Module Name : PhD Chemistry-E Exam Date : 20-Sep-2020 Batch : 16:00-18:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objec	tive Question			
1	1	Which of the following statement is wrong?	4.0	1.00
		Al Van der Waal's radius of iodine is more than its covalent radius :		
		A2 All isoelectronic ion belongs to same period of periodic table		
		<sup>A3</sup> IE, of N is higher than that of O while IE <sub>2</sub> of <b>O</b> is higher than that of N :		
		<sup>A4</sup> : Electron gain enthalpy of N is zero while that of P is 73 $kJmol^{-1}$		
01.				
2	2	Which one of the following sequences represents the increasing order of the polarizing power of the cationic species $K^+$ , $Ca^{2+}$ , $Mg^{2+}$ , $Be^{2+}$ ?	4.0	1.00
		$ \begin{array}{c} A1 \\ \vdots \\ Ca^{2+} < Mg^{2+} < Be^{2+} < K^{+} \end{array} $		
		$\frac{A2}{2} Mg^{2*} < Bc^{2*} < K^* < Ca^{2*}$		
		$Be^{2*} < K^* < Ca^{2*} < Mg^{2*}$		
		$\frac{A4}{E} K^{+} < Ca^{2+} < Mg^{2+} < Be^{2+}$		
01.				
3	3	In which of the following ionisation process, the bond order has increased and the magnetic behaviour has changed?	4.0	1.00
		$ \begin{array}{cc} A1 & N_2 \rightarrow N_2^+ \\ \vdots & & \end{array} $		
		$\begin{array}{c} A2 \\ \vdots \\ \end{array} C_2 \to C_2^+ \end{array}$		
		$\stackrel{A3}{:}$ NO $\rightarrow$ NO <sup>*</sup>		
		$\stackrel{A4}{:} O_2 \rightarrow O_2^*$		
Objec 4	tive Question		4.0	1.00
4	4	Amongst $NO_3^-$ , $AsO_3^{2-}$ , $CO_3^{2-}$ , $CO_3^{2-}$ , $SO_3^{2-}$ and $BO_3^{3-}$ the non-planar species are-	4.0	1.00
		A1 $CO_3^{2-}$ , $SO_3^{2-}$ and $BO_3^{3-}$		

	$A^{2}_{3}$ AsO <sub>3</sub> <sup>3-</sup> , ClO <sub>3</sub> <sup>-</sup> and SO <sub>2</sub> <sup>2-</sup>		
	$\frac{A3}{2} NO_{3}^{-}, CO_{3}^{2-} \text{ and } BO_{3}^{3-}$		
	$A4_{3} SO_{3}^{2-}, NO_{3}^{-} and BO_{3}^{2-}$		
Objective Question			
5 5	In a molecule (CH <sub>3</sub> ) <sub>2</sub> N-PF <sub>2</sub> ,BH <sub>3</sub> and BF <sub>3</sub> will coordinate of which atom/s-	4.0	1.00
	$^{A1}_{:}$ BH <sub>3</sub> and BF <sub>3</sub> both to N atom		
	A2 BH <sub>3</sub> to P atom and BF <sub>3</sub> to N atom :		
	$^{A3}_{:}$ BH <sub>3</sub> and BF <sub>3</sub> both to P atom		
	A4 $BH_3$ to N atom and $BF_3$ to P atom :		
Objective Question			
6 6	The compound that will behave as an acid in $H_2SO_4$ is	4.0	1.00
	A1 CH <sub>3</sub> COOH		
	A2 HNO <sub>3</sub>		
	A <sup>3</sup> HClO <sub>4</sub>		
	A4 H <sub>2</sub> O :		
Objective Ouestion			
7 7	A metal X on heating in nitrogen gives Y. Y on treatment with $H_2O$ gives a colourless gas which when passed through $CuSO_4$ solution gives a blue colour. Y is	4.0	1.00
	$\stackrel{A1}{:} Mg(NO_3)_2$		
	$\stackrel{A2}{:}$ Mg <sub>3</sub> N <sub>2</sub>		
	A3 <sub>NH3</sub> :		

<b>Objective</b> Question			
8	A metal readily form water soluble sulphate MSO <sub>4</sub> ,water soluble hydroxide and oxide which becomes inert on heating. The hydroxide is soluble in NaOH. The M is          A1       Sr         A2       Ba         :       Ba         :       Ca	4.0	
	<sup>A4</sup> Be :		
bjective Question			
9	The square planar complex $[Ir(Cl)_3(PPh_3)_3]$ undergoes oxidative addition of Cl <sub>2</sub> to give two products, which are	4.0	1.00
	A1 Fac- and mer- isomers		
	A2 Cis- and trans- isomers:		
	A3 Linkage isomers		
	A4 Enantiomers		
bjective Question			
0 10	The total number of geometrical and optical isomers for the complex ion dichloro bis (ethylene diamine) rhodium (III) is	4.0	1.00
	A1 6 :		
	A2 4 :		
	A3 2 :		
	A4 3 :		
Dijective Question			
11	The lanthanide complex (acac = acctylacetone, phen =1,10-phenanthroline) that do not have square antiprismatic structure is	4.0	1.00
	$A1 [Ce(NO_3)_6]^{2-}$		
	$\stackrel{A2}{:} [La(acac)_3(H_2O)_2]$		

		A4 [Eu(acac)(phen)]		
bjec	tive Question			
2	12	Which one of the following free ions has the lowest magnetic moment -	4.0	1.00
		: Ce <sup>o</sup>		
		A2 Nd <sup>3+</sup>		
		$^{A3}_{\cdot}$ Sm <sup>3+</sup>		
		$\overset{A4}{:}$ Gd <sup>3+</sup>		
bjec 3	tive Question	Which of the following statement is NOT correct?	4.0	1.00
		A1 V(CO) <sub>6</sub> is isoelectronic and isostructural with $V(N_2)_6$ :		
		AZ V(CO) <sub>6</sub> is para magnetic and monomeric :		
		$A_3 V(CO)$ is dispersion and dimensions to form and M M hand		
		:		
		A4 In V(CO) <sub>6</sub> vanadium is in zerovalent oxidation state and the compound is not very stable		
Objec	tive Question			
4	14	The correct increasing order of bond length in Pt-Cl bond trans to X in the complex $[PtCl_3X]^{n-1}$ (where $X = Pet_3, C_2H_4$ and $Cl^{-1}$ )	4.0	1.00
		$ : C_2H_4 < Cl^- < PEt_3 $		
		A2 $CI^{-} \leq C_{-}H_{-} \leq PEt$		
		A3 $PEt_3 < C_2H_4 < Cl^-$		
		$\overset{A4}{:} Cl^- < PEt_3 < C_2H_4$		
bjec	tive Question			
5	15	In $H_2Ru_6(CO)_{18}$ cluster containing 8 -coordinated Ru centres, the hydrogen atoms are	4.0	1.00
		Al both terminal		
		A2 both terminal and other bridging		

A3 both bridging between two Ru centres
A4 both bridging between three Ru centres

Objective Question       10					
16       16       Which of the following statement is not correct?       40       1.00         16       14       In the structure of Re <sub>2</sub> Cl <sub>1</sub> <sup>2</sup> : the Re-Re distance is same as that of in Remental       14       14         16       14       14 the structure of Re <sub>2</sub> Cl <sub>1</sub> <sup>2</sup> : the Re-Re distance is same as that of in Remental       14       14         16       14       16       structure of Re <sub>2</sub> Cl <sub>1</sub> <sup>2</sup> : the Re-Re distance is same as that of in Remental       14       14         17       17       16       soluture in the structure of Re <sub>2</sub> Cl <sub>2</sub> <sup>2</sup> has clapsed configuration of Cl atoms       10       100         17       17       17       10 acolumn is packed with 0.5 g of a strongly acidic ion exchange rowin in 11 <sup>4</sup> form. A 1.00 NRCl solution is packed humgly NROUL The son exchange copicity of the rows is       10         16       1.00 meg/g       1.10 meg/g <td>Object</td> <td>tive Question</td> <td></td> <td></td> <td></td>	Object	tive Question			
Objective Question       A <sup>A</sup> In the structure of Re <sub>2</sub> Ch <sub>8</sub> <sup>2</sup> , the Re-Re distance is same as that of in Re metal       A <sup>A</sup> In the structure of Re <sub>2</sub> Ch <sub>8</sub> <sup>2</sup> , the Re-Re distance is short as compared to Re metal       A <sup>A</sup> A <sup>A</sup> Ra the structure of Re <sub>2</sub> Ch <sub>8</sub> <sup>2</sup> , the Re-Re distance is short as compared to Re metal       A <sup>A</sup> Structure of Re <sub>2</sub> Ch <sub>8</sub> <sup>2</sup> , the Re-Re distance is short as compared to Re metal       A <sup>A</sup> Objective Question       A column is packed with 0.5 g of a strongly actific in exchange nesin in H <sup>a</sup> form. A 1.0M NaCl solution is passed through.       Action is passed through.       A <sup>A</sup> 17       17       17       A column is packed with 0.5 g of a strongly actific in exchange nesin in H <sup>a</sup> form. A 1.0M NaCl solution is passed through.       A <sup>A</sup> Info         NNOH. The ion exchange capacity of the resin is       A <sup>A</sup> 1.20 med/g.       A <sup>A</sup> Info         A <sup>A</sup> 1.26 med/g.       A <sup>A</sup> 1.26 med/g.       A <sup>A</sup> Info         18       18       The molar extraction coefficient of <i>B</i> (MW = 180) is 4x10 <sup>3</sup> li mol <sup>2</sup> cm <sup>4</sup> . One line solution of C <sub>1</sub> which contains 0.1388g       4 <sup>A</sup> Info         10       A <sup>A</sup> 1.24 med/g       A <sup>A</sup> 1.24 med/g       Info       Info         18       18       19       10       A <sup>A</sup> 1.24 med/g       Info       Info         19	16	16	Which of the following statement is not correct?	4.0	1.00
Objective Question       100         17       17         17       17         18       18         18       18         19       19         19       19         19       19			A1 In the structure of $\text{Re}_2 \text{Cl}_8^{2-}$ , the Re-Re distance is same as that of in Re metal :		
Objective Question       A <sup>3</sup> Structure of Re <sub>2</sub> Cr <sub>3</sub> <sup>3</sup> , has eclipsed configuration of CI atoms       A <sup>4</sup> Re <sub>2</sub> Cl <sub>3</sub> <sup>2</sup> has D <sub>4</sub> symmetry       Image: Clip Circle Question       Image: Clip Circle			<sup>A2</sup> In the structure of, $\text{Re}_2 \text{Cr}_8^2$ , the Re-Re distance is short as compared to Re metal		
Objective Question       Image: Child of the column is packed with 0.5 g of a strongly acidic ion exchange resin in II <sup>+</sup> form. A LOM NoCl solution is passed through the column with the cluant coming out becomes neutral. The collected cluant is completely neutralized by 17ml of 0.5M NaOH. The ion exchange capacity of the resin is       Image: Child of the column with the cluant coming out becomes neutral. The collected cluant is completely neutralized by 17ml of 0.5M NaOH. The ion exchange capacity of the resin is       Image: Child of the column with the cluant coming out becomes neutral. The collected cluant is completely neutralized by 17ml of 0.5M NaOH. The ion exchange capacity of the resin is       Image: Child of the column with the cluant coming out becomes neutral. The collected cluant is completely neutralized by 17ml of 0.5M NaOH. The ion exchange capacity of the resin is       Image: Child of the column with the cluant coming out becomes neutral. The collected cluant is completely neutralized by 17ml of 0.5M NaOH. The ion exchange capacity of the resin is       Image: Child of the column with the cluant coming out becomes neutral. The collected cluant is completely neutralized by 17ml of 0.5M NaOH. The ion exchange capacity of the resin is       Image: Child of the column with the cluant coming outperformed with 0.5 g of a strongly acidic ion exchange capacity of the resin is       Image: Child of the column with the cluant coming outperformed with 0.5 g of a strongly acidic ion exchange capacity of the resin is       Image: Child of the column with the cluant coming outperformed with 0.5 g of a strongly acidic ion exchange capacity of the resin is       Image: Child of the column with 0.5 g of a strongly acidic ion exchange capacity of the resin is         Objective Oversion       The modar extraction extraction excelline of B (MW = 180 ) is 4x1			A3 Structure of $\operatorname{Re}_2 \operatorname{Cr}_8^2$ , has eclipsed configuration of Cl atoms		
Objective Question       Image: Control of the column is packed with 0.5 g of a strongly acidic ion exchange repairing of the one point will the class normal. The collected cluant is completely neutralized by 17ml of 0.5M       4.0       1.00         If       If       Image: I			$\stackrel{A4}{:} \operatorname{Re}_2 \operatorname{Cl}_8^{2-} \operatorname{has} D_4 \operatorname{symmetry}$		
17       17       A column is packed with 0.5 g of a strongly acidic ion exchange resin in H <sup>+</sup> form. A 1.0M NaCl solution is passed through the column until the cluant coming out becomes neutral. The collected cluant is completely neutralized by 17ml of 0.5M       4.0       1.00         NaOH. The ion exchange capacity of the resin is       A 1 1.00 meq/g       A 1 1.00 meq/g       A <sup>1</sup> A <sup>2</sup> 1.24 meq/g       A <sup>3</sup> 1.50 meq/g       A <sup>4</sup> Objective Question       The molar extraction coefficient of <i>B</i> (MW = 180) is 4x10 <sup>3</sup> lit mol <sup>-1</sup> cm <sup>-1</sup> . One fitre solution of C <sub>1</sub> which contains 0.158 g pharmaceutical preparation is       4.0       1.00         No       A <sup>1</sup> 1.020       A <sup>2</sup> 1.460       1.00         A <sup>2</sup> 1.460       A <sup>3</sup> 20.40       A <sup>3</sup> 20.40       1.00         A <sup>2</sup> 1.24 meq/g       A <sup>3</sup> 20.40       A <sup>3</sup> 20.40       1.00         Objective Question       19       19       Athough Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain Zn(II) at the active site because       4.0       1.00	Object	tive Question			
$ \begin{array}{ c c c c } \hline & A_{1} & 1.00 & meq'g \\ & A_{2} & 1.24 & meq'g \\ & A_{2} & 1.24 & meq'g \\ & A_{3} & 1.50 & meq'g \\ \hline & A_{4} & 1.75 & meq'g \\ \hline & A_{4} & A_{$	17	17	A column is packed with 0.5 g of a strongly acidic ion exchange resin in $H^+$ form. A 1.0M NaCl solution is passed through the column until the eluant coming out becomes neutral. The collected eluant is completely neutralized by 17ml of 0.5M NaOH. The ion exchange capacity of the resin is	4.0	1.00
A <sup>2</sup> 1.24 meq'g       Image: A <sup>3</sup> 1.50 meq'g       Image: A <sup>3</sup> 1.50 meq'g         A <sup>4</sup> 1.75 meq'g       A <sup>4</sup> 1.75 meq'g       Image: A <sup>4</sup> 1.75 meq'g         Objective Question       Image: A <sup>4</sup> 1.75 meq'g       Image: A <sup>1</sup> 1.00 meg/g       Image: A <sup>1</sup> I <sup>8</sup> I <sup>8</sup> The molar extraction coefficient of <i>B</i> (MW = 180 ) is 4x10 <sup>3</sup> lit mol <sup>-1</sup> em <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g planmaceutical preparation of B shows an absorbance of 0.441 in a 1 cm quartz cell. The percentage (w/w) of B in the planmaceutical preparation is       Image: A <sup>1</sup> 10.00         A <sup>1</sup> 10.20       A <sup>2</sup> 14.60       A <sup>3</sup> 20.40       Image: A <sup>1</sup> 10.20         A <sup>2</sup> 14.60       A <sup>3</sup> 20.40       A <sup>4</sup> 29.12       Image: A <sup>1</sup> 10.00         Objective Question       Image: A <sup>1</sup> 19       Image: A though Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain Zn(II) at the active site because       Image: A <sup>1</sup> 1.00			A1 1.00 meq/g		
Objective Question       A4       1.50 meq/g       A4       1.75 meq/g         18       18       The molar extraction coefficient of B (MW = 180 ) is 4x10 <sup>3</sup> lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation of B shows an absorbance of 0.441 in a 1 cm quartz cell. The percentage (w/w) of B in the pharmaceutical preparation is       4.0       1.00         18       18       The molar extraction coefficient of B (MW = 180 ) is 4x10 <sup>3</sup> lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       4.0       1.00         20       A1       10.20       A1       10.20       4.1       1.40         A2       14.60       A3       20.40       4.2       29.12       1.40       4.0       1.00         Objective Question         The molar setter Lewis acid compared to Zn(II), most hydrolytic enzymes contain Zn(II) at the active site because       4.0       1.00			A2 1.24 meq/g		
Objective Question       Image: Constraint of the molar extraction coefficient of B (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation of B shows an absorbance of 0.441 in a 1 cm quartz cell. The percentage (w/w) of B in the pharmaceutical preparation is       Image: All of the molar extraction coefficient of B (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation of B shows an absorbance of 0.441 in a 1 cm quartz cell. The percentage (w/w) of B in the pharmaceutical preparation is       Image: All of the molar extraction coefficient of B (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       Image: All of the molar extraction coefficient of B (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       Image: All of the molar extraction coefficient of B (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       Image: All of the molar extraction of B (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       Image: All of the molar extraction of B (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       Image: All of the molar extraction of B (MW = 180) is $4x10^3$ litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       Image: All of the molar extraction of B (MW = 180) is $4x10^3$ litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation is       Image: All of the molar extraction of B (MW = 180) is $4x10^3$ litre solution of C <sub>1</sub> which extraction of B (MW = 180) is $4x10^3$ l			$\frac{A3}{2}$ 1.50 meq/g		
Objective Question         18       18       The molar extraction coefficient of $B$ (MW = 180) is $4 \times 10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of $C_1$ which contains 0.1358g pharmaceutical preparation of B shows an absorbance of 0.441 in a 1 cm quartz cell. The percentage (w/w) of B in the pharmaceutical preparation is       4.0       1.00         A1       10.20       A1       10.20       A1       10.40       A1       10.40       A1       10.40       A1       10.20       A1       10.20       A1       10.20       A1       10.20       A1       10.20       A1       10.20       A1       10.40       A1       10.20       A1       10.20       A1       10.20       A1       10.20       A1       10.20       A1       10.20       A1       A1       10.20       A1       A1       10.20       A1       A1       10.20       A1       A			A4 1.75 meq/g		
18       18       The molar extraction coefficient of $B$ (MW = 180 ) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of $C_1$ which contains 0.1358g pharmaceutical preparation of B shows an absorbance of 0.441 in a 1 cm quartz cell. The percentage (w/w) of B in the pharmaceutical preparation is       4.0       1.00         A1       10.20         A1       10.20          A2       14.60              A3       20.40              Objective Question       A1       29.12        Although Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain $Zn(II)$ at the active site because       4.0       1.00	Object	tive Ouestion			
A1       10.20 $A^2_{::}$ 14.60 $A^3_{::}$ 20.40 $A^4_{::}$ 29.12         Objective Question         19       19         Although Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain Zn(II) at the active site because       4.0         1.00	18	18	The molar extraction coefficient of $B$ (MW = 180) is $4x10^3$ lit mol <sup>-1</sup> cm <sup>-1</sup> . One litre solution of C <sub>1</sub> which contains 0.1358g pharmaceutical preparation of B shows an absorbance of 0.441 in a 1 cm quartz cell. The percentage (w/w) of B in the pharmaceutical preparation is	4.0	1.00
$A^2_1$ 14.60 $A^3_2$ 20.40 $A^3_1$ 20.40 $A^4_1$ 29.12         Objective Question $A^4_1$ 29.12 $A^4_1$ 29.12         19       19       Although Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain Zn(II) at the active site because $4.0$			A1 10.20		
$\begin{array}{ c c c c }\hline A3 & 20.40 & & & \\ A4 & 29.12 & & & \\ \hline Dbjective Question & & & \\ \hline 19 & 19 & & \\ \hline 19 & & \\ \hline 19 & & \\ \hline 10 & & \\ 10 & & \\ \hline 10 & & \\$			A2 : 14.60		
A4       29.12         Objective Question       Although Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain Zn(II) at the active site because       4.0       1.00			A3 20.40		
Objective Question         19       19         Although Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain Zn(II) at the active site because         4.0         1.00			A4 29.12		
19       19       Although Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic enzymes contain $Zn(II)$ at the active site because       4.0       1.00	Object	tive Question			
	19	19	Although Fe(III) is a better Lewis acid compared to $Zn(II)$ , most hydrolytic enzymes contain $Zn(II)$ at the active site because	4.0	1.00

		A1 Fe(III) is a redox active ion		
		A2 Fe(III) has less abundance compared to Zn(II)		
		A3 FE(III) generally makes octahedral complexes while Zn(II) makes tetrahedral complexes		
		A4 : Zn(II) makes kinetically labile complexes		
Objec	tive Question			
20	20	Carboxypeptidase contains	4.0	1.00
		$\stackrel{A1}{:}$ Zn(II) and hydrolysis CO <sub>2</sub>		
		$\stackrel{A2}{:}$ Mg(II) and hydrolysis CO <sub>2</sub>		
		A3 : Zn(II) and hydrolysis peptide bond		
		A4 Mg(II) and hydrolysis peptide bond		
Objec	tive Question			
21	21	The number of EPR signals observed for octahedral Ni (II) complexes is	4.0	1.00
		Al one		
		A2 : two		
		A3 three		
		A4 : zero		
Ohias	tive Question			
22	22	Appropriate reasons for the deviation from the Beer's law among the following are 1. Monochromaticity of light 2. Very high concentration of analyte 3. Association of analyte 4. Dissociation of analyte	4.0	1.00
		A1 : 1,2 and 4		
		A2 2,3 and 4		
		A3 : 1,3 and 4		
		A4 1,2 and 3		

n		
The half-life of ${}^{32}P$ is 14.3 day. Calculate the specific activity of phosphorus containing specimen having 1.0 ppm of ${}^{32}P$ (atomic weight of $P=31$ ).	4.0	1.00
A1 0.295 Ci/g		
A2 0.143 Ci/g		
A3 0.385 Ci/g		
A4 0.623 Ci/g		
n		
There is a stream of neutrons with kinetic energy 0.0327 eV. If the half-life of neutron is 700 sec. what fraction of neutron will decay before they travel 100 metre? $(m_n=1.675 \times 10^{-27} \text{kg})$	4.0	1.00
$ \stackrel{A1}{:} 1.675 \text{x} 10^{-5} $		
$^{A2}_{:}$ 3.96x10 <sup>-5</sup>		
$^{A3}_{:}$ 1.675x10 <sup>-10</sup>		
$\frac{A4}{2}$ 3.96x10 <sup>-10</sup>		
n		
An operator A is defined as $A = -\frac{d}{dx} + x$ Which one of the following statements is true?	4.0	1.00
$A^{1}_{:}$ A is a hermitian operator		
$\stackrel{A2}{:}$ $\mathcal{A}^*$ is an antihermitian operator		
A3 Both $AA^*$ and $A^*A$ are hermitian operators		
$\frac{A4}{A} A^* $ is hermitian but $A^* A$ is not hermitian		
n		
	4.0	1.00
For a certain particle encountering a barrier, the tunnelling probability is approximately e <sup>-10</sup> . If the height doubled, approximate value of the tunnelling probability will be-		
	The half-life of <sup>32</sup> <i>P</i> is 14.3 day. Calculate the specific activity of phosphoms containing specimen having 1.0 ppm of <sup>32</sup> <i>P</i> (atomic weight of <i>P</i> -31). All 0.295 Crig Al 0.295 Crig Al 0.295 Crig Al 0.295 Crig Al 0.623 Crig Al 0.623 Crig Al 0.623 Crig Al 0.623 Crig Al 1.625 Crig Al 1.675 Crig Al 1.675 Crig Al 1.675 Crig Al 1.675 Crig <sup>-1</sup> Al 3.96 Crig <sup>-1</sup> Al 4 is a hermitian operator Al 4 is hermitian but 4 Als not hermitian Al 5 Crig <sup>-1</sup> Al	The half-life of <sup>32</sup> <i>p</i> is 14.3 day. Calculate the specific activity of phosphorus containing specimen having 1.0 ppm of <sup>32</sup> <i>p</i> (atomic weight of <i>P</i> -31). A 0 2395 GVg A 2 0.143 GVg A 3 0.385 GVg A 4 0.623 GVg A 1 0.623 GVg A 1 0.623 GVg A 1 1.675x10 <sup>-25</sup> A 1 4 5 3 4 5 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5

	$\begin{array}{c} A2 \\ \vdots \end{array} e^{-10\sqrt{2}}$		
	$A_{2}^{A_{3}} e^{-30\sqrt{2}}$		
	$\frac{A4}{2} e^{-10}$		
Objective Qu	estion		
27 27	Two trial wave functions $\phi = c_1 x(a-x)$ and $\phi_2 = c_1 x(a-x) + c_2 x^2 (a-x)^2$ give ground state energies $E_1$ and $E_2$ respectively, for the microscopic particle in a $1-D$ box by using the variation method. If the exact ground state energy is $E_0$ , the correct relationship between $E_0$ , $E_1$ and $E_2$ is	4.0	1.00
	$ \begin{array}{c} \mathbf{A}1 \\ \mathbf{E}_{0} = \mathbf{E}_{1} = \mathbf{E}_{2} \end{array} $		
	$E_0 < E_1 < E_2$		
	$     \begin{array}{l}             A3 \\             : & E_0 < E_2 < E_1     \end{array}     $		
	$E_{0}^{A4} E_{0} > E_{2} = E_{1}$		
Objective Qu	estion		
28 28	The angular part of the wave function for the electron in a hydrogen atom is proportional to $\sin^2 \theta \cos \theta e^{2/\varphi}$ . The values of the azimuthal quantum number ( <i>l</i> ) and the magnetic quantum ( <i>m</i> ) are, respectively	4.0	1.00
	$\stackrel{A1}{:}_{2 \text{ and } 2}$		
	A2 2 and -2		
	$\stackrel{A3}{:}_{3 \text{ and } 2}$		
	A4 3 and -2		
Objective Qu	estion		
29 29	The MO wave function for LiH molecule in the determinantal form will be	4.0	1.00
	$\stackrel{\text{A1}}{:} \psi = \left  1\sigma 1\overline{\sigma} \right $		
	$\stackrel{\text{A2}}{:} \psi = \left  1\sigma 1\overline{\sigma} 2\sigma 2\overline{\sigma} \right $		
	$\overset{A3}{:} \psi =  1\sigma 2\sigma $		

$$\overset{A4}{=} \psi = \left| 1\overline{\sigma} 2\overline{\sigma} \right|$$

**Objective** Question 30 30 4.0 1.00 The highest occupied MO in  $N_2$  and  $O^+_2$  respectively are (Take x-axis as internuclear axis)  $^{\text{A1}}{}_{:}\sigma 2p_x, \pi^* 2p_y$  $^{\text{A2}}\pi 2p_{y},\pi 2p_{z}$  $^{A3}{}\sigma^*2p_x,\sigma^2p_x$  $\overset{\mathrm{A4}}{:} \pi^* 2p_y, \pi^* 2p_z$ **Objective** Question 31 31 4.0 1.00 A square pyramidal MX4 molecule belongs to  $C_4$  point group. The symmetry operations are  $E, 2C_4, C_2, 2\sigma_4, 2\sigma\Delta$  . The trace for the reducible representation when symmetry operations of  $C_4$ , applied to  $MX_4$  is A1 : 51113 A2 11111 : A3 51111

#### Objective Question

A4 41113

32	32	The symmetry elements that are present in BF <sub>3</sub> are	4.0	1.00
		$\stackrel{A1}{:} C_3, \sigma_v, \sigma_n, 3C_2$		
		$^{A2}_{:}$ C <sub>3</sub> , 3C <sub>2</sub> , S <sub>2</sub> , $\sigma_v$		
		$\overset{A3}{:} C_3, 3C_2, \sigma_n, S_2$		
		$\stackrel{A4}{:} C_{3}, \sigma_{n}, \sigma_{v}, i$		

**Objective** Question

The vibrational frequency and anharmonicity constant of an allyl halide are  $300 \text{cm}^{-1}$  and 0.0025 respectively. The positions (in cm<sup>-1</sup>) of the fundamental mode and first overtone are respectively 4.0

	A1 300, 600		
	A2 298.5, 595.5		
	A3 301.5, 604.5 :		
	A4 290, 580 :		
Objective Question	<b>n</b>		
34 34	The infrared spectrum of HCl gas shows an absorption band centred at 2885cm <sup>-1</sup> . The zero-point energy of HCl molecule under harmonic oscillator approximation is	4.0	1.00
	$^{A1}_{:}$ 2.866x10 <sup>-22</sup> J		
	$\frac{A2}{2.866 \times 10^{-20} J}$		
	$ \stackrel{A3}{:} 5.733 \times 10^{-22} J $		
	$^{A4}_{:}$ 5.733x10 <sup>-30</sup> J		
Ohiertine Onertier	-		
35 35	$\frac{1}{1} \text{ g of perfect gas at volume } V_A \text{ pressure } P_A \text{ and temperature } T_A \text{ changes from state } A \text{ to state } B \text{ when volume is } V_B \text{ pressure } P_B \text{ and temperature } T_B. \text{ The change in entropy is}$	4.0	1.00
	$\frac{A1}{C_V \log_e \frac{V_B}{V_A} + R \log_e \frac{T_B}{T_A}}$		
	$\stackrel{A2}{:} C_{V} \log_{e} \frac{T_{E}}{T_{A}} + R \log_{e} \frac{V_{E}}{V_{A}}$		
	$\frac{A3}{C_{v} \log_{e} \frac{V_{A}}{V_{B}} + R \log_{e} \frac{T_{A}}{T_{B}}}$		
	$\frac{A4}{C_v \log \frac{T_A}{T_B} + R \log_4 \frac{V_A}{V_B}}$		
Objective Questior	n		
6 36	Gibbs thermodynamic potential can be represented as $G = H$ -TS.Which relation hold true?(where H=Enthalpy,S=Entropy)	4.0	1.00
	$\stackrel{A1}{:} \left(\frac{\partial S}{\partial U}\right)_{r,N} = \frac{P}{T}$		
	$\frac{A2}{C}  \left(\frac{\partial S}{\partial U}\right)_{V,N} = \frac{-P}{T}$		

$$A2 \quad \left(\frac{\partial S}{\partial U}\right)_{V,N} = \frac{-F}{T}$$

$$\begin{pmatrix} \frac{\partial S}{\partial V} \\ \frac{\partial V}{\partial V} \end{pmatrix}_{U,N} = \frac{P}{T}$$

$$A4 \quad \left( \frac{\partial S}{\partial V} \right)_{U,N} = \frac{-P}{T}$$

Objec	ctive Question			
37	37	Four phase points are distributed in two cells ( <i>i</i> and <i>f</i> ) in phase space. Then the thermodynamic probability for the macrostate $n_i=3$ , $n_j=1$ is	4.0	1.00
		A1 2 :		
		A2 4 :		
		A3 6 : 6		
		A4 24		
Objec	ctive Question			
38	38	Six distinguishable particles are to be distributed into 3 cells. Find the number of different combinations of particles that can produce the distribution (4,1,1)	4.0	1.00
		A1 1 :		
		A2 12		
		A3 24 :		
		A4 30 :		
Objec	ctive Question			
39	39	For a 2 molal aqueous NaCl solution, the mean ionic activity coefficient $(Y_{\pm})$ and the Debye-Huckel limiting law constant (a) are related as	4.0	1.00
		$\frac{A1}{2} \log Y_a = \sqrt{2}A$		
		$\stackrel{A2}{:} \log Y_a = -\sqrt{2}A$		
		$A_{\pm}^{A3}$ $Y_{\pm} = 10^4$		
		$ \begin{array}{c} A4 \\ \vdots \\ Y_{\pm} = 10^{-4} \end{array} $		
Objec	ctive Question			
40	40	Given that $E^0(Fe^{3+},Fe)=-0.4V$ and $E^0(Fe^{2+},Fe)=-0.44V$ , the value of $E^0(Fe^{3+},Fe^{2+})$	4.0	1.00

	A1 0.76V :	
	A2 :040V	
	A3 -0.76V	
	A4 0.40V	

Objective Question							
41	41	At $T=300K$ , the thermal energy $[k_BT]$ in cm <sup>-1</sup> is approximately	4.0	1.00			
		A1 20000					
		A2 8000					
		A3 5000					
		A4 200					
Objec	tive Question						
42	42		40	1.00			

42	42	For the reaction, 2X <sub>3</sub> $\leftrightarrows$ 3X <sub>2</sub> the rate of formation of $ X_2^{}$ is	4.0	1.00
		A1 $3(-d[X_3]/dt)$		
		$\stackrel{A2}{:} \frac{1}{2} \left( -d \left[ X_3 \right] dt \right)$		
		$\begin{array}{c} A3 \\ \vdots \\ 3 \\ (-d \mid X_3] dt \end{array}$		
		$\frac{A4}{2} \frac{3}{2} \left(-d \left  X_{3} \right  dt \right)$		
Objec	tive Question			
43	43	Arsenic (III) Sulphide forms a sol with a negative charge. Which of the following ionic substances should be most effective in coagulating the sol?	4.0	1.00
		A1 KCl		

A2 MgCl<sub>2</sub>

A3 Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>

A4 Na<sub>3</sub>PO<sub>4</sub>

Objec	ctive Question			
44	44	Colloidal solutions of gold prepared by different methods are of different colour because of	4.0	1.00
		A1 Different concentration of gold particles		
		A2 Variable valency of gold		
		A3 Different diameters of colloidal gold particles		
		A4		
		Impurities produced by different methods		
Objec	ctive Question			
45	45	The spinals CoFe <sub>2</sub> O <sub>4</sub> and FeFe <sub>2</sub> O <sub>4</sub> respectively are	4.0	1.00
		A1 inverse and inverse		
		A2 inverse and normal		
		A3 normal and normal		
		: At normal and inverse		
Obied	ctive Ouestion			
46	46	The number of manganese ions in tetrahedral and octahedral sites, respectively in $Mn_3O_4$	4.0	1.00
		Al $a$ $M^{2+}$ $M^{3+}$		
		. One Mn <sup>-+</sup> and two Mn <sup>-+</sup>		
		$^{A2}$ One Mn <sup>3+</sup> and two Mn <sup>2+</sup>		
		$\frac{A3}{2}$ two Mn <sup>3+</sup> and one Mn <sup>2+</sup>		
		$\frac{A4}{2}$ two Mn <sup>2+</sup> and one Mn <sup>3+</sup>		
Objec	tive Question			
47	47	There are several types of mean molar masses for polymer and they are dependent on experimental methods like:	4.0	1.00
		<ul><li>(1) osmometry</li><li>(2) light scattering and</li></ul>		
		(3) sedimentation. Correct relation between mean molar masses and experimental method is		
		contect relation between mean motal masses and experimental method is		
		$\overset{A1}{:} \overrightarrow{\mathrm{M}}_{n} \leftrightarrow 3, \overline{\mathrm{M}}_{n} \leftrightarrow 2, \overline{\mathrm{M}}_{2} \leftrightarrow 1$		
		$\stackrel{A2}{:} \overline{\mathrm{M}}_n \leftrightarrow 2, \overline{\mathrm{M}}_n \leftrightarrow 3, \overline{\mathrm{M}}_2 \leftrightarrow 1$		

$$\overset{A3}{:} \quad \overline{\mathbf{M}}_n \leftrightarrow \mathbf{1}, \overline{\mathbf{M}}_n \leftrightarrow \mathbf{2}, \overline{\mathbf{M}}_2 \leftrightarrow \mathbf{3}$$

$$\overset{A4}{:} \overline{\mathrm{M}}_{n} \leftrightarrow 1, \overline{\mathrm{M}}_{n} \leftrightarrow 3, \overline{\mathrm{M}}_{2} \leftrightarrow 2$$

		$\stackrel{A3}{:} \overline{\mathrm{M}}_n \leftrightarrow 1, \overline{\mathrm{M}}_n \leftrightarrow 2, \overline{\mathrm{M}}_2 \leftrightarrow 3$		
		$\stackrel{A4}{:} \overline{M}_n \leftrightarrow 1, \overline{M}_n \leftrightarrow 3, \overline{M}_2 \leftrightarrow 2$		
Obje	ctive Question			
48	48	The number average molar mass $(\overline{\mathbf{M}}_n)$ and weight-average molar mass $\overrightarrow{\mathbf{M}}_w$ of a polymer are obtained respectively by	4.0	1.00
		Al Osmometry and light scattering measurements		
		A2 Osmometry and viscosity measurements		
		A3 Light scattering and sedimentation measurements		
		A4 Viscosity and light scattering measurements :		
Ohie	ctive Question			
49	49	Probable error can be used only when	4.0	1.00
		Al Data is drawn from a normal population :		
		A2 Conditions of random sampling are prevailing during selection of samples :		
		A3 Neither for data nor for random sampling		
		A4 Both for data and for random sampling :		
<u></u>	ative Overtier			
50	50	Concurrent deviation method is associated with	4.0	1.00
		A1 Quantitative measurement		
		A2 Qualitative measurement		
		A3 Variables of qualitative characters		
		A4 Correlation coefficient of variables of two qualitative characters :		
	ative Question			
Obje	cuve Question			

		Write the IUPAC name of		
		он он		
		HO 4 3 2 0		
		A1 2(S),3(S),4(S),5-tetra hydroxypentanal		
		A2 2(5),3(5),4(R),5-tetra hydroxypentanal		
		A3 2(R),3(R),4(S),5- tetra hydroxy pentanal		
		A4 2(R),3(R),4(R),5-tetra hydroxypentanal		
Object	ive Question			
52	52	IUPAC name of following compound -	4.0	1.00
		соон		
		(4Z,2E)-Hexa-2, 4-dienoic acid		
		(22,4E)-Hexa-2, 4-dienoic acid		
		(4E,27)-Hexa-2, 4-dienoic acid		
		A4		
		: (2E,4Z)-Hexa-2, 4-dienoic acid		
Object	ive Question			
53	53	In the compound with structure ClCH <sub>2</sub> BrCH <sub>2</sub> .C=C.CD <sub>2</sub> .CH <sub>3</sub> the Z configuration will have	4.0	1.00
		A1 -CH <sub>2</sub> Br and -CD <sub>3</sub> on opposite sides of the double bond :		
		$^{A2}$ -CH <sub>2</sub> Br and -CD <sub>3</sub> on the same side of the double bond		
		A3 -CH <sub>2</sub> Cl and -CH <sub>3</sub> on opposite sides of the double bond :		
		$^{A4}_{:}$ -CH <sub>2</sub> Cl and -CD <sub>3</sub> on the same side of the double bond		
Object	ive Question		4.0	1.00
54	54	I he dihedral angle between the C-H bonds (as viewed along the C-C bond axis) in the skew conformation of ethane can be any angle other than	4.0	1.00
		: 0°, 60°, 120°		

		A2 : 45°, 90°, 135° A3		
		A4 : 90°, 135°, 180° : 90°, 135°, 180°		
Object	tive Question			
55	55	Consider the following statement, which does not satisfy the rule of aromaticity?	4.0	1.00
		A1 The total number of $\pi$ electrons in the molecule or ion should be $(4n+2)$ where $n = 0, 1, 2, 3$ etc.		
		A2 The unhybridized $p$ -orbitals must overlap to give a continuous ring of parallel orbitals :		
		A3 The molecule should be in a ring like structure and should possess planarity :		
		$\stackrel{A4}{:}$ The atom in the ring should possess $sp^3$ hybridization		
Object	tive Question			
56	56	Which of the following compound is nonaromatic?	4.0	1.00
		A1 2,4,6 -cycloheptatriene- 1 -carboxylic acid		
		A2 : Azulene		
		A3 Sydnone		
		A4 Tropylium cation		
Object	tive Question			L
57	57	The number of unshared electrons on the carbon is -	4.0	1.00
		A2 a		
		: <sup>2</sup>		
		AS 3 :		
		A4 4 :		
Object	tive Question			
58	58	In the singlet and triplet states of methylene radical, the unshared electrons are respectively	4.0	1.00







Objective Question







CHyster     Question     4.9     Using and nices with sicelularly polarised light     4.0     1.00       Chyster     Question     4.1     Using quart vessels as the reaction container     4.0     1.00       Chyster     A.1     In a reaction only once we can perform the protection-deprotection of functional group?     4.0     1.00       A.1     The goal of protection abpoints bould be avoided if possible because it adds two extra stays in a reaction     4.1     1.00       A.1     The goal of protection and deprotection is to keep the number of stars to a minimum     4.1     1.00       A.1     The goal of protection and deprotection (4.2)     4.0     1.00       Chyster     Question     4.1     1.00     1.00       Chyster     Question     1.00     1.00     1.00       Chyster     <			A2 Reacting an optically active reactant with a non-optically active one		
Chycic: Question     Chycic: Question     40     100       Chycic: Question     A1     In a reaction only once we can perform the protection-deprotection of functional group?     40     100       A2     Protection-deprotection and deprotection is to keep the number of steps to a steps in a reaction     A1     In a reaction only once we can perform the protection-deprotection can be done if one functional group reacts at a i different rate in the protection and deprotection is to keep the number of steps to a minimum     40     100       Construct: Countier     Which of the following statement(s) is a work of the COL one functional group reacts at a i different rate in the protection group reacts.     40     100       Construct: Countier     Which of the following statement(s) is a molecule, are present, protection can be done if one functional group reacts at a i different rate in the protecting group reaction     40     100       Construct: Countier     Which of the following statement(s) is an ended of the Goldbe bond.     111     111       Construct: UP and III     21     111     111     111       A2     In and IV     A3     111 and III     111     111       A3     111 and III     111     111     111     111       A3     111 and III     111     111     111     111       A3     111 and III     111     111     111     111        A4     11			A3 Using irradiation with circularly polarised light		
Objective Question       4.0       4.0         60       66       Which of the following statement(-) is valid for protection-deprotection of functional group?       4.0       1.00         A <sup>1</sup> In a reaction only once we can perform the protection-deprotection of functional group?       4.0       1.00         A <sup>2</sup> Protection-deprotection should be avoided if possible because it adds two extra steps in a reaction       A <sup>3</sup> The goal of protection and deprotection is to keep the number of steps to a minimum       4.1       In a reaction and deprotection is to keep the number of steps to a minimum       4.1       In a reaction and deprotection is to keep the number of steps to a minimum       4.1       In a reaction in the same side of the dashbe bond.       1.00         Objective Question       Which of the following regarding the structure of (F)-4-methyl-3-heptene are not correct?       1.00       1.00         III. The methyl method is the same side of the dashbe bond.       III. The methyl method is a side of the dashbe bond.       1.00         III. The methyl method is a constance of (F)-4-methyl-3-heptene are not correct?       4.0       1.00         III. The methyl method is a side of the dashbe bond.       III. The methyl method is a side of the dashbe bond.       1.00         III. The methyl method is the same side of the dashbe bond.       III. The methyl method is the same side of the dashbe bond.       1.00         Viii the output dashe bond.       III			A4 Using quartz vessels as the reaction container :		
66       66       Which of the following statement(s) is valid for protection-deprotection of functional group?       40       1.00         A1       In a searcine only once we can perform the protection deprotection of functional group       A2       Protection-deprotection should be avoided if possible because it adds too extra steps in a reaction       A1         A2       Protection-deprotection is to keep the number of steps to a minimum       A4       If two like instrument(s) is walled for protection can be done if one functional group reacts at a       i         Chipecture Question       67       67       67       40       1.00         Chipecture Question       67       67       11 and H ac on the same side of the dollewing regarding the structure of (E)-4 -mehyl-3 -beptene are not correct?       4.0       1.00         Chipecture Question       67       67       7       11 and H ac on the same side of the dollewing regarding the structure of (E)-4 -mehyl-3 -beptene are not correct?       4.0       1.00         Chipecture Question       67       67       11 and H       12       1.00         A1       11 and H       A2       1 and IV       1       1.00       1.00         A1       11 and H       11       1.01       1.00       1.00       1.00         A2       II and IV       A3       III and IV       1	Objec	tive Question			
Image: Second	66	66	Which of the following statement(s) is valid for protection-deprotection of functional group?	4.0	1.00
0       4 <sup>2</sup> Protection-deprotection should be avoided if possible because it adds two extra steps in a reaction       A <sup>3</sup> The goal of protection and deprotection is to keep the number of steps to a minimum         A <sup>3</sup> The goal of protection and deprotection and deprotection is to keep the number of steps to a minimum       A <sup>4</sup> If two like functional groups in a molecule, are present, protection can be done if one functional group reacts at a different rate in the protecting group reaction       40       100         Objective Question       The propyl and target have missible of the double bond.       4.0       1.00         II. The methyl and II are on the same side of the double bond.       1.1       1.1       1.1         Minimum       A <sup>2</sup> I and II       4.1       1.00         A <sup>2</sup> I and II       A <sup>2</sup> 1 and II       4.0       1.00         A <sup>2</sup> I and II       A <sup>2</sup> 1 and II       4.0       1.00         A <sup>2</sup> I and IV       A <sup>2</sup> I and IV       4.1       1.4       1.00         A <sup>2</sup> I and IV       A <sup>2</sup> I and IV       4.1       1.00       1.00         B <sup>3</sup> II and II       A <sup>2</sup> I and III       1.00       1.00       1.00         Chipcitive Question       II. The methyle and balgoed by an enzyme always gere tw inversio			A1 In a reaction only once we can perform the protection-deprotection of functional group :		
Objective Question       A <sup>3</sup> The goal of protection and deprotection is to keep the number of steps to a minimum       A4 If two like functional groups in a molecule, are present, protection can be done if one functional group reacts at a <ul> <li>different rule in the protecting group reaction</li> <li>The appropriated H are on the same side of the double bond.</li> <li>The appropriated H are on the same side of the double bond.</li> <li>The appropriated H are on the same side of the double bond.</li> <li>A<sup>1</sup></li> <li>I and IV</li> <li>a<sup>2</sup></li> <li>II and IV</li> <li>a<sup>3</sup></li> <li>III and IV</li> <li>a<sup>4</sup></li> <li>II and IV</li> <li>a<sup>4</sup></li> <li>II and IV</li> <li>a<sup>4</sup></li> <li>a<sup>4</sup></li> <li>II and IV</li> <li>a<sup>4</sup></li> <li>II and IV</li> <li>a<sup>4</sup></li> <li>II and IV</li></ul>			A2 Protection-deprotection should be avoided if possible because it adds two extra steps in a reaction		
Conjective Question       4.0 If two like functional groups in a molecule, are present, protection can be done if one functional group reacts at a <ul> <li>if different rate in the protecting group reaction</li> </ul> 4.0         1.00           Conjective Question         If the following regarding the structure of (F)-4 -methyl-3 -heptene are not correct?         4.0         1.00           If the norpoyl and If use on the same side of the C-C bond.         If the norpoyl and If use on the same side of the double bond.         4.0         1.00           If and IV         A1 I and II         A2 II and IV         A3 III and IV         A1 I and III         A1 I and II         A1 I and II         A2 II and IV         A1 II and III         A1 I and II         A2 III and IV         A1 II and II         A1 II and II         A2 II and IV         A1 II and II         A1 II and III         A1 II and II         A1 II and II         A2 III and IV         A1 II and II         A1 II and II         A1 III and II         A1 III and II         A1 III and IV         A1 III and IV         A1 III and IV         A1 III and IV         A1 III and III         A1 III A IIII         A1 III A TO IIIII A TO IIIIIII A TO IIIIIII A TO IIIIIIIIII			A3 The goal of protection and deprotection is to keep the number of steps to a minimum :		
Objective Question       Image: Consider the following regarding the structure of (E)- 4 -methyl- 3 -heptene are not correct?       40       100         67       67       67       Image: Consider the following regarding the structure of (E)- 4 -methyl- 3 -heptene are not correct?       1. The n-propyl and II are on the same side of the C~C bond.       1. The n-propyl and II are on the same side of the C~C bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-propyl and II are on the same side of the double bond.       1. The n-prot and II are on the same side of the double bond. <td></td> <td></td> <td>A4 If two like functional groups in a molecule, are present, protection can be done if one functional group reacts at a : different rate in the protecting group reaction</td> <td></td> <td></td>			A4 If two like functional groups in a molecule, are present, protection can be done if one functional group reacts at a : different rate in the protecting group reaction		
67       67       Which of the following regarding the structure of (E)- 4-methyl- 3-heptene are not correct?       4.0       1.00         1. The n-propyl and H µ are on the same side of the double bond.       1. The n-propyl and H µ are on the same side of the double bond.       1. The n-propyl and H µ are on the same side of the double bond.       1. The n-propyl and H µ are on the same side of the double bond.       1. The n-propyl and H µ are on the same side of the double bond.       1. The n-propyl and H µ are on the same side of the double bond.       1.00       1.00         1. The n-propyl and H µ are on the same side of the double bond.       A1       1.1       1.1       1.1         1. The n-propyl and H µ are on the same side of the double bond.       A1       1.1       1.00       1.00         2. View of the double bond.       A1       1.1       1.00       1.00       1.00         2. If and IV       A3       III and IV       A3       III and IV       1.00         3. If and III       A4       II and IV       1.00       1.00       1.00       1.00         Consider the following statements:       1.0       A reaction catalysed by an enzyme always gives an optically active product.       1.1       A reaction catalysed by an enzyme always gives an optically active product.       1.00       1.1       1.00         I. A reaction catalysed by an enzyme always gives an optically activ	Objec	tive Question			
A <sup>1</sup> I and II       A <sup>2</sup> II and IV       A <sup>3</sup> III and IV         A <sup>3</sup> III and IV       A <sup>3</sup> III and IV       A <sup>4</sup> I and II         A <sup>4</sup> I and II       A <sup>4</sup> II and III       III         Objective Question       Consider the following statements:       I. A reaction catalysed by an enzyme always gives an optically active product.       II. A reacemate can be distinguished from a nesso or an achiral compound by an attempted resolution.       III. Or overview of the output to to a three sore or stare sheep alare of polarized light to the right and L-chantiomer to the left.       V. All stereospecific reactions are necessarily stereo-selective, but the converse is not true.       III. III. III. V         A <sup>2</sup> I, II, IV       A <sup>2</sup> I, II, IV       A <sup>3</sup> III, IV, V       A <sup>3</sup> III, IV, V	67	67	<ul> <li>Which of the following regarding the structure of (E)- 4 -methyl- 3 -heptene are not correct?</li> <li>I. The n-propyl and H are on the same side of the double bond.</li> <li>II. The n-propyl and ethyl are on the same side of the C=C bond.</li> <li>III. The methyl and H are on the same side of the double bond.</li> <li>IV. The ethyl and methyl are on the same side of the double bond.</li> </ul>	4.0	1.00
A2       II and IV         A3       III and IV         A4       II and III         Objective Question       A4         Consider the following statements:       I. A reaction catalysed by an enzyme always gives an optically active product.         II. A reaction catalysed by an enzyme always gives an optically active product.       II. A reacentate can be distinguished from a meso or an achiral compound by an attempted resolution.         III. Conversion of an erythro to a three stereoisomer always occur by inversion at one chiral "C".       IV.A D-enantiomer rotates the plane of polarized light to the right and L-enantiomer to the left.         V. A.D-enantiomer rotates the plane of polarized light to the right and L-enantiomer to the left.       V. All stereospecific reactions are necessarily stereo-selective, but the converse is not true.         Select the correct statement       A1       II, IIV.         A2       I, II, IV.       A3       III, IV. V.			A1 I and II :		
A <sup>3</sup> III and IV     A <sup>4</sup> II and II       Objective Question     A <sup>4</sup> II and III       Consider the following statements:     I. A reaction catalysed by an enzyme always gives an optically active product.     4.0       I. A reaction catalysed by an enzyme always gives an optically active product.     I. A reaction catalysed by an enzyme always gives an optically active product.     4.0       I. A reaction catalysed by an enzyme always gives an optically active product.     I. A reaction catalysed by an enzyme always gocur by inversion at one chiral "C".       IV.A D-enantiomer rotates the plane of polarized light to the right and L-enantiomer to the left.     V. All sterospecific reactions are necessarily stereo-selective, but the converse is not true.       Select the correct statement     A <sup>1</sup> A <sup>1</sup> II. IV.       A <sup>2</sup> I. II. IV.       A <sup>3</sup> III. IV. V.			A2 II and IV		
A4 :     II and III       Objective Question       68       69       69       69       61       10        11			A3 III and IV :		
Objective Question         68       68         Consider the following statements: I. A reaction catalysed by an enzyme always gives an optically active product. II. A racemate can be distinguished from a meso or an achiral compound by an attempted resolution. III. Conversion of an erythro to a threo stereoisomer always occur by inversion at one chiral "C". IV:A D-enantiomer rotates the plane of polarized light to the right and L-enantiomer to the left. V. All stereospecific reactions are necessarily stereo-selective, but the converse is not true. Select the correct statement       4.0       1.00         A1       II, III, V       .       .       .         A2       I, II, IV       .       .         A3       III, IV, V       .       .			A4 II and III :		
68       68       Consider the following statements:       I. A reaction catalysed by an enzyme always gives an optically active product.       II. A reaction catalysed by an enzyme always gives an optically active product.       II. A reaction catalysed by an enzyme always gives an optically active product.       II. A reaction catalysed by an enzyme always gives an optically active product.       II. A reaction catalysed by an enzyme always gives an optically active product.       II. A reaction catalysed by an enzyme always gives an optically active product.       II. A reaction catalysed by an enzyme always occur by inversion at one chiral "C".       IV. A D-enantiomer rotates the plane of polarized light to the right and L-enantiomer to the left.       V. All stereospecific reactions are necessarily stereo-selective, but the converse is not true.       Select the correct statement       A1       II. III. V         A1       III. III. V       A2       I. III. IV.       A3       III. IV, V       III. IV, V	Ohieo	tive Question			
A1 II, III, V A2 I, II, IV A3 III, IV, V :	68	68	Consider the following statements: I. A reaction catalysed by an enzyme always gives an optically active product. II. A racemate can be distinguished from a meso or an achiral compound by an attempted resolution. III. Conversion of an erythro to a threo stereoisomer always occur by inversion at one chiral "C". IV.A D-enantiomer rotates the plane of polarized light to the right and L-enantiomer to the left. V. All stereospecific reactions are necessarily stereo-selective, but the converse is not true. Select the correct statement	4.0	1.00
A2 : A3 : : :			A1 II, III, V		
A3 III, IV, V			A2 I, II, IV :		
			A3 III, IV, V		

		A4 III, IV :		
Object	tive Question			
69	69	In the reaction shown below, the ring opening takes place through	4.0	1.00
		$\square_{h_{H_{Cl}}}^{Cl} \xrightarrow{\Delta} \bigcup_{\substack{I \\ I \\ Cl}}^{Cl} H \text{ trans, trans, diene}$		
		A1 Conrotation		
		A2 : Disrotation		
		A3 Conrotation followed by disrotation		
		A4 : Insertion		
Object	tive Question			
70	70	<ul> <li>In the reaction given below, which one of the statements is correct?</li> <li>Cl→H→ [Product]</li> <li>A1 The product formed is the result of sigmatropic shift</li> <li>A2 The ring opening does not take place in the transition state and it is not a electrocyclic reaction and there is no product : formation</li> <li>A3 The product can only form when the leaving group is ex in position</li> <li>A4 The product formed due to electrocyclic ring opening in a disrotatory mode and the disrotatory mode which moves the : bridgehead hydrogens outward.</li> </ul>	4.0	1.00
Object	tive Question			
71	71	Pyridine undergoes nucleophilic substitution with NaNH <sub>2</sub> at 100°C to form	4.0	1.00
		Al 2-Aminopyridine		
		A2 3-Aminopyridine		
		A3 4-Aminopyridine		
		A4 2,3-diaminopyridine		

Objec	tive Question			
72	72	Which of the following reagents will react with pyrrole to form 2 -formyl pyrrole?	4.0	1.00
		A1 HCOOH		
		A <sup>2</sup> CHCl <sub>3</sub> /KOH		
		A3 H <sub>2</sub> O <sub>2</sub>		
		A4 (CH <sub>3</sub> CO) <sub>2</sub> O/SnCl <sub>4</sub>		
Objec	tive Question		1.0	1.00
/3	/3	α-terpincol on dehydration with oxalic acid to give	4.0	1.00
		Al terpinolene		
		A2 : dipentene		
		A3 Both terpinolene and dipentene		
		A4 None of these		
Objec	tive Question		1.0	1.00
/4	/4	Exposing an organism to a certain chemical can change nucleotide bases in a gene, causing mutation. In one such mutated organism if a protein had only 70% of the primary amino acid sequence, which of the following is likely occur?	4.0	1.00
		A1 Mutation broke the protein		
		A2 The organism could not make amino acids :		
		A3 Mutation created a terminator codon :		
		A4 The gene was not transcribed		
Objec	tive Question			
75	75	The correct order for the basic features of a mass spectrometer is	4.0	1.00
		A1 acceleration, deflection, ionisation		
		A2 ionisation, acceleration, deflection, detection		
		A3 acceleration, ionisation, deflection, detection		

		A4 acceleration, deflection, ionisation, detection		
Obje	ctive Question			
76	76	To check that a secondary alcohol has been completely oxidised to a ketone you can	4.0	1.00
		A1 check that the IR spectrum has absorptions at 3500cm <sup>-1</sup> and 1650cm <sup>-1</sup>		
		$\frac{A2}{2}$ check that the IR spectrum has no absorption around 3500cm <sup>-1</sup>		
		A3 : check that the IR spectrum has no absorption around 1650cm <sup>-1</sup>		
		A4 check that the IR spectrum has no absorption at 3500cm <sup>-1</sup> and 1650cm <sup>-1</sup>		
Obje	ctive Question			
77	77	Maximum Nanotechnology focus is on	4.0	1.00
		A1 Semiconductors		
		A2 Hybrid materials		
		A3 Healthcare		
		A4 Information technology		
Obje	ctive Question			
78	78	Which one is example of passive nanostructures that is 1 <sup>st</sup> generation product?	4.0	1.00
		A1 Targeted drugs		
		A2 3D transistors		
		A3 Nanostructured metals		
		A4 Robotics		
Ohia	ative Question			
79	79	<i>E</i> factor is	4.0	1.00
		A1 Mass ratio of waste to desired product		
		A2 Ratio of molecular weight of desired product and molecular weights of all substances produced in stoichiometric : equation		
		A3 Percentage of product of all the materials used in its preparation		

A4 Total mass used in a process divided by the mass of product :

Object	tive Question			
80	80	Green Chemistry eliminates waste-	4.0	1.00
		A1 At the end of the process		
		A2 : At source		
		A3 Somewhere in middle of the process		
		A4 Nothing to do with waste remediation		

### Objective Question

:

81	81	The disease not caused by a bacterium is	4.0	1.00
		A1 Pneumonia		
		A2 : Meningitis		
		A3 Syphillis		
		A4 Poliomylitis		
Object	tive Question			
82	82	Which of the following statement is wrong?	4.0	1.00
		A1 Penicillin and cephalosporin are commonly referred to as $\beta$ -lactum antibiotics		

- A2 Chloroquine is a 4-aminoquinoline derivative
- A3 Most of the analgesics are obtained from opium :
- A4 : Interferon is a drug for tuberculosis

### Objective Question

83

83	Turbidity in water may be checked by coagulant such as

4.0 1.00

A1 Ferric chloride

A2 EFrric sulphate

		A3 Ferric alum		
		A4 All of these		
Object	jective Question			
84	84	Which among the following are more resistant to undergo decomposition in soil?	4.0	1.00
		Al Carbohydrates		
		A2 Proteins		
		A3 Tannins and lignin		
		A4 Lipids		
Object	ive Question			
85	85	If $\tan A$ , $\tan B$ are the roots of $x^2 - Px + Q = 0$ (where $P, Q \in R$ ), then the value of $\sin^2(A+B) =$	4.0	1.00
		$\stackrel{A1}{:} \frac{P^2}{P^2 + (1-Q)^2}$		
		$\stackrel{A2}{:} \frac{P^2}{P^2 + Q^2}$		

A3 
$$\frac{Q^2}{P^2 + (1-Q)^2}$$

$$\stackrel{A4}{:} \frac{P^2}{(P+Q)^2}$$

Oı 01 .... ....

Objective Question
 4.0
 1.00

 86
 86
 If 
$$a_k = \frac{1}{k(k+1)}$$
, for  $k = 1, 2, 3, \dots, n$ , then  $\left(\sum_{k=1}^n a_k\right)^2 =$ 
 4.0
 1.00

 A1
  $\frac{n}{n+1}$ 
 $A2$ 
 $\frac{n^2}{(n+1)^2}$ 
 $A3$ 
 $\frac{n^4}{(n+1)^4}$ 

 A4
  $\frac{n^6}{(n+1)^5}$ 
 $A4$ 
 $\frac{n^6}{(n+1)^5}$ 
 $A1$ 
 $\frac{n^6}{(n+1)^5}$ 

87 87  $\sum_{k=1}^{\infty} \frac{1}{k!} \left( \sum_{n=1}^{k} 2^{n-1} \right) =$ 

A1 :	e
A2 :	$e^2 + e$
A3 :	e <sup>2</sup>

 $e^{A4}$   $e^2 - e$ 

Object	jective Question				
88	88	The sum of the series $\frac{x}{1-x^2} + \frac{x^2}{1-x^4} + \frac{x^4}{1-x^8} + \dots$ to infinite terms, if $ x  < 1$ is	4.0	1.00	
		$ \begin{array}{c} A1  x \\ \vdots  \frac{x}{1-x} \end{array} $			
		$ \begin{array}{c} A2 \\ \vdots \\ 1 \\ -x \end{array} $			
		$\stackrel{A3}{:} \frac{1+x}{1-x}$			
		A4 1 :			
Object	ive Question				
89	89	If $a = \cos \frac{4\pi}{3} + i \sin \frac{4\pi}{3}$ , then $\begin{vmatrix} 1 & 1 & 1 \\ 1 & a & a^2 \\ 1 & a^2 & a \end{vmatrix}$ is	4.0	1.00	
		A1 : purely real			

4.0

1.00

1.00

A2 : purely imaginary

:

:

$$\overset{A3}{:} \quad a \left( \cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3} \right)$$

Objective Question

Objectiv	re Ouestion	
	$\stackrel{A4}{:} n(A^{-1}BA)$	
	$\stackrel{A3}{:} A^{-1} B^n A$	
	$\stackrel{A2}{:} A^n B^n A^{-n}$	
	$\stackrel{A1}{:} {}_{\mathcal{A}^{-n}B^{n}A^{n}}$	

Objec	live Question			
91	91	If A and B are any two different square matrices of order n with A-B is non-singular and $A^3 = B^3$ and $A(AB) = B(BA)$ , then	4.0	1.00
		$\stackrel{A1}{:} A^{2} + B^{2} = O$		
		$\stackrel{A2}{:} A^{2} + B^{2} = I$		
		$\stackrel{A3}{:} A^{2} + B^{3} = I$		
		$\stackrel{A4}{:} A^{3} + B^{3} = O$		
Objec	tive Question			
92	92	A committee of 6 is chosen from 10 men and 7 women to contain atleast 3 men and 2 women. The number of ways this can be done, if two women refuse to serve on the same committee, is	4.0	1.00
		A1 8000		
		A2 7800		
		A3 7600		
		A4 7200		
Object	tive Question			
93	93	Let $f(x)$ be a function such that $f'(x) = f(x)$ , $f(0) = 1$ and $g(x)$ be a function such that $f(x) + g(x) = x^2$ Then $\int_0^1 f(x)g(x)dx =$	4.0	1.00
		$\stackrel{A1}{:} e - \frac{e^2}{2} - \frac{5}{2}$		

A2 :  $e + \frac{e^2}{2} - \frac{3}{2}$ 

 $e^{A3} = -\frac{e^2}{2} - \frac{3}{2}$ 

A4	e <sup>2</sup>	5
:	e+	2

Objec	tive Question			
94	94	If the system of equations $x + ky + 3z = 0$ , $3x + ky$ , $-2z = 0$ , $2x + 3y - 4z = 0$ has non trivial solution then $\frac{xy}{z^2} =$	4.0	1.00
		: 5/6 A2 -5/6		
		A3 : 6/5		
		A4 -6/5 :		

# Objective Question

95	95	Express in standard form: $(1+2i)^6 (4i+3)^3$	4.0	1.00
		A1 15625		
		A2 : -15625		
		A3 14625 :		
		A4 : -14625		

## Objective Question

96	96		4.0	1.00
		If $A = \begin{bmatrix} 2 & 0 & 0 \\ -1 & 2 & 3 \\ 3 & 3 & 5 \end{bmatrix}$ , then find $A(adjA)$		
		$\stackrel{A1}{:} 4I$		
		A2 2 <i>I</i>		
		A3 5 <i>I</i>		
		A4 7 <i>I</i>		
Objec	tive Question			

		For what value of x, is the matrix $A = \begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ x & -3 & 0 \end{bmatrix}$ skew-symmetric matrix?		
		Al 2 :		
		A2 : -1		
		A3 4 :		
		A4 -3 :		
Object	ive Question			
98	98	If $f(x) = \int_0^x (t^2 + 2t + 2) dt$ , $2 \le x \le 4$ , then	4.0	1.00
		A1 the maximum value of $f(x)$ is $\frac{136}{3}$		
		A2 the minimum value of $f(x)$ is 10		
		A3 the maximum value of $f(x)$ is 26		
		A4 the maximum value of $f(x)$ is zero		
Object	ive Ouestion			
99	99	$\int_{-3\pi/2}^{-\pi/2} \left[ (x+\pi)^3 + \cos^2(x+3\pi) \right] dx \text{ is equal to}$	4.0	1.00
		$\stackrel{A1}{:} \frac{\pi^4}{32}$		
		$ \stackrel{A2}{:} \frac{\pi^4}{32} + \frac{\pi}{2} $		
		$\begin{array}{c} A3 \\ \vdots \\ \end{array} \frac{\pi}{2} \end{array}$		
		$ \stackrel{A4}{:} \frac{\pi}{2} - 1 $		
Object	ive Question			
100	100	Let $a,b$ and $c$ be distinct non-negative numbers. If the vectors $a\hat{i} + a\hat{j} + c\hat{k}$ , $\hat{i} + \hat{k}$ and $c\hat{i} + g\hat{j} + b\hat{k}$ lie in a plane, then $c$ is	4.0	1.00
		A1 the arithmetic mean of $a$ and $b$ :		

A2 the geometric mean of a and b :	
A3 the harmonic mean of $a$ and $b$ :	
A4 : equal to zero.	