RJ VISION PVT. LTD.

(MOST STABLE & INNOVATIVE INSTITUTE)

FT – 1
ENG

PCB
SOLUTION

COURSE NAME: 12TH | DATE : 28-03-2026

FT - 1 (FR) (NEET - CBSE, GSEB) (28 - 03 - 2026)
ANSWER KEY

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

PHYSICS:

1. **Sol. (3)**

Refractive Index, dielectric constant and strain are dimensionsless.

2. **Sol. (3)**

i_{rms} of current is 2A.

3. **Sol. (1)**

$R = \frac{\rho \ell}{A}$ density $= \frac{m}{V}$

$d = \frac{m}{A\ell}$

$R = \frac{\rho \ell}{m} \times d\ell$

$m \propto \rho \times d$

4. **Sol. (1)**

After some time both force becomes equal.

5. **Sol. (1)**

6. **Sol. (1)**

According to Fleming's left hand rule direction of force is along Oy axis.

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

B due to i is acting inwards i.e., into the paper. v is along Ox.

$\Rightarrow F = Q[v\hat{i} \times B(-\hat{k})]$

$\therefore \vec{F} = +QvB\hat{j}$ i.e., in Oy direction.

7. **Sol. (3)**

$R = \frac{mv\sin\theta}{qB}$

8. **Sol. (3)**

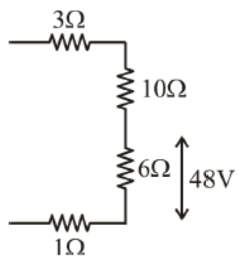
$|v| = |a|$

$\omega\sqrt{A^2 - x^2} = \omega^2 x$

$\omega = \sqrt{\frac{A^2 - x^2}{x^2}} = \sqrt{\frac{(5)^2 - (3)^2}{3^2}} = \frac{4}{3}$

$T = \frac{2\pi}{\omega} = \frac{3\pi}{2}$

9. **Sol. (1)**



$I = \frac{48}{6} = 8A$

V = IR_{eq}

= 8 × 20 = 160 volt

10. **Sol. (3)**

F = kx

$100 = k \times (25 \times 10^{-2})$

k = 400 N/m

$T = 2\pi\sqrt{\frac{m}{k}} = 2\pi\sqrt{\frac{1}{400}}$

$= \frac{2\pi}{20} = \frac{\pi}{10} = 0.314s$

11. **Sol. (4)**

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

As r, h, T are same, $\frac{\cos\theta}{\rho}$ = constant

$\Rightarrow \frac{\cos\theta_1}{\rho_1} = \frac{\cos\theta_2}{\rho_2} = \frac{\cos\theta_3}{\rho_3}$

As $\rho_1 > \rho_2 > \rho_3$

$\Rightarrow \cos\theta_1 > \cos\theta_2 > \cos\theta_3 \Rightarrow \theta_1 < \theta_2 < \theta_3$

As water rises so θ must be acute

So, $0 \le \theta_1 < \theta_2 < \theta_3 < \pi/2$

12. **Sol. (3)**

Statement-I is incorrect because electric field due to point charge on gaussian surface will not be zero.

13. **Sol. (2)**

Escape velocity $v_e = \sqrt{\frac{2GM}{R}}$

Orbital velocity (near earth's surface) $v_0 = \sqrt{\frac{GM}{R}}$

So $v_0 = \sqrt{2}\, v_0$

14. **Sol. (3)**

$V = -\frac{K}{x}$

$E_x = -\frac{dV}{dx} = K\frac{d(x^{-1})}{dx}$

$= \frac{-K}{x^2} = \frac{-K}{2^2} = -\frac{K}{4}$

15. **Sol. (2)**

$[c] = [t^2] = T^2 \quad [v] = \frac{[b][t]}{[t^2]}$

$[v] = [at^2] \quad LT^{-1} = \frac{[b]}{T}$

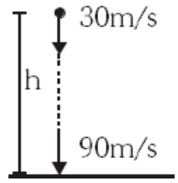
$LT^{-1} = [a]T^2$

$[a] = LT^{-3} \quad [b] = L$

16. **Sol. (3)**

$[M^{-1} L^{-3} T^4 A^2]$ = electric permittivity

17. **Sol. (2)**



$\because v^2 = u^2 + 2gh$

$\therefore 90^2 = 30^2 + 2 \times 10h \Rightarrow 360$ m

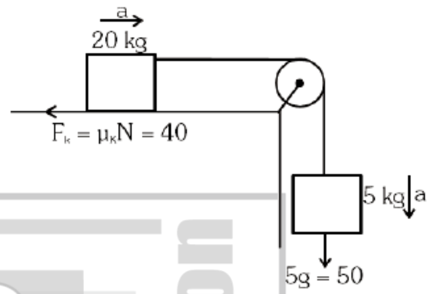
18. **Sol. (4)**

$\vec{R} = 8\sin 2\pi\hat{i} + 8\cos 2\pi\hat{j}$

$\vec{v} = \frac{d\vec{R}}{dt} = 16\pi\cos 2\pi t\hat{i} - 16\pi\sin 2\pi t\hat{j}$

$|\vec{v}| = 16\pi\sqrt{2}$

19. **Sol. (2)**



$a = \frac{\text{net force}}{\text{total mass}} = \frac{50-40}{25} = 0.4\ m/s^2$

20. **Sol. (4)**

A diamagnet is always repelled by a magnetic field. Therefore it is repelled by both the north pole as well as the south pole.

21. **Sol. (1)**

de-Broglie wavelength $\lambda = \frac{h}{\sqrt{2mE}}$

where E is the kinetic energy

Since E is the same, $\therefore \lambda \propto \frac{1}{\sqrt{m}}$

Since $m_\alpha > m_p > m_e$, $\therefore \lambda_e > \lambda_p > \lambda_\alpha$

22. **Sol. (2)**

$\nu = 6 \times 10^{14}, \lambda = \frac{c}{\nu} = \frac{3 \times 10^8}{6 \times 10^{14}} = 5000$ Å

$P = 2 \times 10^{-3}W = n\frac{hc}{\lambda}$

$\nu = 5 \times 10^{24} \times 2 \times 10^{-3} \times 5000 \times 10^{-10}$

$\nu = 5 \times 10^{15}$

23. **Sol. (4)**

24. **Sol. (2)**

$$\frac{\text{Power of } S_2}{\text{Power of } S_1} = \frac{n_2\left(\frac{hc}{\lambda_2}\right)}{n_1\left(\frac{hc}{\lambda_1}\right)} = \frac{n_2\lambda_1}{n_1\lambda_2} = 1$$

25. **Sol. (1)**

26. **Sol. (1)**

$$\hat{V} = \hat{E} \times \hat{B}, \hat{i} = \hat{j} \times \hat{k}$$

$$\therefore \hat{B} = \hat{k}, \text{ +z direction}$$

27. **Sol. (4)**

$$P = \sigma A T^4 \propto T^4$$

According to Wein's law $T \propto \frac{1}{\lambda_m}$

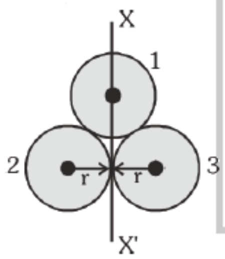
$$P \propto \left(\frac{1}{\lambda_m}\right)^4 \Rightarrow \frac{P_2}{P_1} = \left(\frac{\lambda_{m_1}}{\lambda_{m_2}}\right)^4$$

$$\Rightarrow \frac{nP}{P} = \left(\frac{\lambda_0}{\frac{4}{3}\lambda_0}\right)^4 \Rightarrow n = \frac{81}{256}$$

28. **Sol. (4)**

Net force on the particle in uniform circular motion is centripetal force, which is provided by the tension in string.

29. **Sol. (3)**



$$I_{xx'} = I_1 + I_2 + I_3$$

$$= \frac{2}{3}mr^2 + \left(\frac{2}{3}mr^2 + mr^2\right) + \left(\frac{2}{3}mr^2 + mr^2\right)$$

$$\Rightarrow I_{xx'} = 2mr^2 + 2mr^2 = 4mr^2$$

30. **Sol. (3)**

$P = FV \cos\theta$

$= mgv_0 \cos(90° + 60°)$

$= -mgv \sin 60° = -\frac{mgv_0\sqrt{3}}{2}$

31. **Sol. (4)**

$$R(n) = 0.529\frac{n^2}{z}$$

$$\frac{R_1(n=2)}{R_2(n=4)} = \frac{2^2}{4^2} = \frac{1}{4} = 0.25$$

$$\Rightarrow \frac{R_2}{R_1} = 4$$

32. **Sol. (2)**

For minimum deviation $\delta_{min} = 60°; i = 60°$

Also, $i = e$ and $A = 2r$

$\delta_{min} = 2i - A$

$\Rightarrow A = 2i - \delta_{min} = 120 - 60 = 60°$

For minimum deviation

$$\mu = \frac{\sin\left(\frac{\delta_{min}+A}{2}\right)}{\sin A/2} \Rightarrow \mu = \frac{\sin\left(\frac{120}{2}\right)}{\sin\frac{60}{2}} = \sqrt{3}$$

33. **Sol. (4)**

Pitch = $\frac{1mm}{2} = 0.5\,mm$

LC = $\frac{05mm}{50} = 0.01\,mm$

Reading = 1.5 mm + 35 (.01 mm) – (–0.02 mm)

= 1.87 mm

34. **Sol. (2)**

35. **Sol. (2)**

36. **Sol. (1)**

37. **Sol. (4)**

Refractive index, $n = \frac{c}{v}$

or $v = \frac{c}{n} = \frac{3 \times 10^8}{1.5} = 2 \times 10^8 \text{ ms}^{-1}$

Here, $\mu = 5 \times 10^{-7} \text{ Hm}^{-1}$

$$\therefore v = \frac{1}{\sqrt{\mu\varepsilon}} = \frac{1}{\sqrt{\mu\varepsilon_0\varepsilon_r}}$$

$$\varepsilon_r = \frac{1}{v^2\mu\varepsilon_0} = \frac{1}{(2 \times 10^8)^2 \times (5 \times 10^{-7}) \times (8.85 \times 10^{-12})}$$

$$= 5.65 \simeq 6$$

38. **Sol. (3)**

$$\tau = I\alpha \Rightarrow TR = I\alpha = \frac{mR^2}{2}\alpha$$

$$\Rightarrow T = \frac{mR\alpha}{2} = \frac{100 \times 1 \times 2\pi}{2}$$

= 100π = 314 N

39. **Sol. (1)**

Two consecutive resonant frequencies for a string fixed at both ends will be

$$\frac{nv}{2\ell} \text{ and } \frac{(n+1)v}{2\ell}$$

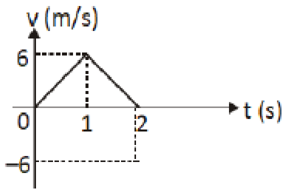
$$\Rightarrow \frac{(n+1)v}{2\ell} - \frac{nv}{2\ell} = 392 - 294$$

$\frac{v}{2\ell} = 98$ Hz : minimum resonant frequency

40. **Sol. (2)**

0 < t < 1s : velocity increases from 0 to 6 m/s

1 < t < 2s : velocity decreases from 6 to 0 m/s



Distance travelled in first second

$$S = \left(\frac{u+v}{2}\right)t = \left(\frac{0+6}{2}\right)(1) = 3\,m$$

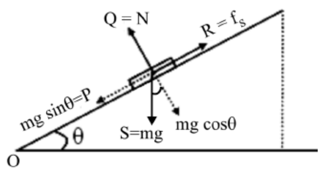
Total distance = 6 m so average speed

$$= \frac{6m}{2s} = 3\text{m/s}$$

Displacement = 6 m so average velocity $= \frac{6}{2}$

= 3 ms^{-1}

41. **Sol. (3)**



Q = Normal reaction

P = mg sinθ

R = Friction force

S = Weight (mg)

(a)-(ii), (b)-(iii), (c)-(iv) and (d)-(i)

42. **Sol. (1)**

$$v = \omega\sqrt{A^2 - x^2}$$

$$v_1 = \omega\sqrt{A^2 - x_1^2} \Rightarrow v_1^2 = \omega^2(A^2 - x_1^2) \qquad ...(1)$$

$$v_2 = \omega\sqrt{A^2 - x_2^2} \Rightarrow v_2^2 = \omega^2[A^2 - x_2^2]$$

$$v_1^2 - v_2^2 = \omega^2[A^2 - x_1^2 - A^2 + x_2^2]$$

$$\omega^2 = \frac{v_1^2 - v_2^2}{x_2^2 - x_1^2}$$

$$\omega = \sqrt{\frac{v_1^2 - v_2^2}{x_2^2 - x_1^2}} \Rightarrow \frac{2\pi}{T} = \sqrt{\frac{v_1^2 - v_2^2}{x_2^2 - x_1^2}}$$

$$T = 2\pi\sqrt{\frac{x_2^2 - x_1^2}{v_1^2 - v_2^2}}$$

43. **Sol. (4)**

$$E_{photon} = \left(-\frac{13.6}{4}\right)eV - (-13.6\ eV) \approx 10.2\ eV.$$

$$eV_0 = 10.2\ eV - 5.1\ eV \Rightarrow V_0 = 5.1\ \text{Volt}$$

44. **Sol.(3)**

$$U_{Loss} = \frac{1}{2}\frac{C_1C_2}{C_1+C_2}(V_1 - V_2)^2$$

$$= \frac{1}{2}\frac{(2)(6)}{8}(V - 0)^2$$

$$= \frac{3}{4}V^2$$

$$U_i = \frac{1}{2}C_1V^2 = \frac{1}{2}(2)(V^2)$$

$$= V^2$$

$$\frac{U_{Loss}}{V_i} = 100\% = \frac{\frac{3}{4}}{1} \times 100\% = 75\%$$

45. **Sol. (2)**

Theory

CHEMISTRY:

46. **Sol.(2)**

$$S = \frac{K_{sp}}{2C} = \frac{18 \times 10^{-11}}{2 \times 10^{-2}} = 9 \times 10^{-9}$$

47. **Sol. (1)**

$$CH_3CONH_2 \xrightarrow[Br_2]{NaOH} CH_3NH_2$$

(Hoffman bromamide reaction)

48. **Sol.(3)**

49. **Sol.(3)**

Co(Z = 27) has electronic configuration in its ground state as [Ar]$3d^7 4s^2$ for ℓ = 2, we have to consider

only $3d^7$.

i.e. | ⇅ | ⇅ | ↑ | ↑ | ↑ |

(i) When first e^- is filled with upward spin $\left(s = +\frac{1}{2}\right)$ maximum no. of e^- is 5.

(ii) When first e^- is filled with downward spin $\left(s = -\frac{1}{2}\right)$, minimum no. of e^- with $s = +\frac{1}{2}$ are 2.

50. **Sol.(2)**

$r \propto n^2$

$\frac{r_2}{r_1} = 4 \Rightarrow \frac{r_2}{a_0} = 4$

$\Rightarrow r_2 = 4a_0$

$n\lambda_d = 2\pi r$

$2 \times \lambda_d = 2\pi r_2$

$\Rightarrow 2 \times \lambda_d = 2\pi\,(4a_0)$

$\Rightarrow \lambda_d = 4\pi a_0$

51. **Sol.(3)**

	$AB_{3(g)}$	⇌	$AB_{2(g)}$	+	$\frac{1}{3}B_{2(g)}$
t = 0	800 torr		0		0
$t = t_{eq.}$	(800 – x)		x torr		$\frac{x}{2}$ torr

Total pressure at equilibrium

$\Rightarrow \left(800 + \frac{x}{2}\right) = 900$

x = 200

$\alpha(\text{in}\%) = \frac{x}{800} \times 100 = \frac{200}{800} \times 100$

= 25%

52. **Sol.(3)**

53.

Sol. **(3)**

$\{H_2O + HSO_3^- \longrightarrow SO_4^{-2} + 2e^- + 3H^+\} \times 3$

$6H^+ + IO_3^- + 6e^- \longrightarrow I^- + 3H_2O$

$IO_3^- + 3HSO_3^- \longrightarrow I^- + 3H^+ + 3SO_4^{2-}$

54. **Sol.(2)**

$q_p = q_v + \Delta n_g RT$

$q_v = q_p - \Delta n_g RT$

$= -780.9 + \frac{3}{2} \times \frac{2 \times 300}{1000}$

$= -780$ kcal

55. **Sol.(3)**

HNO_3	+	NH_3	⟶	NH_4NO_3
t = 0		4 m mol		6 m mol

[Since WB (NH_3) is left and salt (NH_4NO_3) is formed so it is a basic buffer]

Base left = 6 – 4 = 2 mmol

[Acid] = 40 × 0.1 = 4 mmol

[Base] = 20 × 0.3 = 6 mmol

∴ pOH = 4.7 + log 4/2 = 5

and pH = 14 – 5 = 9

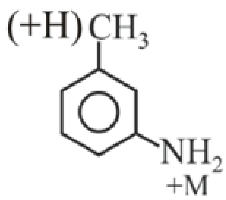
56. **Sol.(1)**

57. **Sol.(2)**

Cathode : $Cu^{+2} + 2e^- \longrightarrow Cu(s)$

Anode : $2H_2O(\ell) \longrightarrow O_2(g) + 4H^+ + 4e^-$

58. **Sol.(3)**



Most reactive due to more activating group

59. **Sol.(4)**

$$\Delta T_f = \frac{1000 K_f w}{M W} \times i$$

$$i = \frac{\Delta T_f . M W}{1000 K_f w}$$

$$i = \frac{1.62 \times 122 \times 100}{1000 \times 4.9 \times 8} = 0.504$$

$$\alpha = \frac{i - 1}{\frac{1}{n} - 1} = \frac{0.504 - 1}{0.5 - 1} = 0.992$$

So, % α = 99.2 %

60. **Sol.(2)**

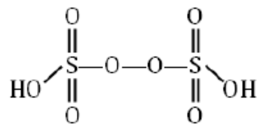
$P_S < P_A + P_B$ (on calculating)

Hence $P_A + P_B = 760$ torr $= 1$ atm

$\therefore$ it shows negative deviation

61. **Sol.(3)**

$H_2S_2O_8$ (Peroxodisulphuric acid / Marshalls acid)



62. **Sol.(2)**

$N - \dot{N}^{-}$, endothermic due to $2p^3$ stable conf.

63. **Sol.(4)**

$P \longrightarrow$ square planar dsp^2

$Q \longrightarrow$ Octahedral sp^3d^2

$R \longrightarrow$ square pyramidal sp^3d

64. **Sol.(4)**

All positions and bond lengths in octahedral SF_6 are equal. There are no separate equitorial and axial positions.

65. **Sol. (2)**

66. **Sol.(3)**

67. **Sol.(3)**

68. **Sol.(1)**

69. **Sol.(3)**

$t_{2g}^5 eg^0$

($\because$ Pairing energy less)

70. **Sol.(3)**

71. **Sol.(2)**

72. **Sol.(3)**

In sec. amine minimum 4C is required to show metamerism.

73. **Sol.(4)**

74. **Sol.(1)**

75. **Sol.(2)**

76. **Sol.(1)**

77. **Sol.(2)**

$N_2 + 2H_2 \longrightarrow N_2H_4 \quad \Delta H = ?$

$\Delta H = \Sigma(BE)_R - \Sigma(BE)_P$

or $\Delta H = (941 + 2 \times 436) - (159 + 4 \times 398)$

$= 62$ kJ

78. **Sol.(3)**

79. **Sol.(1)**

$\Delta S° = 186.3 - 5.7 - 2 \times 130.7$

$= -80.8\ JK^{-1}\ mol^{-1}$

$\Delta G° = -74.81 + \frac{298 \times 80.8}{1000}$

$= -50.7$ kJ/mol

80. **Sol.(4)**

81. **Sol.(2)**

For zero order reaction $t_{\frac{1}{2}} \propto [A]_0$

first order reaction $[A]_t = [A]_0 e^{-kt}$

2^{nd} order reaction $t_{\frac{1}{2}} \propto \frac{1}{[A]_0}$

Pseudo first order reaction involves at least two reactant.

82. **Sol. (3)**

The size of halogen atom increases from F to I

Hence bond length from C – F to C – I increases

$\therefore$ Bond enthalpy from CH_3 – F to CH_3 – I Decreases

C – X Bond	Bond dissociation enthalpies/kJmol^{-1}
CH_3 – F	452
CH_3 – Cl	351
CH_3 – Br	293
CH_3 – I	234

83. **Sol.(2)**

$BCl_3, PCl_5, CO_3^{2-}, SO_3$

84. **Sol.(3)**

85. **Sol.(2)**

86. **Sol.(4)**

87. **Sol.(4)**

88. **Sol.(4)**

89. **Sol.(4)**

90. **Sol.(4)**

Free radical will be formed as intermediate in all reaction.