

QNo	QText	OpText	Marks
1	The research studies carried out with an objective to portray accurately the characteristics of a particular individual, situation or a group is classified as	descriptive research	Correct
		hypothesis-testing research	
		formulative research	
		diagnostic- research	
2	The research studies carried out with an objective to gain familiarity with a phenomenon or to achieve new insights into it	diagnostic- research	
		descriptive research	
		hypothesis-testing research	
		exploratory research	Correct
3	The research problem with central aim to discover a solution for some pressing practical problem is	basic research	
		applied research	Correct
		fundamental research	
		pure research	
4	Arrange the following steps of research process in chronological order. (1) developing the hypothesis; (2) extensive literature survey; (3) generalisations and interpretation, (4) analysis of data;	1-3-2-4	
		2-1-4-3	Correct
		1-2-3-4	
		2-4-3-1	
5	Which of the followings can not be a part of research design?	A clear statement of the research problem	
		Techniques to be used for gathering information	

		Methods to be used in processing and analysing data	
		Conclusion	Correct
6	Which of the followings is often used to judge the significance of population variance?	Chi square test	Correct
		Regression	
		Clustering	
		Association	
7	The agricultural output may be classified on the basis of different varieties of seeds and also on the basis of different varieties of fertilizers used. Which of the following techniques is best suited for analysis of variance?	Two way ANNOVA	Correct
		Chi square test	
		Regression	
		One way ANNOVA	
8	In analysis, if one dependent variable varies linearly with many independent variables, then the best method to establish the relation is	Factor analysis	
		Multiple regression	Correct
		Cluster analysis	
		Metric MDS	
9	Which of the followings is used for non parametric test of hypothesis?	Chi test	
		z-test	
		Sign test	Correct
		t-test	
10	Honesty, Integrity and Respect for Intellectual Property are key elements of	Research Ethics	Correct

		Research Planning	
		Identification of Problem	
		Hypothesis Testing	
11	Which of the following practices are generally considered as unethical? (1) Trimming outliers from a data set without discussing your reasons in paper (2) Using an inappropriate statistical technique in order to enhance the significance of your research (3) Conducting a review of the literature that acknowledges the contributions of other people in the field or relevant prior work	1 and 2	Correct
		1 and 3	
		2 and 3	
		1,2 and 3	
12	A meeting where group of people learn about something through intensive discussions and activities related to it is called	seminar	
		conference	
		symposium	
		workshop	Correct
13	An academic conference is	a small meeting to learn new technology	
		a meeting for informal discussion on new trend in business	
		a large and formal meeting to discuss and present research work.	Correct

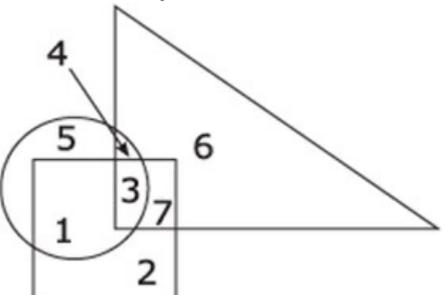
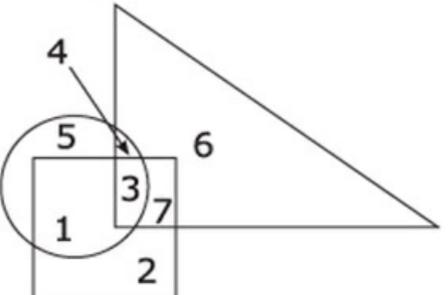
		a meeting for commercial product demonstration	
14	If PALE is coded as 2134, EARTH is coded as 41590, how can PEARL be coded in that language?	29350	
		25124	
		24153	Correct
		29450	
15	Of the following two statements, both of which cannot be true, but both can also be false. Which are these two statements? I. All fans make noise II. Some fans are noisy III. No fan makes noise IV. Some fans are not noisy	I & III	Correct
		I & II	
		II & IV	
		III & IV	
16	Find the odd one among the followings.	shoe	
		glove	
		watch	Correct
		spectacle	
17	Find the odd one among the followings.	Jupiter	
		Saturn	
		Mercury	
		Moon	Correct
18	Find the odd one among the followings.	27	Correct
		17	

		5	
		11	
19	Find the odd one among the followings	Sabarmati	
		Mahisagar	
		Narmada	
		Nal Sarovar	Correct
20	Find the odd one among the followings	42624	Correct
		83283	Correct
		37573	
		74447	
21	Find the next letter in series: A, D, G, J, M, ?	N	
		O	
		P	Correct
		Q	
22	Complete the series: 10,15, 19, 22, 24, ?	25	Correct
		26	
		28	
		30	
23	Complete the series: 2, 4, 8, 16, 32, ?	48	
		36	
		64	Correct
		49	
24	Complete the series: 1, 8, 27, 64, 125, ?	260	
		216	Correct
		256	

		378	
25	Find the next letter in series: B, D, G, K, P ?	S	
		T	
		U	
		V	Correct
26	In a certain code language, if '2' is called 'three', '3' is called 'four', '4' is called 'one' and '1' is called 'five', then in a code language, what is called for the sum of 1 and 3?	'seven'	
		'one'	Correct
		'five'	
		'nine'	
27	In a certain code language for colours, if 'pink' means 'black', 'black' means 'white', 'white' means 'yellow' and 'yellow' means 'red', then the colour of milk in code language is	white	
		yellow	
		black	Correct
		red	
28	How is Kanu's mother in law's only daughter's son related to Kanu?	Son	Correct
		Uncle	
		Brother	
		Nephew	
29	Find the missing word. Gum:Stick:: Needle:?	Prick	
		Stitch	Correct
		Taylor	
		Cloth	
30	Find the missing word. Pen:Write::Knife:?	Cut	Correct

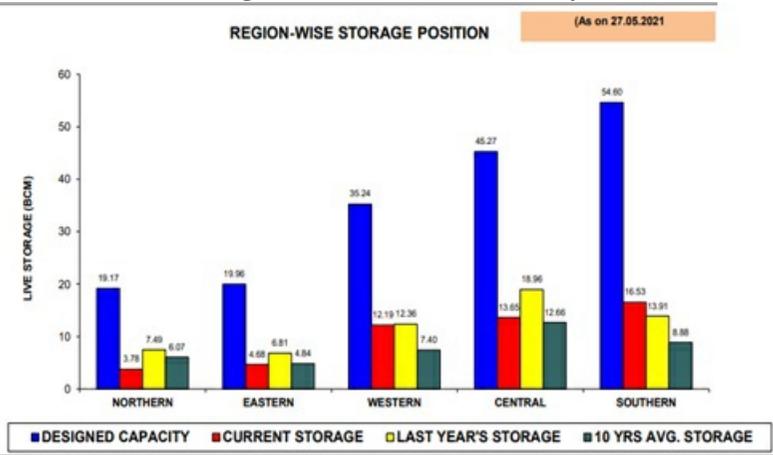
		Vegetable	
		Sharp	
		Steel	
31	Find the missing word. Iron:Blacksmith::Wood:?	Furniture	
		Tree	
		Brown	
		Carpenter	Correct
32	Find the missing word. Train:Track::Bus:?	Road	Correct
		Petrol	
		Passenger	
		Driver	
33	In a class of 100 students, 50 play cricket, 40 play football and 10 play both the cricket and football. How many students play only cricket?	50	
		10	
		40	Correct
		60	
34	In a class of 100 students, 50 play cricket, 40 play football and 10 play both the cricket and football. How many students play at least one game?	70	
		80	Correct
		90	
		50	
35	In a class of 100 students, 50 play cricket, 40 play football and 10 play both the cricket and football. How many students play neither cricket nor football?	20	Correct
		60	

		50	
		10	
36	<p>Read the question in below statement followed by arguments. Select appropriate answer based on strong or weak argument.</p> <p>Statement: Should there be a cap in drawing groundwater for irrigation purpose in India?</p> <p>Argument I: No. Irrigation is of prime importance in India for food production and it is heavily dependent on groundwater in many part of the country.</p> <p>Argument II: Yes. Many international agencies have cautioned India for excessive groundwater withdrawal.</p>	Both I and II are strong	
		Both I and II are weak.	
		Only II is strong	
		Only I is strong	Correct
37	<p>Read the question in below statement followed by arguments. Select appropriate answer based on strong or weak argument.</p> <p>Statement: Should there be a restriction on the construction of high rise buildings in big cities in India?</p> <p>Argument I: Yes. Only builders and developers benefit from the construction of high rise building.</p> <p>Argument II: No. Big cities in India do not have adequate open plots to accommodate the growing population.</p>	Both I and II are strong	
		Both I and II are weak.	
		Only II is strong	Correct
		Only I is strong	

38	<p>In the given figure, circle indicates 'strong', square indicates 'tall' and triangle 'army officers'. The strong army officers who are not tall are shown by,</p> 	3	
		4	Correct
		5	
		6	
39	<p>In the given figure, circle indicates 'strong', square indicates 'tall' and triangle 'army officers'. The tall army officers are shown by,</p> 	1 and 2	
		4 and 3	
		3 and 7	Correct
		2 and 6	

40 Below chart shows the live storage in reservoirs in different region of India before monsoon (source:CWC). In which of the following regions, the current storage is less than 10 years average storage?

Western



Northern

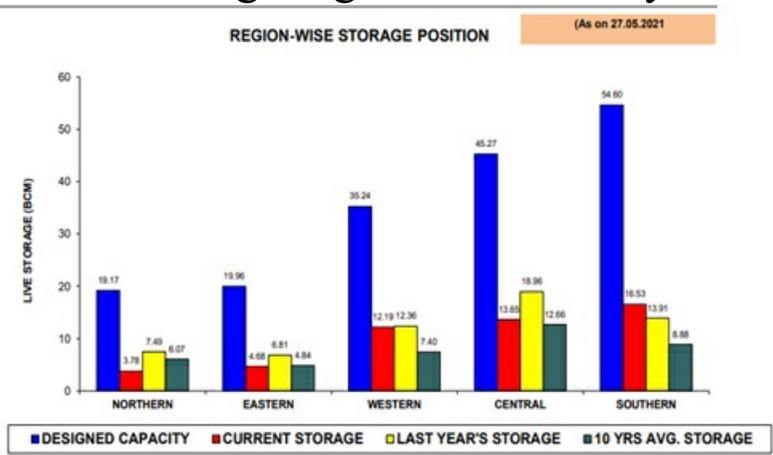
Correct

Southern

Central

41 Below chart shows the live storage in reservoirs in different region of India before monsoon (source:CWC). In which of the following regions, the current storage is greater than last year storage?

Northern



Eastern

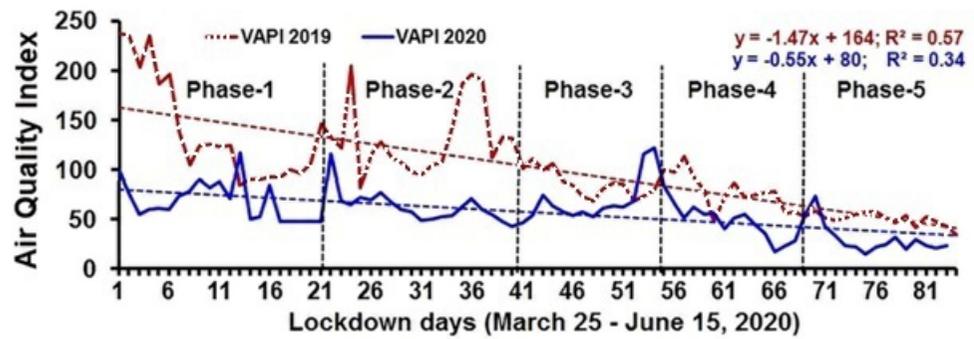
Central

Southern

Correct

42 The below figure shows comparison of Air Quality Index variations during lockdown phases in the year 2020 and that in similar periods of the year 2019 (source: nature.com). In which of the following phases, the Air Quality Index during lockdown year of 2020 was observed well below the values observed on same dates of the year 2019?

Phase-1



Phase-2

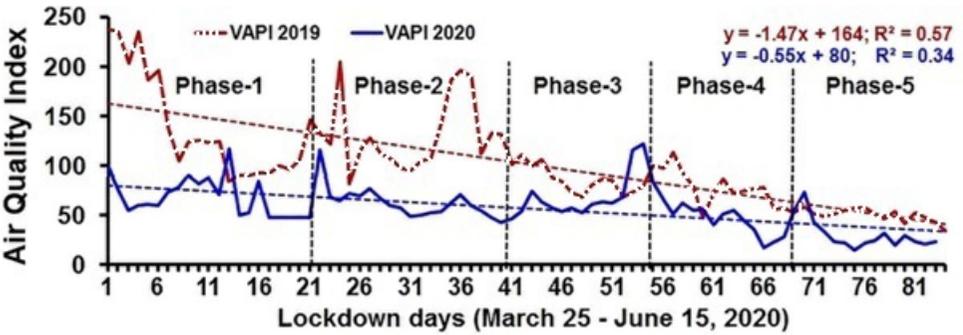
Correct

Phase-4

Phase-5

43 The below figure shows comparison of Air Quality Index (AQI) variations during lockdown phases in the year 2020 and that in similar periods of the year 2019 (source: nature.com). What is the trend of AQI during the year 2019 and 2020?

Increasing in 2019 and decreasing in 2020



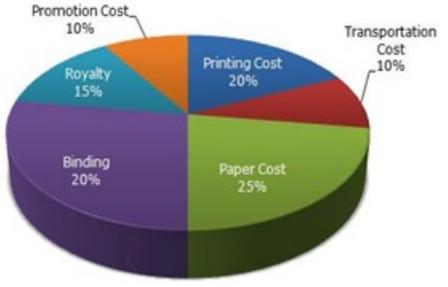
Decreasing in 2019 and increasing in 2020

Increasing in both the years 2019 and 2020

Decreasing in both the year 2019 and 2020

Correct

44 The following pie-chart shows the percentage distribution of the expenditure incurred in publishing a book. Study the pie-chart detailing various expenditures (in percentage) incurred in publishing a book and then answer the following question. If for a certain quantity of books, the publisher has to pay Rs. 40,000 as printing cost, then what will be amount of royalty to be paid for these books?



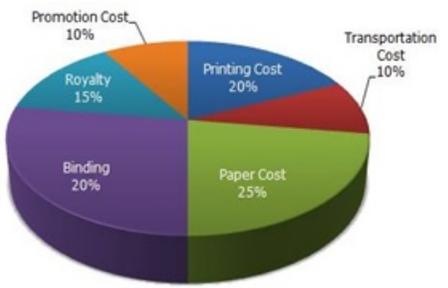
Rs 6,000

Rs 60,000

Rs 30,000 Correct

Rs 15,000

45 The following pie-chart shows the percentage distribution of the expenditure incurred in publishing a book. Study the pie-chart detailing various expenditures (in percentage) incurred in publishing a book and then answer the following question. If for a certain quantity of books, the publisher has to pay Rs. 20,000 as paper cost, then what will be the total cost for these books?



Rs 50,000

Rs 80,000 Correct

Rs 1,00,000

Rs 25,000

46 The following tables shows investment made by the five companies in crores over the years. For which company, the amount of investment had increased continuously over the years?

Company	2001	2002	2003	2004	2005
A	20	22	51	35	70
B	29	32	23	47	39
C	31	30	27	23	18
D	33	15	32	37	47
E	15	16	32	40	46
Total ->	128	115	165	182	220

A

B

C

E Correct

47 The following tables shows investment made by the five companies in crores over the years. For which company, the amount of investment had decreased continuously over the years?

Company	2001	2002	2003	2004	2005
A	20	22	51	35	70
B	29	32	23	47	39
C	31	30	27	23	18
D	33	15	32	37	47
E	15	16	32	40	46
Total ->	128	115	165	182	220

A

B

C Correct

		D																																											
48	<p>The following tables shows investment made by the five companies in crores over the years. For which company, the total amount of investment is maximum over these years?</p> <table border="1"> <thead> <tr> <th>Company</th> <th>2001</th> <th>2002</th> <th>2003</th> <th>2004</th> <th>2005</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>20</td> <td>22</td> <td>51</td> <td>35</td> <td>70</td> </tr> <tr> <td>B</td> <td>29</td> <td>32</td> <td>23</td> <td>47</td> <td>39</td> </tr> <tr> <td>C</td> <td>31</td> <td>30</td> <td>27</td> <td>23</td> <td>18</td> </tr> <tr> <td>D</td> <td>33</td> <td>15</td> <td>32</td> <td>37</td> <td>47</td> </tr> <tr> <td>E</td> <td>15</td> <td>16</td> <td>32</td> <td>40</td> <td>46</td> </tr> <tr> <td>Total -></td> <td>128</td> <td>115</td> <td>165</td> <td>182</td> <td>220</td> </tr> </tbody> </table>	Company	2001	2002	2003	2004	2005	A	20	22	51	35	70	B	29	32	23	47	39	C	31	30	27	23	18	D	33	15	32	37	47	E	15	16	32	40	46	Total ->	128	115	165	182	220	A	Correct
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		B																																											
		D																																											
		E																																											
49	Which of the following types of graph represents a frequency distribution by means of rectangles whose widths represent class intervals and whose areas are proportional to the corresponding frequencies: the height of each is the average frequency density for the interval.	Bar Graph																																											
		Line Graph																																											
		Box Plot																																											
		Histogram	Correct																																										
50	The visual representation of the statistical summary of a given data set in terms of Minimum, First Quartile, Median (Second Quartile), Third Quartile and Maximum is known as	Radar or Spider Chart																																											
		Box Plot	Correct																																										
		Pie Chart																																											
		Line Chart																																											

51	Which among the following statements holds true for a bonding molecular orbital (BMO)?	BMOs are high energy molecular orbitals									
		BMOs are stable in nature	Correct								
		BMOs can sometimes surpass ABMOs in terms of energy									
		BMOs have higher energy than the parent atomic orbitals									
52	The square of the magnitude of wave function is called _____	Current density									
		Zero density									
		Probability density	Correct								
		Volume density									
53	Which among the following matches of point group: example is incorrect?	$D_{3h} : BF_3$									
		$D_{4d} : S_8$									
		$O_h : SF_6$									
		$C_{2v} : H_2O_2$	Correct								
54	Consider the following table and replace I' by Mulliken's notation (take z as the principal axis)	A_2	Correct								
	<table border="1"> <tr> <td>D_3</td> <td>E</td> <td>$3C_3(z)$</td> <td>$3C'_2$</td> </tr> <tr> <td>I'</td> <td>+1</td> <td>+1</td> <td>-1</td> </tr> </table>	D_3	E	$3C_3(z)$	$3C'_2$	I'	+1	+1	-1		
D_3	E	$3C_3(z)$	$3C'_2$								
I'	+1	+1	-1								
		B_2									
		A_1									
		B_1									

55	Gyromagnetic ratio is the ratio between _____	Magnetic moment to angular momentum	Correct
		Angular momentum to magnetic moment	
		Magnetic moment to spin quantum number	
		Spin quantum number to magnetic moment	
56	In a Hollow Cathode Lamp the process of ‘sputtering’ occurs when _____	Positive ions collide with negative ions and metal atoms from anode are ejected	
		Negative ions collide with cathode surface and metal atoms from anode are ejected	
		Positive ions collide with cathode surface and metal atoms from cathode are ejected	Correct
		Positive ions collide with negative ions and photons are ejected	
57	The Maxwell equation derived from differential expression for the Helmholtz free energy (dA) is _____	$(\partial T / \partial V)_S = -(\partial P / \partial S)_V$	
		$(\partial S / \partial P)_T = -(\partial V / \partial T)_P$	

		$(\partial V/\partial S)_P = (\partial T/\partial P)_S$	
		$(\partial S/\partial V)_T = (\partial P/\partial T)_V$	Correct
58	According to Trouton's rule, the ratio of latent heat of vaporization to the boiling point at 1.0113 bar is _____	66 kJ/kgmol K	
		77 kJ/kgmol K	
		88 kJ/kgmol K	Correct
		99 kJ/kgmol K	
59	The number of degrees of freedom for an azeotropic mixture in a two component vapour-liquid equilibria is/are _____	3	
		2	
		1	Correct
		0	
60	The activity of a catalyst at a time $t = 0$ is _____	Zero	
		Unity	Correct
		μ	
		Negative	
61	Order of a reaction can be termed as _____	Sum of the powers of the concentrations of all the reactants	Correct
		Concentration of intermediate species formed	
		Number of molecules of reactants taking part in the reaction	

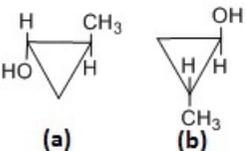
		Power of any one of the reactant concentrations	
62	Which among the following statements is true for an end functional group, having a terminal reactive centre of a polymer molecule?	it cannot be determined	
		same as polymer molecule	
		has a lower mobility than the polymer molecule as a whole	
		has a greater mobility than the polymer molecule as a whole	Correct
63	Surface tension of liquid at critical temperature is _____	Maximum	
		0	Correct
		1	
		Negative	
64	At concentration below CMC, the surfactant molecules are found _____	In the bulk of water	
		Above the surface of water	
		At water-air interface	Correct
		Uniformly in bulk and interface	
65	Freundlich adsorption isotherm is given by the expression $x/m = kp^{1/n}$. Which of the following conclusions holds true?	When $1/n = 0$, adsorption is independent of pressure	Correct
		When $1/n = 0$, adsorption is directly proportional to pressure	

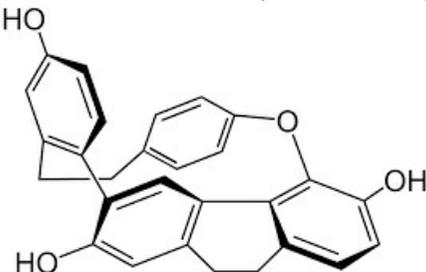
		When $1/n = 0$, adsorption is inversely proportional to pressure	
		When $1/n = 0$, adsorption is exponentially proportional to pressure	
66	The Steady-state form of Schrodinger wave equation is _____	Quadratic	
		Linear	Correct
		Differential equation	
		Derivable	
67	From which type of Phosphorous alpha-black phosphorous is formed?	White phosphorous	
		Black phosphorous	
		Red phosphorous	Correct
		Beta phosphorous	
68	Which of the following is not a Lewis base?	BF_3	Correct
		H^-	
		NH_3	
		H_2O	
69	Among the following which noble gas is known to form maximum number of compounds?	Helium	
		Argon	
		Krypton	
		Xenon	Correct
70	Which of the following d block element has half filled penultimate d sub shell as well as half filled valence sub shell?	Cu	

		Cr	Correct
		Pd	
		Pt	
71	Magnetic measurements indicate that $[\text{Co}(\text{H}_2\text{O})_6]^{+2}$ has three unpaired electrons. The hybridization of the metal's orbitals in this complex is _____	d^2sp^3	
		sp^3d^2	Correct
		dsp^2	
		sp^2d	
72	Which among the following complexes can exhibit geometrical isomerism?	$[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$	Correct
		$[\text{Cu}(\text{NH}_3)_4]^{+2}$	
		$[\text{Co}(\text{NH}_3)_5\text{Cl}]^{+2}$	
		$[\text{Zn}(\text{NH}_3)_2\text{Cl}_2]$	
73	Which among the following lanthanide ions do not exhibit colour?	$\text{Pr}^{+4}, \text{Ce}^{+4}$	
		$\text{Ce}^{+3}, \text{Ce}^{+4}$	
		$\text{Lu}^{+3}, \text{Ln}^{+3}$	Correct
		$\text{Lu}^{+2}, \text{Ln}^{+2}$	
74	Which of the following actinoid is used in cancer treatment?	Uranium	
		Curium	
		Plutonium	
		Thorium	Correct
75	A hydride ligand is _____	2 electron donor; negatively charged	Correct

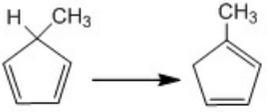
		2 electron donor; positively charged	
		1 electron donor; negatively charged	
		None of these	
76	_____ catalyst used in coordination polymerization.	Zeolite	
		Nitric oxide	
		Ziegler-Natta	Correct
		Vanadium pentoxide	
77	Radioactivity was discovered by _____	J.J.Thomson	
		Madam Curie	
		Henry Becquerel	Correct
		Rutherford	
78	Complete and Balance the following nuclear reaction is _____ $^{239}\text{Pu} + \text{Alpha particle} \textcircled{\text{R}} \text{_____} + \text{neutron}$	^{235}U	
		^{242}Cm	Correct
		^{233}Pa	
		2^{106}Rh	
79	The ligand system present in vitamin B ₁₂ is _____	Phthalocyanine	
		Porphyrin	
		Corrin	Correct
		Crown ether	
80	The reduction of nitrogen to ammonia, carried out by the enzyme nitrogenase requires _____ electrons.	2	
		4	

		6	
		8	Correct
81	When silicon is doped with aluminium _____	Excess of holes will form	Correct
		Excess of Al ions will form that mobilize to conduct electricity	
		The mixture will become an insulator	
		Conductivity will increase due to excess delocalized electrons	
82	The packing efficiency of a metal crystal for a simple cubic lattice is _____	65%	
		74%	
		52.40%	Correct
		54.50%	
83	Stationary phase is more polar than mobile phase in _____	Ion exchange chromatography	
		Normal phase chromatography	Correct
		Reversed phase chromatography	
		Size exclusion chromatography	

84	Why sodium 2,2-dimethylsilapentane-5-sulphonate (DSS) is used instead of tetramethylsilane (TMS) as the ^1H chemical shift reference for a biological sample?	TMS can denature proteins	
		DSS is widely used in protein sample preparation	
		The chemical shift of TMS is dependent on temperature	
		DSS has a higher solubility in aqueous solution	Correct
85	The molecules (a) and (b) shown below are 	Enantiomers	Correct
		Diastereomers	
		Constitutional isomers	
		Identical	
86	According to Fischer projection, the groups on the vertical line are _____	In plane of paper	
		Towards reader	Correct
		Away from reader	
		Towards left side	

87	<p>Which among the following statements can be deduced about the stereochemistry of the given compound?</p> 	This compound is optically active because it has stereogenic centers that create cis-trans isomers	Correct
		This compound is optically active because the compound contains a center, plane, or axis of chirality	
		This compound is not optically active since there are no stereogenic centers	
		This compound is not optically active because of its symmetry	
88	Aryl halides are less reactive towards nucleophilic substitution reactions as compared to alkyl halides due to _____	Longer carbon halogen bond	
		The inductive effect	
		sp ² -hybridized carbon attached to the halogen	Correct
		The formation of a less stable carbanion	

89	Identify the compound marked 'X' in the following reaction.	Phenol	
		Salicylic acid	
		Benzoic acid	
		Aniline	Correct
90	Which among the following reagents will give effective transformation of the following compounds?	CH ₃ Li	
		CH ₂ N ₂	
		Ph ₃ P = CH ₂	Correct
		(CH ₃) ₂ CuLi	
91	The given reaction is known as _____	Kumada Coupling	
		Suzuki Coupling	Correct
		Sonogashira Coupling	
		Stille coupling	
92	Which of the following product is formed in Claisen condensation?	β- ester	

		β -ketone	
		β -keto ester	Correct
		γ -diketone	
93	Medicine bottles are often made with darkened glass to _____	to allow the photodegradation of drug	
		to prevent the drug from photodegradation	Correct
		to reduce the cost	
		to allow oxidation of drug	
94	The following pericyclic reaction proceeded through 	[1,5] sigmatropic hydrogen migration	Correct
		[1,4] sigmatropic hydrogen migration	
		[1,3] sigmatropic hydrogen migration	
		[1,2] sigmatropic hydrogen migration	
95	The product obtained on reaction of thiophene with Br ₂ in benzene is _____	2-bromothiophene	
		3-bromothiophene	
		3,4-dibromothiophene	
		2,5-dibromothiophene	Correct
96	How many resonating structures stabilize a pyridine molecule?	3	

		4	
		5	Correct
		6	
97	Which of the following is also known as invert sugar?	Glucose	
		Sucrose	Correct
		Fructose	
		Dextrose	
98	In which form nitrogen is incorporated into an amino acid?	Nitrite	
		Nitrate	
		Ammonium ion	Correct
		Elemental nitrogen	
99	In a Mass Spectrometer which of the following ions pass through the slit and reach the collecting plate?	Positive ions of specific mass	Correct
		Negative ions of specific mass	
		Parent ions	
		All daughter ions	
100	Which of the following is the commonly used support material for the packed column in gas chromatography?	Glass	
		Metal	
		Stainless steel	
		Diatomaceous earth	Correct