

SECTION -I (MARKS: 5 x 2 =10)**I. ANSWER ANY FIVE QUESTIONS FROM THE FOLLOWING BY CHOOSING ATLEAST TWO QUESTIONS FROM EACH GROUP.****GROUP - A**

1. What are the basic processes involved in the working of laser?
2. You know that the gravitational attraction of the earth on any object is proportional to its mass. Then why do heavy objects do not fall faster than light objects?
3. A stone is thrown up with a velocity of 10m/s. Find the maximum height reached and time of ascent?
4. What is simple harmonic motion? What are its characteristics?

GROUP - B

5. Explain why electrons enter into 4s orbital but not 3d after filling 3p orbital?
6. Why do we add KCl and NaCl to $MgCl_2$ during Mg extraction?
7. A solution is 4% NaOH by weight. If we require 10 grams of NaOH, how much of this solution by weight do we need?
8. What is ionic product of water? Give its value at 25 °C?

SECTION -II (MARKS: 4 x 1 =4)**II. ANSWER ANY FOUR FROM THE FOLLOWING QUESTIONS.**

9. What are isotopes? Give examples?
10. What is population inversion?
11. What is damped vibration?
12. Mention three industrial uses of oil?
13. What is catenation?
14. What are inner transition elements?

SECTION -III (MARKS: 4 x 4 =16)**III. ANSWER ANY TWO QUESTIONS FROM EACH GROUP.****GROUP - A**

15. Distinguish between centripetal force and centrifugal force?
16. What are the important applications of laser light in science and technology?
17. Show $R = R_1 + R_2 + R_3$? (Show effective resistance in series combination in a circuit is equal to the sum of their resistances?)
18. State the properties and uses of junction diode?

GROUP - B

19. State and explain with one example the Hund's rule of maximum multiplicity?
20. Explain the formation of coordinate covalent bond.
21. Describe the methods of extraction of magnesium from its ore?
22. Compare the structure of diamond and graphite?

SECTION -IV (MARKS: 1 x 5 =5)**IV. ANSWER ANY ONE OF THE FOLLOWING.**

23. Draw a diagram of screw gauge and label its various parts.
24. Draw figures to indicate the first and second modes of resonating air-column in a closed tube.