ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)

DISTANCE LEARNING PROGRAMME

NURTURE TEST SERIES / JOINT PACKAGE COURSE
TARGET : PRE-MEDICAL

Test Type : MAJOR   Test Pattern : NEET-UG

ANSWER KEY

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

HINT – SHEET

1. $\frac{dy}{dx} = -2e^{-2x}$

$\frac{d^2y}{dx^2} = 4e^{-2x}$

2. mv = Area of F-t graph

$\frac{v}{2} = \frac{1}{2} \times 4 \times 10^3 \times 20 \times 10^{-3} \Rightarrow$ v = 80 m/s

3. Impulse = change in momentum = ΔP

$\Rightarrow I = m\left(\vec{v}_f - \vec{v}_i\right)_y$

$= 1 \times \left[\frac{25}{\sqrt{3}}\sin 30° - \left(-25\sin 60°\right)\right]$

= 28.87 N–S

4. $Q_{mix} = \frac{C_1\theta_1 + C_2\theta_2}{C_1 + C_2}$

$28° = \frac{C_1(32) + C_2(24)}{C_1 + C_2}$

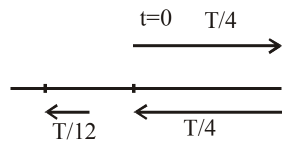
$28C_1 + 28C_2 = C_1(32) + C_2(24)$

$4C_2 = 4C_1 \Rightarrow \frac{C_1}{C_2} = \frac{1}{1}$

5. distance in one oscillation = 4A

so distance travelled in $\frac{5}{8}$ oscillation is

$$= \frac{5}{8} \times 4A = \frac{5}{2}A$$



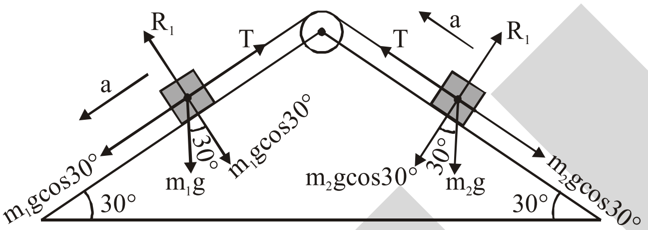
so total time = $\frac{7T}{12}$

6. $\hat{a}$ and $\hat{b}$ are parallel to each other.

7. Here, $m_1 = 40$ kg

$m_2 = 30$ kg

$\theta = 30°$



Let T be the tention in the string and a be the acceleration of the system.
Their equations of motion are

$m_1 g\sin 30° - T = m_1 a$...(i)

$T - m_2 g\sin 30° = m_2 a$...(ii)

Adding (i) and (ii), we get

$(m_1 + m_2)a = (m_1 - m_2)g\sin 30°$

Substituting the given values, we get

$$(40+30)a = (40-30) \times 9.8 \times \frac{1}{2} = 49$$

$$a = \frac{49}{70} = 0.7 \text{ ms}^{-2}$$

8. Impulse $I = \Delta P = m(\vec{v}_f - \vec{v}_i)$

$I = 0.1 \times [40 - (-30)] = 7$ N–S

9. $P = \frac{RT}{2V-b} - \frac{a}{4V^2}$

$\Rightarrow \left(P + \frac{a}{4V^2}\right)(2V - b) = RT$

Real gas equation : $\left(P + \frac{\mu a}{V^2}\right)(V - \mu b) = nRT$

By comparing : $\mu = \frac{1}{2} = \frac{m}{M_w}$

$\therefore \; M = \frac{M_w}{2} = \frac{44}{2} = 22\,\text{gm}$

10. $T \propto r^{3/2}$

$$\frac{T_1}{T_2} = \left(\frac{r_1}{r_2}\right)^{3/2}$$

$r_1 = 3R, r_2 = 6R$

$$\frac{T_1}{T_2} = \left(\frac{1}{2}\right)^{3/2}$$

11. In option (1) $\frac{[L^1T^{-1}]^2}{[L^1][L^1T^{-2}]} = [M^0L^0T^0]$

13. Applying COLM

$20 \times 10 - 20 \times 5 = (20 + 20)v$

$\Rightarrow v = 2.5$ m/s

14. $\lambda \propto \frac{1}{P}$

$\lambda' \rightarrow 2\lambda$

$P' \rightarrow \frac{P}{2}$

15. $\Delta U = \dfrac{mgh}{1+\dfrac{h}{R}}$

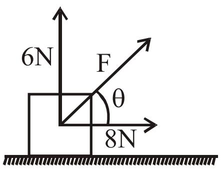
$h = R/4$

$\Delta U = \dfrac{mgR}{5}$

16. $\rho = \dfrac{M}{V}$

$\dfrac{\Delta\rho}{\rho}\% = \dfrac{\Delta M}{M}\times 100 \times \dfrac{\Delta V}{V}\times 100$

17.



Here, m = 10 kg

The resultant force acting on the body is

$F = \sqrt{(8N)^2 + (6N)^2} = 10N$

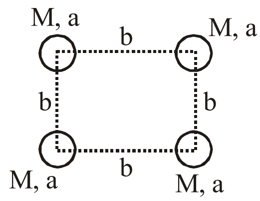
Let the resultant force F makes an angle θ w.r.t. 8N force.

From figure, $\tan\theta = \dfrac{6\,N}{8\,N} = \dfrac{3}{4}$

The resultant acceleration of the body is

$a = \dfrac{F}{m} = \dfrac{10\,N}{10\,kg} = 1\,ms^{-2}$

18.



$I_{system} = 4\left(\dfrac{2}{5}Ma^2\right) + 2(Mb^2)$

19. $\Delta P = \dfrac{2T}{r} = \dfrac{2\times 72\times 10^{-3}}{0.01\times 10^{-2}} = 1440\ N/m^2$

$= 1.44 \times 10^4\ dyne/cm^2$

20. $V_e = \sqrt{\dfrac{2Gm}{R}}$

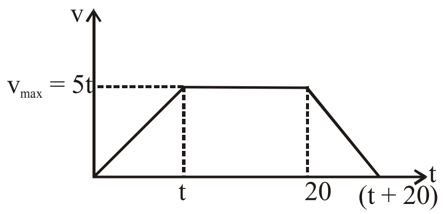
$\dfrac{V_1}{V_2} = \sqrt{\dfrac{M_1}{M_2}\times\dfrac{R_2}{R_1}}$

$M_2 = 2M_1,\ R_2 = 2R_1$

$V_1 = U$

$V_2 = U$

21.



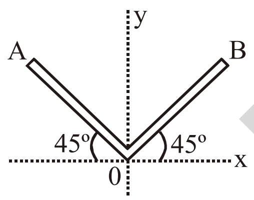
$$V_{av} = \frac{\text{Area under graph}}{\text{Total time}}$$

$$20 = \frac{\frac{1}{2}(20 + t + 20 - t)5t}{(t + 20)}$$

t = 5 sec

v_{max} = 5t = 25 m/s

23.



$$I_x = \frac{m\ell^2}{3}\ \sin^2\theta = \frac{m\ell^2}{6}$$

$$I_y = \frac{m\ell^2}{3}\ \sin^2\theta = \frac{m\ell^2}{6}$$

$$I_z = \frac{m\ell^2}{6}$$

so $I_x = I_y < I_z$

24. Breaking force = Breaking stress × Area of cross section of wire

$\therefore$ Breaking force $\propto r^2$ (Breaking stress is constant)

If radius becomes doubled then breaking force will become 4 times i.e. 40 × 4 = 160 kg wt

25. At t = 0, $y = \frac{1}{1 + x^2}$ or $x = \sqrt{\frac{1 - y}{y}} = x_1$

At t = 2sec,

$$y = \frac{1}{[1 + (x - 1)^2]} \text{ or } x = 1 + \sqrt{\frac{1 - y}{y}} = x_2$$

$$\therefore\ v = \frac{x_2 - x_1}{t_2 - t_1} = \frac{1 + \sqrt{\frac{1-y}{y}} - \sqrt{\frac{1-y}{y}}}{2 - 0} = \frac{1}{2} = 0.5\text{ m/s}$$

26. $t_1 = \sqrt{\frac{2(50)}{g}} = \frac{10}{\sqrt{g}}$

$$t_2 = t - t_1 = \sqrt{\frac{2(100)}{g}} - \sqrt{\frac{2(50)}{g}} = \frac{10}{\sqrt{g}}\left(\sqrt{2} - 1\right)$$

$$\frac{t_1}{t_2} = \frac{1}{\sqrt{2} - 1} = \sqrt{2} + 1$$

27. $W = \int F\,dx$

$$= \int_0^5 \left(7 - 2x + 3x^2\right)dx \quad = 135\text{ J}$$

28. $K_{Total} = \frac{1}{2}mv^2\left(1+\frac{K^2}{R^2}\right)$

$= \frac{1}{2}$ (0.2) $(2 \times 10^{-2})^2 \left(1+\frac{2}{5}\right)$

$= 5.6 \times 10^{-5}$ J

29. Rate of flow under a constant pressure head,

$V = \frac{\pi p r^4}{8\eta l} \Rightarrow V \propto \frac{r^4}{l}$

$\Rightarrow \frac{V_2}{V_1} = \left(\frac{r_2}{r_1}\right)^4 \times \frac{l_1}{l_2} = \left(\frac{1}{2}\right)^4 \times \frac{1}{2}$

$\Rightarrow V_2 = \frac{V_1}{32} = \frac{V}{32}$

31. $\tan\theta = \frac{4H}{R}$

$\tan\theta = \frac{4\times4}{12} = \frac{4}{3} \Rightarrow \theta = 53°$

$H = \frac{u^2\sin^2\theta}{2g}$

$4 = \frac{u^2(4/5)^2}{2g}$

$u = 5\sqrt{\frac{g}{2}}$

32. $\because \frac{mv^2}{R} = mg \therefore v = \sqrt{Rg} = \sqrt{20\times10} = \sqrt{200}$ m/s

33. $\tau = \frac{\Delta L}{\Delta t} = \frac{3A_0}{4}$

34. Density of metal = ρ,

If V is the volume of sample then according to problem

$210 = V\rho g$ ......(i)

$180 = V(\rho - 1)g$ ......(ii)

By solving we get ρ = 7

36. $\vec{V}_{rm} = \vec{V}_r - \vec{V}_m = (-4\hat{j}) - (3\hat{i})$

$V_{rm} = \sqrt{(-3)^2 + (-4)^2} = 5$ km/hr

37. In Balancing condition

$F_{centritugal} \le$ Friction force

$mr\omega^2 \le \mu mg$

$r \le \frac{\mu g}{\omega^2}$

38.

Isothermal	Adiabatic
PV = Constant	PV^r = Constant
P ↑ V ↓	P ↑ V ↓

And slope of adiabatic is more, therefore A is adiabatic and B is isothermal.

39. If velocities of water at entry and exit points are v_1 and v_2, then according to equation of continuity,

$$A_1v_1 = A_2v_2 \Rightarrow \frac{v_1}{v_2} = \frac{A_2}{A_1} = \left(\frac{r_2}{r_1}\right)^2 = \left(\frac{2}{3}\right)^2 = \frac{4}{9}.$$

40. $\omega_1 = 600\pi$ or $n_1 = \frac{600\pi}{2\pi} = 300\,s^{-1}$

$\omega_2 = 608\pi$ or $n_2 = \frac{608\pi}{2\pi} = 304\,s^{-1}$

$\therefore$ Number of beats $= n_2 - n_1 = 304 - 300 = 4s^{-1}$

Intensity ratio

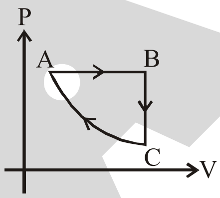
$$= \frac{I_{max}}{I_{min}} = \left(\frac{a_2 + a_1}{a_2 - a_1}\right)^2 = \left(\frac{5+4}{5-4}\right)^2 = \frac{81}{1}$$

41. $V = \frac{dS}{dt} = 2Nt^3$

at t = 1 sec, $V_1 = 2N$

42. $$\vec{R}_{cm} = \frac{\int x dm}{\int dm} = \frac{\int_o^L x(\lambda x dx)}{\int_o^L \lambda x dx} = \frac{\int_o^L x^2 dx}{\int_o^L x dx} = \frac{2L}{3}$$

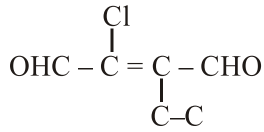
43. AB = P-constant
BC = V-constant
CA = T-constant



44. $T \propto \sqrt{\ell}$

45. $$n'_R = n\left(\frac{v+x}{v-x}\right)$$

x = speed of car

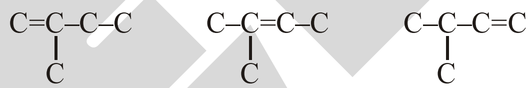
46. 

47. HCl not shows peroxide effect.

51. It contain 23 σ and 4 π-bonds.

52. NBS shows free radical substitution reaction.

56. C=C–C–C–C, C–C=C–C–C (cis and trans)



57. This reaction is wolf - Kischner reduction

61. Priority given by CIP rules.

62. A = $CH_3 - CH_2 - CH_3$ B = $CH_3 - CH_3$

66. –M and –I group increase the acidic strength.

71. This compound follow huckel's rule.

81. 

is o, p directing and activating group.

86. ℓ.p. of Cl part in resonance.

92. Module-5 Pg. # 3

94. NCERT XI Eng. Med. Page # 86 Fig. 6.2(b)

95. NCERT Pg # 136

101. NCERT XI[th] Pg.#21 Para-2.2.2

102. Module-5 Pg. # 9

104. NCERT XI Eng. Med. Page # 96

105. NCERT Pg # 134

111. NCERT XI^{th} Pg.#23 Para-2.3

113. NCERT XI, Pg. # 102

115. NCERT Pg # 165

121. NCERT XI^{th} Pg.#39 Para-3.4

122. Module-5 Pg. # 25

125. NCERT Pg # 138

132. Module-5 Pg. # 21

133. NCERT XI, Pg. # 104

135. NCERT Pg # 131, 132, 134

141. NCERT XI^{th} Pg.#41 Para-3.5

142. NCERT (XI) Pg. # 53

143. NCERT XI, Pg. # 111

144. NCERT XI Eng. Med. Page # 75

145. NCERT Pg # 165

Homologous pair cannot occur in a haploid cell.

151. NCERT XI^{th} Pg.#34 Figure-3.2(d)

152. NCERT (XI) Pg. # 58,59,60

153. NCERT XI, Pg. # 113

154. NCERT XI Eng. Med. Page # 74

155. NCERT Pg # 135, 136

162. NCERT (XI) Pg. # 48

163. NCERT XI, Pg. # 112 fig. 7.15

165. NCERT Pg # 135

171. NCERT XI^{th} Pg.#32 Para-3.1.2

172. NCERT (XI) Pg. # 51 fig. 4.9

174. NCERT XI Eng. Med. Page # 80