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NEET 2023-24

Mark 720	Group PCB	PRE FINAL ROUND -02	Date : 19/03/2024 Time : 3 :20 Hours

Answer Key Version - R (PCB NEET 2023-24)

Physics

Sec. A	11. 1	22. 1	33. 2	43. 1	**Sec. A**	61. 2	72. 2	83. 2	93. 1
01. 3	12. 1	23. 3	34. 1	44. 2	51. 3	62. 4	73. 2	84. 2	94. 3
02. 4	13. 1	24. 3	35. 2	45. 1	52. 4	63. 1	74. 4	85. 4	95. 1
03. 2	14. 2	25. 3	**Sec. B**	46. 1	53. 2	64. 2	75. 1	**Sec. B**	96. 3
04. 2	15. 2	26. 3	36. 3	47. 1	54. 1	65. 2	76. 1	86. 2	97. 2
05. 3	16. 4	27. 1	37. 1	48. 2	55. 3	66. 4	77. 2	87. 2	98. 2
06. 3	17. 1	28. 4	38. 4	49. 1	56. 3	67. 1	78. 2	88. 4	99. 1
07. 2	18. 4	29. 3	39. 3	50. 3	57. 1	68. 1	79. 4	89. 2	100. 1
08. 2	19. 2	30. 2	40. 1		58. 2	69. 3	80. 2	90. 1	
09. 2	20. 2	31. 2	41. 2		59. 1	70. 4	81. 4	91. 4	
10. 3	21. 1	32. 4	42. 4		60. 2	71. 4	82. 2	92. 1	

Biology

Part-I Sec.A	110. 4	121. 4	132. 4	142. 2	**Part-II Sec.A**	160. 3	171. 4	182. 2	192. 2
	111. 3	122. 2	133. 2	143. 4		161. 4	172. 1	183. 4	193. 3
101. 2	112. 1	123. 2	134. 3	144. 4	151. 2	162. 3	173. 2	184. 2	194. 2
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103. 3	114. 2	125. 4	**Sec.B**	146. 4	153. 2	164. 4	175. 2	**Sec. B**	196. 3
104. 3	115. 4	126. 1	136. 2	147. 1	154. 1	165. 2	176. 2	186. 2	197. 1
105. 3	116. 3	127. 1	137. 3	148. 2	155. 1	166. 2	177. 4	187. 2	198. 3
106. 4	117. 2	128. 1	138. 4	149. 3	156. 4	167. 2	178. 3	188. 4	199. 4
107. 4	118. 2	129. 2	139. 1	150. 3	157. 4	168. 1	179. 1	189. 1	200. 2
108. 3	119. 4	130. 4	140. 4		158. 3	169. 3	180. 1	190. 2	
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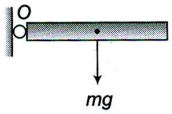
PHYSICS

SECTION - A (35 Questions)

01. **(3)** $V_1 = V_0$, $V_2 = 8\ V_0$, $P_1 = (H+h)m$ of water
$P_2 = H$
$P_1V_1 = P_2V_2$
$(H+h)V_0 = H \cdot 8V_0 \qquad h = 7\ H$

02. **(4)** $I = I_0 + Md^2$
I v/s d graph: $y = I_0 + Mx^2$ (parabola, open upward)

03. **(2)** $\tau_0 = mg\frac{L}{2} = I_0\alpha = \frac{mL^2}{3}\alpha$



$\alpha = \frac{3g}{2L}$

04. **(2)** $L_1 = L, L_2 = 3L$
$\frac{K_2}{K_1} = 9, \left(\frac{K_2}{K_1} - 1\right) \times 100 = 800\%$

05. **(3)** $\Delta Q = \Delta U + \Delta W \qquad = nC_V\Delta T + nR\Delta T$
$= n \cdot \frac{3R}{2} \cdot \Delta T + nR\Delta T \qquad Q = \frac{5nR\Delta T}{2}$
$nR\Delta T = \frac{2Q}{5} = \Delta W$

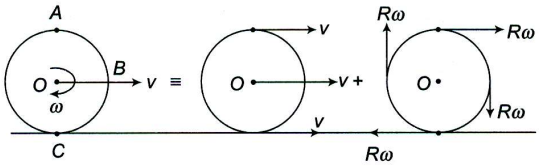
06. **(3)** $(I_1\omega_1 + I_2\omega_2) = (I_1 + I_2)\omega'$
$\omega' = \frac{I_1\omega_1 + I_2\omega_2}{(I_1 + I_2)} \qquad K_f = \frac{1}{2}(I_1 + I_2)\omega'^2$
$= \frac{(I_1\omega_1 + I_2\omega_2)^2}{2(I_1 + I_2)}$

07. **(2)**

08. **(2)** $v_{rms} = \sqrt{\frac{3RT}{M_0}} \qquad v_{rms}^2 = \frac{3RT}{M_0}$
$v_{rms}^2 \propto T$
The graph between v_{rms}^2 v/s T is straight line, through origin

09. **(2)** $I = \frac{m(2L)^2}{12} = \frac{mL^2}{3}$
$\tau\Delta t = \Delta L = I\Delta\omega$
$\tau t = \frac{mL^2}{3}(\omega - 0) \Rightarrow \tau = \frac{mL^2\omega}{3t}$

10. **(3)** When a body rolls without slipping, the velocity of any point of the body is resultant of two velocities; one due to pure translational motion and another due to pure rotational motion. Also, $v = r\omega$.



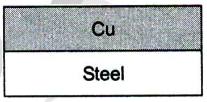
$v_A = v + R\omega = v + v = 2v$
$v_B = \sqrt{v^2 + (r\omega)^2} = \sqrt{2}\,v$
$v_C = v - v = 0$

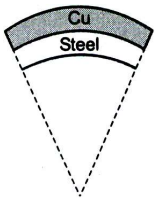
11. **(1)** $a = \frac{g\sin\theta}{1 + k^2/R^2} = \frac{g\sin\theta}{1 + \frac{mk^2}{mR^2}} = \frac{g\sin\theta}{1 + \frac{I}{mR^2}}$

12. **(1)**

13. **(1)** $\frac{x}{5} = \frac{x-32}{9} \Rightarrow 9x = 5x - 160$
$x = -40$

14. **(2)** Increase in length of copper will be greater than steel $(\alpha_c > \alpha_s)$





15. **(2)** When a body is heated, the distance between any two points on it increase.

16. **(4)**
$\frac{1}{2}\alpha\Delta\theta \times 86400 = \frac{1}{2} \times 11 \times 10^{-6}(35 - 25) \times 86400$
$= 4.75$ s

17. **(1)** $\overline{v^2} = \frac{v_1^2 + v_2^2 + v_3^2 + v_4^2}{N}$
$= \frac{(2)^2 + (3)^2 + (4)^2 + (5)^2}{4} \qquad = 27/2$
$v_{rms} = \sqrt{\overline{v^2}} = \sqrt{\frac{27}{2}}$ km/s

18. **(4)** $P = \frac{1}{3}\frac{M}{V}v_{rms}^2 = \frac{1}{3}\rho v_{rms}^2 = \frac{1}{3}\rho \cdot \frac{3RT}{M_0}$

19. **(2)** $n_1 = 1, \gamma_1 = 5/3, n_2 = 1, \gamma_2 = 7/5$
$\frac{n_1 + n_2}{\gamma - 1} = \frac{n_1}{\gamma_1 - 1} + \frac{n_2}{\gamma_2 - 1}$
$\frac{1+1}{\gamma - 1} = \frac{1}{\frac{5}{3} - 1} + \frac{1}{\frac{7}{5} - 1} \qquad \frac{2}{\gamma - 1} = \frac{3}{2} + \frac{5}{2} = 4$

$\overline{\gamma} = \frac{3}{2} = 1.5$

20. **(2)** $\lambda \propto 1/P$

When mean free path is doubled, pressure becomes half

21. **(1)** $mL_v + ms_w(100-0) = M_{ice} \times S_{ice}(10) + M_{ice} \times L_s$

$M \times 540 + M \times 100 = 64 \times \frac{1}{2} \times 10 + 64 \times 80$

$640\ m = 320 + 5120$

$M = \frac{5440}{640} = 8.5\ gm$

22. **(1)**

23. **(3)** $\gamma = \frac{C_P}{C_V} = \frac{R\left(\frac{f}{2}+1\right)}{\frac{f}{2}R} = 1 + \frac{2}{f}$

24. **(3)** $\frac{C_P}{C_V} = \gamma, C_P - C_V = R$

$C_V = \frac{R}{\gamma - 1}, C_P = C_V + R = \frac{\gamma R}{\gamma - 1}$

$S_P = \frac{C_p}{M} = \frac{\gamma R}{M(\gamma - 1)}$

25. **(3)** $\Delta W_{cyclic} = -\pi\left(\frac{P_2 - P_1}{2}\right)\left(\frac{V_2 - V_1}{2}\right)$

$= -\frac{\pi}{4}(P_2 - P_1)(V_2 - V_1)$

26. **(3)** In adiabatic process, $\Delta Q = 0$

$\Delta S = \frac{\Delta Q}{T} = 0$

27. **(1)** $W = U = \frac{1}{2}\frac{AY\Delta L}{L}\Delta L$

$= \frac{1}{2} \times \frac{1 \times 10^{-6} \times 2 \times 10^{11}}{1} \times (10^{-3})^2 = 0.1\ J$

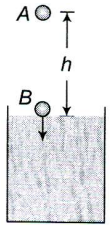
28. **(4)** $100 \times s_\omega(50-\theta) = 10 L_{ice} + 10 \times 1 \times (\theta - 0)$

$100 \times 1(50-\theta) = 10 \times 80 + 10\theta$

$5000 - 100\theta = 800 + 10\theta$

$1110\theta = 4200 \qquad \theta = 38.2^\circ C$

29. **(3)**



$v_T = \frac{2(\rho - \sigma)r^2 g}{9\eta} \qquad \sigma = 1\ g/cc,\ v_T = v$

$v_T = v = \sqrt{2gh} = \frac{2(\rho-1)r^2 g}{9\eta}$

$2h = \frac{4(\rho-1)^2 r^4 g}{81\eta^2} \qquad h = \frac{2(\rho-1)^2 r^4 g}{81\eta^2}$

$= \frac{2}{81} r^4 \left(\frac{\rho - 1}{\eta}\right)^2 g$

30. **(2)** Higher value of γ, curve is more steeper

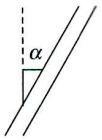
For monoatomic gas, $\gamma_1 = 1.67$, for diatomic gas $\gamma_2 = 1.4$

$\gamma_1 > \gamma_2$ i.e., curve 2 $\rightarrow$ monoatomic gas

curve 1 $\rightarrow$ diatomic gas

31. **(2)**

$h' = \frac{h}{\cos\alpha} = \frac{10}{\cos 45} = 10\sqrt{2}\ cm$



32. **(4)**

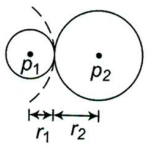
$n = 10^3, \Delta W = -146 \times 10^3\ J, \Delta T = T_2 - T_1 = 7^\circ C$

$\Delta W = \frac{nR(T_1 - T_2)}{\gamma - 1} = -\frac{nR(T_2 - T_1)}{\gamma - 1}$

$-146 \times 10^3 = -\frac{10^3 \times 8.3 \times 7}{\gamma - 1}$

$\gamma - 1 = 0.4 \qquad \gamma = 1.4$, diatomic gas

33. **(2)**



$p_1 - p_0 = \frac{4S}{r_1}$ (i), $\qquad p_2 - p_0 = \frac{4S}{r_2}$ (ii)

(i) – (ii) $\Rightarrow p_1 - p_2 = \frac{4S}{r}$

$\frac{4S}{r_1} - \frac{4S}{r_2} = \frac{4S}{r} \Rightarrow \frac{r_2 - r_1}{r_1 r_2} = \frac{1}{r} \Rightarrow r = \frac{r_1 r_2}{r_2 - r_1}$

34. **(1)**

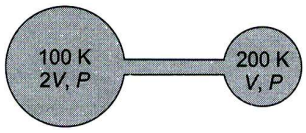
$$\frac{\Delta V}{V}=\gamma\Delta\theta \qquad \frac{0.12}{100}=3\alpha(20)$$

$$\alpha=\frac{0.12}{100\times 60}=2\times10^{-5}/^{\circ}C$$

35. **(2)**

SECTION - B (Attempt Any 10 Questions)

36. **(3)**



$$P\cdot 2V=\frac{m}{M_0}R(100) \qquad \text{(i)}$$

$$P\cdot V=\frac{m'}{M_0}R(200) \qquad \text{(ii)}$$

(i)/(ii) $\quad 2=\frac{m}{m'}\frac{100}{200}$

$m'=m/4$

37. **(1)** $\Delta W_{cycle}=-(2P-P)(3V-V)=-2PV$

Cycle is anticlockwise on P–V diagram. Hence, work done is –ve.

$\Delta Q_{cycle}=\Delta W_{cycle}=-2PV$

Heat rejected in cycle $ABCD=2PV$

38. **(4)** (i) Clockwise cycle on P–V diagram

$\Delta W_{cyclic}=+ve=\Delta Q_{cyclic}$

Heat is absorbed

(ii) anticlockwise cycle on V–P diagram

$\Delta W_{cyclic}=+ve=\Delta Q_{cyclic}$

heat is absorbed

(iii) Clockwise cycle on P–V diagram

$\Delta W_{cyclic}=+ve=\Delta Q_{cyclic}$

heat is absorbed

(iv) clockwise cycle on V–P diagram

$\Delta W_{cyclic}=-ve=\Delta Q_{cyclic}$

heat is rejected

39. **(3)** Substance expand on heating and contract on cooling

40. **(1)**

41. **(2)**

42. **(4)** In an elastic collision both the momentum and kinetic energy remains conserved. But this rule is not for individual bodies, but for the system of bodies before and after the collision. While collision in which there occurs some loss of kinetic energy is called inelastic collision. Collision in daily life is generally inelastic. The collision is said to be perfectly inelastic, if two bodies stick to each other.

43. **(1)** Mass $\propto$ area

m_1 : mass of small disc

$$\frac{m_1}{9M}=\frac{\pi(R/3)^2}{\pi R^2}\Rightarrow m_1=M$$

M.I. of a circular disc of radius R and mass $9M$ about the required axis

$$I_1=\frac{1}{2}\times 9MR^2=\frac{9MR^2}{2}$$

M.I. of a small disc about the same axis

$$I_2=\left[\frac{1}{2}M\left(\frac{R}{3}\right)^2+M\left(\frac{2R}{3}\right)^2\right]=\frac{1}{2}MR^2$$

M.I. of the remaining disc is

$I_1-I_2=4MR^2$

44. **(2)** $T_1=27+273=300$ K,

$$V_1=V, V_2=\frac{8}{27}\text{V}, T_2=?$$

$T_1V_1^{\gamma-1}=T_2V_2^{\gamma-1}$

$$T_2=T_1\left(\frac{V_1}{V_2}\right)^{\gamma-1}=(300)\left(\frac{V}{\frac{8}{27}V}\right)^{\frac{5}{3}-1}=(300)\left(\frac{27}{8}\right)^{\frac{2}{3}}$$

$$=(300)\left[\left(\frac{3}{2}\right)^3\right]^{\frac{2}{3}}=(300)\left(\frac{3}{2}\right)^2$$

$$=300\times\frac{9}{4}=675\,\text{K}$$

$\Delta T=T_2-T_1=675-300=375\,\text{K}=375^{\circ}\text{C}$

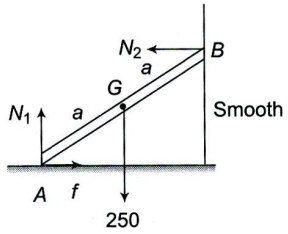
45. **(1)** $\frac{1}{2}mv^2(1+k^2/R^2)=mgh$

$$\frac{1}{2}mv^2\left(1+\frac{2}{5}\right)=mgh \qquad \frac{7}{10}mv^2=mgh$$

$$v=\frac{\sqrt{10gh}}{7} \qquad v\geq\sqrt{\frac{10gh}{7}}$$

46. **(1)** Temperature of liquid oxygen will first increase in the same phase. Then, the liquid oxygen will change to gaseous phase during which temperature will remain constant. After that temperature of oxygen in gaseous state will increase. Hence option (1) represents corresponding temperature-time graph.

47. **(1)**

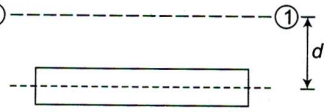


$\uparrow: N_1 = 250\,\text{N}$

$f_{max} = \mu N_1 = 0.3 \times 250 = 75\,\text{N}$

48. **(2)**

49. **(1)**



$I_{1-1} = 0 + Md^2$

Due to change in temperature, no effect on M and d, hence. M.I. remains same.

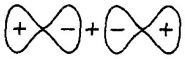
50. **(3)** From $t = 0$ o $t = 1$ min

$$\Delta Q = ms\Delta\theta = \frac{50}{1000} \times 0.6 \times 1000 \times (50 \times 0)$$

$= 1500$ cal

CHEMISTRY

SECTION - A (35 Questions)

51. **(3)** 

52. **(4)** None of these

53. **(2)** $CH_3–CH=CH–CH_3 \xrightarrow[273K]{dil.KMnO_4}$

$$CH_3-\underset{|}{\overset{OH}{CH}}-\underset{|}{\overset{OH}{CH}}-CH_3$$

54. **(1)** E^+ is NO_2^+

55. **(3)** 0.7 V

56. **(3)** y – x

57. **(1)** $Cl_2O_7 > SO_3 > P_4O_{10}$

58. **(2)**

(2)	p	13	7	$7s^2, 7p^1$

59. **(1)** B.O. $\propto \frac{1}{\text{B.L.}}$; CO CO_2 CO_3^{2-}

B.O. 3.0 2.0 $\frac{4}{3}$

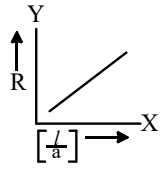
60. **(2)** In (b), octet rule is followed for all atoms.

61. **(2)** $CH_3–CH_2–COONa \xrightarrow{\text{Electrolysis}}$

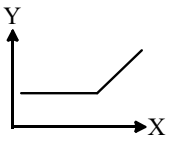
$CH_3CH_2CH_2–CH_3$

62. **(4)** $CH \equiv CH \xrightarrow{Hg^{2+}/H^+} CH_3 - CHO$

63. **(1)**



64. **(2)**



65. **(2)** $SnCl_4$ is most covalent, hence, lowest M.P.

66. **(4)** $Be_2 \Rightarrow$ Because according to MOT bond order is zero.

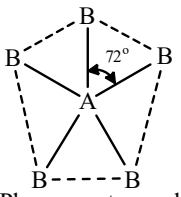
67. **(1)** Geometrical isomers

68. **(1)** If both Assertion & Reason are true and the Reason is the correct explanantion of the Assertion

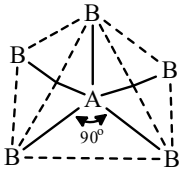
69. **(3)** As the electrolyte paste is having ammonium chloride and zinc chloride and not KOH.

70. **(4)** As we know H^+/H_2 couple has zero standard reduction potential so, ions having positive E^o value are weaker reducing agent, while ions having negative E^o value are stronger reducing agent.

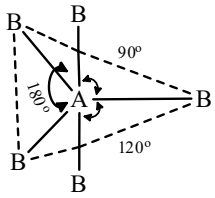
71. **(4)** Fro AB_5 molecules, there are three possible geometries i.e., planar pentagonal, square pyramidal and trigonal bipyramidal.



Planar pentagonal



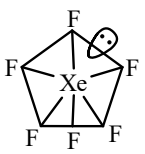
Square pyramidal

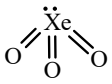


Trigonal bipyramidal

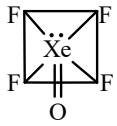
Out of these three geometries, it is only trigonal pyramidal shape in which bond pair-bond pair repulsions are minimum and hence this geometry is the most probable geometry of AB_5 molecule.

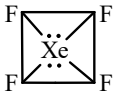
72. **(2)** $XeF_6 \rightarrow sp^3d^3 \rightarrow$ distorted octahedral



$XeO_3 \rightarrow sp^3 \rightarrow$ pyramidal 

$XeOF_4 \rightarrow sp^3d^2 \rightarrow$ square pyramidal



$XeF_4 \rightarrow sp^3d^2 \rightarrow$ 

73. **(2)** Electrode reaction for :

$FeSO_4$ $\quad Fe^{2+} + 2e^- = Fe;\ n = 2$

$Fe_2(SO_4)_3$ $\quad Fe^{3+} + 3e^- = Fe;\ n = 3$

$Fe(NO_3)_3$ $\quad Fe^{3+} + 3e^- = Fe;\ n = 3$

Mass of Fe deposited (m) by the current (I) passed for 't' seconds is given by

$$m = \frac{M}{nF} I.t \quad \text{or} \quad m \propto \frac{M}{n}$$

$$\frac{\text{Mass of Fe deposited in } FeSO_4}{\text{Mass of Fe deposited in } Fe_2(SO_4)_3}$$

$$= \frac{M/2}{M/3} = \frac{3}{2}$$

$$\frac{\text{Mass of Fe deposited in } Fe(NO_3)_3}{\text{Mass of Fe deposited in } FeSO_4}$$

$$= \frac{M/3}{M/2} = \frac{2}{3}$$

$$\frac{\text{Mass of Fe deposited in } Fe_2(SO_4)_3}{\text{Mass of Fe deposited in } FeCl_3}$$

$$= \frac{M/3}{M/3} = 1$$

74. **(4)** 1-iii, 2-iv, 3-i, 4-ii

75. **(1)** a-ii, b-i, c-iv, d-iii

76. **(1)** $Na^+ > Li^+ > Mg^{2+} > Be^{2+}$

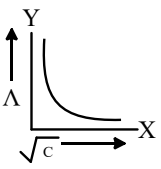
77. **(2)** $1s^2, 2s^2, 2p^6, 3s^23p^1$

78. **(2)** $XeOF_4$ has 5 b.p. and 1 l.p. Similarly, IF_5

79. **(4)** all of these

80. **(2)** (ii) > (i) > (iii)

81. **(4)** It follows (4n) π Rule.

82. **(2)** 

83. **(2)** $E^o_{Fe^{2+}/Fe^{3+}}$, is positive in alkaline medium, hence it is easier to oxidise Fe^{2+} to Fe^{3+} in alkaline medium.

84. **(2)** All isoelectronic ions belong to same period of the periodic table.

85. **(4)** N > C > P > Si

SECTION - B (Attempt Any 10 Questions)

86. **(2)** (2) & (3) only

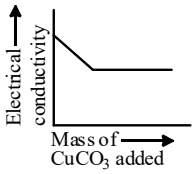
87. **(2)** If both Assertion & Reason are true but the Reason is not the correct explanation of the Assertion

88. **(4)**

(4)	Polarity order	N-H < Sb-H < As-H < P-H

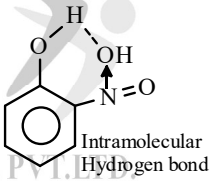
89. **(2)**

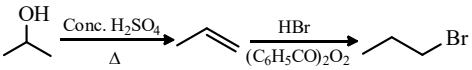
(2)	Trigonal bipyramidal	tetrahedral	octahedral

90. **(1)** 

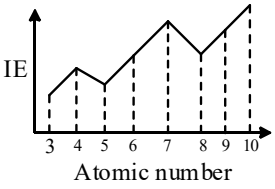
91. **(4)** Cl > S > P > N

92. **(1)** Most volatile compound is due to intramolecular hydrogen bond.

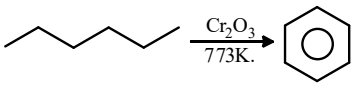


93. **(1)** 

94. **(3)** 1.1

95. **(1)** 

96. **(3)** $\mu_{SO_3} = 0, \mu_{SO_2} \neq 0$

97. **(2)** 

98. **(2)** 1 and 3

99. **(1)** Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for THE Statement-1

100. **(1)**