RJ VISION PVT. LTD.

(MOST STABLE & INNOVATIVE INSTITUTE)

FT – 6

ENG

PCB

SOLUTION

COURSE NAME: 12TH

DATE : 03-04-2026

FT - 6 (FR) (NEET - CBSE, GSEB) (03 - 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	4	2	4	4	2	4	2	3	2	3	1	1	2	1	3	1	2	1	2
Q	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans	4	1	2	4	2	1	2	1	2	1	1	4	2	2	1	4	1	3	2	4
Q	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	1	2	2	1	3	3	2	3	1	2	1	2	3	3	1	2	2	2	2	3
Q	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans	4	2	2	2	2	1	2	2	3	2	2	2	1	2	2	1	4	3	3	4
Q	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans	3	2	2	1	4	2	4	4	2	3	2	3	1	4	4	3	2	4	2	4
Q	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans	4	2	3	3	1	1	4	2	4	3	2	4	4	3	3	3	2	2	2	2
Q	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans	1	1	4	3	3	2	4	2	2	4	2	1	4	4	2	2	2	2	3	2
Q	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans	4	3	3	3	4	1	2	3	3	2	1	2	2	3	1	1	1	4	3	2
Q	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans	1	3	3	4	2	2	3	3	4	4	3	1	2	4	4	2	4	3	4	1

PHYSICS:

1. Sol. (3)

tan 30° = $\frac{\sin r}{\sin i} = \frac{\mu_1}{\mu_2} = \frac{1}{\sqrt{3}}$

$\Rightarrow \frac{v_2}{v_1} = \frac{1}{\sqrt{3}}$ ……(B)

$\sin\theta_c = \frac{\mu_R}{\mu_D} = \frac{1}{\sqrt{3}}$ ……(C)

2. Sol. (4)

$P = P_1 + P_2 = 10 - 5 = 5D$;

P = 5D, so, f = 20 cm

$m = \frac{f}{f+u}$ so, $2 = \frac{20}{u+20}$

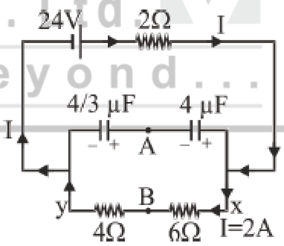
$\Rightarrow u = -10$ cm

3. Sol. (2)

$m = \frac{f_0}{f_e} \Rightarrow 10 = \frac{f_0}{5} \Rightarrow f_0 = 50cm$

$m = \frac{f_0}{f_e}\left(1+\frac{f_e}{D}\right) = \frac{50}{5}\left(1+\frac{5}{25}\right) = 10\times\frac{6}{5} = 12$

4. Sol. (4)



$I = \frac{24}{6+4+2} = 2A$

$V_{xy} = 10 \times 2 = 20V$

Voltage across 4μF is = $\frac{4/3}{4+4/3}\times 20 = 5V$

$V_A + 5 - 12 = V_B$

$V_A - V_B = 7V$

5. Sol. (4)

From mirror equation

$\frac{1}{v}+\frac{1}{u}=\frac{1}{f} \Rightarrow \frac{1}{v} = -\frac{1}{u}+\frac{1}{f}$

$m = -1, C = \frac{1}{f}$

$\frac{1}{f} = -0.10$

$f = \frac{-1}{0.10} = -10cm$

6. **Sol. (2)**

Angle rotate in 60 × 60 sec = 360 × 2π radian

Angle rotate in one second $= \frac{360 \times 2\pi}{60 \times 60} \frac{rad}{\sec}$

7. **Sol. (4)**

$\because \oint \vec{B}.d\vec{\ell} = \mu_0 \sum i$

$B(2\pi r) = \mu_0 (I_1 + I_2 + I_3 + I_4 + I_5)$

$B(2\pi r) = \mu_0 (20 - 6 + 12 - 7 + 18)$

$B = \frac{4\pi \times 10^{-7} \times 37}{2\pi \times 10 \times 10^{-2}} = 74\mu T$

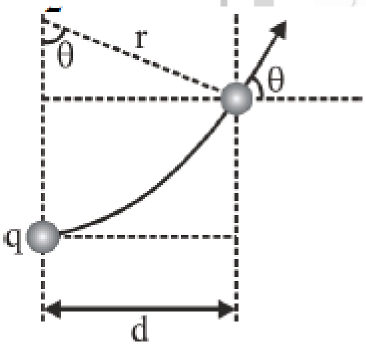
8. **Sol. (2)**

According to following figure, $\sin\theta = \frac{d}{r}$

also, $r = \frac{\sqrt{2mE}}{qB} = \frac{1}{B}\left(\sqrt{\frac{2mV}{q}}\right)$

$\therefore \sin\theta = 0.5 \times 0.1 \sqrt{\frac{1.6 \times 10^{-19}}{2 \times 1.6 \times 10^{-27} \times 500 \times 10^3}}$

$= \frac{1}{2} \Rightarrow \theta = 30^\circ$



9. **Sol. (3)**

$B_{axial} = \frac{\mu_0}{4\pi} \frac{2M}{r^3}$

$B_{equatorial} = \frac{\mu_0}{4\pi} \frac{M}{r^3}$

10. **Sol. (2)**

For first negative cycle, diode D become R.B. Hence all potential drop of –5V will obtain across diode as o/p v_0, but for +ve half cycle, diode is FB and o/p v become zero.

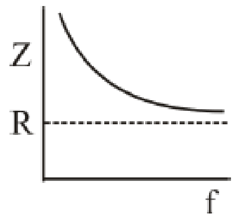
11. **Sol. (3)**

Y = A + B · B

= (A + B) · B = A · B + B · B

= A · B + B = B(A + 1) = B

12. **Sol. (1)**



Bulb & capacitor is R-C circuit

on ↑f ⇒ Z↓

⇓

i ↑ ⇒ Brightness of bulb ↑

13. **Sol. (1)**

$q_{total} = \int_0^R \sigma ds = \int_0^R (\sigma_0 r^3)(2\pi r dr)$

$= 2\pi\sigma_0 \int_0^R r^4 ds = 2\pi\sigma_0 \left[\frac{r^5}{5}\right]_0^R$

14. **Sol. (2)**

(1) Equation $x = x_0 \sin\omega t$

rms value $\frac{x_0}{\sqrt{2}}$

(2) Equation $x = x_0 \sin\omega t \cos\omega t$

$x = \frac{x_0}{2} \sin 2\omega t$

rms value $= \frac{x_0/2}{\sqrt{2}} = \frac{x_0}{2\sqrt{2}}$

(3) $x = x_0 \sin\omega t + x_0 \cos\omega t$

$= x_0\sqrt{2} \sin(\omega t + \pi/4)$

rms value $= \frac{x_0\sqrt{2}}{\sqrt{2}} = x_0$

15. **Sol. (1)**

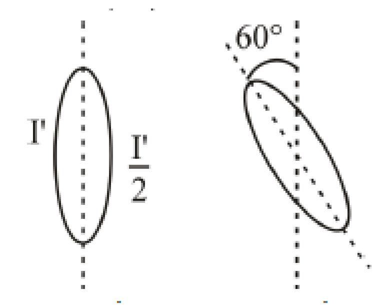
V = 0, inner shell

$\frac{kq'}{R} + \frac{kQ}{3R} = 0$

$q' = \frac{-Q}{3}$

$E_P = \frac{kQ/3}{(2R)^2} = \frac{kQ}{12R^2}$

16. **Sol. (3)**



$$I = \frac{I'}{2}\cos^2 60^\circ = \frac{I'}{2}\times\left(\frac{1}{2}\right)^2 = \frac{I'}{8}$$

$$\Rightarrow \frac{I'/8}{I'}\times 100 = \frac{100}{8} = 12.5\%$$

17. Sol. (1)

Materials	Resistivity (ρ) (Ω m at 0°C)
Copper (Cu)	1.7×10^{-8}
Nichrome (alloy of Ni, Fe, Cr)	100×10^{-8}
Germanium	0.46
Silicon	2300

18. Sol. (2)

$\vec{v}$ is parallel to $\vec{E}\times\vec{B}$, [as $\hat{v} = \hat{i}$]

Option (1) $\vec{E}\times\vec{B} = \vec{0}$ ($\vec{E} \parallel \vec{B}$)

Option (2) $\vec{E}\times\vec{B} = 2\hat{i}$ (parallel to $\vec{v}$)

Option (3) $\vec{E}\times\vec{B} = \vec{0}$ ($\vec{E} \parallel \vec{B}$)

Option (4) $\vec{E}\times\vec{B} = \vec{0}$ ($\vec{E} \parallel \vec{B}$)

19. Sol. (1)

Mobility (μ) = $\frac{v_d}{E}$

Electric conductivity (σ) = $\frac{J}{E}$

Relaxation time (τ) = $\frac{m}{ne^2\rho}$

Current (I) = $neAv_d$

20. Sol. (2)

V_B = voltage drop across R

$$V_B = \left(\frac{R}{R+R_1}\right)V_A = \left(\frac{200}{200+600}\right)16V = 4V$$

21. Sol. (4)

When the electron is in the ground state of a hydrogen atom, then it is in the first orbit whose radius, r = 0.53 Å. For first orbit, the circumference is equal to de-Broglie wavelength.

Therefore, λ = 2πr

= 2 × 3.14 × 0.53 Å = 3.33 Å

22. Sol. (1)

Work function of 'Y' is greater than 'X' and slope of V versus f is h/e.

23. Sol. (2)

$R = n^2 a_0$

$2.12 = n_1^2 \times 0.53$

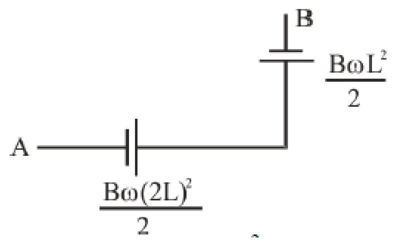
$n_1 = 2$

$4.77 = n_2^2 \times 0.53$

$n_2 = 3$

$$E = 13.6\left(\frac{1}{4}-\frac{1}{9}\right) = \frac{13.6\times5}{36} = \frac{68}{36}$$

24. Sol. (4)



$$V_A + 2B\omega L^2 - \frac{B\omega L^2}{2} = V_B$$

$$V_A - V_B = -\frac{3B\omega L^2}{2}$$

25. Sol. (2)

ΔP in decibles = $10\log_{10}\left(\frac{200}{20}\right)$

= 10 db

26. Sol. (1)

$\Delta\ell = \alpha\,\Delta t.\,\ell$

Strain = α Δt

Stress = Y. Strain

= Y . α. Δt

T = (Area). (Stress) = (Area).Yα Δt

$$v = \sqrt{\frac{T}{\mu}}$$

$$f = \frac{1}{2\ell}\sqrt{\frac{T}{\mu}} = \frac{1}{2\ell}\sqrt{\frac{(Area).Y\alpha\Delta t}{\mu}}$$

$$= \frac{1}{2\times1}\sqrt{\frac{10^{-6}\times2\times10^{11}\times1.21\times10^{-5}\times20}{0.1}} = 11$$

27. Sol. (2)

Velocity gradient → $(LT^{-1})(L^{-1}) = T^{-1}$

frequency → T^{-1}

time → T

28. Sol. (1)

by COME

$(KE + PE)_{x=2} = (KE + PE)_{x=5}$

$0 + 6 = \frac{1}{2} mv^2 + 2$

$4 = \frac{1}{2} v^2$

$V = 2\sqrt{2}$ m/s.

29. Sol. (2)

Before collision ⇒ Ⓐ → v_1 Ⓑ rest

It undergoes completely inelastic collision

Using conservation of linear momentum

Initial momentum = Final momentum

$\Rightarrow mv_1 = mv_2 + mv_2$

$\Rightarrow mv_1 = 2mv_2$

$\Rightarrow \frac{v_1}{v_2} = \frac{2}{1}$

30. Sol. (1)

$|\Delta\vec{P}| = 2mv \sin 45^\circ = \sqrt{2}\, mv$

31. Sol. (1)

S_1, S_2 and S_3 are correct, but S_4 is incorrect. In uniform velocity, velocity at each instant must be constant.

32. Sol. (4)

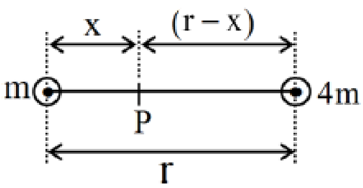
We know that, $T = 2\pi\sqrt{\frac{L}{g}}$

$\therefore \Delta T = \frac{2\pi}{2}\left(\frac{1}{Lg}\right)^{1/2} .\Delta L$

or $\frac{\Delta T}{T} = \frac{\Delta L}{2L} = \frac{1}{2}\alpha\Delta\theta = \frac{2\times10^{-6}\times10}{2} = 10^{-5}$

$\therefore \frac{\Delta T}{T}\times100 = 1\times10^{-5}\times100 = 10^{-3}\%$

33. Sol. (2)



Say at point P (at distance 'x' from 'm'), the gravitational field is zero, then

$\frac{Gm}{x^2} = \frac{G(4m)}{(r-x)^2} \Rightarrow x = \frac{r}{3}$

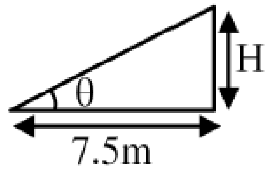
Now, gravitational potential at point P will be,

$V = \frac{-Gm}{x} - \frac{G(4m)}{(r-x)}$

$\Rightarrow V = \frac{-3Gm}{r} - \frac{12Gm}{2r}$

$= -\frac{9Gm}{r}$

34. Sol. (2)



$\tan\theta = \left(\frac{V^2}{Rg}\right) = \frac{10^2}{150\times10} = \frac{1}{15}$

Also, $\tan\theta = \frac{H}{7.5}$

$\therefore \tan\theta = \frac{1}{15} = \frac{H}{7.5}$

$H = \frac{1}{2}$ m = 0.5 m

35. Sol. (1)

$\mu C_p\Delta T = \mu C_v\Delta T + \Delta W$

$\therefore \Delta W = \mu(C_p - C_v)\Delta T$

Fraction of heat converted into work

$= \frac{\Delta W}{\Delta Q} = \frac{\mu(C_p - C_v)\Delta T}{\mu C_p\Delta T}$

$= 1 - \frac{1}{\gamma} = 1 - \frac{3}{5} = \frac{2}{5}$

36. Sol. (4)

PV = μRT

⇒ Rμ = Slope for graph

⇒ more slope, more moles

$\mu_C > \mu_B > \mu_A$

For equal mass;

Less molecular wt, more moles

$\mu_C > \mu_B > \mu_A$

Slope → $H_2 > He > O_2$

37. Sol. (1)

$mr\omega^2_{max} = T_{max}$

$\Rightarrow 2 \times 2 \times \omega^2_{max} = 16000$

$\Rightarrow 4\pi^2 f^2_{max} = 4000$

$\Rightarrow f_{max} = 10$ rotations per second

38. Sol. (3)

v = eu

$$\sqrt{2gh} = e\sqrt{2gh_0}$$

$$e = \sqrt{\frac{h}{h_0}} = \sqrt{\frac{81}{100}} = \frac{9}{10} = 0.9$$

39. **Sol. (2)**

Only external force can change linear momentum. Kinetic energy can be changed by internal and external forces.

40. **Sol. (4)**

Only normal component of velocity will change.

41. **Sol. (1)**

Mass of removed disc = M

M.I of removed disc about O

$$= \frac{1}{2}M\left(\frac{R}{3}\right)^2 + M\left(\frac{2R}{3}\right)^2 = \frac{1}{2}MR^2 \quad ...(i)$$

M.I of complete disc = $\frac{1}{2}(9M)R^2$ ...(ii)

∴ M.I of remaining disc

$$= \frac{9}{2}MR^2 - \frac{1}{2}MR^2$$

= $4MR^2$

42. **Sol. (2)**

$$F \times \frac{3a}{4} = mg \times \frac{a}{2}$$

$$\Rightarrow F = \frac{2}{3}mg$$

43. **Sol. (2)**

According to Kepler's third law

$T^2 \propto R^3$

$$\therefore \frac{T_1}{T_2} = \left(\frac{R_1}{R_2}\right)^{3/2}$$

or $R_2 = (R_1)\left(\frac{T_2}{T_1}\right)^{2/3} = (R_1)\left(\frac{16}{2}\right)^{2/3}$

= $4R_1$ = 4R (given $R_1 = R_2$) .....(i)

Orbital velocity, $v_0 = \sqrt{\frac{GM}{R}}$

$$\therefore \frac{v0_2}{v0_1} = \sqrt{\frac{R_1}{R_2}} = \sqrt{\frac{R_1}{4R_1}} = \frac{1}{2} \qquad \text{(using (i))}$$

or $v0_2 = \frac{1}{2}v0_1 = \frac{1}{2}v_0$

44. **Sol. (1)**

D = 2 × 1 + 5 × $\frac{10-9}{100} = 2.05$ cm

45. **Sol. (3)**

$$h = \frac{2T\cos\theta}{r\rho g} = \frac{(2)(0.465)(\cos 135^\circ)}{(10^{-3})(13.6\times10^3)(9.8)} = 5\times10^{-3}\,m$$

= 5 mm

CHEMISTRY:

46. **Sol.(3)**

$\Delta H_{eg} \Rightarrow Cl > F > Br > I \Rightarrow S > Se > Te > Po > O$

47. **Sol.(2)**

IP $\Rightarrow$ B < C < N < O

48. **Sol.(3)**

49. **Sol.(1)**

MO	Nodal plane
$\sigma 1S$	0
$\sigma^* 1S$	1
$\pi 2Px$	1
$\pi^* 2Px$	2

50. **Sol.(2)**

[BO ∝ BDE]

	O_2^{-2}	O_2^{-}	O_2	O_2^{+}
BO	1	1.5	2	2.5

51. **Sol.(1)**

52. **Sol.(2)**

53. **Sol.(3)**

$K_2Cr_2O_7$ is prepared from chromite ore ($FeCr_2O_4$)

54. **Sol.(3)**

55. **Sol.(1)**

56. **Sol.(2)**

NaCl + Conc. H_2SO_4 + $K_2Cr_2O_7 \rightarrow CrO_2Cl_2$.

Chromyl chloride

57. **Sol.(2)**

58. **Sol.(2)**

59. **Sol.(2)**

60. **Sol.(3)**

$K_3[Co(OX)_3]$

3(+1) + x + 3 (–2) = 0

x = +3

OX^{-2} Bidentate ligand

CR = denticity –1

= 3 (2–1) = 3

61. **Sol.(4)**

Mass of 2 ml liquid = d × v = 1.2 × 2 = 2.4 gm

∵ mass of 20 drops = 2.4 gm

∴ mass of 1 drop $= \frac{2.4}{20}$

Moles of liquid in 1 drop $= \frac{mass}{mol\ w.t} = \frac{\frac{2.4}{20}}{24} = \frac{1}{200}$

Number of molecules $= \frac{1}{200} \times 6.02 \times 10^{23}$

$= 3.01 \times 10^{21}$

62. **Sol.(2)**

63. **Sol.(2)**

$2NH_{3(g)} \rightleftharpoons N_{2(g)} + 3H_{2(g)}$

t = 0; 2mole 0 0

t = teq; (2–2x) x 3x

(2–2x) = 1 (given)

$\Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$

$$K_c = \frac{[N_2]\times[H_2]^3}{[NH_3]^2} = \frac{\frac{1}{2}\times\left(\frac{3}{2}\right)^3}{(1)^2} = \frac{1}{2}\times\frac{27}{8} = 1.68$$

64. **Sol.(2)**

For precipitation

$Q > K_{sp}$

For 2nd option

$Q = [Ag^+] \times [C\ell^-]$

$$= \left(\frac{10^{-4}}{2}\right)\times\left(\frac{10^{-4}}{2}\right) = \frac{1}{4}\times 10^{-8}$$

$= 0.25 \times 10^{-8}$

$Q > K_{sp}$

65. **Sol.(2)**

$\Delta G° = \Delta H° - T\Delta S°$

$\Delta G° = -54.441 \times 1000 - 300 \times 10$

$\Delta G° = -57441$ Joule

$\Delta G° = -2.303 \times 8.314 \times 300 \log_{10}K$

logK = 10

66. **Sol.(1)**

67. **Sol.(2)**

68. **Sol.(2)**

69. **Sol.(3)**

70. **Sol.(2)**

71. **Sol.(2)**

$$K = \frac{2.303}{10}\log\frac{0.8}{0.2} = \frac{2.303}{10}\log 4$$

$$and\ K = \frac{2.303}{t}\log\frac{0.6}{0.15} = \frac{2.303}{t}\log 4$$

$\therefore t = 10\ min.$

72. **Sol.(2)**

73. **Sol.(1)**

74. **Sol.(2)**

$$E_{cell} = E^o_{cell} - \frac{0.06}{2}\log\frac{[Mn^{+2}]}{[Sn^{+2}]}$$

$$=(1.18-0.14)-0.03\log\frac{0.4}{0.04}$$

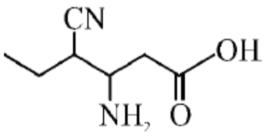
$$=1.04-0.03\log 10=1.01\,volt$$

$$\Delta G=-nF\ E_{cell}=-2\times 96500\times 1.01=-194.93\,kJ$$

75. **Sol.(2)**

76. **Sol.(1)**

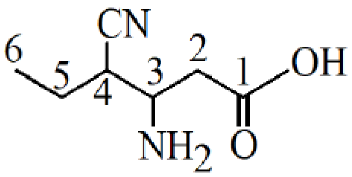
B. Given Data:



C. Concept:

- IUPAC Nomenclature for Organic Compounds with Multiple Functional Groups: When a compound has more than one functional group, a priority order determines the parent name and the suffixes/prefixes used.
- Nitrile as a substituent: When a nitrile is not the principal functional group, it is named as a "cyano" substituent.
- Amino as a Substituent: When an amine is not the principal functional group, it is named as an "amino" substituent.

D. Answer Explanation:



1. **Identify the Main Functional Group:** The compound contains a carboxylic acid (–COOH), a nitrile (–CN), and an amine (–NH_2). Carboxylic acids have the highest priority, so the parent name will be based on the carboxylic acid.
2. **Number the carbon Chain:** Start numbering from the carboxylic acid carbon (which gets the number 1). The chain is six carbons long, making the parent chain "hexanoic acid."
3. **Identify and Name Substituents:**
   - At carbon 3, there is an amino group (–NH_2) making it "3-amino"
   - At carbon 4, there is a cyano group (–CN), making it "4-cyano."
4. **Combine the Parts:** Combine the substituent names alphabetically with the parent chain name: "3-amino-4- cyanohexanoic acid."

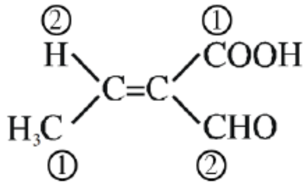
The correct IUPAC name is 3-amino- 4-cyanohexanoic acid

77. **Sol.(4)**

78. **Sol.(3)**

79. **Sol.(3)**

80. **Sol.(4)**

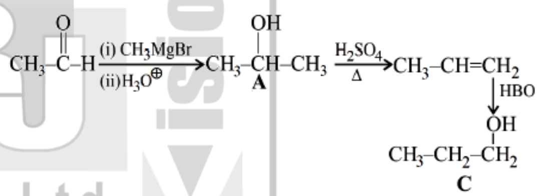


E - isomer

81. **Sol.(3)**

82. **Sol.(2)**

83. **Sol.(2)**



A & C are position isomer.

84. **Sol.(1)**

85. **Sol.(4)**

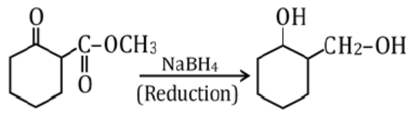
86. **Sol.(2)**

87. **Sol.(4)**

88. **Sol.(4)**

89. **Sol.(2)**

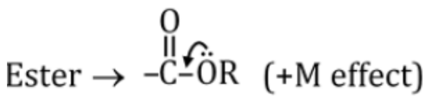
Statement (I) :



It is false statement because $NaBH_4$ cannot reduces ester.

Statement (II): Ester is more reactive than aldehyde towards nucleophile.

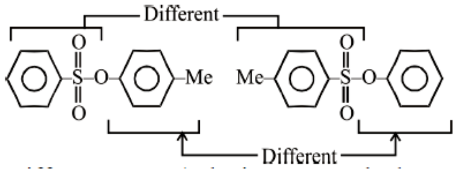
It is a false statement because ester is less reactive than aldehyde to wards nucleophile due to + M effect of –OR group



Which reduced the electrophilicity of $\overset{O}{\overset{\|}{-C-}}$ group.

$\therefore$ Both statement I and Statement II are false.

90. **Sol.(3)**



Different group/substituent attached to polyvalent functional group: Metamerism.