RJ VISION PVT. LTD.

(MOST STABLE & INNOVATIVE INSTITUTE)

FT – 18

ENG

PCB

SOLUTION

COURSE NAME: 12TH

DATE : 15-04-2026

FT - 18 (FR) (NEET - CBSE, GSEB) (15 - 04 - 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	2	3	2	4	3	2	1	2	3	1	2	4	4	2	2	3	3	3	3	4
Q	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans	4	3	1	3	3	3	4	2	3	2	1	3	4	1	1	2	2	2	2	3
Q	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	4	4	2	3	2	2	1	4	1	2	3	3	4	3	1	2	2	2	3	2
Q	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1	2	1	2	2	2	1	3	4	4	4	2	2	3	2	4	2	3	3	1	2
Q	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans	4	2	1	4	2	2	2	2	4	2	3	3	4	4	1	1	3	4	1	2
Q	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans	2	2	4	3	2	4	2	3	2	1	4	2	1	4	1	2	1	3	3	3
Q	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans	2	3	2	3	4	1	1	3	3	3	1	4	4	1	1	4	2	3	3	1
Q	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans	1	3	4	3	2	1	4	1	2	3	4	4	2	3	3	3	2	3	2	3
Q	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans	3	4	3	3	3	1	4	4	4	1	1	2	2	4	1	3	1	1	1	1

PHYSICS:

1. Sol. (2)

The electric field due to conducting infinite sheet placed in a medium of permittivity ε is, $E = \frac{\sigma}{\varepsilon}$

2. Sol. (3)

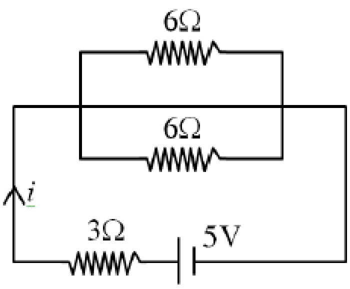
$$V = -x^2 - xy + 2$$

$$E_x = -\frac{dV}{dx} = 2x + y$$

$$E_y = -\frac{dV}{dy} = x$$

$$\hat{E} - = (2x + y)\hat{i} + x\hat{j}\ \text{N/C}$$

3. Sol. (2)



$$i = \frac{5}{3+0} = \frac{5}{3}\text{A.}$$

4. Sol. (4)

$$R = \rho\frac{\ell}{A}\ \&\ V = A\ell \Rightarrow \text{(For stretching)}$$

$$R = \rho\frac{\ell^2}{V} \Rightarrow R \propto \ell^2$$

$$\Rightarrow \frac{R_2}{R_1} = \left(\frac{\ell_2}{\ell_1}\right)^2 = \left(\frac{5\ell_1}{\ell_1}\right)^2 = 25$$

$$\Rightarrow R_2 = 25R_1$$

$$\Rightarrow R_2 = 25 \times 10\Omega$$

$$\Rightarrow R_2 = 250\Omega\ .$$

5. Sol. (3)

$$V = \frac{kP}{r^2}$$

$$V \propto \frac{1}{r^2}$$

6. Sol. (2)

$$Y_{B_3} = \frac{3\lambda D}{d}$$

$$\lambda = \frac{Y_{B_3} \times d}{3D} = \frac{10\times10^{-3}\times0.3\times10^{-3}}{3\times200\times10^{-2}}$$

$\lambda = 5 \times 10^{-7}$ m = 5000 Å

7. **Sol. (1)**

$$mg' = mg\left(1-\frac{d}{R}\right)$$

Here, $d = \frac{R}{4}$

$$mg' = 500\left(1-\frac{4}{4}\right)$$

$mg' = 375$ N

8. **Sol. (2)**

$$V = \frac{Q^2}{2C}$$

$$\Rightarrow U = \frac{Q^2 d}{2\varepsilon_0 \varepsilon_r A}$$

$$\Rightarrow U\alpha = \frac{1}{\varepsilon_r}$$ (∵ Q = constant)

9. **Sol. (3)**

$W = \vec{F}.\vec{S}$

$\Rightarrow (5\hat{i} + 7\hat{j} + 2\hat{k}).(\vec{r}_2 - \vec{r}_1)$

$= (5\hat{i} + 7\hat{j} + 2\hat{k}).(-8\hat{j} + 5\hat{k})$

$= -56 + 10 = -46$ J

10. **Sol. (1)**

$[h] = ML^2T^{-1}$

$[L] = ML^2T^{-1}$

$[P] = MLT^{-1}$

$[\tau] = ML^2T^{-2}$

[Here, h is Planck's constant, L is angular momentum, P is linear momentum and τ is moment of force (Torque)]

11. **Sol. (2)**

Momentum = Mass × Velocity

p = mv ....(1)

when mass and velocity both becomes 4 times.

p' = (4m) (4v) ....(2)

$$\therefore \frac{p}{p'} = \frac{mv}{(4m)(4v)}$$

∴ p' = 16p

12. **Sol. (4)**

By LMC → M_{gn} V_{rcoil} = (m_{Bullet} × V_{Bullet})

$$20\,V_{recoil} = \left(\frac{50}{1000}\times200\right)$$

$V_{recoil} = \frac{1}{2}$ m/s

13. **Sol. (4)**

X-rays is an electromagnetic radiation, so X-ray photons carry neither electric charge nor magnetic moment.

14. **Sol. (2)**

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

15. **Sol. (2)**

Energy, $\frac{hC}{\lambda}$ = 4.5eV

Hence, transition B

16. **Sol. (3)**

According to Rutherford atomic model, most of mass of atom and all its positive charge is concentrated in tiny nucleus & electron revolve around it.

According to Thomson atomic model, atom is spherical cloud of positive charge with electron embedded in it.

Hence,

Statement I is true but statement II is false.

17. **Sol. (3)**

$$\lambda = (3.3\text{Å})\frac{n}{Z} = (3.3\text{Å})\left(\frac{2}{1}\right) = 6.6\text{Å}$$

18. **Sol. (3)**

N = m(g + a), for lift moving up with decreasing speed, a is taken 'negative'.

19. **Sol. (3)**

Acceleration of the blocks :

$$a = \frac{m_2 - m_1}{m_2 + m_1}g = \frac{4-2}{4+2}g = \frac{g}{3}$$

F_{net} (on m_1) = $m_1 a$

$$= 2\times\frac{g}{3} = \frac{20}{3}\text{ N}$$

20. **Sol. (4)**

Based on the equation of continuity, a smaller cross-sectional area leads to a higher velocity to keep the flow rate constant. Hence the velocity is highest in the narrow part of the pipe.

21. **Sol. (4)**

$A_1V_1 = A_2V_2$

$(0.1)2 = (0.05)V_2$

$V_2 = 4$ m/s

22. **Sol. (3)**

$v_{max} \leqslant \sqrt{\mu rg}$

$v \leqslant \sqrt{0.4 \times 400 \times 10}$

$v \leqslant \sqrt{1600} = 40 m/s$

23. **Sol. (1)**

$$V = \frac{C}{\sqrt{\mu_r \varepsilon_r}}$$

$$\varepsilon_r = \frac{C^2}{V^2 \mu_r} = \frac{C^2}{\frac{C^2}{4} \times 2}$$

$\varepsilon_r = 2$

$\varepsilon_m = \varepsilon_0 \varepsilon_r = 2\varepsilon_0$

24. **Sol. (3)**

$$V = \frac{\omega}{k} = \frac{2 \times 10^7}{2} = 10^7 \, m/s$$

25. **Sol. (3)**

$\vec{B} = B_0 \left(2\hat{i} + 3\hat{j} + 4\hat{k}\right) T.$

Area of square $= L^2 \hat{k} \, m^2$

flux $\phi = \vec{B}.\vec{A} = B_0 \left(2\hat{i} + 3\hat{j} + 4\hat{k}\right).L^2\hat{k}$

$= 4B_0L^2$ Wb

26. **Sol. (3)**

$r_1 = r_2$

$$\Rightarrow \frac{m_1 v_1}{q_1, B} = \frac{m_2 v_2}{q_2, B}$$

$$\Rightarrow \frac{V_1}{V_2} = \frac{q_1}{q_2} \times \frac{m_2}{m_1}$$

$$= \frac{e}{2e} \times \frac{4m}{m}$$

$$\Rightarrow \frac{v_1}{v_2} = 2 \Rightarrow V_2 = \frac{v_1}{2}$$

4×10^6 m/s

27. **Sol. (4)**

$$f = \frac{\mu_0 I_1 I_2}{2\pi d} \times \ell = \frac{2 \times 10^{-7} \times 100 \times 1.1}{10^{-1}}$$

$\therefore 22 \times 10^{-5}$ N

28. **Sol. (2)**

$$B = \frac{\mu_0 i}{2r} = \frac{\mu_0 (qt)}{2r} = \frac{\mu_0 \times 100e \times 1}{2 \times 0.8}$$

$$= \frac{\mu_0 \times 100 \times 1.6 \times 10^{-19}}{1.6} = \mu_0 \times 10^{-17}$$

29. **Sol. (3)**

Thermal radiation is electromagnetic radiation and travels with speed of light in vacuum.

30. **Sol. (2)**

$F \propto -x$ (linearly)

so the motion is SHM and hence periodic

At mean position,

$F = -2x + 4 = 0$

$\Rightarrow x = 2$ metre

$\therefore x = 2$ is mean position.

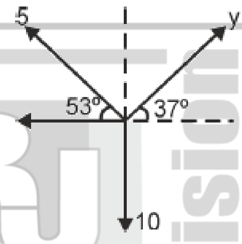
31. **Sol. (1)**

$\Sigma F_x = 0$

$\Rightarrow x + 5 \cos 53^o - y \sin 53^o = 0$

$\Rightarrow x + 3 - \frac{4y}{5} = 0$

$\Rightarrow 5x + 15 - 4y = 0$



$\Sigma F_y = 0$

$10 - 5 \sin 53^o - y \cos 53^o = 0$

$\Rightarrow 10 - 4 - \frac{3y}{5} = 0 \Rightarrow 6 = \frac{3y}{5} \Rightarrow y = 10$

$\therefore x = 5.$

32. **Sol. (3)**

$I \propto MR^2$

$M = \pi R^2 t \times \rho$

$$\frac{I_1}{I_2} = \frac{R_1^2 \times \rho_1 \times R_1^2}{R_2^2 \times \rho_2 \times R_2^2}$$

$$\frac{I_1}{I_2} = \frac{R^2 \times 9\sigma \times R^2}{9R^2 \times \sigma \times 9R^2}$$

$$\frac{I_1}{I_2} = \frac{1}{9}$$

33. **Sol. (4)**

Initially,

$\frac{6}{4} = \frac{\ell_1}{100 - \ell_1} \Rightarrow 600 - 6\ell_1 = 4\ell_1 \Rightarrow \ell_1 = 60$cm

When XΩ is shunted to 6Ω resistance,

$\ell_2 = \ell_1 - 10 = 50$cm

If R = $\frac{6X}{6+X}$, then $\frac{R}{4} = \frac{50}{100-50}$ ⇒ R = 4Ω

⇒ $\frac{6X}{6+X}$ = 4 ⇒ 2X = 24 ⇒ X = 12Ω.

34. **Sol. (1)**

Path, $SS_2O > SS_1O$

$\Delta_x = SS_2 - SS_1$

$\Delta_x = \sqrt{2}\ d - d$

$\Delta_x = (\sqrt{2}-1)\,d$

So, without the slab, central maxima will be below O. Some Δx should be added by mica sheet of μ = 1.5 in path of SS_1O, so that central maxima comes at centre O.

So, both path difference should be equal. The extra path difference in lower slit has to be componsated by extra path difference introduced by mica sheet.

∴ $(\mu - 1)\,t = (\sqrt{2}-1)\,d$

∴ $t = \frac{(\sqrt{2}-1)d}{(\mu-1)} = \frac{(\sqrt{2}-1)d}{(1.5-1)}$

∴ $t = 2(\sqrt{2}-1)\,d$

35. **Sol. (1)**

mass removed, $m = \frac{Mb^2}{R^2}$

$$x_{com} = \frac{M(0) - \frac{Mb^2}{R^2}(R-b)}{M - \frac{Mb^2}{R^2}} = \frac{-b^2}{R+b}$$

36. **Sol. (2)**

37. **Sol. (2)**

Three atoms of deuterium results 21.6 MeV energy. Each atom of $_1H^2$ contains two nucleons. Three atoms contains 6 nucleons.

Thus, the energy released per nucleon

$= \frac{21.6}{5}$ = 3.6 MeV

38. **Sol. (2)**

$V_A = V_B$

$\frac{d}{dt}(X_A) = \frac{d}{dt}(X_B)$

$a + 2t = b - 2t$

$4t = b - a$

$t = \frac{b-a}{4}$

39. **Sol. (2)**

$\phi = BA\cos\theta$

$\phi = B_0t^2 \,.\, \pi R^2 \cos 0^\circ$

$\phi = B_0 \pi R^2 t^2$

$\frac{d\phi}{dt} = 2B_0\pi R^2 t$

$|\varepsilon| = \left|\frac{d\phi}{dt}\right|$

$\varepsilon = 2B_0\pi R^2 t$

Then

$i = \frac{\varepsilon}{r} = \frac{2B_0\pi R^2}{r}t$

40. **Sol. (3)**

ω' = ω

$\frac{1}{\sqrt{L'C'}} = \frac{1}{\sqrt{LC}}$

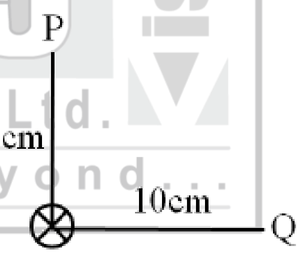
L'C' = LC

L' × 3C = LC

$L' = \frac{L}{3}$

So inductance must be decreased by $\frac{2L}{3}$

41. **Sol. (4)**



$B = \frac{\mu_0 i}{2r\pi} \Rightarrow B \propto \frac{1}{r}$

$\frac{B_1}{B_2} = \frac{r_2}{r_1}$

$\frac{20}{B_2} = \frac{10}{5}$

B = 10 μT

(South)

42. **Sol. (4)**

Heat loss = Heat gain

m × 540 + m × 1(100 – 40)

= 180 × 1 × (40 – 25) + 20 × 1 (40 – 25)

600 m = 15 × (180 + 20)

m = 5

43. Sol. (2)

$$\mu = \frac{\sin \frac{A+\delta_m}{2}}{\sin A/2}$$

$$= \frac{\sin \frac{60^\circ+30^\circ}{2}}{\sin 60^\circ/2} = \frac{\sin 45^\circ}{\sin 30^\circ}$$

$$= \frac{\frac{1}{\sqrt{2}}}{1/2} = \frac{1}{\sqrt{2}} \times \frac{2}{1} = \sqrt{2}$$

44. Sol. (3)

$$M = m_0 \times m_e = m_0 \left(1 + \frac{D}{f_e}\right)$$

$$m_0 = \frac{M}{\left(1+\frac{D}{f_e}\right)} = \frac{30}{\left(1+\frac{25}{5}\right)}$$

$m_0 = 5$

45. Sol. (2)

CHEMISTRY:

46. **Sol.(2)**

47. **Sol.(1)**

48. **Sol.(4)**

Due to maximum z_{eff}.

49. **Sol.(1)**

50. **Sol.(2)**

51. **Sol.(3)**

52. **Sol.(3)**

53. **Sol.(4)**

54. **Sol.(3)**

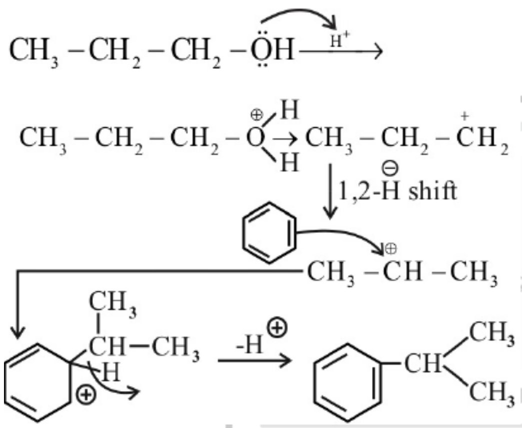
55. **Sol.(3)**

56. **Sol.(2)**

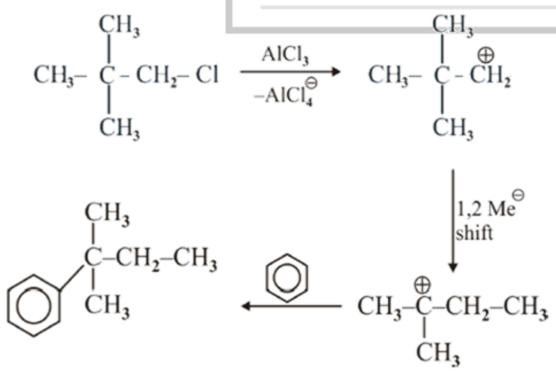
57. **Sol.(2)**

58. **Sol.(2)**

59. **Sol.(3)**



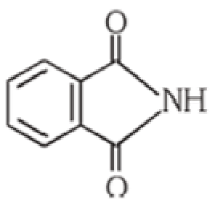
60. **Sol.(2)**



61. **Sol.(2)**

62. **Sol.(1)**

63. **Sol.(2)**



is the major product

64. **Sol.(2)**

65. **Sol.(2)**

$$\underset{\text{Benzyl amine}}{Ph-CH_2-NH_2} + \underset{\text{Chloroform}}{CHCl_3} + \underset{\text{(alc.)}}{KOH} \xrightarrow{\Delta} Ph-CH_2-NC$$

66. **Sol.(1)**

67. **Sol.(3)**

68. **Sol.(4)**

$$AB_2 \rightleftharpoons AB + B$$

$t = 0 \quad 400 \quad 0 \quad 0$

$t_{eq} \quad 400-x \quad x \quad x$

at $eq^m \quad P_T = 600$

$$400 - x + x + x = 600$$

$$x = 200$$

$$K_P = \frac{(x)(x)}{(400-x)}$$

69. **Sol.(4)**

70. **Sol.(4)**

	C	H	Cl
mass %	24.27	4.07	71.65
mole%	$\frac{24.27}{12}$:	$\frac{4.07}{1}$:	$\frac{71.65}{35.5}$
	2.02	4.07	2.01
Rounding	2 :	4 :	2
off	1 :	2 :	1

Empirical formula CH_2Cl

71. **Sol.(2)**

Temp T_1 = 300 K rate constant: K

T_2 = 310 K : 2 K

$$\log\left(\frac{2K}{K}\right) = \frac{E_a}{2.303R}\left[\frac{310-300}{300\times 310}\right]$$

R = 8.314 JK^{-1} mol^{-1}

72. **Sol.(2)**

$$n_{urea} = \frac{0.6}{60}, n_{glu} = \frac{3.42}{342} \begin{cases} i_{urea} = 1 \\ i_{glu} = 1 \end{cases}$$

= 0.01 =0.01

$$\pi = CRT = \left(\frac{0.01+0.01}{0.1}\right)\times 0.0821\times 300$$

73. **Sol.(3)**

HCl + NaOH $\rightarrow$ NaCl + H_2O

0.2g. eq 0.2 g. eq.

complete neutralisation occurs

pH = 7

74. Sol.(2)

$$\overset{0}{Cl_2} \rightarrow Na\overset{-1}{Cl} + Na\overset{+1}{Cl}O + H_2O$$

red (vf = 0); Oxd (vf = 2)

above reaction is a disproportionation reaction

$$vf = \frac{vf_1 \times vf_2}{vf_1 + vf_2} = \frac{2\times 2}{2+2} \quad \ldots\ldots(1)$$

Equation constant $= \frac{MM}{vf} = \frac{71}{1} = 71$

75. Sol.(4)

76. Sol.(2)

77. Sol.(3)

78. Sol.(3)

79. Sol.(1)

as per V.S.E.P.R.

80. Sol.(2)

$$N_2 \xrightarrow{\text{electron}} N_2^-$$

$$(\sigma 2P_z)^2 < (\pi 2P_x)^0 \rightarrow (\sigma 2P_z)^2 < (\pi 2P_x)^1$$

Diamagnetic → Paramagnetic

$$O_2 \xrightarrow{\text{electron}} O_2^-$$

$$(\sigma 2P_x^*)^1 = (\pi 2P_y^*)^1 \rightarrow (\pi 2P_x^*)^2 = (\pi 2P_y^*)^1$$

Diamagnetic → Paramagnetic

81. Sol.(4)

82. Sol.(2)

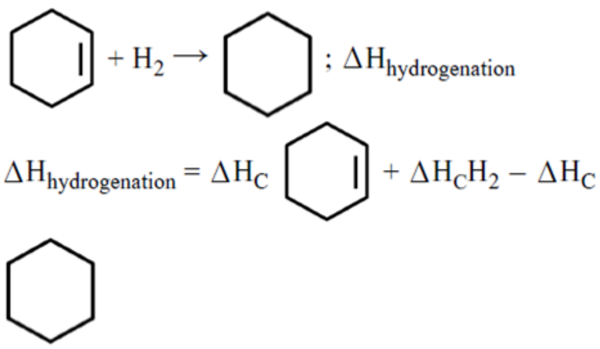
83. Sol.(1)

84. Sol.(4)

85. Sol.(2)

86. Sol.(2)

87. Sol.(2)



$= [(-35) + (-50)] - [-25]$

88. Sol.(2)

T = 450 K $\Delta H_r = 50$ kJ mol^{-1}

$\Delta G_r = \Delta H_r - T\Delta S_r$.

For spontaneous reaction $\Delta G_r < 0$

89. Sol.(4)

Gram equation of H_2SO_4 = M × V × vf

= 0.5 × 0.5 × 2

= 0.5

Gram equation of NaOH = 0.2 × 0.5 × 1

= 0.1 (L.R)

Heat evolved = 57.1 × 0.1

= 5.71 kJ

90. Sol.(2)

$\Delta T_f = iK + M$ {i = 1}

$$0.4 = \frac{1\times 5.12\times 1\times 1000}{MM \quad 50}$$

MM = 256