DATE: 21/06/2026

Test Booklet Code

50

SUSHRUT

Aakash
Medical | IIT-JEE | Foundations

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Sector-18, Udyog Vihar, Gurugram, Haryana - 122015.

Answers & Solutions for NEET (UG)-2026 (Re-Examination)

Time : 3 hrs. 15 min.

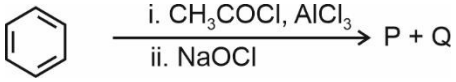
M.M. : 720

Important Instructions:

1. The test is of **3 hours 15 minutes** duration and the Test Booklet contains **180** multiple choice questions (Four options with a single correct answer) from **Physics, Chemistry & Biology (Botany** and **Zoology).**
2. Each question carries **4 marks**. For each correct response, the candidate will get **4 marks**. For each incorrect response, **1 mark** will be deducted from the total scores. The maximum marks are **720**.
3. Use **Blue / Black Ball Point Pen only** for writing particulars on this page / marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate **must handover the Answer Sheet (original & office copy) to the Invigilator** before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. The **CODE** for this Booklet is **50**.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/Answer Sheet. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
8. Each candidate must show on-demand his/her Admit Card to the Invigilator.
9. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.
10. Use of Electronic/Manual Calculator is prohibited.
11. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
12. No part of the **Test Booklet** and **Answer Sheet** shall be detached under any circumstances.
13. The candidates will write the Correct Test Booklet Code as given in the Test Booklet / Answer Sheet in the Attendance Sheet.

CHEMISTRY

46. For the following reaction sequence, choose the correct option.



(1) If **P** is the sodium salt of a carboxylic acid, **Q** is a primary alcohol

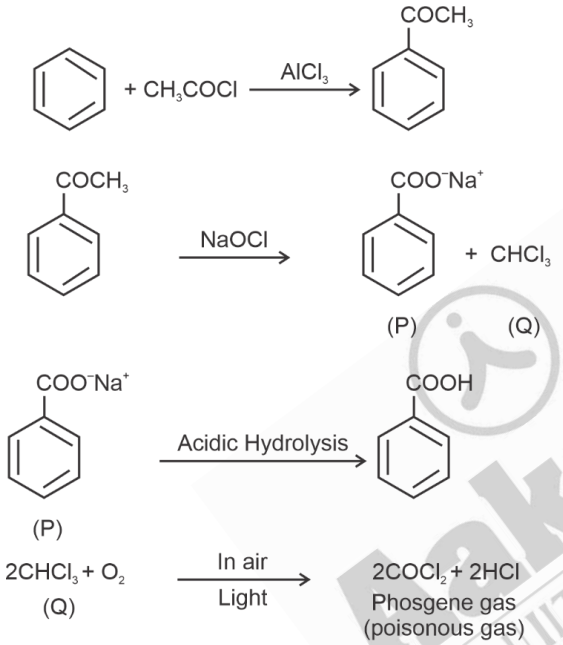
(2) **P** and **Q** are aromatic compounds

(3) If **P** gives a carboxylic acid on acidification, **Q** gives a poisonous gas on exposure to air and light

(4) Both **P** and **Q** are carbonyl compounds

Answer (3)

Sol.



47. Given below are two statements:

Statement-I : $[Fe(ox)_3]^{3-}$ is chiral.

Statement-II : *trans* – $[Cr(H_2O)_2(ox)_2]^-$ is chiral.

(Given : oxH_2 = HOOC – COOH)

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

(1) Both **Statement-I** and **Statement-II** are correct

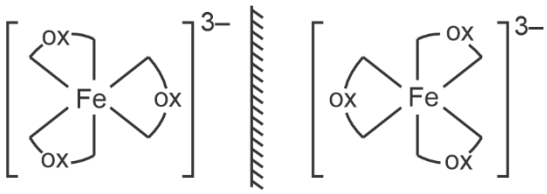
(2) Both **Statement-I** and **Statement-II** are incorrect

(3) **Statement-I** is correct but **Statement-II** is incorrect

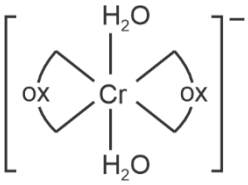
(4) **Statement-I** is incorrect but **Statement-II** is correct

Answer (3)

Sol.



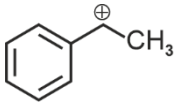
$[Fe(ox)_3]^{3-}$ is optically active and chiral with two non-superimposable mirror images.



Plane of symmetry (POS) is present in given species.

$\therefore$ It is NOT chiral and optically inactive.

48. The following carbocation is stabilized by the interaction of the empty *p* orbital with



(1) filled σ and filled π orbitals

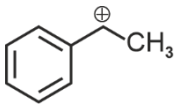
(2) empty σ and empty π^* orbitals

(3) empty σ^* and filled π orbitals

(4) empty σ^* and empty π^* orbitals

Answer (1)

Sol.



Due to resonance it is stabilised by filled π orbital.

Due to hyperconjugation, it is stabilised by filled σ orbitals.

49. In potash alum, the ratio of K^+ and SO_4^{2-} ions is

(1) 1 : 2

(2) 2 : 1

(3) 2 : 3

(4) 3 : 2

Answer (1)

Sol. Potash alum

$K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24\ H_2O$

No. of $K^+ = 2$

No. of $SO_4^{2-} = 4$

Ratio $\frac{K^+}{SO_4^{2-}} = \frac{2}{4} = \frac{1}{2}$

50. The correct statement about peptides and proteins is

(1) Tertiary structure of proteins has two or more polypeptide subunits

(2) Only the proteins having a quaternary structure are biologically active

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

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

Answer (3)

Sol. In β-pleated sheet structure, peptide chains are held together by intermolecular hydrogen bonds.

This is only correct statement.

Remaining (1), (2) and (4) are incorrect statements.

51. The numbers 17.0145 and 21.0235 were rounded to three figures after the decimal point. The resulting numbers, respectively, are

(1) 17.014 and 21.023

(2) 17.015 and 21.023

(3) 17.014 and 21.024

(4) 17.015 and 21.024

Answer (3)

Sol. If the rightmost digit to be removed is 5, then the preceding number is not changed if it is an even number, but it is increased by one if it is an odd number.

52. The correct order of solubility of the given salts in water at 298 K is

Salt	**K_{sp} at 298 K**
AgBr	5.0×10^{-13}
$Zn(OH)_2$	1.0×10^{-15}
Hg_2Cl_2	1.3×10^{-18}

(1) $Hg_2Cl_2 > Zn(OH)_2 > AgBr$

(2) $AgBr > Zn(OH)_2 > Hg_2Cl_2$

(3) $Hg_2Cl_2 > AgBr > Zn(OH)_2$

(4) $Zn(OH)_2 > AgBr > Hg_2Cl_2$

Answer (4)

Sol. $AgBr(s) \rightleftharpoons Ag^+(aq.) + Br^-(aq.)$

$K_{sp} = 5 \times 10^{-13} = S^2$

$S = \sqrt{5 \times 10^{-13}}$, $S = 7.07 \times 10^{-7}$ mol/l

$Zn(OH)_2(s) \rightleftharpoons Zn^{2+}(aq.) + 2OH^-(aq.)$

$K_{sp} = 10^{-15} = (S)(2S)^2$

$4S^3 = 10^{-15}$, $S = 0.63 \times 10^{-5} = 6.3 \times 10^{-6}$ mol/l

$Hg_2Cl_2(s) \rightleftharpoons Hg_2^{2+}(aq.) + 2Cl^-(aq.)$

$K_{sp} = 1.3 \times 10^{-18} = 4S^3$, $S = 0.69 \times 10^{-6} = 6.9 \times 10^{-7}$ mol/l

The correct order of solubility is:

$Zn(OH)_2 > AgBr > Hg_2Cl_2$

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

(1) F > Cl > Br > I

(2) Br > Cl > F > I

(3) Cl > F > Br > I

(4) I > Br > Cl > F

Answer (3)

Sol.

Group 17 Elements	Electron gain enthalpy (kJ/mol)
F	–328
Cl	–349
Br	–325
I	–295

So, the correct order of electron gain enthalpy is Cl > F > Br > I.

54. **Assertion A:** For an ideal solution formed by mixing liquids **P** and **Q**, Δ_{mix} H = 0 and Δ_{mix} V = 0

Reason R: No interactions occur between **P** and **Q**

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

(1) Both **A** and **R** are correct and **R** is the correct explanation of **A**

(2) Both **A** and **R** are correct but **R** is **NOT** the correct explanation of **A**

(3) **A** is correct but **R** is not correct

(4) **A** is not correct but **R** is correct

Answer (3)

Sol. For ideal solution, Δ_{mix} H = 0 and Δ_{mix} V = 0

In ideal solution energy required to break interaction between P-P and Q-Q will be same as the energy released on the interaction of P-Q.

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

(1) leucine

(2) threonine

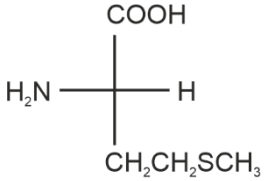
(3) methionine

(4) serine

Answer (3)

Sol. In case both nitrogen and sulphur are present in an organic compound, it gives blood red colour with sodium nitroprusside.

$\therefore$ Methionine



56. The standard electrode potential (E°) for the half-cell reaction $Fe^{3+} + e^- \rightarrow Fe^{2+}$ at 298 K is

(Given : $E°(Fe^{3+}/Fe) = -0.04$ V and $E°(Fe^{2+}/Fe) = -0.44$ V at 298 K)

(1) +0.40 V

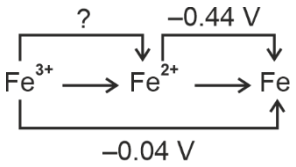
(2) +0.76 V

(3) –0.48 V

(4) +0.92 V

Answer (2)

Sol.



$\Delta G°_{Fe^{3+}/Fe} = \Delta G°_{Fe^{3+}/Fe^{2+}} + \Delta G°_{Fe^{2+}/Fe}$

$-nFE° = -nFE° + -nFE°$

$-3F(-0.04) = -1FE° + 2F(0.44)$

$3F(0.04) = -Fe° + 0.88F$

$0.12 = -E° + 0.88$

$0.12 - 0.88 = -E°$

$-0.76 = -E°$

$E° = 0.76$ V

57. In an acidic medium, 10 mL of 0.25 M oxalic acid is titrated with $KMnO_4$ solution. If the volume of $KMnO_4$ solution required to reach end point is 10 mL, the strength of the $KMnO_4$ solution is

(1) 0.10 M

(2) 0.20 M

(3) 0.25 M

(4) 0.15 M

Answer (1)

Sol. $KMnO_4 + H_2C_2O_4 \xrightarrow{H^+} Mn^{2+} + 2CO_2 + H_2O$

No. of equivalent of $KMnO_4$ = No. of equivalent of $H_2C_2O_4$

$10 \times 5 \times M = 10 \times 0.25 \times 2$

$M = \frac{5}{50}$

$M = \frac{1}{10} = 0.10$ M

58. According to crystal field theory, the correct order of ligands with respect to their decreasing order of field strength is

(1) $CO > NH_3 > H_2O > Cl^-$

(2) $CO > H_2O > NH_3 > Cl^-$

(3) $Cl^- > H_2O > NH_3 > CO$

(4) $Cl^- > NH_3 > H_2O > CO$

Answer (1)

Sol. The correct decreasing order of field strength according to crystal field theory is

$CO > NH_3 > H_2O > Cl^-$

59. Two moles of an ideal gas undergo free expansion from 10 L to 100 L at 300 K. The values of ΔS_{system} and $\Delta S_{surroundings}$ are

(R is universal gas constant)

(1) $\Delta S_{system} = 0$; $\Delta S_{surroundings} = 0$

(2) $\Delta S_{system} = 4.606\ R$; $\Delta S_{surroundings} = -4.606\ R$

(3) $\Delta S_{system} = 0$; $\Delta S_{surroundings} = 4.606\ R$

(4) $\Delta S_{system} = 4.606\ R$; $\Delta S_{surroundings} = 0$

Answer (4)

Sol. During free expansion

$$\Delta S_{system} = nR\ln\frac{V_2}{V_1}$$

$$= 2.303 \times 2 \times R \times \log\frac{100}{10}$$

$$= 4.606\ R$$

$\Delta S_{surroundings} = 0$ as $q = 0$

60. $2A \xrightarrow{k} B$ is a zero-order reaction, where $k = 1.0\ mol\ L^{-1}\ min^{-1}$. If the initial concentration of A is 2 M, then the time taken to complete 75% of the reaction will be

(1) 1.5 min

(2) 0.75 min

(3) 1.0 min

(4) 2.0 min

Answer (2)

Sol. For zero order reaction

$$-\frac{1}{2}\frac{dA}{dt} = k$$

$$t = \frac{A_0 - A_t}{2k}$$

$$t = \frac{2 - 0.5}{2} = 0.75\ min$$

61. Given below are two statements: One is labelled as **Assertion A** and the other is labelled as **Reason R.**

Assertion A: Generally, 3*d* transition metals have high melting points.

Reason R: Involvement of 3*d*-electrons in addition to 4*s*-electrons in the interatomic metallic bonding.

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

(1) Both **A** and **R** are correct and **R** is the correct explanation of **A**

(2) Both **A** and **R** are correct and **R** is **NOT** the correct explanation of **A**

(3) **A** is correct but **R** is not correct.

(4) **A** is not correct but **R** is correct

Answer (1)

Sol. The melting points of 3d transition metals are generally high. This is attributed to the involvement of greater number of electrons from (n – 1) d in addition to the ns electrons in the interatomic metallic bonding.

62. For a salt **XY**, which is a strong electrolyte, the plot of Λ_m versus $\sqrt{c}$ has a slope of –90.0 S cm^2 mol$^{-3/2}$ L$^{1/2}$ at 298 K. At 0.01 M concentration of **XY**, the value of Λ_m is 145.0 S cm^2 mol^{-1}. The limiting molar conductivity of Y^- ion ($\lambda^0_{Y^-}$, in S cm^2 mol^{-1}) at 298 K will be

(Given : $\lambda^0_{X^+}$ = 74.0 S cm^2 mol^{-1})

(1) 80.0

(2) 100.0

(3) 90.0

(4) 76.0

Answer (1)

Sol. y = mx + c

slope = –90

According to $\lambda_m = \lambda^0_m - A\sqrt{c}$

$145 = \lambda^0_m - 90 \times 0.1$

$\lambda^\circ_m = 154 \text{ S cm}^2 \text{ mol}^{-1}$

$\lambda^\circ_{m(XY)} = \lambda^\circ_{X^+} + \lambda^\circ_{Y^-}$

$154 = 74 + \lambda^\circ_{Y^-}$

$\lambda^\circ_{Y^-} = 80 \text{ S cm}^2 \text{ mol}^{-1}$

63. The amount of carbon dioxide evolved upon complete combustion of 116 g of n-butane is

(Given: atomic mass in amu H = 1, C = 12 and O = 16)

(1) 352 g

(2) 322 g

(3) 176 g

(4) 362 g

Answer (1)

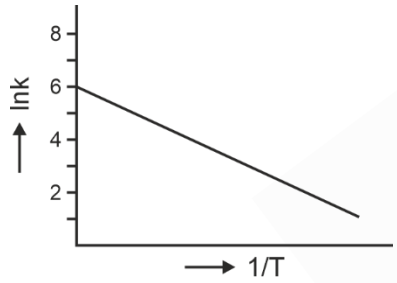
Sol. $C_4H_{10} + \frac{13}{2}O_2 \rightarrow 4CO_2 + 5H_2O$

$\because$ 1 mole C_4H_{10} produces 4 mole CO_2

$\because$ 58 g $C_4H_{10} \equiv 4 \times 44$ g CO_2

$\therefore$ 116 g $C_4H_{10} \equiv \frac{4 \times 44}{58} \times 116 = 352$ g

64. For an elementary chemical reaction, the Arrhenius plot is given below.



If the energy of activation is 6.64 kJ mol^{-1} and R = 8.3 J K^{-1} mol^{-1}, the temperature at which the rate constant becomes e^2 min^{-1}, is

(1) 125 K

(2) 150 K

(3) 200 K

(4) 250 K

Answer (3)

Sol. $\ln k = \ln A - \frac{E_a}{RT}$

$$\ln(e^2) = 6 - \frac{6.64 \times 10^3 \text{ J mol}^{-1}}{8.3 \text{ J K}^{-1} \text{ mol}^{-1} \times T}$$

$$2 = 6 - \frac{6.64 \times 10^3}{8.3 \times T}$$

$$T = \frac{6.64 \times 10^3}{8.3 \times 4} = 200 \text{ K}$$

65. Given below are two statements :

Statement-I : Heating NaCl with concentrated H_2SO_4 and MnO_2 results in oxidation of Mn.

Statement-II : Heating NaI with concentrated H_2SO_4 and MnO_2 results in reduction of Mn.

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

(1) Both **Statement-I** and **Statement-II** are correct

(2) Both **Statement-I** and **Statement-II** are incorrect

(3) **Statement-I** is correct but **Statement-II** is incorrect

(4) **Statement-I** is incorrect but **Statement-II** is correct

Answer (4)

Sol. Statement-I : (False)

$$2NaCl + \overset{+4}{Mn}O_2 + 2H_2SO_4 \rightarrow Na_2SO_4 + \overset{+2}{Mn}SO_4 + 2H_2O + Cl_2$$

So, reduction of Mn is taking place.

Statement-II : (True)

$$2NaI + \overset{+4}{Mn}O_2 + 2H_2SO_4 \rightarrow Na_2SO_4 + \overset{+2}{Mn}SO_4 + I_2 + 2H_2O$$

So, Mn has undergone reduction.

66. Among the species given below, the spin-only magnetic moment is highest for

(Given: Atomic number of Ti = 22, Mn = 25, Fe = 26 and Co = 27)

(1) $[Mn(CN)_6]^{3-}$ (2) $[Fe(CN)_6]^{3-}$

(3) $[Co(NH_3)_6]^{3+}$ (4) $[Ti(H_2O)_6]^{3+}$

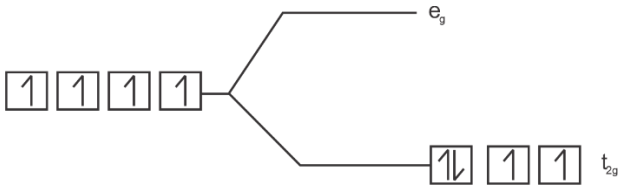
Answer (1)

Sol. In $[Ti(H_2O)_6]^{3+} \Rightarrow Ti^{3+} \Rightarrow [Ar]\ 4s^0\ 3d^1$

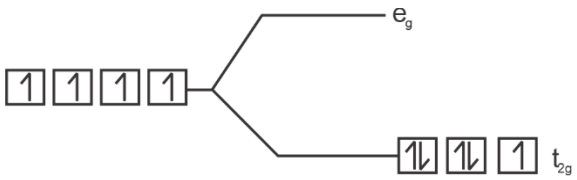
Number of unpaired electron = 1

In $[Mn(CN)_6]^{3-} \Rightarrow Mn^{3+} \Rightarrow [Ar]\ 4s^0\ 3d^4$

Number of unpaired electrons = 2



In $[Fe(CN)_6]^{3-} \Rightarrow Fe^{3+} \Rightarrow [Ar]\ 4s^0\ 3d^5$



Number of unpaired electron = 1

67. The lanthanide ion having four unpaired electrons is

(Given : Atomic numbers of Ce = 58, Nd = 60, Tb = 65 and Ho = 67)

(1) Nd^{3+}

(2) Ce^{3+}

(3) Tb^{3+}

(4) Ho^{3+}

Answer (4)

Sol. The outermost electronic configuration is

Ho^{3+} $4f^{10}$ | ↿⇂ | ↿⇂ | ↿⇂ | 1 | 1 | 1 | 1 |

4 unpaired electrons

Nd^{3+} $4f^3$ 3 unpaired electrons

Ce^{3+} $4f^1$ 1 unpaired electron

Tb^{3+} $4f^8$ | ↿⇂ | 1 | 1 | 1 | 1 | 1 | 1 |

6 unpaired electrons

68. The formula of tetraammineaquachloridocobalt(III) chloride is

(1) $[Co(NH_3)_4Cl_2] \times H_2O$

(2) $[Co(NH_3)_4]Cl_3 \times H_2O$

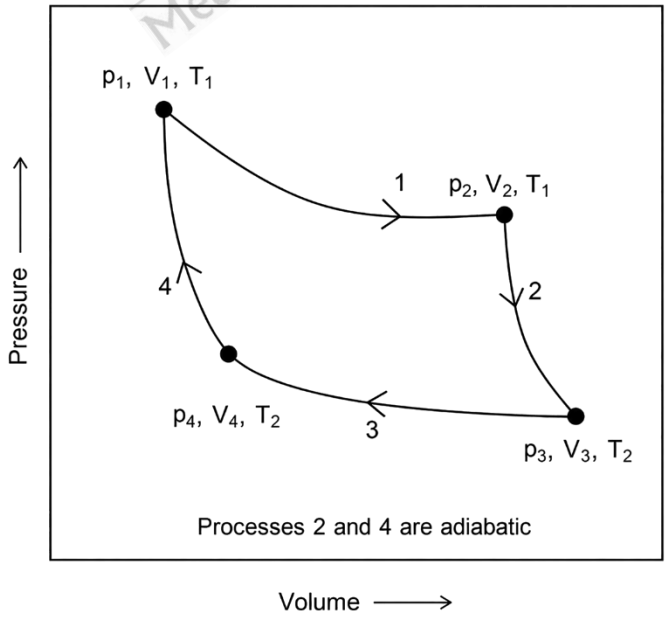
(3) $[Co(NH_3)_4(H_2O)Cl]Cl$

(4) $[Co(NH_3)_4(H_2O)Cl]Cl_2$

Answer (4)

Sol. Tetraammineaquachloridocobalt(III) chloride is $[Co(NH_3)_4(H_2O)Cl]Cl_2$.

69. Consider the reversible processes for 1.0 mol of an ideal gas as shown in the figure.



w_1, w_2, w_3 and w_4 represent work done (in calories) in the processes 1, 2, 3 and 4, respectively; ΔU_2 and ΔU_4 are changes in the internal energy for the processes 2 and 4, respectively.

[use R = 2 cal K^{-1} mol^{-1}]

The correct option is

(1) $w_1 + w_3 = -2T_1 \ln \frac{V_2}{V_1} - 2T_2 \ln \frac{V_4}{V_3}$

(2) $w_2 + w_4 = \Delta U_2 - \Delta U_4$

(3) $w_1 + w_2 = 2T_1 \ln \frac{V_2}{V_1}$

(4) $w_1 + w_2 + w_3 + w_4 = 0$

Answer (1)

Sol. $w_1 \rightarrow$ isothermal reversible process

$$w_1 = -nRT_1 \ln \frac{V_2}{V_1}$$

$$w_1 = -1 \times R \times T_1 \ln \frac{V_2}{V_1}$$

$$w_3 = -n \times R \times T_2 \ln \frac{V_4}{V_3}$$

$$w_3 = -1 \times R \times T_2 \ln \frac{V_4}{V_3}$$

$$w_1 + w_3 = -nRT_1 \ln\left(\frac{V_2}{V_1}\right) - nRT_2 \ln\left(\frac{V_4}{V_3}\right)$$

$$w_1 + w_3 = -2T_1 \ln\left(\frac{V_2}{V_1}\right) - 2T_2 \ln\left(\frac{V_4}{V_3}\right)$$

70. 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:

(1) Both **A** and **R** are correct and **R** is the correct explanation of **A**

(2) Both **A** and **R** are correct and **R** is **NOT** the correct explanation of **A**

(3) **A** is correct but **R** is not correct.

(4) **A** is not correct but **R** is correct

Answer (1)

Sol. N = $1s^2\ 2s^2\ 2p^3$

F : $1s^2\ 2s^2\ 2p^5$

First ionization enthalpy $(\Delta_i H)$

$(\Delta_i H)$ for N = 1402 kJ mol^{-1}

$\Delta_i H$ for O = 1314 kJ mol^{-1}

$\Delta_i H$ for F = 1681 kJ/mol

Due to half filled stable electronic configuration of nitrogen, it's first ionization enthalpy is higher than that of oxygen

$$O(g) \longrightarrow O^+(g) + e^-$$
$$2s^2 2p^4 \qquad 2s^2 2p^3$$

(half filled p subshell)

71. Consider the following statements about the solutions formed by mixing two liquids.

A. An ideal solution thus formed obeys Raoult's law throughout the composition range.

B. Mixture of chloroform and acetone shows negative deviation from Raoult's law.

C. Mixture of aniline and phenol shows positive deviation from Raoult's law.

(1) A and B only

(2) B and C only

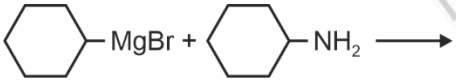
(3) A only

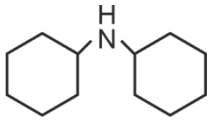
(4) A and C only

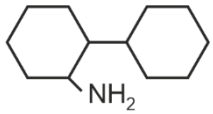
Answer (1)

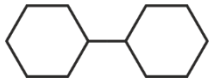
Sol. In the case of phenol and aniline solution, the intermolecular hydrogen bonding between phenolic proton and lone pair on nitrogen atom of aniline is stronger than the respective intermolecular hydrogen bonding between similar molecules. Therefore it shows negative deviation.

72. One of the products formed in the following reaction is



(1) 

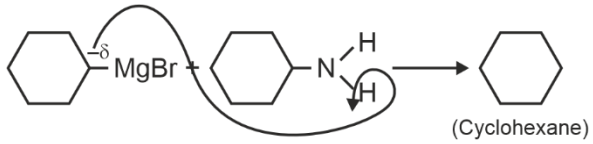
(2) 

(3) 

(4) 

Answer (4)

Sol.



Grignard reagents react with amines to extract proton and convert into corresponding hydrocarbon.

73. The correct statement is

(1) Boron has a maximum covalency of four.

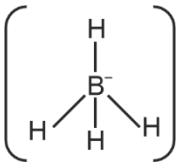
(2) Beryllium has three valence orbitals.

(3) Magnesium has a maximum covalency of four.

(4) Aluminium has five valence orbitals.

Answer (1)

Sol.
- Aluminium has nine valence orbitals
- Beryllium has four valence orbitals
- Magnesium has a maximum covalency of six.
- Boron has maximum covalency of four



74. A protein undergoes reversible thermal denaturation from its initial state **N** to denatured state **D** according to $\mathbf{N} \rightleftharpoons \mathbf{D}$. At 60ºC, the concentrations of both **N** and **D** are equal at equilibrium, and the standard enthalpy change of denaturation is 666 kJ mol^{-1}. The standard entropy change (ΔS^{o} in kJ K^{-1} mol^{-1}) of the protein upon denaturation at 60ºC is closest to

(1) 2.0

(2) 2000.0

(3) 333.0

(4) 11.1

Answer (1)

Sol. $\Delta S = \frac{\Delta H}{T}$

$= \frac{666}{333}$

= 2 kJ K^{-1} mol^{-1}

75. 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:

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

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

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

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

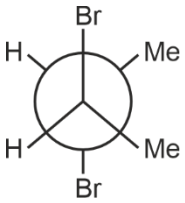
Answer (2)

Sol.

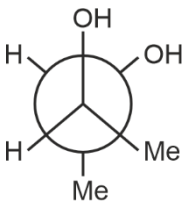
	Compound	Hybridization of central atom/ion	Geometry
A.	PCl_5	sp^3d	Trigonal bipyramidal
B.	BrF_5	sp^3d^2	Square pyramidal
C.	BF_4^-	sp^3	Tetrahedral
D.	$[Ni(CN)_4]^{2-}$	dsp^2	Square planar

76. 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.

(1) Both **Statement I** and **Statement II** are correct

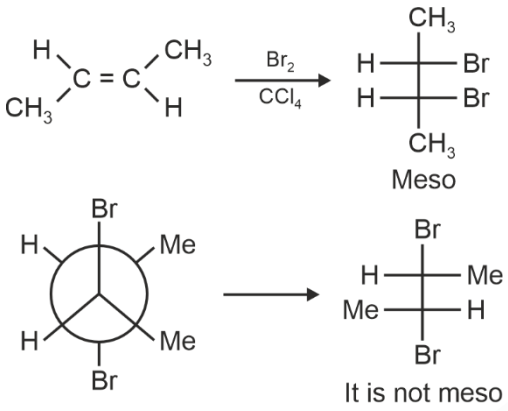
(2) Both **Statement I** and **Statement II** are incorrect

(3) **Statement I** is correct but **Statement II** is incorrect

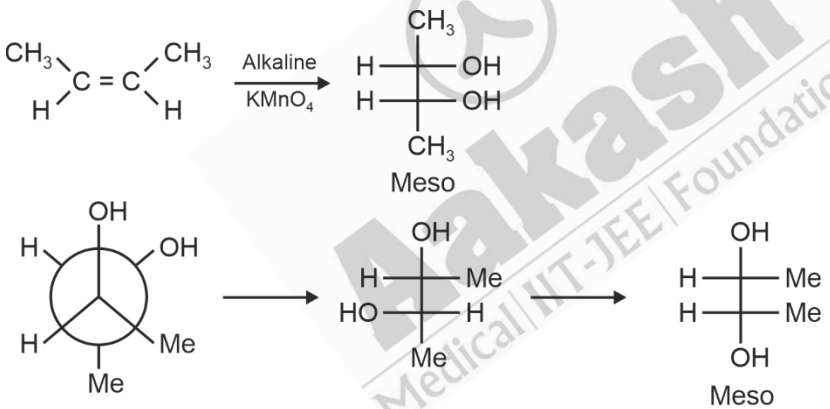
(4) **Statement I** is incorrect but **Statement II** is correct

Answer (4)

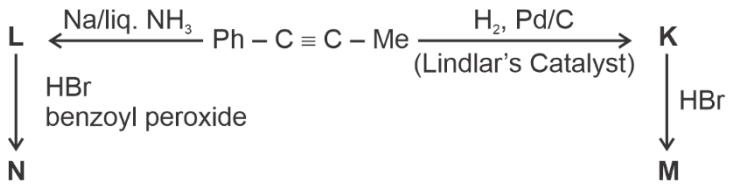
Sol.



Therefore, statement-I is incorrect.



77. Consider the following reaction sequences and choose the correct option.



(1) **K** and **L** are geometrical isomers

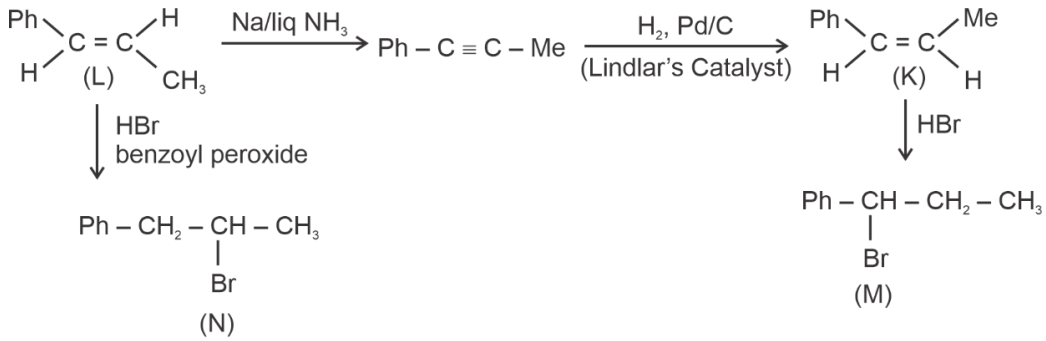
(2) **K** and **L** are enantiomers

(3) **M** and **N** are geometrical isomers

(4) **M** and **N** are stereoisomers

Answer (1)

Sol.



78. The complex which has *facial* and *meridional* isomers is

(Given : py = pyridine and en = $H_2N - CH_2 - CH_2 - NH_2$)

(1) $[Cr(py)_3(Cl)_3]$

(2) $[Cr(H_2O)_6]^{3+}$

(3) $[Co(NH_3)_4(H_2O)_2]^{3+}$

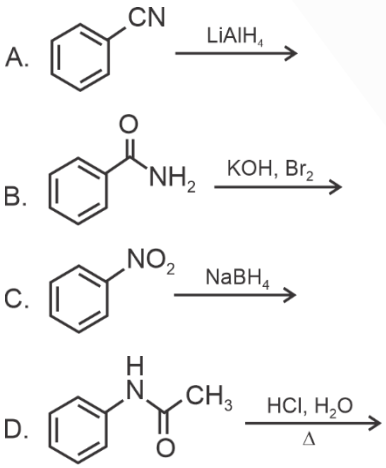
(4) $[Ni(en)_2(H_2O)_2]^{2+}$

Answer (1)

Sol. The complex with type $[Ma_3b_3]$ type of complexes show fac and mer type of isomers.

$\therefore$ $[Cr(py)_3(Cl)_3]$ shows fac and mer isomers.

79. Identify the reactions which give aniline as the major product.



Choose the correct answer from the options given below.

(1) A and B only

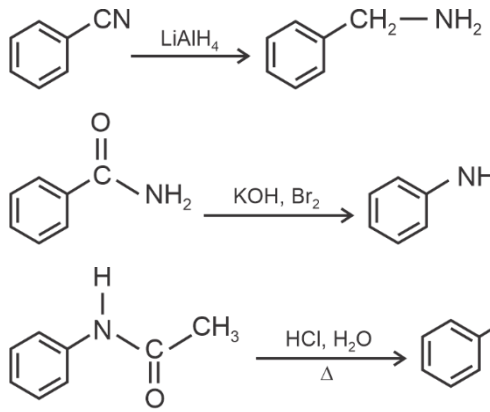
(2) B and D only

(3) A and C only

(4) C and D only

Answer (2)

Sol.



80. Match the vitamins in **List I** with their sources in **List II**

	List I		**List II**
A.	vitamin A	I.	meat
B.	vitamin B_{12}	II.	sunflower oil
C.	vitamin E	III.	green leafy vegetables
D.	vitamin K	IV.	carrots

Choose the correct answer from the options given below.

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

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

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

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

Answer (2)

Sol.

	Vitamin	**Sources**
A.	Vitamin A	Carrot
B.	Vitamin B_{12}	Meat
C.	Vitamin E	Sunflower oil
D.	Vitamin K	Green leafy vegetables

81. The correct decreasing order of oxidation state of the underlined atom in each molecule is

(1) $\underline{P}_4O_{10} > \underline{S}O_3 > H_2\underline{O}$

(2) $\underline{N}_2O_5 > \underline{Al}_2O_3 > H_2\underline{S}$

(3) $\underline{Pb}O_2 > \underline{N}_2O_3 > \underline{S}O_3$

(4) $\underline{P}_4O_6 > \underline{Cl}_2O_7 > \underline{Al}H_3$

Answer (2)

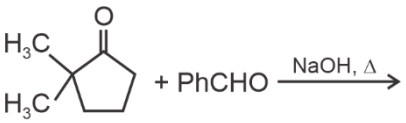
Sol. $\overset{+3}{\underline{P}_4}O_6,\ \overset{+7}{\underline{Cl}_2}O_7,\ \overset{+3}{\underline{Al}}H_3$

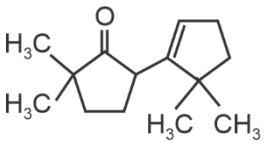
$\overset{+5}{\underline{P}_4}O_{10},\ \overset{+6}{\underline{S}}O_3,\ H_2\overset{-2}{\underline{O}}$

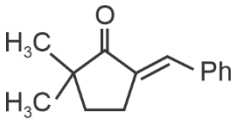
$\overset{+5}{\underline{N}_2}O_5,\ \overset{+3}{\underline{Al}_2}O_3,\ H_2\overset{-2}{\underline{S}}$

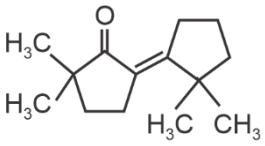
$\overset{+4}{\underline{Pb}_2},\ \overset{+3}{\underline{N}_2}O_3,\ \overset{+6}{\underline{S}}O_3$

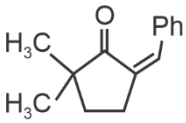
82. The compound that **CANNOT** be obtained from the aldol condensation reaction shown below, is



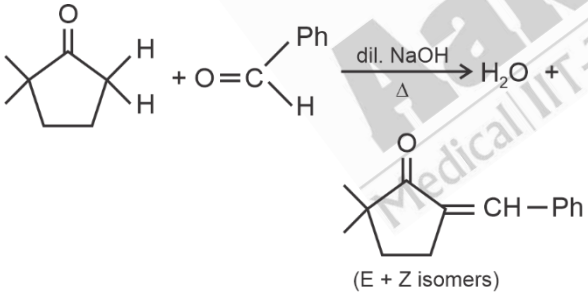
(1) 

(2) 

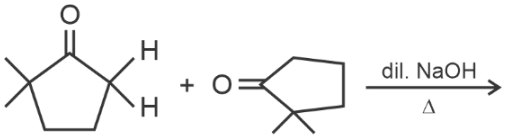
(3) 

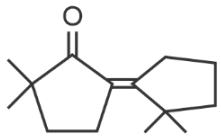
(4) 

Answer (1)

Sol. 

(E + Z isomers)





α, β-unsaturated carbonyl compound

Therefore, compound 2 cannot be obtained by aldol condensation of given compounds.

83. Among the following, the compound having conjugated double bonds is

(1) hepta-1,3-diene

(2) hepta-1,4-diene

(3) hepta-1,5-diene

(4) hepta-1,6-diene

Answer (1)

Sol. hepta-1,6-diene : $\overset{7}{H_2C}=\overset{6}{CH}-\overset{5}{CH_2}-\overset{4}{CH_2}-\overset{3}{CH_2}-\overset{2}{CH}=\overset{1}{CH_2}$

hepta-1,3-diene : $\overset{7}{CH_3}-\overset{6}{CH_2}-\overset{5}{CH_2}-\overset{4}{CH}=\overset{3}{CH}-\overset{2}{CH}=\overset{1}{CH_2}$

hepta-1,4-diene : $\overset{7}{CH_3}-\overset{6}{CH}-\overset{5}{CH}=\overset{4}{CH}-\overset{3}{CH_2}-\overset{2}{CH}=\overset{1}{CH_2}$

hepta-1,5-diene : $\overset{7}{CH_3}-\overset{6}{CH}=\overset{5}{CH}-\overset{4}{CH_2}-\overset{3}{CH_2}-\overset{2}{CH}=\overset{1}{CH_2}$

An organic compound (diene) with two double bonds separated by one single bond is termed as conjugated diene.

84. Given below are two statements:

Statement-I : Oxidation of p-nitrotoluene with acidic $KMnO_4$ gives an acid that is stronger than benzoic acid.

Statement-II : Reduction of p-nitrotoluene with Sn/HCl followed by neutralization gives an amine that is more basic than aniline.

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

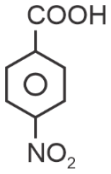
(1) Both **Statement-I** and **Statement-II** are correct

(2) Both **Statement-I** and **Statement-II** are incorrect

(3) **Statement-I** is correct but **Statement-II** is incorrect

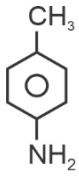
(4) **Statement-I** is incorrect but **Statement-II** is correct

Answer (1)

Sol. • Oxidation of p-nitrotoluene with acidic $KMnO_4$ converts into p-nitrobenzoic acid.  because

of −I effect and −M effect, making p-nitrobenzoic acid as stronger acid than benzoic acid.

- Reduction of p-nitrotoluene with Sn/HCl followed by neutralization reduces the ($-NO_2$) to an amino group ($-NH_2$), forming p-toluidine.



i.e., p-methylaniline is more basic than aniline due to the +I effect and hyperconjugation.

85. The green paramagnetic species formed by heating $KMnO_4$ at 513 K is

(1) K_2MnO_4

(2) Mn_3O_4

(3) MnO

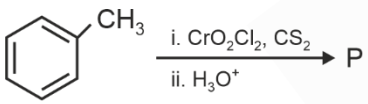
(4) KO_2

Answer (1)

Sol. $2KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

K_2MnO_4 will form on heating $KMnO_4$ which has green colour.

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



(1) On treating compound **P** with saturated $NaHCO_3$ solution, brisk effervescence is observed

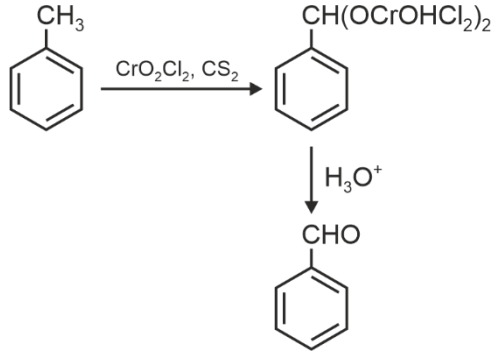
(2) Compound **P** can be prepared by treating benzene with anhydrous $AlCl_3$ and CH_3COCl

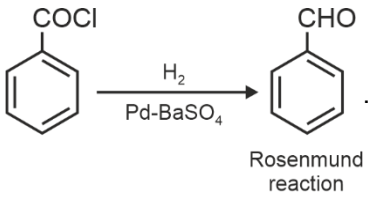
(3) On treatment with bromine water, compound **P** gives a white precipitate

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

Answer (4)

Sol.



Compound P is obtained by 

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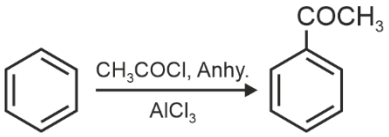


87. A 1 : 3 electrolyte in an aqueous solution is

(1) $[CoCl_2(NH_3)_4]Cl$

(2) $[CoCl(NH_3)_5]Cl_2$

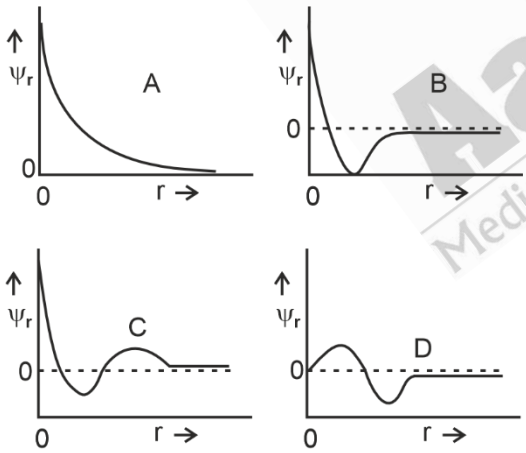
(3) $[Co(NH_3)_6]Cl_3$

(4) $[Co(NH_3)_3(NO_2)_3]$

Answer (3)

Sol. The aqueous solution of $[Co(NH_3)_6]Cl_3$ is a type of 1 : 3 type electrolyte as it undergoes dissociation into $[Co(NH_3)_6]^{3+}$ and $3Cl^-$ ions.

88. Consider the following schematic plots of orbital wavefunction (ψ_r) against distance (r) from the nucleus.



The figure representing two radial nodes in the orbital is

(1) A

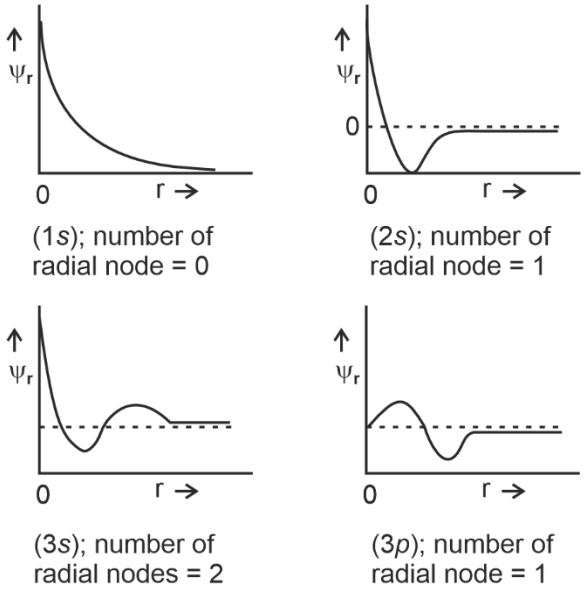
(2) B

(3) C

(4) D

Answer (3)

Sol.



89. Arrange the following compounds in the increasing order of polarity

A. $CH_3CH_2OCH_2CH_3$

B. CH_3CH_2OH

C. CH_3COCH_3

D. CH_3COOH

Choose the correct answer from the options given below.

(1) A < B < C < D

(2) C < A < D < B

(3) C < A < B < D

(4) A < C < B < D

Answer (4)

Sol. On the basis of polarity the correct order is

$C_2H_5OC_2H_5 < CH_3COCH_3 < CH_3CH_2OH < CH_3COOH$

So correct order is

A < C < B < D

90. The highest occupied molecular orbital for Ne_2 is

(1) π_{2p}

(2) σ_{2p}

(3) π^*_{2p}

(4) σ^*_{2p}

Answer (4)

Sol. $Ne_2 : \sigma 1s^2 < \sigma^* 1s^2 < \sigma 2s^2 < \sigma^* 2s^2 < \sigma 2p_z^2 < (\pi 2p_x^2 = \pi 2p_y^2) < \pi^* 2p_x^2 = \pi^* 2p_y^2 < \sigma^* 2p_z^2$

$\sigma^* 2p_z$ i.e. $\sigma^* 2p$ is highest occupied orbital.