PACE-IIT & MEDICAL

AITS – 06 -(NEET 2023 Aspirants) – Answer key & Solutions

1. (1)	2. (2)	3. (4)	4. (2)	5. (4)
6. (4)	7. (1)	8. (3)	9. (3)	10. (2)
11. (1)	12. (1)	13. (2)	14. (3)	15. (1)
16. (1)	17. (2)	18. (2)	19. (2)	20. (2)
21. (2)	22. (4)	23. (2)	24. (3)	25. (2)
26. (4)	27. (1)	28. (4)	29. (4)	30. (2)
31. (4)	32. (1)	33. (3)	34. (1)	35. (3)
36. (3)	37. (1)	38. (2)	39. (1)	40. (3)
41. (4)	42. (2)	43. (4)	44. (2)	45. (3)
46. (1)	47. (2)	48. (1)	49. (4)	50. (2)
51. (3)	52. (1)	53. (2)	54. (3)	55. (3)
56. (1)	57. (2)	58. (1)	59. (1)	60. (4)
61. (4)	62. (2)	63. (2)	64. (3)	65. (2)
66. (1)	67. (2)	68. (3)	69. (3)	70. (4)
71. (4)	72. (4)	73. (1)	74. (1)	75. (Bonus)
76. (3)	77. (2)	78. (4)	79. (3)	80. (1)
81. (1)	82. (2)	83. (2)	84. (3)	85. (4)
86. (4)	87. (3)	88. (2)	89. (1)	90. (1)
91. (3)	92. (3)	93. (3)	94. (4)	95. (4)
96. (4)	97. (3)	98. (1)	99. (4)	100. (2)
101. (2)	102. (1)	103. (2)	104. (3)	105. (1)
106. (2)	107. (4)	108. (3)	109. (3)	110. (2)
111. (1)	112. (3)	113. (1 & 4)	114. (1)	115. (4)
116. (2)	117. (1)	118. (1)	119. (4)	120. (3)
121. (4)	122. (1)	123. (2)	124. (1)	125. (4)
126. (1)	127. (3)	128. (2)	129. (1)	130. (1)
131. (1)	132. (2)	133. (1)	134. (2)	135. (2)
136. (3)	137. (2)	138. (1)	139. (2)	140. (1)
141. (4)	142. (1)	143. (4)	144. (1)	145. (1)
146. (4)	147. (4)	148. (4)	149. (3)	150. (4)
151. (1)	152. (1)	153. (1)	154. (2)	155. (4)
156. (2)	157. (4)	158. (1)	159. (3)	160. (3)
161. (1)	162. (3)	163. (3)	164. (3)	165. (2)
166. (3)	167. (4)	168. (2)	169. (4)	170. (4)
171. (4)	172. (1)	173. (1)	174. (2)	175. (1)
176. (1)	177. (2)	178. (2)	179. (4)	180. (3)
181. (1)	182. (2)	183. (1)	184. (3)	185. (1)
186. (1)	187. (3)	188. (4)	189. (1)	190. (2)
191. (3)	192. (4)	193. (4)	194. (3)	195. (3)
196. (3)	197. (3)	198. (4)	199. (3)	200. (1)

SOLUTIONS

1. (1)

$\vec{B}_{wire} = \frac{\mu_0 I}{2\pi R}\odot$

$\vec{B}_{circle} = \frac{\mu_0 I}{2R}\odot$

$\vec{B}_{net} = \frac{\mu_0 I}{2R}\left(1+\frac{1}{\pi}\right)\odot$

2. (2)

$V_{source} = \sqrt{V_R^2 + V_C^2}$

$\therefore V_C = \sqrt{V_{Source}^2 - V_R^2}$

$= \sqrt{(20)^2 - (12)^2} = 16$ V

3. (4)

4. (2)

As we know,

$|\vec{B}| = \frac{|\vec{E}|}{C} = \frac{6.3}{3\times10^8} = 2.1\times10^{-8}$T

and $\hat{E}\times\hat{B} = \hat{C}$

$\hat{J}\times\hat{B} = \hat{r}$

[$\because$ EM wave travels along +(ve) x-direction]

$\therefore$ $\hat{B} = \hat{k}$ or $\vec{B} = 2.1\times10^{-8}\hat{k}$T

5. (4)

Conceptual

6. (4)

7. (1)

Rate of increment of energy in inductor

$= \frac{du}{dt} = \frac{d}{dt}\left(\frac{1}{2}Li^2\right) = Li\ \frac{di}{dt}$

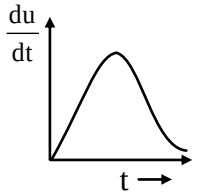
Current in the inductor at time t is :

$i = i_0\left(1-e^{-\frac{t}{\tau}}\right)$ and $\frac{di}{di} = \frac{i_0}{\tau}\ e^{-\frac{t}{\tau}}$

$\frac{du}{dt} = \frac{Li_0^2}{\tau}\ e^{-\frac{t}{\tau}}\ (1-e^{-\frac{t}{\tau}})$

$\frac{du}{dt} = 0$ at t = 0 and t = ∞

Hence E is best represented by :



8. **(3)**

9. **(3)**

10. **(2)**

$\vec{E} \times \vec{B} = \vec{C}$

$E(\hat{k}) \times B(\hat{j}) = C(-\hat{i})$

11. **(1)**

Conceptual

12. **(1)**

Conceptual

13. **(2)**

14. **(3)**

15. **(1)**

We know that $V = \frac{C}{\sqrt{\mu_r \varepsilon_r}}$

$\Rightarrow \quad 2 \times 10^8 = \frac{3 \times 10^8}{\sqrt{1 \times \varepsilon_r}}$

$\Rightarrow \quad \sqrt{\varepsilon_r} = 1.5$

$\Rightarrow \quad \varepsilon_r = (1.5)^2 = 2.25$

16. **(1)**

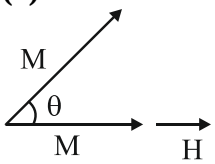
$I_d = \frac{A\varepsilon_0}{d}\frac{dE}{dt} \times d$

$I = \frac{1}{2}\frac{dE}{dt} \times d$

$I = \frac{1}{2}\frac{dV}{dt} \times \frac{1}{d} \cdot d$

$\frac{dV}{dt} = 2I$

17. **(2)**



$W = \Delta U = U_2 - U_1$

$= -MH\cos\theta + MH$

$MH(1 - \cos\theta)$

$= 2MH\sin^2\frac{\theta}{2}$

As $(1 - \cos\theta) = 2\sin^2\frac{\theta}{2}$.

18. (2)

$V_{rms} = \sqrt{\frac{(T/2)V_0^2 + 0}{T}} = \frac{V_0}{\sqrt{2}}.$

19. (2)

Conceptual

20. (2)

21. (2)

Conceptual

22. (4)

The electric mains supply in our homes and offices is a voltage that varies like a sine function with time. Such a voltage is called alternating voltage and the current driven by it in a circuit is called the alternating current

23. (2)

24. (3)

$\omega = 120,\ f = \frac{\omega}{2\pi} = \frac{120}{2\pi} = 19\ Hz$

$V_{rms} = \frac{v_0}{\sqrt{2}} = \frac{240}{\sqrt{2}} \simeq 170$ volt

25. (2)

26. (4)

L = 2H

R = 2Ω

E = 18 V

$I = \frac{E}{R}\left(1 - e^{-\frac{R}{L}t}\right)$

$I = 9\ (1 - e^{-t})$

27. (1)

$i = \frac{V}{Z} = \frac{V}{\sqrt{R^2 + X_c^2}} = \frac{V}{\sqrt{R^2 + (1/\omega C)^2}}$

28. (4)

Conceptual

29. (4)

Conceptual

30. (3)

$V_L = V_C \Rightarrow V_x = 0$. So $V = V_R = 220V$

$$I = \frac{v}{R} = \frac{220}{100} = 2.2A$$

31. (4)

32. (1)

The relation between amplitudes of electric and magnetic field in free space is given by

$$B_0 = \frac{E_0}{c} = \frac{6}{3\times10^8} = 2\times10^{-8}T$$

Propagation direction = $\hat{E}\times\hat{B}$

$\hat{i} = \hat{j}\times B \quad \Rightarrow \quad \hat{B} = \hat{k}$

$\therefore$ The magnetic field component will be along z direction.

33. (3)

Since, reactances produced by inductor and capacitor in opposite direction. So, voltage in these elements are distributed at 180°, i.e. out of phase.

Net voltage = 400 V – 300 V

= 100 V

34. (1)

35. (3)

$$\because P = \frac{V^2}{R} \Rightarrow R = \frac{V^2}{100}$$

$$R_{eq} = \frac{(2R)(R)}{2R+R} = \frac{2R}{3} = \frac{2}{3}\cdot\frac{V^2}{100}$$

$$\because P = \frac{V^2}{R} = \frac{V^2}{\frac{2}{3}\cdot\frac{V^2}{100}} = 150\,W$$

36. (3)

Ampere circuital law (Time varying electric field)

$\Rightarrow \mu_0 I_{in} = \mu_0 I + \mu_0 I_{(displacement\ present)}$

$$\oint B.dl = \mu_0 I_{(conduction\ current)} + \mu_0 \frac{\varepsilon_0 d\phi_E}{dt}$$

$$= \mu_0\left(I + \varepsilon_0 \frac{d\phi_E}{dt}\right)$$

37. (1)

38. (2)

Conceptual

39. (1)

As initially charge is maximum,

$$q = q_0 \cos \omega t$$

$$\Rightarrow \quad I = \frac{dq}{dt} = -\omega q_0 \sin \omega t$$

Given, $\frac{1}{2} L I^2 = \frac{q^2}{2C}$

$$\Rightarrow \frac{1}{2} L (\omega q_0 \sin \omega t)^2 = \frac{(q_0 \cos \omega t)^2}{2C}$$

But $\omega = \frac{1}{\sqrt{LC}}$

$$\Rightarrow \quad \tan \omega t = 1$$

$$\omega t = \frac{\pi}{4}$$

$$\Rightarrow \quad t = \frac{\pi}{4\omega} = \frac{\pi}{4}\sqrt{LC}$$

40. (3)

41. (4)

Length of the wire $l = nl_0 2\pi r$ and $L = \mu_0 n^2 l_0 \pi r^2$

or $n = \sqrt{\frac{L}{\mu_0 l_0 \pi r^2}}$

Thus $l = \sqrt{\frac{L}{\mu_0 l_0 \pi r^2}}\, l_0 2\pi r$

$2\pi r = \sqrt{\frac{L l_0 4\pi}{\mu_0}}$

$= \sqrt{\frac{10^{-3} \times 1 \times 4\pi}{4\pi \times 10^{-7}}} = 100$ m

42. (2)

43. (1)

Iron loss is the energy loss in the form of heat due to the formation of eddy currents in the iron core of the transformer.

44. (2)

Conceptual

45. (3)

By Maxwell's law, time varying electric field produce time – varying magnetic field and vice-versa. So statement-1 is correct and,

$V = \frac{C}{\sqrt{\mu_r \varepsilon_r}}$. So statement-2 is incorrect.

46. (1)

For a transformer, there are two circuits which have N_P and N_S (number of coil turns), I_P and I_S (currents) respectively as shown below.

Here, input voltage, $V_P = 2300$ V

Number of turns in primary coil, $N_P = 4000$

Output voltage, $V_S = 230$ volt

Output power, $P_S = V_S.I_S$

Input power, $P_P = V_P I_P$

$\therefore$ The efficiency of the transformer is

$$\eta = \frac{\text{Output}(\text{secondary})\text{power}}{\text{Input}(\text{primary})\text{ power}}$$

$$\Rightarrow \eta = \frac{V_S.I_S}{V_P.I_P} \times 100$$

$$\Rightarrow \eta = \frac{(230)(I_S)}{(2300)\times 5} \times 100$$

$$90 = \frac{230 I_S}{(2300)\times 5} \times 100 \qquad \Rightarrow I_S = 45\,\text{A}$$

47. (1)

48. (1)

49. (4)

$$I = \frac{P_{av}}{2\pi r^2} = \frac{E_0^2}{\mu_0 c}$$

$$\text{or } E_0 = \sqrt{\frac{\mu_0 C P_{av}}{2\pi r^2}}$$

$$= \sqrt{\frac{(4\pi\times 10^{-7})\times(3\times 10^8)\times 800}{2\pi\times(4)^2}} = 54.77 \text{ V/M}$$

50. (2)

$\because$ Current is leading, so ckt is capacitive.

Power factor = $\cos\phi = \cos 45° = \frac{1}{\sqrt{2}} = 0.707$

51. (3)

In frenkel defect, ions in solids dislocate from their positions. Hence, Frenkel defect is a dislocation defect.

52. (1)

CsCl has a bcc lattice. So $d_{\text{body}} = a\sqrt{3}$

or $d_{\text{body}} = \sqrt{3} \times 0.4123 \text{ nm} = 0.7141 \text{ nm}.$

The sum of the ionic radii of Cs^+ and Cl^- ions is half this distance, i.e.,

$$r_{Cs^+} + r_{Cs^-} = \frac{d_{\text{body}}}{2} = \frac{0.7141}{2} \text{ nm} = 0.3571 \text{ nm}.$$

53. (2)
AgBr exhibits Frenkel-defect due to large difference in the size of Ag^+ and Br^- ions.

54. (3)
Due to addition of $SrCl_2$, each Sr^{2+} ion replaces two Na^+ ions, but occupies only one Na+ lattice point. This makes one cation vacancy.
Number of moles of cation vacancies in 100 mol of NaCl = 10^{-4}
Number of moles of cation vacancies in

$$1\text{mol} = \frac{10^{-4}}{100} = 10^{-6}$$

The total cation vacancies

$$= 6.02 \times 10^{23} \times 10^{-6}$$
$$= 6.02 \times 10^{17}\ \text{mol}^{-1}$$

55. (3)

$$\Delta T = \frac{1000 K_b w_2}{m_2 w_1}$$

$$\frac{\Delta T}{K_b}(AB_2) = \frac{1000 \times 6}{m_2 \times 100} \Rightarrow 1 = \frac{10 \times 6}{m_2}$$

$\therefore\ m_2(AB_2) = 60 = A + 2B$ ...(i)

$$\frac{\Delta T}{K_b}(A_2B) = \frac{1000 \times 9}{m_2 \times 100} = 1$$

$\therefore\ m_2(A_2B) = 90 = 2A + B$ ...(ii)

By solving equation (i) and (ii), we get the value of A and B.

$\therefore$ $A = 40,\ B = 10$

56. (1)

$$\Delta T_b = mK_b i$$
$$2.08 = 1 \times 0.52\ i,\ i = 4$$
$$i = [1 + (y-1)x]$$
$$4 = 1 + (y-1)$$

$\therefore$ $y = 4$ (total 4 ions)

$$K_3[Fe(CN)_6] \rightleftharpoons 3K^+ + [Fe(CN)_6]^{4-}$$

57. (2)

$$M(KCl) = \frac{20 \times 1}{25} = 0.8M$$

$i = 2$ for KCl

$\therefore\ \Delta T_f = i K_f m = 2 \times 2 \times 0.8 = 3.2°$

58. (1)

$C = ? \Rightarrow \pi = CRT$

$\Rightarrow \quad C = \frac{\pi}{RT}$

$\pi = 7.65\ \text{atm}, R = 0.0821\ \text{atm K}^{-1}\text{mol}^{-1}$

$T = 37°C$

$= 37 + 273 = 310\text{K}$

$\therefore \quad C = \frac{7.65}{0.0821 \times 310} = 0.30\ \text{M}$

Molarity of an intravenous glucose solution to have the same osmotic pressure as blood should be 0.03M.

59. (1)

(i) Due to dimer formation of CH_3COOH in benzene, it is therefore, 1M.

(ii) 0.5M KCl ionises in aqueous solution hence, it is 1M.

$$\underset{2M}{2CH_3COOH} \rightleftharpoons \underset{1M}{(CH_3COOH)_2}$$

$$\underset{0.5\ M}{KCl} \rightleftharpoons \underbrace{K^+ + Cl^-}_{1\ M}$$

Thus, both are isotonic (equal osmotic pressure).

60. (4)

Solutions are isotonic, hence, number of moles are equal

$\therefore \quad n_1\ (HCHO) = n_2\ (C_6H_{12}O_6)$

$$\frac{w_1}{m_1} = \frac{w_2}{m_2}$$

$$\frac{w_1}{w_2} = \frac{m_1}{m_2} = \frac{30}{180} = 1:6$$

61. (2)

$p = p_A^\circ \chi_A + p_B^\circ \chi_B = \frac{100}{4} + \frac{60 \times 3}{4}$

$= 70\ \text{mm} < 75\ \text{mm}$ (experimental)

Thus, there is positive deviation (a) as true mixture is more volatile due to decrease in boiling point.

Thus, (b) is true; also force of attraction is decreased thus (c) is true.

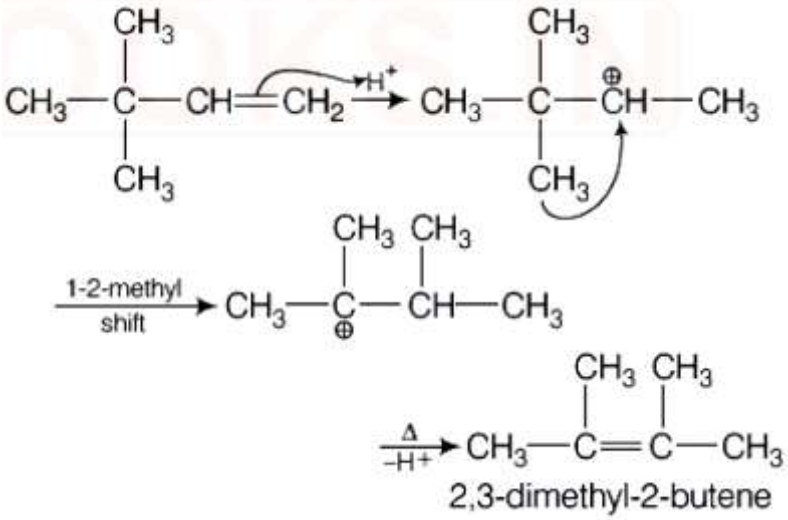
62. (2)

(a) $CH_2=CH_2 \xrightarrow{H_2O/H^+} CH_3CH_2OH$ (1° - alcohol)

(b) $CH_3-CH=CH_2 \xrightarrow{H_2O/H^+} CH_3\underset{\underset{OH}{|}}{C}HCH_3$

2°- alcohol through 2°- carbocation ($CH_3\overset{\oplus}{C}HCH_3$).

63. (2)



64. (3)

The said reactions can be visualised as :

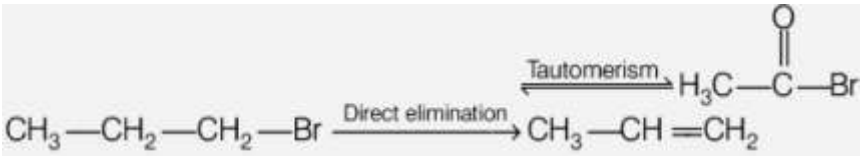
(a) H_2C-CH_2, C, H_2 (Cyclopropane) $\xrightarrow[\text{Electro-philic addition}]{HBr} CH_3-CH_2-\underset{\underset{Br}{|}}{C}H_2$

$\xrightarrow{\text{Elimination}} H_3C-CH=CH_2$

(b) $CH_3-CH_2-CH_2-OH$ (Propanol) $\xrightarrow[\text{Electrophilic addition}]{HBr} CH_3-CH_2-CH_2-Br$ (Bromopropane)

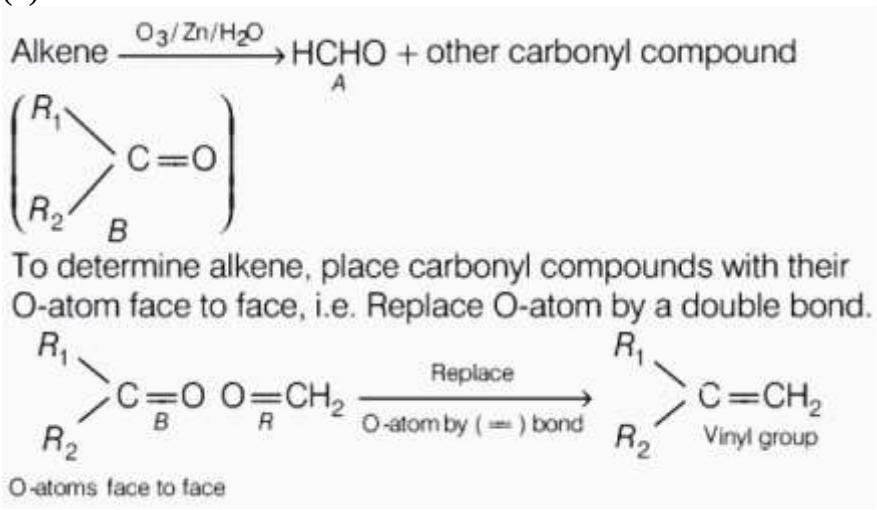
$\xrightarrow{\text{Elimination}} H_3C-CH=CH_2$

(c) $CH_2=C=O \xrightarrow[\text{Nucleophilic addition}]{HBr} H_2C=\underset{\underset{Br}{|}}{C}-OH$

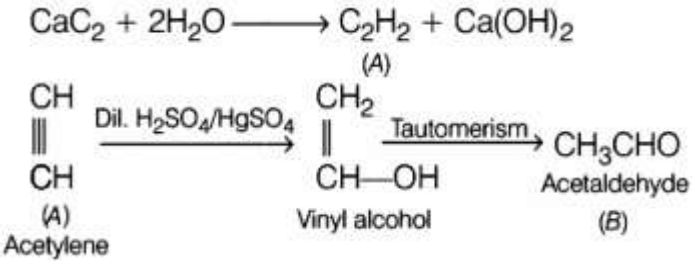


Thus, option (c) is correct answer.

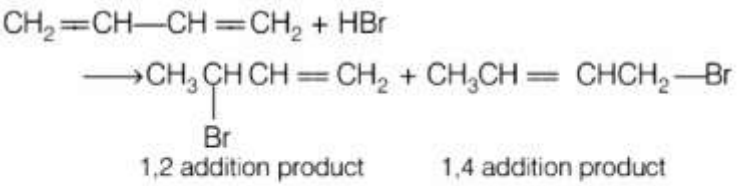
65. (2)



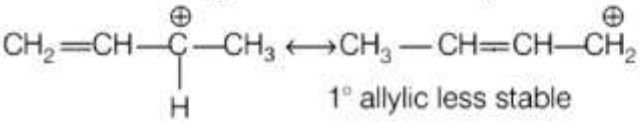
66. (1)



67. (2)



Addition is through the formation of allylic carbocation.



2° allylic more stable

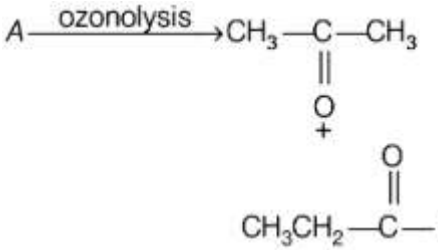
Under mild conditions (temp ≈ –80°C) kinetic product is the 1,2-addition product and under vigorous conditions (temp ≈ –40°C) thermodynamic product is the 1,4, addition product. Thus, under given conditions 1- bromo–2–butene is the major product.

68. (3)

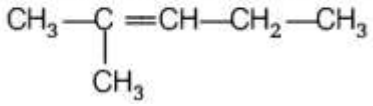
Toluene is highly reactive towards electrophite substitution reaction among the given compounds because toluene has $–CH_3$ group which increases electron density at o/p position of the ring. While in

case of (3) and (4), both have electron withdrawing groups i.e. –Cl and $–NO_2$ respectively. $–NO_2$ has more capacity to attract or to withdraw the electrons from ring. Hence, their reactivity order will be 2 > 1 > 3 > 4

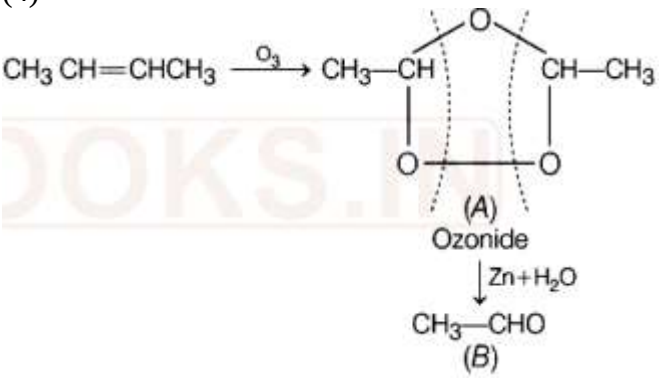
69. (3)



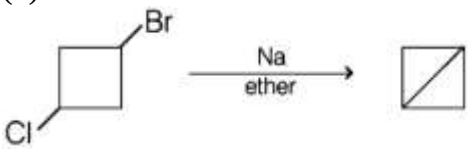
To obtain or to identify '*A*' we need to remove oxygen atom replace it with double bond. Hence, '*A*' is,



70. (4)



71. (4)

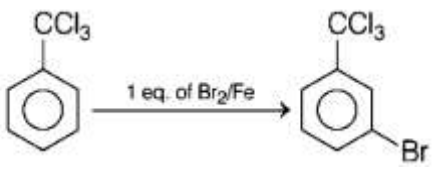


72. (4)

The ignition temperature of black phosphorus is highest among all allotropes because it is thermodynamically more stable than other allotropes of phosphorus.

73. (1)

Due to presence of electron withdrawing group —Cl, benzene ring deactivates and becomes *meta*-directing.



74. (1)

75. (4)
As the size of metal cation increases, number of molecules of water of crystallization decreases.

76. (3)
On the basis of Fajan's rule lower the size of cation higher will be its polarizing power and higher will be covalent character.

$$\text{Polarising power} \propto \frac{1}{\text{Size of cation}}$$

Covalent character $\propto$ polarizing power So, the correct order of covalent character is NaCl< LiCl < $BeCl_2$
($Na^+ > Li^+ > Be^{2+}$, i.e. ionic character)

77. (2)
Among the alkaline earth metals, the size of beryllium and magnesium metals is very small. Therefore, the electrons in these metals are bounded more strongly and are not excited by the energy of flame to higher energy states. Hence, these metals or their salts do not impart any colour to the flame.

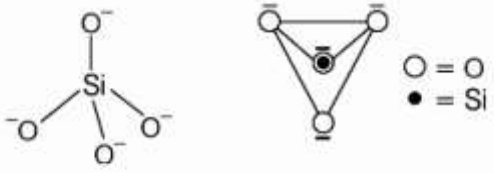
78. (4)
Ionic character increases from Be to Ba.

79. (3)
$Mg + CO \rightarrow MgO + C$

80. (1)
Carbon suboxide (C_3O_2) is anhydride of malonic acid. It has linear structure. C—C bond length is 130 Å and C — O bond length is 120 Å.

81. (1)
Silicon chloride is easily hydrolysed to give white fumes. So it is used as a smoke screen in warfare.
$SiCl_4 + 4H_2O \rightarrow Si(OH)_4 + 4HCl$

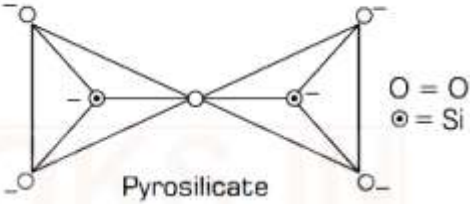
82. (2)
The basic building unit of all silicates is the tetrahedral SiO_4^{4-}. It is represented as



Structure of SiO_4^{4-} unit

83. (2)

In pyrosilicate, only one oxygen atom is shared.



Pyrosilicate

84. (3)

Species	Hybridisation	Bond angle
NO_2	sp	less than 120°
NO_2^-	sp^2	115.4°
NO_2^+	sp (linear)	180°
NO_3^-	sp^2	120°

So, NO_2^+ has maximum bond angle.

85. (4)

$$\underset{\text{Lead nitrate}}{2Pb(NO_3)_2} \xrightarrow[673\ K]{\Delta} 2PbO + \underset{\text{Brown[A]}}{4NO_2(g)} + O_2$$

$$2NO_2(g) \underset{\text{Heating}}{\xrightarrow{\text{Cooling}}} \underset{\text{Colourless [B]}}{N_2O_4(g)}$$

$$2NO + N_2O_4 \xrightarrow{250\ K} \underset{\text{Blue[C]}}{2N_2O_3(s)}$$

86. (4)

Given, ionic radius of cation (A^+)
$= 0.98 \times 10^{-10}$ m

Ionic radius of anion (B^-)
$= 1.81 \times 10^{-10}$ m

Coordination number of each ion in AB = ?

Now, we have

$$\text{Radius ratio} = \frac{\text{Radius of cation}}{\text{Radius of anion}}$$

$$= \frac{0.98 \times 10^{-10}\ m}{1.81 \times 10^{-10}\ m} = 0.541$$

If radius ratio range is in between 0.441–0.732, ion would have octahedral structure with coordination number 'six'.

87. (3)

Boiling point of a solvent is a characteristic temperature at which vapour pressure of liquid becomes equal to 1atm. a decrease in pressure results a decrease in temperature at which water boils.
i.e. 273 + 25 = 298 K

88. (2)

$$\because \quad \Delta T = \frac{1000 \times K_f' \times W}{m \times W} = K_f' \times \text{molality}$$

$$\therefore \quad 0.52 = 1.86 \times \text{molality}$$

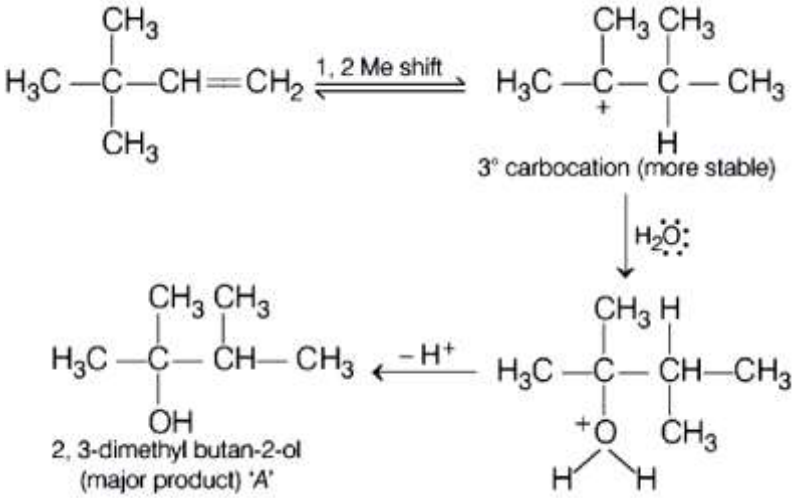
$$\therefore \text{Molality} = \frac{0.52}{1.86} = \text{molarity} \left(\frac{n}{V}\right) \quad \text{(given)}$$

$$\text{Now,} \qquad \pi = CRT \text{ or } \pi = \frac{n}{V} RT$$

$$\therefore \qquad \pi = \frac{0.52}{1.86} \times 0.0821 \times 300$$

$$\pi = 6.886 \text{ atm}$$

89. (1)



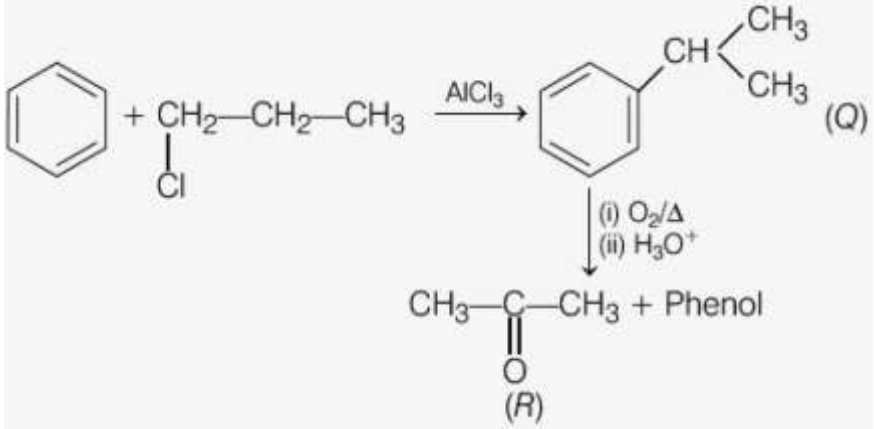
90. (1)

$NaNH_2$ is used to distinguish between 1-butyne and 2-butyne.

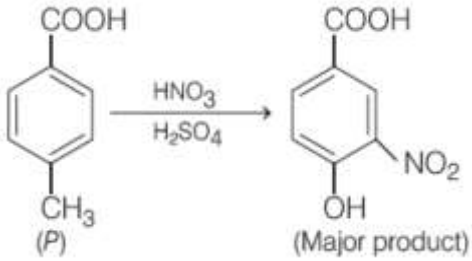
$$\underset{\text{1-butyne}}{CH_3CH_2C \equiv CH} \xrightarrow{NaNH_2} CH_3CH_2C \equiv \overline{C}Na + \frac{1}{2}H_2 \uparrow$$

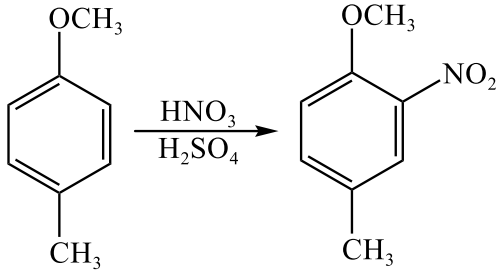
$$\underset{\text{2-butyne}}{CH_3-C \equiv C-CH_3} \xrightarrow{NaNH_2} \text{No reaction}$$

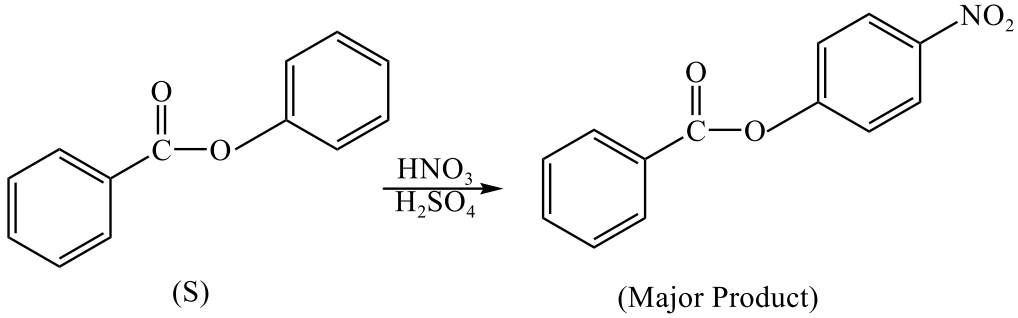
91. (3)



92. (3)







93. (3)

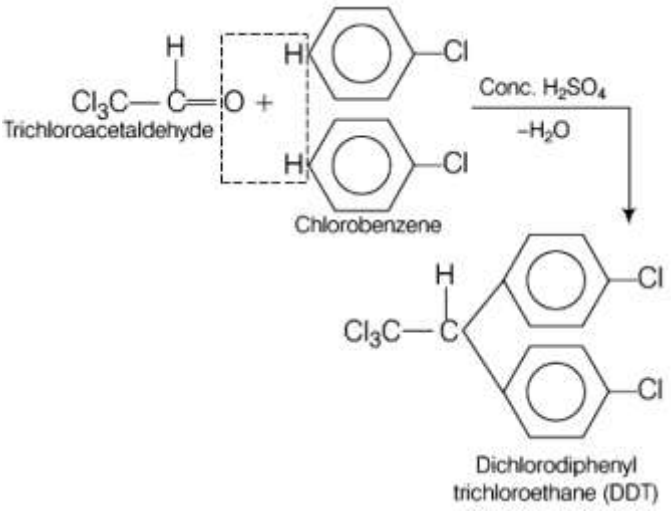
Freon used as refrigerant is CCl_2F_2.

94. (4)

Iodoform reaction is given by alcohols and ketones containing $CH_3-\underset{\underset{OH}{|}}{CH}-$ and $CH_3-\overset{\overset{O}{\|}}{C}-$ group, respectively. Thus, among the given compounds, isobutyl alcohol does not contain $CH_3-\underset{\underset{OH}{|}}{CH}-$ group.

Hence, it does not give iodoform reaction on treatment with I_2/NaOH.

95. (4)



96. (4)

Solubility in water in increasing order

$CaCO_3 < NaHCO_3 < KHCO_3$

97. (3)

According to the Fajan rule, compounds with small cation large anion, more charge on cation or anion show more covalent character. As the above conditions opposes, it shows ionic character.

Since, the size of cation decreases in the order

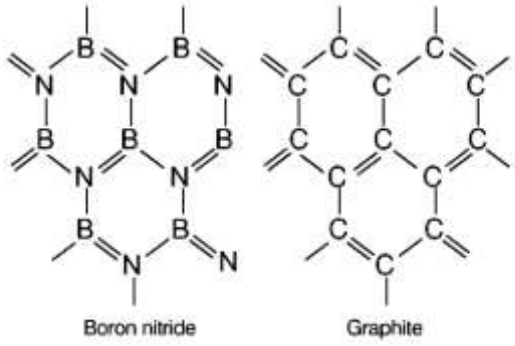
$Ba^{2+} > Ca^{2+} > Be^{2+}$.

Therefore, the correct order of ionic character will be

$BeH_2 < CaH_2 < BaH_2$

98. (1)

Boron nitride $(BN)_x$ resembles with graphite in structure as shown below



99. (4)

When Si is heated with CH3Cl at high temperature in the presence of CO as a catalyst, a mixture of mono, di and tri methyl chlorosilanes alongwith a small amount of tetramethylsilane is formed.

$$\underset{\text{Methyl chloride}}{CH_3Cl} + Si \xrightarrow[570K]{\text{CO power}} CH_3SiCl_3 + (CH_3)_2SiCl_2 + (CH_3)_3SiCl + (CH_3)_4Si$$

100. (2)

The main constituents of air are nitrogen (78%) and oxygen (21%). Only N_2 reacts with three moles of H_2 in the presence of a catalyst to give NH_3 (ammonia) which is a gas having basic nature. On oxidation NH_3 gives NO_2 which is a part of acid rain. So the compounds A to D are as:

A = NH_4NO_2; B = N_2; C = NH_3; D = HNO_3

101. NCERT XII Pg. 96

102. Based on sex determination Pg. 85

103. NCERT XII Pg. 101, 116, 121

104. NCERT XI Pg. 202

105. NCERT XII Pg. 96

106. NCERT XII Pg. 181

107. NCERT XII Pg. 96

108. NCERT XII Pg. 90

109. NCERT XII Pg. 184

110. NCERT XII Pg. 97

111. NCERT XII Pg. 184

112. NCERT XII Pg. 97

113. NCERT XII Pg. 181,182,183

114. NCERT XII Pg. 122

115. NCERT XII Pg. 117

116. NCERT XII Pg. 100

117. NCERT XII Pg. 88

118. NCERT XII Pg. **96**

119. NCERT XII Pg. 100

120. NCERT XII Pg. 97

121. NCERT XII Pg. 182

122. NCERT XII Pg. 97

123. NCERT XII Pg. 182

124. NCERT XII Pg. 90,91

125. NCERT XII Pg. 185

126. NCERT XII Pg. 186,187

127. NCERT XII Pg. 79

128. NCERT XII Pg. 187

129. NCERT XII Pg. 187,188

130. NCERT XII Pg. 75,76

131. NCERT XII Pg. 188

132. NCERT XII Pg. 72

133. NCERT XII Pg. 72,73,74,75

134. NCERT XII Pg. 72

135. NCERT XII Pg. 72

136. NCERT XII Pg. 181

137. NCERT XII Pg. 73

138. NCERT XII Pg. 188

139. NCERT XII Pg. 72,73

140. NCERT XII Pg. 79

141. NCERT XII Pg. 79

142. NCERT XII Pg. 97

143. NCERT XII Pg. 88

144. NCERT XII Pg. 183

145. NCERT XII Pg. 88

146. NCERT XII Pg. 116

147. NCERT XII Pg. 74

148. NCERT XII Pg. 185,186

149. NCERT XII Pg. 96

150. NCERT XII Pg. 115

151. Solution: In asexual reproduction, only a single parent is involved. So, the offspring produced are genetically identical to the parent and to each other as well. Such offspring are called clones.

152. Solution: XII NCERT pg 58. The permissible use of amniocentesis is for detecting any genetic abnormality.

153. Solution: XII NCERT page 57 2nd paragraph.

154. Solution: XII NCERT pg 57. These programmes called 'family planning' were initiated in 1951 and were periodically assessed over the past decades.

155. Solution: Transformation of spermatid to sperms is termed as spermatogenesis. The spermatids mature into spermatozoa, here sertoli cells (nurse cells) which also provide nourishment to them. Spermiation is process by mature spermatids are released.

156. Solution: A vasectomy blocks or cuts each vas deferens tube, keeping sperm out of the semen.

157. Solution: Three days after fertilization, a normally developing embryo will contain about six to 10 cells. By the fifth or sixth day, the fertilized egg is known as a blastocyst — a rapidly dividing ball of cells. The inner group of cells will become the embryo. The outer group will become the cells that nourish and protect it.

158. Solution: Fusion of male and female gamete produces a zygote. Repeated division of the zygote is called cleavage forming a solid morula. After further division and rearrangement, a fluid filled cavity surrounded by blastomeres - blastula is formed. The appearance of germ layers marks the gastrula.

159. Solution: XII NCERT, page no. 47, fig. 3.5

160. Solution: TB is caused by Tuberculosis bacteria. It is a nonsexual disease. Malaria is caused by protozoan protest called *Plasmodium vivax*. When female Anopheles mosquito bites then these parasites goes into the human body and causes malaria

161. Solution: XII NCERT pg 49. The outermost layer of ovum is Corona radiata followed by zona pellucida then vitelline membrane.

162. Solution: XII NCERT pg 52. The second maturation division of the mammalian ovum occurs after the ovum has been penetrated by a sperm.

163. Solution: (c) Leydig cells, also known as interstitial cells, are found adjacent to the seminiferous tubules in the testicle. They produce testosterone in the presence of luteinizing hormone (LH).

164. Solution: The fluid part of semen (seminal plasma), is secreted by seminal vesicles, prostate gland and bulbourethral glands.

165. Solution: NCERT XII, Page 48

166. Solution: Test tube baby is a term that refers to a child that is conceived outside the women's body by a scientific process known as In-Vitro fertilization or IVF treatment. In this process the eggs are taken from the mother's ovary and fertilized by the sperms from the father.

167. Solution:
Infertility is defined as the inability of the couple to produce baby even after unprotected coitus. It might occur due to abnormalities/defects in either male or female or both.
Incurable STI are hepatitis B, HSV, HIV and HPV

168. Solution: (b) Foetal ejection reflex in human female is induced by fully developed foetus and placenta.

169. XII NCERT pg 46. Birth canal is formed of cervix and vagina.

170. Solution: XII NCERT pg 63. STD can lead to fluid discharge pain, itching, swelling, (PID), ectopic pregnancy, still birth, infertility, abortions etc.

171. XII NCETT pg 64

172. Solution: The sperm are stored in the epididymis. Sperm will not be transferred from **the testes to the epididymis** if the vasa efferentia is obstructed.

173. Solution: The technique called Gamete Intra Fallopian Transfer (GIFT) is recommended for those females. who cannot produce an ovum.

174. Solution: The corpus luteum is essential for establishing and maintaining pregnancy in females. In the ovary, the corpus luteum secretes oestrogens and progesterone, which are steroid hormones responsible for the thickening of the endometrium and its development and maintenance, respectively.

175. XII NCERT pg 49,50

176. Solution: Progestogens alone or in combination with estrogen can also be used by females as injections or implants under the skin

177. Solution: Fertilization is internal in Dog fish. The male bear a copulatory organ called clasper.

178. Solution: The suppression of ovulation occurs because of the release of prolactin during suckling that in turn decreases gonadotropin-releasing hormone (GnRH) from the hypothalamus decreasing luteinizing hormone (LH) release so that follicular development is suppressed.

179. XII NCERT pg 49

180. XII NCERT pg 54

181. Solution: An asexually produced mass of cells, which are capable of developing into a new organism or into an adult freshwater sponge, is termed a Gemmule. They are small bud-like cells, which are formed by sponges to withstand unfavourable environmental conditions.

182. Solution: Multiload 375 is a hormone releasing IUD

183. Solution: Identical twins are formed when one sperm fertilizes one egg to form a single zygote. They have the same genotype and phenotype and are of same sex.

184. XII NCERT pg 9. Growth and development in body is mainly controlled by hormones. The changes are brought in body as per the changes happening in the environment.

185. Solution: Natural methods of contraception work on the principle of avoiding chances of ovum and sperm meeting.

186. Solution: XII NCERT pg 60. Copper releasing IUDs release copper ions which suppress the sperm motility and the fertilizing capacity of the sperm.

187. Solution: NCERT XII, Page- 49, Fig. 3.7

188. Solution: XII NCERT pg 57. The major factors affecting Population explosion occurs due to decline maternal mortality rate, decline rate of infant mortality and better medical service.

189. Solution: The umbilical cord connects the baby to mother's placenta and contains two arteries and one vein.

190. (2)

191. Solution: The region outside the somniferous tubules called interstitial spaces, contains interstitial cells or leydig cells. They synthesise and secrete testicular hormones called androgens.

192. Tubectomy is permanent artificial, surgical method of sterilisation in females.

193. Solution: fertilizin-antifertilizin interaction ensures that sperm from the same species merge with the ovum. Acrosin helps in activation of zona pellucida and binding of sperm to it egg. Capacitation takes place in Female reproductive tract.

194. XII NCERT pg 9. Seasonal breeders are non-primates that exhibit oestrous cycle.

195. Solution: XII NCERT pg 59. Saheli is a new kind of oral contraceptive for females. It was developed by the Central Drug Research Institute (CDRI) in Lucknow, India.

196. (3)

197. Solution: Male gametes are motile and they are produced in large numbers. Whereas female gametes are produced in small number as fertilisation is internal.

198. solution: Amnion is an extra embryonic membrane that surrounds embryo in reptiles, birds and mammals. It provides a kind of private aquarium to the embryo and protects it from mechanical shock and desiccation.

199. Solution: MTP is not a contraception method. MTPs can be performed by giving medicines or surgically. Thus, they are not always performed surgically.

200. Solution: The cleavage are mitotic division (equatorial division). Morula is also called as little mulberry. In humans, block to polyspermy is attributed to "oocyte membrane block," also known as "fast block," which primarily involves depolarization of the oocyte membrane after binding of the first spermatozoa and transiently prevents any subsequent sperm binding to the oocyte. (during fertilization). Morula becomes a blastocyst. The blastocyst then burrows into the Endometrium.