

## GENERAL SCIENCE, Paper-I

## (Physical Science)

(English Version)

Time : 2 Hours 45 Mins.]

[Maximum Marks : 50]

## Instructions :

- There are four sections and 33 questions in this paper.
- Answer should be written in a given answer booklet.
- There is internal choice in Section - IV.
- Write all the Questions visible and legibly.
- 15 minutes are given for reading the question paper and 2 hours 30 mins. for answering questions.

## Section - I

Note : (1) Answer all the questions.  
 (2) Each question carries  $\frac{1}{6}$  mark.

 $12 \times \frac{1}{6} = 6$ 

- Three bodies A, B and C are in thermal equilibrium. The temperature of B is  $50^{\circ}\text{C}$ . Then the temperature of C is \_\_\_\_\_.  
 (A)  $55^{\circ}\text{C}$       (B)  $50^{\circ}\text{C}$       (C)  $45^{\circ}\text{C}$       (D)  $40^{\circ}\text{C}$
- A solution turns red litmus into blue, its pH value is \_\_\_\_\_.  
 (A) 1      (B) 4      (C) 5      (D) 10
- Statement P : Optically denser medium may not possess greater mass density.  
 Statement Q : Kerosene with high refractive index is optically denser than water.  
 (A) Both P and Q are correct.      (B) P-correct, Q-wrong.  
 (C) P-wrong, Q-correct.      (D) Both P and Q are wrong.
- Which of the following material cannot be used to make a lens ?  
 (A) Water      (B) Glass      (C) Plastic      (D) Clay
- The value of least distance of distinct vision of the healthy human beings \_\_\_\_\_.
- Which rule is violated in the electronic configuration  $1s^0 2s^2 2p^6$  ?

7. Noble gases belong to \_\_\_\_\_ group of modern periodic table.

8. Match the following :

| Molecule                         |  |     | Spatial angle |
|----------------------------------|--|-----|---------------|
| (i) Ammonia                      |  | (p) | 104°31'       |
| (ii) Boron trifluoride           |  | (q) | 107°48'       |
| (iii) Water                      |  | (r) | 120°          |
| (A) (i)-(p), (ii)-(r), (iii)-(q) |  |     |               |
| (B) (i)-(q), (ii)-(p), (iii)-(r) |  |     |               |
| (C) (i)-(q), (ii)-(r), (iii)-(p) |  |     |               |
| (D) (i)-(p), (ii)-(q), (iii)-(r) |  |     |               |

9. Which element is not having 8 electrons in its valency shell among noble gases ?

Answer 10 and 11 questions based on below table :

| Material   | Silver                | Iron               | Drinking Water     | Air                  |
|--|-----------------------|--------------------|--------------------|----------------------|
| Specific Resistance<br>( $\Omega \cdot m$ ) at 20 °C | $1.59 \times 10^{-8}$ | $1 \times 10^{-8}$ | $2 \times 10^{-1}$ | $1.3 \times 10^{16}$ |

10. In which material the electric current is more ?

11. What is the SI unit of Specific Resistance ?

12. The impurity present in the ore is called as \_\_\_\_\_.

- (A) Gangue      (B) Flux      (C) Slag      (D) Mineral

### Section - II

Note : (1) Answer all the questions.

8 × 1 = 8

(2) Each question carries 1 mark.

13. Convert 27 °C into Kelvin scale.

14. Refractive index of glass relative to water is  $\frac{9}{5}$ . What is the refractive index of water relative to glass ?

15. Write any two material required in the activity.

"To find the refractive index of a glass slab."

16.



Complete the ray diagram with appropriate refracted rays.

17. An electron in an atom has the following set of four quantum numbers of  $3s^1$ :
- |     |     |       |                |
|-----|-----|-------|----------------|
| $n$ | $l$ | $m_l$ | $m_s$          |
| 3   | 0   | 0     | $+\frac{1}{2}$ |

Then write four quantum numbers for  $2s^1$  electron.

18. Write the Mendeleef's Periodic law.
19. An element X belongs to 3<sup>rd</sup> period and group 2 of the modern periodic table. Predict the number of valence electrons and write.
20. Mention the daily life application of thermite process.

#### Section - III

- Note : (1) Answer all the questions.  
 (2) Each question carries 2 marks.
21. Your friend is asked to differentiate between evaporation and boiling. What questions would you ask to make him to know the differences between evaporation and boiling?
22. Write any two daily life uses of lenses.
23. How do you appreciate the work of ciliary muscles in the eye?
24. Write the material required to prove Ohm's law activity.
25. Fill the table given below :

| Baking Soda      | Washing Soda |  |
|------------------|--------------|--|
| $\text{NaHCO}_3$ |              | $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ |

26. Explain the terms in  $n^{\frac{1}{2}}$  method.
27. Predict the reasons for low melting point for covalent compounds when compared with ionic compounds.
28. Write the names of any two ores of iron.

#### Section - IV

- Note : (1) Answer all the questions.  
 (2) Each question carries 4 marks.  
 (3) Every Question has Internal Choice.

$5 \times 4 = 20$

29. What is Myopia? Explain the correction of the defect Myopia.

OR

Deduce the expression for the equivalent resistance of three resistors  $R_1$ ,  $R_2$ ,  $R_3$  ohms connected in series.

30. How do the following properties change in a group and period?

- (i) Atomic radius
- (ii) Ionization energy
- (iii) Electron affinity
- (iv) Electronegativity

OR

Explain the formation of the  $O_2$  molecule using valence bond theory.

31. Suggest an experiment to find the specific heat of solid.

OR

How do you verify experimentally that  $\frac{\sin i}{\sin r}$  is a constant?

32. Observe the table and answer the following questions:

| Solution | A | B | C | D | E  | F | G | H  |
|----------|---|---|---|---|----|---|---|----|
| pH Value | 8 | 2 | 6 | 7 | 13 | 1 | 9 | 12 |

- (i) Which solution is neutral?
- (ii) Which solutions are strong acids?
- (iii) Which solutions are strong bases?
- (iv) Which solutions are weak bases?

OR

Complete the following table:

| Element | Atomic Number | Electronic Configuration |
|---------|---------------|--------------------------|
| Carbon  | 6             | $1s^2 2s^2 2p^2$         |
| Oxygen  | 8             |                          |
| Sodium  | 11            |                          |
| Argon   | 18            |                          |
| Calcium | 20            |                          |

33. Draw ray diagrams for the following positions with respect to convex lens:

- (i) Object is placed beyond  $2F_2$ .
- (ii) Object is placed between  $2F_2$  and  $F_2$ .

OR

Draw a neat diagram of Reverberatory furnace.