

OBJECTIVE

NOTE:



You have four choices for each objective type question as A , B , C and D . The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question.

QUESTION NO. 1

DQK-2-24

- 1 The order of rate of diffusion of gases NH_3 , SO_2 , Cl_2 and CO_2 is
(A) $\text{NH}_3 > \text{SO}_2 > \text{Cl}_2 > \text{CO}_2$ (B) $\text{NH}_3 > \text{CO}_2 > \text{SO}_2 > \text{Cl}_2$ (C) $\text{Cl}_2 > \text{SO}_2 > \text{CO}_2 > \text{NH}_3$ (D) $\text{NH}_3 > \text{CO}_2 > \text{Cl}_2 > \text{SO}_2$
- 2 Partial pressure of oxygen in lungs is :
(A) 760 torr (B) 320 torr (C) 159 torr (D) 116 torr
- 3 Which of the following is a Pseudo solid ?
(A) CaF_2 (B) Glass (C) NaCl (D) KCl
- 4 The number of Na^+ ions which surround each Cl^- ion in the NaCl crystal is :
(A) 4 (B) 6 (C) 8 (D) 12
- 5 The e/m value for the positive rays is maximum for :
(A) H_2 (B) H_e (C) O_2 (D) N_2
- 6 The number of neutrons present in ${}_{19}\text{K}^{39}$ is :
(A) 18 (B) 19 (C) 20 (D) 39
- 7 Which of the following has zero dipole moment ?
(A) NH_3 (B) CHCl_3 (C) H_2O (D) CO_2
- 8 In Al_2O_3 , the ratio between the ions is :
(A) 1 : 2 (B) 2 : 1 (C) 2 : 3 (D) 3 : 2
- 9 Calorie is equivalent to :
(A) 0.4184 J (B) 41.84 J (C) 4.184 J (D) 418.4 J
- 10 The pH of human blood is :
(A) 7.0 (B) 7.35 (C) 4.0 (D) 6.5
- 11 In a mixture of 7 g of N_2 and 8 g of O_2 , the mole fraction of O_2 is
(A) 1 (B) 0.1 (C) 0.5 (D) 0.2
- 12 The cell in which electrical energy is converted into chemical energy is called :
(A) Galvanic cell (B) Electrolytic cell
(C) Fuel cell (D) Deniel cell
- 13 Indicate the enzyme which catalyzes the $\text{C}_6\text{H}_{12}\text{O}_6 \longrightarrow 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2$:
(A) Diastase (B) Zymase (C) Urease (D) Invertase
- 14 18 g of H_2O sample has :
(A) 1 mole of H - atom (B) 0.5 mole of O - atom
(C) 6.22×10^{23} moles of H_2O (D) 6.02×10^{23} molecules of H_2O
- 15 The percentage of nitrogen in ammonia is :
(A) $(14/34) \times 100$ (B) $(14/17) \times 100$ (C) $(3/17) \times 100$ (D) $(28/38) \times 100$
- 16 Which one of the following does not undergo sublimation :
(A) KMnO_4 (B) Naphthalene (C) NH_4Cl (D) Iodine
- 17 The comparative rates at which the solutes move in paper chromatography depend on :
(A) Size of paper (B) R_f value of solute
(C) Temperature of the experiment (D) Size of the chromatographic tank used



SECTION-I

QUESTION NO. 2 Write short answers to any Eight (8) of the following DGK-2-24 16

i	Process of cation formation is endothermic. Justify.
ii	What are homoatomic and heteroatomic molecules ? Give one example of each.
iii	Why actual yield is always less than theoretical yield ?
iv	How rate of filtration can be increased ?
v	What is safe and reliable method for drying the crystals ?
vi	Give two characteristics of ideal solvent used for crystallization.
vii	Define isotherm. What is the effect of temperature on isotherm ?
viii	What is quantitative definition of Charles's law ? Give its mathematical form.
ix	Define critical temperature. On which factor does it depends
x	Define pH and pOH. Give its mathematical form.
xi	Define common ion effect. Give one example.
xii	What are acidic and basic buffers. Give one example of each.

QUESTION NO. 3 Write short answers to any Eight (8) of the following

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i	Define Lattice energy. Give example.
ii	Why transition temperature is shown by elements having allotropic forms and by compounds showing polymorphism. Give example.
iii	Iodine dissolves readily in Tetrachloromethane. Give reason.
iv	Water and ethanol can mix easily and in all proportions. Give reason.
v	Prove that $E = h c \bar{\nu}$
vi	Complete (or) write balanced equation for two Nuclear reactions. (a) ${}^4_2\text{He} + {}^9_4\text{Be} \longrightarrow ?$ (b) ${}^{14}_7\text{N} + {}^1_0\text{n} \longrightarrow ?$
vii	Why is it necessary to decrease the pressure in the discharge tube to get the cathode rays ?
viii	How neutrons are used in the treatment of Cancer ?
ix	One molal solution of urea in water is dilute as compared to one molar solution of urea, but the number of particles of the solute is same. Justify.
x	Differentiate between ideal and non-ideal solutions.
xi	The rate of a chemical reaction is an ever changing parameter under the given conditions. Give reason.
xii	What is Pseudo first order reaction ?

QUESTION NO. 4 Write short answers to any Six (6) of the following

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i	Dipole moment of CO_2 is zero, but that of SO_2 is 1.61 D why ?
ii	Anionic radius is more than its parent atom why ?
iii	Draw geometry of BeCl_2 molecule on the basis of VSEPR theory.
iv	Define covalent radius. Give one example.
v	Define thermochemistry.
vi	State standard enthalpy of solution. Give example.
vii	Define internal energy.
viii	Draw diagram of voltaic cell.
ix	Define electrochemistry.

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5.(A)	What is stoichiometry ? Give its assumptions. Mention two laws which help to perform the stoichiometric calculation	1+2+1
(B)	Define vapour pressure of liquids. Also explain manometric method for its determination.	1+3
Q.6.(A)	Calculate the density of CH_4 (g) at 0°C and 1 atmospheric pressure.	4
(B)	Describe Millikan's oil drop method to measure the charge on electron.	4
Q.7.(A)	Write down the four postulates of VSEPR theory.	4
(B)	N_2 (g) and H_2 (g) combine to give NH_3 (g). The value of K_c in this reaction at 500°C is 6.0×10^{-2} . Calculate the value of K_p for this reaction.	4
Q.8.(A)	Define the following with examples. (i) Enthalpy (ii) Exothermic reaction (iii) Boundary (iv) Enthalpy of atomization	4
(B)	Write any four industrial importance of electrolytic process.	4
Q.9.(A)	Derive a relationship for $M_2 = \frac{K_b}{\Delta T_b} \cdot \frac{1000W_2}{W_1}$	4
(B)	What do you mean by the term "order of reaction" ? Explain by giving any three suitable examples.	1+3