Roll No						
CHEMI	ISTRY 221-(INTER PART – I) Time Allowed: 20 Minutes					
Q.PAPE	R-I (Objective Type) GROUP-I Maximum Marks: 17					
	PAPER CODE = 6487 LHR-G(-21					
Note: 1	Four possible answers A, B, C and D to each question are given. The choice which you think is correct.					
1	fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling					
1-1	two or more circles will result in zero mark in that question.  The pH of mixture of CH COONs, and CH COONs is					
1-1	The pH of mixture of $CH_3COONa$ and $CH_3COOH$ is:					
2	(A) 7 (B) $>$ 7 (C) $<$ 7 (D) 1					
2	Balmer series in hydrogen spectrum lies in the region:					
3	(A) Ultraviolet (B) Visible (C) Infrared (D) Microwave					
3	Density of an ideal gas can be calculated by the formula:					
	(A) $d = nRT$ (B) $d = \frac{PM}{RT}$ (C) $d = \frac{m}{M}RT$ (D) $d = \frac{PV}{M}$					
4	In endothermic reactions, the heat content of the :					
-4						
	(A) Products is more than that of reactants (B) Reactants is more than that of products					
5	(C) Surrounding increases (D) Reactants and products are equal					
)	Which of the following species has unpaired electrons in antibonding molecular orbitals:					
	(A) $O_2^{2+}$ (B) $N_2^{2-}$ (C) $B_2$ (D) $F_2$					
6	(A) $O_2^{2+}$ (B) $N_2^{2-}$ (C) $B_2$ (D) $F_2$ 1 gram formula of $NaC\ell$ is equal to :					
	(A) $58.5 g$ (B) $23 g$ (C) $35.5 g$ (D) $12 g$					
7	The unit of rate constant is the same at that of rate of reaction in:					
	(A) First order reaction (B) Second order reaction					
	(A) First order reaction (B) Second order reaction (C) Zero order reaction (D) This order reaction					
8	When water freezes at 0 °C, its density decreases due to :					
	(A) Cubic structure of ice (B) Empty spaces present in structure of ice					
	(C) Change of bond lengths (D) Change of bond angles					
9	An excess of silver nitrate in aqueous form is added to aqueous barium chloride and					
	precipitate is removed by filtration. What are main ions in the filtrate:					
	(A) $Ag^+$ and $NO_3^-$ only (B) $Ag^+$ and $Ba^{2+}$ and $NO_3^-$					
	(C) $Ba^{2+}$ and $NO_3^-$ only (D) $Ba^{2+}$ and $NO_3^-$ and $C\ell^-$					
10	Many elements have fractional atomic masses, this is because:					
	(A) The mass of an atom is itself fractional (B) Atomic masses are average masses of isobars					
	(C) Atomic masses are average masses of isotopes					
	(D) Atomic masses are average masses of isotopes proportional to their relative abundance					
11	According to VSEPR theory, the shape of PH <sub>3</sub> molecule is:					
	(A) Trigonal pyramidal (B) Tetragonal (C) Linear (D) Trigonal planer					
12	Which of the following compounds do not show process of sublimation:					
	(A) Ammonium chloride (B) Iodine (C) Naphthalene (D) Carbon tetra chloride					
13	A thermometer used in Landsberger's method can read upto:					
	(A) 0.1 K (B) 0.01 F (C) 0.01 K (D) 0.01 °C					
14	In the monoclinic crystal system, bond axes are:					
	(A) $a = b = c$ (B) $a = b \neq c$ (C) $a \neq b = c$ (D) $a \neq b \neq c$					
15	If a salt bridge is not used between two half cells, then the voltage:					
	(A) Decreases rapidly (B) Decreases slowly (C) Does not change (D) Drops to zero					
16	Orbitals having same energy are called:					
	(A) Hybrid orbitals (B) Valence orbitals (C) Degenerate orbitals (D) d-orbitals					
17	If absolute temperature of a gas is doubled and the pressure is reduced to one half, the volume					
• "	of the gas will:					

		AISTRY 221-(INTER PART – I) Time Allowed: 2.40 hours are allowed: 2.40 hours a	2) urs
•	<b>XX/:</b>	SECTION - I HR-4 L21 rite short answers to any EIGHT (8) questions:	16
2.	(i)	How is the law of conservation of mass obeyed during stoichiometeric calculations?	
		and neutrons? Justify.	
		and the same stores (males) in 0.1 a of sodium	
		- Cublimation process	
		C. Lucrosto graphy	
	(vi)	CDO	
		- A A A A A A A A A A A A A A A A A A A	
	viii)	full among	
	(ix)	the statement of Charles's law	
	(x)		
	(xi)	for a second process of a colligative property?	
	(xii)	) Differentiate between ideal and non-ideal solutions.	
3.	Wr	rite short answers to any EIGHT (8) questions :	16
	(i)		
	(ii)		
	(iii)	i) What do you know about anisotropy, explain with example?	
	(iv)		
	(v)		
	(vi)		And the same of th
	(vii)	t the state of the state of the mathematical collision of the mathematical collision	•
(	(viii)		(y <sub>1</sub>
	(ix)	Write Henderson's equation for acidic and basic buffer.	· 4
	(x)		The same of the sa
	(xi)		.acces
	(xii)		12
4.	Wı	Vrite short answers to any SIX (6) questions :	12
	(i)	i) Define bond order and give one example.	ام
	(ii)		ic.
	(iii)		
	(iv)		
	(v)		
	(vi)		
	(vii)	,	
	(viii)		
	(ix)	(Turn Over)	

## SECTION - II

No	ote :	Attempt any THREE questions.	
5.	(a)	$NH_3$ gas can be produced by heating together $NH_4C\ell$ and $Ca(OH)_2$ . If a mixture containing 100g of each solid is heated then calculate the number of grams of NH <sub>3</sub> produced. $2NH_4C\ell + Ca(OH)_2 \rightarrow CaC\ell_2 + 2NH_3 + 2H_2O$	4
	(b)	Explain isomorphism with examples.	2
6.	(a)	Give postulates of kinetic molecular theory.	4
	(b)	Derive an expression to determine radius of an orbit using Bohr's model.	4
7.	(a)	What is $sp^2$ hybridization, how it explains structure of ethene?	4
	(b)	What is Hess's law? Explain by giving two examples.	4
8.	(a)	Calculate the pH of a buffer solution in which 0.11 molar CH <sub>3</sub> COONa and 0.09 molar	
		acetic acid solutions are present. $K_a$ for the $CH_3COOH$ is $1.85 \times 10^5$ .	4
	(b)	Define half life period. How order of reaction can be determined by knowing half life of a reaction?	4
9.	(a)	What are colligative properties of solutions? Explain elevation of boiling points.	4
	(b)	Describe the construction and working of standard hydrogen electrode.	4

### Comparison of the content of t	ره		illed in by the cand	DT I)	Time Allowed: 20 Minutes
PAPER CODE = 6486	<b>EMIS</b>	ΓRY		/	Maximum Marks : 17
ote: 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 pH of 10 <sup>-2</sup> mol dm <sup>-2</sup> of an aqueous solution of H <sub>2</sub> SO <sub>4</sub> is:  (A) 3 (B) 2.7 (C) 2.0 (D) 1.5  2 Bonol angles α − γ = 90°; β ≠ 90° and axes α ≠ b ≠ c is for crystal system:  (A) Tetragonal (B) Hexagonal (C) Monoclinic (D) Triclinic  1 If the rate equation of a reaction 2.4 + B → Products is, rate = K[A] [B] and A is present in large excess, then order is:  (A) 1 (B) 2 (C) 3 (D) Zero  4 Nickel has number of isotopes:  (A) 3 (B) 5 (C) 7 (D) 2  5 pH of human blood is:  (A) 7.35 (B) 6.35 (C) 5.35 (D) 4.35  6 The number of bonds in nitrogen molecule is:  (A) One σ and one π (B) One σ and two π (C) Three sigma only (D) Two σ and one π Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0°C:  (A) 546°C (B) 200°C (C) 546 K (D) 273 K  8 1 gram formula of NaCℓ is equal to:  (A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) 1 (B) 5.1 (C) 1/51 (D) 6  de-Broglie equation is represented as:  (A) 2.6 h (B) 3.1 (C) 418.4 J (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 2.000°C (B) 1000°C (C) 5000°C (D) 10000°C  13 Ionization energy for Mg → Mg <sup>+</sup> + 1e <sup>-</sup> has ΔH = −−:  (A) 7.38 KJ moℓ <sup>-</sup> (B) 238 KJ moℓ (C) 448 KJ moℓ (D) 138 KJ moℓ  14 The velocity of photon is:  (A) 1 Law of mass action (B) The amount of solvent used  (C) Equal to square of its amplitude (D) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used  (C) Distribution law (D) The amount of solvent used  (C) Distribution law (D) The amount of solvent used  (C) Distributi			DADED CODE	= 6486 1 10-6	2-2/
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If the rate equation of a reaction $2A + B \rightarrow \text{Products is}$ , rate = $K[A] [B]$ and A is present in large excess, then order is:  (A) 1 (B) 2 (C) 3 (D) Zero  Nickel has number of isotopes:  (A) 3 (B) 5 (C) 7 (D) 2  5 pH of human blood is:  (A) 7.35 (B) 6.35 (C) 5.35 (D) 4.35  6 The number of bonds in nitrogen molecule is:  (A) One $\sigma$ and one $\pi$ (B) One $\sigma$ and two $\pi$ (C) Three sigma only (D) Two $\sigma$ and one $\pi$ Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) 546 °C (B) 200 °C (C) 546 K (D) 273 K  8 1 gram formula of $NaC\ell$ is equal to:  (A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6  10 de-Broglie equation is represented as:  (A) $\frac{1}{5}$ (B) $\frac{1}{5}$ (C) $\frac{1}{51}$ (D) 6  11 1-ealorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) $\frac{1}{5}$ (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 20000 °C (B) $\frac{1}{5}$ (B) $\frac{238}{5}$ KJ $mo\ell$ (C) $\frac{5}{5}$ (D) 138 KJ $mo\ell$ (D) 138 KJ $mo\ell$ (D) 138 KJ $mo\ell$ (D) 238 KJ $mo\ell$ (D) 249 C) 149 C) 150 C) C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solute  16 Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell	2	Bolic angles $\alpha - \gamma - \gamma$	(D) Havegenel	(C) Monoclin	ic (D) Triclinic
in large excess, then order is:  (A) 1 (B) 2 (C) 3 (D) Zero  Nickel has number of isotopes:  (A) 3 (B) 5 (C) 7 (D) 2  5 pH of human blood is:  (A) 7.35 (B) 6.35 (C) 5.35 (D) 4.35  6 The number of bonds in nitrogen molecule is:  (A) $One \sigma$ and $one \pi$ (B) $One \sigma$ and $two \pi$ (C) Three sigma only (D) Two $\sigma$ and one $\pi$ 7 Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) $S46$ °C (B) $200$ °C (C) $546$ K (D) $273$ K  8 I gram formula of $NaC\ell$ is equal to:  (A) $58.5$ g (B) $23$ g (C) $35.5$ g (D) $12$ g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) $5.1$ (C) $\frac{1}{51}$ (D) 6  10 de-Broglie equation is represented as:  (A) $\frac{h}{2}$ (B) $\frac{h}{mv}$ (B) $\frac{h}{m}$ (C) $\frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to:  (A) $0.4184$ J (B) $41.84$ J (C) $418.4$ J (D) $4.184$ J  12 The temperature of a natural plasma is about:  (A) $20000$ °C (B) $1000$ °C (C) $5000$ °C (D) $10000$ °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738$ $KI mo\ell$ (B) $238$ $KJ mo\ell$ (C) $448$ $KJ mo\ell$ (D) $138$ $KJ mo\ell$ 14 The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solute  16 Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:  (C) NaC $\ell$ (D) All of these		(A) Tetragonal	(B) Hexagonai	(C) Wonochi	- V[4P [R] and A is present
in large excess, then order is:  (A) 1 (B) 2 (C) 3 (D) Zero  Nickel has number of isotopes:  (A) 3 (B) 5 (C) 7 (D) 2  5 pH of human blood is:  (A) 7.35 (B) 6.35 (C) 5.35 (D) 4.35  6 The number of bonds in nitrogen molecule is:  (A) $One \sigma$ and $one \pi$ (B) $One \sigma$ and $two \pi$ (C) Three sigma only (D) Two $\sigma$ and one $\pi$ 7 Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) $S46$ °C (B) $200$ °C (C) $546$ K (D) $273$ K  8 I gram formula of $NaC\ell$ is equal to:  (A) $58.5$ g (B) $23$ g (C) $35.5$ g (D) $12$ g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) $5.1$ (C) $\frac{1}{51}$ (D) 6  10 de-Broglie equation is represented as:  (A) $\frac{h}{2}$ (B) $\frac{h}{mv}$ (B) $\frac{h}{m}$ (C) $\frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to:  (A) $0.4184$ J (B) $41.84$ J (C) $418.4$ J (D) $4.184$ J  12 The temperature of a natural plasma is about:  (A) $20000$ °C (B) $1000$ °C (C) $5000$ °C (D) $10000$ °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738$ $KI mo\ell$ (B) $238$ $KJ mo\ell$ (C) $448$ $KJ mo\ell$ (D) $138$ $KJ mo\ell$ 14 The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solute  16 Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:  (C) NaC $\ell$ (D) All of these	3	If the rate equation of	a reaction $2A + B$ -	→ Products is, rate	
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(A) 3 (B) 5 (C) 7 (D) 2  5 pH of human blood is: (A) 7.35 (B) 6.35 (C) 5.35 (D) 4.35  6 The number of bonds in nitrogen molecule is: (A) One $\sigma$ and one $\pi$ (B) One $\sigma$ and two $\pi$ (C) Three sigma only (D) Two $\sigma$ and one $\pi$ (R) One $\sigma$ and two $\pi$ (C) Three sigma only (D) Two $\sigma$ and one $\pi$ (P) One $\sigma$ and two $\sigma$ (C) Three sigma only (D) Two $\sigma$ and one $\sigma$ (P) One $\sigma$ and two $\sigma$ (C) Three sigma only (D) Two $\sigma$ and one $\sigma$ (R) One $\sigma$ and two $\sigma$ (C) Three sigma only (D) Two $\sigma$ and one $\sigma$ (P) Of these		(A) 1		(C) 3	(D) Zero
5 pH of human blood is:  (A) 7.35 (B) 6.35 (C) 5.35 (D) 4.35  6 The number of bonds in nitrogen molecule is:  (A) One σ and one π (B) One σ and two π (C) Three sigma only (D) Two σ and one π Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) 546 °C (B) 200 °C (C) 546 K (D) 273 K  8 1 gram formula of NaCℓ is equal to:  (A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6  10 dc-Broglie equation is represented as:  (A) $\frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) 418.4 J (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) 738 $KJ mo\ell^-$ (B) 238 $KJ mo\ell^-$ (C) 448 $KJ mo\ell^-$ (D) 138 $KJ mo\ell^-$ 14 The velocity of photon is:  (A) Independent of wavelength (D) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used  (C) Distribution law (D) The amount of solute  Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:	4	Nickel has number of	isotopes:		
5 pH of human blood is:  (A) 7.35 (B) 6.35 (C) 5.35 (D) 4.35  6 The number of bonds in nitrogen molecule is:  (A) One σ and one π (B) One σ and two π (C) Three sigma only (D) Two σ and one π  7 Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) 546 °C (B) 200 °C (C) 546 K (D) 273 K  8 I gram formula of $NaC\ell$ is equal to:  (A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6  10 de-Broglie equation is represented as:  (A) $\lambda = \frac{h}{m\nu}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{\nu}$ (D) $\lambda = \frac{2h}{m\nu}$ 11 1-calorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) 418.4 J (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738 KJ mo\ell^-$ (B) $238 KJ mo\ell^-$ (C) $448 KJ mo\ell^-$ (D) $138 KJ mo\ell^-$ 14 The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used  (C) Distribution law (D) The amount of solvent used  (C) Distribution law (D) The amount of solvent used  (C) Redox potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:		(A) 3	(B) 5	(C) 7	(D) 2
(A) 7.35 (B) 6.35 (C) 5.35 (D) 7.33  6 The number of bonds in nitrogen molecule is:  (A) One $\sigma$ and one $\pi$ (B) One $\sigma$ and two $\pi$ (C) Three sigma only (D) Two $\sigma$ and one $\pi$ 7 Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) 546 °C (B) 200 °C (C) 546 K (D) 273 K  8 1 gram formula of $NaC\ell$ is equal to:  (A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6  10 de-Broglie equation is represented as:  (A) $\frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) 418.4 J (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13 Ionization energy for $Mg \rightarrow Mg^* + 1e^-$ has $\Delta H =$ :  (A) $738 KJ mo\ell^-$ (B) $238 KJ mo\ell^-$ (C) $448 KJ mo\ell^-$ (D) $138 KJ mo\ell^-$ 14 The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used  (C) Distribution law (D) The amount of solvent used  (C) Distribution law (D) The amount of solvent used  (C) Distribution law (D) The amount of solvent used  (C) Redox potential (B) Reduction potential  (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:  (C) NaCl (D) All of these	5	nH of human blood is	:		
6 The number of bonds in nitrogen molecule is:  (A) One σ and one π (B) One σ and two π (C) Three sigma only (D) Two σ and one π  7 Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) 546 °C (B) 200 °C (C) 546 K (D) 273 K  8 I gram formula of $NaC\ell$ is equal to:  (A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6  10 de-Broglie equation is represented as:  (A) $\lambda = \frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) 418.4 J (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738 \ K I mo\ell^-$ (B) $238 \ K J mo\ell^-$ (C) $448 \ K J mo\ell^-$ (D) $138 \ K J mo\ell^-$ 14 The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Redox potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:			(B) 6.35	(C) 5.35	(D) 4.35
(A) One $\sigma$ and one $\pi$ (B) One $\sigma$ and two $\pi$ (C) Three sigma only (D) Two $\sigma$ and one $\pi$ Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at 0 °C:  (A) $546$ °C (B) $200$ °C (C) $546$ K (D) $273$ K  8 1 gram formula of $NaC\ell$ is equal to:  (A) $58.5$ g (B) $23$ g (C) $35.5$ g (D) $12$ g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) $5.1$ (C) $\frac{1}{51}$ (D) $6$ 10 dc-Broglie equation is represented as:  (A) $\lambda = \frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to:  (A) $0.4184$ J (B) $41.84$ J (C) $418.4$ J (D) $4.184$ J  12 The temperature of a natural plasma is about:  (A) $20000$ °C (B) $1000$ °C (C) $5000$ °C (D) $10000$ °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738$ K I $mo\ell$ (B) $238$ K J $mo\ell$ (C) $448$ K J $mo\ell$ (D) $138$ K J $mo\ell$ 14 The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Redox potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:  (C) NaC $\ell$ (D) All of these	6	The number of bonds	in nitrogen molecule		
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of what it is at 0 °C :  (A) $546  ^{\circ}\text{C}$ (B) $200  ^{\circ}\text{C}$ (C) $546  ^{\circ}\text{K}$ (D) $273  ^{\circ}\text{K}$ 8 I gram formula of $NaC\ell$ is equal to :  (A) $58.5  ^{\circ}\text{g}$ (B) $23  ^{\circ}\text{g}$ (C) $35.5  ^{\circ}\text{g}$ (D) $12  ^{\circ}\text{g}$ 9 $18  ^{\circ}\text{g}$ glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is :  (A) $\frac{1}{5}$ (B) $5.1$ (C) $\frac{1}{51}$ (D) $6$ 10 de-Broglie equation is represented as :  (A) $\lambda = \frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to :  (A) $0.4184  ^{\circ}\text{J}$ (B) $41.84  ^{\circ}\text{J}$ (C) $418.4  ^{\circ}\text{J}$ (D) $4.184  ^{\circ}\text{J}$ 12 The temperature of a natural plasma is about :  (A) $20000  ^{\circ}\text{C}$ (B) $1000  ^{\circ}\text{C}$ (C) $5000  ^{\circ}\text{C}$ (D) $10000  ^{\circ}\text{C}$ 13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738  KJ  mo\ell^-$ (B) $238  KJ  mo\ell^-$ (C) $448  KJ  mo\ell^-$ (D) $138  KJ  mo\ell^-$ 14 The velocity of photon is :  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by :  (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solute  16 Stronger the oxidizing agent, greater is the :  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid :		(A) One $\sigma$ and one $\pi$	(B) One of and tw	noroture the volume	of the gas will become twice
(A) $546  ^{\circ}\text{C}$ (B) $200  ^{\circ}\text{C}$ (C) $546  \text{K}$ (D) $273  \text{K}$ 8   1 gram formula of $NaC\ell$ is equal to: (A) $58.5  \text{g}$ (B) $23  \text{g}$ (C) $35.5  \text{g}$ (D) $12  \text{g}$ 9   18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is: (A) $\frac{1}{5}$ (B) $5.1$ (C) $\frac{1}{51}$ (D) 6  10   de-Broglie equation is represented as: (A) $\lambda = \frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11   1-calorie is equivalent to: (A) $0.4184  \text{J}$ (B) $41.84  \text{J}$ (C) $418.4  \text{J}$ (D) $4.184  \text{J}$ 12   The temperature of a natural plasma is about: (A) $20000  ^{\circ}\text{C}$ (B) $1000  ^{\circ}\text{C}$ (C) $5000  ^{\circ}\text{C}$ (D) $10000  ^{\circ}\text{C}$ 13   Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ : (A) $738  KJ  mo\ell^-$ (B) $238  KJ  mo\ell^-$ (C) $448  KJ  mo\ell^-$ (D) $138  KJ  mo\ell^-$ 14   The velocity of photon is: (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15   Solvent extraction is an equilibrium process and it is controlled by: (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solvent used (C) Distribution law (D) The amount of solute  16   Stronger the oxidizing agent, greater is the: (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F. of cell  17   Which of the following is a pseudo solid:  18   Verification of the following is a pseudo solid:  19   Verification of the following is a pseudo solid:  10   Verification of the following is a pseudo solid:	7	Pressure remaining co	instant, at which telli	perature the volume	or the gas was
8   1 gram formula of $NaC\ell$ is equal to:  (A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  9   18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6  10   de-Broglie equation is represented as:  (A) $\lambda = \frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11   1-calorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) 418.4 J (D) 4.184 J  12   The temperature of a natural plasma is about:  (A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13   Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738 KJ mo\ell^-$ (B) $238 KJ mo\ell^-$ (C) $448 KJ mo\ell^-$ (D) $138 KJ mo\ell^-$ 14   The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15   Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solvent used  (C) Distribution law (D) The amount of solute  16   Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential  (C) Redox potential (B) Reduction potential  (C) Redox potential (D) E.M.F of cell			7.00.00	(C) 546 V	(D) 273 K
(A) 58.5 g (B) 23 g (C) 35.5 g (D) 12 g  9 18 g glucose is dissolved in 90 g of water, the relative lowering of vapour pressure is:  (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6  10 dc-Broglie equation is represented as:  (A) $\lambda = \frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{h}{v}$ (D) $\lambda = \frac{2h}{mv}$ 11 1-calorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) 418.4 J (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738  KJ  mo\ell$ (B) $238  KJ  mo\ell$ (C) $448  KJ  mo\ell$ (D) $138  KJ$		(A) 546 °C		(C) 340 K	(B) 273 II
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(A) $\lambda = \frac{h}{mv}$ (B) $m = \frac{h}{\lambda}$ (C) $m = \frac{n}{v}$ (D) $\lambda = \frac{2\pi}{mv}$ 11 1-calorie is equivalent to:  (A) 0.4184 J (B) 41.84 J (C) 418.4 J (D) 4.184 J  12 The temperature of a natural plasma is about:  (A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13 Ionization energy for $Mg \rightarrow Mg^+ + 1e^-$ has $\Delta H =$ :  (A) $738  KJ  mo\ell^-$ (B) $238  KJ  mo\ell^-$ (C) $448  KJ  mo\ell^-$ (D) $138  KJ  mo\ell^-$ 14 The velocity of photon is:  (A) Independent of wavelength (B) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solute  16 Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:	10	de-Broglie equation i	s represented as:	7	2 h
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(A) 20000 °C (B) 1000 °C (C) 5000 °C (D) 10000 °C  13 Ionization energy for Mg → Mg <sup>+</sup> + 1e <sup>-</sup> has ΔH = :  (A) 738 KJ mol <sup>-</sup> (B) 238 KJ mol <sup>-</sup> (C) 448 KJ mol <sup>-</sup> (D) 138 KJ mol <sup>-</sup> 14 The velocity of photon is:  (A) Independent of wavelength (C) Equal to square of its amplitude (D) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solute  16 Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:  (C) NaCl (D) All of these	12	The temperature of a	natural plasma is ab	out:	
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(A) 738 KJ mol (B) 238 KJ mol (C) 448 KJ mol (D) 138 KJ mol  14 The velocity of photon is:  (A) Independent of wavelength (C) Equal to square of its amplitude (D) Depends on wavelength (C) Equal to square of its amplitude (D) Depends on its source  15 Solvent extraction is an equilibrium process and it is controlled by:  (A) Law of mass action (B) The amount of solvent used (C) Distribution law (D) The amount of solute  16 Stronger the oxidizing agent, greater is the: (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid: (C) NaCl (D) All of these		(A) 20000 C			
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(C) Distribution law (D) The amount of solute  16 Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential  (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:  (C) NaC/ (D) All of these	13	l .		mount of solvent use	ed
16 Stronger the oxidizing agent, greater is the:  (A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F of cell  17 Which of the following is a pseudo solid:  (C) NaC/ (D) All of these					
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(C) Redox potential (D) E.M.F of cell  Which of the following is a pseudo solid:  (C) NaC/ (D) All of these	16	Stronger the oxidizing	ng agent, greater is the	ne:	
(C) Redox potential (D) E.M.F of cell  Which of the following is a pseudo solid:  (C) NaCl (D) All of these		(A) Oxidation pote			
Which of the following is a pseudo solid:  (C) NaCl  (D) All of these		(C) Redox potentia	d (D) E.		
(D) All of these	17	Which of the follow	ing is a pseudo solid	1:	
$\frac{\text{(A) Car_2}}{132-221-\text{II-(Objective Type)} - 10250 \text{ (6486)}}$				(C) NaCl	
		(A) Car <sub>2</sub>	(1) 01000	132-221-II-( Obje	ctive Type) - 10250 (6486)

(To be filled in by the candidate) (Academic Sessions 2017 – 2019 to 2020 – 202  EMISTRY  221-(INTER PART – I)  GROUP – II  Maximum Marks: 68	2) rs
APER - I (Essay Type)  SECTION - I  LNR4221	16
2. Write short answers to any EIGHT (8) questions:	10
(i) Define stoichiometry. Give two assumptions for stolemonicates	
(ii) How percentage yield is calculated?	
The 's number Give one example.	
<ul><li>(iii) Define Avogadro's number. Give one station</li><li>(iv) Differentiate between stationary phase and mobile phase in chromatographic technique?</li></ul>	
(v) What is ether extraction?	
1. January From KMT	
(vii) Why the graph plotted between pressure and volume moves away from pressure higher temperature?	
(viii) Calculate SI unit of 'R' gas constant.	
(ix) Why does pilots feel uncomfortable breathing at high altitude?	
<ul> <li>(x) State Raoult's law. Give one mathematical expression.</li> <li>(xi) Relative lowering of vapour pressure is independent of temperature. Justify this statement.</li> </ul>	
(xi) Relative lowering of vapour pressure is independent of temperature	
(xii) Give two applications of colligative properties.	16
3. Write short answers to any EIGHT (8) questions:	
(i) What are dipole dipole forces? Give one example.	
(ii) Name the factors which affect the London forces.	
(iii) Cleavage of the crystals is itself anisotropic behaviour, explain.	
(iv) Define transition temperature with two examples.	
(v) Why cathode rays are also called as electron?	
(vi) Write down any four properties of positive rays.	
(vii) Define spectrum and name any two types of spectrum.	
(vii) Define spectrum and name any two types of $\ell$ (viii) For Azimuthal quantum number, $\ell = 2$ and $\ell = 3$ , calculate the total values of magnetic quantum number (m).	
(ix) How equilibrium constant ( $K_c$ ) predicts direction of a reaction?	
(v) Define pH and write how it is helpful to know nature of solutions.	
will a de you mean by order of reaction? Give two examples.	
(xi) What do you mean by order or the state of chemical reaction? Also write (xii) What is the effect of temperature on rate of chemical reaction? Also write Arrhenius equation.	12
4. Write short answers to any SIX (6) questions:	
(i) Bond distance is the compromise distance between two atoms. Justify.	
(ii) Write down the two postulates of VSEPR theory.	
(iii) Differentiate between covalent and co-ordinate covalent bond.	
(iv) Draw the hypothetical orbital picture of $He_2$ molecule according to M.O.T.	
(v) Define enthalpy of formation with an example. (vi) Prove $q_v = \Delta E$ .	<b>7</b> 2
(vii) Prove $q_v = \Delta E$ . (vii) Calculate the oxidation numbers of the elements underlined: (a) $Na_2\underline{PO_4}$ (b) $H\underline{No}$ (viii) How salt bridge maintains the electrical neutrality in the cell? Justify.	- <b>3</b>
(ix) What is standard hydrogen electrode (SHE)? (Turn Over)	

## LHR-62-21 SECTION - II

No	te:	Attempt any THREE questions.	
5.	(a)	Calculate the number of grams of $K_2SO_4$ and $H_2O$ produced when 14 gram of KOH reacts with excess of $H_2SO_4$ under the following equation:	
		$2KOH + H_2SO_4 \rightarrow K_2SO_4 + 2H_2O$	4
	(b)	Explain the structure of ice on the basis of hydrogen bonding.	4
6.	(a)	State Charles's law. Explain its experimental verification.	4
	(b)	Write down experiment that how neutrons were discovered?	4
7.	(a)	Define ionization energy, write factors affecting ionization energy and explain its trend along group.	4
	(b)	Prove that $\Delta H = q_p$	4
8.	(a)	A buffer solution is prepared by mixing 0.2 M CH <sub>3</sub> COONa and 0.5 M CH <sub>3</sub> COOH	
		in $1 dm^3$ of solution. Calculate pH of solution. $pK_a$ of acid is 4.74.	4
	(b)	Explain energy of activation.	4
9.	(a)	Define solubility curve. Explain different types of solubility curves with the help of graphs.	4
	(b)	Describe electrochemical series. Give its three applications.	4
		132-221-II-(Essay Type) – 41000	