FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION-2023
FOR ECRUITMENT TO POSTS IN BS-17
UNDER THE FEDERAL GOVERNMENT
GENERAL KNOWLEDGE-I (GENERAL SCIENCE & ABILITY)

Roll Number

TIME ALLOWED: THREE HOURS	**PART-I (MCQS) MAXIMUM MARKS = 20**
PART-I(MCQS): MAXIMUM 30 MINUTES	**PART-II MAXIMUM MARKS = 80**

NOTE: (i) **Part-II** is to be attempted on the separate **Answer Book.**
(ii) Attempt **ONLY FOUR** questions from **PART-II** by selecting **TWO** questions from **EACH SECTION**. **ALL** questions carry **EQUAL** marks.
(iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.
(iv) Write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper.
(v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
(vi) Extra attempt of any question or any part of the question will not be considered.
(vii) **Use of Calculator is not allowed.**

PART – II
(SECTION – A)

Q. 2. (a) Define ceramic and nano-ceramic materials. Why the nano-ceramics show better properties than their ceramic counterparts? Write the applications of ceramic materials. (5)

(b) What is 'Black Hole'? How black holes are formed and discovered? (5)

(c) Write two applications of each of the following electromagnetic radiations: (5)

(i) Ultraviolet (ii) Infra-red (iii) Microwaves
(iv) Radio waves (v) X-rays.

(d) What is Wildfire? Explain its types, causes, spread and preventions. (5)**(20)**

Q. 3. (a) (i) Why the bat and whale are considered as mammals? (5)
(ii) Write a note on liver juice 'Bile'.

(b) How the urine is formed? Describe the role of kidney in excretion. (5)

(c) (i) How a bacterial cell is different from a plant cell? (5)
(ii) What do you think cold-blooded animals are slowed down by low temperatures?

(d) What is hepatitis, its types, causes, prevention, and cure? (5)**(20)**

Q. 4. (a) What is the difference between fog and smog? What are the causes of smog and its effects on human health? Write short note on any one of the latest technologies to eliminate smog to avoid atmospheric pollution. (5)

(b) What is the role of oxygen-demanding wastes in water pollution? How it can be prevented? (5)

(c) What is the biosphere? Write a note on the 'Energy Resources' available in the biosphere. (5)

(d) What are the different layers of the atmosphere? On what basis these layers are classified? In which layer 'Auroras' are formed and where do satellites orbit? (5)**(20)**

Q. 5. (a) What are antioxidants and why are they used in foods? Write a short note on natural and synthetic antioxidants. (5)

(b) How the carbohydrates, proteins, and fats are digested in humans? (5)

(c) How does the Navstar GPS system work for different applications? (5)

(d) (i) Differentiate between network and internet. (5)**(20)**
(ii) What is the difference among application, program and software?

(SECTION – B)

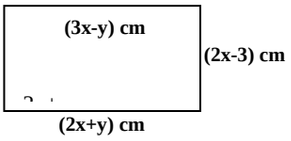
Q. 6. (a) A telephone company charges initially Rs.0.50 and then Rs. 0.11 for every minute. Write an expression that gives the cost of a call that lasts N minutes. (5)

(b) Find the missing number in the series below (5)

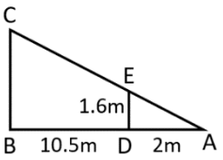
(i) 1, 8, 4, 27, 9, ? (ii) 3,6,8,16,18,? (iii) 2, 8, 512, ?

(iv) 81 ,9,64 ,8,?,12 (v) 6, 11, 21, 36, 56, ?

(c) The perimeter of the rectangle given below is 114 cm. Find the area of the rectangle. (5)



(d) Ahmad stands at point D, 2m in front of a spotlight at point A. He is 1.6m tall and is facing the wall of a building which is 10.5m away from him. How tall (BC) is his shadow on the wall of the building. (5)**(20)**



Q. 7 (a) Ali is standing 10 meters away from a tree. The distance of his eyes from his feet is 1.5 meter. Given that the distance from his eyes to the top of the tree is 15 meters, find the height of the tree. (5)

(b) Find out the correct word from the jumbled spellings given below. (5)
LNUGEF, CKANS, CIREFE, EERAANMOGTP, MNIKPPU.

(c) Draw and write the total number of lines of symmetry in a regular hexagon and octagon. How many lines of symmetry are there in a circle? (5)

(d) The height of the Egyptian pyramid is 146.6 meters and a base length is 230.6 meters. Find the volume of that pyramid. (5)**(20)**

Q. 8. (a) Ali buys an oven for Rs. 36800 and sells it at a gain of 8.5%. For how much does he sell it? (5)

(b) A card is drawn at random from a box containing 12 cards numbered 1,2,3,4,5,….,12. Find the probability of drawing (i) ‘8’, (ii) an even number, (iii) a perfect square, (iv) a negative number and (v) a number less than 13. (5)

(c) The scintillation nuclear radiation detector detects the alpha rays per second. When the energy of the alpha rays (E_α) in MeV increases, the number of counts (N_c) on the detector also increases linearly as shown in the table below. (5)

E_α (MeV)	0.25	0.45	0.65	1	1.4
N_c	17500	23500	29500	40000	52000

Draw the graph of N_c as a function of E_α (MeV) and find the energy of unknown alpha ray if the number of counts are 31600.

(d) The y is directly proportional to x^2 and y = m for a particular value of x. Find an expression for y in terms of m, when this value of x is doubled. (5)**(20)**

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