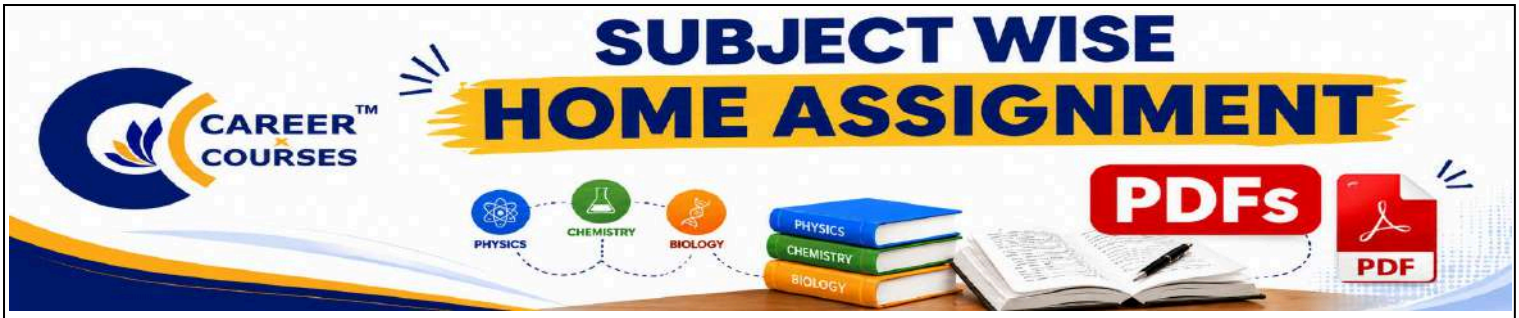


Career and Courses

Subjects : Chemistry | **NEET CHEMISTRY** | **Date** : 10-11-2026

Total Marks : 480 | **Hours** : 3 Hours

Chemistry - Section A (MCQ)

1. The density of 2 M aqueous solution of NaOH is 1.28 g/cm^3. The molality of the solution is.....m [Given that molecular mass of NaOH = 40 $gmol^{-1}$]

   A) 1.20 B) 1.56 C) 1.67 D) 1.32

2. The highest number of helium atoms is in

   A) 4 u of helium B) 4 g of helium

   C) 2.271098 L of helium at STP D) 4 mol of helium

3. Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2. When 0.1 mole of XY_2 weighs 10 g and 0.05 mole of X_3Y_2 weighs 9 g, the atomic weights of X and Y are

   A) 40, 30 B) 60, 40 C) 20, 30 D) 30, 20

4. What mass of 95 % pure $CaCO_3$ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction? (In g)
   $CaCO_{3(s)} + 2HCl_{(aq)} \rightarrow CaCl_{2(aq)} + CO_{2(g)} + 2H_2O_{(l)}$
   [Calculate upto second place of decimal point]

   A) 1.32 B) 3.65 C) 9.50 D) 1.25

5. When $1dm^3$ of CO_2 gas is passed over hot coke, the volume of gaseous mixture after complete reaction at STP becomes $1.4dm^3$. The composition of the gaseous mixture at STP is :

   A) $0.8dm^3$ of CO, $0.8dm^3$ of CO_2

   B) $0.8dm^3$ of CO, $0.6dm^3$ of CO_2

   C) $0.6dm^3$ of CO, $0.8dm^3$ of CO_2

   D) $0.6dm^3$ of CO, $0.4dm^3$ of CO_2

6. The number of protons, neutrons and electrons in $^{175}_{71}Lu$, respectively, are :

   A) 175, 104 and 71 B) 71, 104 and 71 C) 104, 71 and 71 D) 71, 71 and 104

7. A particular station of All India Radio, New Delhi, broadcasts on a frequency of 1,368 kHz $(kilohertz)$. The wavelength of the electromagnetic radiation emitted by the transmitter is : [speed of light $c = 3.0 \times 10^8$ ms^{-1}]

   A) 219.3 m B) 219.2 m C) 2192 m D) 21.92 cm

8. The energy of an electron in the ground state $(n = 1)$ for He^+ion is $-x$ J, then that for an electron in $n = 2$ state for Be^{3+} ion in J is

A) $-\frac{x}{9}$ B) $-4x$ C) $-\frac{4}{9}x$ D) $-x$

9. Orbital having 3 angular nodes and 3 total nodes is

A) $5p$ B) $3d$ C) $4f$ D) $6d$

10. Match List I with List II :

List-I (Quantum Numbers)			List-II (Orbital)
	'n'	'l'	
(A)	2	1	(I) 3d
(B)	4	0	(II) 2p
(C)	5	3	(III) 4s
(D)	3	2	(IV) 5f

Choose the correct answer from the options given below :

A) A-IV, B-II, C-III, D-I B) A-II, B-III, C-I, D-IV

C) A-II, B-III, C-IV, D-I D) A-I, B-II, C-III, D-IV

11. The element $Z = 114$ has been discovered recently. It will belong to which of the following family/group and electronic configuration?

A) Carbon family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^2$ B) Oxygen family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^4$

C) Nitrogen family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^6$ D) Halogen family, $[Rn]\ 5f^{14}\ 6d^{10}\ 7s^2\ 7p^5$

12. Identify the incorrect statement from the following :

A) The largest and the smallest species among Mg, Mg^{2+}, Al and Al^{3+} are Al and Mg^{2+}, respectively.

B) The IUPAC name of the element with atomic number 107 is Unnilseptium.

C) The similarity in behaviour of Li with Mg is referred to as 'diagonal relationship'.

D) The oxidation state and covalency of Al in $[AlCl\,(H_2O)_5]^{2+}$ are 3 and 6 respectively.

13. For the second period elements the correct increasing order of first ionisation enthalpy is

A) $\mathrm{Li} < \mathrm{Be} < \mathrm{B} < \mathrm{C} < \mathrm{N} < \mathrm{O} < \mathrm{F} < \mathrm{Ne}$ B) $\mathrm{Li} < \mathrm{B} < \mathrm{Be} < \mathrm{C} < \mathrm{O} < \mathrm{N} < \mathrm{F} < \mathrm{Ne}$

C) $\mathrm{Li} < \mathrm{B} < \mathrm{Be} < \mathrm{C} < \mathrm{N} < \mathrm{O} < \mathrm{F} < \mathrm{Ne}$ D) $\mathrm{Li} < \mathrm{Be} < \mathrm{B} < \mathrm{C} < \mathrm{O} < \mathrm{N} < \mathrm{F} < \mathrm{Ne}$

14. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: The first ionization enthalpy of O is lower than that of N and F.
Reason R: The loss of an electron from O leads to stable half-filled p orbital
In light of the above statements, choose the most appropriate answer from the options given below:

A) A is not correct but R is correct

B) Both A and R are correct and R is the correct explanation of A

C) Both A and R are correct and R is NOT the correct explanation of A

D) A is correct but R is not correct.

15. Among the following options, the correct trend in the electron gain enthalpy is

A) $I > Br > Cl > F$ B) $F > Cl > Br > I$

C) $Br > Cl > F > I$ D) $Cl > F > Br > I$

16. The number of σ bonds, π bonds and lone pair of electrons in pyridine, respectively are:

A) $12, 2, 1$ B) $11, 2, 0$ C) $12, 3, 0$ D) $11, 3, 1$

17. The calculated spin only magnetic moment of Cr^{2+} lon is..... $B.M.$

A) 2.84 B) 3.87 C) 4.90 D) 5.92

18. The correct geometry and hybridization for XeF_4 are

A) octahedral, sp^3d^2 B) trigonal bipyramidal, sp^3d

C) planar triangle, sp^3d^3 D) square planar, sp^3d^2

19. Match the species in List-I with their geometry in List-II.

List-I	List-II
A. PCl_5	I. Tetrahedral
B. BrF_5	II. Square Planar
C. BF_4^-	III. Trigonal bipyramidal
D. $[Ni(CN)_4]^{2-}$	IV. Square pyramidal

Choose the correct answer from the options given below:

A) A-III, B-II, C-I, D-IV B) A-IV, B-III, C-I, D-II

C) A-III, B-IV, C-I, D-II D) A-III, B-I, C-II, D-IV

20. The highest occupied molecular orbital for Ne_2 is

A) σ^*_{2p} B) π_{2p} C) σ_{2p} D) π^*_{2p}

21. The work done during reversible isothermal expansion of one mole of hydrogen gas at $25^\circ\mathrm{C}$ from pressure of $20\mathrm{atmosphereto}10\mathrm{atmosphere}$ is
(Given $R = 2.0\mathrm{calK}^{-1}\ \mathrm{mol}^{-1}$)

A) -413.14 calories B) 413.14 calories C) 100 calories D) 0 calorie

22. At a certain temperature,T (K), during a process, 500 J is absorbed by the system and work of 200 J is done by the system. Then, change in internal energy of the system is :

A) 400 J B) 300 J C) 700 J D) 500 J

23. The heat of combustion of carbon to CO_2 is $-393.5\ kJ/mol$. The heat released upon formation of $35.2\ g$ of CO_2 from carbon and oxygen gas is

A) $+315\,kJ$ B) $-630\,kJ$ C) $-3.15\,kJ$ D) None of the above

24. In which case change in entropy is negative ?

A) Evaporation of water B) Expansion of a gas at constant temperature

C) Sublimation of solid to gas D) $2H(g) \rightarrow H_2(g)$

25. For the reaction, $X_2O_{4(l)} \rightarrow 2XO_{2(g)}$
$\Delta U = 2.1\ kcal$, $\Delta S = 20\,cal\,K^{-1}$ at $300\,K$ Hence, ΔG is ..... kcal

A) 2.7 B) -2.7 C) 9.3 D) -9.3

26. If the value of equilibrium constant for a particular reaction is 1.6×10^{12} then at equilibrium the system will contain

A) mostly products
B) similar amounts of reactants and products
C) all reactants
D) mostly reactants.

27. Consider the following reaction in a sealed vessel at equilibrium with concentrations of $N_2 = 3.0 \times 10^{-3}M, O_2 = 4.2 \times 10^{-3}M$ and $NO = 2.8 \times 10^{-3}M$.
$2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$
If 0.1 mol L L^{-1} of $NO_{(g)}$ is taken in a closed vessel, what will be degree of dissociation (α) of $NO_{(g)}$ at equilibrium?

A) 0.0889
B) 0.8889
C) 0.717
D) 0.00889

28. For the reaction $CO(g) + Cl_2(g) \rightleftharpoons COCl_2(g)$, $\frac{K_p}{K_c}$ is equal to

A) $\frac{1}{RT}$
B) RT
C) $\sqrt{RT}$
D) $(RT)^2$

29. Which of the following statements is correct for a reversible process in a state of equilibrium?

A) $\Delta G° = -2.30\,RT\,log\,K$
B) $\Delta G° = 2.30\,RT\,log\,K$
C) $\Delta G = -2.30\,RT\,log\,K$
D) $\Delta G = 2.30\,RT\,log\,K$

30. For the reversible reaction,
$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$+ heat
The equilibrium shifts in forward direction

A) by increasing the concentration of $NH_{3(g)}$
B) by decreasing the pressure
C) by decreasing the concentrations of $N_{2(g)}$ and $H_{2(g)}$
D) by increasing pressure and decreasing temperature.

31. Conjugate base for Bronsted acids H_2O and HF are

A) OH^- and H_2F^+ respectively
B) H_3O^+ and F^-, respectively
C) OH^- and F^-, respectively
D) H_3O^+ and H_2F^+, respectively

32. Following solutions were prepared by mixing different volumes of $NaOH$ and HCl of different concentrations
(a) 60 mL$\frac{M}{10}$ HCl + 40 mL$\frac{M}{10}$ NaOH
(b) 55 mL$\frac{M}{10}$ HCl + 45 mL$\frac{M}{10}$ NaOH
(c) 75 mL$\frac{M}{5}$ HCl + 25 mL$\frac{M}{5}$ NaOH
(d) 100 mL$\frac{M}{10}$ HCl + 100 mL$\frac{M}{10}$ NaOH
pH of which one of them will be equal to 1 ?

A) (b)
B) (a)
C) (d)
D) (c)

33. What is the pH of the resulting solution when equal volumes of 0.1 M $NaOH$ and 0.01 M HCl are mixed?

A) 2
B) 7
C) 1.04
D) 12.65

34. The solubility of $AgCl_{(s)}$ with solubility product 1.6×10^{-10} in 0.1 M $NaCl$ solution would be

A) $1.26 \times 10^{-5}\,M$
B) $1.6 \times 10^{-9}\,M$
C) $1.6 \times 10^{-11}\,M$
D) zero.

35. Which will make basic buffer?

A) 50mL of 0.1MNaOH + 25mL of 0.1MCH_3COOH
B) 100mL of 0.1MCH_3COOH + 100mL of 0.1MNaOH

C) $100\text{mL of } 0.1\text{M}HCl + 200\text{mL of } 0.1\text{M}NH_4OH$

D) $100\text{mL of } 0.1\text{M}HCl + 100\text{mL of } 0.1\text{M}NaOH$

36. Which of the following reactions is the metal displacement reaction? Choose the right option.

A) $2KClO_3 \xrightarrow{\Delta} 2KCl + 3O_2$

B) $Cr_2O_3 + 2Al \xrightarrow{\Delta} Al_2O_3 + 2Cr$

C) $Fe + 2HCl \rightarrow FeCl_2 + H_2 \uparrow$

D) $2\ Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2 \uparrow$

37. The correct decreasing order of oxidation state of the underlined atomu> in each molecule is

A) $\underline{P}_4O_6 > \underline{Cl}_2O_7 > \underline{AlH}_3$

B) $\underline{P}_4O_{10} > \underline{SO}_3 > H_2\underline{O}$

C) $\underline{N}_2O_5 > \underline{Al_2O_3} > H_2\underline{S}$

D) $\underline{PbO}_2 > \underline{N}_2O_3 > \underline{SO}_3$

38. The pair of compounds that can exist together is

A) $FeCl_3, SnCl_2$ B) $HgCl_2, SnCl_2$ C) $FeCl_2, SnCl_2$ D) $FeCl_3, KI$

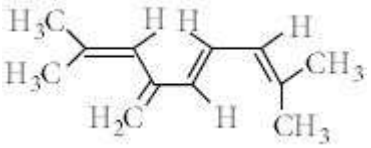
39. On balancing the given redox reaction,
$aCr_2O_7^{2-} + bSO_3^{2-}(aq) + cH^+(aq) \rightarrow 2aCr^{3+}(aq) + bSO_4^{2-}(aq) + \frac{c}{2}H_2O(l)$
the coefficients a, b and c are found to be, respectively-

A) $8, 1, 3$ B) $1, 3, 8$ C) $3, 8, 1$ D) $1, 8, 3$

40. When neutral or faintly alkaline $KMnO_4$ is treated with potassium iodide, iodide ion is converted into 'X'. 'X' is

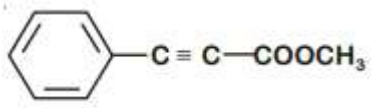
A) I_2 B) IO_4^- C) IO_3^- D) IO^-

41. The total number of $\pi-$ bond electrons in the following structure is



A) 12 B) 16 C) 4 D) 8

42. How many (i) sp^2 hybridised carbon atoms and (ii) π bonds are present in the following compound?



A) $8, 5$ B) $7, 5$ C) $8, 6$ D) $7, 6$

43. Match List-I with List-II.

List-I (Molecule)	List-II. (Number and types of bond/s between two carbon atoms)
A. ethane	I. one σ-bond and two π-bonds
B. ethene	II. two π-bonds
C. carbon molecule, C_2	III. one σ-bond
D. ethyne	IV. one σ-bond and one π-bond

Choose the correct answer from the options given below:

A) $A-IV, B-III, C-II, D-I$

B) $A-III, B-IV, C-II, D-I$

C) $A-III, B-IV, C-I, D-II$

D) $A-I, B-IV, C-II, D-III$

44. A compound with a molecular formula of C_6H_{14} has two tertiary carbons. Its $IUPAC$ name is :

A) $2-$ methylpentane

B) $2, 3-$ dimethylbutane

C) $2,2-$ dimethylbutane D) $n-$hexane

45. The structure of isobutyl group in an organic compound is

A) $CH_3-CH_2-CH_2-CH_2-$ B) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-$

C) $\begin{matrix}CH_3\\CH_3\end{matrix}>CH-CH_2-$ D) $CH_3-\underset{\displaystyle CH_2}{\overset{\displaystyle CH_3-CH-CH_2-CH_3}{|}}$

46. The pair of molecules that are metamers among the following is :

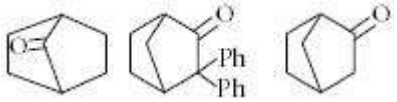
A) $CH_3CH_2CH_2OH$ and $CH_3-CH(OH)-CH_3$

B) $CH_3CH_2CH_2CH_2CH_3$ and $(CH_3)_2CHCH_2CH_3$

C) $H_3C-CO-CH_3$ and H_3C-CH_2-CHO

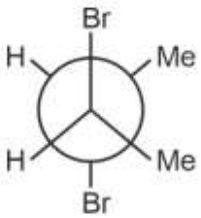
D) $CH_3OCH_2CH_2CH_3$ and $CH_3CH_2OCH_2CH_3$

47. Which among the given molecules can exhibit tautomerism ?

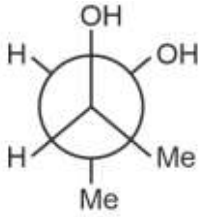


A) III only B) Both I and III C) Both I and II D) Both II and III

48. Given below are two statements :
Statement I : trans-But-2-ene upon treatment with Br_2 in CCl_4 gives the following product.



Statement II : cis-But-2-ene upon treatment with alkaline $KMnO_4$ gives the following product.



In the light of the above statements, choose the most appropriate answer from the options given below.

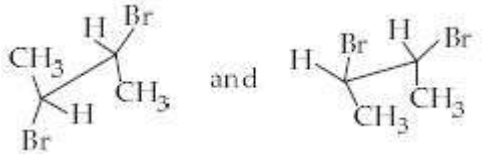
A) Statement I is incorrect but Statement II is correct

B) Both Statement I and Statement II are correct

C) Both Statement I and Statement II are incorrect

D) Statement I is correct but Statement II is incorrect

49. Given : I and II are



A) identical

B) a pair of conformers

C) a pair of geometrical isomers

D) a pair of optical isomers

50. Two possible stereo-structures of $CH_3CHOHCOOH$, which are optically active, are called

A) atropisomers B) enantiomers C) mesomers D) diastereomers

51. A liquid compound (x) can be purified by steam distillation only if it is

A) Not steam volatile, immiscible with water B) Steam volatile, immiscible with water

C) Not steam volatile, miscible with water D) Steam volatile, miscible with water

52. Two products X and Y are formed in the following reaction sequence.

$CH_6CH_6 + CH_3Cl \xrightarrow{Anhydr.AlCl_3} W \xrightarrow[\text{warm}]{dil.HNO_3+dil.H_2SO_4} X + Y$

A) Fractional distillation B) Sublimation

C) Differential extraction D) Continuous extraction

53. In the Kjeldahl's method for estimation of nitrogen present in a soil sample, ammonia evolved from $0.75\,g$ of sample neutralized $10\,mL$ of $1\,M\,H_2SO_4$. The percentage of nitrogen in the soil is

A) 37.33 B) 45.33 C) 35.33 D) 43.33

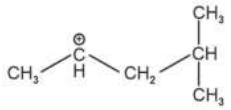
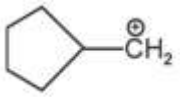
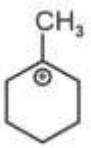
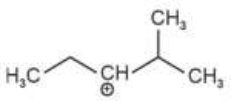
54. The amino acid that gives a red-blood colour on treating its sodium fusion extract with sodium nitroprusside is

A) Threonine B) Methionine C) Serine D) Leucine

55. In Lassaigne's extract of an organic compound, both nitrogen and sulphur are present, which gives blood red colour with Fe^{3+} due to the formation of-

A) $[Fe(SCN)]^{2+}$ B) $Fe_4\,[Fe\,(CN_6)]_3\,xH_2O$ C) $NaSCN$ D) $[Fe(CN)_5NOS]^{4-}$

56. The most stable carbocation among the following is :

A)  B)  C)  D) 

57. The most stable carbocation, among the following is

A) $(CH_3)_3\,C-\overset{\oplus}{C}H-CH_3$ B) $CH_3-CH_2-\overset{\oplus}{C}H-CH_2-CH_3$

C) $CH_3-\overset{\oplus}{C}H-CH_2-CH_2-CH_3$ D) $CH_3-CH_2-\overset{\oplus}{C}H_2$

58. Homolytic fission of the following alkanes forms free radicals
$CH_3-CH_3, CH_3-CH_2-CH_3, (CH_3)_2CH-CH_3,$
$CH_3-CH_2-CH(CH_3)_2.$
Increasing order of stability of the radicals is

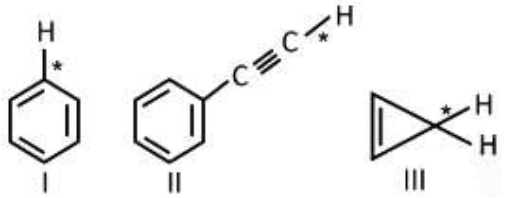
A) $(CH_3)_2\dot{C}-CH_2CH_3 < CH_3-\dot{C}H-CH_3 < CH_3-\dot{C}H_2 < (CH_3)_3\dot{C}$

B) $CH_3-\dot{C}H_2 < CH_3-\dot{C}HH-CH_3 < (CH_3)_2\dot{C}-CH_2-CH_3 < (CH_3)_3\dot{C}$

C) $CH_3-\dot{C}H_2 < CH_3-\dot{C}H-CH_3 < (CH_3)_3\dot{C} < (CH_3)_2\dot{C}-CH_2CH_3$

D) $(CH_3)_3\dot{C} < (CH_3)_2\dot{C}-CH_2CH_3 < CH_3-\dot{C}H-CH_3 < CH_3-\dot{C}H_2$

59. Among the given compound I-III, the correct order of bond dissociation energy of C – H bond marked with * is :-



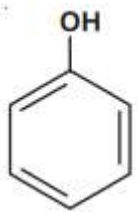
A) II > I > III

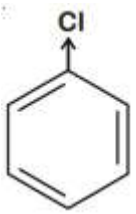
B) I > II > III

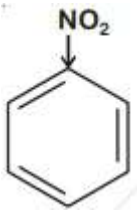
C) III > II > I

D) II > III > I

60. Which of the following compound is most reactive in electrophilic aromatic substitution?

A) 

B) 

C) 

D) 

61. Which compound amongst the following is not an aromatic compound?

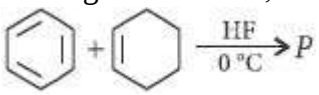
A) 

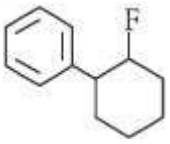
B) 

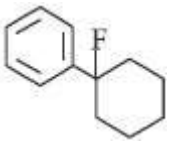
C) 

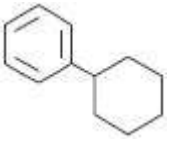
D) 

62. In the given reaction, the product P is



A) 

B) 

C) 

D) 

63. The compound that will react most readily with gaseous bromine has the formula

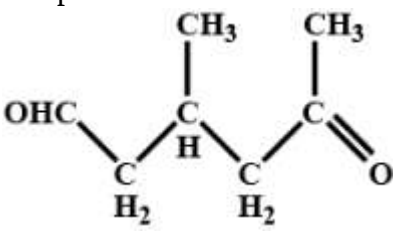
A) C_3H_6

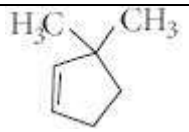
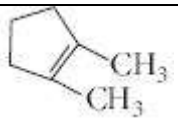
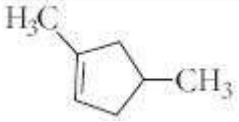
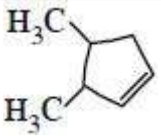
B) C_2H_2

C) C_4H_{10}

D) C_2H_4

64. A single compound of the structure, is obtainable from ozonolysis of which of the following cyclic compounds?



A)  B)  C)  D) 

65. The correct statement regarding the comparison of staggered and eclipsed conformations of ethane, is

A) the eclipsed conformation of ethane ismore stable than staggered conformation even though the eclipsed conformation has torsional strain

B) the staggered conformation of ethane is more stable than eclipsed conformation, because staggered conformation has no torsional strain

C) the staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has torsional strain

D) the eclipsed conformation of ethane is more stable than staggered conformation, because eclipsed conformation has notorsional strain.

66. Which of the following statement is not correct about diborane?

A) The four terminal $B-H$ bonds are two centre two electron bonds.

B) The four terminal Hydrogen atoms and the two Boron atoms lie in one plane.

C) Both the Boron atoms are sp^2 hybridised.

D) There are two $3-$centre$-2-$electron bonds.

67. AlF_3 is soluble in HF only in presence of KF. It is due to the formation of

A) $K_3[AlF_3H_3]$ B) $K_3[AlF_6]$ C) AlH_3 D) $K[AlF_3H]$

68. The species, having bond angles of 120^o is

A) ClF_3 B) NCl_3 C) BCl_3 D) PH_3

69. The liquified gas that is used in dry cleaning along with a suitable detergent is

A) Water gas B) CO C) NO_2 D) CO_2

70. Identify the incorrect statement from the following :

A) Carbon has the ability to form $p\pi-p\pi$ multiple bond with itself.

B) $ECl_3(E=B$ and Al) is a monomer when $E=B$ and a dimer when $E=Al$.

C) The order of catenation property of Group 14 elements is $C \gg Si > Ge \approx Sn$.

D) Oxygen exhibits only −2 oxidation state.

71. Toluene in the vapour phase is in equilibrium with a solution of benzene and toluene having mole fraction of toulene 0.50 If vapour pressure of pure benzene is $119\ torr$ and that of toluene is $37.0\ torr$ at the same temperature, mole fraction of toluene in vapour phase will be:

A) 0.462 B) 0.237 C) 0.506 D) 0.325

72. The boiling point of $0.2\ mol\ kg^{-1}$ solution of X in water is greater than equimolal solution of Y in water. Which one of the following statements is true in this case ?

A) Molecular mass of X is less than the molecular mass of Y.

B) Y is undergoing dissociation in water while X undergoes no change.

C) X is undergoing dissociation in water.

D) Molecular mass of X is greater than the molecular mass of Y.

73. 5 moles of liquid X and 10 moles of liquid Y make a solution having a vapour pressure of 70 torr. The vapour pressures of pure X and Y are 63 torr and 78 torr respectively. Which of the following is true regarding the described solution?

A) The solution shows positive deviation.

B) The solution shows negative deviation.

C) The solution is ideal.

D) The solution has volume greater than the sum of individual volumes.

74. If molality of the dilute solution is doubled, the value of molal depression constant (K_f) will be

A) halved B) tripled C) unchanged D) doubled.

75. The plot of osmotic pressure (Π) vs concentration (molL^{-1}) for a solution gives a straight line with slope $25.73\ \mathrm{Lbarmol}^{-1}$. The temperature at which the osmotic pressure measurement is done is
(Use $\mathrm{R} = 0.083\ \mathrm{L\ bar\ mol\ m}^{-1}\ \mathrm{K}^{-1}$)

A) $310^{\circ}\mathrm{C}$ B) $25.73^{\circ}\mathrm{C}$ C) $12.05^{\circ}\mathrm{C}$ D) $37^{\circ}\mathrm{C}$

76. Mass in grams of copper deposited by passing 9.6487 A current through a voltmeter containing copper sulphate solution for 100 seconds is (Given : Molar mass of Cu : $63\ \mathrm{g\ mol}^{-1}, 1\ \mathrm{F} = 96487\mathrm{C}$)

A) $0.315\ \mathrm{g}$ B) $31.5\ \mathrm{g}$ C) $0.0315\ \mathrm{g}$ D) $3.15\ \mathrm{g}$

77. The molar conductivity of a $0.5\,mol/dm^3$ solution of $AgNO_3$ with electrolytic conductivity of 5.76×10^{-3} $S\,cm^{-1}$ at $298\,K$ is ..... $S\,cm^2/mol$.

A) 2.88 B) 11.52 C) 0.086 D) 28.8

78. A device that converts energy of combustion of fuels like hydrogen and methane, directly into electrical energy is known as

A) dynamo B) $Ni - Cd$ cell C) fuel cell D) electrolytic cell.

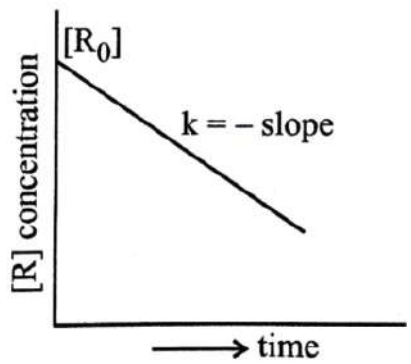
79. Calculate emf of the half cell given below :
$Pt(s)\,|H_2(g, 2atm)|\,HCl(aq, 0.02M)$
$E^{\circ}_{H_2/H^+} = 0V$
(Given : $\frac{2.303RT}{F} = 0.059, \log 2 = 0.3010$)

A) −0.109 V B) 0.035 V C) −0.035 V D) 0.109 V

80. The pressure of H_2 required to make the potential of H_2- electrode zero in pure water at $298\,K$ is

A) $10^{-10}\,atm$ B) $10^{-4}\,atm$ C) $10^{-14}\,atm$ D) $10^{-12}\,atm$

81. For a certain reaction $R \rightarrow$ Product, the plot of concentration $[R]$ vs time has a negative slope as shown. The order of reaction is :



A) 0 B) 1 C) 2 D) 2.5

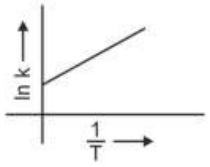
82. If the rate constant of a reaction is $0.03s^{-1}$, how much time does it take for $7.2molL^{-1}$ concentration of the reactant to get reduced to $0.9molL^{-1}$?
(Given : $\log 2 = 0.301$)

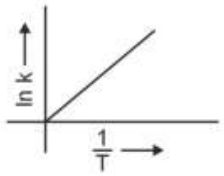
A) 69.3 s B) 23.1 s C) 210 s D) 21.0 s

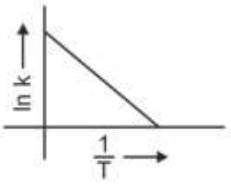
83. If the half-life $(t_{1/2})$ for a first order reaction is 1 minutes, then the time required for 99.9% completion of the reaction is closest to:

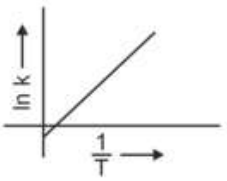
A) 2 minutes B) 4 minutes C) 5 minutes D) 10 minutes

84. Which plot of $\ln k$ vs $\frac{1}{T}$ is consistent with Arrhenius equation?

A) 

B) 

C) 

D) 

85. Zr $(Z = 40)$ and Hf $(Z = 72)$ have similar atomic and ionic radii because of :

A) belonging to same group B) diagonal relationship

C) lanthanoid contraction D) having similar chemical properties

86. Identify the incorrect statement.

A) The oxidation states of chromium in $CrO_4{}^{2-}$ and $Cr_2O_7{}^{2-}$ are not the same

B) $Cr^{2+}\,(d^4)$ is a stronger reducing agent than $Fe^{2+}\,(d^6)$ in water.

C) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes.

D) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.

87. The lanthanide ion having four unpaired electrons is
(Given : Atomic numbers of $Ce = 58, Nd = 60, Tb = 65$ and $Ho = 67$)

A) Ho^{3+} B) Nd^{3+} C) Ce^{3+} D) Tb^{3+}

88. The pair of lanthanoid ions which are diamagnetic is

A) Ce^{3+} and Eu^{2+} B) Gd^{3+} and Eu^{3+} C) Pm^{3+} and Sm^{3+} D) Ce^{4+} and Yb^{2+}

89. Homoleptic complex from the following complexes is

A) Triamminetriaquachromium (III) chloride B) Potassium trioxalatoaluminate (III)

C) Diamminechloridonitrito-N-platinum (II) D) Pentaamminecarbonatocobalt (III) chloride

90. Number of possible isomers for the complex $[Co(en)_2Cl_2]Cl$ will be $(en =$ ethylenediamine$)$

A) 1 B) 3 C) 4 D) 2

91. Match List I with List II :

List-I (Complex/ion)	List-II (Shape/geometry)
(A) $[Pt\,(Cl_2)\,(NH_3)_2]$	(I) Octahedral
(B) $[Co\,(NH_3)_6]\,Cl_3$	(II) Trigonal bipyramidal
(C) $[NiCl_4]^2$	(III) Square planar
(D) $[Fe(CO)_5]$	(IV) Tetrahedral

Choose the correct answer from the options given below:

A) A-III, B-IV, C-I, D-II

B) A-III, B-I, C-IV, D-II

C) A-IV, B-I, C-III, D-II

D) A-I, B-III, C-IV, D-II

92. The correct order of the wavelength of light absorbed by the following complexes is,

A. $[Co\,(NH_3)_6]^{3+}$

B. $[Co(CN)_6]^{3-}$

C. $[Cu\,(H_2O)_4]^{2+}$

D. $[Ti\,(H_2O)_6]^{3+}$

Choose the correct answer from the options given below:

A) $B < D < A < C$ B) $B < A < D < C$ C) $C < D < A < B$ D) $C < A < D < B$

93. In the following reaction sequence, X and Z respectively are :

$CH_3CH_2CH_2 - OH + PCl_5 \longrightarrow CH_3CH_2CH_2Cl + X + HCl$

$CH_3CH_2CH_2Cl \xrightarrow[\Delta]{\text{alc. } KOH} Y \xrightarrow[(C_6H_5CO)_2O_2]{HBr} Z$

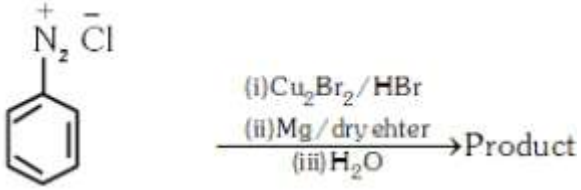
A) $X = POCl_3; Z = CH_3 - CH(Br) - CH_3$

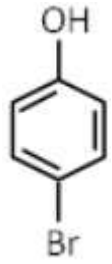
B) $X = POCl_3; Z = CH_3CH_2CH_2 - Br$

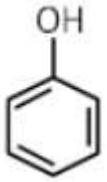
C) $X = H_3PO_3; Z = CH_3 - CH(Br) - CH_3$

D) $X = H_3PO_3; Z = CH_3CH_2CH_2 - Br$

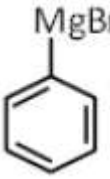
94. Identify the product in the following reaction :



A) 

B) 

C) 

D) 

95. In an S_{N^1} reaction on chiral centres, there is

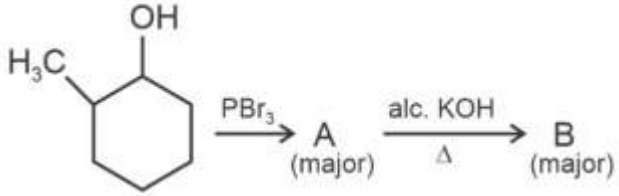
A) inversion more than retention leading to partial racemisation

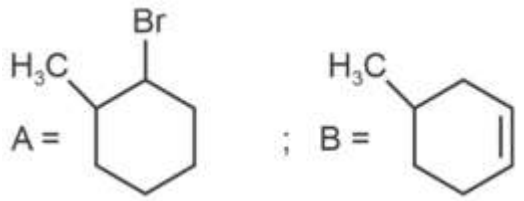
B) 100% retention

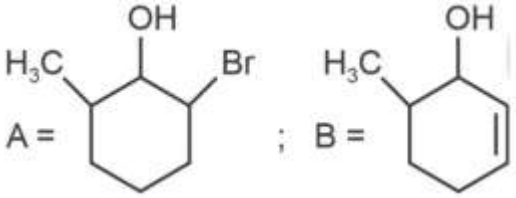
C) 100% inversion

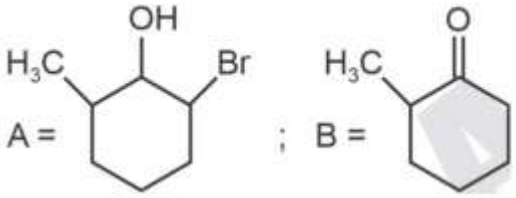
D) 100% racemisation.

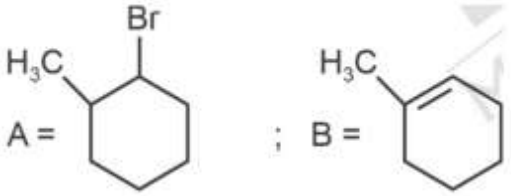
96. Major products A and B formed in the following reaction sequence, are



A) 

B) 

C) 

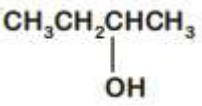
D) 

97. $CH_3CH_2CH=CH_2 \xrightarrow[H_2O,H_2O_2,OH^-]{B_2H_6} Z$ What is Z?

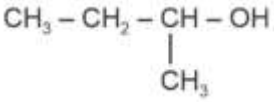
A) $CH_3CH_2CH_2CH_3$

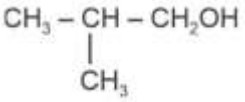
B) $CH_3CH_2CH_2CH_2OH$

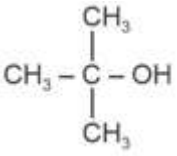
C) $CH_3CH_2CH_2CHO$

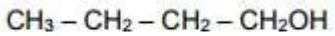
D) 

98. Which one of the following alcohols reacts instantaneously with Lucas reagent?

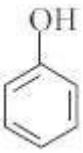
A) 

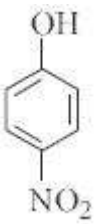
B) 

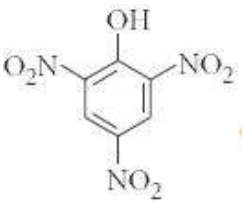
C) 

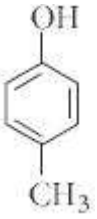
D) 

99. Which one is the most acidic compound?

A) 

B) 

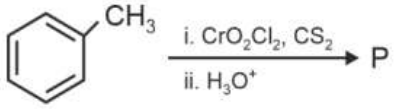
C) 

D) 

100. The heating of phenyl methyl ether with HI produces

A) iodobenzene B) phenol C) benzene D) ethyl chloride.

101. Consider the following reaction, and choose the correct option.



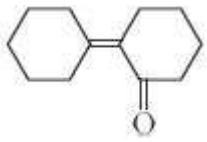
A) Compound P is obtained by the hydrogenation of benzoyl chloride with Pd on $BaSO_4$

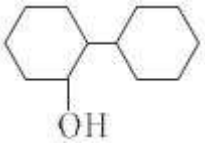
B) On treating compound P with saturated $NaHCO_3$ solution, brisk effervescence is observed

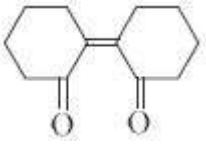
C) compound P can be prepared by treating benzene with anhydrous $AlCl_3$ and CH_3COCl

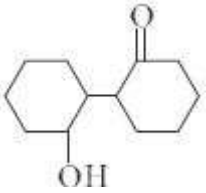
D) On treating with bromine water, compound P gives a white precipitate

102. Of the following, which is the product formed when cyclohexanone undergoes aldol condensation followed by heating ?

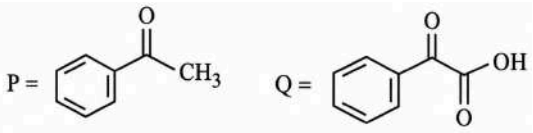
A) 

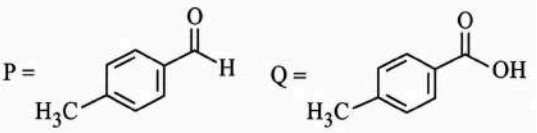
B) 

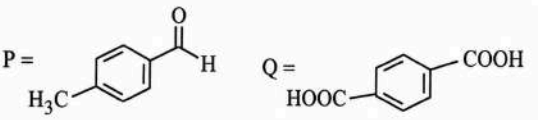
C) 

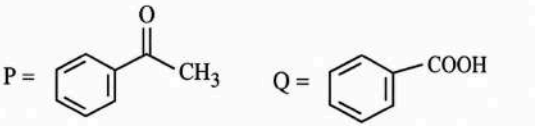
D) 

103. Compound $P\,(C_8H_8O)$ gives a red orange precipitate with 2, 4-DNP reagent and it does not reduce Fehling's reagent. On drastic oxidation with chromic acid, P gives an aromatic product Q that produces effervescence on treating with aq. $NaHCO_3$. Compounds P and Q , respectively, are :

(1) 

(2) 

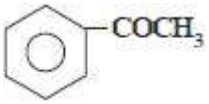
(3) 

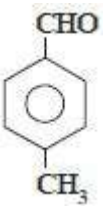
(4) 

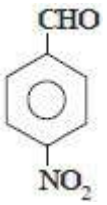
A) 1 B) 2 C) 3 D) 4

104. Which one is most reactive towards nucleophilic addition reaction ?

A) 

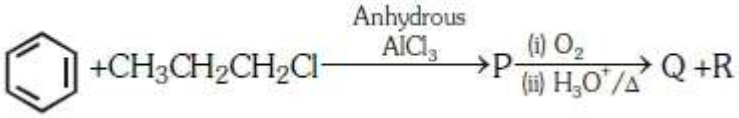
B) 

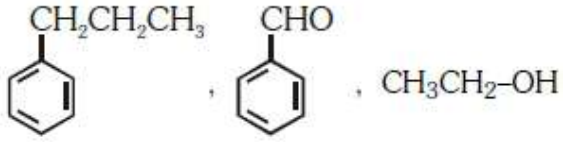
C) 

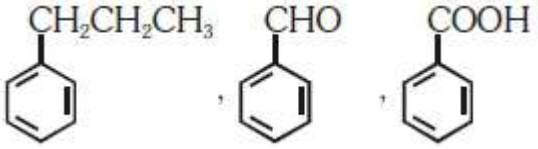
D) 

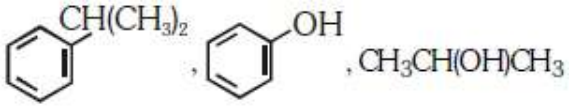
105. Identify the major products P, Q and R in the following sequence of reaction

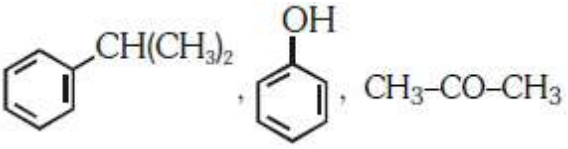
P , Q , R



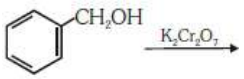
A) 

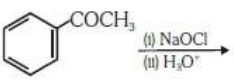
B) 

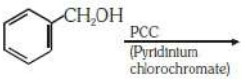
C) 

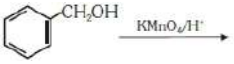
D) 

106. The reaction that does not give benzoic acid as the major product is

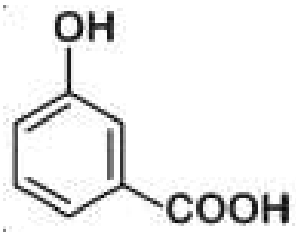
A) 

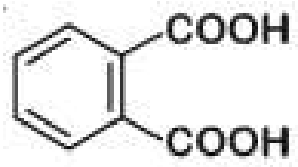
B) 

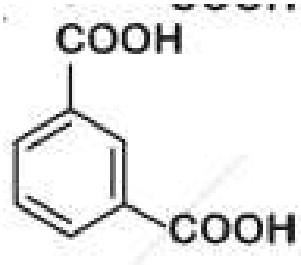
C) 

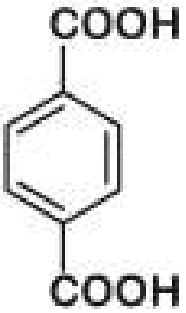
D) 

107. Which of the following acid will form an (a) Anhydride on heating and (b) Acid imide on strong heating with ammonia?

A) 

B) 

C) 

D) 

108. The correct order of decreasing acidity of the following aliphatic acids is :-

A) $(CH_3)_3CCOOH > (CH_3)_2CHCOOH > CH_3COOH > HCOOH$

B) $CH_3COOH > (CH_3)_2CHCOOH > (CH_3)_3CCOOH > HCOOH$

C) $HCOOH > CH_3COOH > (CH_3)_2CHCOOH > (CH_2)_3CCOOH$

D) $HCOOH > (CH_3)_3CCOOH > (CH_3)_2CHCOOH > CH_3COOH$

109. Given below are two statements:

Statement I : Primary aliphatic amines react with HNO_2 to give unstable diazonium salts.

Statement II : Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above $300\,K$.

In the light of the above statements, choose the most appropriate answer from the options given below:

A) Both Statement I and Statement II are incorrect.

B) Statement I is correct but Statement II is incorrect.

C) Statement I is incorrect but Statement II is correct.

D) Both Statement I and Statement II are correct.

110. Given below are two statements :

Statement I : Benzenediazonium salt is prepared by the reaction of aniline with nitrous acid at 273-278 K. It decomposes easily in the dry state.

Statement II : Insertion of iodine into the benzene ring is difficult and hence iodobenzene is prepared through the reaction of benzenediazonium salt with KI. In the light of the above statements, choose the most appropriate answer from the options given below :

A) Both Statement I and Statement II are correct

B) Both Statement I and Statement II are incorrect

C) Statement I is correct but Statement II is incorrect

D) Statement I is incorrect but Statement II is correct

111. The product formed by the reaction of an aldehyde with a primary amine is

A) carboxylic acid B) aromatic acid C) Schiff's base D) ketone

112. Which of the following reactions is appropriate for converting acetamide to methanamine?

A) Hoffmann hypobromamide reaction B) Stephen's reaction

C) Gabriel phthalimide synthesis D) Carbylamine reaction

113. The reagents with which glucose does not react to give the corresponding tests/products are

A. Tollen's reagent B. Schiff's reagent C. HCN D. NH_2OH E. $NaHSO_3$

Choose the correct options from the given below:

A) A and D B) B and E C) E and D D) B and C

114. Sucrose on hydrolysis glves

A) $\alpha-D-$Fructose $+\beta-D-$Fructose B) $\beta-D-$Glucose $+\alpha-D-$Fructose

C) $\alpha-D-$Glucose $+\beta-D-$ Glucose D) $\alpha-D-$Glucose $+\beta-D-$Fructose

115. The correct statement about peptides and proteins is

A) In α-helices, the polypeptide chain is twisted into a left-handed screw (helix) through intramolecular hydrogen bonds

B) Tertiary structure of proteins has two or more polypeptide subunits

C) Only the proteins having a quaternary structure are biologically active

D) In β-pleated sheet structures, peptide chains are held together by intermolecular hydrogen bonds

116. The correct statement regarding RNA and DNA, respectively is

A) the sugar component in RNA is a arabinose and the sugar component in DNA is ribose

B) the sugar component in RNA is $2'-$deoxyribose and the sugar component in DNA is arabinose

C) the sugar component in RNA is arabinose and the sugar component in DNA is $2'-$deoxyribose

D) the sugar component in RNA is ribose and the sugar component in DNA is $2'-$deoxyribose.

117. Strong reducing behaviour of H_3PO_2 is due to

A) Low oxidation state of P

B) Presence of one $-OH$ group and two $P-H$ bonds

C) Presence of two $-OH$ groups and one $P-H$ bonds

D) Low coordination number of P

118. Match List$-l$ with List$-ll$:

List$-I$ (Oxoacids of Sulphur)	List$-II$ (Bonds)
A. Peroxodisulphuric acid	I. Two $S-OH$, Four $S=O$, One $S-O-S$
B. Sulphuric acid	II. Two $S-OH$, One $S=O$
C. Pyrosulphuric acid	III. Two $S-OH$, Four $S=O$, One $S-O-O-S$
D. Sulphurous acid	IV. Two $S-OH$, Two $S=O$

Choose the correct answer from the options given below.

A) $A-III, B-IV, C-II, D-I$

B) $A-I, B-III, C-II, D-IV$

C) $A-III, B-IV, C-I, D-II$

D) $A-I, B-III, C-IV, D-II$

119. Which of the following statements is not true for halogens ?

A) All form monobasic oxyacids.

B) All are oxidizing agents.

C) Chlorine has the highest electron-gain enthalpy.

D) All but fluorine show positive oxidation states.

120. Identify the incorrect statement, regarding the molecule XeO_4 **:**

A) XeO_4 molecule is square planar.

B) There are four $p\pi - d\pi$ bonds.

C) There are four $sp^3 - p, \sigma$ bonds.

D) XeO_4 molecule is tetrahedral.