

CHEMISTRY
FULL PORTION MODEL QUESTION PAPER - 1

TIME : 2HRS 30 MINS

MAXIMUM MARKS : 70

PART - I

Answer all the questions. Choose the most appropriate answer

15 x 1 = 15

1. The critical temperature of CO₂ is _____
a) 13.1°C b) 21.5°C c) 35.5°C d) 31.1°C
2. The crystal lattice of ionic compounds are composed of _____
a) atoms b) molecules
c) oppositely charged ions d) both molecules and ions
3. Which of the following is an extensive property ?
a) Volume b) Density c) Refractive index d) Surface tension
4. Which of the following contains same number of carbon atoms as are in 6.0 g of carbon (C-12)
a) 6.0 g ethane b) 8.0 g methane c) 21.0 g propane d) 28.0 g CO
5. The maximum number of electrons that can be accommodated in the nth level is _____
a) n² b) n + 2 c) 2n² d) n + 1
6. Group 1 elements are also called
a) Halogens b) Noble gases c) Alkali metals d) Chalcogens
7. Which of the following is / are in photoelectric cells ?
a) Cesium and sodium b) Lithium and Sodium
c) Cesium and potassium d) Lithium salicylate
8. Which of the following do not give flame test ?
a) Beryllium and Magnesium b) Barium and Calcium
c) Strontium d) Radium
9. Consider the following statements :
i) Sodium chloride has face centered cubic system
ii) Cesium chloride has edge centered cubic system
iii) Ammonium chloride has body centered cubic system
Which one of the following statement(s) given above is / are correct ?
a) i , ii and iii b) only ii c) only iii d) i and iii
10. The order value of thermal decomposition of acetaldehyde is _____
a) 1 b) 2 c) 1.5 d) 0
11. When the stationary phase is solid, then the compounds can be separated on the basis of _____
a) Adsorption b) Partition c) Both partition and adsorption d) Either

12. Which metal is used to prepare Lassaigne's filtrate ?
 a) Na b) Ag c) Fe d) Cu
13. The IUPAC name of isobutyraldehyde is
 a) Butyraldehyde b) 2-methyl propanal c) 2-methyl propanol d) 1-butanal
14. The purpose of adding con. H_2SO_4 in nitration of benzene is to produce _____
 a) NO_2 b) NO_2^- c) NO_2^+ d) NO_3^-
15. Which of the following reagent react with methyl magnesium iodide to form higher esters ?
 a) Ethyl chloro formate b) Acid chloride
 c) Solid carbon dioxide d) Cyanogen chloride

PART - II

Answer any six questions in which question No.21 is compulsory

6 x 2 = 12

16. Calculate the molality of an aqueous solution containing 6.0 g of urea (molecular mass = 60) in 500 g of water
17. What is the shape of the orbital with (i) $n=2$ and $l=1$ (ii) $n=3$ and $l=0$
18. Beryllium halides are covalent whereas Magnesium halides are ionic. Why ?
19. Define :(i) unit cell (ii) Long range order
20. If a gas diffuses at the rate of one half as fast as O_2 , find the molecular mass of a given gas
21. Enthalpy of neutralization of acetic acid with sodium hydroxide is less than -57.32 kJ. Justify this statement
22. Explain any two ways to detect the presence of oxygen in an organic compound
23. What happens when methyl acetylene is passed through a red hot tube ?
24. Explain about Wurtz – fittig reaction

PART - III

Answer any six questions in which question No.30 is compulsory

6 x 3 = 18

25. How will you determine the equivalent mass of an oxidizing agent ($KMnO_4$)?
26. Explain about the quantum number that accounts for the orientation of the electron orbital
27. Show that hydrogen peroxide is a powerful reducing agent
28. What are the characteristic parameters of unit cell ?
29. Define Joule – Thomson effect
30. a) Define Van't Hoff factor
 b) Calculate the degree of dissociation of KCl of 0.5 percent aqueous solution whose Van't Hoff factor value is 1.92

31. Distinguish between Electrophiles and Nucleophiles
 32. How will you detect the presence of Nitrogen and Sulphur in an organic compound ?
 33. How is DDT prepared ? Give its use ?

PART - IV**Answer all the questions****5 x 5 = 25**

34. a) Distinguish between ore and mineral with suitable examples
 b) Explain froth flotation process with neat diagram

(OR)

- a) Why noble gases have zero electron gain enthalpy ?
 b) Explain about any three factors influencing ionization enthalpy ?
 35. a) How is plaster of paris prepared ?
 b) mention the uses of plaster of paris

(OR)

Calculate the lattice enthalpy of NaCl from the given data :

Enthalpy of atomization of Na(s)	=	+108.7 kJ mol ⁻¹
Enthalpy of dissociation of Cl ₂	=	+122.0 kJ mol ⁻¹
Enthalpy of NaCl	=	+495.0 kJ mol ⁻¹
Electron affinity of chlorine	=	-349.0 kJ mol ⁻¹
ΔH_f° of overall reaction	=	-411.3 kJ mol ⁻¹

36. a) Explain the laws of osmotic pressure
 b) Explain its determination by Berkley – Hartley method

(OR)

Derive the value of K_c and K_p for the dissociation of PCl₅

37. What are the differences between order and molecularity of the reaction ?

(OR)

- a) Define : Chromatography
 b) Explain about thin layer chromatography ?
 38. Explain the following reactions
 a) n-hexane is treated with Cr₂O₃ / Al₂O₃ at 500°C and 10-20 atm
 b) Isobutylene is treated with Ozone

(OR)

- a) Explain the resonance in benzene ?
 b) Mention the two uses of benzene ?