

PART : CHEMISTRY**Section-I****Single Choice Type**

This section contains **35 Single choice questions**. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **Only One** is correct.

35, dy fodYi iz'u gSi iz'u ds4 fodYi (1), (2), (3) rFkk (4) gStuesd flQZd lgh gSA

51. The following solutions were prepared by dissolving 10 g of glucose ($C_6H_{12}O_6$) in 250 ml of water (P_1), 10 g of urea (CH_4N_2O) in 250 ml of water (P_2) and 10 g of sucrose ($C_{12}H_{22}O_{11}$) in 250 ml of water (P_3). The right option for the decreasing order of osmotic pressure of these solutions is :

fuEu foy;uksa dks uk;k x;k :

250 ml ty esa 10 g Xywdksl ($C_6H_{12}O_6$) dks?kksydj (P_1), 250 ml ty esa 10 g ;wfj;k (CH_4N_2O) dks?kksydj (P_2), 250 ml ty esa 10 g lqØksl ($C_{12}H_{22}O_{11}$) dks?kksydj (P_3) A bu foy;uksa dsijk l k nk uksa ds?kVrsØe dk lgh fodYi gS

- (1) $P_1 > P_2 > P_3$ (2) $P_2 > P_3 > P_1$ (3) $P_3 > P_1 > P_2$ (4) $P_2 > P_1 > P_3$

Ans. (4)

Sol. $\pi = iCRT$

C = Concentration of solution

i = 1 for all non-electrolyte solute

molar mass of solute $\downarrow \Rightarrow$ Concentration $\uparrow \Rightarrow$ Osmotic pressure $\uparrow$

Osmotic pressure $\propto$ MolarMass

Molar mass :	Glucose	Urea	Sucrose
	180	60	342 g/mole
	(P_1)	(P_2)	(P_3)

Order of osmotic pressure : $P_2 > P_1 > (P_3)$

52. Which one among the following is the correct option for right relationship between C_P and C_V for one mole of ideal gas ?

fuEu esa ls dksu l k fodYi ,d eksy vkn'kZksl dsfy, C_P , C_V ds lgh la dks0;Dr djrk gS

- (1) $C_P - C_V = R$ (2) $C_P = RC_V$ (3) $C_V - RC_P$ (4) $C_P + C_V = R$

Ans. (1)

Sol. $C_P - C_V = R$

Meyer's relation.

53. The major product formed in dehydrohalogenation reaction of 2-Bromo pentane is Pent-2-ene. This product formation is based on ?

- (1) Hund's Rule (2) Hofmann Rule (3) Huckel's Rule (4) Saytzeff's Rule

2- zksesiu dsfognbM'ksgSykstsuhdj k vfHkfØ;k dk eq[; mRikn iV-2-bZu gSA mDr mRikn dk fuekZ k vk/kkfjr gksrk gS

- (1) gM fu;e (2) gkWQeSu fu;e ij (3) gdy fu;e ij (4) lsVt+sQ fu;e ij

Ans. (4)

Br

Sol.

Elimination →

Major product during dehydrohalogenation.

Major product formation decided by saytzeff's rule.

54.

An organic compound contains 78% (by wt.) carbon and remaining percentage of hydrogen. The right option for the empirical formula of this compound is : [Atomic wt. of C is 12, H is 1]
 ,d dk Zud ;kSfxd esa 78% (Hkkj }kjk) dk Zu ,oaksk izfrkr gkbM%stu dh ek=kk gSA bl ;kSfxd dsewykuq ikrh lw=k dk lgh fodYi gS [ijek kqkkj % C = 12, H = 1]

- (1) CH₂ (2) CH₃ (3) CH₄ (4) CH

Ans.

(2)

Sol.

Remaining part of H = 100 – 78 = 22%

Element	% by mass	Mole	Sample ratio
C	78%	$\frac{78}{12} = 6.5$	$\frac{6.5}{6.5} = 1$
H	22%	$\frac{22}{1} = 22$	$\frac{22}{6.5} = 3.38$

∴ Empirical formula of organic compound = CH₃

55.

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

- (1) diagonal relationship (2) lanthanoid contraction
 (3) having similar chemical properties (4) belonging to same group
 Zr (Z = 40) ,oHf (Z = 72) dsijekf od ,oavk;fud f=kT;k, leku gS bldk dkj k gS
 (1) fod kZE U/k (2) ySUFksukW;M vkdqu
 (3) nksukadsjk;k;fud xq k/keZ leku gS (4) nksukaleku lewg dslnL; gS

Ans.

(2)

Sol.

Zr(40) and Hf (Z = 72) have similar atomic and Ionic Radius because of Lanthanide contraction.

56.

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

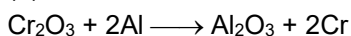
fuEu vfHkfØ;k;vsa lsdksu /kkrq foLFkk iu vfHkfØ;k gS lgh fodYi pquA

- (1) Cr₂O₃ + 2Al $\xrightarrow{\Delta}$ Al₂O₃ + 2Cr (2) Fe + 2HCl $\longrightarrow$ FeCl₂ + H₂ ↑
 (3) 2Pb(NO₃)₂ + 2PbO + 4NO₂ + O₂ ↑ (4) 2KClO₃ $\xrightarrow{\Delta}$ 2KCl + 3O₂

Ans.

(1)

Sol.



Al metal displace Cr from Cr₂O₃ of high temperature in Alumino thermite process.

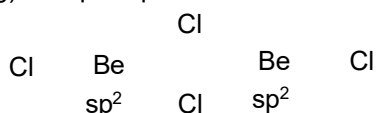
57.

The structures of beryllium chloride in solid state and vapour phase, are :

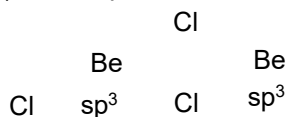
- (1) Linear in both (2) Dimer and Linear, respectively
 (3) Chain in both (4) Chain and dimer, respectively
 sjhfy;e DyksjkbM dh Bksl voLFkk ,oak"i voLFkk esa lajpuk, gS
 (1) nksukasa js[kh; (2) Øe'kl f}yd ,oaj[kh;
 (3) nksukasa J[kyk (4) Øe'kl J[kyk ,oaf}yd

Ans. (4)

Sol. BeCl_2 (g) – Vapour phase exist as dimer



BeCl_2 (s) – Solid phase form chain polymer



58. The **incorrect** statement among the following is :

- (1) Most of the trivalent Lanthanoid ions are colourless in the solid state.
- (2) Lanthanoids are good conductors of heat and electricity.
- (3) Actinoids are highly reactive metals, especially when finely divided.
- (4) Actinoid contraction is greater for element to element than Lanthanoid contraction.

Ans. (1)

Sol. (1) Most of the trivalent Lanthanoid ions are coloured both in solid state and in aqueous solution.

(2) Lanthanoids are good conductors of heat and electricity.

(3) Actinoids are highly reactive metals, especially when finely divided.

(4) Actinoid contraction is greater for element to element than Lanthanoid contraction.

Ans. (1)

Sol. (1) Most of the trivalent Lanthanoid ions are coloured both in solid state and in aqueous solution.

59. Ethylenediaminetetraacetate (EDTA) ion is :

- (1) Unidentate ligand
- (2) Bidentate ligand with two "N" donor atoms
- (3) Tridentate ligand with three "N" donor atoms
- (4) Hexadentate ligand with four "O" and two "N" donor atoms

Ans. (4)

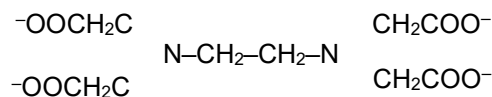
Sol. EDTA is a hexadentate ligand with 4-oxygen and two 'N' donor atom.

(1) Unidentate ligand

(2) Bidentate ligand with two "N" donor atoms

(3) Tridentate ligand with three "N" donor atoms

(4) Hexadentate ligand with four "O" and two "N" donor atoms



- 60.** 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, $c = 3.0 \times 10^8 \text{ ms}^{-1}$]

वर्तमान में, नई दिल्ली, एल.आई.आर. स्टेशन 1,368 kHz (फ्रीक्वेंसी) पर प्रसारण करता है। इस प्रसारण के लिए उत्सर्जित विद्युतचुम्बकीय विकिरण की तरंगदैर्घ्य (Wavelength) क्या है?

[$c = 3.0 \times 10^8 \text{ ms}^{-1}$]

- (1) 219.2 m (2) 2192 m (3) 21.92 m (4) 219.3 m

Ans. (4)

Sol. Frequency $\nu = 1368 \text{ KHz}$
 $\nu = 1368 \times 10^3 \text{ Hz}$
 $C = 3 \times 10^8 \text{ m/sec.}$
 $\lambda = ?$

We know that,

$$\nu = \frac{C}{\lambda}$$

$$\lambda = \frac{3 \times 10^8}{1368 \times 10^3}$$

$$\lambda = 219.3 \text{ metre.}$$

- 61. Statement I :** Acid strength increases in the order given as $\text{HF} \ll \text{HCl} \ll \text{HBr} \ll \text{HI}$.
Statement II : As the size of the elements F, Cl, Br, I increases down the group, the bond strength of HF, HCl, HBr and HI decreases and so the acid strength increases.

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

- (1) Both **Statement I** and **Statement II** are false.
 (2) **Statement I** is correct but **Statement II** are false.
 (3) **Statement I** is incorrect but **Statement II** is true.
 (4) Both **Statement I** and **Statement II** are true.
 दिए गए कथनों के आधार पर निम्नलिखित में से सही उत्तर चुनें।

Statement I : HF, HCl, HBr, HI के अम्ल शक्ति का क्रम $\text{HF} \ll \text{HCl} \ll \text{HBr} \ll \text{HI}$ है।
Statement II : F, Cl, Br, I के परमाणु आकार के साथ समूह में नीचे जाते जाते हैं, HF, HCl, HBr और HI के बंध शक्ति कम होती जाती है और अम्ल शक्ति बढ़ती जाती है।

- (1) दोनों **Statement I** और **Statement II** गलत हैं।
 (2) **Statement I** सही है, **Statement II** गलत है।
 (3) **Statement I** गलत है, **Statement II** सही है।
 (4) दोनों **Statement I** और **Statement II** सही हैं।

Ans. (4)

T

Sol. HF M-H
 HCl M size increase
 HBr Bond strength of M-H bond ↓
 HI Acidic strength ↑

B

62. Noble gases are named because of their inertness towards reactivity. Identify and **incorrect** statement about them.

- (1) Noble gases have very high melting and boiling points
- (2) Noble gases have weak dispersion forces.
- (3) Noble gases have large positive values of electron gain enthalpy.
- (4) Noble gases are sparingly soluble in water.

mRd"V xSlkæd k uke mudh jklk;fud vfHkfØ;k dsifr vfØ;rk dskj k iM+k gSA muls IE fu/kR vIR; dFku dks igpkusaA

- (1) mRd"V xSlkædsxyukad ,oaDoFkukad vfr mPp gksrsgS
- (2) mRd"V xSlkæsa nq Zy ifj{ksi k y gksrsgS
- (3) mRd"V xSlkædsbysDVkWu yfC/k ,UFkSVih dk eku mPp /kukRed gksrk gSA
- (4) mRd"V xSlæa ty esa vR; foyS; gS

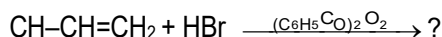
Ans. (1)

Sol. Noble gases have very low melting and boiling points. Due to present of very weak vander wall force of attraction. (London force)

63. The major product of the following chemical reaction is :

fuEu jklk;fud vfHkfØ;k esa eq[;k mRikn gS

CH₃



CH₃

- | | |
|--|---|
| <p>(1) $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}-\text{CH}_2-\text{CH}_2-\text{O}-\text{COC}_6\text{H}_5 \end{array}$</p> <p>(3) $\begin{array}{c} \text{CH}_3 \\ \\ \text{CBr}-\text{CH}_2-\text{CH}_3 \end{array}$</p> | <p>(2) $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}-\text{CH}-\text{CH}_3 \\ \\ \text{Br} \end{array}$</p> <p>(4) $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}-\text{CH}_2-\text{CH}_2-\text{Br} \\ \\ \text{CH}_3 \end{array}$</p> |
|--|---|

Ans. (4)

CH₃

Sol. $\text{CH}-\text{CH}=\text{CH}_2 + \text{HBr} \xrightarrow{(\text{C}_6\text{H}_5\text{COO})_2\text{O}} \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}_2-\text{Br}$

CH₃

CH₃

This is kharas effect or peroxide effect. Which show free radical addition reaction by anti markovnikoft rule.

64. The molar conductance of NaCl, HCl and CH₃COONa at infinite dilution are 126.45, 426.16 and 91.0 S cm² mol⁻¹ respectively. The moalr conductance of CH₃COOH at infinite dilution is. Choose the right option for your answer.

NaCl, HCl ,oaCH₃COONa dh vuar ruqrk ij eksyj pkydrk Øe'kl 126.45, 426.16 ,oa 91.0 S cm² mol⁻¹ gSA vuar ruqrk ij CH₃COOH dh eksy pkydrk gSA

- (1) 390.71 S cm² mol⁻¹ (2) 698.28 S cm² mol⁻¹ (3) 540.48 S cm² mol⁻¹ (4) 201.28 S cm² mol⁻¹

Ans. (1)

Sol. $\lambda_{m(\text{NaCl})}^{\infty} = 126.45 \text{ cm}^2 \text{ mol}^{-1}$, $\lambda_{m(\text{HCl})}^{\infty} = 426.16 \text{ cm}^2 \text{ mol}^{-1}$, $\lambda_{m(\text{CH}_3\text{COOH})}^{\infty} = ?$

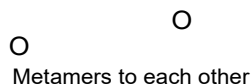
$$\begin{aligned}\lambda_{m(\text{CH}_3\text{COOH})}^{\infty} &= \lambda_{m(\text{CH}_3\text{COONa})}^{\infty} + \lambda_{m(\text{HCl})}^{\infty} - \lambda_{m(\text{NaCl})}^{\infty} \\ &= 91 + 426.16 - 126.45 \\ &= 390.71 \text{ S cm}^2 \text{ mole}^{-1}\end{aligned}$$

65. The compound which show metamerism is :

(1) $\text{C}_3\text{H}_8\text{O}$ (2) $\text{C}_3\text{H}_6\text{O}$ (3) $\text{C}_4\text{H}_{10}\text{O}$ (4) C_5H_{12}

Ans. (3)

Sol. $\text{C}_4\text{H}_{10}\text{O}$ can show metamerism because its ether structure can make metamers.



C_3H_{12} , $\text{C}_3\text{H}_8\text{O}$, $\text{C}_3\text{H}_6\text{O}$ can not show metamerism because no change in alkyl group possible.

66. The correct sequence of bond enthalpy of 'C-X' bond is :

'C-X' bond in alkyl halides

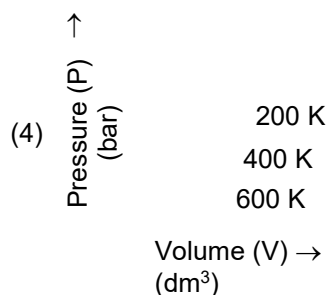
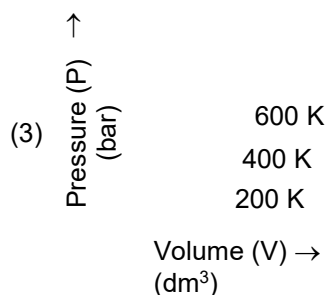
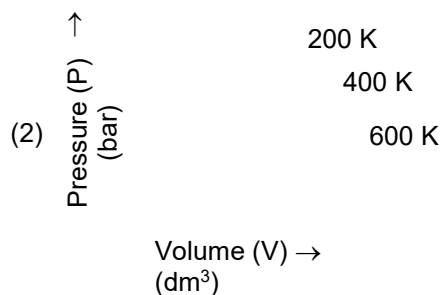
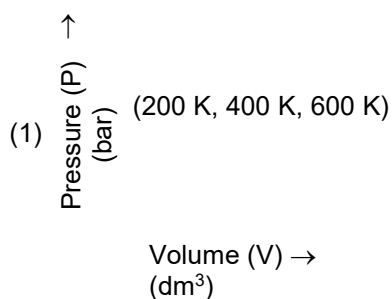
- (1) $\text{CH}_3 - \text{F} > \text{CH}_3 - \text{Cl} > \text{CH}_3 - \text{Br} > \text{CH}_3 - \text{I}$ (2) $\text{CH}_3 - \text{F} < \text{CH}_3 - \text{Cl} > \text{CH}_3 - \text{Br} > \text{CH}_3 - \text{I}$
 (3) $\text{CH}_3 - \text{Cl} > \text{CH}_3 - \text{F} > \text{CH}_3 - \text{Br} > \text{CH}_3 - \text{I}$ (4) $\text{CH}_3 - \text{F} < \text{CH}_3 - \text{Cl} < \text{CH}_3 - \text{Br} < \text{CH}_3 - \text{I}$

Ans. (1)

Sol. $\text{CH}_3 - \text{F} > \text{CH}_3 - \text{Cl} > \text{CH}_3 - \text{Br} > \text{CH}_3 - \text{I}$
 485 328 276 240 KJ/mol

67. Choose the correct option for graphical representation of Boyle's law, which shows a graph of pressure vs. Volume of a gas at different of a gas at different temperatures :

Pressure (P) vs. Volume (V) at different temperatures



Ans. (3)

Sol. For Boyles Law
Temperature → Constant

$$V \propto \frac{1}{P} \quad P \uparrow, V \downarrow$$

Area under curve = PV
and $PV \propto T$ $\uparrow$
So $PV \uparrow \Rightarrow T \uparrow$ P

600 K
400 K
200 K

V →

68. Right option of the number of tetrahedral and octahedral voids in hexagonal primitive unit cell are:
fdlh "kV~dkk; vk %gsDlkxksuy fizfefVo% ,dd dks"Bdk esprq"Qydh; ,oa"VQydh; fjjDr;kad lla[k;g srq
lgh fodYi gS

- (1) 6, 12 (2) 2, 1 (3) 12, 6 (4) 8, 4

Ans. (3)

Sol. For hexagonal primitive unit cell
Number of effective atoms per unit cell $Z = 6$
∴ Total no. of tetrahedral voids = $2Z$

$$= 2 \times 6$$

$$= 12$$

Total no. of octahedral voids = Z
= 6

69. Given below are two statements :

Statement I : Aspirin and Paracetamol belong to the class of narcotic analgesics.

Statement II : Morphine and Heroin are non-narcotic analgesics.

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

- (1) Both **Statement I** and **Statement II** are false
(2) **Statement I** is correct but **Statement II** is false
(3) **Statement I** is incorrect but **Statement II** is true
(4) Both **Statement I** and **Statement II** are true

uhps nksdFku fn, x, gS

dFku I : ,sfl ifju ,oaiSjkfIVkekWy Lokid ihM+kgkjh %ukjdv/d ,susYtsil d% oxZ dsgS

dFku II : ekWQhZu ,oagsjksbu vLokid ihM+kgkjh %ukWu&ukjdv/d ,susYtsil d% oxZ dsgS

mi;Dr dFkuksa ds izdk'k esa uhps fn, gq, fodYiksa lslgh mUkj pquA

- (1) nksukadFku I rFkk dFku II xyr gS (2) dFku I lgh gSysfdu dFku II xyr gSA
(3) dFku I xyr gSysfdu dFku II lgh gSA (4) nksukadFku I rFkk dFku II lgh gS

Ans. (1)

Sol. Aspirin and Paracetamol are non-narcotic analgesics where as Morphine and Heroin are narcotic analgesics.

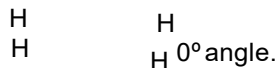
70. Dihedral angle of least stable conformer of ethane is :

(1) 180° (2) 60° (3) 0° (4) 120°

Ans. (3)

Sol. Dihedral angle of least stable conformer (fully Eclipsed) is 0° .

HH



71. Which one of the following methods can be used to obtain highly pure metal is liquid at room temperature?

- (1) Chromatography (2) Distillation (3) Zone refining (4) Electrolysis

Ans. (3)

Sol. Zone refining method of purification is used for highly pure metal or semimetal Ga, Si, B, Ge, In. Ga is liquid at room temperature.

72. Match List-I with List-II

List-I

- (a) PCl_5
(b) SF_6
(c) BrF_5
(d) BF_3

Choose the **correct** answer from the options given below

lwph-I dk feyku lwph-II ls djh

lwph-I

- (a) PCl_5
(b) SF_6
(c) BrF_5
(d) BF_3

uhps fn, x, fodYikss lslgh mUkj pqush

- (1) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
(3) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

Ans. (4)

List-II

- (i) Square pyramidal
(ii) Trigonal planar
(iii) Octahedral
(iv) Trigonal bipyramidal

lwph-II

- (i) oxZ fijkfemh
(ii) f=kdkk; leryh;
(iii) v"VQydh;
(iv) f=kdkk; fijkfemh

- (2) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(4) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

Sol.	PCl_5 Cl $\text{Cl} - \text{P} - \text{Cl}$ $\text{Cl} \quad \text{Cl}$ $\text{bp} = 5$ $\text{p} = 0$ $\text{total} = 5$ <u>Trigonal bipyramidal</u>	SF_6 F $\text{F} \quad \text{S} \quad \text{F}$ $\text{F} \quad \text{F} \quad \text{F}$ $\text{bp} = 6$ $\text{p} = 0$ $\text{total} = 6$ <u>sp³d² octahedral</u>
	BF_3 F $\text{F} - \text{B}$ F $\text{bp} = 3$ $\text{p} = 0$ $\text{total} = 3$ <u>Trigonal planar</u>	BrF_5 $\text{F} \quad \text{Br} \quad \text{F}$ $\text{F} \quad \text{F} \quad \text{F}$ $\text{bp} = 5$ $\text{p} = 1$ $\text{total} = 6$ <u>sp³d² square pyramidal</u>

So correct answer

- (a) $\text{PCl}_5 \longrightarrow$ trigonal bipyramidal (iv)
 (b) $\text{SF}_6 \longrightarrow$ octahedral (iii)
 (c) $\text{BrF}_5 \longrightarrow$ square pyramidal (i)
 (d) $\text{BF}_3 \longrightarrow$ trigonal planar (ii)

73. Tritium, a radioactive isotopes of hydrogen, emits which of the following particles ?

- (1) Alpha (α) (2) Gamma(γ) (3) Neutron(n) (4) Beta(β^-)
 (1) α (2) γ (3) n (4) β^-

Ans. (4)

Sol. Tritium is a Radioactive and emit low energy β^- particle { $t_{1/2} = 12.33$ years}

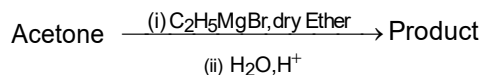
74. Which of the following polymers is prepared by addition polymerisation ?

- (1) Nylon-66 (2) Novolac (3) Dacron (4) Teflon
 (1) $\text{H}_2\text{N}(\text{CH}_2)_6\text{NH}_2$ and $\text{HOOC}(\text{CH}_2)_4\text{COOH}$ (2) $\text{C}_6\text{H}_5\text{CHO}$ and HCHO (3) $\text{HOOC}(\text{CH}_2)_4\text{COOH}$ and $\text{HOCH}_2\text{CH}_2\text{OH}$ (4) $\text{CF}_2=\text{CF}_2$

Ans. (4)

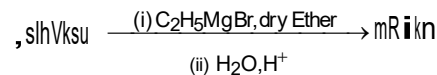
Sol. Teflon is a polymer of tetra fluoroethene so it is a Homo-polymer and addition polymer.

75. What is the IUPAC name of the organic compound formed in the following chemical reaction ?



- (1) pentan-2-ol (2) pentan-3-ol
(3) 2-methyl butan-2-ol (4) 2-methyl propan-2-ol

fuEu jklk; fud vfhk fØ; k esa fufeZr dk Øid ;kSfxd dk IUPAC uke D;k gS



- (1) islsu-2-vkWy (2) islsu-3-vkWy
(3) 2-esfky C;wlsu-2-vkWy (4) 2-esfky islsu-2-vkWy

Ans. (3)

76. The RBC deficiency is deficiency disease of :

- (1) Vitamin B₆ (2) Vitamin B₁ (3) Vitamin B₂ (4) Vitamin B₁₂

RBC dh deh] ghurk tfur jkx gS

- (1) foVkfeu B₆ (2) foVkfeu B₁ (3) foVkfeu B₂ (4) foVkfeu B₁₂

Ans. (4)

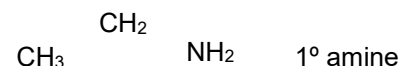
Sol. RBC deficiency is deficiency disease of B-12.

77. Identify the compound that will react with Hinsberg's reagent to give a solid which dissolves in alkali
ml ;kSfxd dksigpkusatksfgll xZ vfhk deZd dslkFk fØ; k djdsBksl uk, xk tkskkj esa ?kqyu'khy gS

- (1) $\begin{array}{c} CH_2 \\ | \\ CH_3 - NH - CH_3 \end{array}$ (2) $\begin{array}{c} CH_2 \\ | \\ CH_3 - NH_2 \end{array}$
(3) $\begin{array}{c} CH_2 \\ | \\ CH_3 - N - CH_3 \end{array}$ (4) $\begin{array}{c} CH_2 \\ | \\ CH_3 - NO_2 \end{array}$

Ans. (2)

Sol. Hinsberg reagent is used to identify amine (1°/2°/3°). If 1° amine react with Hinsberg reagent than white solid ppt appear which dissolve in alkali.



78. Among the following alkaline earth metal halides one which is covalent and soluble in organic solvents is:

- (1) Strontium chloride (2) Magnesium chloride
(3) Beryllium chloride (4) Calcium chloride

fuEu {kkjh; e`nk /kkrq gSykbMkasa lsdksu lgla; ksth ,oak iud foyk; dksa ?kqyu`khy gS

- (1) LV`mU`k;u DyksjkbM (2) eSXuhf`k;e DyksjkbM
(3) sjhf`y;e DyksjkbM (4) dSfY`k;e DyksjkbM

Ans. (3)

T
BeCl₂ Size of cation ↑
MgCl₂ Covalent Char. ↓
CaCl₂
SrCl₂

Sol.

B
So BeCl₂ has covalent nature so it is soluble in organic solvent.

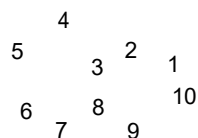
79. The correct structure of 2,6-Dimethyl-dec-4-ene is :

2,6-MkbsfFky-Msd-4-bZu dh lgh ljpuk gS

- (1) (2) (3) (4)

Ans. (4)

Sol. Correct structure of 2,6-Dimethyl dec-4-ene



80. The correct option for the number of bodycentred unit cells in all 14 types of Bravais lattice unit cells is :

dqy 14 izdkj ds astkydadh varh dshz ,dd dksf Bdkv kadh la;k dsf, lgh fodYi gS

- (1) 5 (2) 2 (3) 3 (4) 7

Ans. (3)

Sol. 3 body center found in cubic, tetragonal and orthorhombic in 14 type of bravis lattice.

81. The right option for the statement "Tyndall effect is exhibited by".....is :

- (1) Glucose solution (2) Starch solution (3) Urea solution (4) NaCl solution

"fVUMy i`hko fuEu ds }kj i`znf`kZr fd;k tkrk gSA" lgh fodYi pquA

- (1) Xywdksl foy;u (2) LVkpZ fody;u (3) ;wfj;k foy;u (4) NaCl foy;u

Ans. (2)

Sol. Starch solution is a type of colloidal solution and other are true solution so Starch solution shows Tyndall effect.

82. The pK_b of dimethylamine and pK_a of acetic acid are 3.27 and 4.77 respectively at T(K). The correct option for the pH of dimethylammonium acetate solution is :
 T(K) **ij** Mkbessfky, sehu dk pK_b , oa, slifvd vEy dk pK_a dk eku Øe'ki 3.27, oa 4.77 gSA Mkbessfkyveksu;e ,lhVsV foy;u ds pH dk lgh fodYi gS

(1) 5.50 (2) 7.75 (3) 6.25 (4) 8.50

Ans. (2)

Sol. $pK_b = 3.27$ (dimethylamine)

$pK_a = 4.77$ (acetic acid)

for dimethyl ammonium acetate it is an (WA + WB) salt.

$$pH = 7 + \frac{1}{2} pK_a - \frac{1}{2} pK_b$$

$$= 7 + \frac{1}{2} \times 4.77 - \frac{1}{2} \times 3.27$$

$$pH = 7 + 2.385 - 1.635$$

$$pH = 7.75$$

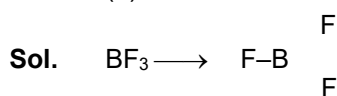
83. BF_3 is planar and electron deficient compound. Hybridization and number of electrons around the central atom, respectively are :

(1) sp^3 and 6 (2) sp^2 and 6 (3) sp^3 and 8 (4) sp^3 and 4

BF_3 ,d leryh; ,oabysDV^akWu U;wu ;kSfxd gSA dslzh; ijek kqdk ladj k ,oamldspkj^avk; bysDV^akWuk adh la;k gS Øe'ki

(1) sp^3 rFkk 6 (2) sp^2 rFkk 6 (3) sp^3 rFkk 8 (4) sp^3 rFkk 4

Ans. (2)



(sp^2 and $6e^-$)

Hybridisation of B is sp^2 and $6e^-$ around central atom.

84. The maximum temperature that can be achieved in blast furnace is :

(1) upto 2200 K (2) upto 1900 K (3) upto 5000 K (4) upto 1200 K

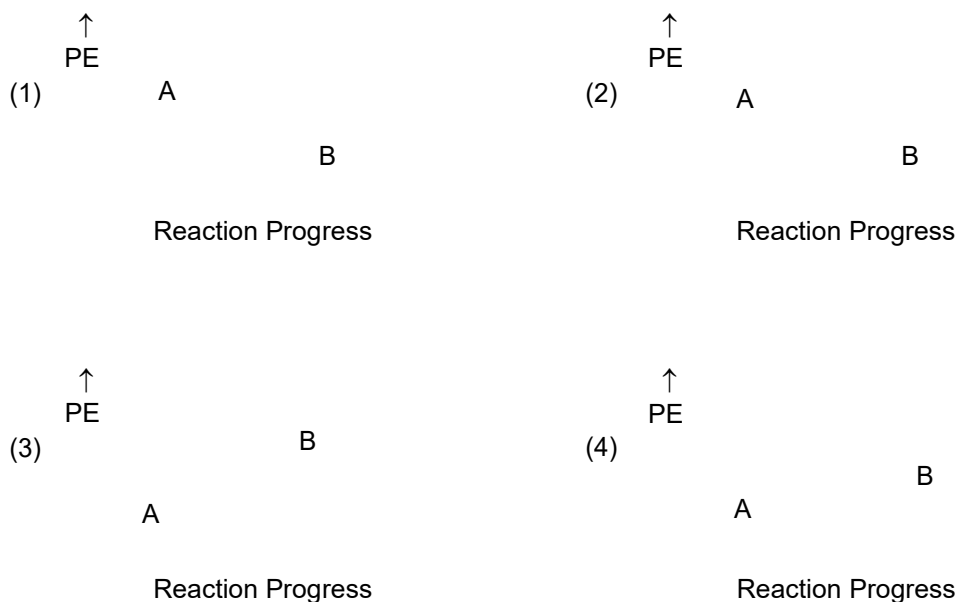
okR;k Hkèh esa izr fd;k tk ldu okyk vf/kdre rkieku gS

(1) 2200 K rd (2) 1900 K rd (3) 5000 K rd (4) 1200 K rd

Ans. (1)

Sol. In blast furnace highest temperature 2170 K (2200k) is found in lower part.

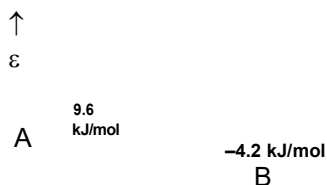
85. For a reaction $A \rightarrow B$ enthalpy of reaction -4.2 kJ mol^{-1} and enthalpy of activation is 9.6 kJ mol^{-1} . The correct potential energy profile for the reaction is shown in option.



Ans. (1)

Sol. $A \rightarrow B$ reaction $\Delta H = -4.2 \text{ kJ/mol}$

It is an exothermic reaction for this Energy of Reactant > Energy of product



E_a is approx. double of ΔH reaction.

Section-II Single Choice Type

This section contains **15 Single choice questions**. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **Only One** is correct.

Q1 [k M esa 15 ,dy fodYi iz'u gSA iz'u ds fodYi (1), (2), (3) rFkk (4) gSA] **Sit** **QZ** d Igh gSA

86. Match List – I with List – II.

List – I

- (a) $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{SO}_3(\text{g})$
 (b) $\text{HOCl}(\text{g}) \xrightarrow{h\nu} \text{HO} + \text{Cl}$
 (c) $\text{CaCO}_3 + \text{H}_2\text{SO}_4 \longrightarrow \text{CaSO}_4 + \text{H}_2\text{O} + \text{CO}_2$
 (d) $\text{NO}_2(\text{g}) \xrightarrow{h\nu} \text{NO}(\text{g}) + \text{O}(\text{g})$

Choose the **correct** answer from the options given below :

List – II

- (i) Acid rain
 (ii) Smog
 (iii) Ozone depletion
 (iv) Tropospheric pollution

lwph – I dk feyku lwph – II ls djia

lwph – I

- (a) $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{SO}_3(\text{g})$
 (b) $\text{HOCl}(\text{g}) \xrightarrow{h\nu} \text{HO} + \text{Cl}$
 (c) $\text{CaCO}_3 + \text{H}_2\text{SO}_4 \longrightarrow \text{CaSO}_4 + \text{H}_2\text{O} + \text{CO}_2$
 (d) $\text{NO}_2(\text{g}) \xrightarrow{h\nu} \text{NO}(\text{g}) + \text{O}(\text{g})$

uhps fn, x, fodYiksa lsgh mUkj pqusaA

lwph – II

- (i) vEY o"kkZ
 (ii) /kwe&dksqjk
 (iii) vkstksu {kj k
 (iv) {kksHkaMyh ; iznwlk k

(1) (a) – (ii), (b) – (iii), (c) – (iv), (d) – (i)

(3) (a) – (iii), (b) – (ii), (c) – (iv), (d) – (i)

(2)

(2) (a) – (iv), (b) – (iii), (c) – (i), (d) – (ii)

(4) (a) – (i), (b) – (ii), (c) – (iii), (d) – (iv)

Ans.

Sol.

- (a) $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{SO}_3(\text{g})$
 (b) $\text{HOCl}(\text{g}) \xrightarrow{h\nu} \text{HO} + \text{Cl}$
 (c) $\text{CaCO}_3 + \text{H}_2\text{SO}_4 \longrightarrow \text{CaSO}_4 + \text{H}_2\text{O} + \text{CO}_2$
 (d) $\text{NO}_2(\text{g}) \xrightarrow{h\nu} \text{NO}(\text{g}) + \text{O}(\text{g})$

- (iv) Tropospheric pollution
 (iii) Ozone depletion
 (i) Acid rain
 (ii) Smog

87. Match List – I with List – II.

List – I

- (a) $\xrightarrow[\text{Anhyd. AlCl}_3 / \text{CuCl}]{\text{CO, HCl}}$
 O
 (b) $\text{R}-\text{C}-\text{CH}_3 + \text{NaOX} \longrightarrow$
 (c) $\text{R}-\text{CH}_2-\text{OH} + \text{R}'\text{COOH} \xrightarrow{\text{Conc. H}_2\text{SO}_4}$
 (d) $\text{R}-\text{CH}_2\text{COOH} \xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) X}_2 / \text{Red P}}$

Choose the **correct** answer from the options given below.

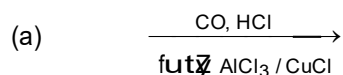
List – II

- (i) Hell-Volhard-Zelinsky reaction
 (ii) Gattermann-Koch reaction
 (iii) Haloform reaction
 (iv) Esterification

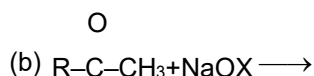
lwph-I dk feyku lwph - II ls dja

lwph-I

lwph - II



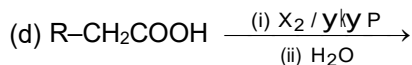
(i) gsy&QksyKMZ&tsfyaLdh vfHkfØ;k



(ii) xkVjeku&dks[k vfHkfØ;k



(iii) gSyksQkeZ vfHkfØ;k



(iv) ,LVjhdj k

uhps fn, x, fodYi& lsgh fodYi pqu&

(1) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)

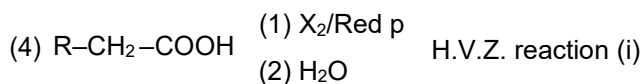
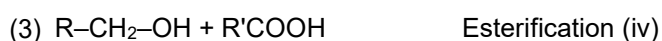
(2) (a) - (i), (b) - (iv), (c) - (iii), (d) - (ii)

(3) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)

(4) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)

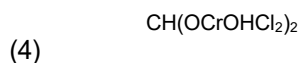
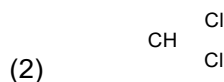
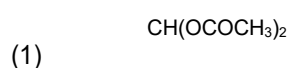
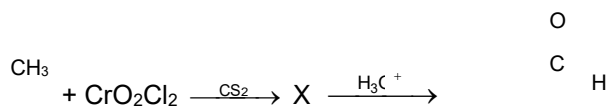
Ans. (3)

Sol. (1) $\xrightarrow[\text{HCl}]{\text{CO}}$ Gatterman- Koch reaction (ii)



88. The intermediate compound 'X' in the following chemical reaction is :

fuEu jklk;fud vfHkfØ;k esa e/;orhZ mRikn 'X' gS



Ans. (4)

Sol. $\text{CH}_3 + \text{CrO}_2\text{Cl}_2 \xrightarrow{\text{CS}_2} \text{CH}(\text{OCrOHCl}_2)_2 \xrightarrow{\text{H}_3\text{O}^+} \text{CHO}$
Toluene Chromium complex Benzaldehyde

89. Which of the following molecules is non-polar in nature ?

fn, x, v kqvkssa lsdksu v/kq; i zd'fr dk gS

- (1) CH₂O (2) SbCl₅ (3) NO₂ (4) POCl₃

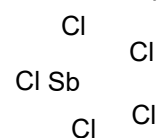
Ans. (2)

Sol. SbCl₅ is non-polar

Hybridisation sp³d

Geometry ⇒ Trigonal bipyramidal which is symmetrical geometry so dipole moment is zero.

So it is non-polar.



90. $\text{CH}_3\text{CH}_2\text{COO}^-\text{Na}^+ \xrightarrow[\text{Heat}]{\text{NaOH} + ?} \text{CH}_3\text{CH}_3 + \text{Na}_2\text{CO}_3$.

Consider the above reaction and identify the missing reagent/chemical.

- (1) Red Phosphorus (2) CaO (3) DIBAL-H (4) B₂H₆

$\text{CH}_3\text{CH}_2\text{COO}^-\text{Na}^+ \xrightarrow[\text{xeZ}]{\text{NaOH} + ?} \text{CH}_3\text{CH}_3 + \text{Na}_2\text{CO}_3$.

Mi; q r vfHkfØ; k esa vuqifLFkr vfHkdeZd@jlk; u dksigpkusa

- (1) yky QkLQksj l (2) CaO (3) DIBAL-H (4) B₂H₆

Ans. (2)

Sol. This is sodalime decarboxylation so with NaOH, CaO is required.

91. In which one of the following arrangements the given sequence is not strictly according to the properties indicated against it ?

- (1) H₂O < H₂S < H₂Se < H₂Te : Increasing pK_a values
 (2) NH₃ < PH₃ < AsH₃ < SbH₃ : Increasing acidic character
 (3) CO₂ < SiO₂ < SnO₂ < PbO₂ : Increasing oxidizing power
 (4) HF < HCl < HBr < HI : Increasing acidic strength

fuEu esa ls fd l O;oLFkk esa] muds lkeus rk, x, xq k/keZ ds vuq[kkj] mfpr Øe ughafn; k x; k gS

- (1) H₂O < H₂S < H₂Se < H₂Te : pK_a ekuksa ds <+rs Øe esa
 (2) NH₃ < PH₃ < AsH₃ < SbH₃ : vEyh; y{k k ds <+rs Øe esa
 (3) CO₂ < SiO₂ < SnO₂ < PbO₂ : vkWDlhdj k {kerk ds <+rs Øe esa
 (4) HF < HCl < HBr < HI : vEyh; lkeF; Zds <+rs Øe esa

Ans. (1)

Sol. Acidic strength of Hydra acid increase from top to bottom in a group of p-block elements and pK_a value decrease.

So, pK_a = H₂O > H₂S > H₂Se > H₂Te

92. From the following pairs of ions which one is not an iso-electronic pair ?

(1) Na^+ , Mg^{2+} (2) Mn^{2+} , Fe^{3+} (3) Fe^{2+} , Mn^{2+} (4) O^{2-} , F^-

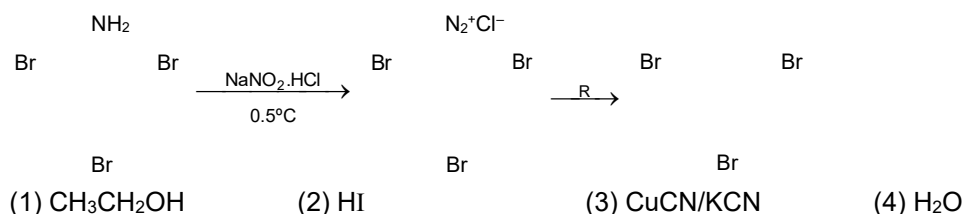
Ans.
Sol.

Fe^{+2} Z = 26 No. of e^- = 24	Mn^{+2} 25 23
O^{-2} No. of e^- = 10	F^- 10
Na^+ No. of e^- = 10	Mg^{+2} 10
Mn^{+2} No. of e^- = 23	Fe^{+3} 23

Ans. Fe^{+2} and Mn^{+2} are not Iso-electronic

93. The reagent 'R' in the given sequence of chemical reaction is :

$\text{Br} \xrightarrow[\text{0.5}^\circ\text{C}]{\text{NaNO}_2 \cdot \text{HCl}} \text{Br} \xrightarrow{\text{R}} \text{Br}$



Ans.

Sol. Reagent R is either $\text{C}_2\text{H}_5\text{OH}$ or H_3PO_2 which reduce $\text{PhN}_2^+\text{Cl}^-$ into Benzene.

94. Match List – I with List – II.

List – I

- (a) $[\text{Fe}(\text{CN})_6]^{3-}$
- (b) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$
- (c) $[\text{Fe}(\text{CN})_6]^{4-}$
- (d) $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$

List – II

- (i) 5.92 BM
- (ii) 0 BM
- (iii) 4.90 BM
- (iv) 1.73 BM

Choose the **correct** answer from the options given below.

List – I **List – II**

List – I

- (a) $[\text{Fe}(\text{CN})_6]^{3-}$
- (b) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$
- (c) $[\text{Fe}(\text{CN})_6]^{4-}$
- (d) $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$

List – II

- (i) 5.92 BM
- (ii) 0 BM
- (iii) 4.90 BM
- (iv) 1.73 BM

uhps fn, x, fodYika: Isgh mUkj pqusaA

- (1) (a) – (ii), (b) – (iv), (c) – (iii), (d) – (i)
- (3) (a) – (iv), (b) – (i), (c) – (ii), (d) – (iii)

- (2) (a) – (i), (b) – (iii), (c) – (iv), (d) – (ii)
- (4) (a) – (iv), (b) – (ii), (c) – (i), (d) – (iii)

Ans. (3)

Sol.	(A) $[\text{Fe}(\text{CN})_6]^{3-}$	Fe^{3+}	$3d^5$	CN^- strong ligand
		$n=1$	$\mu = 1.73 \text{ BM}$	
	(B) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$	Fe^{3+}	$3d^5$	H_2O weak ligand
		$n=5$	$\mu = 5.92 \text{ BM}$	
	(C) $[\text{Fe}(\text{CN})_6]^{4-}$	Fe^{2+}	$3d^6$	CN^- strong ligand
		$n=0$	$\mu = 0$	
	(D) $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$	Fe^{2+}	$3d^6$	H_2O weak ligand
		$n=4$	$\mu = 4.9 \text{ BM}$	

- 95.** The correct option for the value of vapour pressure of a solution at 45°C with benzene to octane in molar ratio 3 : 2 is :
 [At 45°C vapour pressure of benzene is 280 mm Hg and that of octane is 420 mm Hg. Assume Ideal gas]
 (1) 168 mm of Hg (2) 336 mm of Hg (3) 350 mm of Hg (4) 160 mm of Hg

- 95.** 45°C ij ,d foy;u ftesa sthu ,oavkWDVsu dk eksyj vuqir 3 : 2 gksj mldso"i nk dseku dk lgh fodYi g
 (1) 168 mm of Hg (2) 336 mm of Hg (3) 350 mm of Hg (4) 160 mm of Hg
 [45°C ij sthu dk ok"i nk 280 mm Hg rFkk vKWDVsu dk ok"i nk 420 mm Hg gSA vkn'kZSl ekusaA]
 (1) 168 mm Hg (2) 336 mm Hg (3) 350 mm Hg (4) 160 mm Hg

Ans. (2)

Sol. P_A° for benzene = 280 mm of Hg

P_B° for octane = 420 mm of Hg

$$n_A = 3$$

$$n_B = 2$$

According to Raoult's law ss

$$P = P_A^\circ X_A + P_B^\circ X_B$$

$$= 280 \times \frac{3}{5} + 420 \times \frac{2}{5} = \frac{840 + 840}{5}$$

$$= \frac{1680}{5} = 336 \text{ mm Hg}$$

- 96.** The slope of Arrhenius Plot $\left(\ln k \text{ v / s } \frac{1}{T} \right)$ of first order reaction is $-5 \times 10^3 \text{ K}$. The value of E_a of the

reaction is. Choose the correct option for your answer. [Given $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$]

fdlh iZe dk dV dh vfHkfØ;k dsfy, vjZu; l ledj k $\left(\ln k \text{ v / s } \frac{1}{T} \right)$ ds<ky dk eku $-5 \times 10^3 \text{ K}$ gSA vfHkfØ;k

dsfy, E_a dk eku gSA lgh fodYi pquA [fn;k x;k gS $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$]

- (1) 83.0 kJ mol⁻¹ (2) 166 kJ mol⁻¹ (3) -83 kJ mol⁻¹ (4) 41.5 kJ mol⁻¹

Ans. (4)

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

$$\text{slope} = \frac{-E_a}{R}$$

$$-5 \times 10^3 = \frac{-E_a}{R}$$

$$\begin{aligned} E_a &= 5 \times 10^3 \times R \\ &= 5 \times 10^3 \times 8.314 \\ &= 41.57 \times 10^3 \text{ J} \\ &= 41.57 \text{ kJ mol}^{-1} \end{aligned}$$

97. For irreversible expansion of an ideal gas under isothermal condition, the correct option is :

lerkih; ifjLFkfr; ksa fdlh vkn'kZSl dsvuqRØe kh; itj k dsy, lgh fodYi gS

(1) $\Delta U \neq 0, \Delta S_{\text{total}} \neq 0$ (2) $\Delta U = 0, \Delta S_{\text{total}} \neq 0$ (3) $\Delta U \neq 0, \Delta S_{\text{total}} = 0$ (4) $\Delta U = 0, \Delta S_{\text{total}} = 0$

Ans.

(2)

Sol. For irreversible isothermal expansion as temperature constant

$$\Delta Y = \int_1^2 nR \Delta T = 0$$

$\Delta S_{\text{total}} > 0$ for irreversible process

$\Delta U = 0, \Delta S_{\text{total}} \neq 0$

98. Choose the correct option for the total pressure (in atm.) in a mixture of 4 g O_2 and 2 g H_2 confined in a total volume of one litre at 0°C is : [Given $R = 0.082 \text{ L atm mol}^{-1} \text{ K}^{-1}$, $T = 273 \text{ K}$]

1 yhVj vk;ru esa 0°C ij ,d fefJ k ftlesa 4 g O_2 ,oa 2 g H_2 yh xbZ gkS mldk dqy nk (atm. esa) dslgh fodYi dksquasa fn;k gS $R = 0.082 \text{ L atm mol}^{-1} \text{ K}^{-1}$, $T = 273 \text{ K}$

(1) 2.602 (2) 25.18 (3) 26.02 (4) 2.518

Ans.

(2)

Sol. No. of mole of $H_2 = \frac{2}{2} = 1 \text{ mole}$

No. of mole of $O_2 = \frac{4}{32} = \frac{1}{8} \text{ mole}$

Total no. of mole of gaseous = $1 + \frac{1}{8} = \frac{9}{8} \text{ mole}$

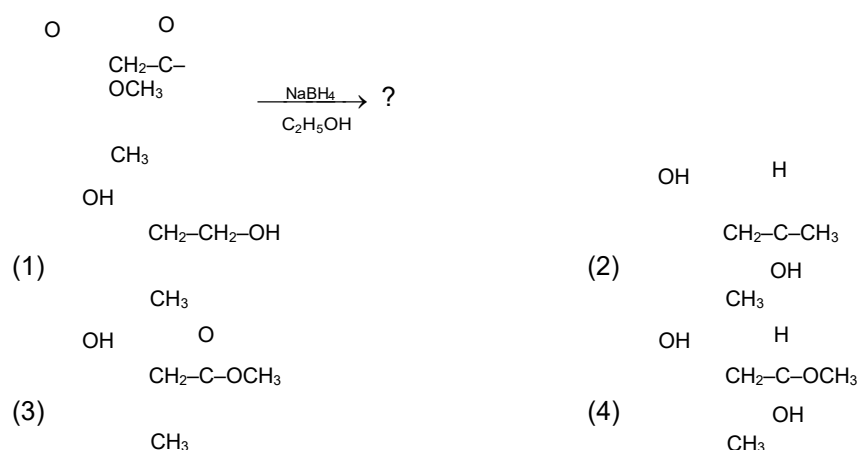
Acc to $PV = nRT$

$$P = \frac{nRT}{V} = \frac{9}{8} \times 0.082 \times \frac{273}{1}$$

$P = 25.18 \text{ atm.}$

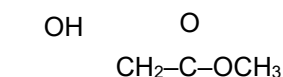
99. The product formed in the following chemical reaction is :

Reaction of methyl isopropyl ketone with NaBH_4 in $\text{C}_2\text{H}_5\text{OH}$.



Ans. (3)

Sol. NaBH_4 reduce only Ketone. Not ester.



Given in option (1)

100. The molar conductivity of 0.007 M acetic acid is $20 \text{ S cm}^2 \text{ mol}^{-1}$. What is the dissociation constant of acetic acid ? Choose the correct option. [$\Lambda_{\text{H}^+}^\circ = 350 \text{ S cm}^2 \text{ mol}^{-1}$; $\Lambda_{\text{CH}_3\text{COO}^-}^\circ = 50 \text{ S cm}^2 \text{ mol}^{-1}$]

0.007 M acetic acid has molar conductivity $20 \text{ S cm}^2 \text{ mol}^{-1}$. Find the dissociation constant of acetic acid. [$\Lambda_{\text{H}^+}^\circ = 350 \text{ S cm}^2 \text{ mol}^{-1}$; $\Lambda_{\text{CH}_3\text{COO}^-}^\circ = 50 \text{ S cm}^2 \text{ mol}^{-1}$]

- (1) $2.50 \times 10^{-4} \text{ mol L}^{-1}$ (2) $1.75 \times 10^{-5} \text{ mol L}^{-1}$
 (3) $2.50 \times 10^{-5} \text{ mol L}^{-1}$ (4) $1.75 \times 10^{-4} \text{ mol L}^{-1}$

Ans. (2)

Sol.
$$\alpha = \frac{\lambda_M}{\lambda_M^\infty} = \frac{\lambda_M}{\lambda_{\text{H}^+}^\infty + \lambda_{\text{CH}_3\text{COO}^-}^\infty} = \frac{20}{350 + 50} = \frac{20}{400} = \frac{1}{20}$$

$$K_a = \frac{C\alpha^2}{1-\alpha}$$

$$K_a = C\alpha^2$$

$$= 0.007 \times \left(\frac{1}{20} \right)^2 = \frac{7 \times 10^{-3}}{400}$$

$$K_a = \frac{7}{4} \times 10^{-5}$$

$$= 1.75 \times 10^{-5} \text{ mol/l}$$

PART : BIOLOGY

Section - A (Biology : Botany)

Section-I

Single Choice Type

This section contains **35 Single choice questions**. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **Only One** is correct.

कुल 35 एकविकल्पीय प्रश्न हैं। प्रत्येक प्रश्न के चार विकल्प (1), (2), (3) और (4) दिए गए हैं, जिनमें से केवल एक सही है।

101. Amensalism can be represented as :

- | | |
|-----------------------------------|---------------------------------------|
| (1) Species A (+) ; Species B (+) | (2) Species A (-) ; Species B (-) |
| (3) Species A (+) ; Species B (0) | (4) Species A (-) ; Species B (0) |
- वृक्षों द्वारा छोटी पौधों को छाया में डालना
- | | |
|-----------------------------------|---------------------------------------|
| (1) प्रजाति A (+) ; प्रजाति B (+) | (2) प्रजाति A (-) ; प्रजाति B (-) |
| (3) प्रजाति A (+) ; प्रजाति B (0) | (4) प्रजाति A (-) ; प्रजाति B (0) |

Ans. (4)

102. In the equation $GPP - R = NPP$ R represents:

- | | |
|------------------------|------------------------|
| (1) Retardation factor | (2) Environment factor |
| (3) Respiration losses | (4) Radiant energy |
- समीकरण $GPP - R = NPP$ में R का अर्थ है
- | | |
|---------------------|-------------------|
| (1) रोकने वाला कारक | (2) पर्यावरण कारक |
| (3) श्वसन क्षति | (4) विकिरण ऊर्जा |

Ans. (3)

103. The plant hormone used to destroy weeds in a field is:

- | | | | |
|---------|-----------|---------|---------|
| (1) NAA | (2) 2,4-D | (3) IBA | (4) IAA |
|---------|-----------|---------|---------|
- क्षेत्र में जड़ों को नष्ट करने के लिए प्रयुक्त पौधे हार्मोन
- | | | | |
|------------|------------|--------------|------------|
| (1) ,u , , | (2) 2,4-Mh | (3) vkbZ h , | (4) vkbZ , |
|------------|------------|--------------|------------|

Ans. (2)