Roll No _____
LHR GRP-1
CHEMIST...
Q.PAPER
Academic Sessions 2019–2021 to 2022–2024)
(T–I)   Time Allowed : 20 Minutes
Maximum Marks : 17

PAPER CODE — 6487

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	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) $1.8 dm^3$	
2	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	
3	Pressure remaining constant, at which temperature the volume of a gas will become twice of what it is at 0 °C :	
	(A) 546 °C (B) 200 °C (C) 546 K (D) 273 K	
4	Calorie is equivalent to :	
	(A) 0.4184 J (B) 4.184 J (C) 41.84 J (D) 418.4 J	
5	Which of the following hydrogen halides has the highest percentage of ionic character :	
	(A) HF (B) HCl (C) HBr (D) HI	
6	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	
7	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	
8	Which of the following has hydrogen bonding :	
	(A) CH_4 (B) CCl_4 (C) NH_3 (D) NaCl	
9	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^-	
10	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	
11	The study of heat changes accompanying a chemical reactions is known as :	
	(A) Electrochemistry (B) Physical chemistry	
	(C) Analytical chemistry (D) Thermochemistry	
12	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	
13	Stronger the oxidizing agent, greater is the :	
	(A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell	
14	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	
15	Cathode in Nickel Cadmium cell is :	
	(A) Zn (B) NiO_2 (C) Cd (D) Ag_2O	
16	Ionic solids are characterized by :	
	(A) Low melting points (B) High vapour pressures	
	(C) Good conductivity in solid state (D) Solubility in polar solvents	
17	The partial pressure of oxygen in air is :	
	(A) 116 torr (B) 159 torr (C) 110 torr (D) 160 torr	

SECTION – I

2. Write short answers to any EIGHT (8) questions :　　　　　　　　　　16

    (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 :　　　　　　　　　　16

    (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 :　　　　　　　　　　12

    (i) Define bond order. Give one example.

    (ii) Differentiate between bonding molecular orbital and antibonding molecular orbital.

(Turn Over)

RY

I (Objective Type)

(To be filled in by the candidate) (Academic Sessions 2019 – 2021 to 2022 – 2024)

223-1ˢᵗ Annual-(INTER PART – I)

GROUP – I

PAPER CODE = 6487

Time Allowed : 20 Minutes

Maximum Marks : 17

possible answers A, B, C and D is ----

(2)

4. (iii) The radius of an onion 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

LHR GRP-1

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 cm³ at 120 °C and pressure of 101325 Nm^{-2}. This gas is transferred to a 10 dm³ 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 nth 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. 2,2

(b) Describe half life method and method of large excess for finding the order of reaction.

42-223-I-(Essay Type) – 41000