HOLIDAY HOMEWORK
GRADE – XI (2026–27)
CHEMISTRY

Solve the assignment in assignment notebook.

Q1. How many moles of electrons weigh one kilogram?
(a) 6.023 × 10^23
(b) 19.108 × 10^26
(c) 0.023 × 10^4
(d) 9.108 × 10^6

Q2. 7.5 grams of a gas occupy 5.6 litres of volume at STP. The gas is:
(a) NO
(b) N2O
(c) CO
(d) CO2

Q3. The total number of orbitals in a shell having principal quantum number n is:
(a) 2n
(b) n
(c) $2n^2$
(d) (n + 1)

General Instructions:
In following questions, a statement of assertion followed by a statement of reason is given.
Choose the correct answer out of the following choices:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

Q4. Assertion (A): Bohr's orbits are called energy levels.
Reason (R): They are associated with fixed amount of energy.

Q5. Assertion (A): The line spectrum of an element is known as fingerprints of its atom.
Reason (R): Each element has a unique line emission spectrum.

Q6. Calculate the total number of required angular nodes and radial nodes present in the 3p orbital.

Q7. A nickel atom can lose two electrons to form a Ni2+ ion. The atomic number of nickel is 28. From which orbital would the nickel lose two electrons?

Q8. What is the difference between terms orbit and orbital?

Q9. The Balmer series in the hydrogen spectrum corresponds to the transition from n1 = 2 to n2 = 3, 4, ……. This series lies in the visible region. Calculate the wave number of lines associated with the transition in the Balmer series if the electron moves to n = 4 orbit.

(RH = 109677 cm■¹)

Q10. Table-tennis ball has a mass of 10 g and a speed of 90 m/s. If speed could be measured with the accuracy of 4%, what will be the uncertainty in speed and position?

Q11. Indicate the number of unpaired electrons in:
(a) P
(b) Si
(c) Cr
(d) Fe

Q12. Calculate the wavelength, frequency and wavenumber of light wave whose period is 2.0 × 10■¹■ s.

Q13. Electrons are emitted with zero velocity from a metal surface when it is exposed to radiation of wavelength 6800 Å. Calculate threshold frequency (v■) and work function (W■) of the metal.

Q14. How much energy is required to ionise a hydrogen atom if an electron occupies n = 5 orbit? Compare your answer with the ionisation energy of H atom (energy required to remove the electron from n = 1 orbit).

Q15. Calculate the number of molecules present in 0.5 moles of CO_2.

Q16. Chlorine is prepared in the laboratory by treating manganese dioxide (MnO_2) with aqueous hydrochloric acid according to the reaction:
$4HCl(aq) + MnO_2(s) \rightarrow 2H_2O(l) + MnCl_2(aq) + Cl_2(g)$
How many grams of HCl react with 5.0 g of manganese dioxide?

Q17. How much copper can be obtained from 100 g of copper sulphate ($CuSO_4$)?
(Atomic mass of Cu = 63.5 amu)

Q18. Determine the molecular formula of an oxide of iron in which the mass percent of iron and oxygen are 69.9 and 30.1 respectively. Given that the molar mass of the oxide is 159.8 g mol■¹.
(Atomic mass: Fe = 55.85, O = 16.00 amu)
Calculation of Empirical Formula.

Q19. In three moles of ethane (C_2H_6), calculate the following:
(i) Number of moles of carbon atoms
(ii) Number of moles of hydrogen atoms
(iii) Number of molecules of ethane

Q20. Calcium carbonate reacts with aqueous HCl according to the reaction:
$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$

What mass of $CaCO_3$ is required to react completely with 25 mL of 0.75 M HCl?

Revise chapters for class test to be conducted after the vacations.