RJ VISION PVT. LTD.

(MOST STABLE & INNOVATIVE INSTITUTE)

FT – 13

ENG

PCB

SOLUTION

COURSE NAME: 12TH

DATE : 10-04-2026

FT - 13 (FR) (NEET - CBSE, GSEB) (10 - 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	3	2	4	3	4	1	4	2	1	3	3	1	3	1	1	2	1	3	4	3
Q	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans	1	4	2	2	1	1	4	1	2	2	1	1	1	4	3	2	4	2	3	3
Q	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	2	3	2	2	1	4	1	2	3	1	2	2	1	3	2	2	4	4	3	2
Q	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans	1	2	2	4	1	2	3	2	2	2	2	3	2	2	4	1	3	3	4	1
Q	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans	3	1	2	2	4	2	2	1	2	3	3	3	1	2	4	3	2	3	1	3
Q	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans	2	2	2	4	1	4	2	4	2	1	1	2	1	4	1	3	2	2	3	4
Q	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans	1	4	2	4	2	3	1	1	3	4	2	3	4	4	2	4	4	1	1	2
Q	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans	1	1	2	4	4	2	3	1	2	1	3	4	3	1	3	4	4	3	1	4
Q	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans	1	1	4	4	2	2	3	4	1	4	3	3	2	2	1	2	4	3	4	2

PHYSICS:

1. **Sol. (3)**

$$C = \frac{\epsilon_0 A}{d}, C' = \frac{\epsilon_0 A}{d-t}$$

$$C' = \frac{\epsilon_0 A}{d - d/3}$$

$$C' = \frac{3}{2}C$$

$$\frac{C'}{C} = \frac{3}{2}$$

2. **Sol. (2)**

$$F = \frac{2KQ^2}{r}$$

After contact

$$F' = \frac{K\left(\frac{3Q}{2}\right)^2}{r^2}$$

$$F' = \frac{9}{4}\frac{KQ^2}{r} \qquad F^1 = \frac{9F}{8}$$

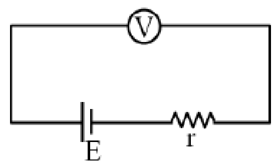
3. **Sol. (4)**

W = (–q) [V∞ – V_{center}]

V∞ = 0

$$V_{center} = \frac{8kq}{\sqrt{3}a/2} = \frac{16q}{4\sqrt{3}\pi \epsilon_0 a}$$

4. **Sol. (3)**



$$E = \frac{4 \times 2 + 6 \times 2}{2+2} = 5\text{V}$$

Reading of (V) = 5V

5. **Sol. (4)**

$$R \propto \frac{1}{r^4}$$

$$\frac{\Delta R}{R} = -4\left(\frac{\Delta r}{r}\right)$$

= – 4 [–0.02%]

= 0.08 %

6. **Sol. (1)**

$$\frac{X}{10}=\frac{40}{60}$$

$$X=\frac{20}{3}\Omega$$

7. **Sol. (4)**

Energy of photon $hv \geq \Delta E_g$

$$v \geq \frac{\Delta E_g}{h}$$

$$v \geq \frac{\Delta E_g}{h}=\frac{2.1eV}{4.13\times10^{-15}eV-S}$$

Minimum frequency ($v_{\min}$) = 5.0 × 10^{14} Hz.

8. **Sol. (2)**

$$\lambda=\frac{h}{mv}$$

$$\frac{\lambda_2}{\lambda_1}=\left(\frac{m_1}{m_2}\right)\left(\frac{v_1}{v_2}\right)=\left(\frac{100\%}{125\%}\right)\left(\frac{100\%}{75\%}\right)$$

$$\frac{\lambda_2}{\lambda_1}=\left(\frac{4}{5}\right)\left(\frac{4}{3}\right)=\left(\frac{16}{15}\right)$$

$$\lambda_2=\left(\frac{16}{15}\right)\lambda$$

9. **Sol. (1)**

$\frac{hc}{\lambda_{\min}}=eV$ (given $V=x_0$)

$$\lambda_{\min}=\frac{hc}{eV}=\frac{hc}{ex_0}$$

$$\lambda_{\min}\propto x_0^{-1}$$

10. **Sol. (3)**

Form Einstein's equation of photo electric effect

$eV_0 = hv - \phi$

eV_0 = 3.4 eV – 2.1 eV

V_0 = 1.3 Volt

11. **Sol. (3)**

Binding energy per nucleon = $\frac{\Delta m.c^2}{A}$

$$=\frac{(0.042)(931\,MeV)}{7}$$

= 5.6 MeV

12. **Sol. (1)**

If at least one input is high then output is low then logic gate is NOR gate.

Truth table

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

13. **Sol. (3)**

By mass action law $n_e.n_h=n_i^2$

Hole concentration $(n_h)=\frac{n_i^2}{n_e}\simeq\frac{n_i^2}{N_D}$

$$=\frac{(10^{16})^2}{10^{21}}=10^{11}m^{-3}$$

14. **Sol. (1)**

$$\frac{1}{\lambda}=R\left(\frac{1}{n_1^2}-\frac{1}{n_2^2}\right)$$

$$\frac{(\lambda_{\min})_{Bracket}}{(\lambda_{\min})_{Balmer}}=\frac{R\left(\frac{1}{(2)^2}-\frac{1}{(\infty)^2}\right)}{R\left(\frac{1}{(4)^2}-\frac{1}{(\infty)^2}\right)}$$

$$(\lambda_{\min})_{Bracket}=4(\lambda_{\min})_{Balmer}$$

$$=4\lambda$$

15. **Sol. (1)**

$$\phi=BA=\frac{F}{I\times L}A=\frac{[MLT^{-2}]\,[L^2]}{[A]\,[L]}=[ML^2T^{-2}A^{-1}]$$

16. **Sol. (2)**

$$LC=\frac{Pitch}{Total\ CSD}$$

$$4\times10^{-6}=\frac{1\times10^{-3}}{N}$$

N = 250

17. **Sol. (1)**

By substituting dimension of each quantity in R.H.S. of option (a) we get $\left[\frac{mg}{\eta r}\right]=\left[\frac{M\times LT^{-2}}{ML^{-1}T^{-1}\times L}\right]=$ $[LT^{-1}]$.

This option gives the dimension of velocity.

18. **Sol. (3)**

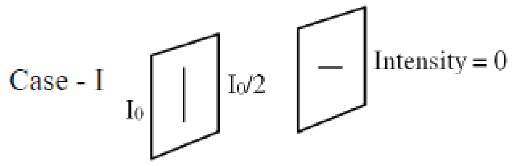
$$\sin\theta_C=\frac{1}{\mu}=\frac{V}{C}=\frac{5d/T}{d/t}=\frac{5t}{T}$$

$$\theta_C = \sin^{-1}\left(\frac{5t}{T}\right)$$

19. **Sol. (4)**

Focal length of mirror will not change because focal length of mirror doesn't depend on medium.

20. **Sol. (3)**

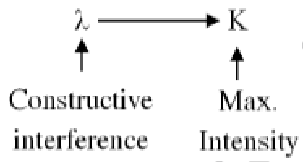


Case - II On ratating 2nd polaroid by 60°, angle between pass axis of crystal 1 and 2 will be 30°.

$$I = \frac{I_0}{2}\cos^2\theta = \frac{I_0}{2}\cos^2 30^\circ = \frac{3I_0}{8}$$

$$\Rightarrow \frac{\frac{3I_0}{8}}{I_0}\times 100 = \frac{300}{8} = 37.5\%$$

21. **Sol. (1)**



$I_1 = I_2 = I'$

$I_{\max} = 4I' = K$

$I' = \frac{K}{4}$

$\Delta x = \frac{\lambda}{4}, \phi = \frac{\pi}{2}$ or 90°

$I = I_1 + I_2 + 2\sqrt{I_1}\sqrt{I_1}\cos\phi$

$= \frac{K}{4} + \frac{K}{4} + 2\sqrt{\frac{K}{4}}\sqrt{\frac{K}{4}}$ cos90°

$I = \frac{K}{2}$

22. **Sol. (4)**

If $\vec{P} \parallel \vec{Q}$, then $\frac{Q_z}{P_z} = \frac{Q_y}{P_y} = \frac{Q_x}{P_x} \Rightarrow \frac{2}{1} = \frac{-\alpha}{-3} = \frac{4}{2} \Rightarrow \alpha = 6$

23. **Sol. (2)**

Ascending time = 7 sec. $\Rightarrow \frac{u}{g} = 7 \Rightarrow u = 70$ m/s

$H = \frac{u^2}{2g} = \frac{70^2}{20} = 245$m

24. **Sol. (2)**

ΔV = Area

$V_{t=15s} - V_{t=0} = (5 \times 10) + \left(\frac{1}{2}\times 5\times 10\right) - \left(\frac{1}{2}\times 5\times 10\right)$

$V_{t=15s} - 40 = 50$

$V_{t=15s} = 40 + 50 = 90$ m/s

25. **Sol. (1)**

To lift up the bananas $T \geq M_{Ban}g$

$M_{Monkey}(g + a) \geq M_{Ban}g$

20 (10 + a) ≥ 30 × 10

a ≥ 5 m/s²

$a_{min} = 5$m/s²

26. **Sol. (1)**

$\vec{v} = (2\hat{i} + 3\hat{j}), \vec{B} = 4\hat{j}$

θ ≠ 90°, 0°, 180°

so, path will be helix

27. **Sol. (4)**

$$B = \frac{\mu_0 I}{2r} = \frac{\mu_0}{2r}\frac{q\omega}{2\pi} = \frac{\mu_0 q\omega}{4\pi r}$$

$r \propto \frac{\omega}{B}$

28. **Sol. (1)**

$e = -N\frac{d\phi}{dt} = -NA\frac{dB}{dt}$

$= -80 \times \frac{22}{7} \times (0.1)^2 \left(\frac{2.0}{0.4}\right)$

$I = \frac{|e|}{R} = 80 \times \frac{22}{7} \times \frac{(0.1)^2 \times 5}{11}$

$= \frac{8}{7}A$

29. **Sol. (2)**

$C = \frac{E_0}{B_0}$

$E_0 = 3\times 10^8 \times 20 \times 10^{-9}$

= 6 Vm⁻¹

30. **Sol. (2)**

Reading of ammeter, $I_{rms} = \frac{V_{rms}}{Z} = \frac{200}{X_C}$

$I_{rms} = \frac{200}{1}\times 100 \times 10^{-6} = 20$ mA

31. **Sol. (1)**

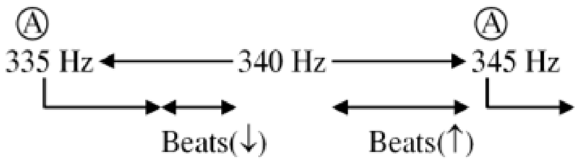
M_1 (0.5)(10) + M_1 (L) = M_2 (1)(50)

5(M_1) + M_1 (L) = 50M_2

$M_1L = 50M_2 - 5M_1$

$L = \frac{50M_2}{M_1} - 5$

32. **Sol. (1)**



So, Answer (335 Hz)

33. **Sol. (1)**

$$C_{Vmix.} = \frac{n\left(\frac{3}{2}R\right)+2n\left(\frac{5R}{2}\right)}{3n} = \frac{13R}{6}$$

$$C_{Pmix.} = C_{Vmix.} + R = \frac{13R}{6} + R = \frac{19R}{6}$$

$$Y_{mix.} = \frac{C_{Pmix}}{C_{Vmix}} = \frac{\frac{19R}{6}}{\frac{13R}{6}} = \frac{19}{13}$$

34. **Sol. (4)**

$$\frac{\theta_2-\theta}{R_2} = \frac{\theta-\theta_1}{R_1}$$

$$\theta_2 R_1 - \theta R_1 = \theta R_2 - \theta_1 R_2$$

$$\theta_2 R_1 + \theta_1 R_2 = \theta(R_1+R_2)$$

$$\theta = \frac{\theta_2 R_1 + \theta_1 R_2}{R_1+R_2}$$

35. **Sol. (3)**

$$K_{eq} = \frac{K_1(K_1)}{K_1+K_1} = \frac{K_1}{2}$$

$$T = 2\pi\sqrt{\frac{m}{K_1}} \qquad T' = 2\pi\sqrt{\frac{m}{K_1/2}}$$

$$T' = \sqrt{2}T$$

36. **Sol. (2)**

Fundamental frequency = $\frac{v}{2\ell} = \frac{1}{2\ell}\times\sqrt{\frac{400}{0.01}} = \frac{200}{2\ell}$

$$f_1 = \frac{200}{2\times\frac{60}{100}} \Rightarrow \frac{100\times100}{60} = \frac{1000}{6}$$

$$f_2 = \frac{200}{2\times\frac{30}{100}} \Rightarrow \frac{100\times100}{30} = \frac{1000}{3}$$

Fundamental frequency

$$f_3 = \frac{200}{2\times\frac{20}{100}} \Rightarrow \frac{100\times100}{20} = \frac{1000}{2}$$

Hence common frequency = 1000 Hz

37. **Sol. (4)**

Road is at rest so work done by cycle on road is 0.

However cycle experiences force opposite to its motion. So work on cycle due to road is negative. So both work are unequal.

38. **Sol. (2)**

$$\frac{d\vec{L}}{dt} = \vec{\tau} = \vec{r}\times\vec{F}$$

$$= \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & -1 & 1 \\ 7 & 3 & -5 \end{vmatrix}$$

$$= (2\hat{i} + 12\hat{j} + 10\hat{k})\text{Nm}$$

39. **Sol. (3)**

$$\theta = \left(\frac{\omega_0+\omega}{2}\right)t \quad \omega_0 = 2\pi n_i = 2\pi\times\frac{360}{60}12\pi$$

$$\&\ \omega = 2\pi n_f = 2\pi\times\frac{840}{60} = 28\pi$$

$$\theta = \left(\frac{12\pi+28\pi}{2}\right)8 = 160\pi$$

No. of revolutions = $\frac{160\pi}{2\pi} = 80$

40. **Sol. (3)**

$$v_e = \sqrt{2gR} \Rightarrow \frac{v_A}{v_B} = \sqrt{\frac{g_A}{g_B}\times\frac{R_A}{R_B}} = \sqrt{x\times r} \therefore \frac{v_A}{v_B} = \sqrt{rx}$$

41. **Sol. (2)**

$$mg' = \frac{mg}{\left(1+\frac{h}{R}\right)^2}$$

∵ h = R/2

$$mg' = \frac{mg}{\left(1+\frac{1}{2}\right)^2} = \frac{4}{9}(mg)$$

$= \frac{4}{9}(72) = 32N$

42. **Sol. (3)**

$P_{excess} = P_{in} - P_{out}$

$P_{in} = P_{out} + P_{ex}$

$P_{in} = P_0 + \rho gh + \frac{2T}{R}$ ....(1)

Now required pressure difference

$\Delta P = P_{in} - P_0$

$\Delta P = \rho gh + \frac{2T}{R}$

$= 1000 \times 10 \times \frac{20}{100} + \frac{2 \times 0.072}{10^{-3}}$

$= 2144\ N/m^2$

43. Sol. (2)

If contact angle is less than 90°, then

(i) liquid will rise in capillary tube.

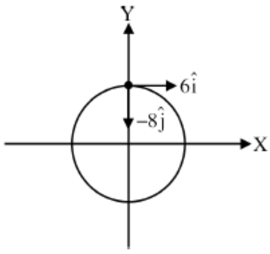
(ii) liquid will wet the solid surface

If contact angle is greater than 90°, then

(i) liquid will not rise in capillary tube.

(ii) liquid will not wet solid surface

44. Sol. (2)



$a_T = 6 \Rightarrow \alpha r = 6$

$\alpha = \frac{6}{2}$

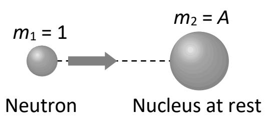
$\boxed{\alpha = 3\ rad/s^2}$

It is angular retardation because it is opposite to the velocity.

$a_{cp} = 8 \Rightarrow \omega^2 r = 8$

$\boxed{\omega = 2\ rad/s}$

45. Sol. (1)



$$\left(\frac{\Delta k}{k}\right)_{retained} = \left(\frac{m_1 - m_2}{m_1 + m_2}\right)^2 = \left(\frac{1-A}{1+A}\right)^2$$

CHEMISTRY:

46. **Sol. (4)**

47. **Sol.(1)**

48. **Sol.(2)**

49. **Sol.(3)**

50. **Sol.(2)**

51. **Sol.(2)**

52. **Sol.(2)**

53. **Sol.(1)**

54. **Sol.(3)**

55. **Sol.(2)**

56. **Sol.(2)**

57. **Sol.(4)**

58. **Sol.(4)**

59. **Sol.(3)**

60. **Sol.(2)**

61. **Sol.(1)**

62. **Sol.(2)**

63. **Sol.(2)**

64. **Sol.(4)**

65. **Sol.(1)**

66. **Sol.(2)**

67. **Sol.(3)**

68. **Sol.(2)**

Hind $\longrightarrow K_p = K_c (RT)^{\Delta ng}$

69. **Sol.(2)**

70. **Sol.(2)**

71. **Sol.(2)**

72. **Sol.(3)**

73. **Sol.(2)**

74. **Sol.(2)**

75. **Sol.(4)**

76. **Sol.(1)**

Ferrocene $[Fe(n^5 - C_5H_5)_2]$

Prussian blue $Fe_4[Fe(CN_6)]_3$

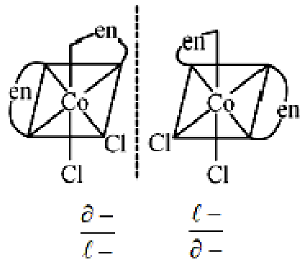
77. **Sol.(3)**

Due to maximum number of rings in $EDTA^{4-}$.

78. **Sol.(3)**

79. **Sol.(4)**

C is of this complex shows optical isomerism.



80. **Sol.(1)**

Pm^{+3} has maximum 4 unpaired electrons

$_{61}Pm$ – $[Xe]4f^5 6s^2$

hence P_m^{+3} $[Xe]4f^4$

81. **Sol.(3)**

82. **Sol.(1)**

Li^+ n = 1

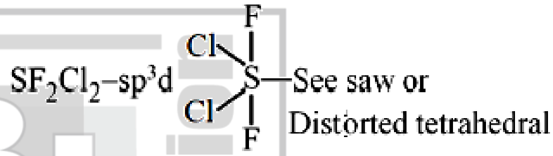
$Na^+ < F^-$ n = 2 (isoelectronic)

$F^- < Cl^-$ (Cl^- n = 3)

83. **Sol.(2)**

84. **Sol.(2)**

85. **Sol.(4)**



86. **Sol.(2)**

Correct order of dipole moment is

$CH_3Cl > CH_3F > CH_3Br > CH_3I$

87. **Sol.(2)**

Debye forces are Dipole-induced dipole attraction between polar and non polar.

88. **Sol.(1)**

89. **Sol.(2)**

90. **Sol.(3)**