47 YEARS OF EXCELLENCE

NARAYANA IIT-JEE/NEET/FOUNDATION

NEET (UG) 2026

CHEMISTRY

SOLUTIONS

PAPER CODE - 12

NARAYANA NATIONAL RESULT

MEDICAL MARVELS OF NARAYANA IN NEET 2025

ALL INDIA OPEN CATEGORY RANKS

MRINAL KISHORE JHA
nPrep
AIR 4

KESHAV MITTAL
nPrep
AIR 7

AASHI SINGH
nPrep
AIR 12

SOMYA SHARMA
Classroom Student
AIR 14

K JEEVAN SAI KUMAR
Classroom Student
AIR 18

RUPAYAN PAL
nPrep
AIR 20

ALL INDIA OPEN CATEGORY RANKS IN TOP 100

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Kavish
nPrep

AIR 47
Rijul Jain
nPrep

AIR 49
Naveen Mittal
nPrep

AIR 52
Aditya Yadav
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AIR 59
D Surya Charan
Classroom Student

AIR 66
Devyansh Arora
Classroom Student

AIR 70
Y Sameer Kumar
Classroom Student

AIR 71
Maulik Bhalgamia
nPrep

AIR 73
Darshan Mule
nPrep

AIR 75
Yashashwi Kumar
nPrep

AIR 77
Armaan Bery
nPrep

AIR 80
Diganth S
Classroom Student

AIR 87
Raghav Goyal
nPrep

AIR 93
Siddh Vimalbhai Vora
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AIR 95
Bidisha Majee
Classroom Student

6 Students in Top 20 | **22** Students in Top 100 | **94** Students in Top 1000

nPrep: Narayana Digital Learning Programme

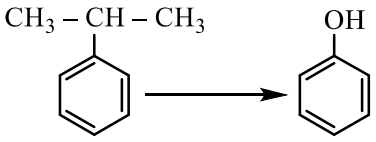
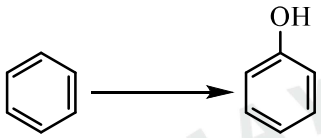
NARAYANA
IIT-JEE/NEET/FOUNDATION

NEET(UG) – 2026

(PAPER & SOLUTIONS)

PAPER CODE – 12

46. Match List-I with List II:

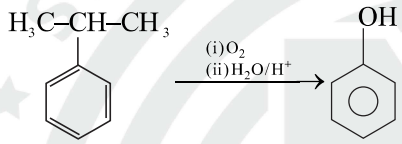
List-I		**List-II**	
A.		I.	(i) oleum; (ii) NaOH; (iii) H^+
B.	$CH_3COOH \rightarrow CH_3CH_2OH$	II.	(i) O_2; (ii) H_2O/H^+
C.	$CH_3CH_2CH_2OH \rightarrow CH_3-\underset{\underset{OH}{\vert}}{CH}-CH_3$	III.	(i) CH_3OH, H^+; (ii) H_2, catalyst
D.		IV.	(i) conc. H_2SO_4, $\triangle$; (ii) H^+ / H_2O

Choose the correct answer from the options given below:

(1) A-I, B-III, C-IV, D-II (2) A-II, B-IV, C-III, D-I

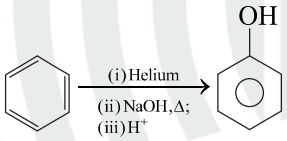
(3) A-II, B-III, C-I, D-IV (4) A-II, B-III, C-IV, D-I

Ans. **4**

Sol. **A.** 

B. $CH_3COOH \xrightarrow[(ii)\,H_2,\text{catalyst}]{(i)\,CH_3OH/H^+} CH_3CH_2OH$

C. $CH_3CH_2CH_2OH \xrightarrow[(ii)\,H^+/H_2O]{(i)\,Conc.H_2SO_4;\Delta;} \;;\Delta;\; CH_3-\underset{\underset{OH}{\vert}}{CH}-CH_3$

D. 

47. The major product z formed in the following sequence of reactions is :

$$C_2H_6 \xrightarrow[\text{UV light}]{Cl_2} \underset{\text{(monochlorinated product)}}{X} \xrightarrow{NH_3} Y \xrightarrow[(ii)\,H_2O]{(i)\,NaNO_2,\,HCl} Z$$

(1) $C_2H_5-N=N-OH$ (2) C_2H_5OH

(3) $C_2H_5NO_2$ (4) $C_2H_5NH_2$

Ans. **2**

Sol. $C_2H_6 \xrightarrow[UV.light]{Cl_2} \underset{(X)}{CH_3CH_2Cl} \xrightarrow{NH_3} \underset{(Y)}{CH_3CH_2NH_2} \xrightarrow[(ii)\,H_2O]{(i)\,NaNO_2/HCl} \underset{(Z)}{CH_3CH_2OH}.$

48. In a qualitative analysis Bi^{3+} is detected by appearance of precipitate of BiO(OH)(s) . Calculate pH when the following equilibrium exists at 298 K:

$BiO(OH)(s) \rightleftharpoons BiO^+(aq) + OH^-(aq),\ K = 4\times10^{-10}$

(Given : $\log 2 = 0{\cdot}3010$)

(1) 4.699 (2) 8.714

(3) 9.301 (4) 5.286

Ans. **3**

Sol. $BiO(OH)_s \longrightarrow \underset{x}{BiO^+} + \underset{x}{OH^-}$

$k = (BiO^+)\,(OH^-)$

$4\times10^{-10} = x\ x = x^2$

$(OH^-) = 2 \times 10^{-5}$

$pOH = -\log 2 \times 10^{-5} = s - 0.3010$

$pH = 14 - 4.69 = 9.3010$

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

(1) 0.6 dm^3 of CO, 0.8 dm^3 of CO_2 (2) 0.8 dm^3 of CO, 0.8 dm^3 of CO_2

(3) 0.8 dm^3 of CO, 0.6 dm^3 of CO_2 (4) 0.6 dm^3 of CO, 0.4 dm^3 of CO_2

Ans. **3**

Sol. $CO_2 + C_{(s)} \longrightarrow 2CO(g)$

Initial $\rightarrow$ $1dm^3$

Final $\rightarrow$ 1-x $\longrightarrow$ 2x

Given: 1–x + 2x = 1.4

Hence CO = 2x = 2×0.4 = 0.8

CO_2 = 1– x = 1–0.4 = 0.6

50. Match List-I with List II:

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

Choose the correct answer from the options given below:

(1) A-II, B-III, C-IV, D-I (2) A-I, B-II, C-III, D-IV

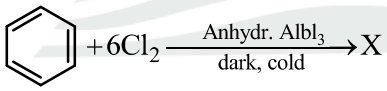
(3) A-IV, B-II, C-III, D-I (4) A-II, B-III, C-I, D-IV

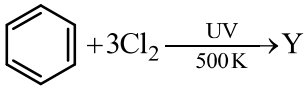
Ans. **1**

Sol.

	'*n*'	**'ℓ'**	
A.	2	1	I. 2p
B.	4	0	II. 4s
C.	5	3	III. 5f
D.	3	2	II. 3d

51. The number of chlorine atoms present in the organic products X and Y of the following reactions, respectively, are



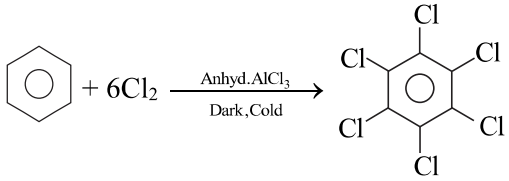


(1) 3 and 6 (2) 6 and 6

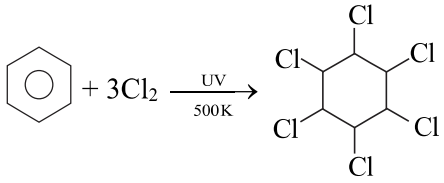
(3) 6 and 3 (4) 3 and 3

Ans. **2**

Sol.



Hexachlorbenzne-ene



Benzene hexachlorine

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

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

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

(1) $X = POCl_3; Z = CH_3-\underset{\underset{Br}{|}}{CH}-CH_3$ (2) $X = H_3PO_3; Z = CH_3CH_2CH_2-Br$

(3) $X = H_3PO_3; Z = CH_3-\underset{\underset{Br}{|}}{CH}-CH_3$ (4) $X = POCl_3; Z = CH_3CH_2CH_2-Br$

Ans. **4**

Sol. $CH_3cH_2CH_2OH + PCl_5 \longrightarrow CH_3CH_3CH_2Cl + POCl_3 + HCl$

$$CH_3CH_2CH_2Cl \xrightarrow[\Delta]{\text{alc. KOH}} \underset{(Y)}{CH_3CH=CH_2} \xrightarrow[(C_6H_5CO_2)_2O_2]{HBr} CH_3CH_2CH_2-Br$$

53. Match List-I with List II:

List-I (transition metal/ compound/complex)		**List-II (Catalytic Role)**
A.	V_2O_5	I. Preparation of ammonia from N_2 / H_2 mixture
B.	Fe	II. Polymerisation of alkynes
C.	$PdCl_2$	III. Preparation of H_2SO_4 from SO_2
D.	Ni complex	IV. Oxidation of ethyne to ethanal

Choose the correct answer from the options given below:

(1) A-III, B-IV, C-I, D-II (2) A-II, B-I, C-IV, D-III

(3) A-IV, B-I, C-III, D-II (4) A-III; B-I, C-IV, D-II

Ans. **4**

Sol. Fact

54. Identify the correct statement about ClF_3 from the following options :

(1) It has a trigonal pyramidal geometry with two lone pairs on Cl atom.

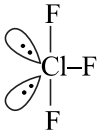
(2) It has T-shaped geometry with two lone pairs on Cl atom. -

(3) It has a planar trigonal geometry with two lone pairs on Cl atom.

(4) It has T -shaped geometry with three lone pairs on Cl atom.

Ans. **2**

Sol.



T shaped geometry

with two lone pairs on Cl atom.

55. Calculate emf of the half-cell given below:

$Pt(s)|\ H_2(g, 2atm)\ |\ HCl(aq, 0.02M)$

$E^0_{H_2/H^+} = 0\,V$

(Given: $\frac{2{\cdot}303RT}{F} = 0{\cdot}059,\ \log 2 = 0.3010$)

(1) 1.109 V (2) 0.035 V

(3) –0.035 V (4) –0.109 V

Ans. **1**

Sol. $$E_{H_2/H^+} = E^0_{H_2/H^+} - \frac{2.305RT}{nF}\log\frac{\left[H^+\right]^2}{\left[P_{H_2}\right]}$$

$$= 0 - \frac{.059}{2}\log\frac{(0.02)^2}{2}$$

$$= -\frac{.059}{2}\log 2\times10^{-4} = 0.109\,V$$

56. Match List-I with List II:

List-I (Order of reaction)	**List-II (Unit of rate constant)**
A. Zero order	I. $mol^{-1}\,Ls^{-1}$
B. First order	II. $mol^{-2}\,L^2\,s^{-1}$
C. Second order	III. s^{-1}
D. Third order	IV. $mol^{-1}\,L^{-1}\,s^{-1}$

Choose the correct answer from the options given below:

(1) A-IV, B-III, C-II, D-I (2) A-I, B-II, C-III, D-IV

(3) A-IV, B-III, C-I, D-II (4) A-IV, B-II, C-I, D-III.

Ans. **3**

Sol. Unit = $(mol\,L^{-1})^{1-n}\,s^{-1}$

n = order of reaction

57. The calculated 'spin-only' magnetic moment of $Ti^{2+}(3d^2)$ is :

(1) 2.84 BM (2) 5.92 BM

(3) 4.90 BM (4) 3.87 BM

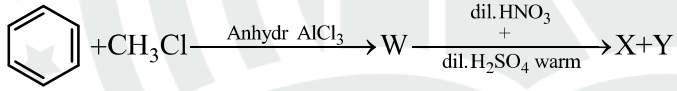
Ans. **1**

Sol. $Ti^{+2} =_{18} [Ar]4s^0 3d^2$

$n = 2$

$u = \sqrt{n(n+2} = \sqrt{2(2+2} = \sqrt{8} = 2.84\,BM$

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



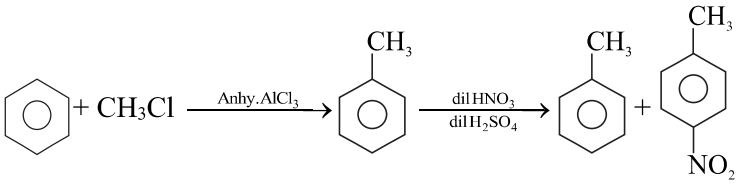
The suitable method that can be used for the separation of products X and Y is:

(1) Continuous extraction (2) Differential extraction

(3) Fractional distillation (4) Sublimation

Ans. **3**

Sol.



X and Y have BP close to each other so it separated by fractional distillation.

59. A bulb is rated at 150 watt, converting 8% energy into light. If energy of one photon is 4.42×10^{-19} J, how many photons are emitted by the bulb per second?

(1) 1.35×10^{19} (2) 4.06×10^{19}

(3) 2.71×10^{19} (4) 27.2×10^{19}

Ans. **3**

Sol. No. of photon =?

Light energy = 8% of 150 Wrated bulb

$$= \frac{150\times8}{100} = 12\,J/sec$$

No. of photon = $\frac{\text{Total energy}}{\text{Energy of one photon}} = \frac{12}{4.42\times10^{-19}}$

$= 2.71\times10^{19}$

60. In a test tube containing a salt, a few drops of dilute H_2SO_4 was added, which gave colourless vapours having the smell of vinegar. The vapours turned the blue litmus paper red.
Identify the correct anion from the following:

(1) Acetate, CH_3COO^- (2) Carbonate, CO_3^{2-}

(3) Sulphate, SO_4^{2-} (4) Sulphide, S^{2-}

Ans. **1**

Sol. Acetate gives vinegar smell and also turn blue Litmus red.

61. Select the reagents that reduce nitriles to primary amines:

A. (i) $LiAlH_4$; (ii) H_2O B. Sn + HCl

C. H_2 / Ni D. $Na(Hg) / C_2H_5OH$

E. Br_2 / aq.NaOH

Choose the correct answer from the options given below:

(1) A, B and C only (2) A, C and D only.

(3) A, D and E only (4) B, D and E only

Ans. **2**

Sol. R-CN converted to primary amine by

(1) $LiAlH/H_2O$

(2) H_2/Ni

(3) Na/C_2H_5OH

62. Identify the incorrect statement from the following:

(1) Carbon has the ability to form pπ-pπ multiple bond with itself.

(2) ECl_3 (E = B and Al) is a monomer when E = B and a dimer when E = A1.

(3) Oxygen exhibits only -2 oxidation state.

(4) The order of catenation property of Group 14 elements is C >> Si > Ge ≈ Sn.

Ans. **.**

Sol. Oxygen can show –2, –1, +1, +2 and –1/2, O.S

Rest all are correct

63. Although +3 oxidation state is most common in lanthanoids, cerium still shows +4 oxidation state because:

(1) Its nearest inert gas is Radon.

(2) After losing one more electron, it acquires $4f^{14}$ electronic configuration.

(3) Its atomic number is 61.

(4) After losing one more electron, it acquires $4f^{0}$ electronic configuration.

Ans. **.**

Sol. When one e^- lost by $4f^1$ it be can $4f^0$.

64. During Lassaigne's test, the elements present in an organic compound are converted from:

(1) covalent form to covalent form (2) ionic form to ionic form

(3) covalent form to ionic form (4) ionic form to covalent form

Ans. **(3)**

Sol. Covalent to ionic so that they can be tested by suitable reagent.

65. The number of hydrogen atoms present in 5.4 g of urea is:

(Given: Molar mass of urea : $60\,g\,mol^{-1}$, $N_A : 6.022\times10^{23}$ particles mol^{-1})

(1) 2.168×10^{23} (2) 2.168×10^{22}

(3) 1.084×10^{22} (4) 1.084×10^{23}

Ans. **(1)**

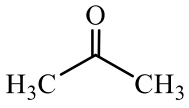
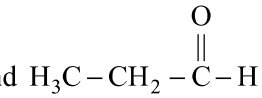
Sol. Mole of urea $= \frac{5.4}{60} = 0.09$

Number of total H-atom = $0.09 \times 6.022 \times 10^{23} \times 4 = 2.168 \times 10^{23}$

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

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

(2) $CH_3OCH_2CH_2CH_3$ and $CH_3CH_2OCH_2CH_3$

(3)  and 

(4) $CH_3CH_2CH_2CH_2CH_3$ and $(CH_3)_2CHCH_2CH_3$

Ans. **(2)**

Sol. alkyl group on both side of ether is different.

67. Identify the incorrect statement from the following:

(1) $P(C_2H_5)_3$ and $As(C_6H_5)_3$ form dπ- dπ bond with transition metals.

(2) Nitrogen can form dπ- pπ bond with oxygen.

(3) Nitrogen can form pπ- pπ multiple bonds with itself.

(4) Phosphorus, arsenic and antimony show catenation property.

Ans. **(2)**

Sol. Nitrogen can't form dπ-pπ bond with oxygen as both N and O does not have d-orbital.

68. Phenolphthalein is used as an indicator for the titration of sodium hydroxide solution against a standard solution of oxalic acid. The colour change that is observed at an alkaline pH close to the equivalence point during this titration is:

(1) pinkish red to yellow (2) yellow to pinkish red

(3) colourless to pink (4) pink to colourless

Ans. **(3)**

Sol. Colorless to pink

$HPh \rightleftharpoons H^+ + \underset{\text{Pink}}{Ph^-}$ (favourd in basic (weak medium))

69. Match List I with List II :

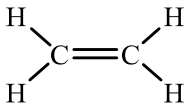
List-I	**List-II**
A. C_2H_4	I. 3σ bond, 2π bonds
B. C_2H_2	II. 3σ bond, one lone pair
C. CH_4	III. 4σ bond
D. NH_3	IV. 5σ bond, 1π bond

Choose the correct answer from the options given below:

(1) A-IV, B-I, C-III, D-II (2) A-III, B-IV, C-II, D-I

(3) A-I, B-II, C-IV, D-III (4) A-II, B-III, C-I, D-IV

Ans. **(1)**

Sol. I.  $\rightarrow 5\sigma + 1\ \pi$

II. $H-C\equiv C-H \rightarrow 3\sigma + 2\ \pi$

III. $CH_4 \rightarrow 4\sigma$ bond

IV. $NH_3 \rightarrow 3\sigma$ bond, 1 lone pair.

70. 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:

(1) 700 J (2) 300 J

(3) 400 J (4) 500 J

Ans. **(2)**

Sol. $\Delta U = q + W$

$= 500 + (-200) = 300$ J

71. Methane reacts with steam at 1273 K in the presence of nickel catalyst to form:

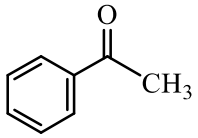
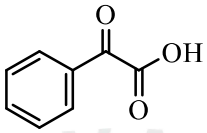
(1) CO and H_2 (2) CO and H_2O

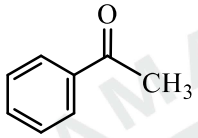
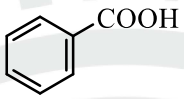
(3) CO_2 and H_2O (4) CO_2 and H_2

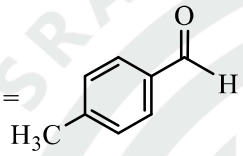
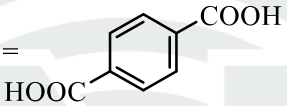
Ans. **(1)**

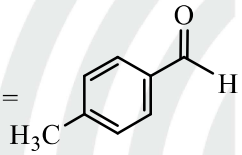
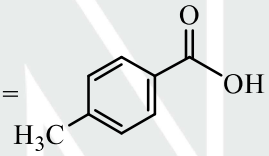
Sol. $CH_4 + \underset{(8\,atm)}{H_2O} \xrightarrow[Ni]{1273\,K} (CO + 3H_2)$ synthesis gas / water gas

72. 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) P =  ; Q = 

(2) P =  ; Q = 

(3) P =  ; Q = 

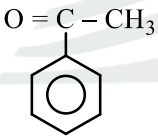
(4) P =  ; Q = 

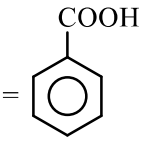
Ans. ()

Sol. P (C_8H_8O) $\xrightarrow{2,4\text{-DNP}}$ $>C=O$ group show + ve test.

$\downarrow H_2CrO_4$

Q $\xrightarrow{NaHCO_3}$ effervescence $C_6H_5COONa + H_2O +$ effervescence

P = 

Q = 

73. A solution of copper sulphate is electrolysed for 10 minutes with a current of 1.5 amperes. The mass of copper deposited at cathode is:

(Given: Molar mass of Cu = 63 g mol^{-1}; 1 F = 96487 C mol^{-1}).

(1) 2.4036 g (2) 1.7018 g

(3) 0.5876 g (4) 0.2938 g

Ans. **(4)**

Sol. $W = \dfrac{M \times i \times t}{n \times F} = \dfrac{63 \times 1.5 \times 600}{2 \times 96500} = 0.2938$ gm

74. The functional group that can be identified through phthalein dye test is:

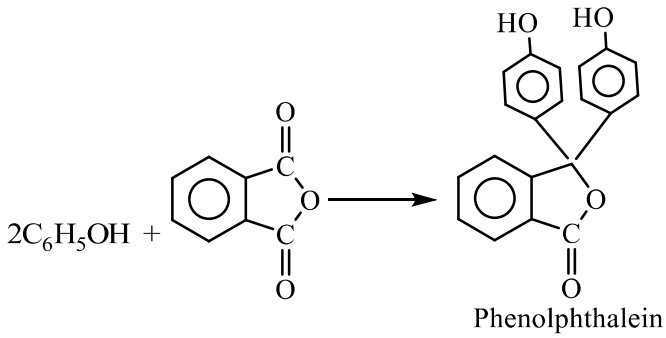
(1) Phenolic (2) Alcohol

(3) Aldehyde (4) Carboxylic acid

Ans. **(1)**

Sol. Phenol + Phthallic anhydride

$\xrightarrow{H_2SO_4}$ Phenophthalein



Phenolphthalein

75. The correct statement with regard to the secondary structure of DNA/RNA is:

(1) DNA possesses a single strand helix structure and contains uracil as one of the four bases.

(2) RNA possesses a single strand helix structure and contains thymine as one of the four bases.

(3) DNA possesses a double strand helix structure and contains thymine as one of the four bases.

(4) RNA possesses a double strand helix structure and contains uracil as one of the four bases.

Ans. **(3)**

Sol. DNA – Double stand helix structure.

76. Identify the correct statements:

A. The molality of 2.5g of ethanoic acid (Molar mass 60 g mol^{-1}) in 75g of benzene solution is 0.556 m.

B. The molarity of a solution containing 5g of NaOH (molar mass: 40 g mol^{-1}) in 450 mL of solution is 0.278 M at 298 K.

C. Aquatic species are more comfortable in cold water.

D. The solubility of gas increases with decrease in pressure.

E. For a binary mixture of A and B, the number of moles of A and B are n_A and n_B respectively.

The mole fraction of B will be $x_B = \frac{n_A}{n_A + n_B}$.

Choose the correct answer from the options given below:

(1) A and C only (2) A, B and C only

(3) A, D and E only (4) A and B only

Ans. **(2)**

Sol. (C) $\rightarrow$ Due to more oxygen content

77. Mixture of chloroform and acetone forms a solution with negative deviation from Raoult's law due to:

(1) formation of hydrogen bonding between acetone and chloroform.

(2) increase in escaping tendency of molecules of each component.

(3) stronger intermolecular forces between chloroform molecules than those between chloroform and acetone molecules.

(4) repulsive forces.

Ans. **(1)**

Sol. Formation of hydrogen bonding between acetone and chloroform.

78. At 298 K, a certain buffer solution contains equal concentrations of X^- and HX, K_b for X is 10^{-10}. What is the pH of this buffer solution?

(1) 2 (2) 10

(3) 4 (4) 6

Ans. **(3)**

Sol. $K_a = \frac{K_w}{K_b} = \frac{10^{-14}}{10^{-10}} = 10^{-4}$

Now, $pH = pK_a + \log\frac{[salt]}{[acid]}$

Since $[X^-] = [HX]$

$= 4 + \log\frac{X^-}{HX} = 4$

79. Identify the incorrect statement from the following:

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

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

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

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

Ans. **2**

Sol. Fact

80. The correct order of increasing metallic character of Na, Be, P, Mg and Si is :

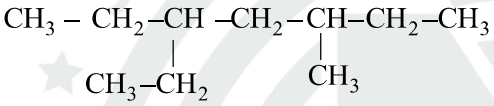
(1) $P < Si < Be < Mg < Na$ (2) $Be < Si < P < Mg < Na$

(3) $P < Si < Na < Mg < Be$ (4) $P < Mg < Be < Si < Na$

Ans. **1**

Sol. Fact

81. The correct IUPAC name of the following compound is:

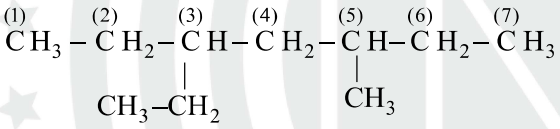


(1) 2,4-diethylhexane (2) 3,5-diethylhexane

(3) 3-ethyl-5-methylheptane (4) 3-methyl-5-ethylheptane

Ans. **3**

Sol.



82. 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:

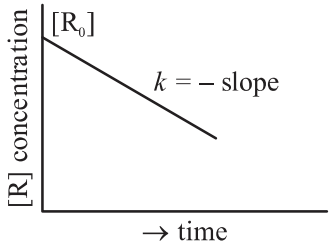
(1) A-I, B-III, C-IV, D-II (2) A-III, B-IV, C-I, D-II

(3) A-IV, B-I, C-III, D-II (4) A-III, B-I, C-IV, D-II

Ans. **4**

Sol. Fact

83. 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:



(1) 0 (2) 1

(3) 2 (4) 2.5

Ans. **1**

Sol. It is type of zero order reaction

84. Which one of the following is an ambidentate ligand ?

(1) Ethylenediaminetetraacetate ion (2) Oxalate

(3) Ethane-1,2-diamine (4) Thiocyanate

Ans. **4**

Sol. Fact

85. Consider the following reaction :

$2A(g) + B(g) \rightarrow 2D(g)$

$\Delta U^{\ominus} = -10\,kJ\,mol^{-1}$ and $\Delta S^{\ominus} = -44\,J\,K^{-1}$ at 298 K.

Identify the correct option with ΔG^{Θ} for the reaction and spontaneity of the reaction at 298 K.

(Given : $R = 8.31\,J\,mol^{-1}\,K^{-1}$)

(1) $-1.635\,kJ\,mol^{-1}$, spontaneous (2) $+0.63568\,kJ\,mol^{-1}$, non-spontaneous

(3) $-0.63568\,kJ\,mol^{-1}$, spontaneous (4) $+1.635\,kJ^{-1}\,mol^{-1}$, non-spontaneous

Ans. **2**

Sol.

$\Delta H = \Delta U + nRT$

$= -10000 - 8.31 \times 298$

$= -12476.3\ J$

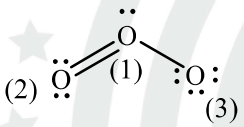
$\Delta G = \Delta H - T\Delta S$

$= 1247.3J - (-44 \times 298)$

$= -12476.3J + 13111.98 = 635.68$

$= +.63568\ kJ/mol$

86.



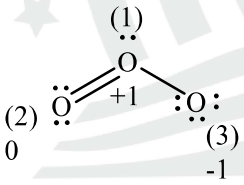
The correct formal charges on oxygen atoms numbered 2, 1 and 3 respectively are:

(1) –1,0, +1 (2) 0, +1, –1

(3) 0, 0, 0 (4) +1, 0, –1

Ans. **2**

Sol.



87. Given below are certain reactions. Identify the reaction for which $K_p \neq K_c$.

(1) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ (2) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$

(3) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ (4) $H_2O(g) + CO(g) \rightleftharpoons H_2(g) + CO_2(g)$

Ans. **3**

Sol. In IIIrd options $\Delta ng < 1$ and in rest all $\Delta ng = 0$.

88. Given below is an expression for the rate constant of a first order reaction occurring at a certain temperature, T(K).

$$\ln k = 14.34 - \frac{1.25 \times 10^4}{T}$$

The energy of activation in kcal mol^{-1} for the reaction is:

(Given: k in s^{-1}, $R = 1.987\,cal\,mol^{-1} \cdot K^{-1}$)

(1) 12.42 (2) 14.34

(3) 18.63 (4) 24.84

Ans. **4**

Sol. $\ell nK = 14.34 - \frac{1.25\times10^4}{T}$

$\ell nK = \ell nA - \frac{EA}{RT}$

$\frac{E_a}{RT} = \frac{1.25\times10^4}{T} = E_a = R\times1.25\times10^4$

$= 1.9\times1.25\times10^4$

$= 24.84$

89. The following two reactions give the same foul smelling product Z.

$C_2H_5Cl \xrightarrow{X} Z$

$C_2H_5\overset{\overset{O}{\|}}{C}NH_2 \xrightarrow{Br_2, NaOH} Y \xrightarrow[\Delta]{CHCl_3/\text{ethanolic KOH}} Z$

X and Z, respectively, are :

(1) $X = AgCN; Z = C_2H_5CN$ (2) $X = KCN; Z = C_2H_5CN$

(3) $X = KCN;\ Z = C_2H_5NC$ (4) $X = AgCN;\ Z = C_2H_5NC$

Ans. **4**

Sol. X = AgCN

$Z = C_2H_5NC$

$C_2H_5 - Cl \xrightarrow[AgCN]{X} Z = C_2H_5NC$

$C_2H_5\overset{\overset{O}{\|}}{C}NH_2 \xrightarrow[(Hoffmann\ bromamide)]{Br_2, NaOH} Y \xrightarrow[(carbyl\ amine\ reaction)]{\Delta} Z$

$Y = C_2H_5–NH_2$

$Z = C_2H_5NC$

90. Match List I with List II:

List-I (Complex)	**List-II (Type of isomerism)**
A. $[Pt(NH_3)_2Cl_2]$	I. Optical
B. $[Co(en)_3]^{3+}$	II. Solvate
C. $[Co(NH_3)_5NO_2]Cl_2$	III. Geometrical
D. $[Cr(H_2O)_6]Cl_3$	IV. Linkage

Choose the correct answer from the options given below:

(1) A-III, B-I, C-II, D-IV (2) A-I, B-III, C-II, D-IV

(3) A-III, B-I, C-IV, D-II (4) A-II, B-IV, C-III, D-I

Ans. **3**

Sol. According to isomerism

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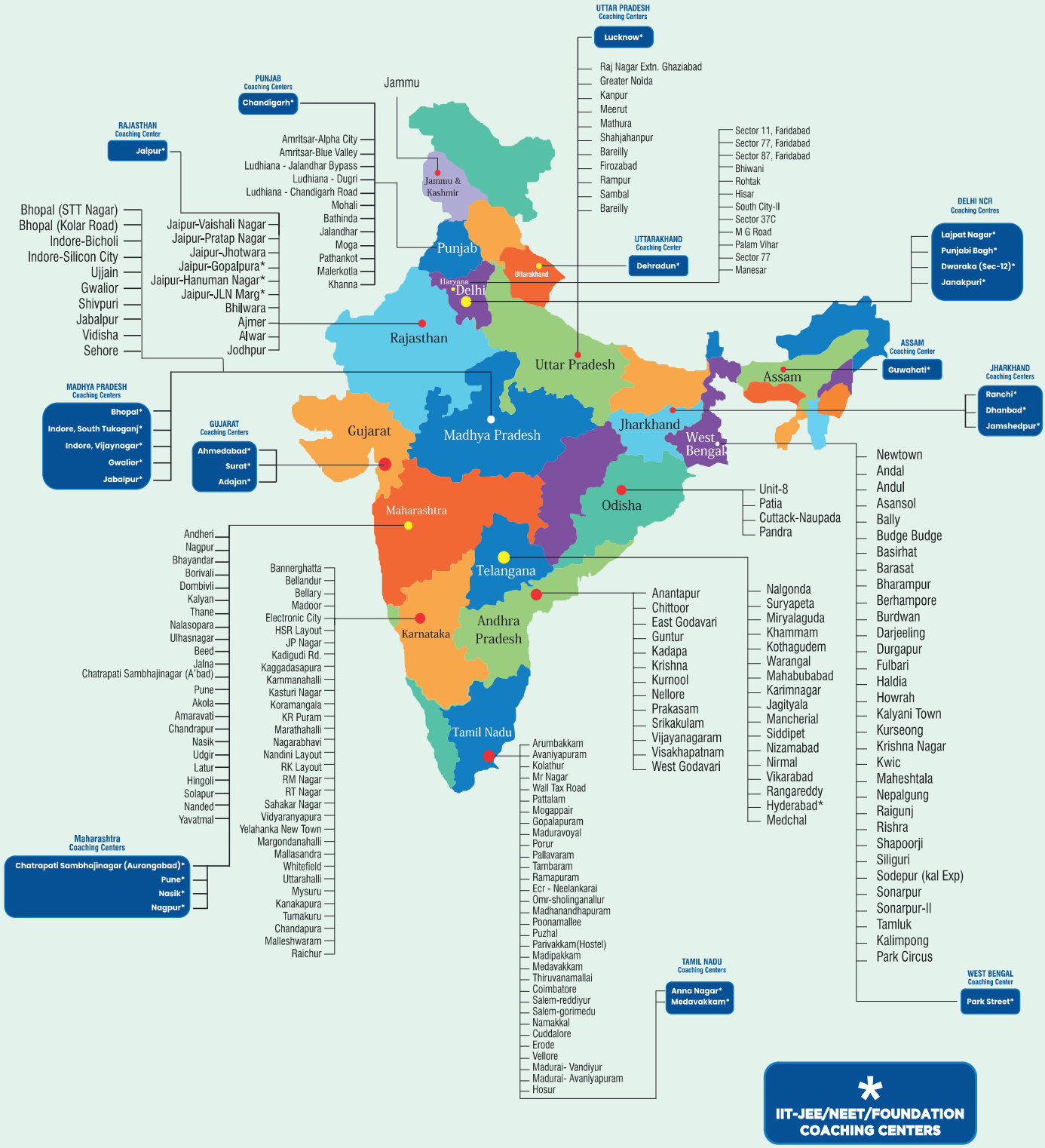

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