ALLEN® CAREER INSTITUTE OVERSEAS

PRE-MEDICAL : OVERSEAS COURSE

Class-XII

PATTERN / TYPE : NEET **ANSWER KEY** **PRE-MEDICAL 2022**

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

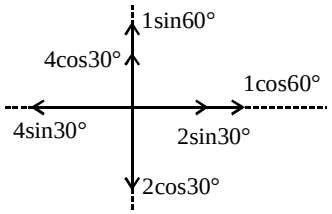
SAMPLE TEST PAPER

HINT – SHEET

1. The component of 1N and 2N force along x-axis.

= 1cos60° + 2sin30°

= 1.5 N

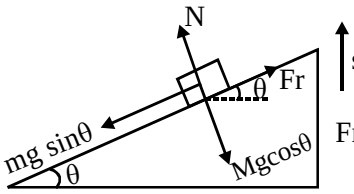


The component of 4N forces along x-axis = 4sin30° = 2N

Hence, net resultant of x component 4sin30°=2N

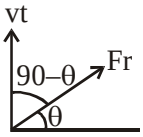
Therefore, if a force of 0.5 N is applied along x-axis the resultant force along x-axis will become zero and the resultant force will be obtained only along y-axis.

2.



s = vt

Fr=mgsinθ



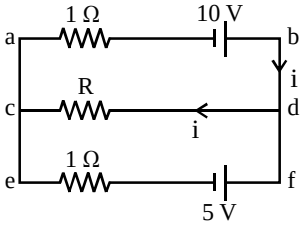
w–D by friction on the block is

$w = f_r \sin\theta \times S = Mgvt\sin^2\theta$

3. Shearing strain $\phi = \frac{x}{L} = \frac{0.02m}{10\ cm}$

$\Rightarrow \phi = 0.002$

4. If no current flows through 5V battery, then potential difference across f and e is 5V. So potential difference across d and c is also 5V.



$i = \frac{10}{R+1}$

$iR = 5 \Rightarrow \frac{10}{(R+1)}R = 5 \Rightarrow R = 1\Omega$

5. $f = \frac{1}{2\pi}\sqrt{\frac{1}{80\times10^{-6}\times5}} = \frac{25}{\pi}$

6. Option (3) is correct

because dimension of resistance is

$[ML^2T^{-3}A^{-2}]$

7. $mgh + \frac{1}{2}mv^2 = \text{constant}$

$gh + \frac{v^2}{2} = \text{constant}$

8. $P_0 + \frac{(M_1+M_2)g}{A} + \rho gh = P_0 + \frac{1}{2}\rho v^2$

$\frac{(45+5)g}{1} + (1000)\ (10)\ (6) = \frac{1}{2}(1000)\ v^2$

$v = \sqrt{121} = 11\ m/s$

9. $S = \frac{I_g R_g}{I - I_g} = \frac{(2)(30)}{10-2} = \frac{2\times30}{8} = \frac{15}{2} = 7.5\Omega$

10. $R.P = \frac{d}{1.22\lambda}$

11. Here $v = e^a h^b \mu^c G^d$.Taking the dimensions

$M^0LT^{-1}A^0$

$=[AT^1]^a[M\ L^2T^{-1}]^b[M\ LT^{-2}A^{-2}]^c[M^{-1}L^3T^{-2}]^d$

There will be 4 simultaneous equations by equating the dimensions of A, T, M and L. These are $a - 2c = 0$, $a - b - 2c - 2d = -1$, $b + c - d = 0$ and $2b + c + 3d = 1$ Solving for 'a', 'b', 'c' and 'd' we get

$a = -2$, $b = 1$, $c = -1$, $d = 0$

Thus, $v = e^{-2}h\mu^{-1}G^0$

12. $v = t^2$

$a_t = 2t$

$a_t = 4m/s^2$

$$a_{cp} = \frac{v^2}{r} = \frac{(2)^4}{4}$$

$a_{cp} = 4m/s^2$

$$a_T = \sqrt{a_t^2 + a_{cp^2}} = 4\sqrt{2}$$

13. $dQ = nC_P dT$

$$C_P = \frac{dQ}{ndT} = \frac{50R}{4\times5} = \frac{5}{2}R \Rightarrow \text{monoatomic}$$

14. In parallel, net power is 2000 W

$\Rightarrow Q_P = 2000\ t$

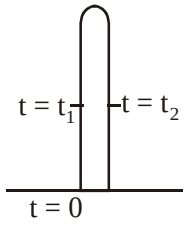
In series, net power is 500 W

$\Rightarrow Q_S = 500\ t$ $\quad\therefore Q_P / Q_S = 4$

15. $n\lambda = m\lambda^1$

$$\frac{n}{m} = \frac{\lambda^1}{\lambda} = \frac{5500}{6000} = \frac{11}{12}$$

16.



$$y = ut - \frac{1}{2}gt^2$$

$$\frac{1}{2}gt^2 - ut + y = 0$$

$$t_1t_2 = \frac{y}{g/2} = \frac{2y}{g}, \text{ as } t_1 = 2,\ t_2 = 8$$

$$y = \frac{g}{2}t_1t_2 = \frac{10}{2}\times 2 \times 8$$

$$= 80\ m$$

17. $v = \sqrt{\mu Rg}$

$v^2 = \mu Rg$

$$\mu = \frac{v^2}{Rg} = \frac{70\times70}{1000\times9.8}$$

$\mu = 0.5$

18. $K_{eq} = \frac{K}{2}$ $\quad f = \frac{1}{2\pi}\sqrt{\frac{K_{eq}}{m}}$ $\quad f = \frac{1}{2\pi}\sqrt{\frac{K}{2m}}$

19. $$\frac{\mu_0 i_1}{2\pi(a+x)} = \frac{\mu_0 i_2}{2\pi(x)}$$

20. Factual theory based Q.

21. Slope $\Rightarrow$ $$\frac{d}{dx}(v^2) = 2v\frac{dv}{dx}$$

Slope = 2a ....(1)

Given $\Rightarrow$ Slope = tan 45° = 1 ....(2)

$\therefore$ $a = \frac{1}{2} = 0.5\ m/s^2$

22. $h_{cm} = \frac{H}{4} = \frac{20}{4} = 5\ cm$

23. Use $v_p = -v\frac{\partial y}{\partial x}$

25. The elements high on the Be versus mass number plot are very tightly bound and hence are stable. And the elements those are lower on this plot, are less tightly bound and hence are unstable.

Since, helium nucleus shown a peak on this plot, so it is very stable.

26. Let initial and final velocity are u & v.

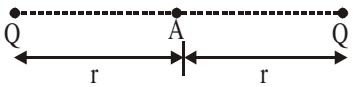
$\therefore$ $v^2 = u^2 - 2gh$ _(1)

and $v\cos 30° = u\cos 60°$ _(2)

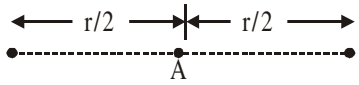
on solving above equation we get

$$u = \sqrt{3gh}$$

28.



$$V_1 = \frac{KQ}{r} \times 2 = \frac{2KQ}{r}$$



$$Q - \frac{Q}{4} \qquad Q + \frac{Q}{4}$$

$$= \frac{3Q}{4} \qquad \frac{5Q}{4}$$

$$V_2 = \frac{K\left(\frac{3Q}{4}\right)}{r} + \frac{K\left(\frac{5Q}{4}\right)}{r}$$

$$= \frac{KQ}{r}\left(\frac{3}{4} + \frac{5}{4}\right) = \frac{kQ}{r}\left(\frac{8}{4}\right) = \frac{2KQ}{r} = V$$

29. For ferromagnetic material
$\chi_m >> 1$

30. Activity $R = \lambda N$.
$\because$ number of nuclei (N) per mole are equal for both the substances.
$\therefore \; R \propto \lambda$.

or $\frac{R_1}{R_2} = \frac{\lambda_1}{\lambda_2} = \frac{4}{3}$

32. $I_{remaining} = I_{complete} - I_{removed}$

Mass of removed part = $\frac{M}{4}$

$$= \frac{MR^2}{2} - \left[\frac{M}{4}\frac{(R/2)^2}{2} + \frac{M}{4}\left(\frac{R}{2}\right)^2\right] = \frac{13}{32}MR^2$$

33. Electric field due to dipole at the place of ring is

$$E = \frac{KP}{R^3}$$

So force on ring is F = QE

$$= \frac{KPQ}{R^3}$$

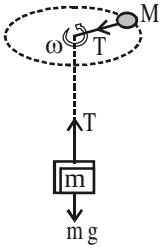
34. $Q_{ind} = \frac{\Delta\phi}{R} = \frac{10-2}{2} = 4C$

35. $I = \frac{15-5}{500\Omega} = 20mA$

$$I_L = \frac{5V}{1K\Omega} = 5mA$$

$$I_Z = I - I_2 = 15mA$$

36. The situation is shown in figure. For the mass m to be stationary, the tension in the string should provide the necessary centripetal force on the rotating mass M.



Now
$T = mg$ and
$T = M\ell\omega^2$ or $mg = m\ell\omega^2$

or $m = \frac{M\ell\omega^2}{g}$

37. Here, R = 2m, M = 100 kg, v = 200 cm s^{-1} = 20 × 10^{-2} m s^{-1}
Total kinetic of the loop = $K_T + K_R$

$$= \frac{1}{2}Mv^2 + \frac{1}{2}I\omega^2 \qquad [\because \text{for a hoop, } I=MR^2]$$

$$= \frac{1}{2}Mv^2 + \frac{1}{2}MR^2\omega^2$$

$$= \frac{1}{2}Mv^2 + \frac{1}{2}Mv^2 \qquad [\because v = R\omega]$$

$= Mv^2$
Work required to stop the hoop = Total kinetic energy of the hoop
$= Mv^2 = (100 \text{ kg})(20 \times 10^{-2} \text{ ms}^{-1})^2 = 4$ J

38. As capacity of circuit increases to charge on C_1 will increase. Also charge on C_2 will decrease because C_3 increases.

39. $i = \frac{V}{R} = \frac{10}{2} = 5$ A

$$U = \frac{1}{2}Li^2 = \frac{1}{2} \times 2 \times 25 = 25 \text{ J}$$

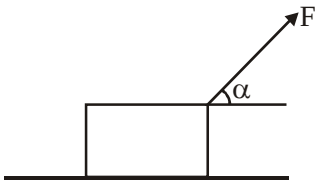
40. $E = \frac{hc}{\lambda} - W_0$ and $2E = \frac{hc}{\lambda'} - W_0$

$$\Rightarrow \frac{\lambda'}{\lambda}=\frac{E+W_0}{2E+W_0}\Rightarrow \lambda'=\lambda\left(\frac{1+W_0/E}{2+W_0/E}\right)$$

Since $\left(\frac{1+W_0/E}{2+W_0/E}\right)>\frac{1}{2}$ so $\lambda'>\frac{\lambda}{2}$

41. Angle of friction $\theta = \tan^{-1}(\mu)$

or $\theta=\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)=30^\circ$



Suppose the body is dragged by a force F acting at an angle α with horizontal. Then,

$$N = mg - F\sin\alpha$$

and $F\cos\alpha = \mu N = \mu(mg - F\sin\alpha)$

$$\therefore\quad F=\frac{\mu mg}{\cos\alpha+\mu\sin\alpha}$$

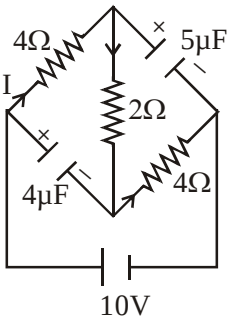
$$F_{min}=\frac{\mu mg}{\sqrt{1+\mu^2}}=\frac{\left(\frac{1}{\sqrt{3}}\right)(25)\,(g)}{\sqrt{1+\frac{1}{3}}}$$

$$= 12.5 \text{ g}$$

$$= 12.5 \text{ kgf}$$

42. If missile launched with escape velocity than it will escape from the gravitational field and at infinity its total energy becomes zero.
But if the velocity of projection is less than escape velocity then sum of energies will be negative. This shown that attractive force is working on the satellite.

43.



$$I=\frac{10}{10}=1A$$

P.d. across 4μF

$-4 \times 1 - 2 \times 1 + v_1 = 0 \Rightarrow v_1 = 6V$

P.d. across 5 μF

$-2 \times 1 - 4 \times 1 + V_2 = 0 \Rightarrow V_2 = 6V$

Energy stored in 4μF & 5μF

$$U_1=\frac{1}{2}\left(4\times10^{-6}\right)(6)^2,$$

$$U_2=\frac{1}{2}\left(5\times10^{-6}\right)(6)^2\Rightarrow\frac{U_2}{U_1}=\frac{5}{4}=1.25$$

44. Electric field between plates of capacitor is given by $E=\frac{\sigma}{\varepsilon_0}$ or $\frac{q}{\varepsilon_0 A}$

Flux through the given area

$$\phi_e=\frac{q}{A\varepsilon_0}\left(\frac{A}{4}\right)=\frac{q}{4\varepsilon_0}$$

Displacement current $I_D=\varepsilon_0\frac{d\phi_E}{dt}$

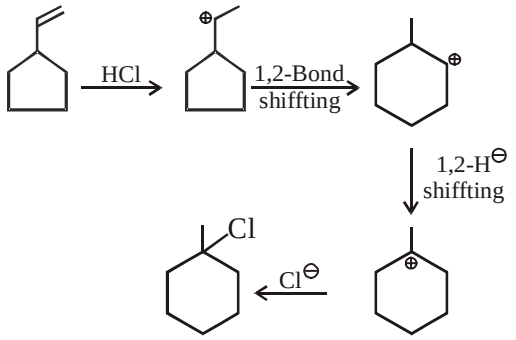
$$=\varepsilon_0\frac{d}{dt}\left(\frac{q}{4\varepsilon_0}\right)=\frac{i}{4}$$

45. By D-Morgan theorem

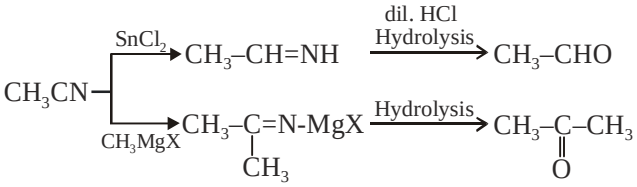
$\overline{A}+\overline{B}+\overline{C}=\overline{ABC}$

$ABC(\overline{ABC})=0$

46.



47.



49.

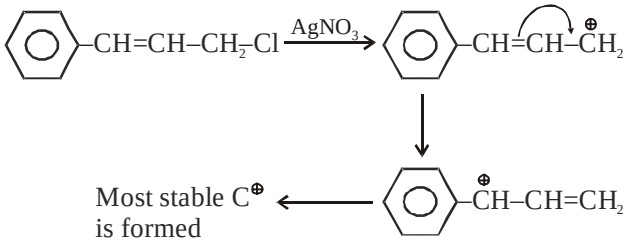
$$H_2 + \frac{1}{2}O_2 \longrightarrow H_2O(g) \quad \Delta H^\circ = -235 \text{ kJ/mol}$$

$$H_2O(g) \longrightarrow H_2O(\ell) \quad \Delta H^\circ = -50 \text{ kJ/mol}$$

$$H_2 + \frac{1}{2}O_2(g) \longrightarrow H_2O(\ell) \quad \Delta H^\circ = -285 \text{ kJ/mol}$$

$$\text{calorific value} = \frac{285}{2} = 142.5 \text{ kJ/g}$$

51.



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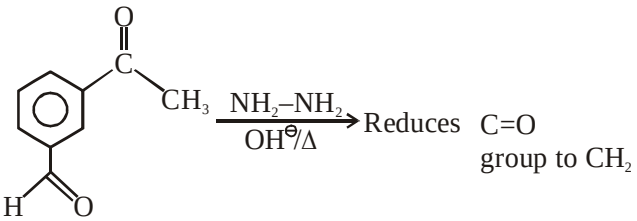


53. $K_{sp} = 4s^3 = 32 \times 10^{-6}$

$s = 2 \times 10^{-2}$

$$Ca(OH)_2 \rightleftharpoons \underset{s}{Ca^{2+}} + \underset{2s}{2OH^-}$$

$[OH^-] = 2s = 4 \times 10^{-2}$

$P^{OH} = 2 - \log 4 = 2 - 0.6 = 1.4$

$P^H = 14 - 1.4 = 12.6$

54.

$$4H^+ + O_2 + 4e^- \longrightarrow 2H_2O \qquad 1.23$$

$$2Fe \longrightarrow 2Fe^{2+} + 4e^- \qquad 0.44$$

$$4H^+ + O_2 + 2Fe \longrightarrow 2Fe^{2+} + 2H_2O \qquad E^\circ = 1.67$$

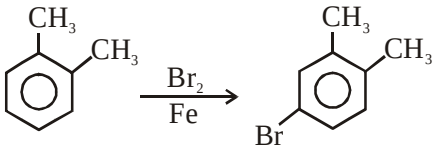
$\Delta G^\circ = -nFE^\circ = -4 \times 96500 \times 1.67$

$= -644$ kJ

55. EAN = 26 – 2 + (6 + 3 × 2) = 36

56. $K_b \propto +I$; +M group

57.



58. $x = \frac{C_P}{C_V} = \gamma$ so, process is an adiabatic process.

So, heat capacity = 0

59. $H^+ + e^- \rightarrow \frac{1}{2}H_2 \qquad E^\circ = 0$

$$E = E^\circ - \frac{0.0591}{1}\log\left(P_H\right)^{1/2} = 0 - \frac{0.0591}{1}\log(100)^{1/2}$$

$= 0.591$ V

61. Sucrose is made up of α-D-Glucose and β-D-Fructose.

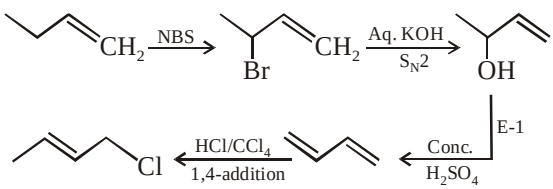
62. If same –M group is attached to benzene then rate of ArS_N2 for various aryl halides follow the order Ph–F > Ph–Cl > Ph–Br > Ph–I

64. On increasing temperature K_w increase,

$K_w\uparrow$ $\{H^+\}\uparrow$ pH↓

66. Fact

67.



68. $\left(p+\frac{a}{V_m^2}\right)(V_m-b)=RT$

$P >> \frac{a}{V_m^2}$

$P(V_m - b) = RT$

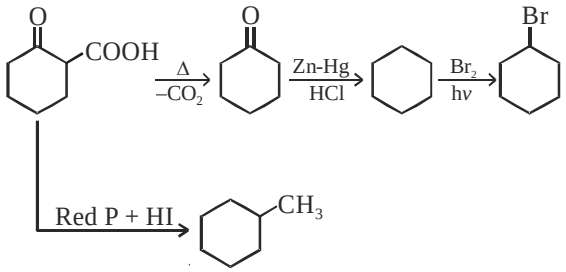
$PV_m = RT + Pb$

70. $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$

$CaO + NH_3 + H_2O \rightarrow NH_4HCO_3$

$NH_4HCO_3 \rightarrow NH_4Cl + NaHCO_3$

71.



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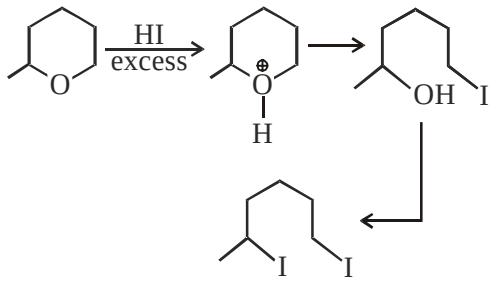


73. Eq. of $KMnO_4$ = Eq. of $Fe_2(C_2O_4)_3$

$x \times 5 = 10 \times 6$

$x = 12$

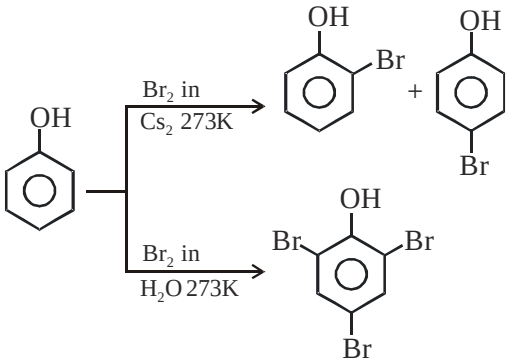
74. (a) $3d < 4d < 5d$ (b) Nature of ligand

(c) $\Delta_0 < \Delta sp$

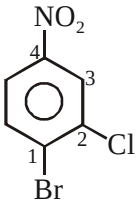
75. $HNO_2 \xrightarrow{-(O)}$ Hypo (HNO)

$(HNO)_2$ $\therefore$ Basicity = 2

76.



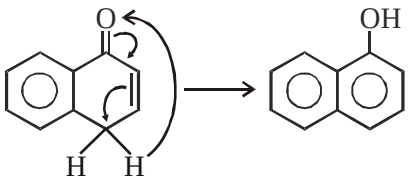
77.



78. Octahedral voids are present at all the edge centres and body centre.

80. (d) $O > S > S^- > O^-$, as per EA

81.



82. Mass of C = $120 \times \frac{40}{100} = 48g$

Suppose number of H and O atoms are 2x and x, then,

$48 + 2x \times 1 + x \times 16 = 120$

$18x = 72$

$x = 4$

Number of H atoms = $2x = 8$

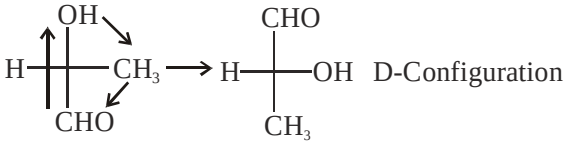
83. $X_{H_2O} = 0.85$ $X_{H_2SO_4} = 0.15$

$\frac{X_{H_2SO_4}}{X_{H_2O}} = \frac{m_{H_2SO_4}}{m_{H_2O}} = \frac{0.15}{0.85}$

$m = \frac{0.15 \times 1000}{0.85 \times 18} = 9.8m$

85. (a) $Pb(NO_3)_2 \xrightarrow{\Delta} PbO + NO_2 + O_2$

86.



D-Configuration

87. $E_P = w_0 + (KE)_{max}$

$E_{P_1} = E$

$E_{P_2} = E + \frac{E}{4} = \frac{5E}{4}$

$E = W + 1.2$ .....(1)

$\frac{5E}{4} = W + 1.8$ .....(2)

$\frac{5E}{4} = \frac{5}{4}W + 1.5$ .....(3)

$\frac{W}{4} = 0.3$

$W = 1.2eV$

88. Reaction following I^{st} order kinetics

$k = \frac{0.7}{t_{1/2}} = \frac{0.7}{30} min^{-1}$

$r = kC_t = \frac{0.7}{30} \times \frac{1}{4} = \frac{7}{1200}$

93. NCERT-XII Pg # 34

100. NCERT-XI Pg # no. 90,95,97

104. NCERT-XII Pg # 232

110. NCERT-XI, Pg # no. 91,93,97

114. NCERT-XII Pg # 226

120. NCERT-XI, Pg # 87

124. NCERT-XII Pg # 244

134. NCERT-XII Pg # 260

137. NCERT Pg # 101

144. NCERT-XII Pg # 293

147. NCERT Pg # 101

164. NCERT-XII Pg # 167

167. NCERT Pg # 332

174. NCERT-XII Pg # 168

Apiculture is not labour intensive.