Path to Success
ALLEN CAREER INSTITUTE
KOTA (RAJASTHAN)

MAJOR TEST # 02

ALLEN NEET-UG | **DATE : 23 - 03 - 2013**

SYLLABUS - 02

ANSWER KEY

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

HINT – SHEET

1. Excess pressure inside the liquid drop = $p_1 = \frac{2T}{r}$

Excess pressure inside the soap bubble = $p_2 = \frac{4T}{r}$

$\therefore\ p_2 = 2p_1$

3. Thermal stress = YA $\propto \Delta\theta$

$$\frac{(\text{Stress})_{cu}}{(\text{Stress})_{Fe}} = \frac{(\alpha)_{cu}}{(\alpha)_{Fe}} \times \frac{Y_{cu}}{Y_{Fe}} = \frac{3}{2} \times \frac{1}{2} = \frac{3}{4}.$$

4. $2.5\ \lambda = 20$

$$\lambda = \frac{20}{2.5} = 8 \text{ cm}$$

$$n = \frac{320}{\frac{8}{100}} = 4000 \text{ Hz}$$

5. By equation of continuity $A_1\ v_1 = A_2 v_2$

6. $v_{max} = 4V$

$Aw = 4n\lambda$

$A.2.\pi.n = 4n\lambda$

$$\frac{A\pi}{2} = \lambda \quad \text{Here } A = y_0$$

7. Reynold's number $R_e \simeq \frac{\rho \upsilon d}{\eta}$.

8. $V = Aw \cos(wt \pm \phi)$.....(1)

$a = Aw^2 \sin(wt \pm \phi)$.....(2)

from (1) & (2)

$$\frac{v^2}{(Aw)^2} + \frac{a^2}{(Aw)^2} = 1$$

equation of ellipse

9. $\frac{v^2}{2g} = 40$ cm

$v = \sqrt{2\times1000\times40} = 200\sqrt{2} = 200\times1.41 = 282$ cm/s.

11. $\frac{\theta_1-\theta_2}{t_1} = K\left(\frac{\theta_1+\theta_2}{2}-\theta_0\right)$

$\Rightarrow \frac{90-80}{10} = K\left(\frac{90+80}{2}-25\right) \Rightarrow 1 = K(85-25)$ ...(i)

and $\frac{80-70}{t_2} = K\left(\frac{80+70}{2}-25\right)$

$\Rightarrow \frac{10}{t_2} = K(75-25)$ ...(ii)

On solving equations (1) and (2)
$\therefore$ $t_2 = 12$ minutes.

12. $V = \frac{w}{k} = \frac{\alpha}{\beta}$

speed same
but due to opposite direction of prapogation velocity will be different

14. $K_1 = \frac{K}{2}$

$K_2 = \frac{2K\times K}{2K+K} = \frac{2}{3}K$

$T = 2\pi\sqrt{\frac{m}{k}} = \frac{1}{n}$

$n \propto \sqrt{K}$

$$\frac{n_1}{n_2} = \sqrt{\frac{\frac{K}{2}}{\frac{2}{3}K}} = \frac{\sqrt{3}}{2}$$

15. By Bernoulli's theorem $P + \frac{1}{2}\rho v^2 = \text{const}$

$\Delta P = \frac{1}{2}\rho v^2 = \frac{1}{2}\rho(r\omega)^2$

$h\rho g = \frac{1}{2}\rho r^2\omega^2$

$h = \frac{r^2\omega^2}{2g}$.

16. $E_0 = \frac{1}{2}KA^2 = 5J$

$\frac{1}{2}\times\left(\frac{10}{100}\right)^2\times K = 5$

$K = 10\times(10)^2$
$= 1000$ N/m

17 $V_{rms} = \sqrt{\frac{3RT}{M_w}}$ & $V_{mp} = \sqrt{\frac{2RT}{M_w}}$

$\Rightarrow \frac{V_{rms}}{V_{mp}} = \sqrt{\frac{3}{2}}$

18. $x = A\sin\omega t = \frac{A}{2}$

$\sin\omega t = \frac{1}{2}$

$\therefore$ Cant $= \frac{\sqrt{3}}{2}$, KE $= E_0\cos^2 wt$

19. At A, $\rho_0 = \frac{P_0M_w}{RT_0}$

At B, $\rho = \frac{3P_0M_w}{RZT_e} = \frac{3}{2}\rho_0$

20. $2A = 4$
$A = 2$
$A\omega = 12$

$\omega = \frac{12}{2} = 6 = 2\pi n$

21. Here Heat lost = Heat gained
so $n_1C_v\Delta T_1 + n_2C_v\Delta T_2 = 0$

$\Rightarrow \frac{P_1V_1}{T_1}[T_1-T] = \frac{P_2V_2}{T_2}[T-T_2]$

$\Rightarrow T = \frac{(P_1V_1+P_2V_2)T_1T_2}{P_1V_1T_2+P_2V_2T_1}$

22. $|a| = |-\omega^2 x|$

$a = \omega^2 x$

$\frac{20}{5} = \omega^2$

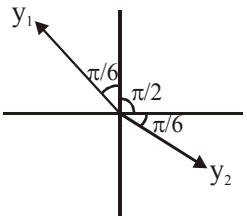
$\omega = \pm 2$

23. $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_1}$

24. $\Delta\lambda = \frac{\lambda v}{C}$

$0.5 = \frac{100 \times v}{C}$

26.



$30° + 90° + 30° = 150°$

27. $E_T \propto T_1 \quad V_{rms} \propto \sqrt{T}$

28. $n^1_{Ref} = n\left(\frac{v+x}{v-x}\right)$

30. $V = \frac{2d}{t} = \sqrt{\frac{\beta}{\rho}}$

31. T = const, $C_{IT} = \infty$

32. $V = n\lambda$

$20 = 50 \times \lambda \qquad \Delta\lambda = 10$ cm

$\lambda = \frac{20}{50} = 40$ cm

$\frac{\Delta T}{T} = \frac{\Delta\lambda}{\lambda}$

$\Delta T = \frac{T}{4} = \frac{1}{4\times 50} = \frac{1}{200}$ sec

33. $ms\Delta\theta = m^1L$

$80 \times 1 \times 30 = m' \times 80$

$m' = 30$ g

34. $n_A = n_0 + \frac{20}{100}n_0 = \frac{6}{5}n_0$

$n_B = n_0 + \frac{30}{100}n_0 = \frac{13}{10}n_0$

$n_B - n_A = \frac{1}{10}n_0$

$7 = \frac{n_0}{10}$

$n_0 = 70$ Hz

35. As $\Delta U = 0$, so

$Q_1 + Q_2 + Q_3 + Q_4 = W_1 + W_2 + W_3 + W_4$

$\Rightarrow \quad 5960 - 5585 - 2980 + 3645 = 2200 - 825 - 1100 + W_4$

$\Rightarrow \quad W_4 = 765$ J

36. $295 \overset{b\downarrow}{\longleftrightarrow} 300 \overset{b\uparrow}{\longleftrightarrow} 305$

38. Silence means minimum intensity

distance between two min is = λ

$\therefore 60 - 30 = 30$ cm $= \lambda$

$\therefore n = \frac{V}{\lambda} = \frac{330}{30/100} = 1100$ Hz

39. $P\rho^{-\gamma} = \text{const}$

$\Rightarrow \frac{P'}{P} = \left(\frac{\rho'}{\rho}\right)^{\gamma}, \quad 32 = \left(\frac{\rho'}{\rho}\right)^{7/5}$

$\Rightarrow (32)^{5/7} = \frac{\rho'}{\rho} \quad \Rightarrow \frac{\rho'}{\rho} = 128$

40. $\frac{I_{max}}{I_{min}} = ?$

$\frac{a_1}{a_2} = \frac{5}{4}$

$\frac{A_{max.}}{A_{min.}} = \frac{9}{1}$

$\therefore \quad \frac{I_{max}}{I_{min}} = \frac{81}{1}$

41. $W = Q_1 - Q_2 = Q_1 - \frac{T_2}{T_1}Q_1 = \left(1 - \frac{T_2}{T_1}\right)Q_1$

$= \left(1 - \frac{300}{900}\right)(3000\text{kcal})$

$= 2000$ kcal

$= 8.4 \times 10^5$ J

42. $\frac{W}{Q}=\frac{P\Delta V}{\mu C_p\Delta T}=\frac{\mu R\Delta T}{\mu C_p\Delta t}$

$=\frac{R}{C_p}=\frac{C_p-C_v}{C_p}=1-\frac{1}{\gamma}$

43. $\because PV^{\gamma}$ = constant $\therefore P \propto V^{-\gamma}$

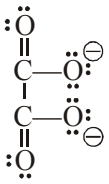
$\Rightarrow \frac{\Delta P}{P}=-\gamma\frac{\Delta V}{V}$

45. $W = P\Delta V = 4.5 \times 10^5[2 - 0.5] = 6.75 \times 10^5$ J
from FLOT, $Q = W + \Delta U$ we have
$\Delta U = Q - W = 8 \times 10^5 - 6.75 \times 10^5$
$= 1.25 \times 10^5$J

46. NCERT XI, P-I, Page no. # 87
Cl is most electron affinity element of periodic table while P due to half filled shows least.

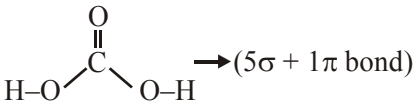
49. NCERT XI, P-I, Page no. # 84

54. NCERT XI, P-I, Page no. # 99



55. NCERT XI, P-I, Page no. # 124

58. NCERT XI, P-I, Page no. # 124

60.  (5σ + 1π bond)

61. C_2H_2 26gm have π'e' $= \frac{4}{26}$

(H–C≡C–H) 2.6 gm $= 0.4$

62. NCERT XI, P-I, Page no. # 126

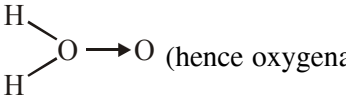
63. H–C≡ N, O = C = O both have 2σ and 2π bond

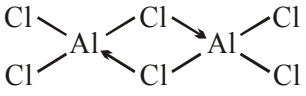
64. NaCN Na^+ CN^- (CN^- is $C \equiv N^{\ominus}$)

66. Ion-ion attraction is ionic bond

67. NCERT XI, P-II, Page no. # 285

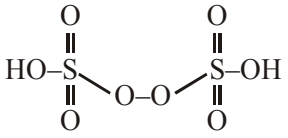
68. NCERT XI, P-II, Page no. # 285

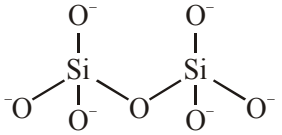
 (hence oxygenated water is H_2O_2)

69. 

70. Tritium is $^{3}_{1}H$ neutron = 2
proton = electron = 1

77. Marshall Acid is $H_2S_2O_8$



78. 

79. [B.P. α^1/velocity]

80. If_4^{-1} sp^3d^2 ZAP hence square planer in shape

81. NCERT XI, P-II, Page no. # 318

87. NCERT XII, P-I, Page no. # 228

88. $Na_2[Fe(CN)_5\overset{+1}{N}O]$
Hence iron is in +2 OX.state

90. NCERT XII, P-I, Page no. # 244
$[Cr(NH_3)_5NO_2]Cl_2$

91. NCERT (XI) Page # 201

93. NCERT (XI) Page # 196

95. NCERT (XI) Page # 191

97. NCERT (XI) Page # 210-211

101. NCERT (XI) Page # 185

103. NCERT (XI) Page # 186

105. NCERT (XI) Page # 189

109. NCERT (XI) Page # 195

111. NCERT (XI) Page # 204

113. NCERT (XI) Page # 214

115. NCERT (XI) Page # 217

117. Rice is a C_3 plant (चावल एक C_3 पादप है।)

119. NCERT (XI) Page # 248-251

121. NCERT (XI) Page # 249

123. NCERT (XI) Page # 231

125. NCERT (XI) Page # 230

127. NCERT (XI) Page # 233

129. NCERT (XI) Page # 220

131. NCERT (XI) Page # 217

133. NCERT (XI) Page # 230

135. NCERT (XI) Page # 252

137. NCERT (XI) Page # 245

139. NCERT (XI) Page # 232

141. NCERT (XI) Page # 218

147. NCERT (XI) Page # 198

151. NCERT (XI) Page # 232

153. NCERT (XI) Page # 178

155. NCERT (XI) Page # 199

157. NCERT (XI) Page # 236-237

159. NCERT (XI) Page # 204

161. NCERT (XI) Page # 213