Test Booklet No. _____

This booklet consists of 150 questions and pages.

RGUPET/2025/1004/102

RGUPET 2025
Common Entrance Test, 2025
DOCTOR OF PHILOSOPHY IN CHEMISTRY

Full Marks: 150 **Time: 3 Hours**

Roll No. | | | | | | | | |

Day and Date of Examination: _____

Signature of Invigilator(s) _____

Signature of Candidate _____

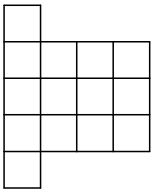
General Instructions:

PLEASE READ ALL THE INSTRUCTIONS CAREFULLY BEFORE MAKING ANY ENTRY.

1. DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO.
2. Candidate must write his/her Roll Number on the space provided.
3. This Test Booklet contains 150 Multiple Choice Questions (MCQs) from the concerned subject. Each question carries 1 mark.
4. Please check the Test Booklet to verify that the total pages and total number of questions contained in the test booklet are the same as those printed on the top of the first page. Also check whether the questions are in sequential order or not.
5. Candidates are not permitted to enter into the examination hall after the commencement of the entrance test or leave the examination hall before completion of Examination.
6. Making any identification mark in the OMR Answer Sheet or writing Roll Number anywhere other than the specified places will lead to disqualification of the candidate.
7. Candidates shall maintain silence inside and outside the examination hall. If candidates are found violating the instructions mentioned herein or announced in the examination hall, they will be summarily disqualified from the entrance test.
8. In case of any dispute, the decision of the Entrance Test Committee shall be final and binding.
9. The OMR Answer Sheet consists of two copies, the Original copy and the Student's copy.

1	The "Mission Sudarshan Chakra", recently launched by the Prime Minister of India, primarily relates to				development of a multilayered air and missile defence system
	a) a national renewable energy mission	b) a national digital currency mission	c) development of a multilayered air and missile defence system	d) a national mission to modernise Indian Railways	(c)
2	"Pushpak"- a national mission being implemented by the Indian Institute of Technology, Bombay is related to the development of				Drone technology
	a) Helicopters	b) Dairy technology	c) Drone technology	d) Artificial intelligence	c)
3	North East India's first underwater tunnel project, announced in 2024, is proposed to connect				Numaligarh and Gohpur
	a) Dibrugarh and Dhemaji	b) Jorhat and Majuli	c) Numaligarh and Gohpur	d) Guwahati and North Guwahati	c)
4	Which of the following statements are correct? A. Canada hosted the 51st G7 summit in 2025. B. Four players were honoured with the Khel Ratna Award 2025. C. Sweden was ranked first in Global Innovation Index 2024. D. Operation Sindoor was Launched by India to attack terrorist bases in Pakistan on 7th May 2025.				(a)
	a) A, B and D	b) A,B and C	c) Only A	d) All of the above	A, B and D
5	Which of the followings are correct? A. Lip Butan has been appointed as the new CEO of Intel in March 2025 B. Shri C P Radhakrishnan has been appointed as the Vice President of India C. India's rank in the Human Development Index 2025 released by UNDP is 99 D. India has become the 2nd largest road network in the World.				(d)
	a) A and B only	b) A, B and C only	c) A, C and D only	d) A, B, D only	A, B, D only
6	Which of the following sentences is false? A. Palk Strait joins India and Sri Lanka B. The Radcliffe Line is between India and Bangladesh C. The MacMohan Line separates India and China D. The Durand Line is between Iran and Afghanistan.				
	a) A, B	b) B, C	c) C, D	d) B, D	(d)

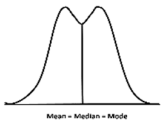
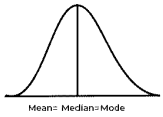
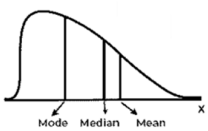
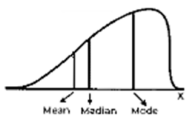
7	Assertion (A): Eclipses do not occur on all full moon and new moon days. Reason (R): The moon revolves round the earth in an elliptical orbit.				A and R are true but R doesnot explain A
	a) A and R are true and R correctly explains A.	b) A and R are true but R does not explain A.	c) A is true R is false	d) R is true but A is false	(b)
8	Right to equality is a-				Fundamental right
	a) fundamental right	b) social right	c) cultural right	d) legal right	(a)
9	The author of the book "Midnight's Children" is-				Salman Rushdie
	a) Shakespeare	b) Leo Tolostoy	c) Salman Rushdie	d) R K Narayan	(c)
10	Match the organizations with their headquarters: A. UNESCO — 1. New York B. WHO — 2. Paris C. UNICEF — 3. Geneva D. IMF — 4. Washington D.C.				
	a) A–3, B–2, C–4, D–1	b) A–2, B–3, C–1, D–4	c) A–2, B–4, C–3, D–1	d) A–1, B–3, C–2, D–4	(b)
11	He said, "Happy new year!" The correct indirect speech of the above is-				He wished me a happy new year.
	a) He said the new year was happy.	b) He wished me a happy new year.	c) He said to me that happy new year.	d) I was wished a happy new year.	(b)
12	Identify the correct sentence(s) from the following. A. One of my friends is a doctor. B. I don't know nothing about her. C. It is a two-hour journey. D. We will be definitely there at the yesterday's programme.				
	a) A, B	b) B, C	c) A, C	d) C, D	(c)
13	"She drank the _____ milk that was there in the flask." The appropriate quantifier to fill in the blank is-				little
	a) all	b) little	c) sour	d) few	(b)
14	"a/ great /and/ reality/their/ theory/in/there/ disparity/is" The correct reordered meaningful sentence with the above jumbled words/phrases is- P. There is a great theory and their reality in disparity. Q. There is a great disparity in their theory and reality. R. Their great disparity is in a theory and reality there. S. Their great theory is a reality and in disparity there.				There is a great disparity in their theory and reality.

	a) P	b) Q	c) R	d) S	(b)
15	The correct match of synonyms and antonyms is: A. Futile – i. Help B. Generic – ii. Effective C. Hinder – iii. Individual D. Inception – iv. Termination				A-ii, B-iii, C-i, D-iv
	a) A-i, B-ii, C-iii, D-iv	b) A-iii, B-ii, C-iv, D-iii	c) A-iv, B-iii, C-i, D-ii	d) A-ii, B-iii, C-i, D-iv	(d)
16	The total number of squares in the following figure is: 				22
	a) 24	b) 20	c) 22	d) 18	(c)
17	Fill in the blank in the following pattern. ELFY GLHX ILJW -------- MLNU				KLLV
	a) KLLV	b) KLMX	c) JLLV	d) JLMX	a)
18	Raghav introduces Vineet as the only son of the only brother of his father's wife. How Raghav and Vineet are related?				cousin
	a) brother	b) cousin	c) uncle	d) son-in-law	(b)
19	Which two numbers should be interchanged to make the given equation mathematically correct? $3 \times 6 + 72 \div 8 - 24 = 12$				6, 8
	a) 6, 8	b) 6, 24	c) 3, 8	d) None	(a)
20	If BANKER is coded as CAOKFR, then how would LAWYER be coded?				MAXYFR
	a) LBWZES	b) LBWYFR	c) MAXYFR	d) MAXZES	c)
21	Same error occurs at the same size in every measurement, and such errors can only be eliminated either by thinking through the sources of problems and removing them. This type of error is termed as:				
	a) Random errors	b) Systematic errors	c) Cascading errors	d) Perpetual errors	b
22	Hypothesis-driven research begins with a hypothesis. A hypothesis is a statement about the world that can be true or false, and whose truth is being tested.				

	a) A valid hypothesis is based on 'that exists'	b) A hypothesis is a positive conclusion	c) A hypothesis can never be tested	d) A valid hypothesis must be falsifiable	d
23	Which of the following statements that could be considered as valid scientific hypotheses? A. Eating two ounces of olive oil a day decreases the odds of contracting heart disease. B. What is the best fertilizer to use to get large and tasty tomatoes? C. Macs are better than PCs. D. Briar's Aspirin cures headaches faster than RCS Aspirin.				Answer
	a) A, B	b) A, B, C	c) A, D	d) B, C	c
24	Relate the 'function or relationship' (A) and 'comment' (B) and select the appropriate answer A: Find how the speed of sound in air at fixed pressure depends upon air temperature. B: The control variable is temperature, and the response variable is sound speed.				Answer
	a) Functional relationship is correct and the comment is true for the relationship	b) Functional relationship is incorrect but the comment is true for the relationship	c) Functional relationship is correct but the comment is false for the relationship	d) Neither the functional relationship is correct nor the comment is true	a
25	Relate 'sampling design' and its 'method' Sampling Design: A. Deliberate; B. Simple random; C. Stratified; D. Sequential Method: i. Sample collected as information received and survey progresses; ii. sample drawn from a heterogeneous group; iii purposive selection of particular units; iv. very item in the population has an equal chance of inclusion				Answer
	a) A-iii, B-iv, C-ii, D-i	b) A-ii, B-iv, C-iii, D-i	c) A-i, B-iii, C-ii, D-iv	d) A-iii, B-ii, C-iv, D-i	a
26	Number of observations in a normal distribution is 1000. How many observations will be there between $\mu+1\sigma$ and $\mu-1\sigma$				Answer
	a) 500	b) 680	c) 720	d) 950	b
27	Which of the following are reasons for citing a paper? A. use its ideas, definitions, terms in a Research B. provides upcoming facts regarding undergoing Research Question. C. to adopt part/full methodology it adopted for a certain task. D. to refer to data also used in Current Research.				Answer
	a) A, B, C	b) B, C, D	c) A, C, D	d) A, B, D	c

<table>
<tr><td>28</td><td colspan="4">Scholars who wish to meet publication expectations mostly resort to a variety of techniques to increase their output and crank up their citation ranking, which are not considered ethical. Identify these techniques:

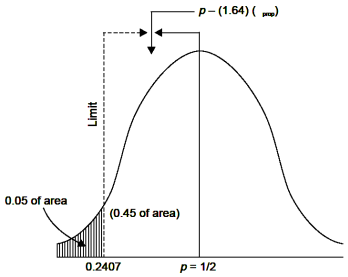
A. Gift authorship
B. Extensive experiments
C. Salami Slicing
D. Extensive referencing</td><td>Answer</td></tr>
<tr><td></td><td>a)A, B, C</td><td>b) A, B, D</td><td>c) B, C, D</td><td>d) A, C, D</td><td>d</td></tr>
<tr><td>29</td><td colspan="4">Match the references (APA 7 style):

<table><tr><td>A. Journal Article</td><td>i. Edwards, A. A., Steacy, L. M., Siegelman, N., Rigobon, V. M., Kearns, D. M., Rueckl, J. G., & Compton, D. L. (2022). Unpacking the unique relationship between set for variability and word reading development: Examining word- and child-level predictors of performance. Journal of Educational Psychology, 114(6), 1242–1256. https://doi.org/10.1037/edu0000696</td></tr><tr><td>B. Authored Book</td><td>ii. Levenson, H., Jinich, S., Vaz, A., & Rousmaniere, T. (2025). Deliberate practice in emotionally focused couple therapy. American Psychological Association. https://doi.org/10.1037/0000436-000</td></tr><tr><td>C. Webpage</td><td>iii. Zeleke, W. A., Hughes, T. L., & Drozda, N. (2020). Home–school collaboration to promote mind–body health. In C. Maykel & M. A. Bray (Eds.), Promoting mind–body health in schools: Interventions for mental health professionals (pp. 11–26). American Psychological Association. https://doi.org/10.1037/0000157-002</td></tr><tr><td>D. Edited Book Chapter</td><td>iv. Taras, Z. (2024, May 30). Situational irony can be funny, tragic or even terrifying. howstuffworks. https://entertainment.howstuffworks.com/arts/literature/situational-irony.htm</td></tr></table></td><td>Answer</td></tr>
<tr><td></td><td>a) A-i, B-ii, C-iv, D-iii</td><td>b) A-ii, B-iii, C-iv, D-i</td><td>c) A-iii, B-ii, C-i, D-iv</td><td>d) A-i, B-ii, C-iii, D-iv</td><td>a</td></tr>
<tr><td>30</td><td colspan="4">Which one of the following refers to positive skewness?</td><td></td></tr>
<tr><td></td><td>a)
 
</td><td>b)
 
</td><td>c)
 
</td><td>d)
 
</td><td>c</td></tr>
<tr><td>31</td><td colspan="4">How much is the degree of freedom for the following data table?</td><td>Answer</td></tr>
</table>

S. No.	X_i	Hypothesised mean $m_{H_0} = 578$ kg.	$D_i = (X_i - \mu_{H_0})$	D_i^2
5	572	578	–6	36
6	578	578	0	0
7	570	578	–8	64
8	572	578	–6	36
9	596	578	18	324
10	544	578	–34	1156
$n = 10$			$\sum D_i = -60$	$\sum D_i^2 = 1816$

	a) 8	b) 9	c) 10	d) 18	b
32	Find out the Null hypothesis for the given table				Answer

S. No.	X_i	Hypothesised mean $m_{H_0} = 578$ kg.	$D_i = (X_i - \mu_{H_0})$	D_i^2
5	572	578	–6	36
6	578	578	0	0
7	570	578	–8	64
8	572	578	–6	36
9	596	578	18	324
10	544	578	–34	1156
$n = 10$			$\sum D_i = -60$	$\sum D_i^2 = 1816$

	a) $\mu_{H0} = 578$kg.	b) $\mu_{H0} \neq 578$kg.	c) $\mu_{H0} = -578$kg.	d) $\mu_{H0} = \pm 578$kg.	a
33	What will be sum of the deviations of observations from the regression line?				Answer
	a) -∞	b) 0	c) +∞	d) undefined	b
34	Derive from the following diagram  Assertion: In this normal distribution 5 percent of the sample are rejected. Justification: It shows a two tailed hypothesis test model at 90 percent confidence level				Answer
	a) Assertion is true and justification explains the Assertion	b) Assertion is false but justification explains the Assertion	c) Assertion is true and justification is true but does not explain the Assertion	d) Assertion is true and justification for the Assertion is incorrect	d
35	Match into pairs for the Statistical method with appropriate details mentioned:				Answer

Statistical method	Details
A. Correlation	i. Order 2, 3, 4, …….
B. Polynomial regression	ii. More than two population on same characteristics
C. ANOVA	iii. Test of homogeneity
D. Chi square	iv. Requires only two variables

	a) A-i, B-ii, C-iii, D-iv	b) A-iv, B-i, C-ii, D-iii	c) A-iv, B-ii, C-i, D-iii	d) A-iii, B-i, C-ii, D-iv	b

36	Match the following and give the correct answer: A. Nature of Interaction holding atom i Kinetics B. Rate of Chemical Reaction ii Bond C. Increase the rate of reaction iii Lipid D. hydrocarbon chain insoluble in water iv catalyst				Answer
	a) A(i), B(ii), C(iii), D(iv)	b) A(ii), B(i), C(iv), D(iii)	c) A(iii), B(ii), C(i), D(iv)	d) A(ii), B(iii), C(i), D(iv)	(b)
37	In a simple harmonic motion, the velocity of a particle is maximum at:				Answer
	a) Mean position	b) Extreme position	c) Halfway between mean and extreme	d) At all positions	(a)
38	In a double-slit experiment, if the distance between slits is doubled, what happens to the fringe spacing on the screen?				Answer
	a) Fringe spacing halves	a) Fringe spacing doubles	c)Fringe spacing remains the same	d)Fringe spacing quadruples	(a)
39	A block slides down a frictionless inclined plane. Which of the following statements is true?				Answer
	a) Mechanical energy is not conserved	b) Potential energy decreases, kinetic energy increases	c) Kinetic energy decreases	d)Acceleration is zero	(b)
40	Which of the following is true for a photon in a vacuum?				Answer
	a) It has mass but no energy	b) It has energy but no rest mass	c) It has rest mass and energy	d) It can be accelerated by a force	(b)

41	If $f(x) = \begin{cases} \{\lvert x-2\rvert)/(x-2)\}, & x \neq 0 \\ 0, & otherwise \end{cases}$				Answer
	a) -1	b) 1	c) 0	d) does not exist	d
42	If $y = x^5 - 5x^4 + 5x^3 - 1$, then the value of $\frac{d^6y}{dx^6}$ is				Answer
	a) $120x - 120$	b) 120	c) 0	d) cannot be evaluated.	c

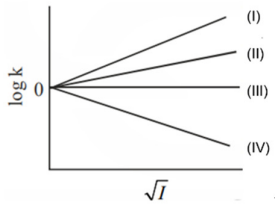
43	Which of the following is/are not true for a function f defined on closed interval $[a, b]$ to satisfy Rolle's theorem? A. f is continuous on closed interval$[a, b]$. B. f is differentiable on the open interval (a, b) C. $f(a) = f(b)$ D. $f(k) = 0$ for at least one $k \in [a, b]$.				Answer
	a) A and B	b) only D	c) B and C	d) Only C	b
44	A group which satisfies commutatively property is known a				
	a) Abelian group	b) Quotient group	c) Coset group	d) Normal group	a
45	Let M^T denotes transpose matrix of M and I is identity matrix. Match the following: A. M is idempotent — i. $M = M^T$ B. M is symmetric — ii. $M = -M^T$ C. M is skew-symmetric — iii. $M^2 = I$ D. M is involution — iv. $M^2 = M$				Answer
	a) A-iv, B-i, C-iii, D-ii	b) A-i, B-iv, C-ii, D-iii	c) A-iv, B-i, C-ii, D-iii	d) A-iv, B-ii, C-i, D-iii	c

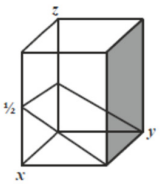
46	Relate the statements: A: Assertion–SSDs are faster than HDDs. B: Justification–Because SSDs use flash memory instead of spinning disks.				Answer
	a) Both A and B are true, and B is the correct explanation of A	b) Both A and B are true, but B is NOT the correct explanation of A	c) A is true, but B is false	d) A is false, but B is true	(a)
47	Match the pairs: A. Machine Learning — i Enables machines to understand and process human language B. Natural Language Processing (NLP) — ii Uses data to learn and improve predictions automatically C. Computer Vision — iii Analyzes and interprets visual data like images and videos D. Expert Systems — iv Mimics human decision-making using rules and knowledge base				Answer
	a) A – iv, B – i, C – iii, D – ii.	b) A – iv, B – iii, C – i, D – ii.	c) A – ii, B – i, C – iii, D – iv.	d) A – iii, B – i, C – iv, D – ii.	(c)
48	Which programming language is widely used for AI and ML development?				Answer
	a) Python	b) JavaScript	c) C#	d) HTML	(a)
49	Which of the following statement is true:				Answer

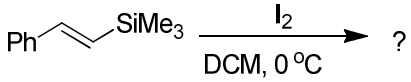
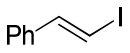
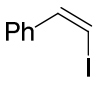
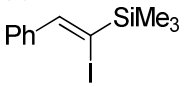
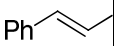
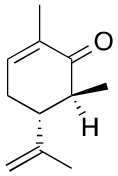
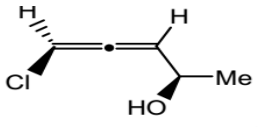
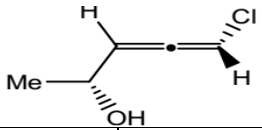
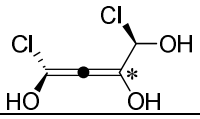
	a) A byte is made up of 16 bits.	b) ROM is volatile memory that loses data when power is switched off.	c) A compiler translates high-level code into machine code line by line.	d) A firewall is used to protect a computer network from unauthorized access.	(d)
50	What is a network of networks called?				Answer
	a) Intranet	b) Internet	c) WAN	d) LAN	(b)

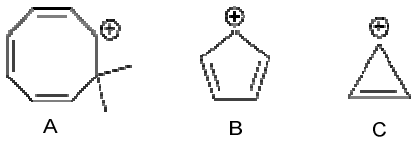
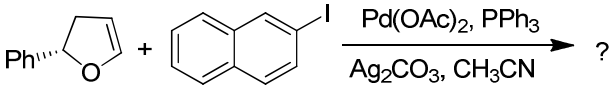
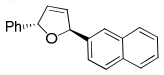
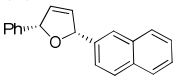
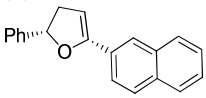
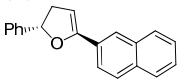
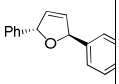
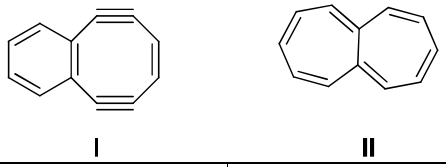
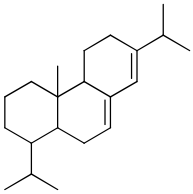
51	The function cos(ax) is an eigenfunction of d^2/dx^2 with an eigenvalue of-				$-a^2$
	(a) $-a$	(b) $-a^2$	(c) a	(d) a^2	(b)
52	The radial wave function, R(r) of hydrogen atom depends on the following quantum numbers-				n and l
	(a) n and l	(b) m and l	(c) l and s	(d) n only	(a)
53	In the linear variation method using two orthogonal basis functions, the two roots obtained are ϵ_0 and ϵ_1 ($\epsilon_0 < \epsilon_1$). The correct relation of these with exact ground and first excited state energies, E_0 and E_1, respectively, is				$\epsilon_0 \geq E_0$ and $\epsilon_1 \geq E_1$
	(a) $\epsilon_0 \geq E_0$ and $\epsilon_1 < E_1$	(b) $\epsilon_0 < E_1$ and $\epsilon_1 \geq E_1$	(c) $\epsilon_0 < E_0$ and $\epsilon_1 < E_1$	(d) $\epsilon_0 \geq E_0$ and $\epsilon_1 \geq E_1$	(d)
54	In a polar solvent, the $\pi \rightarrow \pi^*$ transition shift to-				longer wavelength
	(a) shorter wavelength	(b) longer wavelength	(c) no shifting at all	(d) unpredictable	(b)
55	The vibrational degree of freedom of a linear polyatomic molecule containing n atoms is-				$3n-5$
	(a) $3n-5$	(b) $3n-6$	(c) $3n-4$	(d) $3n$	(a)
56	The energy in joule (J) corresponding to light of wavelength 30 nm is- (Given: Planck's constant, $h = 6.63 \times 10^{-34}$ J s, speed of light, $c = 3 \times 10^8$ m s^{-1})				6.63×10^{-18}
	(a) 6.63×10^{15}	(b) 6.63×10^{11}	(c) 6.63×10^{18}	(d) 6.63×10^{-18}	(d)
57	The molecule, BF_3 belongs to the point group-				D_{3h}
	(a) D_{3h}	(b) D_{3k}	(c) C_{2v}	(d) C_{3v}	(a)
58	Which molecule does not have a center of symmetry?				C_6H_6
	(a) C_6H_6	(b) CH_4	(c) H_2O_2	(d) BF_3	(a)
59	The order and the number of classes present in a group with the irreducible representations A1, A2, B1, B2, E1, and E2, are, respectively-				12 and 6

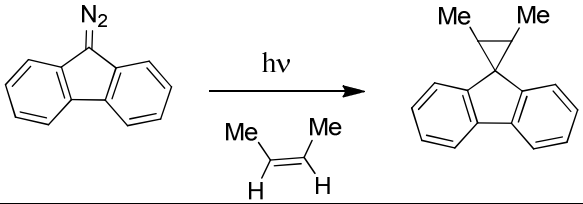
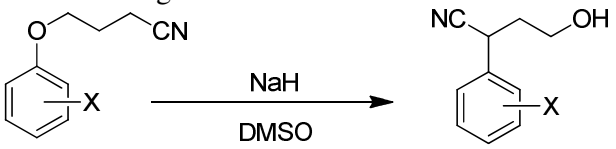
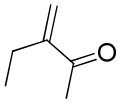
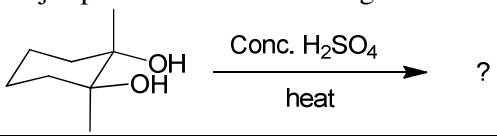
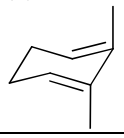
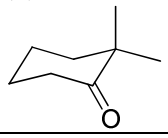
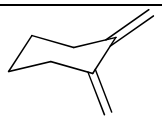
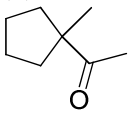
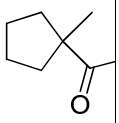
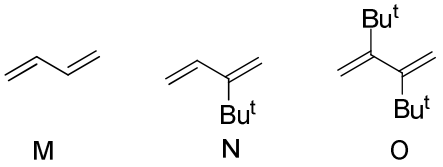
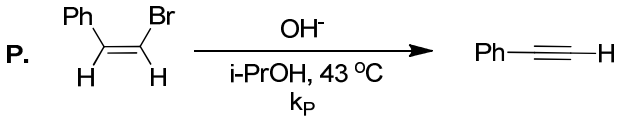
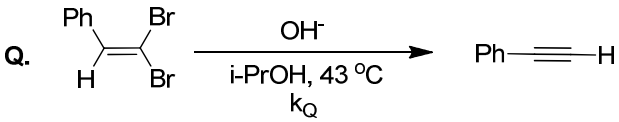
	(a) 6 and 6	(b) 12 and 6	(c) 6 and 3	(d) 12 and 3	(b)
60	Which of the following measures escaping tendency of a component in the system -				chemical potential
	(a) kinetic energy	(b) free energy	(c) chemical potential	(d) entropy	(c)
61	The free energy changes due to mixing of ideal gases is given by-				$\Delta G_{\mathrm{m}} = nRT \sum x_{\mathrm{i}}$
	(a) $\Delta G_{\mathrm{m}} = nRT \sum x_{\mathrm{i}} \ln x_{\mathrm{i}}$	(b) $\Delta G_{\mathrm{m}} = -nRT \sum x_{\mathrm{i}} \ln x_{\mathrm{i}}$	(c) $\Delta G_{\mathrm{m}} = nR \sum x_{\mathrm{i}} \ln x_{\mathrm{i}}$	(d) $\Delta G_{\mathrm{m}} = -nR \sum x_{\mathrm{i}} \ln x_{\mathrm{i}}$	(a)
62	Which of the following is necessary for a process to be spontaneous (ΔS=change in entropy)?				$\Delta S_{universe} > 0$
	(a) $\Delta S_{system} > 0$	(b) $\Delta S_{system} < 0$	(c) $\Delta S_{universe} > 0$	(d) $\Delta S_{surroundings} < 0$	(c)
63	Given below are two statements. One is labelled as **Assertion A** and the other is labelled as **Reason R**. **Assertion A**: If dQ and dW represent the heat supplied to the system and the work done on the system, respectively. Then, according to the first law of thermodynamics dQ = dU – dW. **Reason R**: First law of thermodynamics is based on the law of conservation of energy. In light of the above statements, choose the correct answer from the options given below-				Both A and R are correct and R is the correct explanation of A
	(a) A is correct, but R is not correct	(b) A is not correct, but R is correct	(c) Both A and R are correct, and R is the correct explanation of A	(d) Both A and R are correct, and R is not the correct explanation of A	(c)
64	Six distinguishable particles are distributed over 3 non-degenerate levels of energies 0, ε and 2ε. The most probable value for the total energy is-				6ε
	a) 5ε	b) 6ε	c) 7ε	d) 8ε	(b)
65	If Q is the molar partition function, then the work function, A is given by				$A = -KT \ln Q$
	(a) $A = KT \ln Q$	(b) $A = -KT \ln Q$	(c) $A = QT$	(d) $A = \frac{KT}{\ln Q}$	(b)

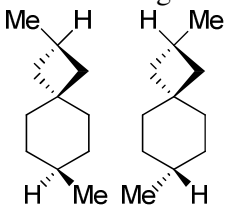
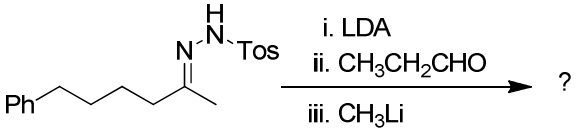
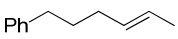
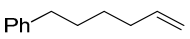
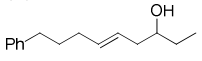
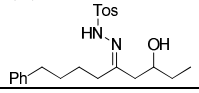
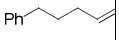
66	The expressions for activity of $Al_2(SO_4)_3$ in terms of its molality and mean ionic activity coefficient is				$a = 108\gamma_{\pm}^{5}m^{5}$
	(a) $a = 36\gamma_{\pm}^{5}m^{5}$	(b) $a = 108\gamma_{\pm}^{4}m^{4}$	(c) $a = 36\gamma_{\pm}^{4}m^{4}$	(d) $a = 108\gamma_{\pm}^{5}m^{5}$	(d)
67	In Daniell cell, electrons flow from-				anode to cathode
	(a) cathode to anode	(b) anode to cathode	(c) copper to zinc	(d) SO_4^{2-} to Cu^{2+}	(b)
68	If the concentration (c) is increased to 4 times its original value (c), the change in molar conductivity for strong electrolytes is (where *b* is the Kohlrausch constant)-				$b\sqrt{c}$
	(a) 0	(b) $b\sqrt{c}$	(c) $2b\sqrt{c}$	(d) $4b\sqrt{c}$	(b)
69	If the solubility of $Al(OH)_3$ is S mol/L, the solubility product is given by-				$K_{sp} = 27S^4$
	(a) $K_{sp} = 27S^2$	(b) $K_{sp} = 27S^3$	(c) $K_{sp} = 27S^4$	(d) $K_{sp} = 3S^3$	(c)
70	For a certain reaction, A → P, a plot of ln [A] versus time, *t,* gives a straight line with a slope of –1.46 s^{-1}. The order of the reaction in A is-				1
	(a) 0	(b) 1	(c) 2	(d) 3	(b)
71	The plot of the rate constant (log *k*) vs. ionic strength ($\sqrt{I}$) of the reaction $[Co(NH_3)_5Br]^{2+} + OH^- \rightarrow [Co(NH_3)_5OH]^{2+} + Br^-$ follows the line (refer to the figure)- 				(IV)
	(a) (I)	(b) (II)	(c) (III)	(d) (IV)	(d)
72	The effective rate constants for the gaseous unimolecular reaction: $A \rightarrow P$ following the Lindemann-Hinshelwood mechanism are 1.7×10^{-3} s^{-1} and 2.2×10^{-4} s^{-1} at [A]=4.37×10^{-4} mol dm^{-3} and 1.0×10^{-5} mol dm^{-3}, respectively. The rate constant for the activation step in the mechanism is approximately equal to (in dm^3 mol^{-1} s^{-1})				24.7
	(a) 12.3	(b) 49.4	(c) 6.1	(d) 24.7	(d)

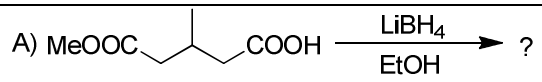
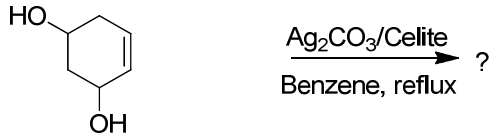
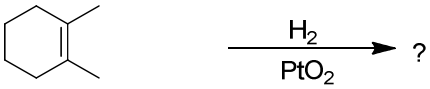
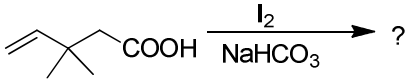
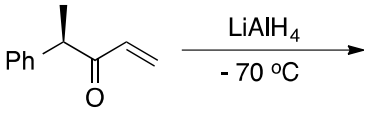
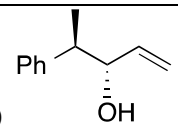
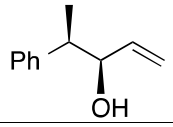
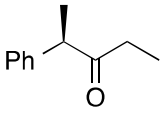
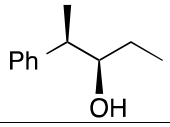
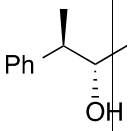
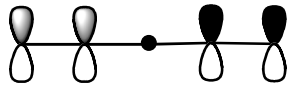
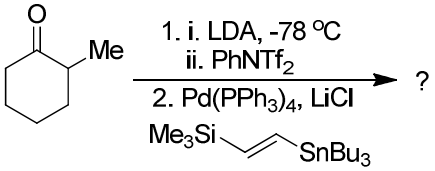
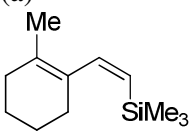
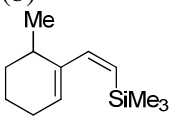
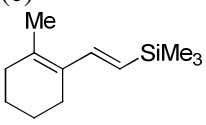
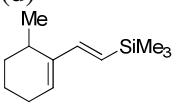
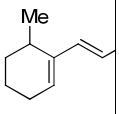
73	The correct form for a simple Langmuir isotherm is-				$\theta = \frac{KP}{1+KP}$
	(a) $\theta = KP$	(b) $\theta = (KP)^{\frac{1}{2}}$	(c) $\theta = \frac{KP}{1+KP}$	(d) $\theta = \frac{1+KP}{KP}$	(c)
74	A monolayer of N_2 molecules (effective area 0.165 nm^2) is formed on the surface of 1.0 g of a solid catalyst by adsorption at 77 K. Upon warming, the desorbed gas occupies 4.25 cm^3 at 273 K and 1.0 atm. The approximate surface area (m^2) of the catalyst is-				19
	(a) 15	(b) 19	(c) 25	(d) 30	(b)
75	Which of the following is not an example of lyophobic colloids?				NaCl solution
	(a) NaCl solution	(b) gold sol	(c) As_2S_3 solution	(d) none of the above	(a)
76	The materials used to construct the filter in an X-ray diffraction instrument is-				metal with the next lower atomic number
	(a) metal with the next higher atomic number	(b) metal with the next lower atomic number	(c) quartz	(d) beryllium	(b)
77	Which method is the most appropriate for determining weight weight-average molecular weight?				viscometry method
	(a) osmometry method	(b) viscometry method	(c) light scattering method	(d) sedimentation method	(b)
78	Which Miller index plane is shown below- 				(0 1 2)
	(a) (0 2 1)	(b) (0 4 1)	(c) (0 1 2)	(d) (0 0 0)	(c)

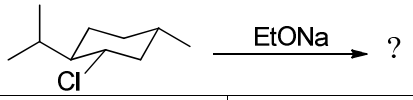
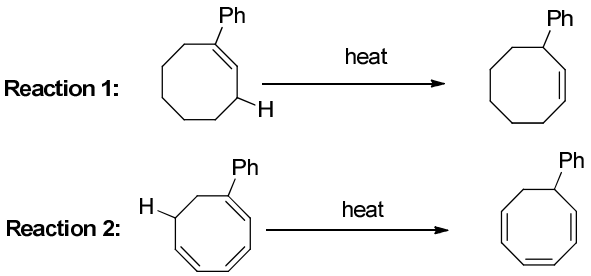
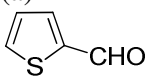
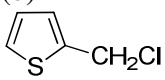
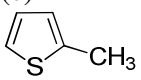
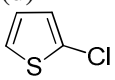
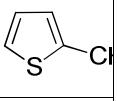
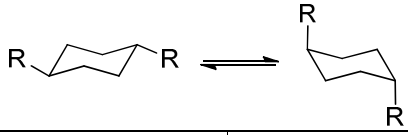
79	During addition polymerisation, the reaction proceeds via–				free radical reaction
	(a) step-growth process	(b free radical reaction	(c) cascade process	(d) elimination reaction	(b)
80	In the osmometry method for the determination of molecular weight of polymers, a plot of π/C versus C is a straight line at 300 K with an intercept of 0.249. The molecular weight of the polymer is approximately -				10000
	(a) 20000	(b) 15000	(c) 10000	(d) 5000	(c)
81	In which of the following numbers all zeroes are significant-				0.0005
	(a) 0.0005	(b) 0.0500	(c) 50.000	(d) 0.0050	(a)
82	The major product formed in the following reaction is: 				(a)
	(a) 	(b) 	(c) 	(d) 	
83	The absolute configuration for the two chiral centres in the following molecule are: 				(b)
	(a) *5R,6R*	(b) *5R,6S*	(c) 5*S*,6*R*	(d) 5*S*,6*S*	*5R,6S*
84	The correct relationship between the following two compounds is:  				(c)
	(a) enantiomers	(b) diastereoisomers	(c) homomers	(d) constitutional isomers	homomers
85	One of the coupling partners for Negeshi cross coupling reaction is:				(b)
	(a) Organo boron	(b) Organo zinc	(c) Organo tin	(d) Organosilicon	Organo zinc
86	In the following molecule, the asterisked C is: 				(d)
	(a) chiral, stereogenic and chirotopic	(b) achiral, non-stereogenic and achirotopic	(c) achiral, stereogenic and achirotopic	(d) achiral, stereogenic and chirotopic	achiral, stereogenic and

					chirotopic
87	Among the carbocations given below 				(a)
	(a) A is homoaromatic, B is antiaromatic and C is aromatic	(b) A is aromatic, B is antiaromatic and C is homoaromatic	(c) A is antiaromatic, B is aromatic and C is harmoaromatic	(d) A is homoaromatic, B is aromatic and C is antiaromatic	A is homoaromatic, B is antiaromatic and C is aromatic
88	The major product formed in the following transformation is: 				(a)
	(a) 	(b) 	(c) 	(d) 	
89	Correct statement for the compounds I & II is: 				(b)
	(a) I is aromatic; II is non-aromatic	(b) I is anti-aromatic; II is non-aromatic	(c) I is anti-aromatic; II is anti-aromatic	(d) I is aromatic; II is aromatic	I is anti-aromatic; II is non-aromatic
90	Number of isoprene units present in the following molecule is: 				(b)
	(a) 3	(b) 4	(c) 2	(d) 5	4
91	Curtius rearrangement involves:				(d)
	(a) carbocation	(b) carbanion	(c) carbene	(d) nitrene	nitrene

92	The intermediate involved in the reaction given below is:  				(a)
	(a) free radical	(b) carbocation	(c) carbanion	(d) carbene	free radical
93	The following reaction is the fastest when X is:  				(b)
	(a) X is *m*-NO_2	(b) X is *p*-NO_2	(c) X is *m*-OMe	(d) X is *p*-OMe	X is *p*-NO_2
94	The λ_{max} value of the following compound is:  				(b)
	(a) 230 nm	(b) 225 nm	(c) 254 nm	(d) 215 nm	225 nm
95	Major product of the following reaction is:  				(d)
	(a) 	(b)  	(c) 	(d)  	
96	The correct order of reactivity for the following dienes with maleic anhydride is:  				(b)
	(a) M > N > O	(b) N > M > O	(c) N > O > M	(d) O > N > M	N > M > O
97	The correct statement for the reactions P and Q is: **P.**  **Q.**  				(a)

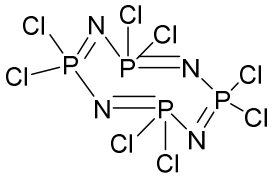
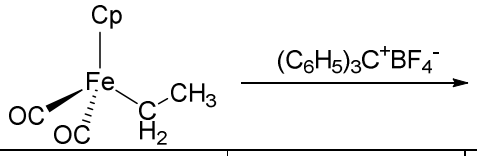
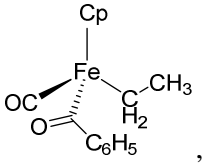
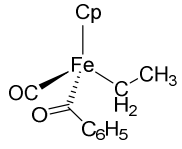
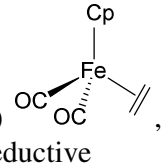
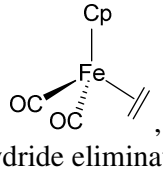
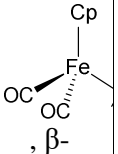
	(a) $k_P > k_Q$; P goes via an E2 and Q goes via an E1cB pathway	(b) $k_P > k_Q$; both P and Q go via E2 pathway	(c) $k_Q > k_P$; P goes via an E1cB and Q goes via an E2 pathway	(d) $k_Q > k_P$; both P and Q go via E1cB pathway	$k_P > k_Q$; P goes via an E2 and Q goes via an E1cB pathway
98	Substrates for Peterson olefination reactions are:				(b)
	(a) carbonyl compounds and β-silyl carbanion	(b) carbonyl compounds and α-silyl carbanion	(c) aromatic acids and α-silyl carbanion	(d) none of the above	carbonyl compounds and α-silyl carbanion
99	Which of the following reagent serves similar purpose as phosphorous ylides serve in Wittig reaction?				(c)
	(a) Gilman's reagent	(b) Fetizon's reagent	(c) Tebbe reagent	(d) Baker's yeast	Tebbe reagent
100	The following two molecules are: 				(c)
	(a) Enantiomers	(b) Diastereomers	(c) Homomers	(d) Constitutional isomers	Homomers
101	Write down the major product of the following reaction: 				(c)
	(a) 	(b) 	(c) 	(d) 	
102	A group whose use makes possible to react less reactive functional group selectively in the presence of more reactive group is known as:				(b)
	(a) umpolung	(b) protecting group	(c) sython	(d) synthetic equivalent	protecting group
103	Among the following, the examples of chemoselective reactions are:				(a)

	A)  B)  C)  D) 				
	(a) A and B	(b) B and C	(c) A and D	(d) C and D	A and B
104	Which of the following compounds act as protecting group for alcohols?				(d)
	(a) Ethers	(b) Acetals	(c) Ketals	(d) All of those	All of those
105	The major product formed in the following reaction is: 				(a)
	(a) 	(b) 	(c) 	(d) 	
106	The following molecular orbital corresponds to 				(a)
	(a) HOMO of pentadienyl cation	(b) HOMO of pentadienyl anion	(c) LUMO of pentadienyl cation	(d) LUMO of pentadienyl anion	HOMO of pentadienyl cation
107	Cram's model can predict major products in:				(b)
	(a) some enantioselective syntheses	(b) some diastereoselective syntheses	(c) any chiral synthesis	(d) none of the above	some diastereoselective syntheses
108	The major product formed in the following reactions sequence is: 				(d)
	(a) 	(b) 	(c) 	(d) 	

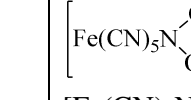
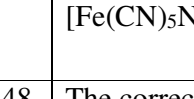
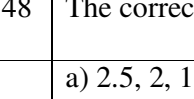
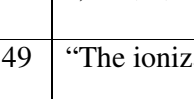
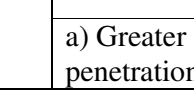
109	The following reaction will result: 				(a)
	(a) a trans-cyclohexene as an exclusive product	(b) a cis-cyclohexene as an exclusive product	(c) a mixture of cis- and trans-cyclohexenes as product	(d) a substitution product	a trans-cyclohexene as an exclusive product
110	For the following reactions, which one of the statements is correct? 				(b)
	(a) Reaction 1 is faster than Reaction 2	(b) Reaction 1 is slower than Reaction 2	(c) Both the reactions will have same reaction rate	(d) Can't be predicted for the given reactions	Reaction 1 is slower than Reaction 2
111	The best spectroscopic technique to determine the presence of -CN functionality in an organic substrate is:				(c)
	(a) ^{13}C NMR	(b) UV-Vis	(c) IR	(d) Mass spectrometry	IR
112	Thiophene reacts with HCHO in presence of aq. HCl to give:				(b)
	(a) 	(b) 	(c) 	(d) 	
113	Biginelli reaction is used to synthesize:				(a)
	(a) pyrimidine derivatives	(b) pyridine derivatives	(c) pyrrole derivatives	(d) pyran derivatives	pyrimidine derivatives
114	The heterocyclic ring present in the amino acid histidine is?				(d)
	(a) pyridine	(b) purine	(c) indole	(d) imidazole	imidazole
115	In the following equilibrium, conformer B is more stable that a when R is 				(b)
	(a) Me	(b) F	(c) Cl	(d) OMe	F
116	In the mass spectrum of dichlorobenzene the ratio of the peaks at m/z 146, 148 and 150 is:				(d)

	(a) 1:1:1	(b) 3:3:1	(c) 1:2:1	(d) 9:6:1	9:6:1
117	Among the following, the optically active compound is:				(d)
118	The character table of D_3 point group is given below D_3 | E | 2C | 3C | | | A_1 | 1 | 1 | 1 | | x^2+y^2, z^2 | A_2 | 1 | 1 | –1 | z, R_z | | E | 2 | –1 | 0 | (x,y) | ($x^2–y^2$, xy) | | | | | (R_x, R_y) | (x_z, y_z) The correct statement for this point group is.				c
	a) All IR-active normal modes are Raman inactive	b) All IR-active normal modes are Raman active	c) It is possible to have a pair of degenerate IR-active normal modes.	d) It is possible to have a totally symmetric normal mode of vibration which is IR active.	It is possible to have a pair of degenerate IR-active normal modes.
119	The character table of C_{2v} point group along with an additional reducible representation is given below C_{2v} | E | C_2 | σ_v | σ_v' | A_1 | 1 | 1 | 1 | 1 | A_2 | 1 | 1 | -1 | -1 | B_1 | 1 | -1 | 1 | -1 | B_2 | 1 | -1 | -1 | 1 | Γ | 8 | -2 | -6 | 4 Γ is given by				c
	a) $A_1 + 5A_2 + 2B_1$	b) $A_1 + 2A_2 + 5B_1$	c) $A_1 + 2A_2 + 5B_2$	d) $2A_1 + A_2 + B_2$	$A_1 + 2A_2 + 5B_2$
120	According to Wade's theory, the structure of the carborane $[B_9C_2H_{12}]^-$ is				c
	a) *arachno*	b) *closo*	c) *nido*	d) *hypo*	*nido*
121	Which among the following compounds is an example of an interstitial carbide?				b
	a) Al_4C_3	b) WC	c) SiC	d) CaC_2	WC
122	The addition of thiocyanate (SCN^-) ion to an aqueous solution of Fe3+ gives an intense red colour. The reason for this red colour is.				A
	a) Ligand to metal charge transfer (LMCT)	b) Metal to ligand charge transfer (MLCT)	c) *d–d* transition	d) *f–f* transition	Ligand to metal charge transfer (LMCT)

123	Consider the following reaction. $[Fe^{II}(CN)_6]^{4-} + [Ir^{IV}(Cl)_6]^{2-} \rightleftharpoons [Fe^{III}(CN)_6]^{3-} + [Ir^{III}(Cl)_6]^{3-}$ The mechanism involved in this reaction is.				c
	a) S_N1 mechanism	b) S_N1 (CB) mechanism	c) Outer sphere mechanism	d) Inner sphere mechanism	Outer sphere mechanism
124	The softest acid among the following is.				d
	a) Mg^{2+}	b) Al^{3+}	c) Ag^{+}	d)Li^{+}	Ag^{+}
125	When a hot concentrated solution of borax is treated with concentrated sulphuric acid, it is converted to				c
p	a) Diborane	b) Tetraboric acid	c) Boric acid	d) Borazine	
126	The reagents required for the synthesis of borazine in chlorobenzene at 140 °C are.				b
	a) NH_4OH and BCl_3	b) NH_4Cl and BCl_3	c) NH_4OH and B_2H_6	d) NH_4Cl and B_2H_6	NH_4Cl and BCl_3
127	Consider the following metalloenzyme and heme proteins in column I and match with column II. **Column I**: i. Carboxypeptidase; ii. Hemerythrin; iii. Carbonic anhydrase; iv. Hemocyanin **Column II**: a. Fe and decomposition of H_2O_2; b. Zn and hydrolyses peptide bonds; c. Cu and O_2 transport; d. Zn and dehydration of bicarbonate ion; e. Mg and hydrolyses peptide bonds; f. Fe and transport of oxygen				d
	a) i.-e.; ii.-d.; iii.-f.; iv.-a.	b) i.-d.; ii.-b.; iii.-f.; iv.-a.	c) i.-b.; ii.-d.; iii.-f.; iv.-c.	d) i.-b.; ii.-f.; iii.-d.; iv.-c.	i.-b.; ii.-f.; iii.-d.; iv.-c.
128	The extent of binding of O_2, at pH 7.2 and low oxygen partial pressure, is.				d
	a) low for both myoglobin and haemoglobin	b) high for both myoglobin and haemoglobin	c) high for haemoglobin and low for myoglobin	d) low for haemoglobin and high for myoglobin	low for haemoglobin and high for myoglobin
129	The correct order of stability for the following pairs is.				d
	a) $Ga^{+} > Ga^{3+}$; $In^{+} > In^{3+}$; $Tl^{+} > Tl^{3+}$	b) $Ga^{+} < Ga^{3+}$; $In^{+} < In^{3+}$; $Tl^{+} < Tl^{3+}$	c) $Ga^{+} > Ga^{3+}$; $In^{+} > In^{3+}$; $Tl^{+} < Tl^{3+}$	d) $Ga^{+} < Ga^{3+}$; $In^{+} < In^{3+}$; $Tl^{+} > Tl^{3+}$	$Ga^{+} < Ga^{3+}$; $In^{+} < In^{3+}$; $Tl^{+} > Tl^{3+}$
130	Among the following statements about halogens and their compounds. Identify the true and false statements. **I.** Interhalogen compounds are generally more reactive than pure halogens because the X–X′ bond is weaker than the X–X bond.				a

	II. The maximum oxidation state exhibited by iodine is +7 due to the availability of d-orbitals. **III.** The boiling point of hydrogen halides increases uniformly from HF to HI due to increasing molecular mass.				
	a) **I**. – True; **II**. – True; **III**. – False	b) **I**. – True; **II**. – False; **III**. – False	c) **I**. – False; **II**. – True; **III**. – False	d) **I**. – True; **II**. – False; **III**. – True	**I**. – True; **II**. – True; **III**. – False
131	The correct order of reactivity of the interhalogens is.				a
	a) $BrF_5 > BrF_3 > BrF$	b) $BrF > BrF_3 > BrF_5$	c) $BrF_3 > BrF_5 > BrF$	d) $BrF > BrF_5 > BrF_3$	$BrF_5 > BrF_3 > BrF$
132	The correct order of first ionization energy for alkali metals is.				d
	a) Li > Na > K > Rb	b) Na > K > Rb > Li	c) K > Na > Li > Rb	d) Rb > K > Na > Li	Li > Na > K > Rb
133	Consider the following cyclophosphazene:  The statement which is/are correct about the above cyclophosphazene is/are. A. The oxidation state of P-atom is +V and N-atom is +III B. The oxidation state of P-atom is +III and N-atom is +III C. Synthesized by the reaction of PCl_5 with NH_4Cl D. Synthesized by the reaction of an azide with PCl_3				a
	a) A and C	b) B and D	c) C and D	d) A, B and C	A and C
134	The structure of XeF_2 and XeO_2F_2 respectively are				b
	a) bent and tetrahedral	b) linear and see-saw	c) linear and tetrahedral	d) bent and see-saw	linear and see-saw
135	The product and reaction of the following transformation reaction is. 				d
	a)  , insertion	b)  , oxidative addition	c)  , reductive elimination	d)  , β-hydride elimination	 , β-hydride eliminat ion
136	In the ESR spectrum, the number of signals expected for $VO(acac)_2$ is: [I = $^7/_2$]				b

	a) 11	b) 8	c) 5	d) 3	8
137	Calculate the number of α and β particles emitted in the conversion of $^{238}_{92}U$ to $^{214}_{82}Pb$.				b
	a) 6α and 4β particles	b) 6α and 2β particles	c) 3α and 4β particles	d) 3α and 2β particles	6α and 2β particles
138	Amongst the following complexes, the complex(s) that show square planar geometry is/are $[Ni(CN)_4]^{2-}$ $[Zn(NH_3)_4]^{2+}$ $[Pt(NH_3)_4]^{2+}$ $[Ni(Cl)_4]^{2-}$				a
	a) $[Ni(CN)_4]^{2-}$ and $[Pt(NH_3)_4]^{2+}$	b) $[Ni(CN)_4]^{2-}$ and $[Zn(NH_3)_4]^{2+}$	c) $[Zn(NH_3)_4]^{2+}$ and $[Ni(Cl)_4]^{2-}$	d) $[Zn(NH_3)_4]^{2+}$, $Pt(NH_3)_4]^{2+}$ and $[Ni(Cl)_4]^{2-}$	$[Ni(CN)_4]^{2-}$ and $[Pt(NH_3)_4]^{2+}$
139	Amongst the following octahedral complexes, the complex that show paramagnetic behaviour are $[Co(NH_3)_6]Cl_3$ $Na_3[CoF_6]$ $K_4[Fe(CN)_6]$ $K_3[TiF_6]$ $K_3[Fe(CN)_6]$				d
	a) $[Co(NH_3)_6]Cl_3$ and $Na_3[CoF_6]$	b) $[Co(NH_3)_6]Cl_3$ and $K_4[Fe(CN)_6]$	c) $Na_3[CoF_6]$, $K_3[TiF_6]$ and $K_4[Fe(CN)_6]$	d) $Na_3[CoF_6]$, $K_3[TiF_6]$ and $K_3[Fe(CN)_6]$	$Na_3[CoF_6]$, $K_3[TiF_6]$ and $K_3[Fe(CN)_6]$
140	In the base hydrolysis of $[Co(NH_3)_5Cl]^{2+}$ via the S_N1 (CB) mechanism, the intermediate involved is.				b
	a) $[Co(NH_3)_5Cl(OH)]^+$	b) $[Co(NH_3)_4NH_2]^{2+}$	c) $[Co(NH_3)_4NH_2(OH)]^+$	d) $[Co(NH_3)3(NH_2)_2]^+$	$[Co(NH_3)_4NH_2]^{2+}$
141	Which of the following statements are true for Eu^{3+}(At. No. 63). A. The 4*f* orbital is more than half-filled. B. The ground state term symbol is $^7F_0$. C. The observed magnetic moment is due to populated higher *J* level D. The position of the sharp bands in UV-vis spectra of the complexes depends heavily on ligand environment.				b
	a) A and B	b) B and C	c) C and D	d) B and D	B and C
142	In an octahedral field, the components arising from *F* term are:				b
	a) $E_g + T_{2g}$	b) $A_{2g} + T_{1g} + T_{2g}$	c) $A_{1g} + T_{1g}$	d) $E_g + T_{2g}$	$A_{2g} + T_{1g} + T_{2g}$
143	Lanthanide ions are pale-coloured and usually give rise to sharp bands in their electronic spectra. The reason for this is				b
	a) *f-f* transition is Laporte allowed and the *f*-orbitals are located outermost in the atom	b) *f-f* transition is Laporte forbidden and the *f*-orbitals are located deep inside the atom	c) *f-f* transition is Laporte allowed and the *f*-orbitals are located deep inside the atom	d) *d-d* transition is Laporte forbidden and the *d*-orbitals are located outermost in the atom	*f-f* transition is Laporte forbidden and

					the *f*-orbitals are located deep inside the atom
144	In the clusters $[Fe_3(CO)_{12}]$ and $[W(\eta^5\text{-}C_5H_5)(\mu\text{-}Cl)(CO)_2]_2$, the number of metal–metal bond(s) respectively, are.				b
	a) 3 and 2	b) 3 and 0	c) 0 and 2	d) 2 and 0	3 and 0
145	Consider the following statements about **Group 16** elements. **A)** Oxygen is predominantly found in the diatomic state (O_2), while sulfur, selenium, and tellurium commonly exist as polyatomic molecules. **B)** The metallic character increases down the group from oxygen to polonium. **C)** The stability of the −2 oxidation state increases from oxygen to polonium. **D)** The tendency to form multiple bonds (like double bonds) decreases as we move down the group. Which of the statements are true or false.				c
	a) **A** – True; **B** – False; **C** – True; **D** – True	b) **A** – True; **B** – True; **C** – False; **D** – False	c) **A** – True; **B** – True; **C** – False; **D** – True	d) **A** – False; **B** – True; **C** – False; **D** – True	**A** – True; **B** –True; **C** – False; **D** – True
146	The following reaction is an example of: *trans*-$IrCl(CO)(PPh_3)_2$ + HCl ⟶ $IrHCl_2(CO)(PPh_3)_2$				b
	a) Reductive elimination reaction	b) Oxidative addition reaction	c) Substitution reaction	d) Insertion reaction	Oxidative addition reaction
147	In the following reaction, the intermediate and product of the reaction is: $[Fe(CN)_5NO]^{2-}$ + OH^- ⟶				a
	a)  , $[Fe(CN)_5NO_2]^{4-}$	b)  , $[Fe(CN)_5NO(OH)]^{4-}$	c)  , $[Fe(OH)(CN)_4NO]^{2-}$	d)  , $[Fe(OH)_2(CN)_3NO]^{2-}$	 , $[Fe(CN)_5NO_2]^{4-}$
148	The correct bond order of O_2^-, O_2 and O_2^+ is.				b
	a) 2.5, 2, 1.5	b) 1.5, 2, 2.5	c) 2, 2.5, 1.5	d) 2, 1.5, 2.5	1.5, 2, 2.5
149	"The ionization energy of Be atom is greater than that of B atom". The reason is.				a
	a) Greater penetration	b) Greater penetration	c) Smaller size of B atom.	d) Larger size of Be atom.	Greater penetrat

	power of *s*-orbitals compared to *p*-orbitals.	power of *p*-orbitals compared to *s*-orbitals.			ion power of *s*-orbitals compared to *p*-orbitals.
150	The correct order of lability of the complexes is				c
	a) $SF_6 > [PF_6]^- > [SiF_6]^{2-} > [AlF_6]^{3-}$	b) $SF_6 > [SiF_6]^{2-} > [PF_6]^- > [AlF_6]^{3-}$	c) $[AlF_6]^{3-} > [SiF_6]^{2-} > [PF_6]^- > SF_6$	d) $[AlF_6]^{3-} > [PF_6]^- > [SiF_6]^{2-} > SF_6$	$[AlF_6]^{3-} > [SiF_6]^{2-} > [PF_6]^- > SF_6$