Chemistry XI - Model Paper

Total Duration: 02 Hours **Total Marks: 85**

SECTION "A" Marks: 43

(M.C.Qs)

Note: This section consists of 43 questions. Attempt all M.C.Qs. Each carries 01 marks.

Q1. Choose the correct answers for each from the given options:

MULTIPLE CHOICE QUESTIONS

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

Note: This section consists of 43 questions. Attempt all M.C.Qs. Each carries 1 marks.
Q. Choose the correct answers for each from the given options.

1. 3.7×10^4 contains_____significant figures.
   a. 2
   b. 3
   c. 5
   d. 6

2. The empirical formula of a compound is CH_2O and molecular mass is 60. Its molecular formula is
   a. CH_2O
   b. $C_2H_4O_2$
   c. $C_3H_6O_3$
   d. $C_4H_8O_4$

3. Temperature at which the volume of a gas theoretically becomes zero is called_____.
   a. Transition temperature
   b. Critical Temperature
   c. Absolute Zero
   d. Kelvin scale

4. If a=b=c and α =β = ϒ = 900 then the shape of the crystal is
   a. Cubic
   b. Tetragonal
   c. Hexagonal
   d. Orthorhombic

5. The process of direct conversion of solid into vapors is
   a. Condensation
   b. Sublimation
   c. Evaporation
   d. Neutralization

6. The formula, which expresses the actual number of each kind of atom present in the molecule of a compound, is called_____.
   a. Molecular Formula
   b. Empirical Formula
   c. Structural Formula
   d. Chemical Formula

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

7. This is not iso-electronic with Na^{+1} :
   a. Ne
   b. F^{-1}
   c. Mg^{+2}
   d. K^{+1}

8. In comparison of rate diffusion Helium diffuses_____times as of SO_2
Half time
Two
Four
Eight

9. Diamond is very hard because of:
   a. sp^2- Hybridization
   b. Vander Waals forces
   c. Close packing of carbon atoms and large number of covalent bonds
   d. Large amount of energy is required to break the bond

10. Two solids, having the same crystalline structure are called:
   a. Isomorphous
   b. Polymorphous
   c. Isotope
   d. Allotropes

11. The value of Rydberg constant is:

a. $109678cm^{-}$
b. $109678m^{-}$
c. $901768cm^{-}$
d. 901867

12. Melting point of those substances which expand on melting increase when the pressure is
    a. Decrease
    b. Increase
    c. Kept unchanged
    d. Atmospheric

13. Quantum number values of 4p orbital are:
    a. n=4, l=1
    b. n=4,l=0
    c. n=2,l=2
    d. n=3,l=0

14. The angle between sp^3 orbitals is:
    a. 127^0
    b. 109.5^0
    c. 180^0
    d. 90^0

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

15. On emission of alpha particles, $_{92}U^{238}$ changes into :
    a. 90Th 234
    b. 88Ra 226
    c. 84Po 210
    d. 91 Pa 231

16. The energy of each quantum of radiation is directly proportional to its:
    a. Wavelength
    b. Frequency
    c. Wave number
    d. Source of energy

17. For M shell the number of orbitals are:
    a. 1
    b. 4
    c. 9
    d. 16

18. Charge was discovered by:
    a. Wavelength
    b. Frequency
    c. Wave number
    d. Source of energy

19. The minimum energy required to bring about a chemical reaction is called:
    a. Bond energy
    b. Ionization energy
    c. Energy of Activation
    d. Dissociation energy

20. The number of orbitals in each energy level is given by formula:
    a. $2n^2$
    b. (2l+1)
    c. 2(2l+1)
    d. n^2

21. The S.I unit of Dipole moment is:
    a. Dyne/cm
    b. Poise
    c. Debye
    d. Coulomb metre

22. The maximum number of unpaired electrons in 3d energy level is:
    a. 5
    b. 6
    c. 7
    d. 8

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

23. Surface tension and enthalpy are the_____properties
    a. Intensive and extensive
    b. Both are intensive
    c. Extensive and intensive
    d. Both are extensive

24. This color has the shortest wave length in the visible spectrum is:
    a. Red
    b. Violet
    c. Green
    d. Yellow

25. The rate of reaction at a particular time is called:
    a. Average Rate of reaction
    b. Absolute rate of reaction
    c. Instantaneous rate of reaction
    d. Overall rate of reaction

26. Alpha rays are Fast moving
    a. Neutron
    b. Electron
    c. Proton
    d. Helium Nuclei

27. The number of bonds in C_2H_2 molecule is:
    a. One σ and two π bonds
    b. Three σ and one π bonds
    c. Three σ and two π bonds
    d. Two σ and two π bonds

28. Bond energy of C≡ C as compared to C=C is :
    a. Greater
    b. Lesser
    c. Same
    d. Double

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

29. The rate of chemical reaction_____with increase in concentration of the reactant:
    a. Increases
    b. Decreases
    c. Does not alter
    d. Becomes zero

30. Enthalpy is the_____of a system
    a. Heat content
    b. Internal energy
    c. Potential Energy
    d. Kinetic energy

31. One Joule is equals to
    a. 0.239 Cal
    b. 0.391 Cal
    c. 0.398 Cal
    d. 4.184 Cal

32. . The strength of sigma bond is higher for:
    a. s-s overlap
    b. s-p overlap
    c. p-p overlap
    d. sp3 – s overlap

33. When the volume is constant the system is called as
    a. Isobaric
    b. Adiabatic
    c. Isolated
    d. Isochoric

34. ΔH for endothermic reactions is
    a. ΔH= 0
    b. ΔH>0
    c. ΔH<0
    d. ΔH≥0

35. ΔE = q – w represents
    a. First Law of Thermodynamics
    b. Hess's Law
    c. Enthalpy Change
    d. Faraday's law

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

36. The extent of reaction will be maximum for this Kc value:
    a. 10-3
    b. 0.1
    c. 10
    d. 103

37. A very low value of Kc indicates that reactants are:
    a. Very stable
    b. Unstable
    c. Moderately stable
    d. Moderately unstable

38. A powdered solid is more reactive than its chunks due to its:
    a. Higher temperature
    b. Greater volume
    c. Greater surface area
    d. Low temperature

39. NH_3 is prepared by the reaction $N_2 + 3H_2 \leftrightarrow 2NH_3$ ΔH = -21.9 Kcal. The maximum yield of NH_3 is obtained:
    a. At low temperature and high pressure
    b. At high temperature and low pressure
    c. At high temperature and high pressure
    d. At low temperature and low pressure

40. Ionic reactions of inorganic compounds are:
    a. very slow
    b. moderately slow
    c. very fast
    d. moderately fast

41. The value of Kc_____upon the initial concentration of the reaction:
    a. Depends
    b. Partially depends
    c. Does not depend
    d. Sometimes depends sometimes does not depend

42. Photochemical reactions, which proceed only under the influence of light, are of the order:
    a. Zero
    b. First
    c. Third
    d. Second

43. At equilibrium the rate of forward reaction and the rate of reverse reaction are:
    a. Equal
    b. Changing
    c. Different
    d. Fixe

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

Section 'B' (Short Answer Questions)

Note: **Attempt any five part questions.** **(Marks = 25)**

Q2. **(i)** Combustion of 0.5 g of a hydrocarbon produced 1.515g CO_2 and 0.77 g of H_2O if the molecular mass of the compound is 58 amu. Determine the molecular formula.

(ii) Define the following.
* Empirical Formula * System * Surface Tension * Avogadro's Law

(iii) State Boyle's Law, Charles's law and prove them in term of Kinetic Molecular Theory.

(iv) Write down the electronic configuration for ground sates of each of the following.
* F (Z = 9) *Ca^{+2} (Z = 20)
* Cu (Z = 29) * N^{-3} (Z = 7)

(v) Differentiate between the following (write only two differences for each).
* Sigma and Pi bond * Hydration and Hydrolysis

(vi) The ratio of rates of diffusion of two gasses A and B is 1.5:1. If the relative molecular mass of gas A is 16, find out the relative molecular mass of gas B.

(vii) State First Law of Thermodynamic. In a certain process, 900 J of work is done on a system which gives off 500 J of heat. What is the value of change in Internal energy for the process?

(viii) Explain the effects of surface area and concentration of reactant on the rate of reaction.

(ix) Define Dipole moment. Why dipole moment of H_2 and C_6H_6 is zero.

(x) Predict the effect of increase in temperature and pressure on the following system at equilibrium state (only predict the direction)
* $N_2 + 3H_2 \leftrightarrow 2NH_3$ + Heat * $N_2 + O_2$ + Heat $\leftrightarrow 2NO$

SECTION "C" (DETAILED-ANSWER QUESTIONS) (Max Marks: 17)

Note: Attempt any one questions from this section.

Q3 (a) Write the postulates of Bohr's atomic theory. Derive the formula for the frequency and wave number for radiated energy when electron jumps from higher to lower energy level (9)

(b) Write the postulates of electron pair repulsion theory. Explain the shape of the CH_4 and CO_3^{2-} on the basis of electron pair repulsion theory. (8)

Q4 (a) Define oxidation and reduction. Balance the given equations by ION electron method (9)

* $Cl_2 + OH^{-1} \longrightarrow Cl^{-1} + ClO_3^- + H_2O$ (Basic)
* $MnO_4^- + H_2S \longrightarrow Mn^{+2} + S$ (Acidic)

(b) Write Kinetic Molecular theory for any one state of matter, and also discuss the behavior of gasses in light of that theory (8)

ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

Q5 (a) What is the experimental evidence for the presence of small nucleus containing most of the mass and all of the positive charge in the atom (9)

(b) How K_c is used to predict the extent of a reversible reaction ? Calculate the number of moles of I_2 produced at equilibrium when one mole of HI is heated at 250 in vessel having a capacity of $12dm^3$ (Kc=0.051) (8)

$$2HI \leftrightarrow H_2 + I_2$$