SAMPLE PAPER # 03

TARGET : PRE-MEDICAL 2022

Test Type : **SAMPLE PAPER** Test Pattern : **NEET (UG)**

ANSWER KEY

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.	3	2	3	3	2	4	4	2	4	2	3	3	4	1	4	3	2	1	2	3	2	2	1	4	3	2	1	2	4	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.	4	3	2	1	1	3	2	3	2	4	1	1	3	1	3	3	3	1	1	4	2	4	4	2	1	2	2	3	3	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	2	2	1	1	1	3	1	2	1	3	4	1	1	4	1	4	4	4	3	3	2	4	3	1	1	4	4	1	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	1	1	3	3	1	3	3	1	1	3	4	2	1	1	4	3	3	2	3	1	2	1	3	2	4	4	3	2	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.	3	1	3	2	1	1	1	1	3	3	4	4	4	2	2	1	3	3	4	1	1	3	4	2	3	1	2	2	4	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.	2	1	1	2	2	1	1	3	4	1	2	4	2	3	2	3	1	4	4	4	3	3	3	2	4	3	4	3	2	3
Q.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200										
A.	3	4	3	4	3	2	2	3	4	3	3	1	4	1	2	3	3	1	2	4										

HINT – SHEET

SUBJECT : PHYSICS

SECTION-A

1. Ans (3)

As $[P] = \frac{[a]}{[b][x]}$ $[a-t^2] = [a]$

$\therefore \left[\frac{a}{b}\right] = [p][x]$

$= \left[M^1L^2T^{-2}\right]\left[LT^{-1}\right]$

$\because \quad = M^1L^3T^{-3}$

2. Ans (2)

$m_{mean} = \frac{2.46+2.47+2.41+2.42+2.44}{5}$

$m_{mean} = 2.44$ kg

$\Delta m_1 = 2.44 - 2.46 = -0.02$ kg

$\Delta m_2 = -0.03$ kg, $\Delta m_3 = 0.03$ kg, $\Delta m_4 = 0.02$ kg

$\Delta m_5 = 0.00$ kg

Mean error

$= \frac{1}{5}[|-0.02| + |-0.03| + 0.03 + 0.02 + 0.00]$

$= 0.02$ kg

$m = 2.44 \pm 0.02$ kg

3. Ans (3)

$S = ut + \frac{1}{2}at^2$

$u = 0$

$\frac{S_1}{S_2} = \frac{t_1^2}{t_2^2}$

$S_2 = \frac{S_1 t_2^2}{t_1^2}$

$S_2 = \frac{h}{8}$ From top

$S_2 = \frac{8h}{9}$ From ground

4. Ans (3)

The resultant velocity of the boat with respect to river is 1.0 km/0.25 h = 4 km/h.

Velocity of the river = $\sqrt{5^2 - 4^2} = 3$ km/h.

5. Ans (2)

$$a = \frac{F}{m + 2m + 4m} = \frac{F}{7m}$$

Let normal force between A and B is N_1, then

$$N_1 = (2m + 4m)a = \frac{6F}{7}$$

and between B and C is N_2, then

$$N_2 = 4ma = \frac{4F}{7}$$

7. Ans (4)

Kinetic energy for first condition

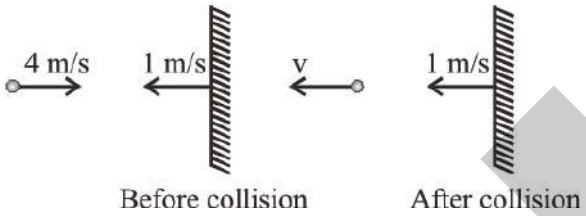
$$\frac{1}{2}m\left(v_2^2 - v_1^2\right) = \frac{1}{2}m\left(20^2 - 10^2\right) = 150 \text{ mJ}$$

K.E. for second condition

$$= \frac{1}{2}m\left(10^2 - 0^2\right) = 50\text{mJ}$$

$$\therefore \quad \frac{(\text{K.E.})\text{I}}{(\text{K.E.})\text{II}} = \frac{150\text{m}}{50\text{m}} = 3$$

9. Ans (4)



Let v be the velocity of ball after collision.

Collision is elastic.

$\therefore$ e = 1

or relative velocity of separation = relative velocity of approach

$\therefore$ v – 1 = 4 + 1

or v = 6m/s (away from the wall)

10. Ans (2)

By doing so the distribution of mass can be made away from the axis of rotation.

11. Ans (3)

$w_s = mg = 72N$

$w_h = mg' = ?$

$$g' = \frac{g}{\left(1 + \frac{h}{R}\right)^2}, \quad g' = \frac{4g}{9} \quad h = R/2$$

$$w_h = \frac{4}{9}mg, \quad w_h = \frac{4}{9} \times 72 = 32N$$

12. Ans (3)

Breaking force α cross-sectional area. Area is quadrupled

13. Ans (4)

$Q = ms\,(T_2 - T_1)$

$$-80 = 4 \times \frac{1}{2}(T_2 - (-10))$$

$-80 = 2\,(T_2 + 10)$

$-40 - 10 = T_2$

$T_2 = -50°C$

14. Ans (1)

$$\text{Coefficient of performance } K = \frac{T_2}{T_1 - T_2}$$

$$= \frac{(273 - 23)}{(273 + 27) - (273 - 23)}$$

$$= \frac{250}{300 - 250} = \frac{250}{50} = 5$$

15. Ans (4)

$U = 20 + (x - 4)^2 \Rightarrow U_{min} = 20J$ at x = 4m

$\Rightarrow$ x = 4m is mean position

U is maximum at x = 0 $\Rightarrow$ x = 0 $\Rightarrow$ x = 0 is an extreme position.

So, amplitude = 4 – 0 = 4m

$U + K = 36 \Rightarrow [20 + (2 - 4)^2] + K = 36$

$\Rightarrow K = 36 - 24 = 12$ J

16. Ans (3)

$$\frac{I_1}{I_2} = \left(\frac{a_1 f_1}{a_2 f_2}\right)^2 = \left(\frac{4 \times 1}{1 \times 5}\right)^2 = \frac{16}{25}$$

17. Ans (2)

$$\phi = \frac{q_{in}}{\varepsilon_0}$$

$q_{in} = (\phi_2 - \phi_1) \times \varepsilon_0$

18. Ans (1)

$W = \Delta U$

$= U_A - U_B$

$= 2.8$ J

19. Ans (2)

$$U = \frac{1}{2}CV^2 = \frac{1}{2} \times 40 \times 10^{-6} \times (3000)^2 = 180 \text{ J}$$

The power delivered in 2 ms is

$$= \frac{180}{2 \times 10^{-3}} = 90 \text{ kW}$$

20. Ans (3)

Reversing the terminals of E_2

21. Ans (2)

$F = 10^{-7}\frac{2i_1 i_2}{a} = 10^{-7} \times \frac{2 \times 5 \times 5}{0.5} = 10^{-5}N$

(repulsive)

23. Ans (1)

At the poles, $\theta = 90°$

$e = vBl \sin\theta = vBl \sin 90° = vBl$

So, when the car moves on a plane road at poles, the induced emf produced across the axle is maximum.

24. Ans (4)

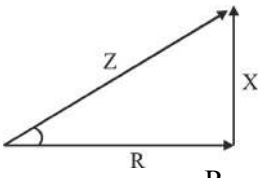
$X_L = X_C \Rightarrow V_{LC} = 0$

$(A) = \frac{V}{R} = \frac{100}{25} = 4A$

$(V) = V = 100V$

25. Ans (3)

Power factor $\cos\phi = \frac{R}{|Z|}$



$\cos\phi_1 = \frac{R}{\sqrt{R^2 + (3R)^2}} = \frac{1}{\sqrt{10}}$

$\cos\phi_2 = \frac{R}{\sqrt{R^2 + (3R - 2R)^2}} = \frac{1}{\sqrt{2}}$

So $\frac{\cos\phi_2}{\cos\phi_1} = \sqrt{5}$

28. Ans (2)

Since aperture of lens reduces so brightness will reduce but there will be no effect on size of image.

30. Ans (3)

$I = \frac{I_0}{2}\cos^2\theta$

$\Rightarrow I = \frac{I_0}{2}\cos^2 30°$

$= \frac{I_0}{2}\left(\frac{\sqrt{3}}{2}\right)^2 = \frac{3}{8}I_0$

33. Ans (2)

By balancing equation.

$_{92}U^{235} + {}_0n^1 \rightarrow {}_{56}Ba^{144} + {}_ZX^A + 3\ {}_0n^1$

$Z = 92 - 56 = 36,\ A = 235 + 1 - 144 - 3 = 89$

34. Ans (1)

In reverse biased P-N junction diode, if doping level is small then width of depletion layer is large and breakdown occurs when potential difference is large so large velocity of the minority charge carriers.

35. Ans (1)

$V_{BB} - I_B R_B - V_{BE} = 0$

$10V - I_B \times 10^6\ \Omega - 0.7V = 0$

$I_B = 9.3 \times 10^{-6}A$

$I_C = \beta I_B = 100 \times 9.3 \times 10^{-6}A$

$I_C = 9.3 \times 10^{-4}A$

$V_{CC} - I_C R_C - V_{CE} = 0$

$10V - 9.3 \times 10^{-4} \times 4 \times 10^3 - V_{CE} = 0$

$V_{CE} = 10V - 3.72V = 6.28\ V$

SECTION-B

36. Ans (3)

$\because F = -\frac{dU}{dx} = 0$ for equilibrium

and $\frac{d^2U}{dx^2} > 0$ for minimum potential energy and stable equilibrium.

$\frac{d^2U}{dx^2} < 0$ for maximum potential energy and unstable equilibrium.

37. Ans (2)

From C.O.M.E.

$\frac{1}{2}mv^2 + \frac{1}{2}\frac{MR^2}{2} \times \frac{v^2}{R^2} = mgh$

$\Rightarrow \frac{3}{4}mv^2 = mgh \Rightarrow h = \frac{3v^2}{4g}$

38. Ans (3)

$\frac{V_P}{V_A} = \frac{r_A}{r_P} = \frac{a(1+e)}{a(1-e)}$

$\frac{K.E._P}{K.E._A} = \frac{V_P^2}{V_A^2} = \left(\frac{1+e}{1-e}\right)^2$

39. Ans (2)

$$h = \frac{2T\cos\theta}{r\rho g} \text{ or } r = \frac{2T\cos\theta}{h\rho g}$$

or

$$r = \frac{2\times 75\times 10^{-3}\times\cos 0^\circ}{3\times 10^{-2}\times 10^3\times 10}\,m = 5\times 10^{-4}m$$

40. Ans (4)

Area under this curve is total emissive power and we know

$E \propto T^4$

$$\frac{A_2}{A_1} = \left(\frac{T_2}{T_1}\right)^4 = \left(\frac{600}{300}\right)^4 = \frac{16}{1}$$

42. Ans (1)

The system can be replaced by a single spring of spring constant, $k_{eff} = k_1 + k_2$.

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

$$T^2 = 4\pi^2\frac{m}{k}$$

$$k = 4\pi^2 mT^{-2} \Rightarrow \frac{1}{k} = \frac{T^2}{4\pi^2 m}$$

$$\frac{1}{k_{eq}} = \frac{1}{k_1} + \frac{1}{k_2}$$

$$t_0^2 = t_1^2 + t_2^2$$

44. Ans (1)

$$\vec{E} = -\vec{\nabla} v$$

where, $\vec{\nabla} = \hat{i}\frac{\partial}{\partial x} + \hat{j}\frac{\partial}{\partial y} + \hat{k}\frac{\partial}{\partial z}$

$$\left[\hat{i}\frac{\partial V}{\partial x} + \hat{j}\frac{\partial V}{\partial y} + \hat{k}\frac{\partial V}{\partial z}\right]$$

45. Ans (3)

Bulbs A and B are in parallel, their effective power is

$P' = P_A + P_B = 200\ W + 200\ W = 400\ W$

P' and bulb C are in series, the resultant power of the combination is

$$P_R = \frac{P'\times P_C}{P' + P_C} = \frac{400\ W\times 400\ W}{400\ W + 400\ W} = 200\ W$$

46. Ans (3)

$$\frac{1}{2}mv^2 = mgR$$

$$= \frac{mv^2}{R} = 2mg$$

$$N = 2mg + mg + qB\sqrt{2gR}$$

$$= 3mg + qB\sqrt{2gR}$$

47. Ans (3)

$L \propto N^2$

48. Ans (1)

P = – 2.5D i.e. concave lens, the person is near sightedness.

$$f = \frac{100}{-2.5} = -40$$

$$-\frac{1}{F.P} - \frac{1}{-(dist.)} = \frac{1}{F}$$

$$\Rightarrow \frac{1}{-(F.P.)} - \frac{1}{\infty} = \frac{1}{-40}$$

$\boxed{F.P. = 40cm}$

49. Ans (1)

$\lambda = h/mv$

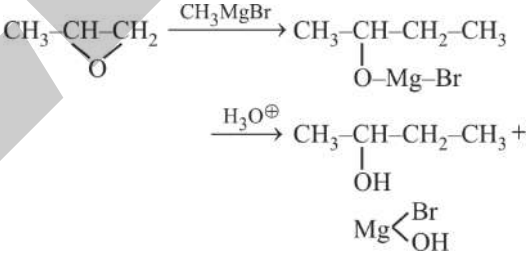
50. Ans (4)

$$\overline{\overline{A} + \overline{B}} = \overline{A} + \overline{B} = \overline{A\cdot B}$$

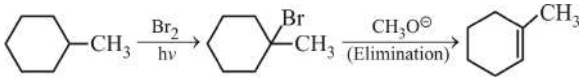
SUBJECT : CHEMISTRY

SECTION - A

51. Ans (2)



52. Ans (4)



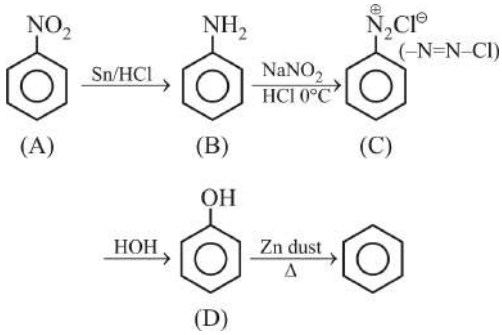
53. Ans (4)

Reaction is known as Gattermann aldehyde synthesis

54. Ans (2)

Steric hindrance decrease reactivity of NAR

55. Ans (1)

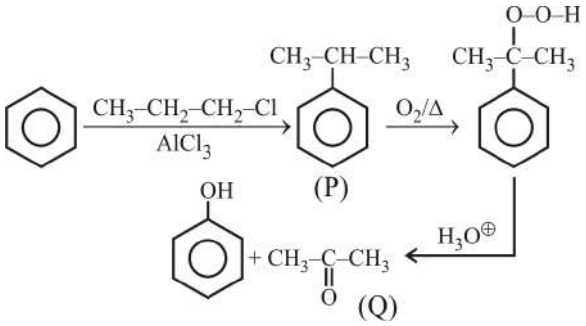


57. Ans (2)

Heat of hydrogenation

$$\propto \frac{1}{\text{Stability of Alkene}}$$

61. Ans (3)



63. Ans (2)

$C : O = 1.2 \times 10^{10} : 14 \times 10^{10}$

$= 1 : 2$

65. Ans (1)

$$\underset{1}{A} + \underset{1}{B} \rightleftharpoons \underset{0}{C} + \underset{0}{D}$$

$$\underset{1-\alpha}{} \quad \underset{1-\alpha}{} \quad \underset{\alpha}{} \quad \underset{\alpha}{}$$

$$k = \left(\frac{\alpha}{1-\alpha}\right)^2$$

$$\alpha = \frac{\sqrt{k}}{\sqrt{k}+1}$$

68. Ans (1)

At low pressure negative deviation is observed.

$$\boxed{PV + \frac{a}{V} = RT}$$

70. Ans (1)

$$Fe(OH)_3 \xrightarrow[\text{Excess}]{FeCl_3} Fe(OH)_3|Fe^{+3}, 3Cl^-$$

73. Ans (1)

Mole fraction in vapour phase

$$y_A = \frac{P_A^0 X_A}{P_T}$$

here, $y_A = X_1$ and $X_A = X_2$

So, $P_T = \frac{P_A^0 X_2}{X_1}$

74. Ans (1)

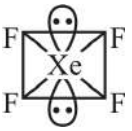
$$\%DOD = \frac{\Lambda^c}{\Lambda^0} \times 100$$

75. Ans (4)

H — F

EN ⇒ 2.1 4.0 ΔEN = 1.9 most polar

76. Ans (1)



⇒ $\mu_{net} = 0$, but Xe – F bond is polar

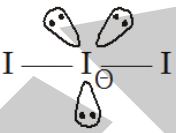
77. Ans (4)

$$\text{B. L.} \propto \frac{1}{\text{B. O.}}$$

78. Ans (4)

$N \equiv N \rightarrow O$ $N \equiv N :\rightarrow N-$

sp, linear sp, linear



sp^3d, Linear

sp^3, Bent

80. Ans (3)

$$\text{L.E.} \propto \frac{|q_1 \times q_2|}{\text{size}}$$

81. Ans (3)

$VOSO_4 = VO^{+2} + SO_4^{-2}$

$\Rightarrow (V^{+4}O^{-2})^{+2} \Rightarrow V^{+4} = d^1$

83. Ans (4)

Beryl = $Be_3Al_2Si_6O_{18}$

84. Ans (3)

$H_2SO_4 + I^- \rightarrow I_2$

SECTION - B

86. Ans (1)

Artificial rubber (Neoprene) is a polymer of chloroprene.

87. Ans (4)

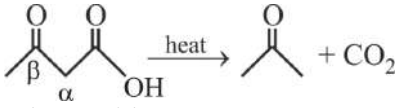
Nylon-2-Nylon-6 is a biodegradable polymer.

89. Ans (1)

$\overset{4}{CH_3}-\overset{3}{CH_2}-\overset{2}{CH}=\overset{1}{CH_2}$ and $\overset{3}{CH_3}-\overset{2}{\underset{\displaystyle CH_3}{C}}=\overset{1}{CH_2}$

Chain Isomer

90. Ans (3)



β-keto acid

91. Ans (3)

$$[H^+] = \frac{10^{-5} + 10^{-3}}{2}$$

$$[H^+] = \frac{10^{-3}(0.01 + 1)}{2}$$

$$[H^+] = \frac{10^{-3} \times 1}{2}$$

$[H^+] = 5 \times 10^{-4}$

$pH = 4 - \log 5 = 4 - 0.7 = 3.3$

93. Ans (1)

For XY $\frac{r_C}{r_a} = \frac{0.65}{1.40} = 0.47$

Cation in octahedral void, So C.N. = 6

For XZ $\frac{r_C}{r_a} = \frac{0.65}{1.84} = 0.35$

Cation in tetrahedral void, So C.N. = 4

94. Ans (3)

$\Delta x = \Delta P$

$$(\Delta x)^2 = \frac{h}{4\pi}$$

$$\Delta h = \frac{1}{2}\sqrt{\frac{h}{\pi}}$$

$$\Delta v = \frac{1}{2m}\sqrt{\frac{h}{\pi}}$$

97. Ans (3)

→ total $7e^-$ in octate

99. Ans (1)

$M(BO_2)_x$ → where M is transitional metal & x is it's oxidation state.

100. Ans (1)

–ve charge ∝ Back bonding ∝ Strength of M-C bond $\propto \frac{1}{\text{Strength of C} - \text{O bond}}$

SUBJECT : BOTANY

SECTION-A

107. Ans (3)

NCERT-XII, Pg. # 112

109. Ans (2)

NCERT-XII # Chapter-6; Page No.119(2nd para)

111. Ans (1)

NCERT -XII, PG No. # 238, Fig. 13.7

112. Ans (2)

NCERT Pg. # 254

114. Ans (3)

NCERT (XII) Pg. # 266, para-15.2.2

117. Ans (4)

NCERT XII- Pg.# 276

118. Ans (3)

NCERT XI (E/H) pg # 13

122. Ans (1)

NCERT XI, Pg. # 70, 71

125. Ans (1)

NCERT XI Pg # 92

127. Ans (1)

NCERT-XII, Pg#35-2.4.1

134. Ans (2)

NCERT (XI) Pg. # 219

SECTION-B

136. Ans (1)

NCERT (XIIth) Pg. # 183

144. Ans (2)

NCERT Pg.# XI Pg.# 79, 5.9.1

146. Ans (1)

NCERT (XIIth) Pg. # 8, 10.1

SUBJECT : ZOOLOGY

SECTION-A

152. Ans (1)

NCERT Pg. # 194

153. Ans (1)

NCERT XII, Page No. # 195

154. Ans (2)

NCERT Pg. # 201, 202

157. Ans (1)

NCERT Pg.# 214

159. Ans (4)

NCERT XI Pg.#113 (E&H)

161. Ans (2)
XIth NCERT Pg. No. 103

162. Ans (4)
NCERT (XIth) (E), Para-4, Pg. # 264
NCERT (XIth) (H), Para-3, Pg. # 264

168. Ans (4)
NCERT-XI, Pg # 288

170. Ans (4)
NCERT-XI, Pg. # 296, Fig. 19.6 (E)
NCERT-XI, Pg. # 297, Fig. 19.6 (H)

171. Ans (3)
NCERT-XI, Pg.# 306 para 20.2.1

172. Ans (3)
Between pubic bones there is pubic-symphysis which is fibro-cartilagenous joint.

177. Ans (4)
NCERT Pg # 335, 22.2.7

179. Ans (2)
Module–1

180. Ans (3)
NCERT, Pg # 51,52

181. Ans (3)
NCERT XII Pg # 60

184. Ans (4)
NCERT Pg. # 150 (E)

SECTION-B

186. Ans (2)
NCERT (XI) Pg. # 143

189. Ans (4)
XI NCERT, Pg. # 55

190. Ans (3)
NCERT Pg. # 57

191. Ans (3)
NCERT XI P.No. 57

192. Ans (1)
NCERT (XIth) Pg. # 115

195. Ans (2)
NCERT Pg. # 275

198. Ans (1)
NCERT (XII) Pg # 140/149(H) Para 7.8