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(MPH/PHD/URS-EE-2017)

Sr. No. 10021

Subject : CHEMISTRY

Code



Time: 14 Hours	Max. Marks: 100	Total Questions: 100
Roll No	(in figure)	(in words
Name :	Father's Name:	
Mother's Name:	Date of Examinat	ion:
(Signature of the candidate)	(\$	Signature of the Invigilator
CANDIDATES MUST READ BEFORE STARTING THE Q	THE FOLLOWING INFORM QUESTION PAPER.	ATION/INSTRUCTIONS

1. All questions are compulsory.

- 2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- 4. The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers MUST NOT be ticked in the Question book-let.
- 5. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.

6. Use only Black or Blue BALL POINT PEN of good quality in the OMR

Answer-Sheet.

Professor & Head

7. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD tt. of Chemis ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETED. University, BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.

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Question No.	Que	Questions			
1.	A NMR transition is shifted from the reference in a 400 MHz spectrometer by 529 Hz. The chemical shift is				
	(1) 1.32 (2	5.29			
	(3) 7.56 (4) 1.76			
2.	Dry ice is used in fire extinguished form. When sprayed on a fire, it quality The change of state is called	ers. It is stored in the cylinder in solid uickly changes into gas known as CO_2 .			
	(1) Evaporation (2	2) Sublimation			
	(3) Condensation (4)) Distillation			
3.	The use of solar power is covered within Green chemistry principle # which is				
	(1) Atom Economy	(2) Design benign chemicals			
	(3) Design for Energy Efficiency	(4) None of these			
4.	Milk is a/an				
	(1) Suspension (2	2) Pure solution			
	(3) Gel	1) Emulsion			
5.	Dipole moment is shown by	•			
	(1) 2, 2-Dimethyl propane	2) Trans-2-pentene			
	(3) Trans-1,2-dichloroethene (4) 2,2,3,3-tetrabromobutane			
6.	Which of the following statement	s about tetramethylsilane is incorrect?			
	(1) It produces a single peak at	S = 10			
	(2) It is inert				
	(3) It is volatile and can be easil	y distilled off and used again			
	(4) It is used to provide a reference measured	erence against which other peaks are			

Question No.	Questions			
7.	The proton nmr of 2-bromo-2-methyl propane will consist of			
	 (1) Three quartets and a singlet (2) Two doublets and a singlet (3) One singlet (4) Two singlets 			
8.	Which compound has a molecular ion at $m/z = 58$, an Infrared absorption at 1650 cm^{-1} and just one singlet in its nmr spectrum?			
1,00	(1) Butane (2) 2-methyl propane			
	(3) CH ₃ CH ₂ CHO (4) CH ₃ COCH ₃			
9.	Which electromagnetic radiation has maximum frequency?			
18+	(1) Cosmic rays (2) X-rays			
Sarra de Caracteria de Caracte	(3) Infra red Rays (4) Ultraviolet rays			
10.	The IUPAC name of the compound			
	CH ₃ CO - CH - CH - COOH			
	$C\ell$ OCH,			
	is			
	(1) 3-chloro-2-methoxy-4-oxo-pentanoic acid			
The state of the s	(2) 3-chloro-2 methoxy-4-keto-pentanoic acid			
	(3) 4-carboxy-3-chloro-4-methoxy-2-butanone			
	(4) 1-carboxy-2-methoxy-3-chloro-ethyl methyl ketone			
11.	Which of the following pairs is epimers:			
	(1) D (+) Glucose and D (-) Fructose			
	(2) D (-) Glucose and D (-) Ribose			
	(3) D (+) Glucose and D (+) Mannose			
	(4) (+) Maltose and (+) Sucrose			

Question No.	Questions				
12. The reactivity of thiophene, furan and pyrrole follows to				role follows the sequence	
		Thiophene < Py < Furan < Thiop		(2) (4)	Thiophene < Furan < Pyrrole Thiophene < Pyrrole < Furan
13.	In UV, λ_{max} fo	or the following	compou	nd wil	ll be at
)		
	(1) 280 nm		(2)	259 n	nm
	(3) 237 nm		(4)	317 n	ım
	(1) Re – Re	HOOC C =	C CH	10 Si – I	20
	(3) Si – Si		(4)	Re –	
15.	In benzilic acid rearrangement				
	(1) Benzaldehyde is converted in to Benzoin				
	(2) Benzil is converted in to Benzilic acid				
	(3) Benzilic acid is converted in to Benzoin				
	(4) None of t	the above			
	How many normal modes of vibration are possible for benzene molecule?				
16.	How many no	rmal modes of v	ibratio	ar are p	obblible for belizelie molecule.
16.	How many no (1) 6	rmal modes of v	(2)	12	Sobble for someone morecule.

Question No.	Questions				
17.	Which is not an anticancer drug?				
1	(1) Vincristine	(2)	Cyclophosphamide		
QE'U	(3) Dexorubicin	(4)	Gabapentin		
18.	Which of the following compounds can be resolved				
	(1) O O COOH	(2)	NO ₂ COOH NO ₂ COOH		
	(3) O_2 COOH O_2	(4)	NO ₂ NO ₂ NO ₂ COOH		
19.	Which is the weakest acid amo	ngst	?		
	(1) H ₃ C — OH	(2)	C/—O—OH		
	(3) O ₂ N—OH	(4)	О—ОН		
20.	$\begin{array}{c} O \\ \hline \end{array} \begin{array}{c} O_2, hv \\ \end{array}$	A.A.			
and the state of t	Product formed in the reaction	is	Total between the firm of the contract of the		
	(1) HOCH ₂ CH ₂ CH ₂ CH ₂ OH	(2)	CO O OH		
	(3)	(4)			

Question No.	Questions					
21.	Stability of (CH ₃) ₃ C [⊕] can be explained by					
	(1) Inductive Effect (2) Hyper conjugation					
meric	(3) Mesomeric Effect					
	(4) Both by Inductive Effect and hyperconjugation					
22.	Absolute configuration of					
	СООН		A Company of the Comp			
	Н-С-ОН		mairizer v			
	Н-С-ОН					
	СООН					
	is	(0)				
	(1) (2R, 3S)	(2)	(2R, 3R)			
	(3) (2S, 3S)	(4)	(2S, 3R)			
23.	Which of the following vitamins has steroidal structure?					
	(1) Vitamin E	(2)	Vitamin K			
	(3) Vitamin D	(4)	Vitamin C			
24.	The Co-enzyme involved in	biosynth	esis of fats is			
	(1) FMN	(2)	Co-I			
	(3) Co – II	(4)	Co-A			
25.	How many small peptides ar has five lysine residues?	e formed	l upon cleavage by trypsin if a protein			
	(1) 4	(2)	5			
	(3) 6	(4)	7			

Question No.	Questions
26.	Which of the following interaction contributes most in protein folding? (1) Hydrophobic interaction (2) Covalent bond (3) van der Walls interaction (4) Ionic bond
27.	Which of the following reactions convert a 1, 5-diene to an isomeric 1,5-diene? (1) Cope rearrangement (2) Claisen rearrangement (3) Photochemical (2 + 2) reaction (4) Diels-Alder reaction
28.	Which is most reactive towards an eletrophile? (1) (2) (3) (4) (4) (4) H
29.	Natural lipids are readily soluble in (1) Oil (2) Mercury (3) Water (4) None of these
30.	A disadvantage of fats is (1) Reduction in rate of heat loss (2) Solvent for vitamins (3) Efficient source of energy (4) Effective insulative material

Question No.	Questions			
31.	A fatty acid with 14 carbon atoms will undergo how many cycles of beta oxidation?			
DAS A	(1) 7			
	(3) 6			
32.	Which of the following compounds show a sharp IR absorption band at 1700 cm ⁻¹ and a broad band at 3300 cm ⁻¹ ?			
In doir	(1) Ethanol (2) Ethanoic acid			
	(3) Propanone (4) diethyl ether			
33.	The product in the following reaction is $CH_3 - C - N \xrightarrow{\text{(i) } CH_3 \text{Mg Br}} ?$			
	CH_3 O			
	CH ₃			
	(1) H_3 C CH_3 (2) CH_3 C CH_2 OH (3) H_3 C $-CH$ $-CH_3$ (4) CH_3 CO CH_3			
34.	OH (3) H ₃ C-CH-CH ₃ (4) CH ₃ CO CH ₃			
34.	CH ₃ OH (3) H ₃ C-CH-CH ₃ (4) CH ₃ CO CH ₃ Number of Orientations with respect to applied magnetic field for duterium			

Question No.	Questions				
35.	When EDTA solution is added to Mg ²⁺ ion, then which of the following statements is not true?				
	(1) Four coordinate sites of Mg ²⁺ ions are occupied by EDTA and remaining two sites are occupied by water molecules				
	(2) pH of the solution is decreased				
ts bos	(3) Colorless [Mg – EDTA] ² - chelate is formed				
	(4) All six coordinates of Mg ²⁺ ions are occupied by EDTA				
36.	When applying VSEPR theory to predict the molecular shape, which of the following we need not take in to account?				
	(1) Valence electrons occupying sigma bonding orbitals				
	(2) Valence electrons occupying π -bonding orbitals				
	(3) Valence electrons occupying non-bonding orbitals				
	(4) None of these				
37.	Which statement about ferrocene is incorrect?				
	(1) The Fe centre in ferrocene can be protonated by treatment with conc. H ₂ SO ₄				
	(2) In the gas phase, the C ₅ H ₅ rings in ferrocene are eclipsed				
	(3) The ligands in ferrocene undergo electrophillic substitution with $RCOCl$ in the presence of a Lewis acid				
mi koj	(4) I ₂ oxidises ferrocene to give a diamagnetic cation				
38.	Chlorophyll converts light energy in to				
	(1) Heat energy (2) Potential energy				
	(3) Chemical energy (4) Electrical energy				

Question No.	Questions				
39.	The tyrosinase, is activated by				
	(1) Copper ion (2) Iron ion				
	(3) Potassium ion (4) Calcium ion				
40.	Which of the following terms best describes a drug inhibits the e but binds to a binding site other than active site?				
	(1) Allosteric inhibitor (2) Reversible inhibitor				
	(3) Irreversible Inhibitor (4) Suicide substrate				
41.	Which statement is incorrect about zeolites?				
	(1) Zeolites are aluminosilicates				
	(2) Each zeolite contains channels of a specific size				
	(3) A zeolite functions as an acid catalyst				
	(4) No zeolites occur naturally				
42.	Chalogenides are the compounds of				
	(1) Sulfur and phosphorus				
	(2) Sulfur and halogens				
	(3) Sulfur, selenium and tellurium				
	(4) Nitrogen and sulfur				
43.	Spin-Orbit coupling is found maximum in				
100.0	(1) Third transition series metal complexes				
1	(2) First transition series metal complexes				
	(3) Second transition series metal complexes				
	(4) p-block elements				

Question No.	n znoi	Qu	estions			
44.	Which one of the polymers i	s a coi	nductive polymer			
	(1) Polyethylene mornout	(8) (2) Polyacetylene			
	(3) Polyvinylene	(4) Poly vinyl Chloride			
45.	The difference in crystal fiel octahedral complex and do octahedral complex and do octahedral the ligands are street	ahedr	bilization energy between low spin d cal with tetragonal elongation complex old ligands, will be			
	(1) $-2.13 \Delta_0$	(2)	$-2.40\Delta_0$			
	(3) $-2.00 \Delta_0$	(4)	None of these			
46.	Natural oxygen carrier other	Natural oxygen carrier other than Hemoglobin is				
	(1) Hem erythrin	(2)	Hemocyanins			
	(3) Tyrosinase	(4)	Ferredoxins			
47.	Among the following ligands,	the tr	ans effect is maximum for			
	(1) NO ₂	(2)	Cl- and and have submit a land in the			
	(3) CN-	(4)	OH-			
18.	Which change is not detected	by DT	A?			
	(1) Sublimation	(2)	Desorption			
	(3) Polymer softening	(4)	Loss of moisture			
19.	Which nuclear model can best explain that all elements with atomic numbe greater than 92 are radioactive?					
· Parameters ((1) Shell Model	(2)	Liquid Drop Model			
	(3) Pion Cloud only	(4)	All of these			

Question No.	Questions					
50.	Spotting electrolyte is used to eleminate					
	(1) Condenser current	(2)	Diffusion current			
	(3) Limiting current	(4)	Migration current			
51.	The range of fluorine chemical sh	ift	in NMR is			
	(1) 12 ppm	(2)	56 ppm			
	(3) 300 ppm	(4)	542 ppm			
52.	Borazine, B ₃ N ₃ H ₆ has a					
	(1) Regular hexagonal structure	lik	ke benzene			
	(2) Tetragonal structure					
	(3) Triangular capped structure					
	(4) Hexagonal prism structure					
53.	In ligand to metal charge spectr responsible for purple color is	a (LMCT) of MnO ₄ ion, the transition			
	(1) 29500 cm ⁻¹	(2)	17700 cm ⁻¹			
	(3) 44400 cm ⁻¹	4)	30300 cm ⁻¹			
54.	When an auxochrome is attached λ_{max} in UV spectrum undergoes	d to	a cargon-carbon double bond, then			
	(1) Hypsochromic shift (2)	Bathochromic shift			
	(3) Hyperchromic shift (4)	Hypochromic shift			
55.	The number of α and β particles emitted in the nuclear reaction					
	$_{92}U^{238} \rightarrow _{82}Pb^{206}$ is					
		2)	6α, 4β			
0.00		4)	8α, 6β			
	(3) 4α , 3β	1)	ου, ορ			

Question No.	Questions				
56.	Among the hydroxides of alkaline earth metals, the least soluble in water is				
	(1) $\operatorname{Mg}(OH)_2$ (2) $\operatorname{Ca}(OH)_2$				
	(3) Be (OH) ₂ (4) Ba (OH) ₂				
57.	Which of the following isotope is not a fission fuel?				
	(1) U-238 (2) U-233				
	(3) U-235 (4) U-239				
58.	Most common oxidation state of tellurium is				
	(1) -2 $(2) +4$				
	(3) +6 (4) +2				
59.	The correct order of acidic strength is				
	(1) $HClO > HIO > HBrO$ (2) $HIO > HBrO > HClO$				
	(3) HBrO > HClO > HIO (4) HClO > HBrO > HIO				
60.	Which of the following is not a hard base?				
	(1) NH ₃ (2) H ₂ O				
	(3) CN- (4) Cl-				
61.	The number of geometrical and optical isomers for the complex $[\mathrm{Rh}\;(\mathrm{en})_2\;\mathrm{C}l_2]^+$ ion				
	(1) Three (2) Two				
	(3) Four (4) Six				

Question No.	Questions The electrons which contribute to isomer shift is Mössbauer spectroscopy are				
62.					
7	(1)	p-electrons	(2)	d-electrons	
	(3)	f-electrons	(4)	s-electrons	
63.	Wh	ich of the following is a bor	rder li	ne acid?	
	(1)	Pd ²⁺	(2)	Co ²⁺	
	(3)	Co ³⁺	(4)	Al ³⁺	
64.	The absorption peaks in IR spectrum are broad, as they possess information related to				
	(1)	Rotational energy	(2)	Bond energy	
	(3)	Inner electron changes	(4)	Outer electron changes	
65.	Wurtzite structure has crystal lattice type				
	(1)	bcc	(2)	hcp	
	(3)	fccp	(4)	None of these	
66.	The	spectroscopic state for d ³	syster	n is	
	(1)	4 _{F_{3/2}}	(2)	$^{4}F_{2}$	
	(3)	3 _{F_{3/2}}	(4)	⁴ D _{3/2}	
67.	The	point group for			
		$C_l > C = O < H$			
	is				
	(1)	C_2h	(2)	$C_2^{} u$	
1	(3)	$C_2 v$	(4)	T_d	

Question No.	Questions				
68.	The number of atoms contained within the unit cell for the diamond lattice are				
	(1) 2	(2)	1		
	(3) 4	(4)	8		
69.	The Miller indices of crystal pl (2a, 3b, c) are	anes	which cut through the crystal axes a		
	(1) (362)	(2)	(263)		
	(3) (326)	(4)	None of these		
70.	The Efficacy of Al^{+3} , Mg^{2+} and Na^{+} ions to cause coagulation vary in the order				
A CONTRACTOR OF THE CONTRACTOR	(1) $Al^{+3} \approx Mg^{2+} \approx Na^+$	(2)	$Na^+ > Mg^{2+} > Al^{3+}$		
	(3) $Na^+ \approx Mg^{+2} > Al^{3+}$	(4)	$Al^{3+} > Mg^{2+} > Na^{+}$		
71.	Polymers having regular alternation of d- and l-configurations in the molecular chain are called				
	(1) Syndiotactic polymers	(2)	Isotactic polymers		
ACCORDING TO THE PARTY OF THE P	(3) Block copolymers	(4)	Copolymers		
72.	The effective nuclear charge fo	or 35 e	electron in sulphur is		
	(1) 4.30	(2)	5.45		
	(3) 3.40	(4)	54.5		
73.	The correct form of Butler-Volmer equation is				
	(1) $i = i_0 e^{-\alpha n/FRT}$	(2)	$i = i_0 \left\{ e^{(1-\alpha) nF/RT} - e^{\alpha nF/RT} \right\}$		
	(3) $i = i_0 \{e^{(1-\alpha)^{nF/RT}} - e^{-\alpha nF/RT}\}$		$i = i_0 \cdot e^{(1-\alpha) nF/RT}$		
	where all the terms have usual meanings				

Question No.	Questions				
74.	The temperature at which the Joule-Thomson coefficient changes sign is known as				
	(1) Critical temperature (2) Boyle temperature				
	(3) Inversion temperature (4) None of these				
75.	The heat of vaporisation of water at 100°C is 2259.4 Jg ⁻¹ . The entropy increase in the evaporation of one mole of water at 100°C will be				
	(1) $10.903 \mathrm{Jk^{-1}mol^{-1}}$ (2) $1090.3 \mathrm{Jk^{-1}mol^{-1}}$				
	(3) $10903 \mathrm{Jk^{-1}mol^{-1}}$ (4) $109.03 \mathrm{Jk^{-1}mol^{-1}}$				
76.	The relation between Entropy and thermodynamic probability is expressed as				
	(1) $S = lnW$ (2) $S = k lnW$				
VO I	(3) $S = R lnW$ (4) $S = \frac{1}{\ell nw}$				
77.	Which out of the following is correct relation?				
	(1) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a - \frac{1}{2} pk_b$ (2) $pH = \frac{1}{2} pk_w - \frac{1}{2} pk_a + \frac{1}{2} k_b$				
	(3) $pH = \frac{1}{2} pk_a - \frac{1}{2} pk_w + \frac{1}{2} k_b$ (4) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a + \frac{1}{2} pk_b$				
78.	Which of the following is an irreversible cell?				
	(1) $Z_n/Z_{n+2} AgCl/Ag$ (2) $Z_n/Z_{n+2} Cd^{2+}/Cd$				
	(3) $Cd / Cd^{2+} KCl, Hg_2Cl_2(s) / Hg$ (4) $Zn / H_2 SO_4 / Ag$				

Question No.	Questions
79.	Which of the following partially miscible liquids have both upper and lower critical solution temperature?
	(1) Water and aniline (2) Water and diethyl amine
	(3) Water and β-picoline (4) Methanal and cyclohexane
80.	For an isentropic change of state
	(1) $dH = 0$ (2) $dT = 0$
	(3) $dS = 0$ (4) $dS = 1$
81.	The number of microstates for a three different atom possesing three quanta of energy are
	(1) 3 (2) 10
TO A STATE OF THE	(3) 6 (4) 4
82.	Step down ladder operator lowers the eigen value of wave function by
	(1) 1 (2) 2
	(3) 3 (4) None of these
83.	The translational partition function 'q _{trans} ' is Expressed by
	(1) $q_{trans} = \frac{(2\pi kT)^{3/2} V}{RT}$ (2) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{RT}$
	(3) $q_{trans} = \frac{(2\pi m kT)^{1/2} V}{RT}$ (4) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{T}$
	Where all the symbols have their usual meaning
	Where all the symbols have their usual meaning

Question No.	Questions				
84.	Isotonic solutions have same				
	(1)	Viscosity	(2)	Surface tension	
	(3)	Dipole moment	(4)	Osmotic pressure	
85.	Wh	ich one of the follow	wing stateme	nts is correct?	
	(1)	Change in zero posystem by E ₀	oint energy,	$\mathbf{E_{0}}$, increases the value of Entropy of	
	(2)	Change in zero pe the system by E ₀	oint Energy,E	Σ_{0} , decreases the value of Entropy of	
	(3) Change in zero point Energy, E ₀ ,doesn't alter the Entropy of the system				
	(4)	Change in zero po	int Energy, E	$_{0}$, increases work function by E_{0}	
86.	The Onsager's reciprocal relation is				
	(1)	$\mathbf{L}_{11} = \mathbf{L}_{22}$	(2)	$\mathbf{L_{11}} = \mathbf{L_{12}}$	
	(3)	$\mathbf{L}_{22} = \mathbf{L}_{21}$	(4)	$\mathbf{L_{12}} = \mathbf{L_{21}}$	
	Where L_{11} , L_{22} and L_{12} , L_{21} are like and unlike phenomological coefficient respectively				
87.	Colloidal sols are purified by				
	(1)	Dialysis	(2)	Peptization	
eine te et f	(3)	Coagulation	(4)	Flocculation	

Question No.	Questions				
88.	There cannot be a quadrupole point on the phase diagram for one component system, because the degree of freedom is				
	(1) 3 (2) 4				
	(3) -1 (4) zero				
89.	The average position of a particle, $< x > $ can be estimated quantum mechanically using relation				
	(1) $\langle x \rangle = \frac{\int x \Psi \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$ (2) $\langle x \rangle = \frac{\int \Psi x \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$				
	(3) $\langle x \rangle = \frac{\int x^2 \Psi \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$ (4) $\langle x \rangle = \frac{\int \Psi x^2 \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$				
90.	The term "steady state" deals with				
	(1) Statistical mechanics (2) quantum mechanics				
	(3) Thermodynamics (4) Irreversible thermodynamics				
91.	A fuel which can not be classed as a renewable source of energy is				
	(1) Methanol (2) Hydrogen				
	(3) Methane (4) Ethanol				
92.	$50~\mathrm{m}l$ of 0.1 NaOH is added to $49~\mathrm{m}l$ of 0.1 M HCl. The resulting solution has pH				
	(1) 12 (2) 11				
	(3) 9 (4) 10				

Questions	hoddedd Yr.			
A copolymer can be obtained by				
(1) Polymerizing two identical polymer				
(2) Mixing two identical polymer				
(3) Polymerizing two different monomer				
(4) Mixing two different polymer				
If $\left(\frac{\partial P}{\partial T}\right)_{V} \frac{\alpha}{\beta}$ then according to Maxwell's relation				
(1) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\beta}{\alpha}$ (2) $\left(\frac{\partial S}{\partial V}\right)_{T} = \alpha \beta$				
(3) $\left(\frac{\partial S}{\partial V}\right)_{T} = -\frac{\alpha}{\beta}$ (4) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\alpha}{\beta}$				
TheDebroglie wave length of an electron with kinetic energy of 1	.00 eV is			
(1) 1.23 nm (2) 12.3 nm				
(3) 28.7 pm (4) None of these				
Cooking time of food is reduced in a pressure cooker because				
(1) The boiling point of water is lowred				
(2) The boiling point of water is raised				
(3) There is uniform distribution of heat				
(4) Higher pressure softens the food				
	A copolymer can be obtained by (1) Polymerizing two identical polymer (2) Mixing two identical polymer (3) Polymerizing two different monomer (4) Mixing two different polymer If $\left(\frac{\partial P}{\partial T}\right)_{V}^{\alpha} \alpha_{\beta}^{\prime}$ then according to Maxwell's relation (1) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\beta}{\alpha}$ (2) $\left(\frac{\partial S}{\partial V}\right)_{T} = \alpha \beta$ (3) $\left(\frac{\partial S}{\partial V}\right)_{T} = -\frac{\alpha}{\beta}$ (4) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\alpha}{\beta}$ The Debroglie wave length of an electron with kinetic energy of 1 (1) 1.23 nm (2) 12.3 nm (3) 28.7 pm (4) None of these Cooking time of food is reduced in a pressure cooker because (1) The boiling point of water is lowred (2) The boiling point of water is raised (3) There is uniform distribution of heat			

	Questions			
Which of the following is a	Boson?	20 - 25		
(1) Proton	(2) Electron			
(3) ⁴ He ₂	$(4) D^2$			
		s of equally		
(1) 2B	(2) B			
(3) 1.5 B	(4) 0.5 B			
What is the percentage strength of "15 volume" H_2O_2				
(1) 6.09 %	(2) 4.55 %			
(3) 3.03 %	(4) 1.50 %			
For a particle possessing rotational motion				
$(1) C_p - C_v = R$	$(2) C_p - C_v = 2R$			
$(3) C_{p} - C_{v} = 0$	(4) None of these			
	30.3800 OF 30.1			
The second second second	server and respirations and			
		(8)		
	roles (c.). Albert M. Charle			
	 (1) Proton (3) ⁴He₂ The rotational spectrum of spaced lines with spacing end of the space o	The rotational spectrum of a rigid diatomic rotator consists spaced lines with spacing equal to (1) $2B$ (2) B (3) $1.5B$ (4) $0.5B$ What is the percentage strength of "15 volume" H_2O_2 (1) 6.09% (2) 4.55% (3) 3.03% (4) 1.50% For a particle possessing rotational motion (1) $C_p - C_v = R$ (2) $C_p - C_v = 2R$ (3) $C_p - C_v = 0$ (4) None of these		

frencher Everlewton on 20/1/17 @ 10: 06 AM

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

(MPH/PHD/URS-EE-2017)

Sr. No. 10010 Subject: CHEMISTRY

Code



Time: 1¼ Hours	Max	x. Marks : 100	Total Questions: 10
Roll No.	_(in figure)_		(in words
Name:		_ Father's Name :	
Mother's Name :		_ Date of Examinatio	on :
(Signature of the candidate)		(Si	gnature of the Invigilator

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- All questions are compulsory.
- The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. SSOT Answers MUST NOT be ticked in the Question book-let.
- There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- Use only Black or Blue BALL POINT PEN of good quality in the OMR Answer-Sheet.
- BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.

University, Ro

Question No.	Questions Questions
1.	Which of the following pairs is epimers:
	(1) D (+) Glucose and D (-) Fructose
	(2) D (-) Glucose and D (-) Ribose
	(3) D (+) Glucose and D (+) Mannose
1 oluv-	(4) (+) Maltose and (+) Sucrose
2.	The reactivity of thiophene, furan and pyrrole follows the sequence
	(1) Furan < Thiophene < Pyrrole (2) Thiophene < Furan < Pyrrole
	(3) Pyrrole < Furan < Thiophene (4) Thiophene < Pyrrole < Furan
3.	In UV, λ_{max} for the following compound will be at
	(1) 280 nm (2) 259 nm
	(3) 237 nm (4) 317 nm
4.	Enantiotropic faces of the following compound can be given as $HOOC \longrightarrow C = C \stackrel{\text{H}}{\smile} CHO$
	(1) Re – Re (2) Si – Re
	(3) Si – Si (4) Re – Si

Question No.	Questions					
5.	In benzilic acid rearrangement					
	(1) Benzaldehyde is conv	erted in to	Benzoin			
	(2) Benzil is converted in	to Benzilio	acid			
	(3) Benzilic acid is conve	rted in to B	enzoin			
	(4) None of the above		O Chose of the Co Co. Co.			
6.	How many normal modes	of vibration	are possible for benzene molecule			
. 8	(1) 6	(2)	12 Constitution of the second			
	(3) 30	(4)	24			
7.	Which is not an anticancer drug?					
AN HARMAN PART AND AN AND AND AND AND AND AND AND AND	(1) Vincristine	(2)	Cyclophosphamide			
	(3) Dexorubicin	(4)	Gabapentin			
8.	Which of the following compounds can be resolved					
	NO_2		NO ₂ COOH			
	(1)	(2)	⊙—©			
CHICAGO CONTRACTOR CON	соон		NO ₂ COOH			
Annual vision report to	NO ₂ COOH		NO ₂ NO ₂			
	(3)	(4)				
Security Sec	COOH NO2		NO ₂ COOH			
9.	Which is the weakest acid a	amongst?				
	(1) H ₃ C — OH	(2) C	2/ - ⊙−OH			
200000000000000000000000000000000000000	(3) O ₂ N—O)—OH	(4) <	OH (8 – 10 (2)			

No.		C 1985 () 20 1986 ()	Quest	ions
10.		$ \begin{array}{c} O_2, h\nu \\ \end{array} $		
	Prod	uct formed in the reactio	n is	
	(1)	$\mathrm{HOCH_{2}CH_{2}CH_{2}CH_{2}OH}$	(2)	CO O OH
81.7.6	(3)		(4)	
11.	A fu	el which can not be classe	ed as a	renewable source of energy is
	(1)	Methanol	(2)	Hydrogen
	(3)	Methane	(4)	Ethanol
12.	50 r		o 49 m <i>l</i>	of 0.1 M HCl. The resulting solution
	(1)	12	(2)	11
	(3)	9	(4)	10
13.	A co	ppolymer can be obtained	by	
	(1)	Polymerizing two identic	cal poly	mer
	(2)	Mixing two identical pol	ymer	
	(3)	Polymerizing two differen	ent mo	nomer
	(4)	Mixing two different pol	ymer	

Question No.	Questions				
14.	If $(\partial P/\partial T)_v \alpha/\beta$ then according to Maxwell's relation				
	(1) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\beta}{\alpha}$ (2) $\left(\frac{\partial S}{\partial V}\right)_{T} = \alpha \beta$				
	(3) $\left(\frac{\partial S}{\partial V}\right)_{T} = -\frac{\alpha}{\beta}$ (4) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\alpha}{\beta}$				
15.	The Debroglie wave length of an electron with kinetic energy of 1.00 eV is				
	(1) 1.23 nm (2) 12.3 nm				
	(3) 28.7 pm (4) None of these				
16.	Cooking time of food is reduced in a pressure cooker because				
	(1) The boiling point of water is lowred				
	(2) The boiling point of water is raised				
	(3) There is uniform distribution of heat				
	(4) Higher pressure softens the food				
17.	Which of the following is a Boson?				
	(1) Proton (2) Electron				
A American School of the Control of	(3) ${}^{4}\text{He}_{2}$ (4) D^{2}				
	(Eller The Commence of the Com				

Question No.	on Questions					
18.	The rotational spectrum of a rigid diatomic rotator consists of equally spaced lines with spacing equal to					
	(1) 2B	(2)	Besiden endificate (1)			
	(3) 1.5 B	(4)	0.5 B			
19.	What is the percentage	strength of	"15 volume" H ₂ O ₂			
	(1) 6.09 %	(2)	4.55 %			
	(3) 3.03 %	(4)	1.50 %			
20.	For a particle possessing rotational motion					
	$(1) C_p - C_v = R$	(2)	$C_p - C_v = 2R$			
	(3) $C_p - C_v = 0$	(4)	None of these			
21.	Polymers having regular alternation of d- and l-configurations in the molecular chain are called					
	(1) Syndiotactic polym	ners (2)	Isotactic polymers			
	(3) Block copolymers	(4)	Copolymers			
22.	The effective nuclear charge for 35 electron in sulphur is					
	(1) 4.30	(2)	5.45			
	(3) 3.40	(4)	54.5			
23.	The correct form of But	ler-Volmer e	equation is			
	(1) $i = i_0 e^{-\alpha n/FRT}$	(2)	$i = i_0 \left\{ e^{(1-\alpha) nF/RT} - e^{\alpha nF/RT} \right\}$			
	(3) $i = i_0 \{e^{(1-\alpha)^{nF/RT}} - e^{-\alpha t}\}$	nF/RT} (4)	$i = i_0 \cdot e^{(1-\alpha) nF/RT}$			
	where all the terms hav	e usual mear	nings			

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Question No.	Questions					
24.	The temperature at which the Joule-Thomson coefficient changes sign is known as					
	(1) Critical temperature (2) Boyle temperature					
	(3) Inversion temperature (4) None of these					
25.	The heat of vaporisation of water at 100°C is 2259.4 Jg ⁻¹ . The entropy increase in the evaporation of one mole of water at 100°C will be					
	(1) $10.903 \mathrm{Jk^{-1}mol^{-1}}$ (2) $1090.3 \mathrm{Jk^{-1}mol^{-1}}$					
	(3) $10903 \mathrm{Jk^{-1}mol^{-1}}$ (4) $109.03 \mathrm{Jk^{-1}mol^{-1}}$					
26.	The relation between Entropy and thermodynamic probability is expressed as					
	(1) $S = lnW$ (2) $S = k lnW$					
	(3) $S = R \ln W$ (4) $S = \frac{1}{\ln W}$					
27.	Which out of the following is correct relation?					
	(1) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a - \frac{1}{2} pk_b$ (2) $pH = \frac{1}{2} pk_w - \frac{1}{2} pk_a + \frac{1}{2} k_b$					
•	(3) $pH = \frac{1}{2} pk_a - \frac{1}{2} pk_w + \frac{1}{2} k_b$ (4) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a + \frac{1}{2} pk_b$					
28.	Which of the following is an irreversible cell?					
	(1) $Z_n/Z_{n+2} AgCl/Ag$ (2) $Z_n/Z_{n+2} Cd^{2+}/Cd$					
	(3) $\operatorname{Cd}/\operatorname{Cd}^{2+} \operatorname{KC}l, \operatorname{Hg}_2\operatorname{C}l_2(s)/\operatorname{Hg}$ (4) $\operatorname{Zn}/\operatorname{H}_2\operatorname{SO}_4/\operatorname{Ag}$					

Question No.		tions				
29.	Which of the following partially miscible liquids have both upper and lower critical solution temperature?					
	(1)	Water and aniline	(2)	Water and diethyl amine		
	(3)	Water and β-picoline	(4)	Methanal and cyclohexane		
30.	For a	an isentropic change of s	tate			
	(1)	dH = 0	(2)	dT = 0		
	(3)	dS = 0	(4)	dS = 1		
31.	The	range of fluorine chemic	al shift	in NMR is		
	(1)	12 ppm	(2)	56 ppm		
	(3)	300 ppm	(4)	542 ppm		
32.	Bora	zine, B ₃ N ₃ H ₆ has a		- P		
	(1) Regular hexagonal structure like benzene					
	(2)	Tetragonal structure				
	(3)	Triangular capped struc	ture			
	(4)	Hexagonal prism struct	ure			
33.	In ligand to metal charge spectra (LMCT) of MnO ₄ ion, the transition responsible for purple color is					
	(1)	$29500 \mathrm{cm^{-1}}$	(2)	17700 cm ⁻¹		
	(3)	$44400 \ \mathrm{cm^{-1}}$	(4)	30300 cm ⁻¹		
34.		n an auxochrome is atta n UV spectrum undergo		a cargon-carbon double bond, then		
	(1)	Hypsochromic shift	(2)	Bathochromic shift		
	(3)	Hyperchromic shift	(4)	Hypochromic shift		

Question No.	Questions						
35.	The number of α and β particles emitted in the nuclear reaction $_{92}U^{238} \rightarrow _{82}Pb^{206}$ is						
	(1) 7α, 5β	(2)	6α, 4β				
	The second secon	(4)	and always the second of the				
36.	Among the hydroxides of alkalis	ine e	arth metals,the least soluble in water				
	(1) Mg (OH) ₂	(2)	Ca (OH) ₂				
	(3) Be (OH) ₂	(4)	Ba (OH) ₂				
37.	Which of the following isotope is not a fission fuel?						
	(1) U-238	(2)	U-233				
	(3) U–235	(4)	U-239				
38.	Most common oxidation state of	Most common oxidation state of tellurium is					
	(1) -2	(2)	+4				
	(3) +6	(4)	+2				
39.	The correct order of acidic strength is						
	(1) HClO > HIO > HBrO	(2)	HIO > HBrO > HClO				
	(3) HBrO>HClO>HIO	(4)	HClO > HBrO > HIO				
40.	Which of the following is not a hard base?						
	(1) NH ₃	(2)	H ₂ O				
	(3) CN-	(4)	Cl-				
	The condition of						

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Question No.	Ques	ions
41.	A fatty acid with 14 carbon atoms woxidation?	ill undergo how many cycles of beta
box	(1) 7	4
505	(3) 6 (4)	5
42.	Which of the following compounds a 1700 cm ⁻¹ and a broad band at 3300	
i in its	(1) Ethanol (2)	Ethanoic acid
	(3) Propanone (4)	diethyl ether
43.	The product in the following reaction	n is
	$CH_3-C-N \xrightarrow{\text{(i) } CH_3 Mg Br}$?	
	(1) $H_3C - \overset{C}{C} - OH$ (2) CH_3	CH ₃ -C-NH ₂
	ОН	CH ₃ CO CH ₃
44.	Number of Orientations with respect is	to applied magnetic field for duterium
7	(1) 3	4
	(3) 2	1

Question No.	Questions				
45.	When EDTA solution is added to Mg ²⁺ ion, then which of the following statements is not true?				
	(1) Four coordinate sites of Mg ²⁺ ions are occupied by EDTA and remaining two sites are occupied by water molecules				
	(2) pH of the solution is decreased				
	(3) Colorless [Mg - EDTA] ²⁻ chelate is formed				
	(4) All six coordinates of Mg ²⁺ ions are occupied by EDTA				
46.	When applying VSEPR theory to predict the molecular shape, which of the following we need not take in to account?				
	(1) Valence electrons occupying sigma bonding orbitals				
	(2) Valence electrons occupying π-bonding orbitals				
	(3) Valence electrons occupying non-bonding orbitals				
	(4) None of these				
47.	Which statement about ferrocene is incorrect?				
	(1) The Fe centre in ferrocene can be protonated by treatment with conc. H ₂ SO ₄				
	(2) In the gas phase, the C ₅ H ₅ rings in ferrocene are eclipsed				
	(3) The ligands in ferrocene undergo electrophillic substitution with $RCOCl$ in the presence of a Lewis acid				
	(4) I ₂ oxidises ferrocene to give a diamagnetic cation				
48.	Chlorophyll converts light energy in to				
	(1) Heat energy (2) Potential energy				
	(3) Chemical energy (4) Electrical energy				

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Question No.	Questions						
49.	The	The tyrosinase, is activated by					
	(1)	Copper ion		(2)	Iron ion	•	
	(3)	Potassium ion	/0-1-12	(4)	Calcium ion		
50.	The State of the State of	ch of the follow binds to a bindi			escribes a drug inhibit n active site ?	s the enzyme,	
	(1)	Allosteric inhib	oitor	(2)	Reversible inhibitor		
	(3)	Irreversible In	hibitor	(4)	Suicide substrate		
51.	Stab	oility of (CH ₃) ₃ (C [⊕] can be ex	plair	ned by		
	(1)	Inductive Effect	ct				
	(2)	Hyper conjugat	tion				
	(3)	Mesomeric Eff	ect				
	(4)	Both by Induct	ive Effect ar	nd hy	perconjugation		
52.	Abso	olute configurat	ion of				
		СООН					
		H-C-OH					
		H-C-OH					
		COOH					
	is						
	(1)	(2R, 3S)		(2)	(2R, 3R)		
	(3)	(2S, 3S)		(4)	(2S, 3R)		
53.	Which of the following vitamins has steroidal structure?						
	(1)	Vitamin E		(2)	Vitamin K		
	(3)	Vitamin D			Vitamin C		

Question No.	Questions					
54.	The Co-enzyme involved in biosynthesis of fats is					
	(1) FMN (2) Co-I					
	(3) Co – II (4) Co – A					
55.	How many small peptides are formed upon cleavage by trypsin if a protein has five lysine residues?					
	(1) 4 (2) 5					
	(3) 6					
56.	Which of the following interaction contributes most in protein folding?					
The state of the s	(1) Hydrophobic interaction (2) Covalent bond					
4	(3) van der Walls interaction (4) Ionic bond					
57.	Which of the following reactions convert a 1, 5-diene to an isomeric 1,5-diene?					
	(1) Cope rearrangement					
	(2) Claisen rearrangement					
	(3) Photochemical (2 + 2) reaction					
STATE OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PER	(4) Diels-Alder reaction					
58.	Which is most reactive towards an eletrophile?					
	The state of the s					
	$(1) \qquad (2) \qquad (3)$					
	N					
- (3) $\langle N \rangle$ (4)					
	H I					
	H Chimb					

Question No.	Questions	. jvi			
59.	Natural lipids are readily soluble in				
	(1) Oil (2) Mercury				
	(3) Water (4) None of these				
60.	A disadvantage of fats is				
i zelge	(1) Reduction in rate of heat loss				
	(2) Solvent for vitamins				
	(3) Efficient source of energy				
	(4) Effective insulative material				
61.	Which statement is incorrect about zeolites?				
	(1) Zeolites are aluminosilicates				
	(2) Each zeolite contains channels of a specific size				
	(3) A zeolite functions as an acid catalyst				
	(4) No zeolites occur naturally				
62.	Chalogenides are the compounds of				
	(1) Sulfur and phosphorus				
	(2) Sulfur and halogens				
	(3) Sulfur, selenium and tellurium				
	(4) Nitrogen and sulfur				
63.	Spin-Orbit coupling is found maximum in	Name of Street, Street			
	(1) Third transition series metal complexes				
	(2) First transition series metal complexes				
	(3) Second transition series metal complexes				
	(4) p-block elements				

Question No.		Que	stions			
64.	Which one of the polymers	s is a con	ductive polymer			
	(1) Polyethylene	(2)	Polyacetylene			
	(3) Polyvinylene	(4)	Poly vinyl Chloride			
65.	The difference in crystal is octahedral complex and do assuming the ligands are s	octahedra	ilization energy between low spin of al with tetragonal elongation completed ld ligands, will be			
	(1) $-2.13 \Delta_0$	(2)	$-2.40\Delta_{\scriptscriptstyle 0}$			
	(3) $-2.00 \Delta_0$	(4)	None of these			
66.	Natural oxygen carrier oth	er than I	Hemoglobin is			
	(1) Hem erythrin	(2)	Hemocyanins			
	(3) Tyrosinase	(4)	Ferredoxins			
67.	Among the following ligands, the trans effect is maximum for					
	(1) NO ₂	(2)	Cl- contill the appropriate to the			
	(3) CN-	(4)	OH-			
68.	Which change is not detected	ed by DT	A ?			
	(1) Sublimation	(2)	Desorption			
	(3) Polymer softening	(4)	Loss of moisture			
69.	Which nuclear model can bes greater than 92 are radioac	that all elements with atomic number				
	(1) Shell Model	(2)	Liquid Drop Model			
	(3) Pion Cloud only	(4)	All of these			

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Question No.	Questions			tions	
70.	Spotting electrolyte is used to eleminate				
	(1)	Condenser current	(2)	Diffusion current	
AAD CONTRACTOR	(3)	Limiting current	(4)	Migration current	
71.	and the same of the same of	number of geometrical $(en)_2 Cl_2$] tion	and	optical isomers for the complex	
	(1)	Three	(2)	Two	
	(3)	Four	(4)	Six	
72.	The	electrons which contribute	to iso	mer shift is Mössbauer spectroscopy	
	(1)	p-electrons	(2)	d-electrons	
i	(3)	f-electrons	(4)	s-electrons ·	
73.	Whi	ch of the following is a bord	ler lir	ne acid ?	
	(1)	Pd ²⁺	(2)	Co ²⁺	
	(3)	Co ³⁺	(4)	$\mathrm{A}l^{3+}$	
74.	The absorption peaks in IR spectrum are broad, as they possess information related to				
	(1)	Rotational energy	(2)	Bond energy	
	(3)	Inner electron changes	(4)	Outer electron changes	
75.	Wur	tzite structure has crystal	lattic	e type	
	(1)	bee	(2)	hcp	
4	(3)	fccp	(4)	None of these	

Question No.	Questions		
76.	The spectroscopic state for d ³ systematical systems of the spectroscopic state for d ³ systems of d ³ systems of the spectroscopic state for d ³ systems of d ³ systems of the spectroscopic state for d ³ systems of the spectroscopic state for d ³ systems of the spectroscopic systems of the spectroscopic state for d ³ systems of the spectroscopic systems of the spectroscopic systems of the spectroscopic syst	em is a strategical and thought.	
	(1) ${}^{4}F_{3/2}$ (2)		
esiqm	(3) ${}^{3}F_{\frac{3}{2}}$	$^{4}D_{\frac{3}{2}}$	
77.	The point group for		
	$C_l > C = O < H$		
	is		
	(1) C_2h (2)	$C_2 v$	
	(3) $C_2 v$ (4)	$\mathbf{T_d}$	
78.	The number of atoms contained with are	nin the unit cell for the diamond lattice	
	(1) 2 (2)	1	
	(3) 4	8	
79.	The Miller indices of crystal planes (2a, 3b, c) are	which cut through the crystal axes at	
	(1) (362) (2)	(263)	
	(3) (326) (4)	None of these	
80.	The Efficacy of Al^{+3} , Mg^{2+} and Na^{+} ions to cause coagulation vary in the order		
	(1) $Al^{+3} \approx Mg^{2+} \approx Na^{+}$ (2)	$Na^{+} > Mg^{2+} > Al^{3+}$	
The state of the s	(3) $Na^+ \approx Mg^{+2} > Al^{3+}$ (4)	$Al^{3+} > Mg^{2+} > Na^{+}$	

Question No.	Questions		
81.	A NMR transition is shifted from the reference in a 400 MHz spectrometer by 529 Hz. The chemical shift is		
	(1) 1.32 (2) 5.29		
	(3) 7.56 (4) 1.76		
82.	Dry ice is used in fire extinguishers. It is stored in the cylinder in solid form. When sprayed on a fire, it quickly changes into gas known as CO ₂ . The change of state is called		
	(1) Evaporation (2) Sublimation		
	(3) Condensation (4) Distillation		
83.	The use of solar power is covered within Green chemistry principle $\neq 6$, which is		
Total Control of the	(1) Atom Economy (2) Design benign chemicals		
	(3) Design for Energy Efficiency (4) None of these		
84.	Milk is a/an		
	(1) Suspension (2) Pure solution		
	(3) Gel (4) Emulsion		
85.	Dipole moment is shown by		
	(1) 2, 2-Dimethyl propane (2) Trans-2-pentene		
	(3) Trans-1,2-dichloroethene (4) 2,2,3,3-tetrabromobutane		
86.	Which of the following statements about tetramethylsilane is incorrect?		
	(1) It produces a single peak at $\delta = 10$		
	(2) It is inert		
	(3) It is volatile and can be easily distilled off and used again		
	(4) It is used to provide a reference against which other peaks are measured		

Question No.	Questions				
87.	The proton nmr of 2-bromo-	2-methy	l prop	ane will consist of	
	(1) Three quartets and a s	inglet	(2)	Two doublets and a singlet	
	(3) One singlet		(4)	Two singlets	
88.	Which compound has a mole at 1650 cm ⁻¹ and just one si			/z = 58, an Infrared absorption r spectrum ?	
	(1) Butane	(2)	2-me	thyl propane	
	(3) CH ₃ CH ₂ CHO	(4)	CH ₃ C	COCH ₃	
89.	Which electromagnetic radi	ation ha	s maxi	mum frequency?	
	(1) Cosmic rays	(2)	X-ray	ys	
	(3) Infra red Rays	(4)	Ultra	aviolet rays	
90.	The IUPAC name of the con $ CH_3CO-CH-CH-CO-CH-CH-CO-CH-CH-CO-CH-CH-CO-CH-CH-CO-CH-CH-CO-CH-CH-CO-CH-CO-CH-CH-CO-CH-CH-CO-CH-CH-CO-CH-CH-CO-CH-CH-CH-CO-CH-CH-CH-CO-CH-CH-CH-CH-CO-CH-CH-CH-CH-CH-CO-CH-CH-CH-CH-CH-CH-CH-CH-CH-CH-CH-CH-CH-$		Congress		
	(1) 3-chloro-2-methoxy-4-oxo-pentanoic acid				
The state of the s	(2) 3-chloro-2 methoxy-4-keto-pentanoic acid				
	(3) 4-carboxy-3-chloro-4-methoxy-2-butanone				
	(4) 1-carboxy-2-methoxy-3	-chloro-e	thyl m	nethyl ketone	
91.	The number of microstates for a three different atom possessing three quanta of energy are				
Total Control of Contr	(1) 3	(2)	10		
·	(3) 6	(1)	A med	(1985년) - 1985년 - 1985 (1985년) - 1985년 - 1985	

Question No.	Questions			
92.	Step down ladder operator lowers the eigen value of wave function by			
	(1) 1 (2) 2			
	(3) 3 (4) None of these			
93.	The translational partition function 'q _{trans} ' is Expressed by			
	(1) $q_{trans} = \frac{(2\pi kT)^{3/2} V}{RT}$ (2) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{RT}$			
	(3) $q_{trans} = \frac{(2\pi m kT)^{1/2} V}{RT}$ (4) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{T}$			
	Where all the symbols have their usual meaning			
94.	Isotonic solutions have same			
	(1) Viscosity (2) Surface tension			
Tomaci	(3) Dipole moment (4) Osmotic pressure			
95.	Which one of the following statements is correct?			
	(1) Change in zero point energy , E_0 , increases the value of Entropy of system by E_0			
	(2) Change in zero point Energy, E_0 , decreases the value of Entropy of the system by E_0			
	(3) Change in zero point Energy, E ₀ ,doesn't alter the Entropy of the system			
	(4) Change in zero point Energy, E_0 , increases work function by E_0			

Question No.					
96.	The Onsager's reciprocal relation is				
	(1) $L_{11} = L_{22}$	(2)	$\mathbf{L_{11}} = \mathbf{L_{12}}$		
	(3) $L_{22} = L_{21}$	(4)	$\mathbf{L_{12}} = \mathbf{L_{21}}$		
	Where $L_{_{11}}$, $L_{_{22}}$ and $L_{_{12}}$, $L_{_{21}}$ are respectively	e like ar	nd unlike phenomological coefficients		
97.	Colloidal sols are purified by				
	(1) Dialysis	(2)	Peptization		
	(3) Coagulation	(4)	Flocculation		
98.	There cannot be a quadrup component system, because (1) 3 (3) -1		int on the phase diagram for one ree of freedom is 4 zero		
99.		particle	<pre>, < x > can be estimated quantum</pre>		
	(1) $\langle x \rangle = \frac{\int x \Psi \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$	(2)	$\langle x \rangle = \frac{\int \Psi x \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$		
	(3) $\langle x \rangle = \frac{\int x^2 \Psi \Psi^@ d\tau}{\int \Psi \Psi^@ d\tau}$	(4)	$\langle x \rangle = \frac{\int \Psi x^2 \Psi^@ d\tau}{\int \Psi \Psi^@ d\tau}$		
100.	The term "steady state" deals	with	A. S. Complete Reserve Statistics, who approximately		
	(1) Statistical mechanics	(2)	quantum mechanics		
	(1) Dudibulan modian		quantum mechanics		

Opened for Evaluation on 20/1/17 @ 10:06 Am

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

(MPH/PHD/URS-EE-2017)

10031

Subject: CHEMISTRY



Time: 1¼ Hours	Max	x. Marks : 100	Total Questions: 100		
Roll No.	(in figure) _			(in words	
Name :		_ Father's Name :			
Mother's Name :		_ Date of Examination	n:		

(Signature of the candidate)

(Signature of the Invigilator)

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- All questions are compulsory.
- The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
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- There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- Use only Black or Blue BALL POINT PEN of good quality in the OMR Answer-Sheet.
- BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.

M.D. University, F

Question No.					
1.	Which statement is incorrect about zeolites?				
	(1) Zeolites are aluminosilicates				
	(2) Each zeolite contains channels of a specific size				
	(3) A zeolite functions as an acid catalyst				
	(4) No zeolites occur naturally				
2.	Chalogenides are the compounds of				
	(1) Sulfur and phosphorus				
	(2) Sulfur and halogens				
	(3) Sulfur, selenium and tellurium				
	(4) Nitrogen and sulfur				
3.	Spin-Orbit coupling is found maximum in	Witness .			
	(1) Third transition series metal complexes				
	(2) First transition series metal complexes				
	(3) Second transition series metal complexes				
	(4) p-block elements				
4.	Which one of the polymers is a conductive polymer	need to the			
	1) Polyethylene (2) Polyacetylene				
(3) Polyvinylene (4) Polyvinyl Chloride				
	The difference in crystal field stabilization energy between low spin d ⁶ octahedral complex and d ⁹ octahedral with tetragonal elongation complex, assuming the ligands are strong field ligands, will be				
(1	1) $-2.13 \Delta_0$ (2) $-2.40 \Delta_0$				
(3	3) $-2.00 \Delta_0$ (4) None of these				

Question No.	Questions						
6.	Natural oxygen carrier other than Hemoglobin is						
	(1) Hem erythrin	(2)	Hemocyanins				
	(3) Tyrosinase	(4)	Ferredoxins				
7.	Among the following ligands	s, the tra	ans effect is maximum for				
	(1) NO ₂	(2)	Cl-				
	(3) CN-	(4)	OH-				
8.	Which change is not detecte	d by DT	A?				
	(1) Sublimation	(2)	Desorption				
Talan reacceptation and the second se	(3) Polymer softening	(4)	Loss of moisture				
9.	Which nuclear model can best explain that all elements with atomic number greater than 92 are radioactive?						
	(1) Shell Model	(2)	Liquid Drop Model				
	(3) Pion Cloud only	(4)	All of these				
10.	Spotting electrolyte is used to eleminate						
	(1) Condenser current	(2)	Diffusion current				
	(3) Limiting current	(4)	Migration current				
11.	Stability of (CH ₃) ₃ C [⊕] can be explained by						
in half	(1) Inductive Effect	((-))	ibit				
a position	(2) Hyper conjugation		The breeze and the state of the				
	(3) Mesomeric Effect						
	(4) Both by Inductive Effect	and hy	e de la continue de la companya del companya de la companya de la companya de la companya de la companya del companya de la co				

Question No.	Proideol	Que	stions		
12.	Absolute configuration of		MALLEN AND A STREET AND A STREET		
	СООН				
	Н-С-ОН				
	Н-С-ОН		British (Internal Control of Control		
	СООН				
	is Yallago asteur				
	(1) (2R, 3S)	(2)	(2R, 3R)		
	(3) (2S, 3S)	(4)	(2S, 3R)		
13.	Which of the following vitamins has steroidal structure?				
	(1) Vitamin E	(2)	Vitamin K		
	(3) Vitamin D	(4)	Vitamin C		
14.	The Co-enzyme involved in bios	yntl	nesis of fats is		
	(1) FMN	(2)	Co-I		
	(3) Co – II	(4)	Co-A		
15.	How many small peptides are for has five lysine residues?	rmed	l upon cleavage by trypsin if a protein		
	(1) 4	(2)	5		
	(3) 6	(4)	7		
16.	Which of the following interaction	on co	ontributes most in protein folding?		
	(1) Hydrophobic interaction	(2)	Covalent bond		
	(3) van der Walls interaction	(4)	Ionic bond		

Question No.	Questions					
22.	Dry ice is used in fire extinguishers. It is stored in the cylinder in solid form. When sprayed on a fire, it quickly changes into gas known as CO ₂ . The change of state is called					
	(1) Evaporation (2)	Sublimation				
	(3) Condensation (4)	Distillation				
23.	The use of solar power is covered wit which is	hin Green chemistry principle ≠ 6,				
	(1) Atom Economy	(2) Design benign chemicals				
	(3) Design for Energy Efficiency	(4) None of these				
24.	Milk is a/an					
	(1) Suspension (2)	Pure solution				
,	(3) Gel (4)	Emulsion				
25.	Dipole moment is shown by					
,	(1) 2, 2-Dimethyl propane (2)	Trans-2-pentene				
	(3) Trans-1,2-dichloroethene (4)	2,2,3,3-tetrabromobutane				
26.	Which of the following statements about tetramethylsilane is incorrect?					
	(1) It produces a single peak at $\delta = 10$					
	(2) It is inert					
	(3) It is volatile and can be easily distilled off and used again					
	(4) It is used to provide a reference against which other peaks are measured					
27.	The proton nmr of 2-bromo-2-methyl propane will consist of					
	(1) Three quartets and a singlet	(2) Two doublets and a singlet				
	(3) One singlet	(4) Two singlets				

Question No.	Questions				
28.	Which compound has a molecular ion at $m/z = 58$, an Infrared absorption at 1650 cm^{-1} and just one singlet in its nmr spectrum?				
	(1) Butane	(2)	2-methyl propane		
	(3) CH ₃ CH ₂ CHC	(4)	CH ₃ COCH ₃		
29.	Which electroma	gnetic radiation ha	s maximum frequency?		
2 = vis	(1) Cosmic rays	(2)	X-rays		
	(3) Infra red Ra	ays (4)	Ultraviolet rays		
30.	The IUPAC nam	e of the compound			
		H-CH-COOH 0 OCH,	Helast in A		
	is		(2)		
	(1) 3-chloro-2-methoxy-4-oxo-pentanoic acid				
	(2) 3-chloro-2 methoxy-4-keto-pentanoic acid				
	(3) 4-carboxy-3-chloro-4-methoxy-2-butanone				
	(4) 1-carboxy-2-methoxy-3-chloro-ethyl methyl ketone				
31.	A fuel which can	not be classed as a	renewable source of energy is		
	(1) Methanol	(2)	Hydrogen		
san in 1996	(3) Methane	(4)	Ethanol		
32.	$50~\mathrm{m}l$ of 0.1 NaOH is added to $49~\mathrm{m}l$ of 0.1 M HCl. The resulting solution has pH				
	(1) 12	(2)	11		
	(3) 9	(4)	10		

Question No.	Questions			
33.	A copolymer can be obtained by			
	(1) Polymerizing two identical polymer			
	(2) Mixing two identical polymer			
a marke	(3) Polymerizing two different monomer			
	(4) Mixing two different polymer			
34.	If $(\partial P_{\partial T})_{\nu} \alpha_{\beta}$ then according to Maxwell's relation			
	(1) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\beta}{\alpha}$ (2) $\left(\frac{\partial S}{\partial V}\right)_{T} = \alpha \beta$			
	(3) $\left(\frac{\partial S}{\partial V}\right)_{T} = -\frac{\alpha}{\beta}$ (4) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\alpha}{\beta}$			
35.	The Debroglie wave length of an electron with kinetic energy of 1.00 eV is			
	(1) 1.23 nm (2) 12.3 nm			
	(3) 28.7 pm (4) None of these			
36.	Cooking time of food is reduced in a pressure cooker because			
	(1) The boiling point of water is lowred			
	(2) The boiling point of water is raised			
	(3) There is uniform distribution of heat			
The second secon	(4) Higher pressure softens the food			

Question No.			Ques	stions		
37.	Wh	Which of the following is a Boson?				
	(1)	Proton	(2)	Electron		
	(3)	$^4\mathrm{He}_2$	(4)	D^2		
38.		e rotational spectrum of a ced lines with spacing equa		diatomic rotator consists of equally		
	(1)	2B	(2)	B		
	(3)	1.5 B	(4)	0.5 B		
39.	Wh	at is the percentage strengt	th of	"15 volume" H ₂ O ₂		
	(1)	6.09 %	(2)	4.55 %		
	(3)	3.03 %	(4)	1.50 %		
40.	For a particle possessing rotational motion					
	(1)	$C_p - C_v = R$	(2)	$C_p - C_v = 2R$		
	(3)	$C_p - C_v = 0$	(4)	None of these		
41.	and the same of the same of	number of geometrical $(en)_2 Cl_2$] ⁺ ion	and	optical isomers for the complex		
	(1)	Three	(2)	Two		
	(3)	Four	(4)	Six		
42.	The electrons which contribute to isomer shift is Mössbauer spectroscopy are					
	(1)	p-electrons	(2)	d-electrons		
	(3)	f-electrons	(4)	s-electrons		
43.	Which of the following is a border line acid?					
	(1)	Pd ²⁺	(2)	Co ²⁺		
	(3)	Co ³⁺	(4)	Al ³⁺		

Question No.	Questions				
44.	The absorption peaks in IR spectrum are broad, as they possess information related to				
	(1) Rotation	al energy	(2)	Bond energy	
	(3) Inner ele	ectron changes	(4)	Outer electron changes	
45.	Wurtzite stru	cture has crystal	latti	ce type	
	(1) bcc		(2)	hcp	
	(3) fccp		(4)	None of these	
46.	The spectroso	copic state for d ³ s	yster	n is	
	(1) $^{4}F_{3/2}$		(2)	4_{F_2}	
de bei	(3) ${}^{3}F_{\frac{3}{2}}$	ri pri de a woma e Le la completa de la completa de La completa de la co	(4)	⁴ D _{3/2}	
47.	The point gro	up for			
e a propinsi de la compania del compania de la compania del compania de la compania del la compania de la compania del la compania de la comp	$C_l > C = C$	CH H		ountiness of the	
	is			came agle, est or proportient, - 16	
	(1) C ₂ h		(2)	$C_2^{}$ V	
	(3) C ₂ v		(4)	T_d	
48.	The number o	f atoms contained	with	n the unit cell for the diamond lattice	
	(1) 2		(2)	1 10-2-31 0	
	(3) 4		(4)	8	
49.	The Miller inc (2a, 3b, c) are		nes	which cut through the crystal axes at	
To the second	(1) (362)		(2)	(263)	
	(3) (326)	K.	(4)	None of these	

Question No.	Questions		
50.	The Efficacy of Al^{+3} , Mg^{2+} and Na^{+} ions to cause coagulation vary in order		
	(1) $Al^{+3} \approx Mg^{2+} \approx Na^{+}$ (2)	$Na^{+} > Mg^{2+} > Al^{3+}$	
	(3) $Na^+ \approx Mg^{+2} > Al^{3+}$ (4)	$Al^{3+} > Mg^{2+} > Na^{+}$	
51.	A fatty acid with 14 carbon atoms voxidation?	vill undergo how many cycles of beta	
	(1) 7	4	
	(3) 6 (4)	5	
52.	Which of the following compounds show a sharp IR absorption band 1700 cm ⁻¹ and a broad band at 3300 cm ⁻¹ ?		
	(1) Ethanol (2)	Ethanoic acid	
	(3) Propanone (4)	diethyl ether	
53.	The product in the following reaction	n is	
	$CH_3-C-N \xrightarrow{(i) CH_3 Mg Br} ?$		
10000	ble care beat roll so have all parties.		
	CH_3 (1) $H_3C-C-OH$ (2)	CH ₃ -C-NH ₂	
	CH ₃		
	OH		
	(3) $H_3C - CH - CH_3$ (4)	CH ₃ CO CH ₃	
		(858) (1	

Question No.	Questions		
54.	Number of Orientations with respect to applied magnetic field for duterium is		
	(1) 3 (2) 4		
	(3) 2 (4) 1		
55.	When EDTA solution is added to Mg ²⁺ ion, then which of the following statements is not true?		
	(1) Four coordinate sites of Mg ²⁺ ions are occupied by EDTA and remaining two sites are occupied by water molecules		
	(2) pH of the solution is decreased		
	(3) Colorless [Mg – EDTA] ² - chelate is formed		
	(4) All six coordinates of Mg ²⁺ ions are occupied by EDTA		
56.	When applying VSEPR theory to predict the molecular shape, which of the following we need not take in to account?		
	(1) Valence electrons occupying sigma bonding orbitals		
	(2) Valence electrons occupying π-bonding orbitals		
	(3) Valence electrons occupying non-bonding orbitals		
	(4) None of these		
57.	Which statement about ferrocene is incorrect?		
	(1) The Fe centre in ferrocene can be protonated by treatment with conc. $\rm H_2SO_4$		
	(2) In the gas phase, the C ₅ H ₅ rings in ferrocene are eclipsed		
	(3) The ligands in ferrocene undergo electrophillic substitution with $RCOCl$ in the presence of a Lewis acid		
	(4) I ₂ oxidises ferrocene to give a diamagnetic cation		

Question No.	Questions				
58.	Chlorophyll converts light energy in to				
	(1) Heat energy	(2)	Potential energy		
	(3) Chemical energy	(4)	Electrical energy		
59.	The tyrosinase, is activated by	y			
	(1) Copper ion	(2)	Iron ion		
	(3) Potassium ion	(4)	Calcium ion		
60.	Which of the following terms but binds to a binding site oth		lescribes a drug inhibits the enzyme, in active site?		
	(1) Allosteric inhibitor	(2)	Reversible inhibitor		
	(3) Irreversible Inhibitor	(4)	Suicide substrate		
61.	Polymers having regular alternation of d- and l-configurations in the molecular chain are called				
	(1) Syndiotactic polymers	(2)	Isotactic polymers		
	(3) Block copolymers	(4)	Copolymers		
62.	The effective nuclear charge for 35 electron in sulphur is				
	(1) 4.30	(2)	5.45		
	(3) 3.40	(4)	54.5		
63.	The correct form of Butler-Volmer equation is				
	(1) $i = i_0 e^{-\alpha n/FRT}$	(2)	$i = i_0 \left\{ e^{(1-\alpha) nF/RT} - e^{\alpha nF/RT} \right\}$		
	(3) $i = i_0 \{e^{(1-\alpha)^{nF/RT}} - e^{-\alpha nF/RT}\}$	(4)	$i = i_0 \cdot e^{(1-\alpha) nF/RT}$		
	where all the terms have usual meanings				
	appearate to entrance a				

Question No.	Questi	ons			
64.	The temperature at which the Joule-Thomson coefficient changes sign is known as				
	(1) Critical temperature (2)	Boyle temperature			
	(3) Inversion temperature (4)	None of these			
65.	The heat of vaporisation of water at increase in the evaporation of one mo	100°C is 2259.4 Jg ⁻¹ . The entropy le of water at 100°C will be			
	(1) $10.903 \mathrm{Jk^{-1} mol^{-1}}$ (2)	$1090.3 \mathrm{Jk^{-1} mol^{-1}}$			
	(3) $10903 \mathrm{Jk^{-1} mol^{-1}}$ (4)	109.03 Jk ⁻¹ mol ⁻¹			
66.	The relation between Entropy and theras	rmodynamic probability is expressed			
	(1) S = lnW (2)	S = k lnW			
	(3) S = R lnW	$S = \frac{1}{\ell nw}$			
67.	Which out of the following is correct relation?				
	(1) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a - \frac{1}{2} pk_b$	(2) $pH = \frac{1}{2} pk_w - \frac{1}{2}pk_a + \frac{1}{2} k_b$			
	(3) $pH = \frac{1}{2} pk_a - \frac{1}{2} pk_w + \frac{1}{2} k_b$	(4) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a + \frac{1}{2} pk_b$			
68.	Which of the following is an irreversible cell?				
	(1) Zn/Zn ⁺² AgCl/Ag	(2) $Z_n / Z_{n^{2+}} Cd^{2+} / Cd$			
	(3) Cd / Cd ²⁺ KCl, Hg ₂ Cl ₂ (s) / Hg	(4) Zn/H ₂ SO ₄ /Ag			

Question No.	Questions			
69.	Which of the following partially miscible liquids have both upper and lower critical solution temperature?			
	(1) Water and aniline (2) Water and diethyl amine			
69.	(3) Water and β-picoline (4) Methanal and cyclohexane			
70.	For an isentropic change of state			
	(1) $dH = 0$ (2) $dT = 0$			
	(3) $dS = 0$ (4) $dS = 1$			
71.	The number of microstates for a three different atom possesing three quanta of energy are			
	(1) 3 (2) 10			
	(3) 6 (4) 4			
72.	Step down ladder operator lowers the eigen value of wave function by			
	(1) 1 (2) 2			
	(3) 3 (4) None of these			
73.	The translational partition function 'q _{trans} ' is Expressed by			
	(1) $q_{trans} = \frac{(2\pi kT)^{3/2} V}{RT}$ (2) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{RT}$			
	The state of the second respective to the second respective to the second respective to the second respective to			
	(3) $q_{trans} = \frac{(2\pi m kT)^{1/2} V}{RT}$ (4) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{T}$			
	Where all the symbols have their usual meaning			

Question No.	Questions				
74.	Isotonic solutions have same				
	(1) Viscosity (2) Surface tension				
	(3) Dipole moment (4) Osmotic pressure				
75.	Which one of the following statements is correct?				
	(1) Change in zero point energy , E_0 , increases the value of Entropy of system by E_0				
	(2) Change in zero point Energy, E_0 , decreases the value of Entropy of the system by E_0				
	(3) Change in zero point Energy, E ₀ ,doesn't alter the Entropy of the system				
	(4) Change in zero point Energy, E_0 , increases work function by E_0				
76.	The Onsager's reciprocal relation is				
	(1) $L_{11} = L_{22}$ (2) $L_{11} = L_{12}$				
	(3) $L_{22} = L_{21}$ (4) $L_{12} = L_{21}$				
	Where L_{11} , L_{22} and L_{12} , L_{21} are like and unlike phenomological coefficients respectively				
77.	Colloidal sols are purified by				
1-1977	(1) Dialysis (2) Peptization				
Trace!	(3) Coagulation (4) Flocculation				

Question No.	Questions				
78.	There cannot be a quadrupole point on the phase diagram for one component system, because the degree of freedom is				
	(1) 3 (2) 4				
	(3) -1 zero				
79.	The average position of a particle, $< x > $ can be estimated quantum mechanically using relation				
	(1) $\langle x \rangle = \frac{\int x \Psi \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$ (2) $\langle x \rangle = \frac{\int \Psi x \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$				
out to	(3) $< x > = \frac{\int x^2 \Psi \Psi^@ d\tau}{\int \Psi \Psi^@ d\tau}$ (4) $< x > = \frac{\int \Psi x^2 \Psi^@ d\tau}{\int \Psi \Psi^@ d\tau}$				
80.	The term "steady state" deals with				
	(1) Statistical mechanics (2) quantum mechanics				
	(3) Thermodynamics (4) Irreversible thermodynamics				
81.	Which of the following pairs is epimers:				
	(1) D (+) Glucose and D (-) Fructose				
	(2) D (-) Glucose and D (-) Ribose				
	(3) D (+) Glucose and D (+) Mannose				
	(4) (+) Maltose and (+) Sucrose				
82.	The reactivity of thiophene, furan and pyrrole follows the sequence				
	(1) Furan < Thiophene < Pyrrole (2) Thiophene < Furan < Pyrrole				
	(3) Pyrrole < Furan < Thiophene (4) Thiophene < Pyrrole < Furan				

Question No.	Questions				
83.	In UV, λ_{max} for the following compound will be at				
	(1) 280 nm (2) 259 nm				
1 77	(3) 237 nm (4) 317 nm				
84.	Enantiotropic faces of the following compound can be given as				
	HOOC				
	$H \subset C = C \subset CHO$				
	(1) Re – Re (2) Si – Re				
	(3) Si – Si (4) Re – Si				
85.	In benzilic acid rearrangement				
	(1) Benzaldehyde is converted in to Benzoin				
	(2) Benzil is converted in to Benzilic acid				
	(3) Benzilic acid is converted in to Benzoin				
	(4) None of the above				
86.	How many normal modes of vibration are possible for benzene molecule?				
	(1) 6 (2) 12				
	(3) 30 (4) 24				
87.	Which is not an anticancer drug?				
	(1) Vincristine (2) Cyclophosphamide				
	(3) Dexorubicin (4) Gabapentin				

Question No.	Questions		
88.	Which of the following compounds can be resolved		
	(1) \bigcirc \bigcirc (2) \bigcirc		
	(3) O_2 COOH O_2 (4) O_2 NO ₂ NO ₂ COOH		
89.	Which is the weakest acid amongst?		
	(1) H ₃ C —O—OH (2) C/—O—OH		
	(3) O ₂ N—O)—OH (4) O)—OH		
90.	$O \longrightarrow O_2, hv \longrightarrow$		
	Product formed in the reaction is		
	(1) HOCH ₂ CH ₂ CH ₂ CH ₂ OH (2)		
	(3) (4) (0)		
91.	The range of fluorine chemical shift in NMR is		
	(1) 12 ppm (2) 56 ppm		
	(3) 300 ppm (4) 542 ppm		

luestion No.	Questions		
92.	Borazine, B ₃ N ₃ H ₆ has a		
	(1) Regular hexagonal structure like benzene		
	(2) Tetragonal structure		
	(3) Triangular capped structure		
	(4) Hexagonal prism structure		
93.	In ligand to metal charge spectra (LMCT) of MnO ₄ ion, the transition responsible for purple color is		
	(1) $29500 \mathrm{cm^{-1}}$ (2) $17700 \mathrm{cm^{-1}}$		
	(3) 44400 cm^{-1} (4) 30300 cm^{-1}		
94.	When an auxochrome is attached to a cargon-carbon double bond, then λ_{max} in UV spectrum undergoes		
	(1) Hypsochromic shift (2) Bathochromic shift		
	(3) Hyperchromic shift (4) Hypochromic shift		
95.	The number of α and β particles emitted in the nuclear reaction		
	$_{92}U^{238} \rightarrow _{82}Pb^{206}$ is		
	(1) 7α , 5β (2) 6α , 4β		
	(3) 4α , 3β (4) 8α , 6β		
96.	Among the hydroxides of alkaline earth metals, the least soluble in water is		
	(1) Mg (OH) ₂ (2) Ca (OH) ₂		
	(3) Be $(OH)_2$ (4) Ba $(OH)_2$		

Question No.	Questions			
97.	Which of the following isotope is not a fission fuel?			
	(1) U–238 (2) U–233			
	(3) U-235 (4) U-239			
98.	Most common oxidation state of tellurium is			
	(1) -2 $(2) +4$			
neilien	(3) +6 (4) +2			
99.	The correct order of acidic strength is			
7.30	(1) HClO > HIO > HBrO (2) HIO > HBrO > HClO			
	(3) HBrO>HClO>HIO (4) HClO>HBrO>HIO			
100.	Which of the following is not a hard base?			
	(1) NH ₃ (2) H ₂ O			
	(3) CN- (4) Cl-			
	the contract training of the first best in the contract of the			
	마이스 등록 다시되어 현실하게 되었다면 하는 것이 되었다면 하는 것으로 하는 것이다. 			
	CHOP-H (S)			

opend for Evaluation on 20/1/17

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

(MPH/PHD/URS-EE-2017)

Sr. No. 10032 Subject: CHEMISTRY



Time: 1% Hours	Max. Marks: 100	Total Questions: 100
Roll No.	_(in figure)	(in words
Name :	Father's Name :	
Mother's Name :	Date of Examination	1:

(Signature of the candidate)

(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- All questions are compulsory.
- The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Optit. of Chemist Answers MUST NOT be ticked in the Owner's larger of the O The candidate MUST NOT do any rough work or writing in the OMR Answers MUST NOT be ticked in the Question book-let.
- There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- Use only Black or Blue BALL POINT PEN of good quality in the OMR Answer-Sheet.
- BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LETS. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.

A.D. University.

Question No.	and the second s	Que	estions
1.	Polymers having regular alternation of d- and l-configurations in t molecular chain are called		
	(1) Syndiotactic polymers	(2)	Isotactic polymers
	(3) Block copolymers		
2.	The effective nuclear charge	for 35	electron in sulphur is
	(1) 4.30	(2)	
	(3) 3.40	(4)	54.5
3.	The correct form of Butler-Vo	lmer	equation is
	$(1) i = i_0 e^{-\alpha n/FRT}$	(2)	$i = i_{\alpha} \{ e^{(1-\alpha) \text{ nF/RT}} - e^{\alpha \text{nF/RT}} \}$
18 v. U.	(3) $i = i_0 \{e^{(1-\alpha)^{nF/RT}} - e^{-\alpha nF/RT}\}$	(4)	$i = i_0 \cdot e^{(1-\alpha) nF/RT}$
	where all the terms have usua		
4.	The temperature at which the known as	Joule	e-Thomson coefficient changes sign is
	(1) Critical temperature	(2)	Boyle temperature
	(3) Inversion temperature	(4)	None of these
5.	The heat of vaporisation of w increase in the evaporation of	ater a	at 100°C is 2259.4 Jg ⁻¹ . The entropy cole of water at 100°C will be
	(1) 10.903 Jk ⁻¹ mol ⁻¹	(2)	1090.3 Jk ⁻¹ mol ⁻¹
	(3) $10903 \mathrm{Jk^{-1}mol^{-1}}$	(4)	$109.03 \mathrm{Jk^{-1} mol^{-1}}$
6.	The relation between Entropy a	nd the	ermodynamic probability is expressed
	(1) $S = l_n W$	(2)	S = k lnW
	(3) $S = R lnW$	(4)	$S = \frac{1}{\ell nw}$
		1	

Question No.	Questions			
7.	Which out of the following is correct relation?			
	(1) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a - \frac{1}{2} pk_b$ (2) $pH = \frac{1}{2} pk_w - \frac{1}{2} pk_a + \frac{1}{2} k_b$			
	(3) $pH = \frac{1}{2} pk_a - \frac{1}{2} pk_w + \frac{1}{2} k_b$ (4) $pH = \frac{1}{2} pk_w + \frac{1}{2} pk_a + \frac{1}{2} pk_a$			
8.	Which of the following is an irreversible cell?			
	(1) $Z_n/Z_{n+2} A_gC_l/A_g$ (2) $Z_n/Z_{n+2} C_{d+2} / C_d$			
	(3) Cd / Cd ²⁺ KCl, $\text{Hg}_2\text{C}l_2(s)$ / Hg (4) Zn / H ₂ SO ₄ / Ag			
9.	Which of the following partially miscible liquids have both upper and lower critical solution temperature?			
	(1) Water and aniline (2) Water and diethyl amine			
	(3) Water and β-picoline (4) Methanal and cyclohexane			
10.	For an isentropic change of state			
	(1) $dH = 0$ (2) $dT = 0$			
	(3) $dS = 0$ (4) $dS = 1$			
11.	The range of fluorine chemical shift in NMR is			
ACCINE MALE	(1) 12 ppm (2) 56 ppm			
	(3) 300 ppm (4) 542 ppm			
12.	Borazine, B ₃ N ₃ H ₆ has a			
	(1) Regular hexagonal structure like benzene			
	(2) Tetragonal structure			
	(3) Triangular capped structure			
	(4) Hexagonal prism structure			

Question No.	Questions			
13.	In ligand to metal charge spectra (LMCT) of MnO ₄ ion, the transition responsible for purple color is			
	(1) 29500 cm ⁻¹	(2)	17700 cm ⁻¹	
	(3) 44400 cm ⁻¹	(4)	30300 cm ⁻¹	
14.	When an auxochrome is atta λ_{max} in UV spectrum undergo		a cargon-carbon double bond, then	
	(1) Hypsochromic shift	(2)	Bathochromic shift	
	(3) Hyperchromic shift	(4)	Hypochromic shift	
15.	The number of α and β particle 92 U ²³⁸ \rightarrow 82 Pb ²⁰⁶ is	cles emi	tted in the nuclear reaction	
	(1) 7α, 5β	(2)	6α, 4β	
	(3) 4α, 3β	(4)	8α, 6β	
16.	Among the hydroxides of alkaline earth metals, the least soluble in water is			
	(1) Mg (OH) ₂	(2)	Ca (OH) ₂	
	(3) Be (OH) ₂	(4)	Ba (OH) ₂	
17.	Which of the following isotope is not a fission fuel?			
	(1) U-238	(2)	U-233	
	(3) U-235	(4)	U-239	
18.	Most common oxidation state of tellurium is		urium is	
	(1) -2	(2)	+4	
The state of the s	(3) +6	(4)	+2	

Question No.	Questions		tions
19.	The correct order of acidic strength is		
11 -33-2 1 -33-2	(1) $HClO > HIO > HBrO$	(2)	HIO > HBrO > HClO
	(3) HBrO>HClO>HIO	(4)	HClO > HBrO > HIO
20.	Which of the following is not a l	nard	base?
menti k	(1) NH ₃	(2)	H_2O
	(3) CN-	(4)	.Cl-
21.	A fatty acid with 14 carbon ato oxidation?	ms w	vill undergo how many cycles of beta
	(1) 7	(2)	4
	(3) 6	(4)	5
22.	Which of the following compounds show a sharp IR absorption band 1700 cm ⁻¹ and a broad band at 3300 cm ⁻¹ ?		
	(1) Ethanol	(2)	Ethanoic acid
	(3) Propanone	(4)	diethyl ether
23.	The product in the following rea	action	n is
	$CH_3-C-N = \frac{(i) CH_3 Mg Br}{(ii) H_2O}$	→?	
	CH_3		0
	(1) $H_3C-C-OH$	(2)	$CH_3 - C - NH_2$
	CH ₃		dista Jipasi beng publimby teniki d
	(3) H ₃ C-CH-CH ₃	(4)	CH ₃ CO CH ₃

Question No.	Questions
24.	Number of Orientations with respect to applied magnetic field for duterium is (1) 3 (2) 4
	(3) 2 (4) 1
25.	When EDTA solution is added to Mg ²⁺ ion, then which of the following statements is not true?
	(1) Four coordinate sites of Mg ²⁺ ions are occupied by EDTA and remaining two sites are occupied by water molecules
	(2) pH of the solution is decreased
SEV Sh	(3) Colorless [Mg – EDTA] ² – chelate is formed
	(4) All six coordinates of Mg ²⁺ ions are occupied by EDTA
26.	When applying VSEPR theory to predict the molecular shape, which of the following we need not take in to account?
	(1) Valence electrons occupying sigma bonding orbitals
	(2) Valence electrons occupying π-bonding orbitals
	(3) Valence electrons occupying non-bonding orbitals
	(4) None of these
27.	Which statement about ferrocene is incorrect?
	(1) The Fe centre in ferrocene can be protonated by treatment with conc. H ₂ SO ₄
	(2) In the gas phase, the C ₅ H ₅ rings in ferrocene are eclipsed
	(3) The ligands in ferrocene undergo electrophillic substitution with $R \subset O \subset l$ in the presence of a Lewis acid
Part I	(4) I, oxidises ferrocene to give a diamagnetic cation

Question No.	Questions	
28.	Chlorophyll converts light energy in to	
	(1) Heat energy (2) Potential energy	
	(3) Chemical energy (4) Electrical energy	
29.	The tyrosinase, is activated by	
	(1) Copper ion (2) Iron ion	
	(3) Potassium ion (4) Calcium ion	
30.	Which of the following terms best describes a drug inhibits the enzym but binds to a binding site other than active site? (1) Allosteric inhibitor (2) Reversible inhibitor (3) Irreversible Inhibitor (4) Suicide substrate	
	Which of the following pairs is epimers: (1) D (+) Glucose and D (-) Fructose (2) D (-) Glucose and D (-) Ribose (3) D (+) Glucose and D (+) Mannose (4) (+) Maltose and (+) Sucrose	
(The reactivity of thiophene, furan and pyrrole follows the sequence 1) Furan < Thiophene < Pyrrole (2) Thiophene < Furan < Pyrrole 3) Pyrrole < Furan < Thiophene (4) Thiophene < Pyrrole < Furan	

Question No.	Questions
33.	In UV, λ_{max} for the following compound will be at
	O CO
	(1) 280 nm (2) 259 nm
	(3) 237 nm (4) 317 nm
34.	Enantiotropic faces of the following compound can be given as
	HOOC
	$H \subset C = C \subset CHO$
	(1) Re – Re (2) Si – Re
	(3) Si – Si (4) Re – Si
35.	In benzilic acid rearrangement
	(1) Benzaldehyde is converted in to Benzoin
	(2) Benzil is converted in to Benzilic acid
	(3) Benzilic acid is converted in to Benzoin
	(4) None of the above
36.	How many normal modes of vibration are possible for benzene molecule?
	(1) 6 (2) 12
	(3) 30 (4) 24
37.	Which is not an anticancer drug?
	(1) Vincristine (2) Cyclophosphamide
	(3) Dexorubicin (4) Gabapentin

Question No.	Questions		
38.	Which of the following compounds can be resolved		
	(1) \bigcirc		
	(3) \bigcirc COOH \bigcirc (4) \bigcirc NO ₂ NO ₂ \bigcirc NO ₂ COOH		
39.	Which is the weakest acid amongst?		
NAME OF THE PROPERTY OF THE PR	(1) H ₃ C O OH (2) C/O OH		
	(3) O₂N—⊙—OH (4) ⊙—OH		
40.	O_2, hv		
	Product formed in the reaction is		
	(1) $HOCH_2CH_2CH_2OH$ (2) OOO^{OH}		
	(3) (4) (0)		
41.	A fuel which can not be classed as a renewable source of energy is		
	(1) Methanol (2) Hydrogen		
	(3) Methane (4) Ethanol		

Question No.	Questions												
42.	$50~\mathrm{m}l$ of 0.1 NaOH is added to $49~\mathrm{m}l$ of 0.1 M HCl. The resulting solution has pH												
	(1) 12 (2) 11												
	(3) 9 (4) 10												
43.	A copolymer can be obtained by												
	(1) Polymerizing two identical polymer												
	(2) Mixing two identical polymer												
	(3) Polymerizing two different monomer												
lyurug	(4) Mixing two different polymer												
44.	If $\left(\frac{\partial P}{\partial T}\right)_{V} \frac{\alpha}{\beta}$ then according to Maxwell's relation												
	(1) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\beta}{\alpha}$ (2) $\left(\frac{\partial S}{\partial V}\right)_{T} = \alpha \beta$												
	(3) $\left(\frac{\partial S}{\partial V}\right)_{T} = -\frac{\alpha}{\beta}$ (4) $\left(\frac{\partial S}{\partial V}\right)_{T} = \frac{\alpha}{\beta}$												
45.	The Debroglie wave length of an electron with kinetic energy of 1.00 eV is												
	(1) 1.23 nm (2) 12.3 nm												
	(3) 28.7 pm (4) None of these												

Question No.	anolia Questions	estion No.						
46.	Cooking time of food is reduced in a pressure cooker because	1.5						
	(1) The boiling point of water is lowred	over the state of						
A TOTAL OF THE PARTY OF THE PAR	(2) The boiling point of water is raised							
The second secon	(3) There is uniform distribution of heat							
	(4) Higher pressure softens the food mende of any nemylogon A	54 A. C.						
47.	Which of the following is a Boson?	And the second s						
	(1) Proton (2) Electron							
TO THE PARTY OF TH	(3) ⁴ He ₂ genome (4) D ² generation (5)							
48.	The rotational spectrum of a rigid diatomic rotator consists of easpaced lines with spacing equal to	qually						
	(1) 2B (2) B							
	(3) 1.5 B (4) 0.5 B							
49.	What is the percentage strength of "15 volume" H_2O_2							
	(1) 6.09 % (2) 4.55 %							
	(3) 3.03 % (4) 1.50 %							
50.	For a particle possessing rotational motion							
	(1) $C_p - C_v = R$ (2) $C_p - C_v = 2R$ (3)							
	(3) $C_p - C_v = 0$ (4) None of these							

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Question No.	Questions											
51.	The [Rh	number of geometri $(en)_2 Cl_2$] $^+$ ion	cal and	optical isomers for the complex								
	(1)	Three	(2)	Two								
	(3)	Four	(4)	Six								
52.	The	electrons which contrib	ute to iso	mer shift is Mössbauer spectroscopy								
of the sector function ((1)	p-electrons	(2)	d-electrons								
attice	(3)	f-electrons	(4)	s-electrons								
53.	Which of the following is a border line acid?											
	(1)	Pd2+	(2)	Co ²⁺								
tepp	(3)	Co ³⁺	(4)	A <i>l</i> ³⁺								
54.	The	absorption peaks in IR sp ted to	ectrum a	re broad, as they possess information								
	(1)	Rotational energy	(2)	Bond energy								
	(3)	Inner electron changes	(4)	Outer electron changes								
55.	Wur	tzite structure has cryst	al lattice	e type								
	(1)	bcc MAKTOM KTOV	(2)	hcp hcp								
	(3)	fccp	(4)	None of these								
56.	The	spectroscopic state for d	l³ system	is it is a second of the secon								
Section of the sectio	(1)	4 _{F_{3/2}}	(2)	$4_{ m F_2}$								
	(3)	$3_{\mathrm{F}_{3/2}}$	(4)	⁴ D _{3/2}								

Questions											
Step down ladder operator lowers the eigen value of wave function by											
(1) 1 (2) 2											
(3) 3 (4) None of these											
The translational partition function 'q _{trans} ' is Expressed by											
(1) $q_{trans} = \frac{(2\pi kT)^{3/2} V}{RT}$ (2) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{RT}$											
(3) $q_{trans} = \frac{(2\pi m kT)^{1/2} V}{RT}$ (4) $q_{trans} = \frac{(2\pi m kT)^{3/2} V}{T}$											
Where all the symbols have their usual meaning											
Isotonic solutions have same											
(1) Viscosity (2) Surface tension											
(3) Dipole moment (4) Osmotic pressure											
Which one of the following statements is correct?											
(1) Change in zero point energy , E_0 , increases the value of Entropy of system by E_0											
(2) Change in zero point Energy, E_0 , decreases the value of Entropy of the system by E_0											
(3) Change in zero point Energy, E_0 , doesn't alter the Entropy of the system											
(4) Change in zero point Energy, E_0 , increases work function by E_0											

The Onsage	Questions										
The Onsager's reciprocal relation is											
(1) $L_{11} = L_2$		(2)									
(3) $L_{22} = L_2$	eaself lo smol	(4)	$\mathbf{L}_{12} = \mathbf{L}_{21}$	(8)							
Where L_{11} , L_{22} and L_{12} , L_{21} are like and unlike phenomological coefficients respectively											
Colloidal sol	s are purified	by									
(1) Dialysis		(2)	Peptization								
(3) Coagula	tion	(4)	Flocculation								
There cannot be a quadrupole point on the phase diagram for one component system, because the degree of freedom is											
(1) 3		(2)	4								
(3) –1		(4)	zero								
			< x > can be estimated	l quantum							
(1) < x > = -	∫x ΨΨ [@] dτ ∫ΨΨ [@] dτ	(2)	$< x > = \frac{\int \Psi \times \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$								
(3) < x > = -	√x² ΨΨ [@] dτ √ΨΨ [@] dτ	(4)	$< x > = \frac{\int \Psi x^2 \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$								
	Where L ₁₁ , L respectively Colloidal sols (1) Dialysis (3) Coagula There cannot component s (1) 3 (3) -1 The average mechanically	Where L_{11} , L_{22} and L_{12} , L_{21} respectively Colloidal sols are purified (1) Dialysis (3) Coagulation There cannot be a quadromponent system, because (1) 3 (3) -1 The average position of a mechanically using relation (1) $< x > = \frac{\int x \Psi \Psi^{@} dt}{\int \Psi \Psi^{@} dt}$	Where L_{11} , L_{22} and L_{12} , L_{21} are like an respectively Colloidal sols are purified by (1) Dialysis (2) (3) Coagulation (4) There cannot be a quadrupole pocomponent system, because the degree (1) 3 (2) (3) -1 (4) The average position of a particle, mechanically using relation (1) $< x > = \frac{\int x \Psi \Psi^@}{\int \Psi \Psi^@} d\tau}$ (2)	Where L_{11} , L_{22} and L_{12} , L_{21} are like and unlike phenomological respectively Colloidal sols are purified by (1) Dialysis (2) Peptization (3) Coagulation (4) Flocculation There cannot be a quadrupole point on the phase diagracemponent system, because the degree of freedom is (1) 3 (2) 4 (3) -1 (4) zero The average position of a particle, $< x >$ can be estimated mechanically using relation (1) $< x > = \frac{\int x \Psi \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$ (2) $< x > = \frac{\int \Psi x \Psi^{@} d\tau}{\int \Psi \Psi^{@} d\tau}$							

Question No.	Questions												
70.	The term "steady state" deals with												
20101	(1) Statistical mechanics (2) quantum mechanics												
٠	(3) Thermodynamics (4) Irreversible thermodynamics												
71.	Which statement is incorrect about zeolites?												
	(1) Zeolites are aluminosilicates												
	(2) Each zeolite contains channels of a specific size												
	(3) A zeolite functions as an acid catalyst												
	(4) No zeolites occur naturally												
72.	Chalogenides are the compounds of												
	(1) Sulfur and phosphorus												
	(2) Sulfur and halogens												
	(3) Sulfur, selenium and tellurium												
	(4) Nitrogen and sulfur												
73.	Spin-Orbit coupling is found maximum in												
75,050	(1) Third transition series metal complexes												
	(2) First transition series metal complexes												
	(3) Second transition series metal complexes												
	(4) p-block elements												
74.	Which one of the polymers is a conductive polymer												
	(1) Polyethylene (2) Polyacetylene												
	(3) Polyvinylene (4) Polyvinyl Chloride												

Question No.	Questions									
75.		hedra	ilization energy between low spin deal with tetragonal elongation complex, d ligands, will be							
	(1) $-2.13 \Delta_0$	(2)	$-2.40\Delta_0$							
	(3) $-2.00 \Delta_0$	(4)	None of these							
76.	Natural oxygen carrier other t	han I	Hemoglobin is							
*	(1) Hem erythrin	(2)	Hemocyanins							
	(3) Tyrosinase	(4)	Ferredoxins							
77.	Among the following ligands,	the tra	ans effect is maximum for							
	(1) NO ₂	(2)	Cl-							
	(3) CN-	(4)	OH-							
78.	Which change is not detected	by DT	'A ?							
	(1) Sublimation	(2)	Desorption							
	(3) Polymer softening	(4)	Loss of moisture							
79.	Which nuclear model can best egreater than 92 are radioactiv		that all elements with atomic number							
	(1) Shell Model	(2)	Liquid Drop Model							
	(3) Pion Cloud only	(4)	All of these							
80.	Spotting electrolyte is used to	elemi	nate							
	(1) Condenser current	(2)	Diffusion current							
	(3) Limiting current	(4)	Migration current							

Question No.	Questions												
81.	Stability of (CH ₃) ₃ C [⊕] can be explained by												
	(1) Inductive Effect												
	(2) Hyper conjugation												
orten	(3) Mesomeric Effect												
	(4) Both by Inductive Effect and hyperconjugation												
82.	Absolute configuration of												
	COOH H-C-OH												
	H-C-ОН СООН												
	is												
	(1) (2R, 3S) (2) (2R, 3R)												
	(3) (2S, 3S) (4) (2S, 3R)												
83.	Which of the following vitamins has steroidal structure?												
	(1) Vitamin E (2) Vitamin K												
	(3) Vitamin D (4) Vitamin C												
84.	The Co-enzyme involved in biosynthesis of fats is												
	(1) FMN (2) Co – I												
	(3) Co – II (4) Co – A												
85.	How many small peptides are formed upon cleavage by trypsin if a protein has five lysine residues?												
	(1) 4 (2) 5												
	(3) 6 (4) 7												

Question No.	Questions
86.	Which of the following interaction contributes most in protein folding?
	(1) Hydrophobic interaction (2) Covalent bond
	(3) van der Walls interaction (4) Ionic bond
87.	Which of the following reactions convert a 1, 5-diene to an isomeria, 5-diene?
	(1) Cope rearrangement
	(2) Claisen rearrangement
	(3) Photochemical (2 + 2) reaction
	(4) Diels-Alder reaction
88.	Which is most reactive towards an eletrophile?
	$(1) \bigcirc$ $(2) \bigcirc$ N
	$(3) \bigvee_{\substack{N \\ H}} \qquad \qquad (4) \bigvee_{\substack{N \\ H}} \qquad \qquad (4)$
89.	Natural lipids are readily soluble in
	(1) Oil (2) Mercury
	(3) Water (4) None of these
90.	A disadvantage of fats is
	(1) Reduction in rate of heat loss
0.10.033	(2) Solvent for vitamins
	(3) Efficient source of energy
	(4) Effective insulative material

Question No.	Questions												
91.	A NMR transition is shifted from the reference in a 400 MHz spectrometer by 529 Hz. The chemical shift is												
-10190	(1) 1.32 (2) 5.29												
	(3) 7.56 (4) 1.76												
92.	Dry ice is used in fire extinguishers. It is stored in the cylinder in solid form. When sprayed on a fire, it quickly changes into gas known as CO ₂ . The change of state is called												
	(1) Evaporation (2) Sublimation												
	(3) Condensation (4) Distillation												
93.	The use of solar power is covered within Green chemistry principle ≠ 6, which is (1) Atom Economy (2) Design benign chemicals												
	(3) Design for Energy Efficiency (4) None of these												
94.	Milk is a/an												
	(1) Suspension (2) Pure solution												
	(3) Gel (4) Emulsion												
95.	Dipole moment is shown by												
	(1) 2, 2-Dimethyl propane (2) Trans-2-pentene												
	(3) Trans-1,2-dichloroethene (4) 2,2,3,3-tetrabromobutane												
96.	Which of the following statements about tetramethylsilane is incorrect												
	(1) It produces a single peak at $\delta = 10$												
	(2) It is inert												
	(3) It is volatile and can be easily distilled off and used again												
	(4) It is used to provide a reference against which other peaks ar measured												

Question No.	Questions
97.	The proton nmr of 2-bromo-2-methyl propane will consist of (1) Three quartets and a singlet (2) Two doublets and a singlet (3) One singlet (4) Two singlets
98.	(3) One singlet Which compound has a molecular ion at m/z = 58, an Infrared absorption at 1650 cm ⁻¹ and just one singlet in its nmr spectrum?
	(1) Butane (2) 2-methyl propane (3) CH ₃ CH ₂ CHO (4) CH ₃ COCH ₃
99.	Which electromagnetic radiation has maximum frequency?
e k	(1) Cosmic rays (2) X-rays (3) Infra red Rays (4) Ultraviolet rays
100.	The IUPAC name of the compound $CH_{3}CO - CH - CH - COOH$ $C\ell OCH_{3}$ is (1) 3-chloro-2-methoxy-4-oxo-pentanoic acid (2) 3-chloro-2 methoxy-4-keto-pentanoic acid (3) 4-carboxy-3-chloro-4-methoxy-2-butanone
	(4) 1-carboxy-2-methoxy-3-chloro-ethyl methyl ketone

1.	1	16.	3	31.	3	46.	4	61.	1	76.	2	91.	1	===	===	====	====	====	====	=
2.	2	17.	4	32.	2	47.	3	62.	4	77.	1	92.	2							
3.	3	18.	3	33.	4	48.	3	63.	2	78.	4	93.	3							
4.	4	19.	1	34.	1	49.	2	64.	2	79.	3	94.	4							
5.	2	20.	2	35.	1	50.	3	65.	3	80.	3	95.	1							
6.	1	21.	4	36.	2	51.	4	66.	1	81.	2	96.	4							
7.	3	22.	1	37.	4	52.	1	67.	2	82.	1	97.	3							
8.	4	23.	3	38.	3	53.	2	68.	4	83.	2	98.	1							
9.	1	24.	1	39.	1	54.	2	69.	3	84.	4	99.	2							
10.	1	25.	3	40.	2	55.	4	70.	4	85.	3	100.	3							
11.	3	26.	1	41.	4	56.	3	71.	1	86.	4									
12.	2	27.	2	42.	3	57.	1	72.	2	87.	1									
13.	4	28.	3	43.	1	58.	2	73.	3	88.	3									
14.	1	29.	4	44.	2	59.	4	74.	3	89.	2									
15.	2	30.	1	45.	1	60.	3	75.	4	90.	4									

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1.	3	16.	4	31.	4	46.	2	61.	4	76.	1	91.	2
2.	2	17.	3	32.	1	47.	4	62.	3	77.	2	92.	1
3.	4	18.	1	33.	2	48.	3	63.	1	78.	4	93.	2
4.	1	19.	2	34.	2	49.	1	64.	2	79.	3	94.	4
5.	2	20.	3	35.	4	50.	2	65.	1	80.	4	95.	3
6.	3	21.	1	36.	3	51.	4	66.	4	81.	1	96.	4
7.	4	22.	2	37.	1	52.	1	67.	3	82.	2	97.	1
8.	3	23.	3	38.	2	53.	3	68.	3	83.	3	98.	3
9.	1	24.	3	39.	4	54.	1	69.	2	84.	4	99.	2
10.	2	25.	4	40.	3	55.	3	70.	3	85.	2	100.	4
11.	1	26.	2	41.	3	56.	1	71.	1 .	86.	1		
12.	2	27.	1	42.	2	57.	2	72.	4	87.	3		
13.	3	28.	4	43.	4	58.	3	73.	2	88.	4		
14.	4	29.	3	44.	1	59.	4	74.	2	89.	1		
15.	1	30.	3	45.	1	60.	1	75.	3	90.	1		

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=	1.	4	16.	1	31.	1	46.	1	61.	1	76.	4	91.	4
	2.	3	17.	2	32.	2	47.	2	62.	2	77.	1	92.	1
	3.	1	18.	3,	33.	3	48.	4	63.	3	78.	3	93.	2
	4.	2	19.	4	34.	4	49.	3	64.	3	79.	2	94.	2
	5.	1	20.	1	35.	1	50.	4	65.	4	80.	4	95.	4
	6.	4	21.	1	36.	4	51.	3	66.	2	81.	3	96.	3
	7.	3	22.	2	37.	3	52.	2	67.	1	82.	2	97.	1
	8.	3	23.	3	38.	1	53.	4	68.	4	83.	4	98.	2
	9.	2	24.	4	39.	2	54.	1	69.	3	84.	1	99.	4
	10.	3	25.	2	40.	3	55.	1	70.	3	85.	2	100.	3
	11.	4	26.	1	41.	1	56.	2	71.	2	86.	3		
	12.	1	27.	3	42.	4	57.	4	72.	1	87.	4		
	13.	3	28.	4	43.	2	58.	3	73.	2	88.	3		*
	14.	1	29.	1	44.	2	59.	1	74.	4	89.	1		
	15	3	30	1	45.	3	60.	2	75.	3	90.	2		

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SET : D

			====	====	====			====	====			=====	====	=====	====	====	====	====	==
1.	1	16.	3	31.	3	46.	4	61.	2	76.	4	91.	1						
2.	2	17.	1	32.	2	47.	3	62.	1	77.	3	92.	2						
3.	3	18.	2	33.	4	48.	1	63.	2	78.	3	93.	3						
4.	3	19.	4	34.	1	49.	2	64.	4	79.	2	94.	4						
5.	4	20.	3	35.	2	50.	3	65.	3	80.	3	95.	2						
6.	2	21.	3	36.	3	51.	1	66.	4	81.	4	96.	1						
7.	1	22.	2	37.	4	52.	4	67.	1	82.	1	97.	3						
8.	4	23.	4	38.	3	53.	2	68.	3	83.	3	98.	4						
9.	3	24.	1	39.	1	54.	2	69.	2	84.	1	99.	1						
10.	3	25.	1	40.	2	55.	3	70.	4	85.	3	100.	1						
11.	4	26.	2	41.	1	56.	1	71.	4	86.	1								
12.	1	27.	4	42.	2	57.	2	72.	3	87.	2								
13.	2	28.	3	43.	3	58.	4	73.	1	88.	3								
14.	2	29.	1	44.	4	59.	3	74.	2	89.	4								
15.	4	30.	2	45.	1	60.	4	75.	1	90.	1								

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