temperatures, whereas fixed oils—as distinct from essential oils and petroleum—are liquid.

(vi) Absorption and adsorption:

Adsorption : the adhesion of a thin layer of molecules of some substance to the surface of a solid or liquid.

Absorption: the ability of a substance to absorb light, noise, or energy, or the fact that it does so

13. Which part of a plant do they belong to?

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

Answers:

(i) Ginger... ...Underground Stem
(ii) Raddish... ...Edible Root
(iii) Potato... ... Under ground Stem (tuber)
(iv) Cinnamon... ..Bark of stem
(v) Peanut... ...Underground Seed/Fruit
(vi) Saffron... .Stigma of Flower
(vii) Almond... .Fruit
(viii) Chillies... ..Edible pod with seeds/Fruit
(ix) Spinach... .Leaves
(x) Tomato ... .Fruit

15. Fill in the blanks.

(i) In a heat engine, heat energy is changed into _____ (**mechanical energy**, magnetic energy, light energy)

(ii) Frequency of audible sound in Hertz (Hz) is _____ (**20 - 20,000Hz**, 20,000 - 30,000Hz, 30,000 - 4,000Hz)

(iii) Deficiency of vitamin B causes _____ (rickets, **beriberi**, night blindness)

(iv) Cheapest source of producing electricity is _____ (coal, natural gas, **water**)

(v) The smallest unit of measurement of wavelength is _____ (micrometer, **angstrom**, nanometer)

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

(vii) The unit of 'TON' to specify air conditioners is equal to _____ (10,000 BTU/hour, **12,000 BTU/hour,** 16,000 BTU/hour)

(viii) Unit of electricity 'KILOWATT HOUR' is the unit of (force, **work,** power)

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

(x) Heat radiation travels at a speed equal to _____ (half the speed of light, **speed of light,** speed of wind)

Every Day Science Paper - 1995
Partial Solution

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

a) Cryptograms are non-flowering plants.
False

b) Reserve food material is usually stored as glycogen in plants.
False

c) Streptococcus is a gram negative bacteria
False

d) Spinach is a good source of vitamin K.
True

e) Insulin is a hormone secreted by the spleen.
False

f) Femur is a bone of the forearm.
False

g) The moon has no atmosphere.
True

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

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

j) Electricity is a secondary source of energy.
True

2. Define any FIVE of the following scientific terms:

a) Doping
b) Immunization
c) Pasteurization
d) Modulation

e) Catabolism
f) Reprocessing of reactor fuel

Answers:

a) Doping: is adding impurities to semiconductor materials in order to change their electrical characteristics.

b) Immunization: Also called vaccination or inoculation, a method of stimulating resistance in the human body to specific diseases using microorganisms—bacteria or viruses—that have been modified or killed. These treated microorganisms do not cause the disease, but rather trigger the body's immune system to build a defense mechanism that continuously guards against the disease. If a person immunized against a particular disease later comes into contact with the disease-causing agent, the immune system is immediately able to respond defensively.

c) Pasteurization: Pasteurization, process of heating a liquid, particularly milk, to a temperature between 55° and 70° C (131° and 158° F), to destroy harmful bacteria without materially changing the composition, flavor, or nutritive value of the liquid. The process is named after the French chemist Louis Pasteur, who devised it in 1865 to inhibit fermentation of wine and milk. Milk is pasteurized by heating at a temperature of 63° C (145° F) for 30 minutes, rapidly cooling it, and then storing it at a temperature below 10° C (50° F).

d) Modulation: change sound: to change the tone, pitch, or volume of sound, e.g. of a musical instrument or the human voice

e) Catabolism: constructive metabolism, is the process of synthesis required for the growth of new cells and the maintenance of all tissues. Catabolism, or destructive metabolism, is a continuous process concerned with the production of the energy required for all external and internal physical activity. Catabolism also involves the maintenance of body temperature and the degradation of complex chemical units into simpler substances that can be removed as waste products from the body through the kidneys, intestines, lungs, and skin.

f) Reprocessing of reactor fuel:

The spent fuel still contains almost all the original uranium-238, about one-third of the uranium-235, and some of the plutonium-239 produced in the reactor. In cases where the spent fuel is sent to permanent storage, none of this potential energy content is used. In cases where the fuel is reprocessed, the uranium is recycled through the diffusion plant, and the recovered plutonium-239 may be used in place of some uranium-235 in new fuel elements.

3. What do you understand by the term “deforestation”? Discuss its ill-effects on the mankind.

Deforestation: is a large-scale removal of forest prior to its replacement by other land uses.

Forests are removed for a variety of reasons, including agriculture, timber harvesting, and mining, and to make way for roads, dams, and human settlements.

Deforestation poses a severe worldwide environmental problem. Forests take enormous amounts of carbon dioxide from the atmosphere in the process of photosynthesis. The destruction of forests exacerbates the accumulation of carbon dioxide in the atmosphere, which then contributes to global warming. In addition, deforestation causes soil erosion and destabilizes watersheds, resulting in flooding or drought.

Deforestation also reduces biodiversity, particularly significant in tropical forests that are home to a substantial portion of the world's plant and animal species. Deforestation processes are, in general, more destructive in the tropics. Most forest soils in the tropics are far less fertile than temperate soils, and more vulnerable to erosion. This is due to high rainfall, which leaches nutrients from the soil and speeds erosion.

4. Fill in the blanks.

a) The largest planet of the solar system is **Jupiter.**

b) The outermost layer of the earth is called **crust.**

c) Newton is the unit of **force.**
d) Radium was discovered by **Madam Curie.**

e) The memory of the computer is expressed in **bytes.**

f) Quartz is a crystalline form of **silicon dioxide.**

g) AIDS is caused by **Human Immune Deficiency Virus (HIV).**

h) Chemical name of gypsum is **Calcium Sulfate.**

i) Molten super hot material present inside a volcano is called **magma.**

j) Richter scale measures the severity of **earth quake.**

6. Write short notes (not more than 150 words) on any two of the following.

a) Semi-conductors
b) Pesticides
c) Laser.

Answers:

a) Semi-conductors:

Semiconductor, solid or liquid material, able to conduct electricity at room temperature more readily than an insulator, but less easily than a metal.

Such metals as copper, silver, and aluminum are excellent conductors, but such insulators as diamond and glass are very poor conductors .At low temperatures, pure semiconductors behave like insulators. Under higher temperatures or light or with the addition of impurities, however, the conductivity of semiconductors can be increased dramatically, reaching levels that may approach those of metals.

b) Pesticides: a chemical substance used to kill pests, especially insects. The chemical agents called pesticides include herbicides (for weed control), insecticides, and fungicides.

c) Laser: a device that produces and amplifies light. The word laser is an acronym for Light Amplification by Stimulated Emission of Radiation. Laser light is very pure in color, can be extremely intense, and can be directed with great accuracy. Lasers are used in many modern technological devices including bar code readers, compact disc (CD) players, and laser printers. Lasers can generate light beyond the range visible to the human eye, from the infrared through the X-ray range. Masers are similar devices that produce and amplify microwaves.

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

Answers:

a) Blue whale----**Mammals**
b) Cobra--------**Reptile**
c) Panda--------**Mammal**
d) Ostrich-------**Bird**
e) Penguin------**Bird**
f) Kiwi----------**Bird**
g) Shark--------**Fish**
h) Alligator -----**Reptile**
i) Dolphin-------**Mammal**
j) Tortoise------**Reptile**

12. Differentiate between the following.

a) Hypoglycemia and hyperglycemia
b) Epidemic and endemic
c) Herbivores and carnivores
d) Photosynthesis and respiration
e) Pollination and fertilization

Answers:

a) Hypoglycemia and Hyperglycemia:

Hypoglycemia:the medical condition of having an unusually low level of sugar in the blood

Hyperglycemia: the medical condition of having an unusually high level of sugar in the blood

b) Epidemic and Endemic

Epidemic: outbreak of contagious disease affecting an unusually large number of people or involving an extensive geographical area.

Endemic:a disease that usually occurrs within a particular area or locality some time in a year.

c) Herbivores and carnivores

Herbivore, animal that eats only plant material. Herbivores are primary consumers in the food web.

Carnivore, general term for any animal that subsists mainly on the flesh of other animals

d) Photosynthesis and respiration:

Photosynthesis: process by which green plants and certain other organisms use the energy of light to convert carbon dioxide and water into the simple sugar glucose.An extremely important byproduct of photosynthesis is oxygen, on which most organisms depend.

Respiration: Here we take oxygen and exhale carbon dioxide where as in plants in day time co2 is taken and o2 is given off.

e) Pollination and fertilization:

Pollination: transfer of pollen grains from the male structure of a plant to the female structure of a plant. The pollen grains contain cells that will develop into male sex cells, or sperm. The female structure of a plant contains the female sex cells, or eggs. Pollination prepares the plant for fertilization, the union of the male and female sex cells. Virtually all grains, fruits, vegetables, wildflowers, and trees must be pollinated and fertilized to produce seed or fruit, and pollination is vital for the production of critically important agricultural crops, including corn, wheat, rice, apples, oranges, tomatoes, and squash.

Fertilization: the process in which gametes—a male's sperm and a female's egg or ovum—fuse together, producing a single cell that develops into an adult organism. Fertilization occurs in

both plants and animals that reproduce sexually—that is, when a male and a female are needed to produce an offspring.

14. Fill in the blanks with the correct choice.

a) pH of blood is (3.4-4.4, **7.3-7.4,** 9.3-9.4)

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

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

d) Hypo is a solution of (sodium chloride, silver nitrate, **sodium thiosulphate**)

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

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

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

h) Bauxite is an ore of (boron, **aluminum,** magnesium).

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

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

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

Answers:

.**A**…….. ……..**B**

Einstein…….. .Mass energy conversion equation
Roentgen... .. …..X-rays
Charles Darwin...Theory of evolution
Chadwick……Neutron
Mendel…….. ..Laws of hereditary

Every Day Science Paper - 1996
Partial Solution

1. Which of the following statements are true.

a) Jbir Ibne Hayyan was the author book Kitab Al- Manazir.
False

b) Abyl Qasim Al-Zahravi was a famous Muslim mathematician.
False

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

d) Ideally water can e used as a car fuel after electrolysis.
True

e) A machine helps us do more work with less force.
True

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

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

h) Sound can travel through vacuum.
False

i) Famous Muslim botanist Ibn Al Baitar lived during the period 700-90 A.D.
False

j) A ceramic engine would have greater efficiency.
True

2. Fill in the blanks with the correct choice.

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

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

c) **Blue** colour has shortest wavelength. (blue, yellow, green)

d) **Copper** metal has the highest electrical conductivity. (silver, tungsten, copper)

e) light travels fastest in **vacuum.** (glass, vacuum, plastics)

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

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

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

i) **Protein** is a natural polymer. (glucose, protein, polyethylene)

j) **Astronomers** cannot be nominated for the Nobel Prize. (physicists, economists, astronomers)

3. Define any five of the following terms.

a) Biogas
b) Geothermal energy
c) Vaccine
d) Antibiotic
e) Ceramics
f) Light year

Answers:

a) Biogas:

Biogas is the result of the controlled microbial breakdown of organic materials such as animal manures or food scraps in an anaerobic digester.Biogas is a mixture of about 60-70% methane (natural gas), 30-40% carbon dioxide and other trace gases, such as hydrogen sulfide.

b) Geothermal energy:

The word geothermal comes from the Greek words geo (earth) and therme (heat). So, geothermal energy is heat from within the earth. We can use the steam and hot water produced inside the earth to heat buildings or generate electricity. Geothermal energy is a renewable energy source because the water is replenished by rainfall and the heat is continuously produced inside the earth.

c) Vaccine:

Vaccine is an immunogen consisting of a suspension of weakened or dead pathogenic cells injected in order to stimulate the production of antibodies.

d) Antibiotic:

Chemical substance formed as a metabolic by-product in bacteria or fungi and used to treat bacterial infections. Antibiotics can be produced naturally, using microorganisms, or synthetically.

e) Ceramics:

Ceramics are classified as inorganic and nonmetallic materials that are essential to our daily lifestyle. This category of materials includes things like tile, bricks, plates, glass, and toilets.Ceramics are generally made by taking mixtures of clay, earthen elements, powders, and water and shaping them into desired forms. Once the ceramic has been shaped, it is fired in a high temperature oven known as a kiln. Often, ceramics are covered in decorative, waterproof, paint-like substances known as glazes.

f) Light year:

A light-year is a unit of distance. It is the distance that light can travel in one year. Light moves at a velocity of about 300,000 (km) each second. So in one year, it can travel about 10 trillion km. More precisely, one light-year is equal to 9,500,000,000,000 kilometers.

5. What are Endocrine Glands? Name any two. From which part of the body are the following secreted:

a) Insulin
b) Thyroxin
c) Adrenaline
d) Oestrogen
e) Testosterone
f) Cortisol

Answers:

“These are those glands which pour their secretions directly into the blood stream”. Their secretions are called as “Hormones” which are the chemical substances produced by the cells of one part and transported by the body fluids to another site of body where they exert their action. They serve as chemical messengers or regulators.

They control growth, metabolism, reproduction and many other functions of body and mind.

E.g. Pituitary Gland, Thyroid Gland etc.

The following hormones are secreted by:

Name of Hormone…….**Gland secreting Hormone**

a) Insulin……..…….….Pancreas
b) Thyroxin……..……..Thyroid
c) Adrenaline……..…….…Adrenal Medulla
d) Oestrogen……. ……..….Ovaries
e) Testosterone……..……..Testes
f) Cortisol…….. ……...Adrenal Cortex

8. What do the following scientific abbreviations stand for?

a) LPG Liquefied Petroleum Gas

b) TNT Tri niotro toline

c) RNA Ribonucleic Acid

d) CNG Compressed Natural Gas

e) ATP Adenosine tri Phosphate

f) RBC Red Blood Cells

g) ECG Electro Cardio Gram

h) PVC Poly Vinyl Chloride

i) RAM Random Access Memory

j) CFC Chlorofluorocarbons

9. Write short notes on any two of the following:

a) Acid rain
b) Green house effect
c) Ozone depletion

Answers:

a) Acid rain:

The problem begins with the production of sulfur dioxide and nitrogen oxides from the burning of fossil fuels, such as coal, natural gas, and oil, and from certain kinds of manufacturing. Sulfur dioxide and nitrogen oxides react with water and other chemicals in the air to form sulfuric acid, nitric acid, and other pollutants. These acid pollutants reach high into the atmosphere, travel with the wind for hundreds of miles, and eventually return to the ground by way of rain, snow, or fog, and as invisible "dry" forms.

Acid rain leaches nutrients from soils, slows the growth of trees, and makes lakes uninhabitable for fish and other wildlife. In cities, acid pollutants corrode almost everything they touch, accelerating natural wear and tear on structures such as buildings and statues. Acids combine with other chemicals to form urban smog, which attacks the lungs, causing illness and premature deaths

b) Green house effect:

Greenhouse Effect, the capacity of certain gases in the atmosphere to trap heat emitted from Earth's surface, thereby insulating and warming the planet. Without the thermal blanketing of the natural greenhouse effect, Earth's climate would be about 33°C (about 59°F) cooler—too cold for most living organisms to survive.

The greenhouse effect results from the interaction between sunlight and the layer of greenhouse gases in the atmosphere that extends up to 100 km (60 mi) above Earth's surface. Sunlight is composed of a range of radiant energies known as the solar spectrum, which includes visible light, infrared light, gamma rays, X rays, and ultraviolet light. When the Sun's radiation reaches Earth's atmosphere, some 25 percent of the energy is reflected back into space by clouds and other atmospheric particles. About 20 percent is absorbed in the atmosphere. For instance, gas molecules in the uppermost layers of the atmosphere absorb the Sun's gamma rays and X rays. The Sun's ultraviolet radiation is absorbed by the ozone layer, located 19 to 48 km (12 to 30 mi) above Earth's surface.

About 50 percent of the Sun's energy, largely in the form of visible light, passes through the atmosphere to reach Earth's surface. Soils, plants, and oceans on Earth's surface absorb about 85 percent of this heat energy, while the rest is reflected back into the atmosphere—most effectively by reflective surfaces such as snow, ice, and sandy deserts. In addition, some of the Sun's radiation that is absorbed by Earth's surface becomes heat energy in the form of longwave infrared radiation, and this energy is released back into the atmosphere.

Certain gases in the atmosphere, including water vapor, carbon dioxide, methane, and nitrous oxide, absorb this infrared radiant heat, temporarily preventing it from dispersing into space. As

these atmospheric gases warm, they in turn emit infrared radiation in all directions. Some of this heat returns back to Earth to further warm the surface in what is known as the greenhouse effect, and some of this heat is eventually released to space. This heat transfer creates equilibrium between the total amount of heat that reaches Earth from the Sun and the amount of heat that Earth radiates out into space. This equilibrium or energy balance—the exchange of energy between Earth's surface, atmosphere, and space—is important to maintain a climate that can support a wide variety of life.

The heat-trapping gases in the atmosphere behave like the glass of a greenhouse. They let much of the Sun's rays in, but keep most of that heat from directly escaping. Because of this, they are called greenhouse gases. Without these gases, heat energy absorbed and reflected from Earth's surface would easily radiate back out to space, leaving the planet with an inhospitable temperature close to -19°C (2°F), instead of the present average surface temperature of 15°C (59°F).

c) Ozone depletion:

Ozone Layer, a region of the atmosphere from 19 to 48 km (12 to 30 mi) above Earth's surface. Ozone concentrations of up to 10 parts per million occur in the ozone layer. The ozone forms there by the action of sunlight on oxygen. This action has been taking place for many millions of years, but naturally occurring nitrogen compounds in the atmosphere apparently have kept the ozone concentration at a fairly stable level.

The ozone layer of the atmosphere protects life on Earth by absorbing harmful ultraviolet radiation from the Sun. If all the ultraviolet radiation given off by the Sun were allowed to reach the surface of Earth, most of the life on Earth's surface would probably be destroyed. Short wavelengths of ultraviolet radiation, such as UV-A, B, and C, are damaging to the cell structure of living organisms. Fortunately, the ozone layer absorbs almost all of the short-wavelength ultraviolet radiation and much of the long-wavelength ultraviolet radiation given off by the Sun.

In the 1970s scientists became concerned when they discovered that chemicals called chlorofluorocarbons, or CFCs (see Fluorine)—long used as refrigerants and as aerosol spray propellants—posed a possible threat to the ozone layer. Released into the atmosphere, these chlorine-containing chemicals rise into the upper stratosphere and are broken down by sunlight, whereupon the chlorine reacts with and destroys ozone molecules—up to 100,000 per CFC molecule. The use of CFCs in aerosols has been banned in the United States and elsewhere. Other chemicals, such as bromine halocarbons, as well as nitrous oxides from fertilizers, may also attack the ozone layer. Thinning of the ozone layer is predicted to cause increases in skin cancer and cataracts, damage to certain crops and to plankton and the marine food web, and an increase in atmospheric carbon dioxide (Global Warming) due to the decrease in plants and plankton.

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

Answer:

Abbreviation for central processing unit, and pronounced as separate letters. The CPU is the brains of the computer. Sometimes referred to simply as the central processor,but more commonly called processor, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

it has 3 parts

1)Memory unit: It stores vital information.such as computer language codes.It has 2 parts.

a)Ramdom access memory
b)read only memory

2)The arithmetic logic unit (ALU), which performs arithmetic and logical operations.

3)The control unit (CU), which extracts instructions from memory and decodes and executes them, calling on the ALU when necessary.

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

Answer:

The most important tool of photography is the camera itself. Basically, a camera is a lighttight box with a lens on one side and light-sensitive film on the other.

Parts:

1.camera box
2.film
3.aperture or diaphragm and shutter
4.the lense
5.the viewing system

Cameras may work with the light of the visible spectrum or with other portions of the electromagnetic spectrum. A camera generally consists of an enclosed hollow with an opening (aperture) at one end for light to enter, and a recording or viewing surface for capturing the light at the other end. A majority of cameras have a lens positioned in front of the camera's opening to gather the incoming light and focus all or part of the image on the recording surface. The diameter of the aperture is often controlled by a diaphragm mechanism, but some cameras have a fixed-size aperture.

Refraction is the phenomenon which makes image formation possible by the eye as well as by cameras and other systems of lenses.
Human eyes have often been compared to cameras. They are alike in terms of structure, but they have one fundamental difference in functioning mechanism.

Similarities & the Difference between Camera and Human Eye

Similarities:

1. opening for light to enter aperture in Camera and pupil in eye.
2. control the amount of light entering camera/eye.
diaphragm control size of aperture in camera and iris muscles control size of pupil in eye.
3. refract light glass biconvex lens in Camera .And mainly cornea ; lens, aqueous & vitreous humor in eye.
4. object of light action to form image photosensitive chemicals on film in camera and photoreceptors(rods & cones) in retina of eye.
5. absorb excessive light to prevent multiple images formation dark internal surface in camera and pigmented, dark choroid in eye.

Difference:

1. focusing mechanism change distance between lens & film in camera and change focal length of lens using ciliary muscles in eye.

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

Answers:

a) Thermoplastics and thermosetting plastics:

Thermoplastics:

Thermoplastics can be repeatedly softened by heating and hardened by cooling.Thermoplastic molecules, which are linear or slightly branched, do not chemically bond with each other when

heated. Instead, thermoplastic chains are held together by weak van der Waal forces (weak attractions between the molecules) that cause the long molecular chains to clump together like piles of entangled spaghetti. Thermoplastics can be heated and cooled, and consequently softened and hardened, repeatedly, like candle wax. For this reason, thermoplastics can be remolded and reused almost indefinitely.
in few words you can say:

1.Thermoplastics can be repeatedly softened by heating and hardened by cooling.
2.Thermoplastic molecules do not chemically bond with each other when heated.
3.examples are Polystyrene and polyethylene .

Thermosetting Plastics:

Thermosetting plastics, on the other hand, harden permanently after being heated once.Thermosetting plastics consist of chain molecules that chemically bond, or cross-link, with each other when heated. When thermosetting plastics cross-link, the molecules create a permanent, three-dimensional network that can be considered one giant molecule. Once cured, thermosetting plastics cannot be remelted, in the same way that cured concrete cannot be reset. Consequently, thermosetting plastics are often used to make heat-resistant products, because these plastics can be heated to temperatures of 260° C (500° F) without melting.

In few words we can say:

1. Harden permanently after being heated once.
2. Molecules that chemically bond when heated.
3. Examples are polyurethane and phenolic.

b) Lunar eclipse and solar eclipse:

A lunar eclipse occurs when Earth is between the Sun and the Moon, and Earth's shadow darkens the Moon. **A solar eclipse** occurs when the Moon is between the Sun and Earth, and the Sun's shadow moves across the face of Earth. An eclipse is called a total eclipse if the light is completely blocked or a partial eclipse if the light is only partly blocked.

c) Asteroid and meteorite:

Asteroid, small rocky or metallic body that orbits the Sun. Hundreds of thousands of asteroids exist in the solar system. Asteroids range in size from a few meters to over 500 km (300 mi) wide. They are generally irregular in shape and often have surfaces covered with craters

Meteorite, meteor that reaches the surface of Earth or of another planet before it is entirely consumed by heat and friction from the atmosphere. Meteors and meteorites originate as meteoroids in space. On Earth most meteoroids burn up as meteors before they can become meteorites. Meteoroids also strike bodies in space that lack atmospheres, such as the Moon

and asteroids, becoming meteorites without being meteors.

Meteor, bright streak of light caused when a small solid body from outer space known as a meteoroid enters the atmosphere of Earth or another planet and is heated by friction from rapid motion through the air. The outer surface of the meteoroid melts and forms an envelope of extremely hot gas and air that radiates light. The meteoroid may burn up almost completely and fall as dust, or it may fragment or explode in midair. Remains of meteoroids that reach the surface are called meteorites.

d) Renewable and non-renewable energy resources:

Renewable energy resources:

Generally a form or forms of energy that are not based on fossil fuels but are renewable sources.they are mostly environmental friendly. Examples, Geothermal Energy; Solar Energy; Tidal Energy; and Wind Energy.

Non-renewable energy resources:

Generally a form or forms of energy that are based on fossil fuels .they are not environmental friendly.
examples, natural gas, oil, wood.patrol etc.

e) Endothermic and exothermic reactions:

Chemical reactions can occur spontaneously if the reactants possess more potential energy (stored energy) than the products. This type of reaction occurs spontaneously because of the downhill energy path (from more potential energy to less). These reactions are called exothermic (heat-producing) reactions, because potential energy is converted to heat as the reactions proceed. Conversely, endothermic (heat-absorbing) reactions do not occur spontaneously because of the uphill energy path that exists. The products of endothermic reactions contain more potential energy than the reactants. As a result, energy must be added to trigger an endothermic reaction.

f) Star and planet:

discussed in 2008 papers.

g) Nuclear fission and nuclear fusion:

discussed in 2008 papers.

15. Fill in the blanks:

a)**Enzymes** are biological catalysts which have multiple function in the body.

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

c) The branch of zoology which deals with the study of insects is called **entomology.**

d) Electric current is measured by an **ammeter.**

e) Dry ice is solid **carbon dioxide.**

f) Fuels formed from animal and plant matter that lived thousands of years ago are known as **fossil fuels.**

g) Light with larger wavelength than that of the red colour is called **infra red.**

h) Penicillin was discovered by **Alexander Fleming.**

i) Medulla Oblongata connects the **small brain** with the spinal chord.

j) The pH of normal human blood is **7.45-7.35.**

Every Day Science Paper - 1997
Partial Solution

Note: Attempt **TEN** questions. All questions carry equal marks. Draw diagrams where necessary. Negative marking would be done for incorrect answers in Question Nos. 13 and 14.

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

2. Explain the structure of Earth and its atmosphere.

3. Write short notes on any two of the following:

(i) Solar eclipse
(ii) Thermoplastics
(iii) Non-renewable energy resources.

4. What are pesticides? Discuss their classification, commonly in use with agronomists.

5. What is the difference between.

(i) BIT and BYTE
(ii) RAM and ROM
(iii) C.U. and A.L.U
(iv) Hardware and Software
(v) Personal computer and mainframe

Answers:

(i) BIT and BYTE:

BIT:

Short for binary digit, the smallest unit of information on a machine. A single bit can hold only one of two values: 0 or 1. More meaningful information is obtained by combining consecutive bits into larger units. For example, a byte is composed of 8 consecutive bits.

BYTE:

Abbreviation for binary term, a unit of storage capable of holding a single character. On almost all modern computers, a byte is equal to 8 bits. Large amounts of memory are indicated in terms of kilobytes (1,024 bytes), megabytes (1,048,576 bytes), and gigabytes (1,073,741,824 bytes).

(ii) RAM and ROM:

RAM:

Pronounced ramm, acronym for random access memory, a type of computer memory that can be accessed randomly; that is, any byte of memory can be accessed without touching the preceding bytes. RAM is the most common type of memory found in computers and other devices, such as printers.

ROM:

Pronounced rahm, acronym for read-only memory, computer memory on which data has been prerecorded. Once data has been written onto a ROM chip, it cannot be removed and can only be read.

Unlike main memory (RAM), ROM retains its contents even when the computer is turned off. ROM is referred to as being nonvolatile, whereas RAM is volatile.

Most personal computers contain a small amount of ROM that stores critical programs such as the program that boots the computer. In addition, ROMs are used extensively in calculators and peripheral devices such as laser printers, whose fonts are often stored in ROMs.

In common usage, the term RAM is synonymous with main memory, the memory available to programs. For example, a computer with 8MB RAM has approximately 8 million bytes of memory that programs can use. In contrast, ROM (read-only memory) refers to special memory used to store programs that boot the computer and perform diagnostics. Most personal computers have a small amount of ROM (a few thousand bytes). In fact, both types of memory (ROM and RAM) allow random access. To be precise, therefore, RAM should be referred to as read/write RAM and ROM as read-only RAM.

(iii) C.U. and A.L.U:

CU:

Short for control unit, it is a typical component of the CPU that implements the microprocessor instruction set. It extracts instructions from memory and decodes and executes them, and sends the necessary signals to the ALU to perform the operation needed. Control Units are either hardwired (instruction register is hardwired to rest of the microprocessor) or micro-programmed.

ALU:

Abbreviation of arithmetic logic unit, the part of a computer that performs all arithmetic

computations, such as addition and multiplication, and all comparison operations. The ALU is one component of the CPU (central processing unit).

(iv) Hardware and Software:

Hardware:

Refers to objects that you can actually touch, like disks, disk drives, display screens, keyboards, printers, boards, and chips. In contrast, software is untouchable. Software exists as ideas, concepts, and symbols, but it has no substance.

Books provide a useful analogy. The pages and the ink are the hardware, while the words, sentences, paragraphs, and the overall meaning are the software. A computer without software is like a book full of blank pages -- you need software to make the computer useful just as you need words to make a book meaningful.

Software:

Computer instructions or data. Anything that can be stored electronically is software. The storage devices and display devices are hardware.

The terms software and hardware are used as both nouns and adjectives. For example, you can say: "The problem lies in the software," meaning that there is a problem with the program or data, not with the computer itself. You can also say: "It's a software problem."

(v) Personal computer and mainframe:

Personal Computer (PC):

Short for personal computer or IBM PC. The first personal computer produced by IBM was called the PC, and increasingly the term PC came to mean IBM or IBM-compatible personal computers, to the exclusion of other types of personal computers, such as Macintoshes.

In recent years, the term PC has become more and more difficult to pin down. In general, though, it applies to any personal computer based on an Intel microprocessor, or on an Intel-compatible microprocessor. For nearly every other component, including the operating system, there are several options, all of which fall under the rubric of PC .

Mainframe Computer:

A very large and expensive computer capable of supporting hundreds, or even thousands, of users simultaneously. In the hierarchy that starts with a simple microprocessor (in watches, for

example) at the bottom and moves to supercomputers at the top, mainframes are just below supercomputers. In some ways, mainframes are more powerful than supercomputers because they support more simultaneous programs. But supercomputers can execute a single program faster than a mainframe. The distinction between small mainframes and minicomputers is vague, depending really on how the manufacturer wants to market its machines.

6. Explain any five of the following terms (in not more than four lines each):

(i) Osmosis Glycolysis
(ii) Phototaxis
(iii) Transpiration
(iv) Saponification
(v) Emulsion

Answers:

(i) Osmosis:

osmosis, in botany and chemistry, the flow of one constituent of a solution through a membrane while the other constituents are blocked and unable to pass through the (selecyively permeable membrane)membrane. experimentation is necessary to determine which membranes permit selective flow, or osmosis, because not all membranes act in this way. many membranes allow all or none of the constituents of a solution to pass through; only a few allow a selective flow.

Glycolysis:

Glycolysis, chemical process in which glucose is broken down, or catabolized, into the simpler sugar lactic acid, and energy is released.

(ii) Phototaxis:

movement of organism caused by light: movement of an organism either toward or away from a source of light . Phototaxis is called positive if the movement is in the direction of light and negative if the direction is opposite.

(iii) Transpiration:

Transpiration, evaporation of water particles from plant surfaces, especially from the surface openings, or stomata, on leaves . Stomatal transpiration accounts for most of the water loss by a plant, but some direct evaporation also takes place through the surfaces of the epidermal cells of the leaves.

(iv) Saponification:

Saponification is the hydrolysis of an ester under basic conditions to form an alcohol and the salt of a carboxylic acid (carboxylates). Saponification is commonly used to refer to the reaction of a metallic alkali (base) with a fat or oil to form soap. Saponifiable substances are those that can be converted into soap.

Sodium hydroxide (NaOH) is a caustic base. If NaOH is used a hard soap is formed, whereas when potassium hydroxide (KOH) is used, a soft soap is formed. Vegetable oils and animal fats are fatty esters in the form of triglycerides. The alkali breaks the ester bond and releases the fatty acid salt and glycerol. If necessary, soaps may be precipitated by salting it out with saturated sodium chloride. The saponification value is the amount of base required to saponify a fat sample.

(v) Emulsion:

A suspension of small globules of one liquid in a second liquid with which the first will not mix: an emulsion of oil in vinegar

7. Fill in the blanks:

(i) A sheet of muscles called **diaphragm** separates the chest from the abdomen. (ii)

In the human body, blood-clotting factor is produced by the **liver.**

(iii) Human blood is able to carry large amounts of oxygen because of the chemical **hemoglobin.** (iv)

The living part of a plant cell is composed of a nucleus and **cytoplasm.**

(v) The pattern for building protein molecules is stored in the **messenger RNA.**

(vi) Anvil and stirrup are names of bones present in the **ear.**

(vii) The front of the eye is covered with a tough transparent material called **cornea.**

(viii) The young plant inside a grain of wheat is called the **embryo plant.**

(ix) In born behaviour that involve only one part of the body are called **reflex action.**

(x) The smallest branches of an artery lead into tiny blood vessels called **capillaries.**

8. What are Exocrine glands? Give names of any four along with the name of their secretion.

Answer:

Glands are of two principal types:

(1) those of internal secretion, called endocrine, and
(2) those of external secretion, called exocrine.

Some glands such as the pancreas produce both internal and external secretions. Because endocrine glands produce and release hormones directly into the bloodstream without passing through a canal, they are called ductless. For the functions and diseases of endocrine glands, see Endocrine System.

Sweat gland…….. ..Sweat
Sebaceous gland… ……Sebum
Lacrimal gland …… ..Tears
Salivary gland……. .Saliva

9. Which quantity do the following units measure:

(i) Volt
(ii) Coulomb
(iii) Walt
(iv) Ohm
(v) Mho
(vi) Ampere
(vii) Dyne
(viii) Celsius
(ix) Joule
(x) Calorie

Answers:

(i) Voltage
(ii) Charge of Electricity
(iii) Power
(iv) Resistance
(v) Conductivity
(vi) Current
(vii) Force
(viii) Temperature
(ix) Energy
(x) Heat

10. Give scientific reasons (in not more than four lines each) for the following:

(i) Meat takes longer to cook on the mountains
(ii) Water remains cool in earthen pitchers
(iii) Ice and salt mixture is used as a freezing agent by manual ice cream makers. (iv) It is not advisable to sleep under trees during the night.
(v) Greenhouse operators paint their glass roofs white in summer.

Answers:

(i) Meat takes longer to cook on the mountains:

The atmospheric pressure decreases as the altitude increases. The boiling point of water is 100 c at standard atmospheric pressure. At the mountains this atmospheric pressure is less, thus water boils at temperature lower than 100c.Therefore the meat takes longer time to be cooked. This can be overcome by using pressure cookers.

(ii) Water remains cool in earthen pitchers:

The water gets evaporated through the pores of earthen pot and in so doing takes more heat from the water in the form of latent heat and gets cooled in turn. While a metal or glass container has no pores and therefore does not permit the evaporation of water which does not get so cooled.

(iii) Ice and salt mixture is used as a freezing agent by manual ice cream makers.

Salt lowers down the temperature of ice by decreasing its freezing point. That is why ice and salt mixture is used as freezing agent in ice cream making.

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

Because plants at night releases carbon dioxide and takes up oxygen.

(v) Greenhouse operators paint their glass roofs white in summer.

In summer there is already much hot and white colour has a property of reflection of light to a maximum. And therefore white colour is painted on the roofs in the summer.

11. Which part/organ of the human body do the following belong:

(i) Eustachian tube
(ii) Cartilage

(iii) Auricle
(iv) Tendon
(v) Dendrites

Answers:

(i) Eustachian tube..... Ear
(ii) Cartilage..... ... Connective tissue
(iii) Auricle..... .. Ear
(iv) Tendon .....Muscle
(v) Dendrites... ..... Neuron

12.Briefly describe the solar system. Name its members outlines the main characteristics of any two members.

13. Fill in the blanks.

(i) Insulin is produced in the human body by the _____. (Liver, **Pancreas,** Gallbladder)

(ii) In an animal cell protein is synthesized in the _____. (Nucleus, Mitochondria, **Ribosome**)

(iii) Chemically finger nails are made up of _____. (Carbohydrate, **Protein,** Minerals)

(iv) Muscle stiffness is a symptom caused by the disease _____ (Polio, **Tetanus,** Rabies)

(v) Animals which obtain their food from dead organisms are called _____. (Carnivores, **Scavengers,** Saprophytes)

(vi) _____ is not affected by cooking. (**Ascorbic acid,** Thiamin, Riboflavin)

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

(viii) The number of chromosomes in the spermatozoa is _____ (Twenty-two,**twenty-three,** Forty-six)

(ix) The fat in our food is digested by the enzymes _____. (**lipase,** lactase, trypsin)

(x) The most abundant element in the human body is _____. (Carbon, Hydrogen,**Oxygen**)

14. Which of the following statements are false and which are true. (i)

Sound is a form of energy. **True**

(ii) A fraction of sunlight is refracted as it enters the earth's atmosphere. **True**

(iii) The energy possessed by a water fall is kinetic energy. **False**

(iv) Rainbows are produced by the reflection of light through raindrops. **False**

(v) Light switches in our homes are connected in parallel series. **True**

(vi) Generators convert mechanical energy into electricity. **True**

(vii) Modern incandescent bulbs contain filaments made of copper. **False**

(viii) A steam engine cannot be powered by fossil fuels. **False**

(ix) Nuclear energy is a cheap source of abundant electricity. **True**

(x) Oil burns cleaner and is less damaging to the environment than coal as a fuel. **True**

15. Match words of List A with those of List B.

...**A**...	**B**
Protein….....	Fat
Magnesium.....	Milk
Carotene….....	Ozone
Bauxite…	Nitrogen
Haemitite.....	Amino acid
Casein...	Vitamin A
Pancreas...	Aluminium
Quartz...	Chlorophyll
Chlorofluorocarbon...	Iron
Urea...	Silicon

Answers:

...**A**...	**B**
Protein…	Amino acid
Magnesium.....	Chlorophyll
Carotene…	Vitamin A

Bauxite…	Aluminium
Haemitite…..……	Iron
Casein...	Milk
Pancreas...	FATS
Quartz...	Silicon
Chlorofluorocarbon...	Ozone
Urea...	Nitrogen

Every Day Science Paper - 1998
Partial Solution

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

1. "Earthquakes have helped a great deal in deciphering the internal structure of the earth". Comment on this statement.

2. Discuss briefly the achievements of Muslims in the development of science. State the reasons of downfall of science in Muslim Society.

3. Discuss in detail the fission and fusion processes. Which one of thee processes in the source of solar energy?

4. Give a detailed description of global warming and its possible effects on life. What measures have been taken by various nations to tackle this problem?

5. Give chemical name of one Nitrogenous and one Phosphorus containing fertilizer. What is the role of Nitrogen, Phosphorous and Potash in the growth and development of various parts of a plant.

6. Write short notes on the following:

(i) Conductor
(ii) Resistor
(iii) Semi-conductor
(iv) Thermistor
(v) Transistor

7. Write short notes on five of the following:

(i) Antibody
(ii) Blood group
(iii) Carbon cycle
(iv) Nitrogen cycle
(v) Scavenger
(vi) Reaction time
(vii) Photosynthesis
(viii) Starfish

8.Which of the following statements are true?

(i) Trout is a sea fish.
False

(ii) Epiphytes is a plant that grows upon another plant.
True

(iii) Hepatitis is inflammation of membranes surrounding the brain.
False

(iv) Meningitis is the inflammation of liver.
False

(v) Equinox is the time when the sun appears vertically overhead at noon at the equator.
True

(vi) Drought is a long period of rain.
False

(vii) Joseph Aspdin is the inventor of cement.
True

(viii) Neurology is the science of nervous system.
True

(ix) Biochemistry is the application of statistics in the study of Biology.
True

(x) Aviculture is the science of the rearing of animals.
False

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

(i) Newton
(ii) Joule
(iii) Watt
(iv) Volt
(v) Light year
(vi) Angstrom
(vii) Acre-foot
(viii) Becquerel
(ix) Hertz
(x) Cusec

Answers:

(i) Force
(ii) Work Energy
(iii) Power of electricity
(iv) Potential difference
(v) Distance of stars and planets
(vi) Length
(vii) Volume
(viii) Radioactivity
(ix) Frequency
(x) Rate of flow of water

10. Match the cause of the disease:

Disease-----**Cause**

Rickets-----Plasmodium
Goiter------Protein deficiency
Typhoid----Iodine deficiency in diet
Merismis--- Salmonella typhosa
Malaria---- Deficiency of vitamin D

Answers:

Disease-----**Cause**

Rickets -------Deficiency of vitamin D
Plasmodium ---Malaria
Goiter---------Iodine deficiency
Typhoid------ Salmonella typhosa
Merismis ------Protein deficiency

11. What is the function of each of the following in a motor car:

(i) Gear box
(ii) Battery
(iii) Carburetor
(iv) Dynamo
(v) Radiator

12. Explain the following:

(i) Blood group
(ii) Short circuit
(iii) Short sight
(iv) International date line
(v) Plaster of Paris

Answers:

(i) Blood group

A blood type (also called a blood group) is a classification of blood based on the presence or absence of inherited antigenic substances on the surface of red blood cells (RBCs). These antigens may be proteins, carbohydrates, glycoproteins or glycolipids, depending on the blood group system, and some of these antigens are also present on the surface of other types of cells of various tissues. Several of these red blood cell surface antigens, that stem from one allele (or very closely linked genes), collectively form a blood group system.

(ii) Short circuit:

1) An electrical circuit of lower than usual resistance, especially one formed unintentionally.

2) A short circuit (sometimes abbreviated to short or s/c) allows a charge to flow along a different path from the one intended. The electrical opposite of a short circuit is an open circuit, which is infinite resistance between two nodes. It is common to misuse "short circuit" to describe any electrical malfunction, regardless of the actual problem.

(iii) Short sight:

the inability to see things clearly unless they are relatively close to the eyes; myopia.

Detail:
Short-sightedness, is a refractive defect of the eye in which collimated light produces image focus in front of the retina when accommodation is relaxed.

Those with myopia see nearby objects clearly but distant objects appear blurred. With myopia, the eyeball is too long, or the cornea is too steep, so images are focused in the vitreous inside the eye rather than on the retina at the back of the eye. The opposite defect of myopia is hyperopia or "farsightedness" or "long-sightedness" — this is where the cornea is too flat or the eye is too short.

(iv) International date line:

Longitude line located at 180 degrees, longitude line that divides time zones so that one side is one one calendar day and the other side is on the next calendar day

(v) Plaster of Paris:

Plaster of Paris, or simply plaster, is a type of building material based on calcium sulfate hemihydrate, nominally $CaSO_4 \cdot 0.5H_2O$. It is created by heating gypsum to about 150 °C.

13. Answer the following:

(i) Of what lead pencils are made of?
(ii) Why is one's breath visible in cold but not in hot weather?
(iii) What is the chemical composition of diamond?
(iv) Name the vaccine that protects against tuberculosis.
(v) Name the disease of the liver that causes a patient to turn yellow.

14. Fill in the blanks.

(i) **Black hole** is a hypothetical region of space having a gravitational pull so great that no matter or radiation can escape from it.

(ii) **Fungicides** are used against mould and fungi.

(iii) The science which deals with heredity is known as **genetics.** (iv)

Insulin is used for the treatment of **diabetes.**

(v) **Yuri Gagarin** is the first space man.

(vi) **Pluto** is the farthest planet from the sun in Solar System.

(vii) The distance between the earth and the sun is called **Astronomoical Unit.** (viii)

The study of chemical processes of living organisms is called **biochemistry.** (ix) The

first computer virus invented by two Pakistani brothers is called the **brain.** (x) Severe

efficiency of vitamin C results in **scurvy.**

15. Differentiate between any five of the following.

(i) Artery and vein
(ii) Hard water and soft water
(iii) E-mail and Snail mail
(iv) Apes and monkey
(v) Hydrostatics and hydrodynamics
(vi) Comet and meteor
(vii) Barrage and dam
(viii) Electron and hole
(ix) Isobars and isotopes
(x) Autopsy and biopsy

Answers:

(i) Artery and vein:

Arteries:

Muscular blood vessels that carry blood away from the heart. All arteries, with the exception of the pulmonary and umbilical arteries, carry oxygenated blood.

Vein:

A blood vessel that carries blood toward the heart. The majority of veins in the body carry lowoxygen blood from the tissues back to the heart; the exceptions being the pulmonary and umbilical veins which both carry oxygenated blood.

(ii) Hard water and soft water:

Hard water:

Water that has a high mineral content (contrast with soft water), usually consisting of calcium (Ca^{2+}) and magnesium (Mg^{2+}) ions, and possibly including other dissolved metals, bicarbonates, and sulfates. Calcium usually enters the water as either calcium carbonate ($CaCO_3$) in the form of limestone and chalk, or calcium sulfate ($CaSO_4$) in the form of other mineral deposits. The predominant source of magnesium is dolomite ($CaMg(CO_3)_2$). Hard water is generally not harmful.

Soft water:

The term used to describe types of water that contain few or no calcium or magnesium ions. The term is usually relative to hard water, which does contain significant amounts of such ions.

(iii) E-mail and Snail mail:

E-Mail:

Method of correspondence via the Internet; communication sent by electronic mail.

Snail Mail:

Regular mail, normal postal service (not electronic mail)

(iv) Apes and monkey:

A monkey is any member of either the New World monkeys or Old World monkeys, two of the three groupings of simian primates, the third group being the apes.

(v) Hydrostatics and hydrodynamics:

Hydrostatics:

Fluid statics (also called hydrostatics) is the science of fluids at rest, and is a sub-field within fluid mechanics

Hydrodynamics:

The branch of science concerned with forces acting on or exerted by fluids (especially liquids).

(vi) Comet and meteor:

Comet:

Any icy object that exists within the solar system. They are pieces of the primitive, unprocessed matter that formed the solar system 4.6 x 109 years ago. They are typically a few kilometers across and consist mainly of dust grains, frozen water, carbon monoxide and carbon dioxide; they contain many simple organic molecules.

Meteor:

A meteoroid is a small sand to boulder-sized particle of debris in the Solar system. The visible path of a meteoroid that enters Earth's (or another body's) atmosphere is a meteor, commonly called a "shooting star" or "falling star". Many meteors are part of a meteor shower.

(vii) Barrage and dam:

Barrage:

Not built at heights.
Pressure is not enough to produce electricity.
Only Canals are marked out of it.

Dam:

Built at heights.
Pressure is enough to move turbines so hydroelectricity is generated.

(viii) Electron and hole:

Electron:

They belong to the lepton family and are the negatively charged components of atoms (1.6 x10^-19 coulomb). In the simplest model of the atom, electrons are envisaged to move around the atomic nucleus in specified circular and elliptical orbits.

Electron Hole:

An electron hole is the conceptual and mathematical opposite of an electron, useful in the study of physics and chemistry. The concept describes the lack of an electron. It is different from the positron, which is the antimatter duplicate of the electron.

(ix) Isobars and isotopes:

Isobars:

line on a weather map or chart that connects areas of equal barometric pressure

Isotopes:

Any of the several different forms of an element each having different atomic mass (mass number). Isotopes of an element have nuclei with the same number of protons (the same atomic number) but different numbers of neutrons.

Or

Isotopes and Isobars:

The various nuclides, or species, of a particular chemical element with equal proton number (atomic number), but different neutron numbers were called isotopes of the element, before the more inclusive term "nuclide" was internationally accepted (ca. 1950. Such particular nuclides may still be called "isotopes." However, nuclides with equal mass number but different atomic number are called isobars (isobar = equal in weight), whereas Isotones are nuclides of equal neutron number but different proton numbers.

(x)Autopsy and biopsy:

Autopsy:

Postmortem, examination of a corpse to determine cause of death

Biopsy:

Removal and study of a tissue sample for diagnostic purposes

Partial Solution
EVERYDAY SCIENCE PAPER 1999

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

1. Discuss in brief, the contribution of Muslim scientists in the field of biological science.

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

The universe can be explored by astronomical instruments called telescopes, and by space probes sent from earth to other planets. When using telescopes astronomers try to look at the energy being produced by the universe not just in the visible part of the spectrum (where our eyes can see) but at the whole range of electromagnetic radiation. We thus have radio telescopes, infrared telescopes, X-ray telescopes and even some telescopes that are burried deep underground looking for neutrinos.

Various Instruments

The most notable Universe exploring instruments may be as follows

1- The Hubble Space Telescope (HST)

The Hubble Space Telescope (HST) is a telescope in orbit around the Earth, named after astronomer Edwin Hubble. Its position outside the Earth's atmosphere provides significant advantages over ground-based telescopes — images are not blurred by the atmosphere, there is no background from light scattered by the air, and the Hubble can observe ultra-violet light that is normally absorbed by the ozone layer in observations made from Earth. Since its launch in 1990, it has become one of the most important instruments in the history of astronomy. With it, astronomers have made many observations leading to breakthroughs in astrophysics. Hubble's Ultra Deep Field is the most sensitive astronomical optical image ever taken.

2- Wilkinson Microwave Anisotropy Probe (WMAP)

The Wilkinson Microwave Anisotropy Probe (WMAP) is a NASA satellite mission led by Professor Charles L. Bennett of Johns Hopkins University, whose mission is to survey the sky to measure the temperature of the radiant heat left over from the Big Bang. The satellite was launched by a Delta II rocket on June 30, 2001, at 3:46 p.m. EDT from Cape Canaveral Air Force Station, Florida, USA

3. Explain the Solar System and the unifying characteristics which the Sun and its planets have.

4. How the solar and lunar eclipses are caused?

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

Ozonosphere

A layer in the stratosphere (at approximately 20 miles) that contains a concentration of ozone sufficient to block most ultraviolet radiation from the sun

The ozone layer is a layer in Earth's atmosphere which contains relatively high concentrations of ozone (O3). This layer absorbs 97-99% of the sun's high frequency ultraviolet light which is potentially damaging to life on Earth. Over 90% of ozone in earth's atmosphere is present here. "Relatively high" means a few parts per million—much higher than the concentrations in the lower atmosphere but still small compared to the main components of the atmosphere. It is mainly located in the lower portion of the stratosphere from approximately 15 km to 35 km above Earth's surface, though the thickness varies seasonally and geographically.

The ozone layer was discovered in 1913 by the French physicists Charles Fabry and Henri Buisson. Its properties were explored in detail by the British meteorologist G. M. B. Dobson, who developed a simple spectrophotometer that could be used to measure stratospheric ozone from the ground. Between 1928 and 1958 Dobson established a worldwide network of ozone monitoring stations which continues to operate today. The "Dobson unit", a convenient measure of the total amount of ozone in a column overhead, is named in his honor.

Depletion of the ozone

Only a few factors combine to create the problem of ozone layer depletion. The production and emission of CFCs, chlorofluorocarbons, is by far the leading cause.

Many countries have called for the end of CFC production because only a few produce the chemical. However, those industries that do use CFCs do not want to discontinue usage of this highly valuable industrial chemical.
CFCs are used in industry in a variety of ways and have been amazingly useful in many products. Discovered in the 1930s by American chemist Thomas Midgley, CFCs came to be used in refrigerators, home insulation, plastic foam, and throwaway food containers.

Only later did people realize the disaster CFCs caused in the stratosphere. There, the chlorine atom is removed from the CFC and attracts one of the three oxygen atoms in the ozone molecule. The process continues, and a single chlorine atom can destroy over 100,000 molecules of ozone.
In 1974, Sherwood Rowland and Mario Molina followed the path of CFCs. Their research proved that CFCs were entering the atmosphere, and they concluded that 99% of all CFC molecules would end up in the stratosphere.
Only in 1984, when the ozone layer hole was discovered over Antarctica, was the proof truly

conclusive. At that point, it was hard to question the destructive capabilities of CFCs.

Even if CFCs were banned, problems would remain. There would still be no way to remove the CFCs that are now present in the environment. Clearly though, something must be done to limit this international problem in the future.

Harm to the Humanity

Even minor problems of ozone depletion can have major effects. Every time even a small amount of the ozone layer is lost, more ultraviolet light from the sun can reach the Earth.

Every time 1% of the ozone layer is depleted, 2% more UV-B is able to reach the surface of the planet. UV-B increase is one of the most harmful consequences of ozone depletion because it can cause skin cancer.
The increased cancer levels caused by exposure to this ultraviolet light could be enormous. The EPA estimates that 60 million Americans born by the year 2075 will get skin cancer because of ozone depletion. About one million of these people will die.

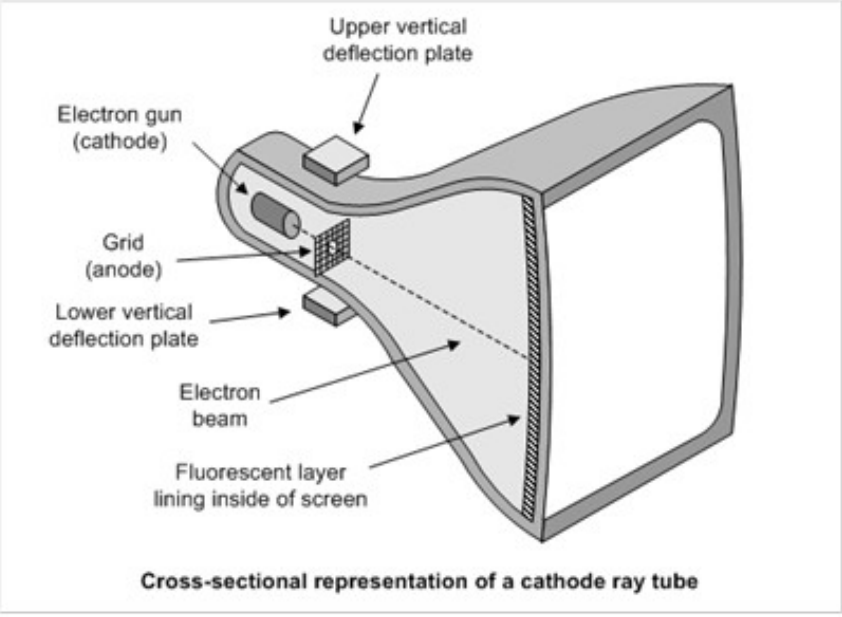
In addition to cancer, some research shows that a decreased ozone layer will increase rates of malaria and other infectious diseases. According to the EPA, 17 million more cases of cataracts can also be expected.
The environment will also be negatively affected by ozone depletion. The life cycles of plants will change, disrupting the food chain. Effects on animals will also be severe, and are very difficult to foresee.

Oceans will be hit hard as well. The most basic microscopic organisms such as plankton may not be able to survive. If that happened, it would mean that all of the other animals that are above plankton in the food chain would also die out. Other ecosystems such as forests and deserts will also be harmed.

The planet's climate could also be affected by depletion of the ozone layer. Wind patterns could change, resulting in climatic changes throughout the world.

6. Describe the principle and make up of a Television.

Almost all TVs in use today rely on a device known as the **cathode ray tube**, or **CRT**, to display their images. In a cathode ray tube, the "cathode" is a heated filament (not unlike the filament in a normal light bulb). The heated filament is in a vacuum created inside a glass "tube." The "ray" is a stream of electrons that naturally pour off a heated cathode into the vacuum.



Cross-sectional representation of a cathode ray tube

Electrons are negative. The anode is positive, so it attracts the electrons pouring off the cathode. In a TV's cathode ray tube, the stream of electrons is focused by a focusing anode into a tight beam and then accelerated by an accelerating anode. This tight, high-speed beam of electrons flies through the vacuum in the tube and hits the flat screen at the other end of the tube. This screen is coated with phosphor, which glows when struck by the beam.

7. What is escape velocity? How the Satellites are launched and what are their uses?

Escape Velocity

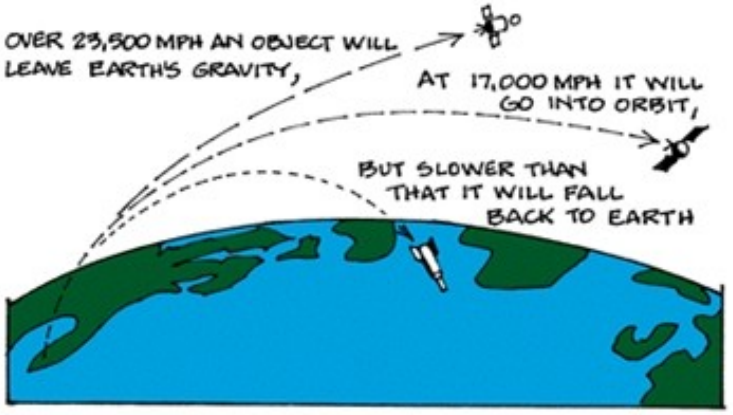
In physics, escape velocity is the speed where the kinetic energy of an object is equal in magnitude to its potential energy in a gravitational field. It is commonly described as the speed needed to "break free" from a gravitational field. On the surface of the Earth, the escape velocity is about 11.2 kilometers per second

How are satellites launched?

Most satellites are sent into orbit either on rockets or expendable launch vehicles, which fall into the ocean once they've used up all their fuel. Some, such as the Hubble Space Telescope, are launched via the USA's Space Shuttle which returns to Earth after each mission and is reused.
The trick when launching a satellite is to get it high enough to do its job without losing the capsule to outer space. It's a delicate balance of push and pull, accomplished by the inertia of the moving object and the Earth's gravity. If you launch a satellite at 17,000 mph, the forward momentum will balance gravity, and it will circle the earth. On the other hand, if the satellite is launched faster then 23,500 mph, it will leave the gravitational pull of the Earth.

Why does a satellite stay in orbit?

Due to the balance of two factors:
1. velocity, or the speed at which it would travel in a straight line, and
2. the gravitational pull between the Earth and the satellite.



Uses
Satellites are used almost every day by everyone. Even though you can't see it, there will probably be one traveling above you today. Satellites are used for many things such as communication, oceanography, astronomy, surveillance, and a variety of other things as well . They help many scientists get a perceptive view at all kinds of objects anywhere in the world.

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

9. How characters are transmitted from parents to offspring?

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

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

a) Iron
Iron Deficiency Anemia

b) Iodine
Goiter

c) Fluoride
May cause increased dental caries and possibly osteoporosis

d) Vitamin A
Vitamin A is essential for night vision and improves effectiveness of the immune system. Its

deficiency also causes retarded growth, Night blindness and susceptibility to infection. It can be found in many dairy products, and especially in carrots.

e) Vitamin D
Essential part of the diet required in the absorption of minerals in food, where a lack of vitamin D in the diet leads to a condition called rickets, where softening of the bones cause them to bend from the lack of calcium. Its deficiency also causes osteomalacia in the adults. Humans have the ability to synthesize vitamin D from sunlight.

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

13. Differentiate between

a) Neuron and neutron
b) Meiosis and mitosis
c) Heavy water and hard water
d) Climate and weather
e) Isotopes and isobars

14. Fill in the blanks

a) Plant cells manufacture their food due to the presence of _____ (**chlorophyll**, vacuole, cell wall)

b) The mitochondria in a cell are the constituent of the _____ (nucleus, **cytoplasm**, cell membrane)

c) Mitosis is a type of cell division wherein the number of chromosomes in the daughter cell is the _____ (**same**, half, double)

d) Blood cells are of _____ types (two, **three**, four)

Platelet is actually a fragment of the large bone marrow cells known as megakaryocytes

e) The _____ causes sunburn and suntan (**ultraviolet rays**, alpha particles, gama radiation)

15. Which of the following statements are false or true. Write only true of false in the answer book. Do not reproduce the questions.

a) Xylem and Phloem are conducting tissues. **(True)**
b) Carbohydrates are cheapest and most ready source of energy. **(True)**
c) Enzymes are responsible for chemical digestion of food. **(True)**
d) Plasma is the fluid part of the blood in which the cells are suspended. **(True).**

e) Hemoglobin combines with oxygen and transport to different cells of the body. **(True)**
f) Neutron is the negative charged particles in an atom. **(False)**
g) Helium is the lightest gas. **(True)**
h) Venus is the smallest planet of the solar system. **(False)**
i) Image of an object is formed on the retina of the eye. **(True)**
j) Barometer is used for measuring the current. **(False)**

Partial Solution
Everyday Science Paper 2000

TIME ALLOWED: 3 HOURS MAXIMUM MARKS: 100
NOTE: Attempt any TEN questions. All questions carry equal marks. Illustrate your answer with diagram where necessary.

1. Write comprehensive notes on any TWO of the following: (5,5)

(a) Contribution of Muslim scientists in the field of biology. (b) Water pollution.
(c) Semiconductors.

2. Describe the various type of movements of the earth? What are the effects of these movements? Draw simple diagrams to illustrate your answer. (4,6)

3. Explain the following using suitable examples. (2 each) (a)

Feedback mechanism of human system.

Homeostatic Feedback Mechanisms

Many endocrine glands are linked to neural control centers by homeostatic feedback mechanisms. The two types of feedback mechanisms are negative feedback and positive feedback. Negative feedback decreases the deviation from an ideal normal value, and is important in maintaining homeostasis. Most endocrine glands are under the control of negative feedback mechanisms.

Negative feedback

Negative feedback mechanisms act like a thermostat in the home. As the temperature rises (deviation from the ideal normal value), the thermostat detects the change and triggers the airconditioning to turn on and cool the house. Once the temperature reaches its thermostat setting (ideal normal value), the air conditioning turns off.

An example of negative feedback is the regulation of the blood calcium level. The parathyroid glands secrete parathyroid hormone, which regulates the blood calcium amount. If calcium decreases, the parathyroid glands sense the decrease and secrete more parathyroid hormone. The parathyroid hormone stimulates calcium release from the bones and increases the calcium uptake into the bloodstream from the collecting tubules in the kidneys. Conversely, if blood calcium increases too much, the parathyroid glands reduce parathyroid hormone production. Both responses are examples of negative feedback because in both cases the effects are negative (opposite) to the stimulus.

Positive feedback

Positive feedback mechanisms control self-perpetuating events that can be out of control and do not require continuous adjustment. In positive feedback mechanisms, the original stimulus is promoted rather than negated. Positive feedback increases the deviation from an ideal normal value. Unlike negative feedback that maintains hormone levels within narrow ranges, positive feedback is rarely used to maintain homeostatic functions.
An example of positive feedback can be found in childbirth.

The hormone oxytocin stimulates and enhances labor contractions. As the baby moves toward the vagina (birth canal), pressure receptors within the cervix (muscular outlet of uterus) send messages to the brain to produce oxytocin. Oxytocin travels to the uterus through the bloodstream, stimulating the muscles in the uterine wall to contract stronger (increase of ideal normal value). The contractions intensify and increase until the baby is outside the birth canal. When the stimulus to the pressure receptors ends, oxytocin production stops and labor contractions cease

(b) Eco-system
(c) Troposphere
(d) Carbon cycle
(e) Meningitis

4. What is excretion? Name the excretory organs in man. Describe the structure and function of human kidney for the excretion of urine. (1,2,7)

5. Describe the Principle, construction and working of a telephone? (2,4,4)

6. What are latitudes and longitudes? How can the central line of latitude be used to find the location of a place? (4,6)

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.

8. Define the following terms: (1 each)

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

9. Discuss the structure of a typical animal cell in detail. 10)

Kindly have a look at the following link
http://www.cellsalive.com/cells/3dcell.htm

10. Fill in the blanks with appropriate words: (1 each)

(a) Monomer of proteins are **Amino Acids**

(b) Water transport in plants occurs within **Xylem.**

(c) Underground horizontal stems are called **Rhizomes.**

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

(e) Plant **hormones** control plant responses to environmental stimuli. (f)

Mitochondria are often called the power houses of the cell.

(g) The rate at which a current changes direction is called its **Drift velocity**. (Please Confirm) (h)

The energy of electrons at the negative terminal of a battery is called

(i) **Mercury** is the smallest planet of the solar system.

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

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

What is plastic?

Plastic is a common name for Polymers: materials made of long strings of carbon and other elements. Each unit in a string is called a monomer, and is a chemical usually derived from oil.

The monomer is made into polymer by chain-linking reactions. This is like making a daisy chain. Instead of flowers, carbon atoms are joined together. The appearance of the daisy chain will be different if you use different colored flowers, and so will polymers.

There are many different types of plastic, depending on the starting monomer selected, the length of polymer chains, and the type of modifying compounds added. Each plastic has been developed for a special purpose.
There are two main groups of plastics:

1. THERMOPLASTICS

soften with heat and harden with cooling.

* Some typical thermoplastics are:
* Acrylic (Perspex)
* Acrylo-nitrile (Nylon)
* Polyethylene (Polythene)
* Polypropylene
* Poly Vinyl Acetate (PVA)
* Poly Vinyl Chloride (PVC)
* Polystyrene and ABS
* PTFE (Teflon)

2. THERMOSETS

are cured or hardened by heat.
Some typical thermosets are:

* Bakelite
* Epoxy
* Melamine
* Polyester
* Polyurethane

Manufacture of Plastics

Plastics are made into shapes in many ways

1. EXTRUSION

Hot molten plastic is squeezed through a nozzle to make long lengths of special shapes like pipes, spouting and wallboard joining strips. It is also used to make large thick sheets of plastic for fabrication.

2. BLOW EXTRUSION (Fig 1)

This is used for making plastic films and bags. While it is still hot, an extruded tube is blown up like a balloon, with compressed air. This stretches the plastic and makes it thin. The balloon is made long enough to allow the plastic to cool. The end of the balloon is pinched together by rollers, to hold the air in and make it flat. The flat tube is then wound on to a big roll. You can see continuous rolls of plastic bags in a fruit shop.

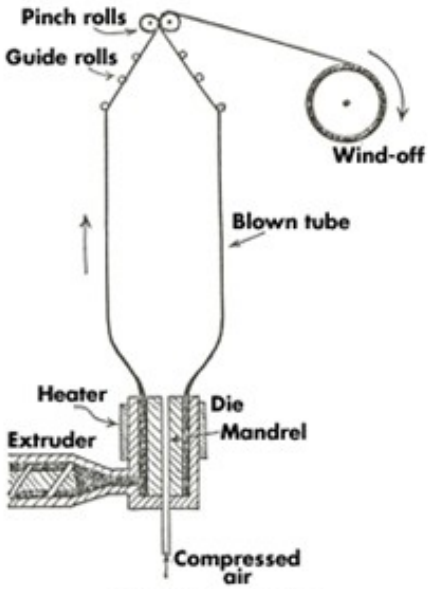


Fig 1. Film Blowing

3. INJECTION MOULDING

Hot molten plastic is squeezed into a mould to make lots of objects all the same. They can be very small like a washer or quite large, like a bowl or a clothes basket. Lots of everyday articles are made this way.

4. BLOW MOULDING (Fig 2)

A little bit of hot soft plastic is squeezed into the end of a mould. Compressed air is used to blow a big bubble inside the plastic. The plastic swells out like a balloon until it fills up the whole mould. Many bottles, toys and money boxes are made this way.

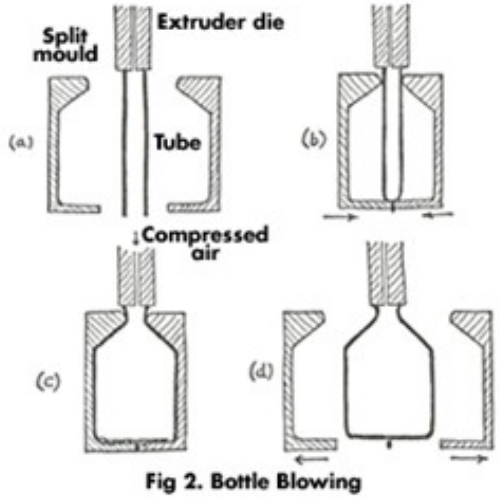


Fig 2. Bottle Blowing

5. ROTATIONAL MOULDING

Plastic powder is scooped into a mould. The mould is rotated over a big gas burner. As the mould gets hot, the plastic melts and sticks to the mould. This method is used for making big hollow things like water tanks and barrels.

6. COMPRESSION MOULDING

This is used for thermoset resins. Dry powder is put in a mould which is squeezed and heated until the plastic is cured. This is used for making ashtrays, cups and plates, and some electrical switches.

7. REACTION INJECTION MOULDING

Two chemicals are mixed together and squirted into a mould. The chemicals react together. This is how they make car bumpers, some disposable cups and plates, and the meat trays you get from supermarkets.

8. VACUUM FORMING (Fig 3)

A sheet of plastic is clamped in a frame and heated until it is stretchy. Then it is sucked into a mould. This is how they make the inside of your refrigerator, bath and handbasin. It is also used to make a lot of packaging for cosmetics, chocolates, biscuits, some yoghurt containers and some disposable cups.

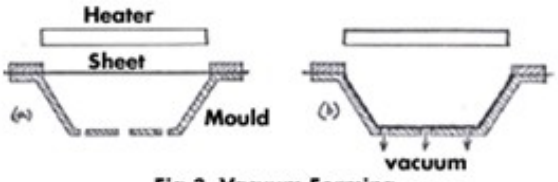


Fig 3. Vacuum Forming

9. FABRICATION

Some thermoplastics are fabricated like sheetmetal. Sheets of plastic are cut to shape. They can be folded by heating a narrow line through the plastic. When it is soft, the sheet will bend along the heated line. Sheets can be joined together by glueing, or by welding. The join is heated with hot air and a thin filler rod is forced into the gap. These fabrication methods are used to make acrylic signs and displays, and industrial tanks and equipment. Our company, Calibre Plastics Ltd, uses fabricating methods to manufactures laboratory fume cupboards and exhaust fans.

Thin flexible plastic sheets are used for making folders, wallets, swimming pool liners, inflatable toys and raincoats. The seams are welded by ultrasonic vibration.

Impact on Environment

The biggest threat to the conventional plastics industry is most likely to be environmental concerns, including the release of toxic pollutants, greenhouse gas, litter, biodegradable and non-biodegrable landfill impact as a result of the production and disposal of petroleum and petroleum-based plastics. Of particular concern has been the recent accumulation of enormous quantities of plastic trash in ocean gyres.

12. Which of the following statements are False and which are True (1 each)

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

(b) Anaphase is the stage of mitosis during which the daughter chromosomes move towards the 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 of 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 gemstones Ruby and sapphires are composed of Aluminum Oxide. **(True)**

(j) In a chemical battery chemical energy ions directly converted into mechanical energy. **(False)**

13. Choose the correct answers. Don't reproduce the questions. (1 each)

(i) Speed of the wind is measured by:

(a) Barometer (b) Hygrometer (c) perimeter **(d) Anemometer** (e) None of these. (ii)

_____ connects the muscle with the bone.

(a) Cartilage (b) Ligament **(c) Tendon** (d) Disc (e) None of these. (iii)

Polio is caused by a:

(a) Bacterial **(b) Virus** (c) Fungus (d) Deficiency of vitamin (e) none of these. (iv)

The coldest planet of the solar system is:

(a) Earth (b) Venus (c) Mars **(d) Pluto** (e) None of these

Up until recently, it would have been Pluto with an estimated surface temperature between -235 and -210 degrees Celsius, but Pluto has now been relegated the status of a Dwarf Planet. So now, Neptune would be the coldest planet.

(v) _____ is a vitamin:

(a) Citric acid (b) Tartaric acid **(c) Ascorbic acid** (d) Acetic acid (d) none of there (vi)

An eggshell is composed of:

(a) Iron (b) Starch (c) Carbon(d) Protein **(e) None of these**

(vii) The most abundant element in the earth's crust is:

(a) Nitrogen(b) Silicon (c) Carbon **(d) Oxygen** (e) None of these

(viii) The main constituent of Biogas is:

(a) Methane (b) Hydrogen (c) Oxygen (d) Carbon dioxide (e) None of these. (ix)

Stalagmites are deposits of :

(a) Calcium oxide (b) Calcium sulphate (c) Calcium hydroxide **(d) Calcium carbonate** (e) Mixture of all salts.

(x) Gigantism is the result of: (Please confirm)

(a) Hypothyroidism (b) Recessive gene **(c) Hyper pituitarism** (d) Vitamin D deficiency (e) None of these.

14. What are the causes of Earthquakes: How have earthquakes helped in deciphering the internal structure of the earth? (4,6)

15. What is the endocrine system? Write the names and function of any eight endocrine glands. (2,8)

Endocrine System

The endocrine system is an integrated system of small organs which involve the release of extracellular signaling molecules known as hormones. The endocrine system is instrumental in regulating metabolism, growth and development, tissue function, and plays a part also in mood. The field of medicine that deals with disorders of endocrine glands is endocrinology, a branch of the wider field of internal medicine.

List of endocrine glands and their hormones

A. Hypothalamus

a. Gonadotropin Releasing Hormone (GnRH)
--Stimulates FSH and LH secretion by pituitary
b. Thyrotropin Releasing Hormone (TRH)
--Stimulates TSH secretion by pituitary
c. Corticotropin Releasing Hormone (CRH)
--Stimulates ACTH secretion by pituitary
d. Prolactin Inhibiting Factor (PIF)
--Inhibits prolactin secretion by pituitary
e. Melanocyte Stimulating Hormone Release Inhibitory Hormone (MIF) --
Inhibits MSH secretion by pituitary
f. Somatostatin (SST)
--Inhibits GH secretion by pituitary
h. Growth Hormone Releasing Hormone (GHRH) --
Stimulates GH secretion by pituitary

B. Posterior Pituitary

a. Oxytocin (OT)
--Stimulates milk letdown; uterine contractions
b. Antidiuretic Hormone (ADH)
i. Also called Vasopressin (AVP)
--Increases renal water absorption; vasoconstriction

C. Anterior Pituitary

a. Follicle Stimulating Hormone (FSH)
i. Also called follitropin
--Female: Increases ovarian follicular growth
and estradiol synthesis
--Male: Initiates spermatogenesis
b. Luteinizing Hormone (LH)
i. Also called lutropin

--Female: Ovulation; Corpus luteum (CL) formation; Ovarian Steroidogenesis
--Male: Testicular androgen synthesis
c. Prolactin (PRL)
--Milk synthesis; Progesterone synthesis in C.L. of some species
d. Thyroid Stimulating Homone (TSH)
--Stimulates Thyroid hormone synthesis and secretion
e. Adrenal Corticotropic Hormone (ACTH)
i. Also called Corticotropin
--Stimulates Adrenal Steroidogenenesis
f. Growth Hormone (GH)
i. Also called somatotropin (ST)
--Stimulates hepatic somatomedin biosynthesis

D. Thyroid

a. Thyroxine (T4)
--Increase growth; differentiation; calorigenesis
b. Triiodothryonine (T3)
--Same as Thyroxine
c. Calcitonin (CT)
--Decrease blood calcium

E. Adrenal Cortex

a. Glucocorticoids
i. Cortisol
ii. Corticosterone
--Stimulate carbohydrate metabolism; sympathetic function
b. Mineralocorticoids
i. Aldosterone
--Increase sodium retention

F. Adrenal Medulla

a. Epinephrine
i. Classically called Adrenalin
--Modulate effects on nerve, muscles, cellular secretions, and metabolism
b. Norepinephrine
i. Classically called Noradrenalin
--Similar to Epinephrine

G. Ovary

a. Estradiol (E2)
--Stimulates female sexual development and behavior
i. Produced by follicle
b. Progesterone (P or P4)
--Stimulate uterine and mammary gland growth; maternal behavior
i. Produced by Corpus Luteum and Follicle
c. Relaxin
--Relaxation of pubic symphysis and dilation of uterine cervix
i. Produced by Corpus Luteum
d. Inhibin and Activin
--Regulate FSH release
i. Produced by follicle

H. Placenta

a. Chorionic Gondadotropin (CG)
--CL progesterone synthesis
b. Placental Lactogen (PL)
--Immunoprotection; fetal growth and development; mammary development
c. Female Sex Steroid Hormones

I. Testis

a. Testosterone (T or T4)
--Male sexual development and behavior
b. Inhibin and Activin
--Regulate FSH secretion by pituitary
c. Mullerian Inhibiting Factor (MIF)
Also MRF, AMH, AMF, MIH etc.
--Mullerian duct regression

J. Pineal

a. Melatonin
--Regulates seasonal breeders

K. Thymus

a. Thymosin and Thymopoetin
--Stimulates proliferation and differentiation of lymphocytes

L. Pancreas

a. Insulin
--Decreases blood glucose; stimulates protein, glycogen, and fat synthesis
b. Glucagon
--Increases blood glucose; stimulates gluconeogenesis, lipolysis, and glycogenolysis
c. Somatostatin (SST)
--Inhibits secretion of other pancreatic islet hormones
d. Pancreatic Polypeptide (PP)
--Modulates secretion of other pancreatic islet hormones

M. Gastrointestinal Tract

a. Gastrin
--Increases HCl secretion by stomach
b. Secretin
--Stimulates pancreatic acinar cell fluid (bicarbonate) secretion
c. Cholecystokinin (CCK)
--Stimulates pancreatic acinar cell enzyme secretion; gall bladder contractions
d. Gastric Inhibitory peptide (GIP)
--Decreases HCl secretion by stomach
--Increases insulin secretion
e. Vasoactive intestinal peptide (VIP)
--Stimulates intestinal secretion of electrolytes; smooth muscle relaxation
f. Glucagon-like peptide-1 (GLP-1)
--Increases insulin secretion
g. Motilin
--Stimulates gastric acid secretion
h. Neurotensin (NT)
--Enteric neruotransmitter
i. Substance P (SP)
--Enteric neruotransmitter
j. Gastrin Releasing peptide (GRP)
--Stimulates Gastrin secretion and acid secretion

N. Parathryroid Gland

a. Parathyroid Hormone (PTH)
--Increase blood calcium
--Decreases blood phosphate
--Activates vitamin D

O. Skin, Liver, Kidney

a. Vitamin D3
--Increases blood Calcium; intestinal and renal calcium absorption

P. Liver

a. Angiotensin II (AII)
--Stimulates vasoconstriction; aldosterone secretion; and thrist

Q. Kidney

a. Erythropoietin (EP)
--Increases erythropoiesis
b. Renin
--Initiates Angiotensin II from liver
c. Vitamin D
--Increases blood Calcium; intestinal and renal calcium absorption

R. Most all Tissues (Eicosinoids)

a. Prostaglandins (PGF2alpha and PGE2)
--Luteolysis, Vasoconstriction, Ovulation (PGF2alpha) --
Vasodilation, Ovulation (PGE2)
b. Prostacyclins (PGI2)
--Decrease Platelet Aggregation
c. Thromboxanes (TXA2)
--Increase Platelet Aggregation
d. Leukotrienes (LTE4)
--Vasoconstriction and permeability

S. Various Tissues (Growth Factors)

a. Epidermal Growth Factor (EGF)
--Stimulates epithelial cell profliferation
b. Fibroblast Growth Factor (FGF)
--Stimulates fibroblast proliferation
c. Nerve Growth Factor (NGF)
--Neurite development
d. Somatomedins or
--Insulin-like Growth Factors (IGF-I, II)
--Cellular growth and development; Initiation of lactation; etc.

T. Heart

a. Atrial Natriuretic factor (ANF)
--Stimulates renal salt and water diuresis

U. Various neural tissues (Misc.)

a. Endorphins and Enkephalins
--Endogenous opiates
--Neuromodulators

V. Adipose tissue

a. Leptin
--Regulates Fat Deposition

Partial Solution
Everyday Science Paper 2001

Time Allowed: Three Hours Maximum Marks: 100
Note: Attempt any ten questions. All questions carry equalmarks.

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) ibn Hayyan
(iv). Jhn al Baitar
(v) Zakariya Al-Razi.

Q. 2. (a) Differentiate clearly between Cyclone, Huriicane and tornado.

(b)

(i) Name two minerals which are exported from Pakistan.

Gypsum and Common salt

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

Topaz, Emerald, Jade, Opel, Saphire, Garnet, Diamond etc.

(iii) What is dead sea.

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

The earth's dust, gas and air particles scatter the sun's light in different directions. Violet light has a peculiar property due to which it gets scattered the most. Red light gets scattered the least.
At sunrise the earth is rotating towards the sun. Similarly, during sunset, the earth is rotating away from the sun. During these times the sunlight has to travel at an angle and thus cover a longer distance through the atmosphere. It encounters more obstacles in its path. Most of the colours, like green and violet, get scattered before the light reaches the earth. Since red is scattered the least, it is this colour that we see as it reaches us.

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

Lunar eclipses can only happen when the Earth is between the Sun and the Moon, and that can

only happen at full Moon. The moon passes completely into the earth's umbral shadow

For details
http://www.abc.net.au/science/features/lunaeclipse2007/

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.

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

(i) Synthetic Polymers
(ii) Laser.
(iii) Pesticides
(iv) Fission and Fusion
(v) Pararnagnetism and Diamagnetism.

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.

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

(i) Pressure cocker
(ii) Television
(iii) Microwave oven
(iv) Radar
(v) Tape recorder.

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 and Measles
(vi) Pig iron and Stainless Steel.
(vii) Alloy and Amalgum
(viii) Isotopes and Isobars
(ix) Artery and Vein
(x) Barrage and Dam.

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.

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. **(False)**
(ii) Cellulose is a natural polymer. **(True)**
(iii) Magnetite is the ore of copper **(False)**
(iv) Malaria is caused by drinking polluted water. **(False)**
(v) The instrument used to measure velocity of wind is Barometer. **(False)** (vi)
Our eye is very sensitive to blue light. **(False)**
(vii) Sound can not travel through vacuum. **(True)**
(viii) Enzymes are biological catalyst. **(True)**
(ix) Leprosy is a disorder of Nervous System. **(False)**
(x) Mica is a non-conductor of electricity. **(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
(vi) Cortisol

(Discussed in paper 2000)

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

A flower is regarded as a modified stem with shortened internodes and bearing, at its nodes, structures that may be highly modified leaves

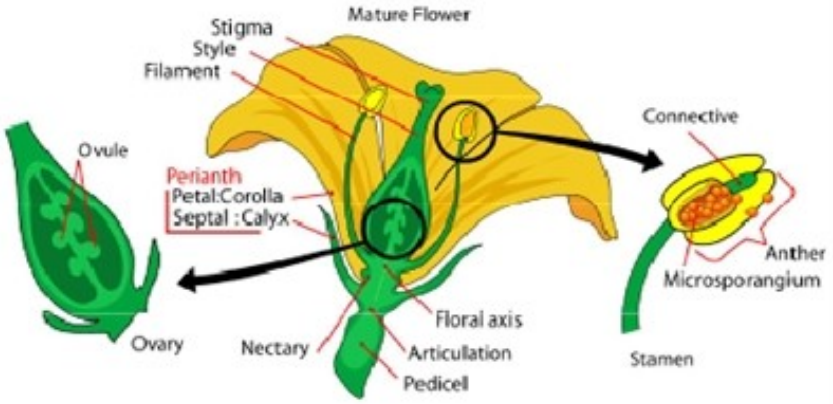
Typical Flower Structure

Calyx:
the outer whorl of sepals; typically these are green, but are petal-like in some species.

Corolla:
the whorl of petals, which are usually thin, soft and colored to attract insects that help the process of pollination.

Androecium:
(from Greek andros oikia: man's house): one or two whorls of stamens, each a filament topped by an anther where pollen is produced. Pollen contains the male gametes.

Gynoecium:
(from Greek gynaikos oikia: woman's house): one or more pistils. The female reproductive organ is the carpel: this contains an ovary with ovules (which contain female gametes). A pistil may consist of a number of carpels merged together, in which case there is only one pistil to each flower, or of a single individual carpel (the flower is then called apocarpous). The sticky tip of the pistil, the stigma, is the receptor of pollen. The supportive stalk, the style becomes the pathway for pollen tubes to grow from pollen grains adhering to the stigma, to the ovules, carrying the reproductive material.**b)**



Explain the Pollination and Fertilization processes.

Pollination
The transfer of pollen from the anthers of a flower to the stigma of the same flower or of another flower. Pollination is a prerequisite for

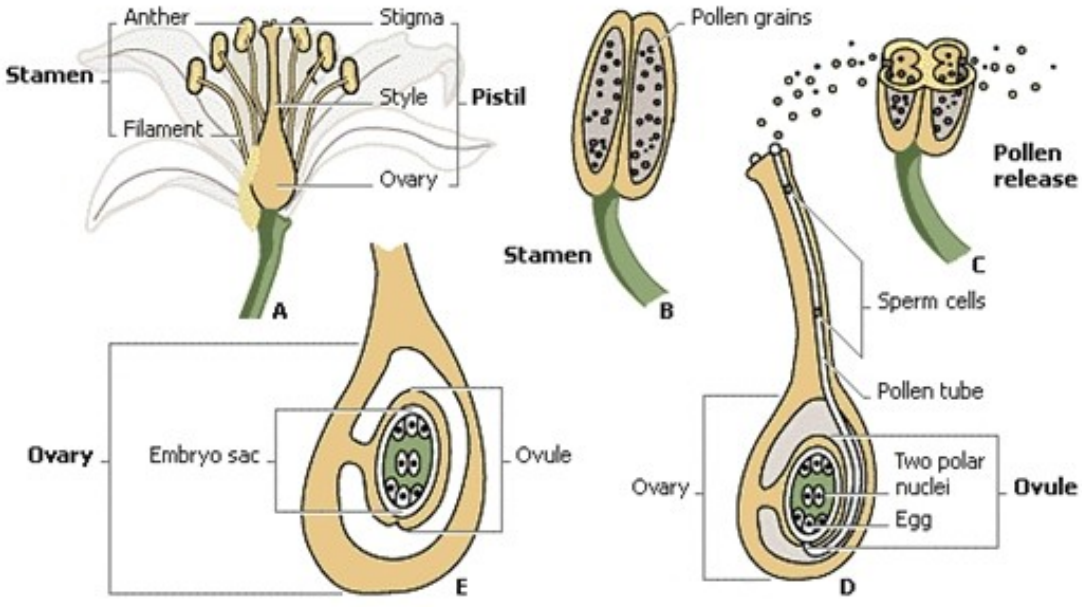
fertilization:
the fusion of nuclei from the pollen grain with nuclei in the ovule. Fertilization allows the flower to develop seeds.

Summary - Pollination and Fertilization

Flowers contain the structures necessary for sexual reproduction. The male component, or stamen, consists of a thin stalk called the filament, capped by the anther. The female component, the pistil, includes the stigma, a sticky surface that catches pollen; the ovary, which contains the ovule and embryo sac with its egg; and the style, a tube that connects the stigma and ovary (A).

Pollen is produced in the anther (B), and is released when mature (C). Each mature pollen grain contains two sperm cells. In self-pollinating plants, the pollen lands on the stigma of the same flower, but in cross-pollinating plants—the majority of plants—the pollen is carried by wind, water, insects, or small animals to another flower. If the pollen attaches to the stigma of a flower from the same species, the pollen produces a pollen tube, which grows down the neck of the style, transporting the sperm to the ovule (D).

Within the embryo sac of the ovule, one sperm cell fertilizes the egg, which develops into a seed. The second sperm cell unites with two cells in the embryo sac called polar nuclei, and this results in the development of the endosperm, the starchy food that feeds the developing seed. The ovary enlarges (E) and becomes a fruit.



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

(i) Ecosystem
(ii) CNG
(iii) PVC
(iv) Hormones
(v) Antibiotics
(vi) Ceramics
(vii) Green House Effect
(viii) Photosynthesis
(ix) Pasteurization
(x) Vaccine.

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

Q.14 Fill in the blanks with appropriate words:

(i) The purpose of computer is **store, retrieve, and process information** (ii)

polio is caused by **Virus**

(iii) The stalagmite is deposit of **Calcium Carbonate** (iv)

Bauxite is one of the ores of **Aluminium**

(v) The chemical name of washing soda is **Sodium Carbonate** (vi)

The main constituent of Sui gas is **Methane**

(vii) **Violet** color has the shortest wave length.

(viii) Glass is an **amorphous** solid.

(ix) Monomers of protein are **Amino Acids**

(x) Ascorbic acid is vitamin **C**

(xi) The solar system has **8** planets

(xii) Aids is caused by **Human Immunodeficiency Virus**

(xiii) In a normal resting person the rate of heart heat is **70 bpm**

(slightly varying values from different sources)

(xiv) The science which deals with heredity is known as **Genetics**

(xv) In Pakistan Copper mineral is found in **Saindak**

(xvi) The most abundant element in the earth crust is **Oxygen**

(xvii) **Manometer** is an apparatus used tbr measuring the pressure of gases.

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

(xix) The living part of a plant cell is composed of a nucleus and **cellulose**

(xx) The fastest revolving planet is **Mercury**

Partial Solution
Every Day Science Paper 2002

Time Allowed: Three Hours Maximum Marks: 100
Note: Attempt any ten questions. All questions carry equal marks.

Q.1 Write short notes on any two of the following : 5 each

a. Acid Rain b. pesticides c. endocrine system

Q.2 Differentiate between any five of the following pairs : (2 each)

a) rotation and revolution of earth

b) monocot and dicot plants

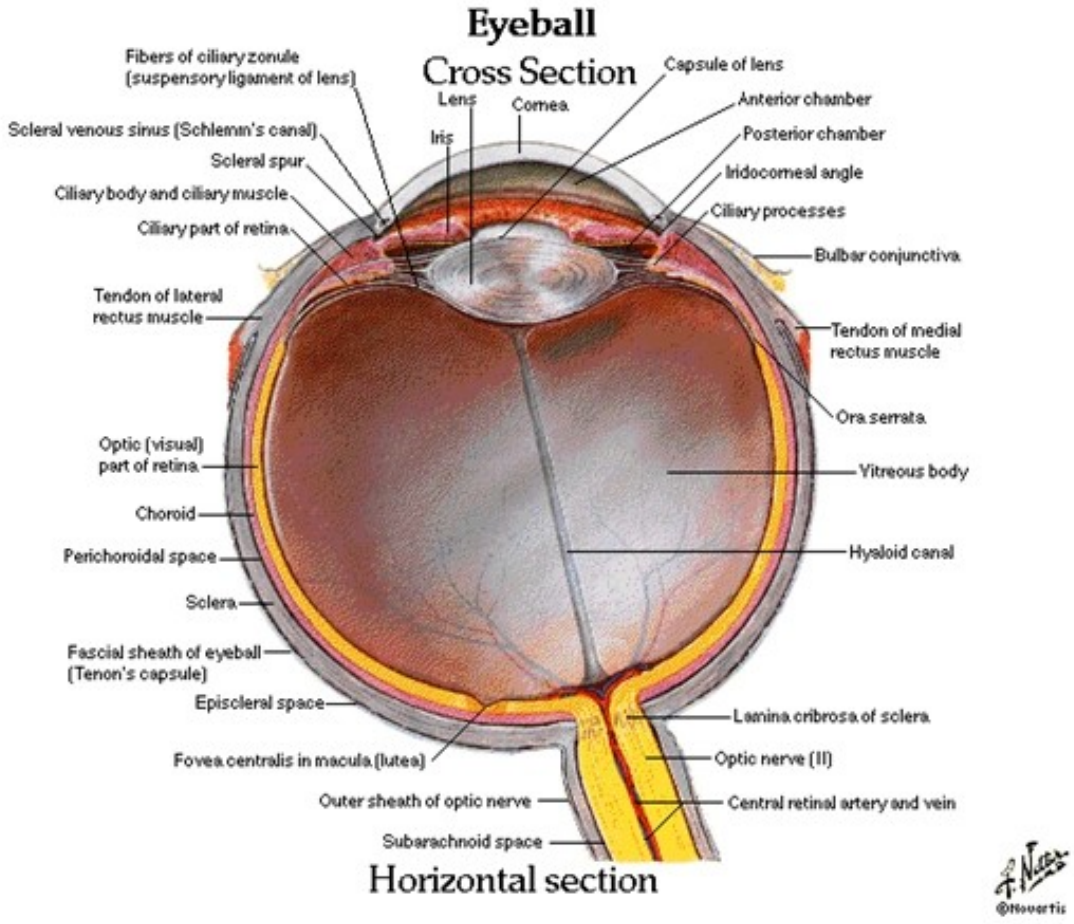
c) pollination and fertilization

d) umbra and penumbra

e) nucleus and nucleolus

f) heavy water and hard water

Q.3 Draw a labeled diagram of human eye, indicating all essential parts, discuss its working (5,5)



Q.4 Fill in the blanks with suitable words : (1 each)

a. Heavenly objects, which resembles stars and emit radio waves are called **Planets** (kindly confirm)

b. **Geysers** are hot springs that erupt hot water and steam from time to time

c. Hot liquid rock beneath the earth's surface is called **Magma**

d. The first simply microscope was invented by **Robert Hook**

e. **Mitochondria** is the power house 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 **Green House Effect**

g. Computer works on the principle introduced by the Muslim scientist **Al Khawarzmi**

h. Coldest planet of the solar system is **Neptune**

i. The rupture of red blood cells is called **Hemolysis/Erythrolysis** *(both are correct)*

j. Muslim Scientist Ali ibn Al Tabari is famous for his work on **Medicine**

Q.5 What is the solar system ? Indicate the position of planet pluto in it. State the characteristics that classify it as : (5,1,4)
a. a planet b. an asteroid

Q.6 which quantities are measured by the following SI units : (1 each)

a. Watt b. Coulomb c. Pascal d. Ohm e. Kelvin f. Joule g. meter h. Farady i. Hertz j. Ampere

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

Minerals

Natural substance belonging to a group of inorganic (often crystalline) compounds which are found in the earth, that which is not animal or vegetable

A mineralis a naturally occurring substance formed through geological processes that has a characteristic chemical composition, a highly ordered atomic structure and specific physical properties

Elements as Parts of Minerals

Oxygen, Silicon, Carbon, Sulphur, Phosphorus, Halogens (Flourine, Chlorine, Bromine, Iodine)

Characteristics to Identify Minerals

Color - this varies depending on the chemicals present and is the least informative in identifying a mineral variety

Luster - what the surface looks like in the light

Specific Gravity - how heavy it feels, heft

Crystal Form - shape of crystal, shape the mineral would take if it had room to grow in a cavity, not massive - some minerals have a number of different crystal shapes

Cleavage - pattern when mineral is broken - in planes or conchoidal

Fracture

Tenacity - toughness, how cohesive the mineral is, if it falls apart

Hardness - what it can scratch & what scratches it

Transparency - The ability to transmit light. Depending on a number of things, rocks & minerals can also transmit light.

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

a. Polymerization b. Ecosystem c. Antibiotics
d. Renewable energy resources e. Gene f. Software

Q.9 what do you understand by the term "Balanced Diet ? What are its essential constituents ? state the function of each constituent (2,3,5)

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 lens 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 (98.6 F) **(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 j. DNA

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

a. Lunar eclipse lasts much longer than solar eclipse

b. Goiter is common in people living in hilly areas

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

d. Detergents are better cleaning agents compared to soap

e. Decomposers are important for life on land and water

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

Q.13 Name (1 each)

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

b. The major fossil fuel impurity **(Sulphur)**

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

d. An ore of Zinc **(Zinc Blende)**

e. Two most abundant elements present in the sun **(Hydrogen & Helium)**

f. The metal atom present in chlorophyll **(Magnesium)**
o
g. The gland responsible for the secretion of the hormone estrogen **(Ovary)**

h. An element used in the doping of silicon for the preparation of a p-type semiconductor **(Boron or Aluminium)** *(both are correct)*

i. A synthetic fibre which is a polyamide **(Nylon)**

j. Major constituent of Biogas **(Methane)**

Q.14 What are fertilizers ? what do you understand by the term NPK fertilizer ? How do fertilizers contribute to water pollution ? (3,1,6)

Q.15 Choose the one alternative the best completes the statement or answer the question (1 each)

1). Glycogen is an example of

a) Carbohydrate b) Peptide c) Lipid d) steroids

2). The cell 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) input/output device b) main memory **c) operating system** d) both a & b

5). The number of natural satellite orbiting around the planet Mars is

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 flowering stalk

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 excep

a) glycogen **b) insulin** c) cortisol d) epinephrine

10. The famous book Al-Qanoon was written by the Muslim scientist

a) Jabir-ibn-Hayan b) Zakriya Al-Razi **c) Abu Ali Sina** d) Abul-Qasim Majreeti

Partial Solution
Every Day Science Paper 2003

Time Allowed: Three Hours Maximum Marks: 100
Note: Attempt any ten questions. All questions carry equal marks.

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

a). Microwave oven :

It is one of the great inventions of the 20th century. Microwave ovens are popular because they cook food quickly. They are also extremely efficient in their use of electricity because a microwave oven heats only the food - nothing else. A microwave oven uses microwaves to heat food. Microwaves are radio waves. In the case of microwave ovens, the commonly used radio wave frequency is roughly 2,500 megahertz (2.5 gigahertz). Radio waves in this frequency range are absorbed by water, fats and sugars. When they are absorbed they are converted directly into atomic motion - heat. Microwaves in this frequency range have another interesting property: they are not absorbed by most plastics, glass or ceramics. Metal reflects microwaves, that's why metal pans do not work well in a microwave oven.

b). Optic fibre :

Optical fiber refers to the medium and the technology associated with the transmission of information as light pulses along a glass or plastic wire or fiber. Optical fiber carries much more information than copper wire. Most telephone company long-distance lines are now of optical fiber.
Transmission on optical fiber wire requires repeaters at distance intervals. The glass fiber requires more protection within an outer cable than copper. For these reasons and because the installation of any new wiring is labor-intensive, few communities yet have optical fiber wires or cables from the phone company's branch office to local customers. A type of fiber known as single mode fiber is used for longer distances; multimode fiber is used for shorter distances.

c). Biotechnology:

The simplest definition of biotechnology is "applied biology" and the application of biological knowledge and techniques to develop products. It may be further defined as the use of living organisms to make a product or run a process. By this definition, the classic techniques used for plant and animal breeding, fermentation and enzyme purification would be considered biotechnology. Some people use the term only to refer to newer tools of genetic science. In this context, biotechnology may be defined as the use of biotechnical methods to modify the genetic materials of living cells so they will produce new substances or perform new functions. Examples include recombinant DNA technology, in which a copy of a piece of DNA containing one or a few genes is transferred between organisms or "recombined" within an organism.

2. Give names of the members of the solar system. Briefly write down main characteristics of : a). Mars b). venus

Mercury - Venus - Earth - Mars - Jupiter - Saturn - Uranus - Nepture - Pluto

Mars : It is the fourth planet in solar system. (Greek: Ares) is the god of War. The planet probably got this name due to its red color; Mars is sometimes referred to as the Red Planet. The name of the month March derives from Mars. The first spacecraft to visit Mars was Mariner 4 in 1965. Though Mars is much smaller than Earth, its surface area is about the same as the land surface area of Earth.

Venus : Venus is the second planet from the sun and the sixth largest. Venus' orbit is the most nearly circular of that of any planet. (Greek: Aphrodite; Babylonian: Ishtar) is the goddess of love and beauty. The planet is so named probably because it is the brigthest of the planets known to the ancients.

Q-3. Name :

a). The instrument used for the measurement of blood pressure : **sphygmomanometer**

b). A mammal, which can fly : **bat**

c). A disease which is more common in men than in women and is hereditary in character : **daibetes millatus**

d). One endangered animal species of Pakistan : **snow leopard**

e). An ore of mercury : **Cinnabar**

f). A cyanobacterium : **Nostoc**

g). A hormone secreted by pancreas : **insulin**

h). The nuclear reaction taking place on the surface of sun : **fusion reaction**

i). The scientist who discovered sulfuric acid : **Jabir bin Hayan**

j). The constituent elements of brass : **Zinc and Copper**

4). What do the following scientific abbreviations stand for :

a). SONAR : **SO**und **NA**vigation and **R**anging
b). SARS : severe acute respiratory syndrome
c). NTP : network time protocol

d). RQ : respiratory quotient
e). PVC : polyvinyl chloride
f). NPN : negative positive negative
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.

Toxic chemicals that are used to destroy pests are known as pesticides. Fungicides (which kill fungi), herbicides (which kill plants), and insecticides (which kill insects) are types of pesticides.

Classification of Pesticides :

Acarcides, Algicides, Bactericides, Bird repellents, Fungicides, Herbicides, Insect attractants, Insect repellents, Insecticides, Nematacides , Mamal repellents, Rodenticides , Virucides and plant growth regulators

Each major group of pesticides (e.g. herbicides or plant growth regulators) is subdivided into chemical or other classes (e.g. chloroacetanilide herbicides or auxins).

Q 6 : Define any five of the following :

Acoustics : The science of sound dealing with the production, effects, and transmission of sound waves through various mediums. Includes the effects of reflection, refraction, diffraction, absorption, and interference

Quartz : It is a hard glossy mineral consisting of silicon dioxide in crystal form; present in most rocks (especially sandstone and granite); yellow sand is quartz with iron oxide impurities. It is a mineral composed of the elements silicon and oxygen (silicon dioxide) that occurs in multiple forms.

Cross Pollination : Mixing the pollen of one flowering plant with another to create a hybrid. It is done by transfer of pollen from one flower to another of a different variety but of same species. Necessary for the fruit development of many plants.

Allele : Any of the alternative forms of a gene that may occur at a given gene locus. One of the variant forms of a gene at a particular locus, or location, on a chromosome. Different alleles produce variation in inherited characteristics such as hair color or blood type.

Optical Illusion : drawing or object that appears to have an effect that it does not really have, such as when a flat painting seems to have three-dimensional depth. When something appears different than it actually is. Example: Trompe de oil murals which "trick the eye" into thinking

they are 3 dimensional, or when a ceiling appears higher than it is because of colors, etc. used.

Ovulation : The release of an egg (or eggs) from the ovary.

Aqua Regia : Aqua regia is a 3:1 mixture of hydrochloric acid and nitric acid. Aqua regia is used to test gold and platinum; it is just about one of the few substances that can dissolve gold and platinum.

Q. 7 : Which physical quantities are measured by the following units :

a) Pascal - Sound Pressure
b) Torr - Pressure
c) Curie - Intensity of radioactivity
d) Angstrom - Unit of length
e) Light year - The distance light travels in a year
f) Dioptre - Lens refractive power
g) Horse power - Unit of Power
h) Radian - Unit of angular measure
i) Candela - Unit of luminous intensity
j) Mole - unit of molecular weight

Q. 8: Explain the structure of Earth and its Atmosphere

Atmosphere of Earth :

Gaseous envelope of the Earth, or any other celestial object. The Earth's atmosphere is made up of nitrogen (78 per cent), oxygen (21 per cent), argon (0.9 per cent), carbon dioxide (0.03 per cent), varying amounts of water vapour, and trace amounts of hydrogen, ozone, methane, carbon monoxide, helium, neon, krypton, and xenon.

The atmosphere is divided into several layers. The lowest one, the troposphere, extends up to about 16 km (10 mi) in tropical regions and to about 9.7 km (6 mi) in temperate latitudes. Most clouds occur in this layer. Above the troposphere is the stratosphere, which has an upper boundary of almost 50 km (30 mi). The layer from 50 to 80 km (30 to 50 mi), called the mesosphere, is characterized by a marked decrease in temperature as the altitude increases. At an altitude of 80 km (50 mi), ultraviolet radiation, X-rays, and showers of electrons from the sun ionize several layers of the atmosphere, causing them to conduct electricity. Because of the relatively high concentration of ions, this layer, extending to an altitude of 640 km (400 mi), is called the ionosphere. The region beyond the ionosphere is called the exosphere; it extends to about 9,600 km (6,000 mi), the outer limit of the atmosphere.

Air pressure is measured by a barometer and is expressed in torrs, which are related to the height of a column of mercury that the air pressure will support. Normal atmospheric pressure at sea level is 760 torrs. At about 5.6 km (3.5 mi), it is 380 torrs; half of all the air in the

atmosphere lies below this level.

Q. 9 : Fill in the blanks :

The conversion of non-diffuisalbe substances into diffusible ones by the action of enzymes in called **Digestion**

Diamond is the purest naturally occurring crystalline form of **Carbon**

Caustic soda is extensively used for making **Surf**

When a person can see nearer objects but not the distant ones he is said to be suffering from **nearsightedness (myopia)**

Marble is **metaphoric** rock

Curie is a unit of **radioactivity**

The brown colour of rust is because of **oxidation**

The movement of food through esophagus is by the muscular action known as **peristalsis**

Granite is a form of **rock**

Cellulose is the main chemical substance in the plant cell wall :

Cell was first discovered by Robert Brown :

Q 10. What are Endocrine Glands ? Name any two . From which of the body are the following secreted :

Group of organs and tissues of the body that release hormones. The endocrine glands and their hormones regulate the growth, development, and function of various tissues and coordinate many of the processes of metabolism.

Pituitary Gland
The pituitary gland has three lobes: anterior, intermediate, and posterior. It is situated at the base of the brain and has been called the “master gland”. The pituitary secretes various hormones that stimulate the function of other endocrine glands; growth hormone; and endorphins, peptides that reduce sensitivity to pain. The pituitary also stores vasopressin, an antidiuretic hormone secreted by the hypothalamus.

Adrenal Glands
The adrenal glands, located on top of each kidney, consist of a medulla (inner part) and a cortex

(outer part). The adrenal medulla produces adrenaline and noradrenaline, which affect a number of functions that help the body deal with acute emergencies. The adrenal cortex secretes a group of steroid hormones, including cortisone and hydrocortisone, that are essential to the maintenance of life and adaptation to stress.

Insulin: Pancreas
Thyroxin: Thyroid
Adrenaline: Adrenal medulla
Estrogen: Ovaries
Testosterone: Testes
Cortisol: Adrenal cortex

Q. 11 Chose the best choice in the following statements :

1. Enzymes are organic catalysts made up of :

a. Carbohydrate **b. Proteins** c. Fats d. Nucleic Acid

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 computer is :
a. 133 Mhz b. 233 Mhz **c. 333 Mhz** d. 433 Mhz

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**

6. The Unit that coordinates different devices of Computer system is :
a. ALU b. Register **c. Control Unit** d. Logical Instruction

7. Seed is technically :
a. Ripened Ovule b. Carpel c. Ripened Ovary d. Fully mature pollen grain

8. ADH is a harmone secreted by :
a. Anterior pituitary **b. posterior pituitary** c. Adrenal Cortex d. Adrenal Medulla

9. The number of natural satellites orbiting around the Mars is :
a. 1 **b. 2** c. 5 d. 14

10. Permian Period belongs to :
a. Palaeozoic era b. Mesozoic era c. Coenozoic era d. Precambrian era

Q . 12 Differentiate between the following pairs :

a). Lava and Magma

Molten rock, when it is still beneath the earth's surface is Magma, and "lava" after it has erupted.

b). Ultraviolet and infrared

Ultraviolet :

Electromagnetic radiation with wavelengths between 4,000 nm, the wavelength of violet light, and 150 nm, the length of X-rays. (The nanometre, nm, equals a millionth of a millimetre).
Natural ultraviolet radiation comes from the Sun, and artificial ultraviolet radiation comes from electric-arc lamps (Electric Arc).

Infrared :

Electromagnetic radiation in the portion of the spectrum just beyond the red portion of visible light. The wavelengths of infrared radiation are shorter than radio wavelengths and longer than those of light.

c). Fault and Fold

Fault :

The line of fracture along which one section of the Earth’s crust displace relative to another section, as a result of vertical or horizontal movement of earth.

Fold :

In geology, bends in layered, or stratified rocks. Most stratified rocks were originally sediments laid down as horizontal or near-horizontal layers, or beds. However, not only have they solidifed, but they are usually inclined, or dip, in one direction or another, and they have been tilted.

d). Caustic Soda and Caustic Potash

Caustic Soda:

A common name for sodium hydroxide strongly alkaline caustic used in manufacturing soap and paper and aluminum and various sodium compounds

Caustic Potash

It is potassium hydroxide, often used in agriculture and industry

e). S.E.M. and T.E.M.

S.E.M. :

Scanning electronic microscope an electronic microscope that produces a three-rdimensional image, allowing the surface stucture of a specimen to be examined.

T.E.M.:

Transmission electronic microscope.

Q.13 which of the following statements are true and which are false

a) Right kidney in man is slightly lower in position than the left kidney : **True**

b) Light is not visible : **False**

c) Steel is more elastic than rubber : **True**

d) Pitch of man's voice is greater than that of woman : **False**

e) Diastolic blood pressure is greater than systolic blood pressure : **False**

f) Base metal can be converted into gold by heating : **False**

g) Guava contains more vitamin C than orange : **False**

h) A light year is a unit of time : **False**

i) Mercury is heavier than lead ; **False**

j) Movement of tectonic plates may cause eruption of a volcano : **True**

Q.14 Give scientific reason of the following :

a) Colour blindness is more common in men than in women

Women have the sex chromosomes XX, while men have the chromosomes XY. The gene for normal colour vision is found on the X-chromosome. If a woman has one X-chromosome with the gene and one without it, she will not be colour blind. On the other hand, a man with an X-chromosome that is missing the gene has no 'backup'. He will definitely be colour blind. Colour

blind women have both X-chromosomes missing the colour vision gene. This is less probable mathematically than having just one X-chromosome missing the gene.

b) Light coloured clothes are generally worn in summer

c) A person is hurt more when he falls on hard ground than on soft

Force of friction is greater on a hard ground as compared to a soft ground. This force of friction becomes the cause of person being hurt and as it is greater on a hard ground hence the person falling on a hard ground is hurt more.

d) Deforestation causes more floods

Trees and Forests act as natural barriers in the way of flowing water. When these trees are cut the natural barriers ultimately vanish and more floods are caused

e) The man-hole covers are generally round

Answered in 2009 paper (will be updated)

Partial Solution
Every Day Science Paper 2004

Time Allowed: Three Hours Maximum Marks: 100
Note: Attempt any ten questions. All questions carry equal marks.

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

a. Superconductivity

The pairing of electrons in certain materials when cooled below a critical temperature, causing the material to lose all resistance to electricity flow. Superconductors can carry electric current without any energy losses.
About one third of all metals loose all electrical resistance at temperatures below a specific critical temperature. Many elemental metals are superconductors.

Some critical temperatures are: lead Tc = 7.2 K, tin Tc = 3.7 K, niobium Tc = 9.2 K, aluminum Tc = 1.2 K, mercury Tc = 4.2 K, and vanadium Tc = 5.3 K.

Superconducting wires can carry currents with zero losses up to very high current densities. Above a critical current density Jc, superconductivity is supressed. A typical critical current density is 106 A/cm2. Superconductivity is also supressed by strong magnetic fields.

b. Night Vision Technology

Night vision works in the basis of the following two technologies

- **Image enhancement** - This works by collecting the tiny amounts of light, including the lower portion of the infrared light spectrum, that are present but may be imperceptible to our eyes, and amplifying it to the point that we can easily observe the image.
- **Thermal imaging** - This technology operates by capturing the upper portion of the infrared light spectrum, which is emitted as heat by objects instead of simply reflected as light. Hotter objects, such as warm bodies, emit more of this light than cooler objects like trees or buildings.

For details see
http://electronics.howstuffworks.com...ightvision.htm

c. Seismograph

A measuring instrument for detecting and measuring the intensity and direction and duration of movements of the ground (as an earthquake). It senses and records the vibrations that radiate out from the earthquake focus. It is a machine for measuring the intensity of

earthquakes by recording the seismic waves that they generate.

2. Briefly write down characteristics of : (5 each)

a. Mercury

The closest planet to the Sun. Mercury is the smallest of the the **terrestrial planets**. It is somewhat similar in appearance to Earth's only natural satellite, the Moon, in that it is heavily cratered. It has a substantial core of ferrous metals which is thought to account for seventy per cent of the mass of the planet. This core is a very large region as well, accounting for three quarters of the volume of the planet. Mercury does not have an atmosphere, however, since it is too small to possess the gravity necessary to hold gases to its surface. Mercury has no natural satellites.

b. Pluto

Pluto , also designated 134340 Pluto, is the second-largest known dwarf planet in the Solar System (after Eris) and the tenth-largest body observed directly orbiting the Sun. Originally classified as a planet, Pluto is now recognised as the largest member of a distinct region called the Kuiper belt. Like other members of the belt, it is composed primarily of rock and ice and is relatively small; approximately a fifth the mass of the Earth's Moon and a third its volume. It has an eccentric orbit that takes it from 30 to 49 AU (4.4-7.4 billion km) from the Sun, and is highly inclined with respect to the planets. As a result, Pluto occasionally comes closer to the Sun than the planet Neptune.

3. Name :

a. The desert mammal which does not drink water **:Knagaroo Rat/Addax**

b. The mixture which can dissolve platinium : **Aqua regia**

c. The constituent elements of Bronze **: Tin and Copper**

d. The vitamin whose deficiency causes a disease called beri beri : **Thiamine(B1)**

e. The electrical device which transform voltage : **transformer**

f. A nuclear reaction in which two or more than two lighter nuclear are fused together to form a relatively heavier one : **nuclear fusion**

g. The purest naturally occurring crystalline form of carbon : **diamond**

h. The hormone secreted by adrenal cortex : **aldosterone**

i. The three colours combination which produces the sensation of white light : **Red green and blue**

j. The defect of vision because of which a person cannot see distant objects clearly : **Myopia or Short sightedness**

4. What are fertilizers ? what do you understand by the term NPK fertilizer ? How do fertilization contribute to the pollution ?

5. Write briefly about any five of the following

a. Nuclear radiation

Three are atomic nuclei of some elements that continuously emit some ultraviolet waves called radiation. When the process of radiation is stimulated through various nuclear processes it is called nuclear radiation. The important nuclear radiation, from a weapon standpoint, are alpha and beta particles, gamma rays and neutrons. All nuclear radiation is ionizing radiation, but the reverse is not true; X-rays for example, are included among ionizing radiation, but they are not nuclear radiation since they do not originate from atomic nuclei.

b. Theodolite

An instrument used in surveying to measure horizontal and vertical angles with a small telescope that can move in the horizontal and vertical planes.
It is a key tool in surveying and engineering work, but theodolites have been adapted for other specialized purposes in field like meteorology and rocket launch technology.

c. Dialysis

In medicine, dialysis is primarily used to provide an artificial replacement for lost kidney function (renal replacement therapy) due to renal failure. Dialysis may be used for very sick patients who have suddenly but temporarily, lost their kidney function (acute renal failure) or for quite stable patients who have permanently lost their kidney function (end stage renal failure).

When healthy, the kidneys maintain the body's internal equilibrium of water and minerals (sodium, potassium, chloride, calcium, phosphorus, magnesium, sulfate) and the kidneys remove from the blood the daily metabolic load of fixed hydrogen ions. The kidneys also function as a part of the endocrine system producing erythropoietin and 1,25-dihydroxycholecalciferol (calcitriol).

Dialysis treatments imperfectly replace some of these functions through the diffusion (waste removal) and convection (fluid removal). Dialysis is an imperfect treatment to replace kidney

function because it does not correct the endocrine functions of the kidney.

d. Enrichment of Uranium

Uranium is a radioactive element that occurs naturally in the earth's surface. Uranium is used as a fuel for nuclear reactors. Uranium-bearing ores are mined, and the uranium is processed to make reactor fuel.
In nature, uranium atoms exist in several forms called isotopes - primarily uranium-238, or U-238, and uranium-235, or U-235. In a typical sample of natural uranium, most of the mass (99.3%) would consist of atoms of U-238, and a very small portion of the total mass (0.7%) would consist of atoms of U-235.

To enrich the uranium, a process called gaseous diffusion was developed by the United States in the 1940s. The gaseous diffusion process creates two products: enriched uranium hexafluoride, and depleted uranium hexafluoride (depleted UF6).

Enriched uranium is used for the defense needs and in making fuel for commercial light water nuclear power reactors. Depleted UF6 has had only limited uses, and since gaseous diffusion was initiated in the 1940s, large quantities of depleted UF6 has accumulated at the gaseous diffusion plants where it was created.

e. Richter Scale

A scale for measuring the magnitude of an earthquake devised by the American seismologist Charles Richter. The device measures the tremors originates during the earth quake and shows its intensity on scale which is from 1 to 10, ten being the highest while one is the lowest of scales in terms of intensity of earth quake.

f. Aqua regia

Aqua regia is a 3:1 mixture of hydrochloric acid and nitric acid. Aqua regia is used to test gold and platinum; it is just about one of the few substances that can dissolve gold and platinum.

g. Iodized salt

Iodine is a natural element required by the human body for proper physical and mental development. It is essential to the production of hormones that affect many parts of the body, particularly muscles, the heart, liver, kidneys and the brain. While most people receive sufficient amounts of iodine from their daily diets, but number of people cannot get it as their soil lacks iodine and because they lack access to foods which contain iodine.
Physical manifestations of iodine deficiency (IDD) include mental retardation, coordination abnormalities, deaf-mutism, spastic diplegia (spastic paralysis of the lower limbs) and dwarfism. During childhood, mild IDD can result in permanent intellectual impairment, with the intelligence quotient lowered by 10-15 points

To overcome the deficiency, Salt has become the most accepted food for iodine fortification because it is one of the few commodities that is almost universally consumed by all sections of a community, and at approximately the same level throughout the year, irrespective of economic level.

6. Which physical quantities are measured by the following units ?

a. Rutherford : Atomic Spectrum
b. Torr: Atmospheric pressure
c. Fermi : metric unit of length for measuring nuclear distance
d. Sved berg unit: sedimentation rate
e. Diopter: refractive power of a lens
f. Mho : conductance
g. Henry: inductance
h. Maxwell: magnetic flux
i. Becquerel: radioactivity
j. Kilo watt hour: Energy

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 ?

8. Which are the following statements true and which are false ?

a. a six feet tall lady can see her full image in a three feet Plane Mirror: **(True)**

b. Vanadium, a steel gray corrosion resistant metal occur naturally in oxide state :**(False)**

c. Fibre optics cable carries data in the form of light: **(True)**

d. Blue flame is hotter than red flame :**(True)**

e. The falling of yellow leaves during autumn is the seasonal time for plants to get rid of accumulated wastes : **(True)**

f. Friction is necessary evil: **(True)**

g. There are 9.5 x 10^15 m in one light year **(True)**

h. The velocity of a moving object is least where the pressure is greatest **(True)**

i. Heat reaches earth from the sun by means of convection : **(False)**

j. Meningitis is the inflammation of liver : **(False)**

9. Differentiate between the following pairs

a. periscope & pyrometer

periscope is an optical instrument
pyrometer is a meter used to measure high temperature

b. cell & battery

Cell is a small unit/device that delivers an electric current as the result of a chemical reaction
Battery is a device that produces electricity having several cells arranged in parallel or series

c. perimeter & altimeter

perimeter is the outer boundary of a figure or area; total length of the outer boundary

altimeter is an instrument for determining altitude attained, especially a barometric or radar device fitted in an aircraft.

d. pelage and plumage

pelage is growth of hair/fur/wool covering the skin of animals while
plumage are feathers covering the body of birds

e. smog and smoke

Smog is formed by the interaction of pollutants present in the air in presence of sun light (photochemical smog), it usually restricts visibility and is hazardous to health

Smoke are the thin fine particles usually result from the combustion

10. Fill in the blanks

a. the largest planet of solar system is **Jupiter**

b. the temperature of the dead human body on Celsius scale is **according to the temperature around the body**

c. for a large span of a long jump, two things are taken into account viz (i) angle with which one jumps and (ii) **angle of projection**

d. the number of the spinal nerves in the man is **31** pairs

e. a primary cell can **not** be charged again

f. Halos around the moon are formed because of the phenomenon of **dispersion of light**

g. Scattering of light **determines** the duration of the day

h. Muscle stiffness is caused by a disease called **Tatnus**

i. Oil rises in a wick of oil lamp on account of a property of matter called **Capillary action**

j. Muslim scientist Ali al Tabari is famous for his work on **medical sciences**

11. Give scientific reason of the following

1. rain water is more fertile than water from tube well

after falling, the rain drops start moving on slope side, during this movements, the soluble salts and minerals solves from top soil in the flowing water, which increases its fertility, while the rain drops which percolates into deeper regions of soil are note able to absorb more salts and minerals so is less fertile as compared to rain water in streams

2. the man-hole covers are generally round

Manhole covers are round so that is doesn't get dropped accidentally into the manhole. The round shape requires less space than a square and makes handling easier. Once removed, the cover can be transported by rolling.

3. clothes of a moving dancer bulge

due to movement of dancer the clothes got electric charge, which on fast movement collides with the opposite charge so the clothe bulge inside out

4. peoples are advised not to stand near a fast moving train

people are advised not to stand near a fast moving train as the train in tremendous speed cuts the pressure of air which can disbalance the objects after passing of train present near the railway line

5. the image of a tree looks inverted on the bank of a lake

This is due to the law of reflection according to which image is formed far and inverted

12. why are the scientists worried about the increase of carbon dioxide gas in the atmposphere ? is there any possible benefit for the mankind in case of global warming ?

13. what do the following scientific abbreviations stand for ?

a. STP standard temperature and pressure/ Shielded Twisted Pair
b. ATP Adenosine Tri-Phosphate
c. PNP proton - neutron - proton
[Positive-Negative-Positive (transistor)]
d. LAN local area network
e. KWh kilo watt hour
f. BTU British Thermal Unit
g. LDL Low-density lipoprotein
[commonly referred to as bad cholesterol]
h. ROM Read only memory
i. MAF million acre feet
j. SONAR Sound Navigation and Ranging

14. Match the column A and B but write the answers serial wise in column C

S.No... Column A... .. Column B... ..... . Column C
A ... ...Frank whittle ... ..Fission ... .Jet Engine
B ……..Addison… . Electricity..... Electricity
C ……..Hahn … ..Genetics ... . .Fission
D ... .Mendel … .Lightening Conductor... ....Genetics
E …..Benjamin Franklin …../.Steam Engine... ..... Lightning Conductor
F …..Bardeen & Brattin …..Uncertaininty principle … ....Fusion
G … …Heisenberg … .Jet engine ....Uncertainity Principle
H ... .Fermi ... .Cydotron .....Length
I ..... .Lawrence ... ...Electro magnetic waves..... .. Cyclotron
J ... ..Maxwell Hertz... ..Fusion ... .Electro Magnetic Waves
H... .. .James Watt ... ..Length... .....Steam Engine

15. Choose the best choice in the following statements

1. 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

2. the most abundant element in the human body is :
a. Carbon b. Hydrogen **c. Oxygen** d. Nitrogen

3. ammonium nitrate is not used for :
a. Rice crop b. wheat crop c. sugarcane crop d. cotton crop

4. sea divers use a mixture of gases for breathing during diving. The mixture is :
a. 80% He & 20%O_2 b. 80% N_2 & 20 O_2 c. 20%O_2 & 40% N_2 40% CO_2 d. 50% He & 50% O_2

5. Which one of the following is a water soluble vitamin
a. Niacin **b. Ascorbic acid** c. trypsin d. riboflavin

6. Which of the following enzymes bring about hydrolysis of fats ?
a. urease b. zymase c. maltase **d. lipase**

7. the solution of which acid is used for seasoning of food :
a. formic acid **b. acetic acid** c. benzoic acid d. botanic acid

8. influenza is caused by :
a. fungi b. bacteria **c. virus** d. protoza

9. the blood glucose level is raised by the following except :
a. carbohydrates b. cholesterol **c. insulin** d. epinephrine

10. the energy possessed by water in a dam is :
a. electrical energy b. kinetic energy **c. potential energy** d. mechanical energy

Every Day Science Paper - 2005
Partial Solution

1. Write short notes on any TWO of the following: (5 each) (a)

Communication Satellite:

A communications satellite is an artificial satellite stationed in space for the purposes of telecommunications. Modern communications satellites use geosynchronous orbits, Molniya orbits or low Earth orbits. For fixed services, communications satellites provide a technology complementary to that of fiber optic submarine communication cables. For mobile applications, such as communications to ships and planes, for which application of other technologies, such as cable, are impractical or impossible.

(b) Geo-thermal Energy:

The name "geothermal" comes from two Greek words: "geo" means "Earth" and "thermal" means "heat". Geothermal Energy is energy from heat inside the Earth.The centre of the Earth is around 6000 degrees Celsius - hot enough to melt rock. Even a few kilometers down, the temperature can be over 250 degrees Celsius. In general, the temperature rises one degree Celsius for every 36 meters you go down. In volcanic areas, molten rock can be very close to the surface. Geothermal energy has been used for thousands of years in some countries for cooking and heating.

(c) Ultrasonic:

Ultrasound is sound with a frequency greater than the upper limit of human hearing, approximately 20 kilohertz. Some animals, such as dogs, dolphins, and bats, have an upper limit that is greater than that of the human ear and thus can hear ultrasound.

Ultrasound has industrial and medical applications. Medical Sonography (also called ultrasonography) can visualise muscle and soft tissue, making them useful for scanning the organs, and obstetric sonography is commonly used during pregnancy. Typical diagnostic ultrasound scanners operate in the frequency range of 2 to 13 megahertz. More powerful ultrasound sources may be used to generate local heating in biological tissue, with applications in physical therapy and cancer treatment. Focused ultrasound sources may be used to break up kidney stones or for cataract treatment by phacoemulsification.

2. Write short notes on the life and work of the following: (5 each) (a)

Al-Biruni (b) Ibn Al - Haitham

3. Name: (1 each)

(a) The alloy which consists of copper and tin.
Bronze

(b) The device used to measure radioactivity.
Geiger counter

(c) The organ in (the human body which is responsible for the digestion of protein only
Stomach

(d) The instrument used to measure very high temperature.
Pyrometer

(e) The scientist who designed the first internal combustion engine used to burn low grade fuel.
Francois Isaac de Rivaz

(f)The scientist who asserted the earth to be a huge magnet.
William Gilbert

(g) The metal known as quick silver.
Mercury

(h) The device which converts the chemical energy into electrical energy.
Battery

(i) The first person to orbit the earth in space.
Yuri Gagarin

(j) The scientist who discovered water.
Antoine Lavoisier

4-Write briefly about any FIVE of the following: (2each) (a)

Shock Waves

In fluid dynamics, a shock wave is a nonlinear or discontinuous pressure wave. It can also be when the actual molecular or particle speed is moving faster than the wave propagation speed

(space shuttle through air). They can and do transport and transmit tremendous amounts of energy (hundreds of Megawatts per square meter for shocks generated by nuclear explosions).

(b) Sound Barrier

In aerodynamics, the sound barrier is the apparent physical boundary stopping large objects from becoming supersonic. The term came into use during World War II when a number of aircraft started to encounter the effects of compressibility, a grab-bag of unrelated aerodynamic effects, and fell out of use in the 1950s when aircraft started to routinely "break" the sound barrier.

(c) Solar Cell

A solar cell, or photovoltaic cell, is a semiconductor device consisting of a large-area p-n junction diode, which, in the presence of sunlight is capable of generating usable electrical energy. This conversion is called the photovoltaic effect. The field of research related to solar cells is known as photovoltaic.

(d) Super Fluid

Super fluidity is a phase of matter characterized by the complete absence of viscosity. Thus super fluids, placed in a closed loop, can flow endlessly without friction. Super fluidity was discovered by Pyotr Leonidovich Kapitsa, John F. Allen, and Don Misener in 1937. The study of super fluidity is called quantum hydrodynamics.

(e) Tsunami

Tsunami is a natural phenomenon consisting of a series of waves generated when water in a lake or the sea is rapidly displaced on a massive scale. Earthquakes, landslides, volcanic eruptions and large meteorite impacts all have the potential to generate a tsunami. The effects of a tsunami can range from unnoticeable to devastating.

(f) Photovoltaic Cell
Same As Solar Cell.

(g) Hygrometer

Hygrometers are instruments used for measuring humidity. The simplest form of a hygrometer consists of two thermometers, one of which has its bulb constantly kept wet. Evaporation from the bulb lowers the temperature so that this thermometer usually shows a lower temperature.

5. Which physical quantities are measured by the following units? (1 each)

(a) Coulomb

Unit of electrical charge

(b) Weber
Unit of magnetic flux

(c) Tesla
Unit of magnetic flux density

(d) Siemen
Unit of conductance

(e) Rutherford
Unit of rate of decay of radioactive material

(f) Faraday
Unit of electric charge

(g) Angstrom
Unit of length, used especially to specify radiation wavelengths

(h) Parsec
Unit of astronomical length

(i) Degree
Unit of measurement of an angle

(j) Steradian
Unit of solid angle measurement

6. How do our domestic and industrial activities pollute water? Explain with reference to two important industries of Pakistan. (5,5)

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.
True

(j) Nitrogen is the most occurring element in the human body.
False

8. Differentiate between the following pairs. (2 each) (a)

Radiotherapy & Chemotherapy

Radiotherapy:

Radiation therapy (or radiotherapy) is the medical use of ionizing radiation as part of cancer treatment to control malignant cells. Radiotherapy may be used for curative or adjuvant cancer treatment. It is often used as a palliative treatment, where cure is not possible and the aim is for local disease control or symptomatic relief.

Chemotherapy:

Chemotherapy is the use of chemical substances to treat disease. In its modern-day use, it refers almost exclusively to cytostatic drugs used to treat cancer.
In its non-oncological use, the term may also refer to antibiotics (antibacterial chemotherapy).

(b) Penumbra & Umbra

Penumbra:

The penumbra (Latin for mid-shadow) is the portion of a shadow that results from the source of illumination being only partially blocked. Penumbras only occur when the source of light is not

a point-source. As the sun is a visible disc, solar shadows have penumbras. The penumbra part of a shadow is contrasted with the umbra part of the shadow in which the light source is completely blocked.

Umbra:

The umbra (Latin for shadow) is the darkest part of a shadow. From within the umbra, the source of light is completely blocked by the object causing the shadow. This contrasts with the penumbra where the light source is only partially blocked and there is only a partial shadow. The umbra is also the comparatively dark central region of a sunspot.

(c) Springtides & Neaptides

Neap Tides

When the moon is at first quarter or last quarter, it's located at right angles to the sun. Then the gravity of the sun and moon pull at cross-purposes, and the range between high and low tides is at its least. These are *neap tides*, and at such times the difference between high and low tides might be only inches a day.

Spring tides

But whenever there's a full moon or a new moon, the Earth, sun and moon make a straight line - more or less - in space. Then the sun and moon's gravity combine to create extremely high and low tides, known as *spring tides*.

(d) Vertebrates &. Invertebrates

Vertebrates:

Living Beings which do have spinal columns or backbone are said to be vertebrates. The internal skeleton which defines vertebrates consists of cartilage or bone, or in some cases both. The skeleton provides support to the organism during the period of growth. For this reason vertebrates can achieve larger sizes than invertebrates.

Invertebrate:

Invertebrate is a term to describe any animal without a spinal column. It therefore includes all animals except vertebrates.

(e) Fluorescent light & Neon signs

Florescent Light:

The common fluorescent tube relies on fluorescence. Inside the glass tube is a partial vacuum and a small amount of mercury. An electric discharge in the tube causes the mercury atoms to emit light. The emitted light is in the ultraviolet range and is invisible, and also harmful to living organisms, so the tube is lined with a coating of a fluorescent material, called the phosphor, which absorbs the UV and re-emits visible light.

Neon Signs:

Neon signs are produced by the craft of bending glass tubing into shapes. A worker skilled in this craft is known as a glass bender, neon or tube bender.
The neon sign is an evolution of the earlier Geissler tube (also called a Crookes tube), which is a glass tube for demonstrating the principles of electrical discharge.

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 **mammals.**

(e) Defect of eye due to which nearly located objects arc not clearly visible is called
Farsightedness also called Hypermetropia

(f) About **65%** 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 **Chromite.**

(i) **Nitric** acid was discovered by Jabbar bin Hayyan.(HCL was also discovered by him) (j)

The measurement of rainfall is made by an instrument known as **rain gauge**.

10. What are the main reasons of water - logging in Pakistan? How does a tube-well reclaim a water logged soil? (5,5)

11 . Give scientific reason of the following: (2 each)

(1) Pole star is always seen in the north.

Because the pole star, which we have in the south, is too faint that it cannot be seen from the naked eye.

or

Because the earths motion is from east to west and not from south to north, around its own axis.

(2) We never see birds urinating.

They don't have urethra in their body, by which normally mammals urinate.

(3) Pasteurized milk has more nourishment than the ordinary boiled milk.

Because its normally refrigerated, covered and protected. It is heated for a very short time, which not only kills the microbes but also prevents the delicate proteins and vitamins to loose.

(4) Bees die when they sting human beings.

Their stingers are actually ovipositors, tubular structures extending from the abdomen that sometimes contain eggs. When the barbed stinger is left inside the victim, the honeybee mortally tears her abdomen in the process. They leave their stingers in the wound with a tiny venom sac attached. Fortunately, only about one out of a hundred people are allergic to bee stings, but allergic reactions can be very serious.

(5) Cloudy nights are usually warmer than the clear ones.

Clouds will insolate the lower troposphere, causing the temperature to not cool off as much at night. The clouds form an attic over and entraps the air. This prevents to the heat to get lost in the atmosphere, above the clouds. Ultimately, the heat produced in the vicinity is restored.

12. What are Nuclear reactors?

A nuclear reactor is a device in which nuclear chain reactions are initiated, controlled, and sustained at a steady rate. Nuclear reactors are used for many purposes, but the most significant current uses are for the generation of electrical power and, in rare cases, for the production of plutonium for use in nuclear weapons.

--How the Electrical energy is produced by Nuclear Power Plants?

A nuclear power plant (NPP) is a thermal power station in which the heat source is one or more nuclear reactors generating nuclear power.

Nuclear power plants are base load stations, which work best when the power output is constant (although boiling water reactors can come down to half power at night). Their units range in power from about 40 MWe to almost 2000 MWe, typical of new units under construction in 2005 being in the range 600-1200 MWe.

As of 2005 there are 441 nuclear power reactors in operation around the world, which together produce about one-sixth of the world's electric power.

--**Name the devices which convert:**

(1) Mechanical energy into electrical energy
Electric Generator/Dynamo

(2) Heat energy into mechanical energy
Combustion Engines

(3) Electrical energy into mechanical energy
Electrical Motors

(4) Electrical energy into sound energy
Speakers

(5) Sound energy into electrical energy
Microphone

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

(a) I-1DL

(b) McV - **Means Cell Volume**

(c)UHF - **Ultrahigh Frequency**

(d) LED - **Light-Emitting Diode**

(e) LCD - **Liquid Crystal Display**

(f) BASIC - **Beginner's All-Purpose Symbolic Instruction Code**

(g) MASER - **Microwave Amplification by Stimulated Emission of Radiation** (h)

ETT - **Educational Telecommunications and Technology**

(i) HST - **High-Speed Train or Hubble space telescope**

(j) DBS - **Direct Broadcast Satellite or Direct Broadcasting by Satellite.**

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 -- Sulphur Dioxide
2. Marble--------Fermi ---------- Calcium Carbonate
3. Ozone ------- Aqua regia----- - Dobson Unit
4. Argon --------Beta- Particle ----Blue purple light
5. Quartz -------Frequency --------Silicon Dioxide
6. Mirage -------Calcium Carbonate -Total Internal Reflection
7. Gold ---------Dobson Units----- -Aqua Regia
8. Modulation ---Silicon dioxide -----Frequency
9. Length -------Total internal reflection -Fermi
10. Solar Energy--Blue purple light ---Beta Particle

15. Choose the best choice in the following statements. (I)

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

(2) Radioactive isotope of Uranium used in Nuclear Bomb is:

(a)92 U 235
(b)92 U 234
c)92 U 233
d)92 U 238

(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.

(4) Which woody raw material is used for the manufacture of paper pulp?

(a) Cotton
(b) Poplar
(c) Bagasse
(d) Rice straw

(5) Rectified spirit contains alcohol about:

(a) 80%
(b) 95%
(c) 70%
(d) 85%

(6) Which of the following elements is not present abundantly in earth's crust:

(a) Silicon
(b) Radium
(c) Aluminum
(d) Carbon

(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

(8) Basic metals can be converted into gold by:

(a) Heating
(b) Beating
(c) Artificial nuclear radioactivity
(d) Chemical reaction

(9) A light year is a unit of:

(a) Time
(b) Energy
(c) Length
(d) Mass

(10) One of the main function of the earth's ozone layer is to:

(a) Prevent global warming

(b) Filter out ultraviolet rays
(c) Absorb pollution
(d) All of the above

Every Day Science Paper - 2006
Partial Solution

Q.1. Write short notes on only TWO of the following: (5 each)

(a) Magnetic Resonance Imaging
(b) Tidal Energy
(c) Supersonics

Q.2. What is Pollen Allergy? What preventive measures are to be taken to avoid it? (4, 6)
Q.3 Name. (1 each)

1) The alloy consisting of metals copper, zinc and nickel.
2) The instrument specially designed for recording earthquake waves, **(Seismograph)**
3) The electrical device which converts sound energy into electrical energy. **(Microphone)**
4) The ore of mercury metal. **(Cinnabar)**
5) The device with which variation of blood flow can be heard. **(Sphygmomanometer)(stethoscope)**
6) The element, which is abundantly present in the human body. **(Hydrogen)**
7) The scientist who discovered penicillin. **(Sir 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. **(Camel)**
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:

Compound of Calcium.
When hydrated, the form is rigid.
Blessing for broken bones.
Also used for architecture designing(Model designing), Sculpures and for filling purposes in different areas.

(b) Theodolite

(c) **Bird Flu :**

A viral disease of birds.
It is not only effective in birds,but generally is, some viruseshave a strong tendency for

mutations. the people who work at poultry farms and shops should be innoculated.
Recent attack in Pakistan
Preventive measures

(d) **Gene:**

A thread like nuclear structure in not only the nucleus, it is also found in the prokaryotic cells and viruses, the of a living cell
physiological traits determinant.
Some think that it is also reponsible character determination, in humans.

(e) **Thermistor:**

A type of an electrical device/A semiconductor, which regulates the current flow under the influence of heat.
Used in sensitive heat measuring/operative devices e.g thermocouples/ers

(f) **Thermostat:**

Thermo= Heat, Stat= Statically stable
Its a thermo-electrical device.
works on the principle of thermal expansion.
Used as a temperature regulator in home appliances like refrigerators, ac,and iron. (g) Pedometer

Q.5. Which physical quantities are measured by the following units? (1 each) (a)

Foot-Pound **(Energy)**

(b) Torr **(Pressure)**

(c) Slug **(Mass)**

(d) Guass **(Magnetism)**

(e) Acre Foot **(Volume of water)**

(f) Becquerel **(X-ray)**

(g) Erg **(Energy)**

(h) Dyne **(Force)**

(i) Gilbert **(Magneto motive force)**

(j) Dioptre **(Lens optical power)**

Q.6. What is the difference between Dam and Barrage? What benefits are obtained by constructing a big dam? (2, 8)

Ans:A dam is a storage of water, while a barrage is made to increase the water depth.

Benefits of Dams:

Leverage to agriculture, by making use of the rain water also.
Ensures regulated flow in the streams. So is an agricultural blessing.
Electricity Production is cheaper for a big dam.
By the constructoin of big dams, we get an employment channel for our talented Pakistanis.

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, because pitch is the ear response to a sound.

2) Ultraviolet light is visible but infrared light is not visible.
False, both are invisible

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, it moves through the wire and creates a field around the wire.

5) A guava contains more vitamin C than an orange. **True**

6) Sound travels faster in iron than in air.
True, the molecules of a metal are closely packed, hence the density is higher

7) Wheat Bridge is the name of an electrical circuit.
False, the correct name for it is wheatstone bridge

8) Morphine can cause constipation and lowering of blood pressure. **True**

9) A concave lens is used for the correction of the Hyperphobia.
False,(since no lens is used so far to cure a mental disease.)

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:

Telemeter is used to convey the physical statistics to a distance, while a multimeter is a complex device, having a potentiometer and ammeter.

(b) Perimeter and Altimeter

Perimeter is a conceptual term, while the altimeter is a device, for measuring the altitudes.

(c) Periscope and Microscope

In microscope, the channel of light waves is straigt, while in a periscope, it is bended by the use of a mirror o a prism.

(d) Nucleon and Photon

Nucleon is a sub-nuclear particle, while a photon is n energy packet.

(e) Cusec and Comet

Cusec is a measure of flow, while comet is an object.

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 **beriberi** 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) **Jupiter** is the fastest planet of the solar system.

6) Mercury metal is **13.5** 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 **thermometer**.

9) Gold and silver are known as **coinage metals.**

10) The amount of ozone in the atmosphere is expressed in **ppm.** (4, 6)

Q.11. Give scientific reasons of the following: (2 each)

a) Why do some people snore?

In unconscious sleep, the tongue droops back due to muscular relaxation.
The tongue comes in the way of wir channel and flutters and hits the pallete.

b) Why do we sometimes sleep walk?

1- Sometimes our unconscious mind takes over.
2- The unconscious is derived by the conscious, that's why we have fewer accidents.

c) Climber bends forward while climbing a mountain.

1- Drops his weight forward and uses the gravity effect to get a pull forwards.
2- The weight on the limbs is also lessened, so they get tired a little late then otherwise.

d) The manhole covers are generally round.

1- Because generally, the drain pipes are round and it is easy to connect through them in this way.
2- The weight is distributed at every angle evenly, So it is easy to lift them off from any corner.

e) Roads are bent inwards on curves.

1- The centrifugal force experienced by the vehicle is lowered by the raised end, so the vehicle doesn't skit or goes off from the road.
2- The centripetal force is supplemented by the gravitaional forces from below.

Q.12. What are vitamins and minerals? Which vitamins and minerals play major role in the development of bones? (4, 6)

Minerals:

These are the ground matters, naturally occurring abundantly in the non-livings also.Examples are sodium, potassium, calcium, phosphorous, iron, sulphur and molybdenum etc.

Vitamins:

These are chemical compounds which are synthesized naturally by living cells. They are vital for physical functions, but are not primarily required for the basic function of life like metabolism including both, the catabolism and anabolism.

b) For bones, calcium is the major component along with the phosphorous. While the absorption of these is vitalized by the vitamin D.

Q.13. what do the following scientific abbreviations stand for? (1 each)

(1) CRO-CRO - **Cathode rays oscillator**
(2) SARS - **Severe Acute respiratory syndrome**
(3) BOT - **Built operate transfer**
(4) AMU - **Atomic mass unit**
(5) EMF - **Electromotive force**
(6) ADH - **Anti diuretic harmome**
(7) STP - **Standard Temperature Pressure**
(8) GeV - **Giga Electron Volt**
(9) NTP - **Normal Temperature Pressure OR Network Time Protocol**
(10) CRT - **Cathode ray tube**

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

Answers:

(1) Geiger Muller Counter Semi Conductor (1) Radioactivity
(2) Newton Magnet (2) Gravitation
(3) Addison Electricity (3) Electricity
(4) Bardeen and Brattin Radioactivity (4) Semiconductor
(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) E.M. 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

2) Copper can be converted into gold by:

(a) Artificial radioactivity
(b) heating
(c) Electroplating
(d) Chemical reaction

3) The three elements needed for healthy growth of plants are:

(a) N, P, K
(b) N, C, P
(c) N, K,
(d) N, S, P

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

5) Max Planck received the noble prize in Physics in 1918 for his discovery of:

(a) electron
(b) energy quanta
(c) photon
(d) positron

6) Bronze medal is made up of metals:

(a) (copper,nickel)
(b) (copper, tin)
(c) (copper, silver)
(d) (copper, zinc)

7) Addison's disease is caused by the excessive secretion of:

(a) Antiduretic Harmone
(b) Luteinising Harmone

(c) Melanophore stimulating Harmone
(d) Adrenocorticotrophic Harmone

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

9) Margalla Hill is a branch of:

(a) Karakorum range
(b) Hindukash range
(c) Himalaya range
(d) Nanga Parbat range

10) Humming bird belongs to a category called:

(a) Ectotherm
(b) Endotherm
(c) Exotherm
(d) Heterotherm.

Every Day Science Paper - 2007
Partial Solution

Q.1. write short notes on any two of the following (5 each).

(a) Laser
(b) Nuclear reactor
(c) Ceramics

a. Laser

Laser is a device which generates the coherent light or "well organised" light .Ordinary white light is made up of many different colours. Each colour has different wavelength and the photons of each colour are out of step with each other. In a beam of laser light, all the photon have the same wavelength and move in step , travelling along like a well drilled army. The mechanism relies on a process known as stimulated emission and the word laser is derived from light amplification by stimulated emission.

--**The essential components of a typical laser are**

1. The active medium such as a ruby rod or carbon dioxide gas

2. A method of introducing energy into the active medium, for instance a flash lamp

3. A pair of mirrors is placed on each side of the active medium, one of which transmits part of the radiation that strikes it.

A typical laser using Ruby rod as an active medium has a pulse duration of 20 nsec. with power of 10 MW and the laser beam has a wave length of 694 nm.

b. Nuclear Reactor

A device in which the fission reaction involving neutrons and nuclear fuel is controlled for the production of heat is called "nuclear reactor". It is also known as " The nuclear power plant". This heat is converted by means of turbines and generator to electrical energy for commercial use. A nuclear power plant works in a similar way to an oil-fired or a coal-fired power station. The difference between the two types of power plants is in the fuel they use to heat the boiler. Inside a nuclear power plant, energy is released by nuclear fission in the core of a piece of equipment called the reactor. The energy heats water in the boiler (the water boils and produce steam). This steam turns the huge turbine wheels, and the turbines drive the generator that produces the electricity.

--**There are three types of reactor which are given bellow.**

1. Light water reactor (LWR)
2. Boiling water reactor (BWR)
3. Pressurized water reactor (PWR)
4. Heavy water reactor (HWR)
5. High-temperature Gas-Cooled reactor (HTGR)

Q.2. Write briefly (not more than three to four sentences) about any five of the following (2 each)

(a) Asteroids
(b) Black Hole
(c) Aurora
(d) Sedimentary Rock
(e) Epiphytes
(f) Ionosphere

a. Asteroids

Asteroids, also called minor planets or planetoids, are a class of astronomical objects. The asteroid is a small celestial body that drift in the solar system in orbit around the sun. Between the orbits of mars and Jupiter.

b. Black Hole

black hole is an object with a gravitational field so powerful that even electromagnetic radiation(such as light) cannot escape its pull.

c. Aurora

The aurora is a bright glow observed in the night sky, usually in the polar zone. For this reason some scientists call it a "polar aurora" .

d. Sedimentary Rock

A Sedimentary rock is one of the three main rock groups (along with igneous and metamorphic rocks) . Sedimentary rocks cover 75% of the Earth's land area. Sedimentary rocks include common types such as chalk, limestone, sandstone and shale.

e. Epiphytes

An epiphyte is an organism that grows upon or attached to a living plant. Epiphytic plants are

sometimes called "air plants" because they do not root in soil.

f. Ionosphere

The ionosphere is the part of the atmosphere that is ionized by solar radiation. It plays an important part in atmospheric electricity and forms the inner edge of the magnetosphere.

Q.3 Differenitate between the following pairs: (2 each)

(a) BIT and BYTE

Bit: -the computer works with binary numbers, which are 0 and 1. Each binary digit is called a "bit". Bit is the short for binary integer. It is the smallest piece of data used by the computer.

Byte: -the combination of eight bits is called a "Byte". One byte represents one alphabetic, numeric and alphanumeric character.

(b) RAM and ROM

RAM:- RAM stands for Random access memory. it is also called as primary memory or main memory. It is the high-speed memory. The computer can access any location of this memory extremely fast. It can read or write at any location of this memory in 100 millionth of a second. Ram cannot store the data or instructions permanently. When the computer is turned off, all programs and data are erased from the RAM. It is a temporary storage unit also called as the volatile memory.

ROM:- ROM stands for read only memory. The instructions written in ROM can only be read but cannot be changed or deleted. It is not possible to write new information or instructions into the ROM. Unlike RAM; ROM stores data and instructions permanently. When the power is turned off, the instructions stored in ROM are not lost.

(c) Epidemic and endemic

Epidemic: -this terminology is usually concerned with the increased cases of bad happening especially in the case of diseases and crimes. It basically explains the increased cases of a particular disease happening at the same time in a particular community. For example, flu epidemic
while

Endemic: - it explains the condition that is regularly found in a particular area or particular group of people and it is difficult to get rid of it. Something that is very localized. Markhor is endemic to khunjerab

(d) Photosynthesis and respiration

Respiration: - it is one of the most important metabolic activities of all organisms, which occurs at two levels: the organism and cellular level. Organismic respiration is also called breathing or ventilation while in cellular respiration cell utilizes oxygen, produces CO_2 , extracts and conserves the energy from food molecules by combustion in the form of ATP.

Photosynthesis: - it is the reverse of respiration, which involves the synthesis of carbohydrates with the help and water and carbon dioxide in the presence of light and chlorophyll. Photosynthesis is the characteristic feature of autotrophic plants and not found in heterotrophic organisms. Plants use CO_2 and eliminate O_2 into the environment.

Respiration: $C_6H_{12}O_6 + 6O_2 \rightarrow 6H_2O + 6CO_2 +$ energy

Photosynthesis: $6H_2O + 6CO_2 +$ energy $\rightarrow C_6H_{12}O_6 + 6O_2$ **(e)**

Herbivores and carnivores

Herbivores: - the animals that depend totally on plants or plant material for their food are called herbivores. Examples include rabbits, squirrels, cattle etc.

Carnivores: - the animals that depend on other animals for their food and eat flesh as their food are called as the carnivores. Such animals have the adaptive characters so that they may predate and tear the flesh easily. Examples include cat, dog, lion, tiger etc. Herbivores and carnivores constitute the food chain of a particular community.

Q.4 (i) What are the endocrine glands? Name any Two. (2+2)

Ans: Endocrine glands are the ductless glands which, with few exceptions, are the discrete group of cells which make specific chemical compounds called the hormones and secrete them in the stream of blood. Endocrine system consists of some 20 glands/tissues lying in different parts of the body.

1. Adrenal glands
2. thyroid glands

(ii) Name the parts of human body from where the following secreted: (6)

(a) Insulin- **Pancreas**
(b) thyroxin- **thyroid gland**
(c) adrenalin- **Adrenal Medulla**
(d) oestrogen- **From ovaries (in females)**
(e) cortisol- **From adrenal cortex**
(f) Testosterone- **From testis** (in males) and from adrenal cortex in both males and females.

Q.5 (a) Briefly discuss the classification of plants giving suitable examples: (6)

There are nearly half a million species of plants on the earth. With the exception of few , all of them need three basic ingredients to survive : air , light and water . Plants are found in almost every type of habitat. They take their own food using simple raw materials and energy from the sun. Plants requires water to grow. They cannot get this water unless it is available in the soil. Plants obtain water from the soil through their roots. It then passes up the stem to the leaves and flowers. The plant does not take all the water available in the soil. Much of the remaining water evaporates into the surrounding air. The plants can be divided in to the following categories.

Non-Green Plants :

This is a group of plants having simple plant body without root, stem and leaves. They do not contain chlorophyll and hence do not involve photosynthesis. They can grow without the aid of sunlight and seem to popout of the ground overnight. Typical examples of nongreen plants are bacteria , fungi and viruses.

Green Plants :

These are those plants which contain chlorophyll and carry out photosynthesis. There are two categories of green plants : non-flowering and flowering plants.

a. Non-Flowering Plants (Cryptogams).

These are seedless green plants. They reproduce by means of spores. these plants have existed on earth for much longer than flowering plants. Many of them have remained almost unchanged for million of years. They generally have a simple structure and , with the exception of ferns , do not have supporting fiber.

b. Flowering Plants (Phanerogams).

These are seed containing green plants . There are two groups of seed plants : the gymnosperms and the angiosperms. This division is based on the type of seeds they have. The gymnosperms are the pine, fir , cedar , cypress and spruce three while the angiosperms include most other trees , the flowering plants, the grasses , crop plants , vegetable and weeds.

(b) define the following: (4)

(1) **Vaccine:** an antigenic preparation used to establish immunity to a disease.

(2) **Antibiotic:** a drug that kills or prevents the growth of bacteria.

(3) **Solar eclipse:** occurs when the moon passes between earth and the sun.

(4) **Exothermic:** A reaction that releases energy in the form of heat is called exothermic.

Q.5 Give scientific reasons of the following: (2 each)

(a) Why climbers get their food by climbing on other trees ?

Ans: By climbing on other trees, they get close to the light source. **(b)**

Mars is called red planet.

Ans: Mars is a barren desert. It is covered with red dust, that is why we call mars, the Red Planet.

(c) Vitamin D is the essential component of the Body.

Ans: Vitamin D is responsible for the absorption of calcium and phosphorus in the bones.. **(d)**

The weight of the object is less at the equator than at the poles.

Ans: At equator, the distance from the earth's center is greater than any other point of the earth's surface. Since, weight is defined as the force with which a body is attracted towards the earth's center, so greater the distance, less is the force applied. Hence, the object's weight is lightest at the earth's equator, than at poles.

(e) Why do some people snore?

Ans: Throat weakness causing the throat to close during sleep

Q.7 Give description of satellites and also give their functions. (10)

Q.8 (a) What is balance diet? (5)
(b) How are characters transmitted from parents to offspring? (5)

Every Day Science Paper - 2008
Partial Solution

PART-II (Subjective)

TIME ALLOWED: 100 MINUTES…… …….Maximum Marks: 50

NOTE:
(i) Attempt ONLY FIVE questions. All questions carry EQUAL marks.
(ii) Extra attempt of any question or any part of the attempted question will not be considered.

Q.1. Write briefly about the life and scientific contributions of the following Muslim Scientists: (5+5)

a. Muhammad bin Musa Al-Khawarizmi
b. Abu Ali Sina

Q.2. Differentiate clearly between the following pairs: (2 each)

a. Fission and Fusion:

Fission splits a massive element into fragments, releasing energy in the process. **Fusion** joins two light elements, forming a more massive element, and releasing energy in the process.

b. Star and Planet:

A star is a huge ball of hot glowing gases whirling in space. Our sun is a star and the only one close enough to earth for us to see its ball shape. all are made up of the same two gases, hydrogen and helium. The stars shine because atomic energy at their center makes them very hot. They shine night and day, but we see them only at night when the sky is dark.

A planet, on the other hand, is a smaller, solid body which does not shine by its own light, but rather by the light reflected from the sun. While planets shine steadily, stars seem to twinkle. This is because of the movement of layers of air between the stars and the earth.

b. Fertilization & Pollination:

Fertilization is a process in sexual reproduction that involves the union of male (sperm) and female (ovum) gametes (each with a single, haploid set of chromosomes) to produce a diploid zygote

Pollination is the process by which pollen is transferred in flowering plants, thereby enabling

fertilisation and sexual reproduction.

c. Telescope & Microscepe:

A telescope is an instrument designed for the observation of remote objects by the collection of electromagnetic radiation.

A microscope is an instrument for viewing objects that are too small to be seen by the naked or unaided eye.

d. Antibiotics & Vaccination:

An antibiotic is a substance or compound that kills or inhibits the growth of bacteria.
Antibiotics belong to the group of antimicrobial compounds used to treat infections caused by microorganisms, including fungi and protozoa.

Vaccination is the administration of antigenic material to produce immunity to a disease.
Vaccines can prevent or ameliorate the effects of infection by a pathogen. It is considered to be the most effective and cost-effective method of preventing infectious diseases.

Q.3. a. Discuss briefly the SOLAR SYSTEM. (6)
b. How are EARTHQUAKES caused? (4)

Q.4. Write briefly (not more than four to five sentences) about any FIVE of the following: (2 each)

a. Supernova: star increasing suddenly in brightness.

b. Radioactivity: spontaneous disintegration of atomic nuclei, with the emission of usu. penetrating radiation or particles.

c. Laser: device that generates an intense beam of coherent light, or other electromagnetic radiation, in one direction. (Light Amplification by Stimulated Emission of Radiation)

d. **Semiconductors:** substance that in certain conditions has electrical conductivity intermediate between insulators and metals.

e. Geothermal Energy: Geothermal power is power extracted from heat stored in the earth. This geothermal energy originates from the original formation of the planet, from radioactive decay of minerals, and from solar energy absorbed at the surface.

f. Computer Virus: self-replicating code maliciously introduced into a computer program and intended to corrupt the system or destroy data.
g. Pasteurization:

Q.5. a. What are HORMONES? Name four important hormones and describe their functions in the human body. (2+4)

b. Explain the structure and function of an ANIMAL CELL with a labeled diagram. (2+2)

Q.6. a. What are the essential nutrients of BALANCED DIET? Describe one such nutrient in detail explaining its role in the metabolism. (2+4)

b. What do the following scientific abbreviations stand for? (1/2 each)

i. PVC - Polyvinyl Chloride
ii. BCG - Bacillus Calmette-Guérin, an anti-tuberculosis vaccine. **iii.**
ECG - Electrocardiogram.
iv. CFC - Chlorofluorocarbon
v. LPG - Liquefied Petroleum Gas
vi. DNA - Deoxyribonucleic acid
vii. AIDS - Aquired Immune Deficiency Syndrome
viii. TNT - Trinitrotoluene
ix. EEG - Electroencephalogram

Q.7. a. Define ENERGY. Name four renewable sources of energy. How can our country come out of Energy Crisis? (1+2+3)

Energy:

In physics, energy ", is a scalar physical quantity that describes the amount of work that can be performed by a force, an attribute of objects and systems that is subject to a conservation law. Eight different forms of energy exist to explain all known natural phenomena. These forms include kinetic, potential, thermal, gravitational, sound, light, elastic, and electromagnetic energy. The forms of energy are often named after a related force.

Renewable sources of Energy:

Renewable energy sources can be replenished in a short period of time. The five renewable sources used most often are:

o Biomass - including wood and wood waste, municipal solid waste, landfill and biogas, ethanol, and biodiesel
o Water (hydropower)
o Geothermal
o Wind
o Solar

Recommendations to overcome Energy Crisis:

-New power generation and conservation projects. -
Replacement of inefficient plants.
-Reducing transmission and distribution loss.
-Construction of new Dams.
-Institutional and Administrative Improvement.
-Utilization of largest deposits of coal.
-Renewable sources of energy.
-Public Awareness.

b. Write a brief note on CERAMICS. (4)

Q.8. a. Describe very briefly the working of a CAMERA. How does it resemble in its function with that of the HUMAN EYE? (3+3)

b. What are PLASTCS? Describe briefly their characteristics and Limitations. (1+3)

Part - I (Objective Portion)

Note: Candidates were not allowed to take away the Question Paper of MCQs portion. The following MCQs are recalled by members of CSSForum.

~Japan is called:

-Land of earthquakes
-Land of rising sun
-Land of rivers

~Which of the following is used to kill rats?

-Rodenticides

~Which planet of our solar system is called as Morning star?

-Venus

~What is the diameter of the earth?

-12 756.2 kilometers

~ Opium is found in?

-Drug made from the juice of a certain poppy, used esp. as an analgesic and narcotic.

~Opium is used to make the following

-Heroine

~Which one of the following book was written by Ibn-al-haisham?

~Speed of light is?

~Which of the following energy in converted into electric in a generator?

-Chemical
-Mechanical
-Thermal

~Diamond is the refined form of

- **Carbon**
-Coal

12) Dry Ice is?

-Co2

~Telephone was invented by?

-Alexander Graham Bell

~Name the instrument used to measure electric current? -

Ammeter

~Ascorbic is vitamin?

-A, B, **C**, K

~Total number of bones in human face are?

~Name of vitamin C: **Ascorbic Acid**

~The sky appears blue due to: **Tyndal effect**

~Fat soluble vitamins

~Mixture used for welding - **Chemical composition**

~(which of the following is not a thermoplasic? **Bakelite**

~Hematite (a mineral) is the important source of? **Iron** ~fat

soluble vitamins are? A,D,E and K.

~Bauxite is the mineral of? **Aluminium.**

~Abu Ali Sina, Al Biruni, Ibn Al Haitham belonged to which century - **10the century**

~Bakelite, Polyester are which type of plastics - **Thermosetting plastics**

~Bronze is an alloy of - **Copper and tin**

~which of the following is an invertebrate - **Insects**

~identify the animal - rudimentary wings, long bill, lives in burrows - **Kiwi**

~Largest organ of human body - **Skin**

~Vaccine for T.B - **Bacille calmine gurette (BCG)**

~Power house of cell - **Mitochondria**

Partial Solution
Every Day Science Paper 2009

TIME ALLOWED:
(PART-I) 80 MINUTES MAXIMUM MARKS: 50
(PART-II) MINUTES MAXIMUM MARKS: 50

NOTE:
(i) First attempt PART-I (MCQ) on separate Answer Sheet which shall be taken back after 80 minutes.
(ii) Overwriting/cutting of the options/answers will not be given credit.

PART - I (MCQs)
(COMPULSORY)

Q.1. Select the best option/answer and fill in the appropriate Box on the Answer Sheet: (50)

(1) Person with following blood group are considered to be universal recipient.

a. A+
b. B+
c. AB+
d. O+
e. None of these

The AB group is considered to be universal recipient

(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 Sulphate
e. None of these

(4) Sensitive layer of the eye is:

a. Choriods
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 of the unification of:

a. Electromagnetic force and gravitational force
b. Electromagnetic force and weak nuclear force
c. Gravitational 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 diabetic baby born to parents both heterozygous normal ?

a. Zero
b. ¼
c. ½
d. ¾
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 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 alcholo
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. Michael 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 people is:

a. Ethnology (branch of anthropology)
b. Morphology
c. Ethics
d. Genetics
e. None of these

(15) Chemical 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 Carbon dioxide
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) Defeciency of following vitamin decreases hemoglobin production:

a. Biotin
b. Thiamine
c. Niacin
d. Pyridoxine (known as Vitamin B6, causes anemia i.e. deficiency of hemoglobin)
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. 365 days
c. 2 years
d. 98 days
e. None of these

(23) The most splendid and the most magnificient constellation on the sky is:

a. Orion
b. Columbia
c. Canis Major
d. Taurus
e. None of these

(24) "Black holes" refer to:

a. Hole occurring in heavenly bodies
b. Bright spots on the sun
c. Collapsing objects of high density
d. Collapsing of low density
e. None of these

(25) Eugenics is the study of:

a. Altering human beings by changing their genetic components (close to the actual definition)
b. People of European region
c. Different races of mankind
d. Genetic of plants
e. None of these

Eugenics: study of the possibility of racial improvement through selective breeding and other methods

(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 make radio transmission possible?

a. Troposphere
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 fiber
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. Everywhere 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 it take to reduce it from 10 mg to 5 mg?

a. 4 days
b. 12 days
c. 16 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

The opposite is the famous red shift which indicated the universe is expanding away from us.

(35) Kilowatt-hour is a unit of:

a. Power
b. Electric Current
c. Energy
d. Time
e. None of these

(36) Fuel used in a Fast Breeder Reactor is:

a. Uranium Oxide
b. Uranium Plutonium carbide
c. Uranium Plutonium Oxide
d. Uranium thorium Oxide
e. None of these

FBRs usually use a mixed oxide fuel core of up to 20% plutonium dioxide (PuO_2) and at least 80% uranium dioxide (UO_2).

(37) Monsoon is caused by:

a. Seasonal reversal of winds
b. Revolution of earth
c. Movement of clouds
d. Rise in temperature
e. Rain forests

(38) Which of the following atmospheric layers help 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 elections
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. Manganese
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 rays
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. Mesosphere
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. Fertile land

(46) Quartz crystal in quartz watches work on the principle called:

a. Photoelectric effect
b. Stark effect

c. Thermionic effect
d. Piezo-electric effect
e. None of these

Piezo-electric effect
electric polarization produced in certain crystals by the application of mechanical stress.

(47) The fruits without seed, like banana, are called:

a. seedless fruits
b. parthenogenesis fruits
c. parthenocarpic fruits
d. placental fruits
e. Organic fruits

parthenocarpy *(literally meaning virgin fruit) is the natural or artificially induced production of fruit without fertilization of ovules. The fruit is therefore seedless*

(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 tin 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. All 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

PART - II (Subjective)

Q.2. Write short note on the following by giving their exact life span and contribution to the field of science (Accurate facts will be appreciated) (5x2)

(a) Umer Al Khayam
(b) Zakariya Al Razi

Q.3. Differentiate between ANY FIVE of the following pairs. (2x5) (a)

Umbra and Penumbra

Umbra - area of the shadow of an eclipse, dark center of a sunspot
Penumbra - partly lighted area around any shadow

(b) Heavy water and hard water

Heavy Water - water with a higher average molecular weight than ordinary water, water used for cooling the core of an atomic reactor
Hard Water - water containing a high concentration of minerals and calcium

(c) Smog and Smoke

Smog - mixture of smoke and fog
Smoke - visible vapor given off by burning material;

(d) Myopia and Hypropia

Myopia - nearsightedness, condition of the eyes in which objects that are far away cannot be seen clearly (Ophthalmology); lack of insight and forethought
Hyperopia - far-sightedness, ability to see distant objects more clearly than near ones

(e) Lava and Magma

Lava - molten rock expelled from a volcano; solidified volcanic rock
Magma - molten rock beneath the earth's crust from which igneous rocks are formed (Geology)

(f) Periscope and perimeter

Periscope - optical scope that allows one to see objects that are located above one's line of sight
perimeter - outer boundary of a figure or area; total length of the outer boundary

(g) X-rays and Gamma rays

X-Rays - High energy electromagnetic radiation of wavelengths in the range 10 to 0.1 nanometres. X-rays are extra-nuclear and have two sources: (1). A characteristic (e.g.K- or L-) X-ray photon is created and emitted when an electron drops down orbits to fill a vacancy in an innermost shell.
2). A bremsstrahlung photon is produced when a high speed positive or negative electron decelerates when passing through the electric field in the close vicinity of an atomic nucleus

Gamma Rays - The wavelength of gamma rays is typically less than 10-12 metres. They differ from X-rays in that they originate in the nucleus of atoms. A gamma ray is a photon, i.e. a discrete packet of many waves

Q.4. Sun is glorious star in our sky. Write down its characteristics with reference to the following date:

(a) Distance from earth

149,600,000 kilometers, or 92,960,000 miles

(b) Mean distance from center of galaxy

26,000 light-years

(c) Velocity around centre of galaxy

251 km/s

(d) Revolution period around centre of galaxy

225-250 million years (one Galactic year).

(e) Equatorial diameter

6.955 × 10 power 8 m
This is the equatorial radius, the diameter wud be the double of that

(f) Rotation period at the equator

25.05 days

(g) Core temperature

15.7 × 10 power 6 K

(h) Solar wind

A steady stream of charged particles that boil off the sun's outer atmosphere and which stream away along magnetic field lines which lead into the interplanetary medium. It is composed of charged particles such as protons , electrons and helium nuclei.

(i) The lovely Diamond Ring effect

large gush of light that shows up a few seconds before and after totality during a solar eclipse (caused by the last bit of sunlight that shines through valleys on the edge of the moon);

(j) Future of sun

The Sun does not have enough mass to explode as a supernova. Instead, in about 5 billion years, it will enter a red giant phase, its outer layers expanding as the hydrogen fuel in the core is consumed and the core contracts and heats up. Helium fusion will begin when the core temperature reaches around 100 million kelvins and will produce carbon, entering the asymptotic giant branch phase

Q.5. Write briefly (not more than three to four senetences) about ANY FIVE of the following: (2x5)

(a)Allotropy

existence of a chemical element in two or more different forms
For example, the element carbon has two common allotropes: diamond, where the carbon atoms are bonded together in a tetrahedral lattice arrangement, and graphite, where the carbon atoms are bonded together in sheets of a hexagonal lattice.

(b) Nebula

an interstellar cloud of dust, hydrogen gas and plasma. It is the first stage of a star's cycle. Originally *nebula* was a general name for any extended astronomical object, including galaxies beyond the Milky Way (some examples of the older usage survive; for example, the Andromeda Galaxy was referred to as the *Andromeda Nebula* before galaxies were discovered by Edwin Hubble). Nebulae often form star-forming regions, such as in the Eagle Nebula

(c) Enrichment of Uranium

Enrichment of Uranium corresponds to percent composition of uranium-235 being increased through the process of isotope separation. *Natural* uranium is 99.284% U-238 isotope, with U-235 only constituting about 0.711 % of its weight. However, U-235 is the only isotope existing in nature (in any appreciable amount) that is fissionable by thermal neutrons.

(d) Aqua Regia

Aqua regia (Latin for "royal water") is a highly corrosive, fuming yellow or red solution. The mixture is formed by freshly mixing concentrated nitric acid and concentrated hydrochloric acid, usually in a volumetric ratio of one to three respectively. It is one of the few reagents that dissolves gold and platinum. It was so named because it can dissolve the so-called royal, or noble metals, although tantalum, iridium, and a few other metals are able to withstand it.

(e) Greenhouse effect

The effect produced as greenhouse gases allow incoming solar radiation to pass through the Earth's atmosphere, but prevent part of the outgoing infrared radiation from the Earth's surface and lower atmosphere from escaping into outer space. This process occurs naturally and has kept the Earth's temperature about 59 degrees F warmer than it would otherwise be. Current life on Earth could not be sustained without the natural greenhouse effect.

(f) Igneous rocks

rocks formed by solidification of cooled magma (molten rock), with or without crystallization, either below the surface as intrusive (plutonic) rocks or on the surface as extrusive (volcanic) rocks. This magma can be derived from partial melts of pre-existing rocks in either the Earth's mantle or crust. Typically, the melting is caused by one or more of the following processes — an increase in temperature, a decrease in pressure, or a change in composition. Over 700 types of igneous rocks have been described, most of them formed beneath the surface of the Earth's crust. **Q.6. (a) Define GENETIC ENGINEERING. In how many ways Genetic Engineering can be applied in different fields of life? Does it benefit society ? Discuss. (1+3+2)**

(b) What do the following abbreviations stand for? (1/2 each)

i. SONAR
SOund **NA**vigation and **R**anging

ii. CNS
Central Nervous System

iii. PTFE
polytetrafluoroethylene.

iv. LDL
low-density lipoprotein.

v. SARS
Severe Acute Respiratory Syndrome

vi. GUT
Grand unified theory

vii. BASIC
Beginner's All purpose Symbolic Instruction Code

viii. BTU
British Thermal Unit

Q.7. (a) What are MINERALS? Discuss ANY TWO physical properties thereof. Also mention the names of four precious minerals of high commercial value.

(b) Define the following: (1 each)

(a) Amphibion

cold-blooded vertebrate animal able to live both on land and water

(b) Synchronous satellite

A satellite in a synchronous orbit
A synchronous orbit is one in which an orbiting object has a period equal to the average rotational period of the body being orbited.

(c) Big Dipper

group of seven stars (in the constellation Ursa Major)

(d) Fermentation

chemical conversion of organic compounds by means of enzymes; agitation, unrest

(e) Millennium Bug

an inability in older computing software to deal correctly with dates of 1 January 2000 or later.

Q.8. (a) Define RECEPTORS in man. Name different receptor organs in human body. Also discuss ANY TWO of them briefly.

In a sensory system, a sensory receptor is a sensory nerve ending that recognizes a stimulus in the internal or external environment of an organism.
Following are the different sensory receptors

- Ampullae of Lorenzini respond to electric fields, salinity, and to temperature, but function primarily as electroreceptors
- Baroreceptors respond to pressure
- Chemoreceptors respond to chemical stimuli
- Hydroreceptors respond to changes in humidity
- Mechanoreceptors respond to mechanical stress or mechanical strain
- Nociceptors respond to damage to body tissues leading to pain perception
- Osmoreceptors respond to the osmolarity of fluids (such as in the hypothalamus)
- Photoreceptors respond to light
- Proprioceptors provide the sense of position
- Thermoreceptors respond to temperature, either heat, cold or both
- Electromagnetic Receptors's respond to electromagnetic waves

(b). Give Scientific reasons of the following: (1 each)

i. The dogs pant, the birds open their mouth and the elephants move rapidly their ears.

I think all of these do not sweat, they use the above mentioned mechanisms to cool themselves

ii. The manholes covers are generally round.

It is impossible to drop a round lid into a smaller round hole.
It is because round is the only shape that if turned or flipped over, it still retains the same length across its center. If you used a square, rectangle, triangle, hexagon or any other shaped lid, it could be rotated and fall into the hole.

Other reasons
A round cover can be moved by rolling it on its edge.
A round cover contains less metal than a same-sized cover of any other shape.

iii. A geostationary satellite appears standstill to a viewer on the equator of earth.

Because these satellites are in the geosynchronous orbit (an orbit around the Earth with an orbital period matching the Earth's sidereal rotation period)

Geostationary orbit is a type of geosynchronous orbit that is directly above the equator

iv. We never see birds urinating.

Birds do not have a urinary bladder or external urethral opening and uric acid is excreted along with feces as a semisolid waste

v. Pasteurized milk has more nourishment than the ordinary boiled milk.

Q.9. (a) Highlight the similarities and differences between animals and plants. (3+3)

Kindly have a look at the following link
http://www.cellsalive.com/cells/3dcell.htm

(b) Write short note on ANY

TWO of the following. (2 each) (i)

Teleprinter (ii) Dengue Virus (iii)

Vacuum Cleaner

END