ALLEN® CAREER INSTITUTE OVERSEAS

PRE-MEDICAL : OVERSEAS COURSE

Class-XI

PATTERN / TYPE : NEET **ANSWER KEY** **PRE-MEDICAL 2023**

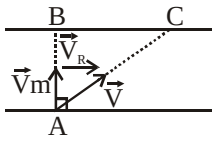
Q.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A.	2	1	3	4	2	3	1	3	4	3	4	2	4	1	2	2	3	2	3	2	1	3	1	4	4	1	1	4	4	1
Q.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
A.	2	1	2	4	3	1	3	1	2	1	2	3	2	1	4	1	3	2	2	4	3	4	3	1	1	4	3	2	2	4
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.	4	4	2	2	1	1	3	2	2	1	3	4	1	3	3	2	1	1	2	2	2	4	2	3	4	2	1	1	2	1
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.	2	1	3	2	3	1	3	2	2	2	4	1	3	3	2	1	2	3	3	3	4	2	4	3	1	1	4	2	3	3
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.	3	4	3	4	2	3	1	3	2	2	4	2	3	4	2	3	2	2	3	1	4	3	3	4	1	3	2	4	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.	1	3	4	2	4	2	3	3	3	3	3	2	3	4	4	4	3	2	1	1	3	4	4	1	1	1	3	4	2	4

SAMPLE TEST PAPER

HINT – SHEET

1. $y = 5 \sin x$

2.



$$t = \frac{AB}{V_M} = \frac{1}{4}hr = 15 \text{ min}$$

4. A/C to COME

$E_s = E_\infty$

$$\frac{1}{2}mV^2 + \left(\frac{-GMm}{R}\right) = \frac{1}{2}mV_\infty^2 + 0$$

$$\begin{cases} V_e = \sqrt{\frac{2GM}{R}} \\ V = 3Ve \end{cases}$$

On solving $V_\infty = 2\sqrt{2}V_e$

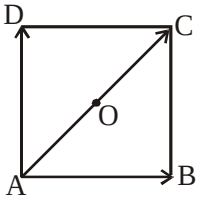
5. $\eta = 1 - \frac{T_2}{T_1}, \frac{T_1}{T_2} = \frac{1}{1-\eta}$

$$\omega = \frac{T_2}{T_1 - T_2} = \frac{1}{(T_1/T_2) - 1}$$

$$= \frac{1}{[1/(1-\eta)] - 1} = \frac{1-\eta}{\eta}$$

As $\eta = 10\% = 0.1$, $\omega = \frac{1-0.1}{0.1} = 9$

6.



$\overrightarrow{AB} + \overrightarrow{AD} = \overrightarrow{AC}$

$\overrightarrow{AB} + \overrightarrow{AD} + \overrightarrow{AC} = 2\overrightarrow{AC}$

$\left[\because \overrightarrow{AC} = 2\overrightarrow{AO}\right]$

$\overrightarrow{AB} + \overrightarrow{AD} + \overrightarrow{AC} = 4\overrightarrow{AO}$

7. Relative vertical acceleration of A with respect to B = $g(\sin^2 60° - \sin^2 30°)$

$$= 9.8\left(\frac{3}{4} - \frac{1}{4}\right) = 4.9 \text{ m/s}^2$$

8. acc^n of 3 kg particle $a_2 = \frac{f}{m}$

$a_2 = 2 \text{ m/s}^2$

velocity at t = 5 sec; $v_2 = at = 10$ m/s

$$v_{com} = \frac{m_1v_1 + m_2v_2}{m_1 + m_2} = 6 \text{ m/s}$$

9. Breaking stress $\sigma = \frac{T}{A} = \frac{500}{\frac{\pi}{4}(1)^2}$

$$\sigma = \frac{T'}{A'}$$

$$\frac{500}{\frac{\pi}{4}(1)^2} = \frac{T'}{\frac{\pi}{4}(2)^2} \Rightarrow T' = 2000 \text{ N}$$

10. $y = \cos^3\omega t$ & $y = 1 + \omega t + \omega^4 t^4$

will not represent SHM

11. $\cos\theta = \frac{\vec{A} \cdot \vec{B}}{|\vec{A}|\,|\vec{B}|} \Rightarrow \frac{1}{\sqrt{3}}$

12. Force exerted by 20 kg. on 50 kg

$N = 20[g + a] = 20[10 + 1.5] = 230$ N

13. $h_n = he^{2n} = 1 \times e^{2\times1} = 1 \times (0.6)^2 = 0.36$m

14. Apply work – Energy Theorem

$mg(2 + h) - F_B(h) = \Delta K$ $(\Delta K = 0)$

$h = 8$m

15. $KE_{mean} = KE_{max} = TE - U_{min} = 10 - 5 = 5J$

16. Surface tension $= \frac{\text{Force}}{\text{Length}} =$ newton/metre

17. $6g - T = 6a$ ...(i)

$T = 4a$ ...(ii)

$\therefore$ $6g = (6 + 4)a$ or $a = \frac{6g}{10} = \frac{6\times10}{10} = 6\,m\,s^{-2}$

18. $\omega = \omega_0 + \alpha t$

$\omega = 0 + \frac{1000}{200}\times 3 = 15$ rad/s $\quad (\because \alpha = \frac{\tau}{I})$

19. $2 = \frac{2T}{\rho g r}$ ...(1)

$1 = \frac{2T\cos\theta}{\rho g r}$ ...(2)

(1)/(2) $\frac{2}{1} = \frac{1}{\cos\theta}$

$\cos\theta = \frac{1}{2}$

$\theta = 60°$

20. $\frac{T_1}{T_2} = \sqrt{\frac{m_1}{m_2}}$

$\frac{3}{T_2} = \sqrt{\frac{900}{400}}$

$T_2 = 2$

21. By principle of dimensional homogenity

$\left[\frac{a}{V^2}\right] = [P]$

$\therefore$ $[a] = [P]\,[V^2] = [ML^{-1}T^{-2}] \times [L^6] = [ML^5T^{-2}]$

22. $x = (t-3)^2 \Rightarrow v = \frac{dx}{dt} = 2(t-3)$

at t = 0 ; $v_1 = -6$m/s and at t = 6 sec, $v_2 = 6$ m/s

so, change in kinetic energy

$= W = \frac{1}{2}mv_2^2 - \frac{1}{2}mv_1^2 = 0$

23. $I = I_1 + I_2 + I_3$

$= \left(\frac{2}{3}mR^2 + mR^2\right) + \left(\frac{2}{3}mR^2 + mR^2\right) + \frac{2}{3}mR^2$

$= 4\,m\,r^2$

24. $\frac{T_X - (20°x)}{220°x - 20°x} = \frac{T_Y - (-40°Y)}{120°Y - (-40°Y)}$

$\frac{T_X - 20°X}{200°X} = \frac{T_Y + 40°Y}{160°Y}$

$\frac{100°X - 20°X}{200°X} = \frac{T_Y + 40°Y}{160°Y}$

$\frac{80°X}{200°X}\times 160Y = T_Y + 40°Y$

$\boxed{T_Y = 24°Y}$

25. $y = 0.25\cos(2\pi t - 2\pi x)$

equation of wave in opposite direction

$y = 0.5\cos(\pi t + \pi x)$

26. Volume = 9 cm × 8 cm × 2.45 cm

= 176.4 cm^3

Result cannot have any significant figures after the decimal.

Volume = 200 cm^3

= 2×10^2 cm^3

27. $a = \frac{3-2}{3+2}g = \frac{g}{5}$

Distance covered in fourth second

$= \frac{(2n-1)}{2} = \frac{(2\times4-1)\times g}{2\times5} = \frac{7g}{10}$

Hence, work done by gravity = $(m_2 - m_1)gh$

$= (3-2)g\times\frac{7g}{10} = \frac{7}{10}g^2$

28. $v = \sqrt{\frac{2gh}{1+\frac{K^2}{R^2}}}$ for solid sphere

$I = \frac{2}{5}MR^2 \Rightarrow v = \sqrt{\frac{2gh}{1+\frac{2}{5}}} \Rightarrow v = \sqrt{\frac{10gh}{7}}$

29. (i) Clockwise cycle on P-V diagram

ΔW_{cyclic} = +ve = ΔQ_{cyclic}

Heat is absorbed

(ii) anticlockwise cycle on V-P diagram

ΔW_{cyclic} = +ve = ΔQ_{cyclic}

heat is absorbed

(iii) clockwise cycle on P-V diagram

ΔW_{cyclic} = +ve = ΔQ_{cyclic}

heat is absorbed

(iv) clockwise cycle on V-P diagram

ΔW_{cyclic} = –ve = ΔQ_{cyclic}

heat is rejected

31. $\frac{u}{4} = u + (-a)t_0$

$\frac{3u}{4} = at_0 \Rightarrow \frac{u}{a} = \frac{4t_0}{3}$

For total motion, $0 = u + (-a)t$

$t = \frac{u}{a}$

$t = \frac{4t_0}{3}$

32. Area under the graph $\| \int dw = \int P.dt$

Area under graph increases, hence work done upon the particle from A to B increases.

33. According to the law of conservation of angular momentum

$Mr^2\omega = (Mr^2 + 2mr^2)\,\omega' \Rightarrow \omega' = \frac{\omega M}{M+2m}$

34. $\lambda_0 T_1 = \frac{3\lambda_0}{4} T_2$

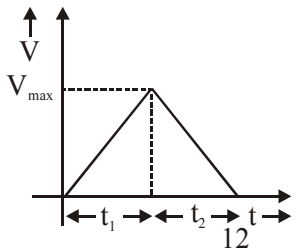
$\frac{T_2}{T_1} = \frac{4}{3}$

$\frac{P_2}{P_1} = \left(\frac{T_2}{T_1}\right)^2 = \left(\frac{4}{3}\right)^4 = \frac{256}{81}$

35. If the speed of engine is v, the distance traveled by engine in 5 sec will be 5v, and hence the distance traveled by sound in reaching the hill and coming back to the moving driver = 900 + (900 – 5v) = 1800 – 5v
So the time interval between original sound and it's echo

$t = \frac{(1800-5v)}{330} = 5 \Rightarrow v = 30$ m/s.

36.



$\frac{V_{max}}{t_1} = u$ and $\frac{V_{max}}{t_2} = 2$

$t_1 + t_2 = 12$

$\frac{V_{max}}{4} + \frac{V_{max}}{2} = 12 \Rightarrow V_{max} = 16$ m / s

37. If time periods are equal then angular speed are also equal. $\because\ \omega = \frac{2\pi}{T}$

$\frac{\omega_1}{\omega_2} = \frac{1}{T}$

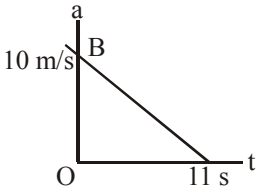
38. $\frac{Gm}{x^2} + \frac{G(2m)}{(2x)^2} + \frac{G(4m)}{(4x)^2} + ...\infty$

$\frac{Gm}{x^2}\left[1 + \frac{1}{2} + \frac{1}{4} + ...\infty\right]$

$\frac{Gm}{x^2}\left[\frac{1}{1-\frac{1}{2}}\right] = \frac{2GM}{x^2}$

40. The time interval between successive maximum intensities will be $\frac{1}{n_1 \sim n_2} = \frac{1}{454-450} = \frac{1}{4}$sec.

41. The area under acceleration time graph quies changes in velocity.



As acceleration in zero at the end of 11 s.
i.e. V_{max} = Area of $\Delta OAB = 1/2 \times 11 \times 10 = 55\ ms^{-1}$

42. $T = 2mg = mr\omega^2$

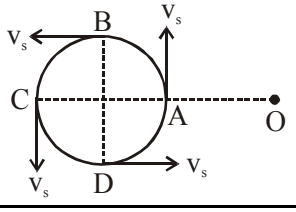
$\omega = \sqrt{\frac{2g}{r}} = \sqrt{2g}$ rad/s

43. $g' = g\left(\frac{R}{R+h}\right)^2 \Rightarrow \frac{g}{4} = g\left(\frac{R}{R+h}\right)^2 \Rightarrow \frac{1}{2} = \frac{R}{R+h}$

44. $N = \frac{PV}{RT} \times N_A$

$= \frac{1.3\times10^5 \times 7\times10^{-3}}{8.314\times273} \times 6.023\times10^{23} = 2.4 \times 10^{23}$

45. Frequency heard by the observer will be maximum when the source is in position D. In this case, source will be approaching towards the stationary observer, almost along the line of sight (as observer is stationed at a large distance).



$$n_{max.} = \frac{\upsilon}{\upsilon - \upsilon_s} \times n = \frac{330}{330 - 1.5 \times 20} \times 440$$

$$= \frac{330}{300} \times 440 = 484 \text{ Hz}$$

Similarly, frequency heard by the observer will be minimum when the source reaches at the position B. Now, the source will be moving away from the observer.

$$n_{min.} = \frac{\upsilon}{\upsilon - \upsilon_s} \times n = \frac{330}{330 + 1.5 \times 20} \times 440$$

$$= \frac{330 \times 440}{360} = 403.3 \text{ Hz}$$

46. Nuclear charge is highest on 1s electron of Phosphorus

50. $2Al + 3MnO \xrightarrow{\Delta} Al_2O_3 + 3Mn$

Al is limiting reagent.

2 moles Al remains.

51. Apply Zeff, e^- configuration

56. Due to s^2 Zeff $\uparrow\uparrow$ configuration

$Be^{+2} \rightarrow 1S^2 \rightarrow$ The maximum I.P. required.

$$X \underset{IP}{\overset{EA}{\rightleftharpoons}} X^-$$

63. $$\frac{1}{\lambda} = Rz^2\left[\frac{1}{2^2} - \frac{1}{3^2}\right] \quad .....(1)$$

$$\frac{1}{\lambda_\beta} = Rz^2\left[\frac{1}{2^2} - \frac{1}{4^2}\right] \quad .....(2)$$

$$\frac{eq(1)}{eq(2)} \Rightarrow \frac{\lambda_\beta}{\lambda} = \frac{80}{108}$$

68. 2° amine is most basic.

70. $PbBr_2 \rightleftharpoons Pb^{+2}(aq) + 2Br^-(aq)$

$0.8S \quad 2 \times 0.8S$

$8 \times 10^{-5} = K_{sp} = (0.8\ S)\ (1.6S)^2$

$$S = \left(\frac{10^{-4}}{1.6 \times 1.6}\right)^{1/3}$$

71. General formula of chain silicate is $(SiO_3)_n^{-2n}$ but we have to add terminal 'O' and charge (–2)

For 100 unit :

$$(Si_{100}O_{300})^{-200} + O^{-2} = Si_{100}O_{301}^{-202}$$

73. –M group decrease stability of carbocation.

75. Velocity is proportional to $\frac{Z}{n}$

79. $C_2H_{6(g)} \rightarrow 2CO_{2(g)} + 3H_2O_{(g)}$

$$\frac{3}{30}\text{mol} \rightarrow \frac{2 \times 3}{30}\text{mol}$$

Volume of CO_2 produced = 4.48 L

80. pH = 2, $[H^+] = 10^{-2}$

85. $$\frac{K_c}{K_p} = \frac{1}{RT}$$

89. $\Delta_r H = -110.5 - 241.8 + 393.5 = 41.2$

92. NCERT XI Pg # 126

94. NCERT Pg # 55-56

97. NCERT XI Pg # 290

99. NCERT XI Pg # 80

100. NCERT XI Pg # 75

102. NCERT XI Pg # 132, 8.5.2

104. NCERT Pg # 47-48

107. NCERT XI Pg # 293

110. NCERT XI Pg # 73

114. NCERT Pg # 50-60

117. NCERT XI Pg # 294

118. NCERT XI Pg # 67

119. NCERT XI Pg # 70

122. NCERT XI Pg # 168, 169, 170

124. NCERT Pg # 48

127. NCERT XI Pg # 297

128. NCERT XI Pg # 71

129. NCERT XI Pg # 67, 68, 70, 75

132. NCERT XI Pg # 133

134. NCERT XI Pg # 115

137. NCERT XI Pg # 150

138. NCERT XI Pg # 72, 79

139. NCERT XI Pg # 74

142. NCERT XI Pg # 167, 10.3

144. NCERT XI Pg # 114

146. NCERT Pg # 270

147. NCERT XI Pg # 149

148. NCERT XI Pg # 72, 73

149. NCERT XI Pg # 79

152. NCERT XI Pg # 139, 8.5.10

153. NCERT Pg # 58-59

154. Module No # 2

156. NCERT Pg # 270-271

157. NCERT XI Pg # 144

158. NCERT XI Pg # 74

159. NCERT XI Pg # 69

161. NCERT XI Pg # 308

163. NCERT Pg # 56-57

166. NCERT Pg # 275

168. NCERT XI Pg # 76 (Fig. 5.17(a))

169. NCERT XI Pg # 72,75,76,78

171. NCERT XI Pg # 310

173. NCERT Pg # 49-58

176. NCERT Pg # 273

178. NCERT XI Pg # 79

179. NCERT XI Pg # 68, 69