

PAPER CODE = 6485 LHR-11-1-23

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	The study of heat changes accompanying a chemical reactions is known as : (A) Electrochemistry (B) Physical chemistry (C) Analytical chemistry (D) Thermochemistry
2	Which of the following has hydrogen bonding : (A) CH_4 (B) CCl_4 (C) NH_3 (D) $NaCl$
3	An excess of aqueous silver nitrate is added to aqueous barium chloride and precipitate is removed by filtration. What are the main ions in the filtrate : (A) Ag^+ and Ba^{2+} and NO_3^- (B) Ag^+ and NO_3^- only (C) Ba^{2+} and NO_3^- only (D) Ba^{2+} and NO_3^- and Cl^-
4	Mass in grams of 2.74 moles of $KMnO_4$: (A) 0.715 g (B) 1416.2 g (C) 432.92 g (D) 294 g
5	The unit of the rate constant is the same as that of the rate of reaction in : (A) Zero Order Reaction (B) First Order Reaction (C) Second Order Reaction (D) Third Order Reaction
6	Splitting of spectral lines when atoms are subjected to strong electric field is called : (A) Stark effect (B) Zeeman effect (C) Photoelectric effect (D) Compton effect
7	The partial pressure of oxygen in air is : (A) 116 torr (B) 159 torr (C) 110 torr (D) 160 torr
8	Isotopes differ in : (A) Arrangement of electrons in orbitals (B) Properties which depend upon mass (C) Chemical properties (D) The extent to which they may be affected in electromagnetic field
9	Calorie is equivalent to : (A) 0.4184 J (B) 4.184 J (C) 41.84 J (D) 418.4 J
10	Stronger the oxidizing agent, greater is the : (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell
11	Which of the following hydrogen halides has the highest percentage of ionic character : (A) HF (B) HCl (C) HBr (D) HI
12	Pressure remaining constant, at which temperature the volume of a gas will become twice of what it is at $0^\circ C$: (A) $546^\circ C$ (B) $200^\circ C$ (C) 546 K (D) 273 K
13	Cathode in Nickel Cadmium cell is : (A) Zn (B) NiO_2 (C) Cd (D) Ag_2O
14	Ionic solids are characterized by : (A) Low melting points (B) High vapour pressures (C) Good conductivity in solid state (D) Solubility in polar solvents
15	Solvent extraction is an equilibrium process and is controlled by : (A) Law of mass action (B) Distribution law (C) The amount of solvent used (D) The amount of solute
16	The optimum pressure in ammonia synthesis by Haber's process is : (A) 100 – 400 atm (B) 250 – 400 atm (C) 200 – 300 atm (D) 150 – 450 atm
17	A solution of glucose is 10% w/v. The volume in which 1 g mole of it is dissolved will be : (A) $1 dm^3$ (B) $200 cm^3$ (C) $900 cm^3$ (D) $1.8 dm^3$

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2. Write short answers to any EIGHT (8) questions :

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- (i) Define percentage yield give example.
- (ii) How many moles of CO_2 can be produced from burning one mole of octane mass of octane is 114?
- (iii) Calculate mass in grams of 2.74 mole of KMnO_4 .
- (iv) How do you differentiate between diffusion and effusion?
- (v) Gases show non ideal behaviour at low temperature and high pressure, give reason.
- (vi) What is Avogadro's law of gases? Give example.
- (vii) Write electronic configuration of Cu_{29} and K_{19}
- (viii) Why positive rays are also called as canal rays?
- (ix) Why oxygen molecule is paramagnetic in nature?
- (x) Define state function, give example.
- (xi) Justify that heat of formation of a compound is the sum of all the other enthalpies.
- (xii) What is a spontaneous process? Give two examples.

3. Write short answers to any EIGHT (8) questions :

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- (i) What is difference between qualitative and quantitative analysis?
- (ii) Define sublimation. Write name of two compounds which can be sublimed.
- (iii) Write two uses of chromatography.
- (iv) What are intermolecular forces of attraction? Give two examples.
- (v) Evaporation causes cooling. Give reason.
- (vi) Diamond is hard and an electrical insulator. Give reason.
- (vii) Differentiate between hydration and hydrolysis.
- (viii) The concentration in terms of molality is independent of temperature but molarity depends upon temperature. Give reason.
- (ix) Justify that the boiling point of one molal urea solution is 100.52°C but the boiling point of two molal urea solution is less than 101.04°C .
- (x) Define homogeneous catalysis. Give one example.
- (xi) Justify that the radioactive decay is always a first order reaction.
- (xii) Differentiate between rate and rate constant of a reaction.

4. Write short answers to any SIX (6) questions :

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- (i) Define bond order. Give one example.
- (ii) Differentiate between bonding molecular orbital and antibonding molecular orbital.

(Turn Over)

(2)

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4. (iii) The radius of an anion is always larger than parent atom. Why?
- (iv) How does the equilibrium constant of a reaction tell us the direction of a chemical reaction?
- (v) How can NaCl be purified by common ion effect?
- (vi) What are pK_a and pK_b ? How do they show the acidic and basic strength?
- (vii) What is the function of salt bridge in galvanic cell?
- (viii) What is anodized aluminium?
- (ix) Calculate the oxidation state of Mn in $KMnO_4$ and K_2MnO_4

SECTION – II

Note : Attempt any THREE questions.

5. (a) Define the following terms with examples :
(i) Relative atomic mass (ii) Molecular ion (iii) Isotope (iv) Molar volume. 1,1,1,1
- (b) A sample of nitrogen gas is enclosed in a vessel of volume 380 cm^3 at 120°C and pressure of 101325 Nm^{-2} . This gas is transferred to a 10 dm^3 flask and cooled to 27°C . Calculate the pressure in Nm^{-2} exerted by the gas at 27°C . 4
6. (a) Describe four properties of the crystalline solids. 4
- (b) What is bomb calorimeter and describe it with the help of diagram? 4
7. (a) Derive the equation to calculate radius of electron in n th orbit hydrogen atom by using Bohr's model. 4
- (b) The solubility of PbF_2 at 25°C is 0.64 g dm^{-3} . Calculate K_{sp} of PbF_2 . 4
At. Mass of Pb = 207
At. Mass of F = 19
8. (a) Define atomic orbital hybridization. How can we describe the geometry of NH_3 on its basis? 4
- (b) What is lead accumulator battery? Discuss its discharging process. 4
9. (a) Discuss Raoult's law when one component is volatile other is non-volatile. 4
- (b) Describe half life method and method of large excess for finding the order of reaction. 2,2