DELHI PUBLIC SCHOOL BANGALORE NORTH(2021– 22)

WEEKLY TEST -01

CLASS: XI **CHEMISTRY** **MAX. MARKS: 25**
TIME: 1 HR

General Instructions:

a) There are 12 questions in this question paper. All Questions are compulsory.
b) SECTION- A: Question number 1-5 are MCQ type carrying 1 mark each.
c) SECTION- B: Question number 6-8 are short answer type carrying 2 Marks each.
d) SECTION- C: Question number 9-11 are short answer type carrying 3 Marks each.
e) SECTION- D: Question number 12 is a long answer type Carrying 5 Marks.
f) There is no overall choice, however internal choices have been provided.
***Note:* (Atomic number of Cr =24, P = 15, Ar =18, Fe =26, Ni =28, N=7, H=1)**
(Atomic mass of C =12, O =16, Al =27), R=109,677 cm^{-1}, h=6.62 x10^{-34} Js, c=3 x10^{8} m/s
Mass of electron=9.1 x10^{-31}kg

SECTION- A

1. I mole of CO_2 contains:
   a) 6.02 x 10^{23} atoms of C
   b) 6.02 x 10^{23} atoms of O
   c) 3g atoms of CO_2
   d) 18.10 x 10^{23} molecules of CO_2
2. The series of lines present in the visible regions of Hydrogen spectrum is:
   a) Lyman
   b) Balmer
   c) Paschen
   d) Brackett
3. 20 g of ethylene glycol ($C_2H_6O_2$) is dissolved in 80 g of water. The mole fraction of ethylene-glycol will be?
   a) 0.068
   b) 0.50
   c) 0.01
   d) 0.932
4. Which of the following is related to both wave nature and particle nature of photons?
   a) Interference

b) Diffraction

c) $E = mc^2$

d) $\lambda = h/mv$

5. Nitrogen has the electronic configuration $1s^2\ 2s^2\ 2p_x^1\ 2p_y^1\ 2p_z^1$ and not $1s^2\ 2s^2\ 2p_x^2\ 2p_y^1\ 2p_z^0$ according to

   a) Pauli's exclusion principle

   b) Aufbau principle

   c) Hund's Rule of maximum multiplicity

   d) Uncertainty principle

SECTION- B

6. State Heisenberg's Uncertainty principle .Why this principle is not applicable to macroscopic objects in motion? (2)
7. Calculate the molality of the solution prepared by dissolving 2.5 g of ethanoic acid (CH_3COOH) in 75 g of Benzene (C_6H_6). (2)
8. 27 g of Al reacted with 80 g of oxygen. Identify the Limiting reagent.

   $4\ Al + 3\ O_2 \rightarrow 2\ Al_2O_3$ (2)

SECTION- C

9. a) Why two electrons in an atom cannot have the same set of all quantum numbers? (3)

   b) Write the electronic configuration of Cr and Ni^{2+} and find the number of unpaired electrons in them.

10. 29.20 % (w/w) HCl stock solution has a density of 1.25 g/mL

    (i) What is the molarity of the solution?

    (ii) What is the volume (mL) of stock solution required to prepare 200mL of solution of 0.40 M HCl? (3)

11. An organic substance containing Carbon, Hydrogen, and Oxygen gave the following percentage composition.

    C= 57.82%, H= 3.6 % and O = 38.58 %, the molecular mass of the compound is 166 u. Find its molecular formula. (3)

SECTION- D

12. a) An electron is in a 3d orbital. List out the possible quantum numbers of that electron.

b) What is the wavelength of a photon emitted during a transition of an electron from n=5 state to n= 2 state in the Hydrogen atom. (5)

OR

a) Two particles A and B are moving with the same velocity but the wavelength of A is found to be doubled than that of B. What do you infer from this?

b) Using s, p, d, f notations, describe the orbitals with the following quantum numbers and arrange them in their increasing order of energy.
i) n=2, l=1 ii) n=4, l=0 iii) n=5, l=3.

c) Calculate the de-Broglie wavelength of an electron moving with 1 % velocity of light. (5)

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