PACE-IIT & MEDICAL

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MOCK TEST - 13 - (NEET 2018 Aspirants) - Solutions

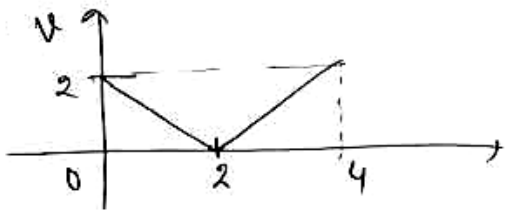
(1) $\frac{1}{f} = \frac{1}{20.1} + \frac{1}{50.1} \Rightarrow f = 14.3448 = 14.3$

$$\frac{\Delta f}{f^2} = \frac{\Delta u}{u^2} + \frac{\Delta v}{v^2} \Rightarrow \Delta f = (14.3)^2\left(\frac{0.5}{(50.1)^2} + \frac{0.2}{(20.1)^2}\right)$$

$\Delta f = 0.1419$ round off to one digit; because
$= 0.1$ our original measurement have only one significant figure after decimal point

(2) → (b)

(3)



distance $= \frac{1}{2}(2\times2) + \frac{1}{2}(2\times2)$
$= 4\ m$

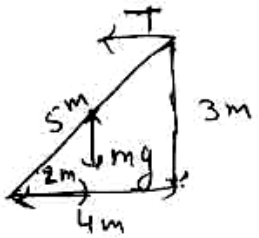
(4) $a_A = g\sin60°$; $a_B = g\sin30°$

In vertical direction $a_{Av} = (g\sin60°)\cos30° = \frac{3g}{4}$

$a_{Bv} = (g\sin30°)\cos60° = \frac{g}{4}$

$(a_{A/B})_{vertical} = a_{Av} - a_{Bv} = \frac{3g}{4} - \frac{g}{4} = \frac{g}{2} = 4.9\ m/s^2$

(5)



from torque eq^n

$T \times 3 = mg \times 2$

$T = \frac{15\times10\times2}{3} = 100\ N$

(6) - (4)

(7) For angular momentum to be conserved; $\tau = 0$

$$\vec{r} \times \vec{F} = 0 \Rightarrow \begin{vmatrix} i & j & k \\ 2 & -6 & -12 \\ a & 3 & 6 \end{vmatrix} = 0\hat{i} - \hat{j}(12+12a) + k(6+6)$$

$$a = -1$$

(8) $$X_{c.m} = \frac{\int_0^L \left(\frac{a}{L}x^2\,dx\right)x}{\int_0^L \frac{a}{L}x^2\,dx} = \frac{\frac{a}{L}\frac{L^4}{4}}{\frac{a}{L}\frac{L^3}{3}} = \frac{3L}{4}$$

(9) Area velocity $= \frac{\text{Angular momentum}}{2m}$

$$L = 2MA$$

(10) (3) $$\frac{l_1 T_2 - l_2 T_1}{T_2 - T_1}$$

(11) $$v(\pi(3R)^2) = v_1\pi(R)^2$$

$$v_1 = 9v$$

(12) $$F = \frac{(7\times10^{-2})(2\times40\times10^{-4})}{10^{-6}} = 560\,N$$

(13) → (3)

(14) → (3)

(15) $P = 10^5 + \frac{50\times10}{100\times10^{-4}} = 10^5 + 50000$

$= 1.5\times10^5$

$W = P\Delta V = 1.5\times10^5 \times (100\times10^{-4}\times0.2) = 300$

For Isobaric procen $W = nR\Delta T$

$Q = \frac{7}{2}nR\Delta T$ (Diatomic gen)

$Q = \frac{7}{2}\times300 = 1050$ joule

(16) $\eta = 1 - \frac{T_L}{T_H}$

(a) $\rightarrow 1 - \frac{300}{400} \Rightarrow 25\%$.

(b) $\rightarrow 1 - \frac{400}{500} \Rightarrow 20\%$.

(c) $1 - \frac{500}{600} = 16.67\%$. ✓

(d) $1 - \frac{600}{800} = 25\%$.

(17) (4)

(18) $mA\omega^2 = \mu mg \Rightarrow A = \frac{\mu g}{\omega^2} = \frac{\frac{1}{2}(10)}{(10)^2} = \frac{1}{20}\ m = 5$ c.m.

(19) $A = A_0 e^{-ct}$

$\frac{A_0}{3} = A_0 e^{-c(100T)}$ — (i)

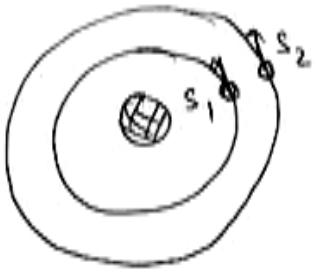
$A = A_0 e^{-c(200T)}$ — (ii)

$\frac{3A}{A_0} = e^{-c100T}$

$A = \frac{1}{3}\left(A_0 e^{-c100T}\right) = \frac{1}{3}\left(\frac{A_0}{3}\right) = \frac{A_0}{9}$

(20) $T^2 \propto R^3$

$$\left(\frac{T_1}{T_2}\right)^2 = \left(\frac{R_1}{R_2}\right)^3 \Rightarrow \left(\frac{1}{8}\right)^2 = \left(\frac{10^4}{R}\right)^3 \Rightarrow R = 4\times10^4$$



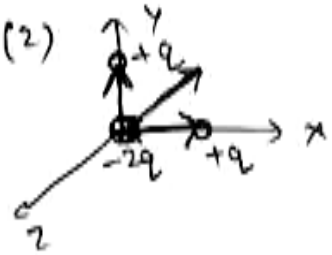
$$V_{21} = V_2 - V_1$$
$$= \omega_2 R_2 - \omega_1 r_1$$
$$= \left(\frac{2\pi}{8}\right)(4\times10^4) - \left(\frac{2\pi}{1}\right)\times10^4$$
$$= \pi\times10^4 - 2\pi\times10^4$$
$$= -\pi\times10^4 \text{ Km/h}$$

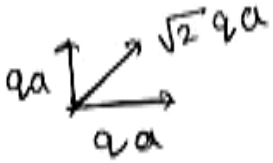
(21) (1) equipotential line will be $\perp^{r}$ to E.

(22) (3)

(23) (4)

(24) (2)





(25) (1)
flux is increasing in downward direction, Hence current will flow B to A & D to C.

(26) $P_{avg} = V_{rms} I_{rms} = 4\times220$

(1) $Q = 1\times4200\times(100-20) = 336000$ joule

$$t = \frac{Q}{P_{avg}} = 6.3 \text{ min}$$

(27) $F = q\vec{v} \times \vec{B}$

$F = (-2\times10^{-6})\left[(2\hat{i}+3\hat{j})\times10^{6}) \times (2\hat{j})\right]$

$= -2\left[4\hat{k}\right] = -8\hat{k}\ N$

(28) $i = \frac{qv}{2\pi R}$; $A = \pi R^2$

$M = iA = \frac{qvR}{2}$

(29) (3)

(30) (2)

(31) (1)

(32) (3) $P_{avg} = E_{rms} I_{rms} \cos\phi = \frac{E_0 I_0}{2} \cos\phi$

(33) (3)

(34) (3)

(35) $\mu \sin\theta = 1 \sin 90^\circ$

$\mu\left(\frac{3}{8}\right) = 1 \Rightarrow \mu = \frac{8}{3}$

$v = \frac{c}{\mu} = \frac{3\times10^8}{(8/3)} = 1{\cdot}8\times10^8\ m/s$

(36) $\frac{1}{v} + \frac{1}{30} = \frac{2(1.5-1)}{20} \Rightarrow v = 60$ c.m.

$m = -\frac{60}{30} = -2$

$h_i' = -2\,h_o = -4$ c.m (inverted & Real)

(37) $\theta = 1.22\frac{\lambda}{D} = 1.22 \times \frac{8 \times 10^{-7}}{2 \times 10 \times 10^{-2}} = 6.1 \times 10^{-6}$ rad

(38) $\frac{1}{f} = \frac{1}{40} - \frac{1}{100} \Rightarrow \frac{1}{f} = \frac{3}{200}$ c.m

$f = \frac{200}{3}$ c.m (or) $\frac{2}{3}$ m

$P = \frac{1}{f} = \frac{3}{2} = +1.5$ D

(39) $\Delta x = 0$; $I_r = 4I_0$

(40) $2t = n\lambda \Rightarrow t_{min} = \frac{\lambda}{2} = \frac{5890 \times 10^{-10}\ m}{2} = 2.945 \times 10^{-7}$ m

(41) $n = \frac{9 \times 10^{-3}}{(hc)/(667 \times 10^{-9})} = \frac{9 \times 10^{-3} \times 667 \times 10^{-9}}{6.67 \times 10^{-34} \times 3 \times 10^{8}} = 3 \times 10^{16}$

(42) $\frac{1}{15} = \frac{(1/2)^{t/50}}{1-(\frac{1}{2})^{t/50}}$

$16\left(\frac{1}{2}\right)^{t/50} = 1$

$\Rightarrow \left(\frac{1}{2}\right)^{t/50} = \frac{1}{16} \Rightarrow t/50 = 4 \Rightarrow t = 200$ years

(43) $hf = 2.5$ eV $\Rightarrow f = \frac{2.5}{4.13 \times 10^{-15}} = 6.05 \times 10^{14}$

(44) - (4)

(45) - (4)

46. (1)
47. (3)
48. (2)
49. (2)
50. (4)
51. (1)
52. (1)
53. (3)
54. (2)
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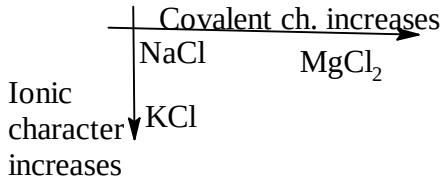
72. (3)



73. (2) Hybrid state of B is sp^2

74. (3)

75. (4) CN^- is ionic in nature.

76. (2)

77. (1)

$$O=\underset{\underset{O}{\|}}{\overset{O}{\|}}{Cl}-O^- \quad B.O=\frac{\text{No. of bonds}}{\text{No. of resonating structure}}$$

78. (3)
79. (3)
80. (2)
81. (2)
82. (2)
83. (4)
84. (3)
85. (4)
86. (2)
87. (3)
88. (4)
89. (4)
90. (2)

91. (3) Homonym is the same name given to two different species
92. (1) page no.20, 2.2.1 Chrysophytes
93. (3) page no. 26, last paragraph
94. (3) NCERT XI page 35
95. (3) NCERT XI page 42
96. (4) Ribosomes
97. (3) higher plants
98. (4) microtubules
99. (1) It is the significance of meiosis.
100. (4) Plant cell lacks both centrioles as well as asters
101. (4) NCERT pg no 66
102. (4) Inflorescence in cauliflower is compound corymb
103. (4) In *Nepenthes*, colourful lid of pitcher is formed by modified leaf apex to attract insects
104. (3) Factional Question
105. (1) page no. 84 , 6.1.1 Meristematic tissues
106. (1) permeable and differentially permeable respectively
107. (3) DPD
108. (3) Pg. no. 202
109. (4) Pg. no. 202
110. (2) NCERT pg no 208
111. (2) NCERT pg no 216, 222, HSC 67, 69
112. (1) HSC pg no 70
113. (1) page no 231,232
114. (2) page no 230 , 14.3 Fermentation
115. (4) ETS is inhibited by cyamides antimycin A and Co.
116. (1) NCERT XI page 246
117. (3) NCERT XI page 252
118. (2) NCERT XI page 248
119. (2) NCERT XII page 6
120. (2) Xenogamy
121. (3) Chemotropism
122. (4) Nutritive
123. (2) page no 70 , fig, 5.1
124. (4) page no 88 , 89
125. (3) page no 89 , Haemophilia
126. (2) An auxotroph is that mutant which is not able to prepare its own metabolites from the raw materials obtained from external source.
127. (1) NCERT XII, Pg. no.107

128. (3) NCERT XII, Pg. no. 97,120
Prokaryotes have three major types of DNA synthesizing enzymes call DNA polymerase III, II and I. All of them possess 3' to 5' exonuclease activity, but DNA pol I also has 5' to 3' exonuclease activity.
Rifampicin inhibits RNA synthesis by inhibiting RNA polymerase.
129. (3) NCERT XII page 175
130. (2) NCERT XII page 175
131. (3) Insulin is being synthesized using genetically engineered *E. coli*
132. (3) NCERT pg no 184
133. (1) Natality equal to mortality
134. (2) Immigration, natality, mortality, emigration
135. (3) NCERT-XII Pg.no.252
136. (4) NCERT-XII Pg.no.253
137. (4) NCERT XII page 263
138. (3) NCERT XII page 261 & 262
139. (3) Stone leprosy is damage caused to rocks and marble caused by acid rain.
140. (3) HSC pg no 253
141. (3)
142. (2)
143. (4)
144. (3)
145. (3) Menstrual, proliferative and ovulatory phase.
146. (1)
147. (4)
148. (2) Patient suffering from amoebiasis.
149. (2)
150. (1) Jelly fish have radial symmetry.Crab,Round worms are true coelomates.
151. (2)
152. (4) In Chameleon pharyngeal gill slits are present.Non chordates like scorpion have dorsal heart.Post anal tail is present in Chordates.
153. (4) Pg 55 Last para
154. (3) Astrocytes arrange themselves forming blood brain barrier.
155. (3) Acetyl choline neurotransmitter is produced by vagus nerve which decreases the heart beat.
156. (4) Pg 323 3rdpara
157. (4) parathormone increases calcium level in blood and thus deficiency causes less calcium level affecting clotting.
158. (3) Excessive secretion of adrenal cortex hormones causes Cushing disease.
159. (1) cortisol causes gluconeogenesis which is opposite to action of insulin.
160. (1) Sting apparatus,modified ovipositor is present posteriorly in honey bee.
161. (1)
162. (2)
163. (4)
164. (3)
165. (4) Thomas R Malthus – An essay on population
166. (4)
167. (4)
168. (4)
169. (1)
170. (1)
171. (3)

172. (4)
173. (1)
174. (2)
175. (2)
176. (3)
177. (3)
178. (1) Mitral valves close during ventricular systole while aortic valves close during diastole.
179. (3)
180. (3)