

CAREER POINT

MOCK TEST PAPER for AIPMT

Physics, Chemistry & Biology

Solutions

ANSWER KEY

PHYSICS

Ques.	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
Ans.	1	3	3	1	1	4	3	1	3	2	4	4	3	3	3	1	2	2	2	1	2	4	2	4	1
Ques.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45					
Ans.	2	1	3	4	2	3	1	1	1	1	3	3	4	2	3	2	3	1	1	1					

CHEMISTRY

Ques.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
Ans.	3	3	2	2	1	1	2	4	4	1	3	3	2	1	2	4	2	3	2	1	2	3	1	4	1
Ques.	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90					
Ans.	2	1	1	1	4	1	2	2	2	1	2	4	3	1	3	3	1	1	2	2					

BIOLOGY

Ques.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110
Ans.	3	4	3	1	4	2	4	1	2	1	2	4	4	3	4	4	4	1	3	1
Ques.	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
Ans.	1	3	1	2	2	1	2	4	1	2	4	1	3	2	4	3	1	3	1	1
Ques.	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
Ans.	1	3	4	4	4	3	4	2	2	2	2	4	1	2	4	4	2	4	1	4
Ques.	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170
Ans.	3	4	4	2	2	2	2	3	4	2	3	3	4	4	4	2	4	1	3	1
Ques.	171	172	173	174	175	176	177	178	179	180										
Ans.	4	4	2	4	4	2	3	3	3	4										

PHYSICS

2.[3] $F = 600 - 2 \times 10^5 t = 0$

$$t = \frac{600}{2 \times 10^5}$$

$$= 3 \times 10^{-3} \text{ s}$$

$$\text{Impulse} = \int_0^t F dt$$

3.[3] Let m be the mass of the disc. Then translational kinetic energy of the disc is :

$$K_T = \frac{1}{2} mv^2 \quad \dots (1)$$

When it ascends on a smooth track its rotational kinetic energy will remain same while translational kinetic energy will go on decreasing. At highest point.

$$K_T = mgh$$

$$\text{or } \frac{1}{2} mv^2 = mgh$$

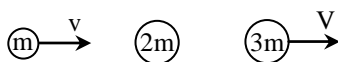
$$\text{or } h = \frac{v^2}{2g} = \frac{(6)^2}{2 \times 10} = 1.8 \text{ m}$$

4.[1] $P = \frac{\text{Energy}}{\text{time}} = \frac{dm}{dt} gh = 100 \times 10 \times 100$
 $= 100 \text{ kW}$

5.[1] (i) $W = \Delta U = \left\{ \frac{m}{6} g \left(\frac{\ell}{12} \right) \right\} = \frac{mg\ell}{72}$

6.[4] From conservation of linear momentum
 $8 \times 6 = 4 \times v \Rightarrow v = 12 \text{ ms}^{-1}$

$$\text{As kinetic energy} = \frac{1}{2} mv^2$$

7.[3] 

Initial momentum = mv

final momentum = $3mV$

$$mv = 3mV$$

$$\Rightarrow V = v/3$$

8.[1] $y_{cm} = \frac{m_1 y_1 + m_2 y_2}{m_1 + m_2}$

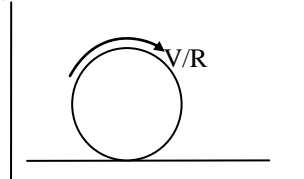
$$0 = \frac{\left(\frac{m}{4}\right)(15) + \left(\frac{3m}{4}\right)y}{\frac{m}{4} + \frac{3m}{4}}$$

$$y = -5 \text{ cm}$$

9.[3] $\frac{2}{5} MR^2$

10.[2] $k = \frac{I}{2} \omega^2$

12.[4] From figure



$$V = R\omega$$

$$V_{\text{net}} \text{ (for lowest point)} = v - R\omega = v - v = 0$$

$$\text{and Acceleration} = \frac{v^2}{R} + 0 = \frac{v^2}{R}$$

(Since linear speed is constant) Hence (D)

13.[3] $U = -\frac{GMm}{r}$; $K = \frac{GMm}{2r}$; $E = \frac{-GMm}{2r}$

14.[3] $Y = \frac{F/A}{\Delta x} \Rightarrow F = \frac{YA}{L} \Delta x \propto \frac{A}{L}$

$$V = AL \Rightarrow L \propto \frac{1}{A}$$

$$F \propto A^2$$

15.[3] $\theta = mS \Delta T$

$$\frac{\Delta \theta}{\Delta t} = P$$

$$(P) (1) = 50 \times 0.6 \times 50 \text{ Cal}$$

16.[1] $B_\phi = \gamma P$; $B_0 = P$

17.[2]

18.[2] $C_{V_{\min}} = \frac{n \frac{3R}{2} + n \frac{5R}{2}}{n + n} = 2R$

$$C_p = nC_p dT$$

$$Q = n(p\lambda)$$

$$= n3R(2T - T)$$

$$Q = 3nRT$$

19.[2] $T_1 = 2 \text{ sec}$

$$T_2 = 2\pi \sqrt{\frac{16}{g}}$$

$$= 4 \left(2\pi \sqrt{\frac{1}{g}} \right) = 8 \text{ sec}$$

$$t = \frac{T_1 T_2}{T_2 - T_1} = \frac{(8)(2)}{8 - 2}$$

$$t = \frac{8}{3}$$

Number of oscillation of shorter pendulum

$$n = \frac{t}{T_1} = \frac{4}{3}$$

$$20.[1] \quad K = \frac{\pi}{20} \Rightarrow \frac{2\pi}{\lambda} = \frac{\pi}{20}$$

$$\lambda = 40 \text{ cm}$$

$$\text{Ans.} \Rightarrow \lambda/2 = 20 \text{ cm}$$

$$21.[2] \quad v = \sqrt{\frac{T}{\mu}} \Rightarrow v = \sqrt{\frac{1.6 \times 0.4}{10^{-2}}} = 8 \text{ m/s}$$

$$\Delta t = \frac{2L}{v} \Rightarrow \Delta t = \frac{2 \times 0.4}{8} = 0.1 \text{ sec.}$$

22.[4] By theory.

$$23.[2] \quad W_{A \rightarrow B} = q(V_B - V_A)$$

$$= q \int_B^A \mathbf{E} \cdot d\mathbf{r}$$

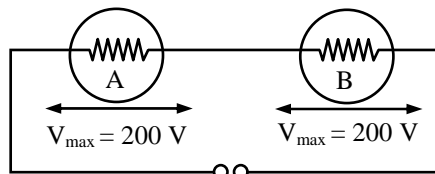
$$= q_0 \int_{2a}^{3a} \frac{\lambda}{2\pi\epsilon_0 r} \cdot dr$$

$$= \frac{\lambda q_0}{2\pi\epsilon_0} \ell \ln \frac{3}{2}$$

$$24.[4] \quad (n \times 1 \mu\text{F}) 500 = 10^6 \mu\text{C}$$

$$n = \frac{10^6}{500} = 2000$$

$$25.[1] \quad R_A = \frac{200 \times 200}{40} = 1000 \Omega, R_B = \frac{200 \times 200}{100} = 400 \Omega$$



$$V_1 = \frac{V \times R_1}{R_1 + R_2} = 200$$

[considering that bulb A will not fuse]

$$\frac{V \times 1000}{1400} = 200$$

$$V = \frac{200 \times 1400}{1000} = 280 \text{ V}$$

$$V_2 = \frac{V \times R_2}{R_1 + R_2} = 200$$

$$V = \frac{200 \times 1400}{400} = 700 \text{ V}$$

If 700 volt is applied Bulb A will fuse.

Hence correct answer is 280 volt

$$26.[2] \quad \text{By symmetry } R_{AB} = \frac{3R}{2}$$

$$27.[1] \quad \frac{3R}{R} = \frac{\ell}{100 - \ell} \Rightarrow 300 - 3\ell = \ell$$

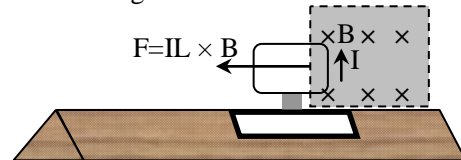
$$\Rightarrow \ell = 75 \text{ cm}$$

28.[3] There will be no force on the loop due to horizontal current carrying wires because forces acting on these wires will be equal and opposite. Further, $F_{AD} > F_{BC}$. F_{AD} is directed towards left hand side and F_{BC} towards right hand side (according right hand rule). Therefore, the net force acting on the loop will be towards wire.

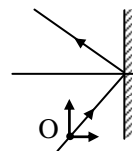
$$29.[4] \quad \epsilon = VB\ell$$

$$= 4 \times 1.25 \times 10^{-4} \times 2 = 10^{-3} \text{ V}$$

30.[2] The correct answer is b. A counterclockwise current will be induced in the wire as the front edge enters the coil. This can be deduced by applying the Right Hand Rule to the free charges in the length of wire as they travel through the magnetic field, or by using Faraday's Law to examine the increasing magnetic flux through the area of the loop as it enters the magnetic field. This current-carrying wire, exposed to the external magnetic field B , experiences a magnetic force F_B in a direction opposite v , again determined using the Right Hand Rule and it is this magnetic force that causes the glider to slow down.



31.[3]

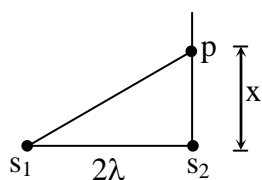


$$\vec{v}_O = \frac{5}{\sqrt{2}} \hat{i} + \frac{5}{\sqrt{2}} \hat{j}$$

$$\vec{v}_I = -\frac{5}{\sqrt{2}} \hat{i} + \frac{5}{\sqrt{2}} \hat{j}$$

$$\vec{v}_{I/O} = -\frac{10}{\sqrt{2}} \hat{i} ; |\vec{v}_{I/O}| = 5\sqrt{2} \text{ m/s}$$

32.[1] Path difference at s_2 is 2λ . Therefore, for minimum intensity at P, let x be the minimum distance from s_2 then,



$$s_1P - s_2P = \frac{3\lambda}{2} \neq \frac{\lambda}{2}$$

$$\text{or } \sqrt{4\lambda^2 + x^2} - x = \frac{3\lambda}{2}$$

$$\text{Solving Eq. (1), we get } x = \frac{7\lambda}{12}$$

Note that if we substitute $s_1P - s_2P = \lambda/2$ in Eq. (1), we get

$$x = \frac{15\lambda}{4} \text{ which is greater than } \frac{7\lambda}{12}.$$

$$\begin{aligned} 34.[1] \quad M.P. &= m_0 \times m_e \\ 32 &= m_0 \times 4 \\ \therefore m_0 &= 8 \end{aligned}$$

$$\begin{aligned} 35.[1] \quad I_{\min} &\propto (a - a)^2 \\ I_{\min} &\propto (2a - a)^2 \end{aligned}$$

Clearly, the intensity of minima increases. Again

$$\begin{aligned} I_{\max} &\propto (a + a)^2 \\ I_{\max} &\propto (2a + a)^2 \end{aligned}$$

Clearly, the intensity of maxima increases

$$\begin{aligned} 36.[3] \quad p' &= 1.25p \text{ \& } \lambda = \frac{h}{p} \\ \frac{\lambda' - \lambda}{\lambda} \times 100 &= \left(\frac{\lambda'}{\lambda} - 1 \right) \times 100 \\ &= \left(\frac{p}{p'} - 1 \right) \times 100 \\ &= \left(\frac{1}{1.25} - 1 \right) \times 100 \\ &= -20\% \end{aligned}$$

$$37.[3] \quad \text{use, } \lambda = \frac{h}{\sqrt{2mqV_0}}$$

$$38.[4] \quad F = 2hp$$

$$39.[2] \quad F = -\frac{dU}{dr} = -m\omega^2 r$$

$$m\omega^2 r = \frac{mv^2}{r}$$

$$\text{Also, } v = \omega r \quad mvr = \frac{nh}{2\pi}$$

$$r = \sqrt{\frac{nh}{2\pi m\omega}}$$

$$\begin{aligned} 40.[3] \quad A &= \frac{A_0}{2^{T_{1/2}}} \\ 2000 &= \frac{16000}{2^{12/T_{1/2}}} \end{aligned}$$

$$\begin{aligned} 41.[2] \quad \alpha &= 0.9 \\ \frac{\Delta I_C}{\Delta I_E} &= 0.9 \end{aligned}$$

$$42.[3] \quad \bar{A} + \bar{B} = 4$$

43.[1] Virtual, Inverted

$$44.[1] \quad g_d = g \left(1 - \frac{d}{R} \right) = g \left(1 - \frac{R}{2R} \right) = \frac{g}{2}$$

$$45.[1] \quad \frac{MR^2}{4} + \frac{ML^2}{12}$$

CHEMISTRY

$$\begin{aligned} 46.[3] \quad \text{atom of X} &= 3 \times 10^{23} \\ \text{Mole atom of X} &= 0.5 \\ \text{Atomic wt. of X} &= \frac{80}{0.5} = 160 \end{aligned}$$

$$\begin{aligned} 47.[3] \quad \text{Number of electrons} &= 2 \times 10^{-3} \times 6.02 \times 10^{23} \times 10 \\ &= 1.2 \times 10^{22} \end{aligned}$$

$$\begin{aligned} 48.[2] \quad T &= 1.52 \times 10^{-16} \frac{n^3}{Z^2} \text{ sec.} \\ \frac{T_1}{T_2} &= \frac{(2)^3}{(1)^2} \times \frac{(2)^2}{(3)^3} = \frac{32}{27} \end{aligned}$$

$$49.[2] \quad M_{\text{av.}} = \frac{M_1x_1 + M_2x_2 + M_3x_3}{x_1 + x_2 + x_3}$$

According to option (2)

$$(M + 0.5) = \frac{M \times 4 + (M + 1) \times 1 + (M + 2) \times 1}{4 + 1 + 1}$$

then L.H.S. = R.H.S

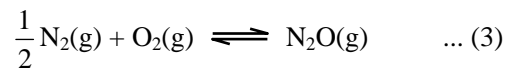
$$50.[1] \quad \Delta E \propto \frac{1}{n_1^2} - \frac{1}{n_2^2}$$

51.[1] Boiling moles the bond strianed

$$52.[2] \quad w = -2.303 nRT \log \frac{V_2}{V_1} = (-0.42 - (-0.72)) - \frac{0.0591}{6} \log \frac{(0.1)^2}{(0.01)^3}$$

$$53.[4] \quad \frac{1}{2} N_2(g) + O_2(g) \rightleftharpoons NO_2(g) \quad \dots (1)$$

$$2NO_2(g) \rightleftharpoons N_2O_4(g) \quad \dots (2)$$



i.e. (3) = (1) × 2 + (2)

$$K_3 = K_1^2 K_2$$

$$K_3' = \frac{1}{K_3}$$

$$54.[4] \quad K_{sp} = (S^2) + 10^{-4} S$$

$$S = \frac{K_{sp}}{10^{-4}} = \frac{10^{-16}}{10^{-4}} = 10^{-12}$$

55.[1] After mixing

$$[Ag^+] = \frac{1}{2} \times 10^{-4} = 5 \times 10^{-5} M$$

$$[Cl^-] = \frac{1}{2} \times 10^{-4} = 5 \times 10^{-5} M$$

$$K_{ip} = [Ag^+][Cl^-] = (5 \times 10^{-5})^2 = 2.5 \times 10^{-9}$$

Since ionic product is greater than K_{sp} hence precipitation will take place.

57.[3] FCC lattice have six face and each face is shared by one other unit cell.

58.[2] ($\pi \propto$ No. of partical)

$$59.[1] \quad y_A = \frac{P_A^0 X_A}{P_A^0 X_A + P_B^0 X_B}$$

$$y_A = \frac{1}{1 + \frac{P_B^0 X_B}{P_A^0 X_A}}$$

$$y_A = \frac{1}{1 + (3)(3)} = \frac{1}{10} = 0.1$$

60.[2] Fact

$$\lambda_M NaNO_3 = \lambda_M KNO_3 - \lambda_M KCl$$

$$= 128 + 111 - 152 = 87 S \text{ cm}^2 \text{ mol}^{-1}$$

$$61.[4] \quad E_{cell} = E^\circ_{cell} - \frac{0.0591}{6} \log \frac{(Cr^{+3})^2}{(Fe^{+2})^3}$$

$$62.[2] \quad \frac{R_A}{4} = \frac{R_B}{1} = \frac{R_C}{2} = \frac{R_D}{2}$$

$$63.[3] \quad K = \frac{R}{[A]} = \frac{7.5 \times 10^{-4}}{0.5} = 1.5 \times 10^{-3} \text{ sec}^{-1}$$

67.[3] β -keto acid.

68.[1] Include stereo isomers.

69.[4] It has localised $l.p.$

72.[1] Intramolecular Cannizzaro.

74.[1] Nucleophilicity $\propto K_b$.

76.[1] $Ph-NO_2 \rightarrow Ph-NH_2 \rightarrow Ph-N \equiv C \rightarrow Ph-NH-CH_3$

79.[2] Intramolecular E.S.R.

BIOLOGY

91.[3] NCERT-XI, page No. 47

92.[4] NCERT-XI, page No. 49

93.[3] NCERT-XI, page No. 50

94.[1] NCERT-XI, page No. 56-57

95.[4] NCERT-XI, page No. 50

96.[2] NCERT-XI, page No. 51

97.[4] NCERT-XI, page No. 57

98.[1] NCERT-XI, page No. 59

$$100.[1] \quad \text{No. of bp} = \frac{\text{length of DNA } (\text{\AA})}{3.4 \text{\AA}}$$

101.[2] Base ratio is constant for a species.

[क्षार अनुपात एक प्रजाति के लिये नियत होता है]

132.[3] Cat – Felidae

Dog – Canidae

[बिल्ली – फेलीडी]

- 133.[4]** All were included in Plantae.
[सभी प्लांटी में सम्मिलित किए गए थे]
[NCERT, Class XI, Page no.16]
- 134.[4]** Floridean starch is branched carbohydrate similar to amylopectin and glycogen.
[फ्लोरीडिन स्टार्च एमाइलोपेक्टिन तथा ग्लायकोजन के समान शाखित कार्बोहाइड्रेट होता है]
- 135.[4]** Orange rot is caused by Alternaria.
[ओरेंज रोट अल्टीनेरिया के कारण होता है]
- 139.[2]** A– *Selaginella*, B– *Equisetum*, C– Fern,
D– *Salvinia*
[A– सिलेजिनेला, B– इक्वीसेटम, C– फर्न,
D– साल्वीनिया]
- 140.[2]** Lignified cell wall is not present in meristematic tissue.
[विभज्योतकी ऊतक में लिग्निफिकृत कोशिका भित्ति उपस्थित नहीं होती है]
- 142.[4]** Heart wood
[अन्तःकाष्ठ]
- 143.[1]** Still root
- 146.[4]** NCERT XI page no. 96
- 148.[4]** NCERT-XI, Page No. 132, 8.5.1
- 150.[4]** Mitosis can not occur without DNA replication.
[समसूत्रण बिना DNA प्रतिकृतिकरण के नहीं हो सकता है]
- 151.[3]** Meiosis always occurs in diploid cell.
[अर्धसूत्रण सदैव द्विगुणित कोशिका में पाया जाता है]
- 152.[4]** Cell wall consists of lignin, hemicellulose, pectin and cellulose.
[कोशिका भित्ति में लिग्निन, हेमीसेल्यूलोज, पेक्टिन तथा सेल्यूलोज पाया जाता है]
- 154.[2]** NCERT-XI, Page No. 166, 10.2.4
- 155.[2]** NCERT-XI, Page No. 133, 8.5.3
- 157.[2]** Both show saturation effect.
[दोनों संतृप्तता प्रभाव दर्शाते हैं]
- 158.[3]** Nucleolus disappear, astral ray formation,
[केन्द्रिका विलोपन, तारक रश्मि निर्माण]