COURSE NAME: 12TH DATE : 04-04-2026

FT - 7 (FR) (NEET - CBSE, GSEB) (04 - 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	4	3	2	1	3	1	3	4	1	2	1	1	1	4	2	1	4	3	2	2
Q	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans	3	2	2	3	2	1	2	4	1	1	2	2	2	4	2	2	2	1	2	1
Q	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	3	2	2	2	4	3	1	1	4	4	2	4	1	1	4	4	3	1	3	1
Q	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans	4	4	2	4	2	3	2	3	2	2	1	2	2	2	4	2	3	1	1	4
Q	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans	4	1	2	3	2	3	3	2	4	4	3	4	4	4	1	3	1	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	2	3	3	1	1	3	3	4	2	2	3	4	1	4	1	1	4	4	2	3
Q	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans	4	3	1	3	2	3	2	2	1	4	2	2	2	2	1	1	3	1	3	1
Q	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans	3	1	4	2	3	2	2	1	2	3	3	3	3	3	1	3	2	2	4	4
Q	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans	2	3	2	4	4	4	3	4	2	3	3	3	2	4	4	1	3	4	1	1

PHYSICS:

1. Sol. (4)

For uniformly charged spherical shell,

$V = \frac{kq}{R}$ (For r ≤ R)

$\therefore V_C = V_P$

$V_C - V_P$ = Zero

2. Sol.(3)

At central point on screen, path difference is zero for all wavelength. So, central bright fringe is white and other fringes depend on wavelength as $\beta = \frac{\lambda D}{d}$.

Therefore, other fringes will be coloured.

3. Sol. (2)

V.C = MSD – VSD ...(1)

given: (N + 1) VSD = N MSD

$VSD = \left(\frac{N}{N+1}\right) MSD$ ....(2)

From (1) and (2)

$V.C = (MSD) - \frac{N}{N+1}(MSD)$

$= MSD\left(1 - \frac{N}{N+1}\right) = \frac{MSD}{N+1}$

$= \frac{0.01}{N+1} = \frac{1}{100(N+1)}$

4. Sol. (1)

Moment of inertia of rod = I = $\frac{m\ell^2}{12}$

$\Rightarrow 2400 = 400\frac{\ell^2}{12}$

$\Rightarrow 72 = \ell^2$

$\Rightarrow \ell = \sqrt{72}$ =8.48 cm ≃ 8.5 cm

5. Sol.(3)

The magnitude of magnetic field due to circular coil of N turns is given by

$B_C = \frac{\mu_0 i N}{2R}$

$= \frac{4\pi \times 10^{-7} \times 7 \times 100}{2 \times 0.1}$

= 4.4 × 10^{-3} T= 4.4 mT

6. **Sol. (1)**

$x = 2t - 1$

$v = \frac{dx}{dt} = 2 m s^{-1}$

P = F .v

= 2 × 5 = 10 W

7. **Sol. (3)**

F = $(M_1 + M_2)a$

$a = \frac{10}{2+3} = 2\ ms^{-2}$

F' = $M_2(2)$ = 3 × 2 N = 6 N

8. **Sol. (4)**

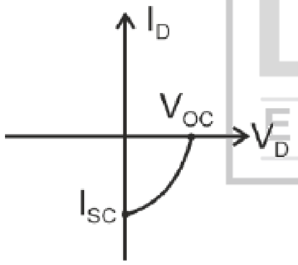
$g' = \frac{GM'}{R'^2} = \frac{GM}{10\left(\frac{R}{2}\right)^2}$

$= \frac{4}{10}\frac{GM}{R^2} = 0.4 \times 9.8$

$= 3.92 m s^{-2}$

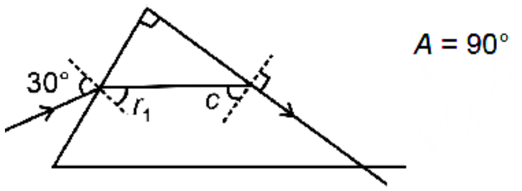
9. **Sol. (1)**

A: Solar cell characteristics



B: In reverse biased pn junction diode, the current measured in (μA), is due to minority charge carrier.

10. **Sol.(2)**



In prism, $r_1 + c = A$

$r_1 = 90° - c$ …..(1)

$\sin c = \frac{1}{\mu} \Rightarrow \cos c = \frac{\sqrt{\mu^2 - 1}}{\mu}$

⇒ Apply Snell's law, on incidence surface

$1 \cdot \sin 30° = \mu \sin(r_1) \Rightarrow 1 \times \frac{1}{2} = \mu \times \sin(90° - c)$

$\frac{1}{2} = \mu \times \frac{\sqrt{\mu^2 - 1}}{\mu}$

On squaring $\frac{1}{4} = \mu^2 - 1$

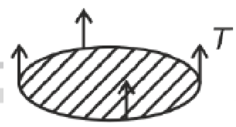
$\Rightarrow \mu^2 = \frac{5}{4} \Rightarrow \mu = \frac{\sqrt{5}}{2}$

11. **Sol. (3)**

Statement I is true as atoms are electrically neutral because they contain equal number of positive and negative charges.

Statement II is wrong as atom of most of the elements are stable and emit characteristic spectrum. But this statement is not true for every atom.

12. **Sol.(1)**



Excess force = T × 2πR

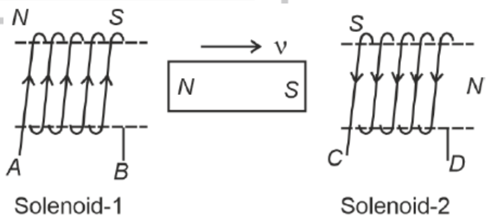
$= \frac{7}{100} \times 2 \times 3.14 \times \frac{4.5}{100}$

= 197.82 × 10^{-4}

= 19.8 × 10^{-3} N

= 19.8 mN

13. **Sol.(1)**



North of magnet is moving away from solenoid 1 so end B of solenoid 1 is South and as south of magnet is approaching solenoid 2 so end C of solenoid 2 is South.

14. **Sol.(4)**

A particle moving with uniform speed in a circular path maintains varying velocity and varying acceleration. It is because direction of both velocity as well as acceleration will change continuously.

15. **Sol. (2)**

Energy difference $\Delta E = \frac{hc}{\lambda}$

$\therefore \lambda \propto \frac{1}{\Delta E}$

$(\Delta E)_{6-2} > (\Delta E)_{5-2} > (\Delta E)_{4-2} > (\Delta E)_{3-2}$

$\lambda_{6-2} < \lambda_{5-2} < \lambda_{4-2} < \lambda_{3-2}$

A-III, B-IV, C-II, D-I

16. Sol.(1)

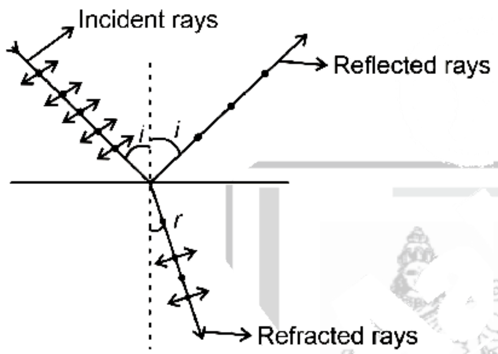
Solid angle $d\Omega = \frac{dA}{r^2}$ has dimensions $[M^0L^0T^0]$

Strain $= \frac{\Delta l}{l}$ has dimensions $[M^0L^0T^0]$

Angle measured in radians is also dimensionless $[M^0L^0T^0]$

$\theta = \frac{l}{r}$

17. Sol.(4)



According to Brewster's law, reflected rays are completely polarized and refracted rays are partially polarized.

18. Sol. (3)

The potential V at any point, at distance r from centre of dipole $= \frac{KP\cos\theta}{r^2}$

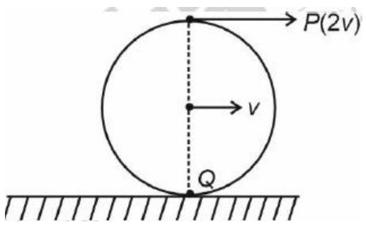
At axial point where $\theta = 0°$,

$V = \frac{KP}{r^2} = \frac{9\times10^9 \times 4\times10^{-6}}{2^2} = 9\times10^3 V$

At axial point where $\theta = 180°, V = \frac{-KP}{r^2} = -9\times10^3 V$

19. Sol.(2)

In the case of pure rolling,



The topmost point will have velocity 2v while point Q i.e. lowest point will have zero velocity.

Hence point P moves faster than point Q.

20. Sol. (2)

$x = 5\sin\left(\pi t + \frac{\pi}{3}\right) m$

Amplitude = 5 m

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

$T = \frac{2\pi}{\pi} = 2\ s$

21. Sol. (3)

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

According to given truth table, output is independent on value of A

$\therefore$ Output $Y = \overline{B}$

22. Sol.(2)

(A) If c is the velocity of light

so, E = hν (Energy of photon)

(B) Velocity of photon is equal to velocity of light i.e. c.

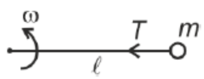
(C) $\lambda = \frac{h}{p}$

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

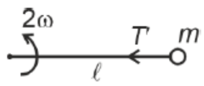
$p = \frac{h\nu}{c}$

(D) In photon-electron collision both total energy and total momentum are conserved.

23. Sol. (2)



$T = m\ell\omega^2$

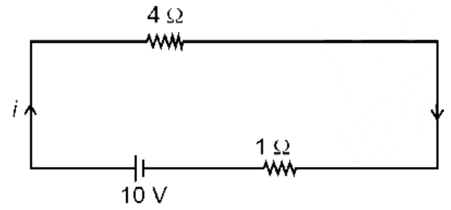


$T' = m\ell(2\omega)^2$

$T' = 4T$

24. Sol. (3)

RJ Vision Pvt. Ltd. Excellence & Beyond...

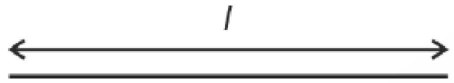


Current in circuit $i = \frac{10}{4+1} = 2A$

Terminal voltage = E – iR

= 10 – 2 × 1 = 8 V

25. **Sol. (2)**



Divided into 10 parts

$R = \frac{\rho l}{A}$

$R' = \frac{\rho l}{10A} = \frac{R}{10}$

$R_S = 5 \times \frac{R}{10}$ [series]

$R_S = 50$

$R_P = \frac{R}{50}[parallel]$

$R_{eq} = R_S + R_P$

= 52 Ω

26. **Sol. (1)**

	(Material)		**(Susceptibility (χ))**
A.	Diamagnetic	II.	$0 > \chi \geq -1$
B.	Ferromagnetic	III.	$\chi >> 1$
C.	Paramagnetic	IV.	$0 < \chi < \varepsilon$
D.	Non-magnetic	I.	$\chi = 0$

27. **Sol. (2)**

According to transformer ratio,

$\frac{V_S}{V_P} = \frac{N_S}{N_P} = 2:1$

28. **Sol. (4)**

de-Broglie wavelength

$\lambda = \frac{h}{P} = \frac{h}{mv} = \frac{h}{\sqrt{2mE}}\ where\ E = \frac{1}{2}mv^2$

Squaring both sides,

$\lambda^2 = \frac{h^2}{4m^2E}$

$\Rightarrow \frac{1}{\lambda^2}$ =constant E

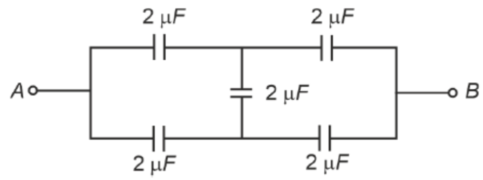
Graph passes through origin with constant slope.

29. **Sol. (1)**

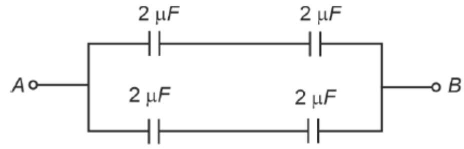
Path *bc* is an isochoric process.

∴ Work done by gas along path *bc* is zero.

30. **Sol. (1)**



Given circuit is balanced Wheatstone bridge



$C_{AB} = 1 + 1 = 2\ \mu F$

31. **Sol.(2)**

Given V' = V = Constant

$(i)\ C' = \frac{\varepsilon_0 A}{d'}, C = \frac{\varepsilon_0 A}{d}$

d' < d

C' > C

Hence, final capacitance greater than initial capacitance,

(ii) $U' = \frac{1}{2}C'V^2$

$U = \frac{1}{2}CV^2$

$U' > U$

Hence final energy is greater than initial energy

(iii) $\frac{Q'}{V'} = C'\ and\ \frac{Q}{V} = C$

$\frac{Q'}{V'} \neq \frac{Q}{V}$

(iv) Product of charge and voltage

X' = Q'V = C'V^2

X = QV =CV^2

X' > X

32. **Sol.(2)**

Capacitive Reactance

$X_C = \frac{1}{\omega C} = \frac{1}{2\pi f C} = \frac{1}{2 \times 3.14 \times 50 \times 10 \times 10^{-6}}$

$= \frac{1000}{3.14}$

$V_{rms} = 210$ V

$$i_{rms} = \frac{V_{rms}}{X_C} = \frac{210}{X_C}$$

Peak current $= \sqrt{2} i_{rms} = \sqrt{2} \times \frac{210}{1000} \times 3.14 = 0.932$

$\simeq 0.93$ A

33. Sol. (2)

From principle of homogeneity

$[F] = [\alpha t^2] = [\beta t]$

$$[\alpha] = \frac{[F]}{[t^2]} and [\beta] = \frac{[F]}{[t]}$$

$\therefore [\alpha]\,[t] = [\beta]$

$\therefore \frac{\alpha t}{\beta}$ = dimensionless

34. Sol. (4)

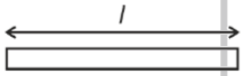
At same temperature, curve with higher volume corresponds to lower pressure.

$V_3 > V_2 > V_1$

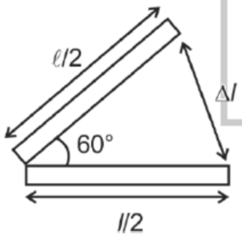
$\Rightarrow P_1 > P_2 > P_3$

(We draw a straight line parallel to volume axis to get this)

35. Sol. (2)



$M = ml.$



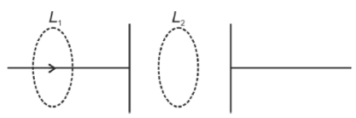
$$\Delta l = 2\frac{l}{2}\sin 30°$$

$$= \frac{l}{2}$$

$M' = ml/2$

$= M/2$

36. Sol.(2)



According to modified Ampere's law

$\oint B.\,dl = \mu_0(I_C + I_D)$

For Loop L_1 $\quad I_c \neq 0$ and $I_D = 0$

For Loop L_2 $\quad I_c = 0$ and $I_D \neq 0$

Due to KCl $\quad I_C = I_D$

37. Sol. (2)

Thermal strain = Longitudinal strain = $\alpha\,\Delta T$

$\Rightarrow$ Longitudinal strain, $\delta = 10^{-5} \times 10^2 = 10^{-3}$

$\Rightarrow$ Compressive stress = $\delta \times$ Yong's Modulus

$= 10^{-3} \times 0.5 \times 10^{11}$

$= 0.5 \times 10^8$

$\Rightarrow$ Compressive force $= 0.5 \times 10^8 \times 10^{-3} = 0.5 \times 10^5$

$$= 5 \times 10^4 \times \frac{10}{10} = 50 \times 10^3 N$$

38. Sol. (1)

In option (1), $\frac{10}{15}, \frac{10}{5 + R_D}$

The diode can conduct and have resistance RD = 10 Ω because diode have dynamic resistance. In that case bridge will be balanced.

39. Sol. (2)

$f_0 = 140$ cm and $f_e = 5$ cm

For distant object, $m = \frac{f_0}{f_e} = \frac{140}{5} = 28$

40. Sol. (1)

Apply energy conservation, $U_i + K_i = U_f + K_f$

$$\Rightarrow -\frac{GMm}{R} + K_i = -\frac{GMm}{3R} + \frac{1}{2}mv^2$$

$$\Rightarrow -\frac{GMm}{R} + K_i = -\frac{GMm}{3R} + \frac{1}{2} \times m \times \frac{GM}{3R}$$

$$\Rightarrow K_i = -\frac{1}{6}\frac{GMm}{R} + \frac{GMm}{R}$$

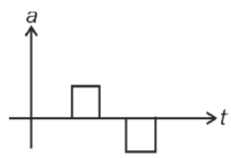
$$K_i = \frac{5}{6}\frac{GMm}{R}$$

41. Sol. (3)

Initially, the body has zero velocity and zero slope. Hence the acceleration would be zero initially.

After that, the slope of v-t curve is constant and positive.

After some time, velocity becomes constant and acceleration is zero. After that, the slope of v-t curve is constant and negative.



42. **Sol. (2)**

$$T' = 2\pi\sqrt{\frac{\ell'}{g}} \, where \, \ell' = \frac{\ell}{2}$$

$$T = 2\pi\sqrt{\frac{\ell'}{g}}$$

$$T' = \frac{x}{2}T$$

$$2\pi\sqrt{\frac{\ell}{2g}} = \frac{x}{2}2\pi\sqrt{\frac{\ell}{g}}$$

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

43. **Sol.(2)**

A. A magnetic pole will repel or attract magnetic sheet so force is need.

B. If sheet is non-magnetic, no force needed.

C. If it is conducting, then there will be addy current in sheet, which opposes the motion. So forces is needed move sheet with uniform speed.

D. The non-conducting and non-polar sheet do not interact with magnetic field of magnet.

44. **Sol. (2)**

Power Consumed $= P = \frac{V^2}{R}$

$$\frac{P_A}{P_B} = \frac{R_B}{R_A}$$

$$R_A = 2R_B$$

For series combination

$$R_S = \frac{V^2}{3R_B}$$

For parallel combination

$$P_P = \frac{3V^2}{2R_B}$$

$$\frac{P_S}{P_P} = \frac{2}{9}$$

45. **Sol. (4)**

The EM waves originate from an accelerating charge. The charge moving with uniform velocity produces steady state magnetic field.

Pvt. Ltd.
Excellence & Beyond...

CHEMISTRY:

46. Sol. (3)

Despite having the aldehyde group glucose does not give Schiff's test and it does not form the hydrogen sulphite addition product with $NaHSO_3$.

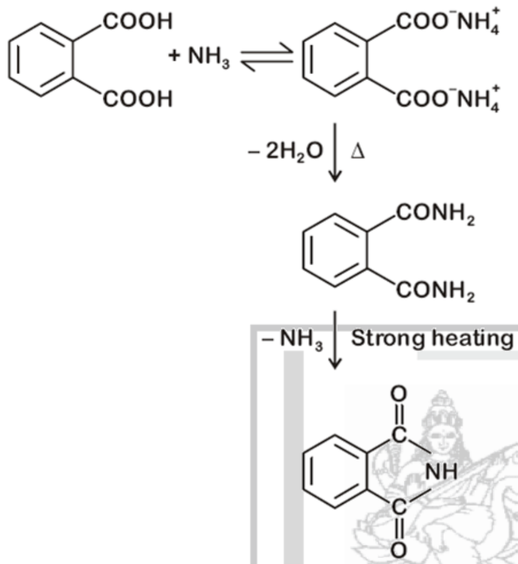
47. Sol. (1)

'Be' and 'N' have comparatively more stable valence sub–shell than 'B' and 'O'

∴ Correct order of first ionisation enthalpy is:

Li < b < Be < C < O < N < F < Ne

48. Sol. (1)



Phthalimide

Pvt. Ltd.
Excellence & Beyond

49. Sol. (4)

∴ $W_{irr} = -P_{ext}\,\Delta V$

$= -2 \text{ bar} \times (0.25 - 0.1) \text{ L}$

$= -2 \times 0.15$ L-bar

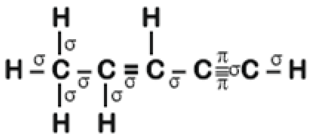
$= -0.30$ L-bar

$= -0.30 \times 100$ J

$= -30$ J

Therefore work done by gas is 30 J. According to NTA Answer key.

50. Sol. (4)



Number of σ bonds = 10

and number of π bonds = 3

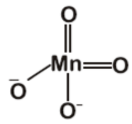
51. Sol. (2)

On going down the group thermal stability order of H_2E decreases because H–E bond energy decreases.

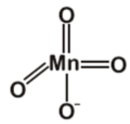
∴ Order of stability would be:-

$H_2Po < H_2Te < H_2Se < H_2S < H_2O$

52. Sol. (4)

Manganate (MnO_4^{2-}): 

⇒ π-bonds are of $d\pi$–$p\pi$ type

Paramanganate (MnO_4^-): 

⇒ π-bonds are of $d\pi$–$p\pi$ type

53. Sol. (1)

Statement I is correct, because boiling point of hydrides of group 16 follows the order

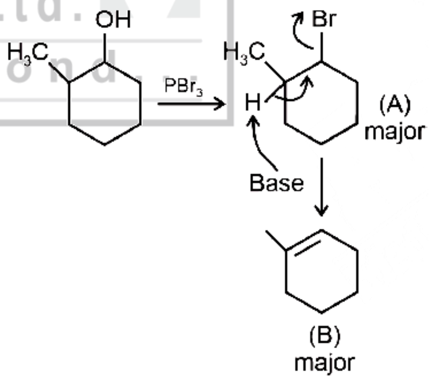
$H_2O > H_2Te > H_2Se > H_2S$.

Statement II due to intermolecular H-bonding H_2O shows higher boiling point than respective hydrides of group 16.

(Both Statement are true)

Order from H_2Te to H_2S is due to decreasing molar mass.

54. Sol. (1)



55. Sol. (4)

During the preparation of Mohr's salt, dilute sulphuric acid is added to prevent the hydrolysis of Fe^{2+} ion.

56. Sol. (4)

$2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$

$$K_c = \frac{[N_2][O_2]}{[NO]^2}$$

$$= \frac{3\times10^{-3}\times4.2\times10^{-3}}{2.8\times10^{-3}\times2.8\times10^{-3}}$$

= 1.607

$2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$

t = 0   0.1   0   0

$0.1 - 0.1\alpha \quad 0.05\alpha \quad 0.05\alpha$

$$K_c = \frac{0.05\alpha \times 0.05\alpha}{(0.1-0.1\alpha)^2}$$

$$K_c = \frac{0.05\alpha \times 0.05\alpha}{0.01(1-\alpha)^2}$$

$$1.607 = \frac{(0.05)^2\alpha^2}{0.01(1-\alpha)^2}$$

$$\frac{\alpha^2}{(1-\alpha)^2} = \frac{1.607 \times (0.1)^2}{(0.05)^2}$$

$$\frac{\alpha}{1-\alpha} = \frac{1.27 \times 0.1}{0.05}$$

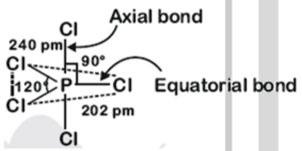
$$\frac{\alpha}{1-\alpha} = 2.54$$

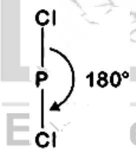
$\alpha = 2.54 - 2.54\alpha$

$3.54\alpha = 2.54$

$$\alpha = \frac{2.54}{3.54} = 0.717$$

57. Sol. (3)





(1) True

(2) True

Axial bond : 240 pm

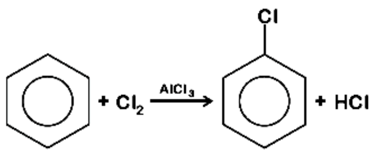
Equatorial bond : 202 pm

(3) False

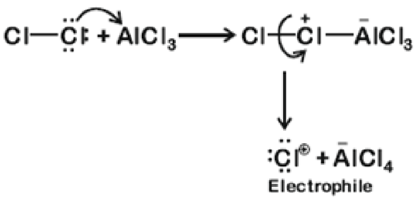
Due to longer and hence weaker axial bonds, PCl_5 is a reactive molecule.

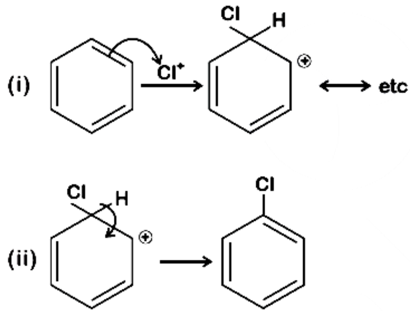
(4) True

58. Sol. (1)



Generation of electrophile:





59. Sol. (3)

(a) Pure nitrogen – Sodium azide or Barium azide

(b) Haber process – Ammonia

(c) Contact process – Sulphuric acid

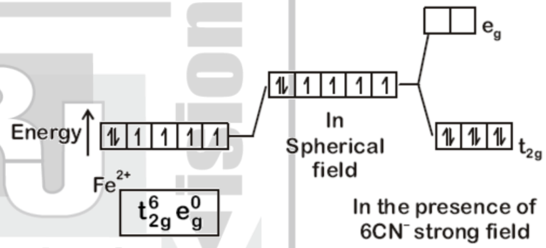
(d) Deacon's process – Chlorine

60. Sol. (1)

$K_4[Fe(CN)_6]$

Fe ground state: $[Ar]3d^64s^2$

Fe^{2+}: $3d^64s^0$



61. Sol. (4)

(a) $2\overset{+1}{Cu^{+1}} \rightarrow \overset{+2}{Cu^{2(+)}} + \overset{0}{Cu^0}$ } Disproportionation

(b) $3\overset{+6}{Mn}O_2^{2(-)} + 4H^{(+)} \rightarrow 2\overset{+7}{Mn}O_4^- + \overset{+4}{Mn}O_2 + 2H_2O$ } Disproportionation

(c) $2K\overset{+7}{Mn}O_4^{-2} \xrightarrow{\Delta} K_2\overset{+6}{Mn}O_4^{+} + \overset{+4}{Mn}O_2 + \overset{0}{O_2}$ } $\therefore$ Not a disproportionation

(d) $2\overset{+7}{Mn}O_4^- + 3\overset{+2}{Mn}^{2(+)} + 2H_2O \rightarrow 5\overset{+4}{Mn}O_2 + 4H^{\oplus}$

62. Sol. (4)

$\Delta G^{\ominus} = -nFE^{\ominus}_{cell}$

$= -2 \times 96500 \times 0.24$ J mol^{-1}

$= -46320$ J mol^{-1}

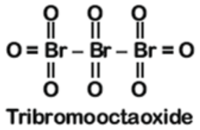
$= -46.32$ kJ mol^{-1}

63. Sol. (2)

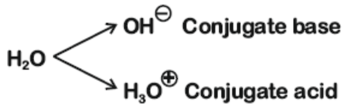
At high altitudes the atmospheric pressure is less but the body temperature remains same hence concentration of oxygen in the air as well as blood is less.

64. Sol. (4)

The correct structure is



65. Sol. (2)



HF on loss of $H^{\oplus}$ ion becomes $F^{\ominus}$ is the conjugate base of HF

Example:

HF	**+**	**H_2O**	**⇌**	$F^{\ominus}$	**+**	$H_3O^{\oplus}$
Acid		**Base**		**Conjugate base**		**Conjugate acid**

66. Sol. (3)

Due to involvement of lone pair of electrons in resonance in phenol, it will have positive charge (partial), hence incoming proton will not be able to attach easily.

67. Sol. (2)

$E_{cell} = E^o_{cell} - \frac{0.059}{n}\log Q$ ...(i)

(At equilibrium, Q = K_{eq} and E_{cell} = 0)

$0 = E^o_{cell} - \frac{0.059}{1}\log K_{eq}$ (From equation(i))

$\log K_{eq} = \frac{E^o_{cell}}{0.059} = \frac{0.59}{0.059} = 10$

$K_{eq} = 10^{10} = 1 \times 10^{10}$

68. Sol. (3)

Due to presence of d-orbital in Si, Ge and sn they form species like $SiF_6^{2-}, [GeCl_6]^{2-}, [Sn(OH)_6]^{2-}$

$SiCl_6^{2-}$ does not exist because six large chloride ions cannot be accommodated around Si^{4+} due to limitation of its size.

69. Sol. (2)

$N_2 + 3H_2 \rightleftharpoons 2NH_3$

Rate of reaction is given as

$$-\frac{d[N_2]}{dt} = -\frac{1}{3}\frac{d[H_2]}{dt} = +\frac{1}{2}\frac{d[NH_3]}{dt}$$

70. Sol. (2)

(1)	CH_3COOH	+	NaOH	→	CH_3COONa	+	H_2O
Before	100 mL × 0.1 M		100 mL × 0.1 M		0		
	= 10 mmol		= 10 mmol				
After	0		0		10 mmol		

Hydrolysis of salt takes place, This is not basic buffer.

(2)	HCl	+	NH_4OH	→	NH_4Cl	+	H_2O
Before	100 mL × 0.1 M		200 mL × 0.1 M		0		
	= 10 mmol		= 20 mmol				
After	0		10 mmol		10 mmol		

This is basic buffer

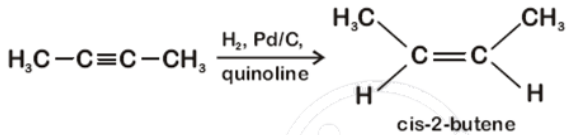
(3)	HCl	+	NaOH	→	NaCl	+	H_2O
Before	100 mL × 0.1 M		100 mL × 0.1 M		0		
	= 10 mmol		= 10 mmol				
After	0		0		10 mmol		

Neutral solution

(4)	CH_3COOH	+	NaOH	→	CH_3COONa	+	H_2O
Before	25 mL × 0.1 M		50 mL × 0.1 M		0		
	= 2.5 mmol		= 5 mmol				
After	0		2.5 mmol		2.5 mmol		

This is basic solution due to NaOH, This is not basic buffer.

71. Sol. (1)

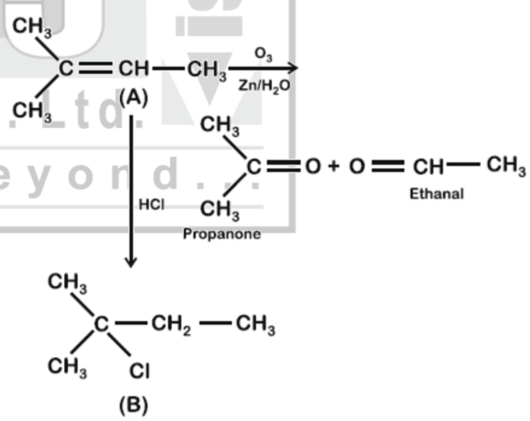


72. Sol. (2)

MO configuration C_2 is:

$\sigma 1s^2, \sigma 1s^2, \sigma 2s^2, \sigma 2s^2, \pi 2p_x^2 = \pi 2p_y^2$

73. Sol. (2)



74. Sol. (2)

$\Delta_{mix}H = 0$

$\Delta_{mix}S > 0$

$\Delta_{mix}G < 0$

$\Delta_{mix}V = 0$

75. Sol. (4)

In aqueous solution, electron donating inductive effect, salvation effect (H-bonding) and steric hindrance all together affect basic strength of substituted amines.

Basic character:

$(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N$

$2^o \quad 1^o \quad 3^o$

76. **Sol. (2)**

First order rate constant is given as,

$$k = \frac{2.303}{t}\log\frac{[A_0]}{[A]_t}$$

99% completed reaction,

$$k = \frac{2.303}{t}\log\frac{100}{1}$$

$$= \frac{2.303}{t}\log 10^2$$

$$k = \frac{2.303}{t}\times 2\log 10$$

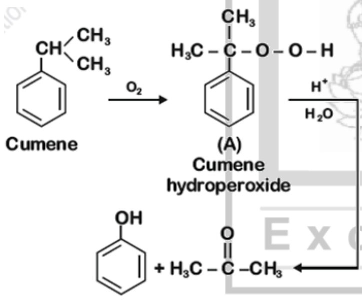
$$t = \frac{2.303}{k}\times 2 = \frac{4.606}{k}$$

$$t = \frac{4.606}{k}$$

77. **Sol. (3)**

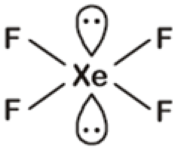
There is no effect on heat evolved or absorbed during the reaction in the presence of a catalys since it does not participate in the reaction

78. **Sol. (1)**



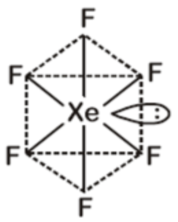
79. **Sol. (1)**

(1) XeF_4 :



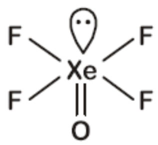
$\Rightarrow$ Square planar

(2) XeF_6 :



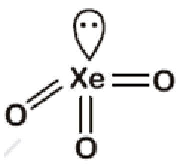
$\Rightarrow$ Distorted octahedral

(3) $XeOF_4$:



$\Rightarrow$ Square pyramidal

(4) XeO_3 :



$\Rightarrow$ Pyramidal

80. **Sol. (4)**

PbF_4 and SnF_4 are ionic in nature.

81. **Sol. (4)**

(n + l) values for, 4d = 4 + 2 = 6

5p = 5 + 1 = 6

5f = 5 + 3 = 8

6p = 6 + 1 = 7

$\therefore$ Correct order of energy would be

5f > 6p > 5p > 4d

82. **Sol. (1)**

In H-spectrum, Balmer series transitions fall in visible region.

83. **Sol. (2)**

84. **Sol. (c)**

Half life of zero order

$$t_{1/2} = \frac{[A_0]}{2K}$$

$t_{1/2}$ will be doubled on doubling the initial concentration.

85. **Sol. (2)**

$$CH_3NH_2 + HNO_3 \xrightarrow{0^o - 5^o C} CH_3OH + N_2 + H_2O$$

86. **Sol.(3)**

$H_2O(\ell) \rightleftharpoons H_2O(v)$, $\Delta S > 0$

Expansion of gas at constant temperature, $\Delta S > 0$

Sublimation of solid to gas, $\Delta S > 0$

$2H(g) \therefore H_2(g)$, $\Delta S < 0$ ($\because \Delta n_g < 0$)

87. **Sol. (3)**

It is present in pyranose structure.

88. **Sol. (2)**

Haber's process

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

20 moles need to be produced

2 moles of $NH_3 \rightarrow$ 3 moles of H_2

Hence 20 moles of $NH_3 \rightarrow \frac{3\times 20}{2} = 30$ moles of H_2

89. **Sol. (4)**

$Ca(OH)_2 \rightleftharpoons Ca^{2+} + 2OH^-$

pH = 9 Hence pOH = 14 – 9 = 0

$[OH^-] = 10^{-5}$ M

Hence $[Ca^{2+}] = \frac{10^{-5}}{2}$

Thus $K_{sp} = [Ca^{2+}][OH^-]^2$

$= \left(\frac{10^{-5}}{2}\right)(10^{-5})^2$

$= 0.5 \times 10^{-15}$

90. **Sol. (4)**

Solutions showing negative deviation from Raoult's law form maximum boiling azeotrope

Water and Nitric acid $\rightarrow$ forms maximum boiling azeotrope

Pvt. Ltd.
Excellence & Beyond...