PERIODIC TEST-1
TIME: 1:30 min

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SUB : CHEMISTRY (XI)
FULL MARK : 40

1. *There are 20 questions in this question paper with internal choice.*
2. ***SECTION A** consists of 11 multiple-choice questions carrying 1 mark each.*
3. ***SECTION B** consists of 3 very short answer questions carrying 2 marks each.*
4. ***SECTION C** consists of 3 short answer questions carrying 3 marks each.*
5. ***SECTION D** consists of 1 case-based questions carrying 4 marks each.*
6. ***SECTION E** consists of 2 long answer questions carrying 5 marks each.*

SECTION – A

1. The number of significant figures in 0.00450 is:
a) 2 b) 3 c) 4 d) 5

2. The SI unit of amount of substance is:
a) Gram b) Mole c) Kilogram d) Litre

3. One mole of oxygen molecules contains:
a) 6.022×10^{23} atoms b) 3.011×10^{23} molecules c) 6.022×10^{23} molecules d) 1 atom

4. Which law states that mass can neither be created nor destroyed?
a) Law of constant proportion b) Law of multiple proportion
c) Law of conservation of mass d) Gay-Lussac's law

5. The empirical formula of benzene (C_6H_6) is:
a) CH b) CH_2 c) C_2H_2 d) C_6H_6

6. The charge on an electron was determined by:
a) Rutherford b) J.J. Thomson c) Chadwick d) Millikan

7. The nucleus of an atom was discovered by:
a) Bohr b) Dalton c) Rutherford d) Thomson

8. What is the frequency of light having a wavelength of 4.50×10^{-6} cm?
(a) $2.84 \times 10^{-12}\ s^{-1}$ (b) $2.10 \times 10^{4}\ s^{-1}$ (c) $4.29 \times 10^{14}\ s^{-1}$ (d) $1.06 \times 10^{22}\ s^{-1}$ (e) $6.67 \times 10^{15}\ s^{-1}$

9. Isotopes have same:
a) Mass number b) Number of neutrons c) Atomic number d) Atomic mass

10. According to Bohr's model, electrons revolve around nucleus in:
a) Random paths b) Circular orbits c) Elliptical paths d) Straight lines

11. The species having 17 protons and 18 electrons is:
a) Na^+ b) Cl^- c) K^+ d) Ar

SECTION – B

Short Answer Questions (2 Marks each)

12. Define mole. Calculate the number of molecules present in 18 g of water.

13. State the postulates of Dalton's atomic theory. (Any three)

14. The number of protons, electrons and neutrons in Al^{+3}(At. no 13, Mass no 27).

SECTION – C

Short Answer Questions (3 Marks each)

15. Calculate the percentage composition of oxygen in water (H_2O).

Or
How many grams of NaOH should be dissolved in water to prepare 250 mL of 2M solution?

16. Explain Rutherford's α-particle scattering experiment and write any two conclusions.

17. Write Bohr's postulates of atomic model. Mention one limitation of Bohr's model.

SECTION – D
Case Study Based Questions (4 Marks)

18. Read the following passage carefully and answer the questions that follow:

An atom consists of electrons, protons, and neutrons. Electrons revolve around the nucleus in fixed energy levels according to Bohr's atomic model. The atomic number represents the number of protons in an atom, while mass number is the sum of protons and neutrons. Atoms of the same element having different mass numbers are called isotopes.

a) What is the atomic number of an atom having 11 protons?
b) Define mass number.
c) .Calculate the mole fraction of ethanol and water in a sample of ethanol which contains 92% of ethanol by mass.
d) According to Bohr's model, where are electrons present in an atom?

SECTION – E
Long Answer Questions (5 Marks each)

19.
a) Calculate the number of atoms in each of the following (i) 52 moles of Ar (ii) 52 u of He
(iii) 52 g of He.

b) Calculate the concentration of nitric acid in moles per litre in a sample which has
a density, 1.41 g mL–1 and the mass per cent of nitric acid in it being 69%

c) Determine the empirical formula of a compound containing 40% carbon, 6.7% hydrogen and 53.3% oxygen.

20.
a) What are the frequency and wavelength of a photon emitted during a transition from n = 5 state to the n = 2 state in the hydrogen atom?.
Or
Difference between absorption and emission spectrum?
b) Calculate the wavelength of radiation having frequency 6×10^{14} Hz.(Speed of light = 3×10^{8} m/s)

c) Write the number of protons and neutrons are there in the following
${}_{6}O^{13}$,${}_{38}Sr^{88}$,${}_{26}Fe^{56}$.