

FT - 21 (FR) (NEET - CBSE, GSEB) (23 - 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	1	2	1	4	2	3	4	3	1	4	4	2	4	3	2	2	3	4	2
Q	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans	2	2	2	1	1	3	2	4	3	2	1	3	2	2	2	2	1	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	2	4	2	4	2	2	4	4	4	2	2	2	1	4	3	1	3	2	3
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	1	4	2	2	2	3	4	1	2	2	1	2	1	1	2	2	4
Q	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans	4	4	1	2	3	3	4	3	4	1	4	1	3	1	1	1	3	1	1	4
Q	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans	1	2	3	4	4	2	4	2	4	3	2	2	4	2	1	4	1	2	1	2
Q	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans	4	1	3	2	4	1	1	1	4	1	4	2	2	1	3	3	1	2	1	1
Q	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans	4	4	3	2	1	1	4	4	2	1	3	1	1	1	3	4	1	4	2	4
Q	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans	2	1	3	4	2	4	1	4	2	4	3	4	2	3	1	4	2	2	1	2

PHYSICS:

1. Sol. (3)

$$L=10 \times 10^{-3}$$

$$C=1 \times 10^{-6} \text{ F}$$

$$R=100 \Omega$$

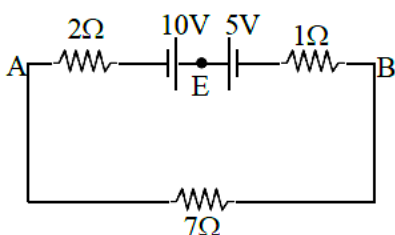
At resonance $X_L=X_C$

$$\omega L = \frac{1}{\omega C}$$

$$f = \frac{1}{2\pi\sqrt{LC}} = \frac{1}{2\pi\sqrt{10 \times 10^{-3} \times 10^{-6}}} = 1.59 \text{ KHz}$$

2. Sol. (1)

$$i = \frac{10-5}{10} = \frac{5}{10} \text{ A}$$

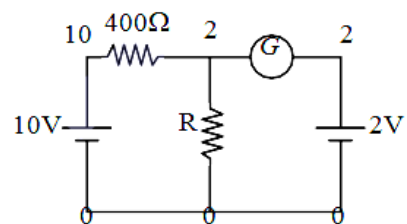


$$= 0.5 \text{ A}$$

3. Sol. (2)

From A to B through E.

For no reading galvanometer. Potential across it is same.



$$i_{400\Omega} \Rightarrow \frac{10-2}{400} = \frac{8}{400} = \frac{1}{50} = i_R$$

$$i_R \Rightarrow \frac{V_R}{R} = \frac{2}{R} = \frac{1}{50} = R = 100 \Omega$$

4. Sol. (1)

$$v_{\text{rms}} \propto \sqrt{T}$$

$$\frac{v_1}{v_2} = \sqrt{\frac{T_1}{T_2}}$$

= let initial speed is v.

As speed is increased by 3 times so final speed become $4v$

$$\Rightarrow \frac{v}{4v} = \sqrt{\frac{223}{T}}$$

$$T = 3568 \text{ K}$$

$$\text{So temp. in } ^\circ\text{C} = 3568 - 273 = 3295^\circ\text{C}$$

5. **Sol. (4)**

$$\text{Radius of gyration: } K = \sqrt{\frac{I}{m}}$$

$$\frac{k_{\text{solid sphere}}}{k_{\text{hollow sphere}}} = \sqrt{\frac{2mR^2 / 5m}{2mR^2 / 3m}} = \sqrt{3} : \sqrt{5}$$

6. **Sol. (2)**

$$H_{\text{max}} = \frac{u^2 \sin^2 \theta}{2g}$$

$$= \frac{(280)^2 (\sin 30^\circ)^2}{2(9.8)}$$

$$= 1000 \text{ m}$$

7. **Sol. (3)**

$$\tau \text{ on a dipole} = \vec{p} \times \vec{E}$$

$$\tau = pE \sin \theta$$

$$4 = q \times \ell \times E \times \sin 30^\circ$$

$$4 = q \times 2 \times 10^{-2} \times 2 \times 10^5 \times \frac{1}{2}$$

$$q = 2 \times 10^{-3}$$

$$q = 2 \text{ m C}$$

8. **Sol. (4)**

Statement I: Photocell / solar cell convert light energy into electric energy / current.

Statement II: We use zener diode in reverse biased condition, when reverse biased voltage more than break down voltage than it act as stabilizer..

9. **Sol. (3)**

Error arise due to unpredictable fluctuation in temperature and voltage supply are \rightarrow random erros.

10. **Sol. (1)**

$$\frac{n_{\text{oop}}}{n_{\text{oop}}} = \frac{2L}{4L}$$

$$\Rightarrow \frac{n_{\text{oop}}}{n_{\text{oop}}} = \frac{2}{1}$$

11. **Sol.(4)**

Given energy of photon $E = 2.20 \text{ eV}$

Work function of Cs $\phi_0 = 2.14 \text{ eV}$, K $\phi_0 = 2.30 \text{ eV}$, Na $\phi_0 = 2.75 \text{ eV}$

We know that e^- emits when $h\nu > \phi_0$

Here it is clear that energy of photon is more than the work function of Cs [Caesium] only so Ans. Only (Cs).

12. **Sol. (4)**

Magnetic field exist in

Closed Loops (Monopoles do not exist)

$$\oint \vec{B} \cdot d\vec{A} = 0$$

(Gauss law for magnetism)

13. **Sol. (2)**

Minimum wavelength of X-rays is

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

$$\text{Hence } \lambda_{\text{min}} \propto \frac{1}{V}$$

$$\text{So, Ans. } \left(\frac{1}{V} \right)$$

14. **Sol. (4)**

$$V_{\text{is}} = V_{\text{p}} \text{ (ideal Transformer)}$$

$$\Rightarrow P_{\text{out}} = P_{\text{in}}$$

$$\Rightarrow 60 = 220 \times I_{\text{p}}$$

$$I_{\text{p}} = \frac{60}{220} = 0.27 \text{ A}$$

15. **Sol. (3)**

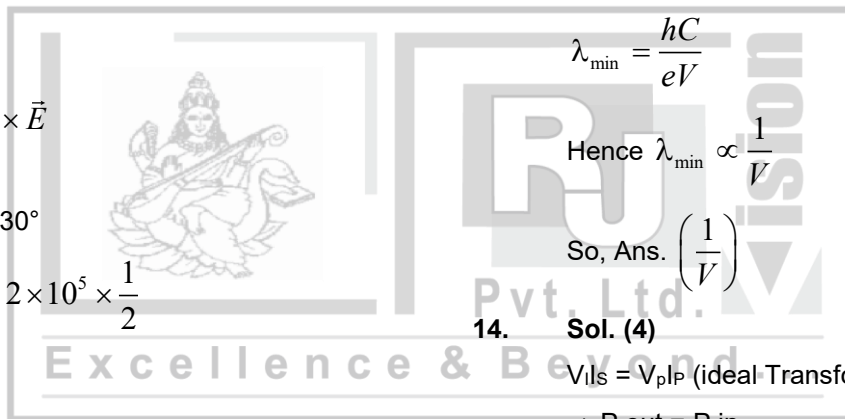
$$\text{Speed of light is air } V_1 = \frac{x}{t_1}$$

$$\text{Speed of light is air } V_2 = \frac{10x}{t_2}$$

$$\sin \theta_c = \frac{V_2}{V_1} = \frac{10xt_1}{t_2x}$$

$$\theta_c = \sin^{-1} \left(\frac{10t_1}{t_2} \right)$$

16. **Sol. (2)**



$$\rho = \frac{M}{V}$$

$$\rho = \frac{M}{\pi r^2 \ell}$$

$$\frac{\Delta \rho}{\rho} = \frac{\Delta M}{M} + \frac{2\Delta r}{r} + \frac{\Delta \ell}{\ell}$$

$$\frac{\Delta \rho}{\rho} \% = \left[\frac{0.002}{0.4} + \frac{2(0.001)}{(0.3)} + \frac{0.02}{5} \right] \times 100\%$$

$$= \frac{1}{2}\% + \frac{2}{3}\% + \frac{2}{5}\% = 1.6\%$$

17. Sol. (2)

$$\text{Angular width, } \theta_w = \frac{\lambda}{d}$$

θ_w independent of D but depends on λ .

18. Sol. (3)

Half time T = 20 min

$$\text{Left fraction of activity } \frac{1}{16}$$

$$\therefore \frac{R}{R_0} = \left(\frac{1}{2}\right)^{t/T}$$

$$\frac{1}{16} = \left(\frac{1}{2}\right)^{t/20}$$

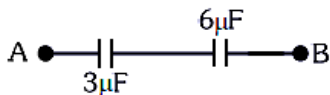
$$\left(\frac{1}{2}\right)^4 = \left(\frac{1}{2}\right)^{t/20}$$

$$= t/20$$

$$t = 80 \text{ min}$$

19. Sol. (4)

$$C_{AB} = \frac{3 \times 6}{3 + 6} = 2 \mu F$$



20. Sol. (2)

$$R = [22 \times 10^3 \pm 5\%] \Omega$$

Acc. To color code

Third Band \rightarrow Orange

(color code for digit 3 is orange)

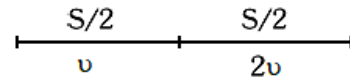
21. Sol. (2)

$$i_C = i_D = \frac{V_o}{X_c} \sin \omega t$$

$$i_C = i_D = (V_o \omega C) \sin \omega t$$

On decreasing frequency $i_C \downarrow$

22. Sol. (2)



$$V_{avg} = \frac{2v_1 v_2}{v_1 + v_2} = \frac{2(v)(2v)}{v + 2v} = \frac{4v^2}{3v} = \frac{4v}{3}$$

23. Sol. (2)

$$E = 2 T (4\pi R^2)$$

$$= 2 (0.03) (4) (3.14)(2 \times 10^{-2})^2$$

$$= 3.01 \times 10^{-4} \text{ J}$$

24. Sol. (1)

Venturimeter works on Bernoulli's principle

25. Sol. (1)

Shortest wavelength in Balmer series when transition of e from ∞ to $n = 2$

$$\therefore \frac{1}{\lambda} = RZ^2 \left[\frac{1}{2^2} - \frac{1}{\infty^2} \right]$$

$$\therefore \frac{1}{\lambda} = \frac{R}{4} \dots (1)$$

Shortest wavelength is Bracket series when transition of e from ∞ to $n = 4$

$$\frac{1}{\lambda'} = R(1)^2 \left[\frac{1}{4} - \frac{1}{\infty^2} \right] \Rightarrow \frac{1}{\lambda'} = \frac{R}{16} \dots (2)$$

Eq. (1)/ Eq. (2) ...

$$\frac{\lambda'}{\lambda} = \frac{R}{4} \times \frac{16}{R} \Rightarrow \lambda' = 4\lambda$$

26. Sol. (3)

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

For $x = 2$

$$U = \frac{1}{2} k(2)^2 \dots (1)$$

$$U = \frac{1}{2} k(8)^2 \dots (2)$$

Eq. (2)/ Eq. (1)

$$\Rightarrow \frac{U'}{U} = \left(\frac{8}{2}\right)^2$$

$$\Rightarrow U' = 16U$$

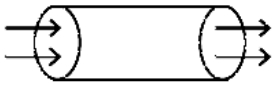
27. Sol. (2)

Capacitor used to remove AC ripples from Rectifier output.

28. Sol. (4)

$$\phi_{\text{closed}} = 0$$

So $\phi_{\text{in}} = \phi_{\text{out}}$



Number of field lines entering is equal number of field lines leaving.

29. Sol. (3)

$$\text{Energy} = \frac{1}{2} Li^2$$

$$= \frac{1}{2} 4 \times 10^{-6} \times 2^2$$

$$= 8 \times 10^{-6} \text{J}$$

$$\text{Energy} = 8 \mu\text{J}$$

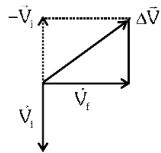
30. Sol. (2)

$$\vec{V}_1 = (v) \text{Southward}$$

$$\vec{V}_F = (V) \text{Eastward}$$

$$\Delta\vec{V} = \vec{V}_F - \vec{V}_1$$

= Along North - East

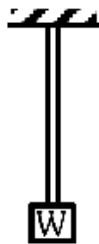


31. Sol. (1)

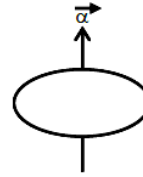
$$\text{Stress} = \frac{IRF}{A}$$

$$\text{Stress} = \frac{W}{A}$$

(Here A Cross-sectional Area)



32. Sol. (3)



Along the axis of rotation

33. Sol. (2)

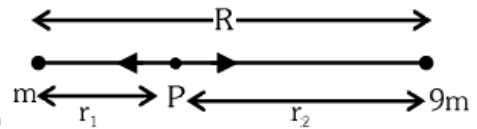
$$C = \frac{E_0}{B_0}$$

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

$$= \frac{48}{3 \times 10^8}$$

$$= 1.6 \times 10^{-7} \text{ T}$$

34. Sol. (2)



Position of Neutral point (Zero Gravitational field)

$$r_1 = \frac{\sqrt{m_1} R}{\sqrt{m_1} + \sqrt{m_2}} = \frac{\sqrt{m} R}{\sqrt{m} + \sqrt{9m}} = \frac{R}{4}$$

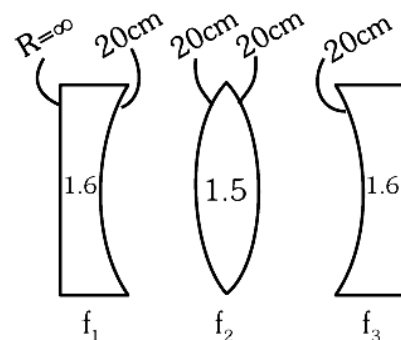
$$r_2 = R - R/4 = 3R/4$$

Now Gravitational potential at point P

$$V_p = -\frac{GM}{R/4} - \frac{9(GM)}{3R/4}$$

$$= \frac{-16GM}{R}$$

35. Sol. (2)



$$\text{Use } \frac{1}{f} = [\mu - 1] \left[\frac{1}{R_1} - \frac{1}{R_2} \right]$$

$$\frac{1}{f_1} = [1.6 - 1] \left[\frac{1}{\infty} - \frac{1}{20} \right] = \frac{-3}{100}$$

$$\frac{1}{f_2} = [1.5 - 1] \left[\frac{1}{20} + \frac{1}{20} \right] = \frac{1}{20}$$

$$\frac{1}{f_3} = \frac{-3}{100}$$

$$\frac{1}{f_{eq}} = \frac{1}{f_1} + \frac{1}{f_2} + \frac{1}{f_3}$$

$$\frac{1}{f_{eq}} = \frac{3}{100} + \frac{1}{20} - \frac{1}{100} = \frac{-1}{100}$$

36. Sol. (2)

$$F_s = ma$$

$$F_L = ma_{\max}$$

$$\mu mg = ma_{\max}$$

$$A_{\max} = \mu g$$

$$= 0.15(10)$$

$$= 1.5 \text{ m/s}^2$$

37. Sol. (1)

$$T = \frac{2\pi}{\sqrt{GM}} r^{3/2} \Rightarrow T^2 = \frac{4\pi^2 R^3}{G \left(\frac{4}{3} \pi R^3 d \right)}$$

$$T^2 = \frac{3\pi}{Gd}$$

38. Sol. (3)

$$x = A \sin(\omega t)$$

$$\frac{dx}{dt} = v = A \omega \cos(\omega t)$$

$$\frac{dv}{dt} = a = -\omega^2 A \sin(\omega t)$$

$$a = - \left(\frac{2\pi}{8} \right)^2 \times 1 \sin \left(\frac{2\pi}{8} \times 2 \right)$$

$$\Rightarrow a = - \frac{\pi^2}{16} \times \sin \left(\frac{\pi}{2} \right)$$

$$\therefore a = \frac{-\pi^2}{16} \text{ m/s}^2$$

39. Sol. (1)

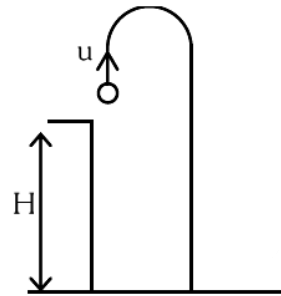
$$Y = \overline{\overline{A} \cdot \overline{B}} = \overline{\overline{A}} + \overline{\overline{B}}$$

$$= (A + B) \text{ OR Gate}$$

A	B	y
0	0	0
0	1	1
1	0	1
1	1	1

40. Sol. (2)

$$S = ut + \frac{1}{2} at^2$$



$$-H = 4 \times 4 - \frac{1}{2} \times 10 \times 4^2$$

$$-H = 16 - 80$$

$$-H = -64$$

$$H = 64 \text{ m}$$

41. Sol. (3)

$$\frac{1}{f_{eq}} = \frac{1}{f_1} + \frac{1}{f_2}$$

$$\frac{1}{f_{eq}} = \frac{1}{f} - \frac{1}{f}$$

$$f_{eq} = \infty$$

42. Sol. (2)

$$\vec{F} = I(\vec{\ell} \times \vec{B})$$

$$= I[(L\hat{i}) \times (2\hat{i} + 3\hat{j} - 4\hat{k})]$$

$$= I(4L\hat{j} + 3L\hat{k})$$

$$|\vec{F}| = 5 IL$$

43. Sol. (4)

$$\text{By } V^2 = u^2 + 2as$$

$$\left(\frac{u}{3} \right)^2 = u^2 - 2ax$$

$$2ax = u^2 - \frac{u^2}{9}$$

$$2ax = \frac{8u^2}{9} \dots\dots(1)$$

Similarly from starting

$$V^2 = u^2 + 2ax$$

$$0 = u^2 - 2ax_2$$

$$2ax_2 = u^2 \dots\dots(2)$$

By (1)/(2)

$$\frac{x}{x_2} = \frac{8}{9}$$

$$\frac{24}{x_2} = \frac{8}{9}$$

$$x_2 = 27 \text{ cm}$$

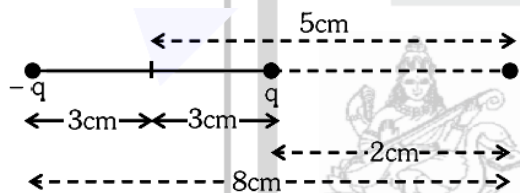
44. Sol. (2)

$$R_T = R_0 [1 + \alpha(T - T_0)]$$

$$6.8 = 2[1 + \alpha(80 - \alpha)]$$

$$\alpha = \frac{2.4}{80} = 0.03 / ^\circ C = 3 \times 10^{-2} / ^\circ C$$

45. Sol. (4)



$$v = \frac{Kq}{2 \times 10^{-2}} - \frac{Kq}{8 \times 10^{-2}}$$

$$= Kq \left[\frac{3}{8} \right] \times 10^2$$



CHEMISTRY:46. **Sol. (2)**Conductivity = conductance \times cell constant

$$k = G G^*$$

$$= \frac{1}{R} G^*$$

$$G^* = k \times R = 0.0210 \times 60 = 1.26 \text{ cm}^{-1}$$

47. **Sol. (2)**

$$\text{Rate } (r) = k[A]^2[B]$$

When concentration of A is tripled

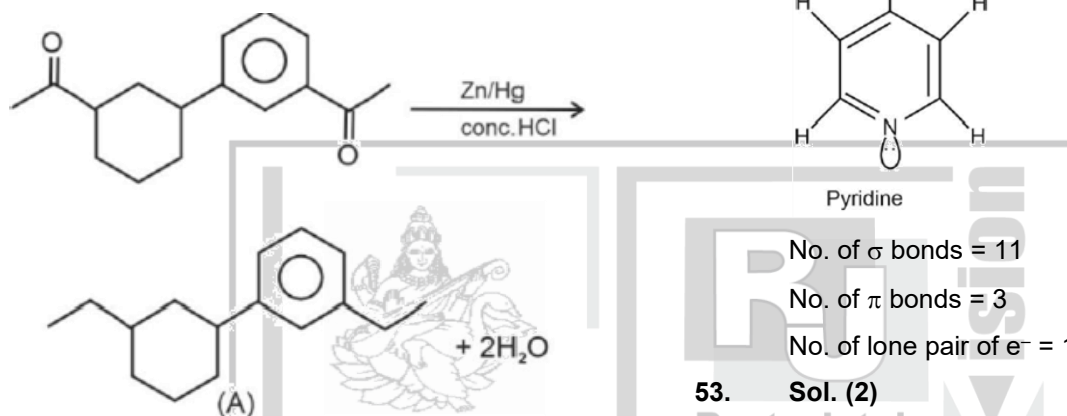
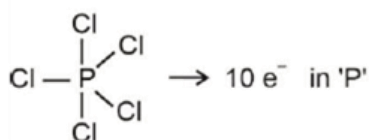
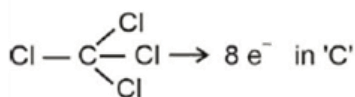
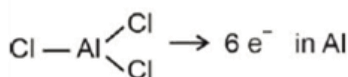
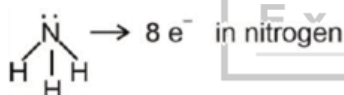
$$[A'] = [3A]$$

$$\text{New rate, } r' = k[A']^2[B] = k[3A]^2[B] = 9k[A]^2[B]$$

$$r' = 9r$$

48. **Sol. (4)**

This reaction is Clemmensen reduction

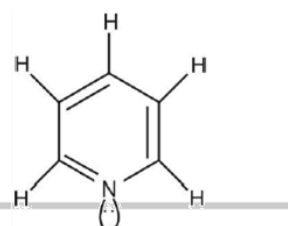
49. **Sol. (4)**50. **Sol. (4)**For molecules like B_2 , C_2 , N_2 etc. the increasing order of energies of various molecular orbitals is

$$\sigma 1s < \sigma^* 1s < \sigma 2s < \sigma^* 2s < (\pi 2p_x = \pi 2p_y) <$$

$$\sigma 2p_z < (\pi^* 2p_x = \pi^* 2p_y) < \sigma^* 2p_z$$

51. **Sol. (2)**

- Coke is largely used as a reducing agent in metallurgy.
- In diamond, each carbon atom undergoes sp^3 hybridisation and linked to four other carbon atoms by using hybridised orbitals in tetrahedral fashion.
- Buckminsterfullerene contains six membered and five membered rings and hence is a cage like molecule.
- Graphite is very soft and slippery. Hence, it is used as a dry lubricant in machines running at high temperature.

52. **Sol. (2)**

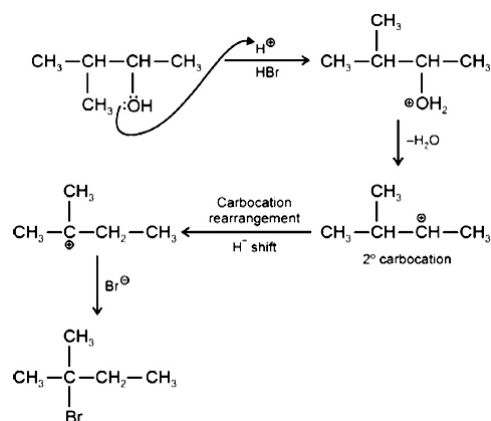
Pyridine

No. of σ bonds = 11No. of π bonds = 3No. of lone pair of e^- = 153. **Sol. (2)**

For isoelectronic species, as the charge on anion increases, ionic size increases

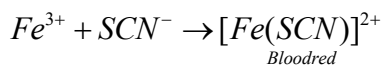
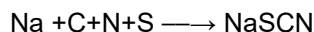
So, N forms N^{3-} anion with largest ionic size54. **Sol. (1)**

- Few reactions can have zero activation energy for example radical reactions.
- Activation energy is defined as the minimum amount of extra energy absorbed by reactants to achieve threshold energy.

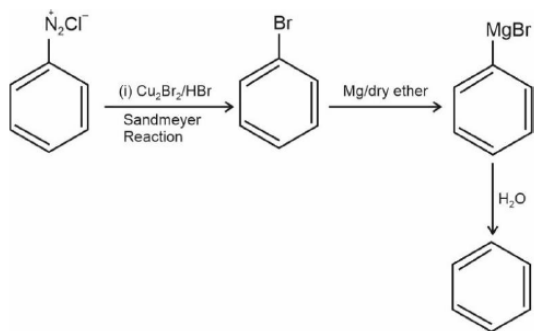
55. **Sol. (4)**

56. Sol. (3)

In case, nitrogen and sulphur both are present in organic compound, sodium thiocyanate is formed. It gives blood red colour and no Prussian blue since there are no free cyanide ions.



57. Sol. (1)



58. Sol. (3)

Atoms consist of three fundamental particles:

Electrons, protons and neutrons

- The mass of the electron is 9.10939×10^{-31} kg
- All the isotopes of a given element show same chemical properties.
- Protons and neutrons present in the nucleus are collectively called as nucleons.
- Dalton's atomic theory, regarded the atom as the ultimate particle of matter

So, the correct statements are B, C, E only

59. Sol. (2)

A unit formed by the attachment of a base to 1' position of sugar is known as **nucleoside**. In nucleosides, the sugar carbons are numbered as 1', 2', 3', etc. in order to distinguish these from the bases (Fig.(a)). When nucleoside is linked to phosphoric acid at 5' -position of sugar moiety, we get a nucleotide (Fig.(b)).

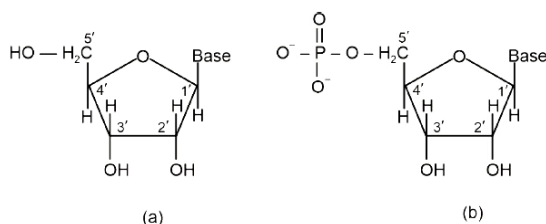


Fig. : Structure of (a) a nucleoside and (b) a nucleotide

60. Sol. (3)

As we move down the group, due to poor shielding effect of intervening *d* and *f* orbitals, the increased effective nuclear charge holds ns electrons tightly and therefore restricting their participation in bonding.

So, the relative stability of +1 O.S increases for heavier elements.

$$E^\circ \text{ for } \text{In}^{3+} | \text{In}^+ = -0.16 \text{ V}$$

$$E^\circ \text{ for } \text{Tl}^{3+} | \text{Tl}^+ = +1.6 \text{ V}$$

Hence, Tl is more stable than Tl₃

61. Sol. (2)

Intermolecular forces are the forces of attraction and repulsion between interacting molecules. This term does not include covalent bonds as covalent bond holds atoms of a molecule together.

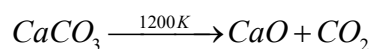
Hence, dipole - dipole forces, dipole - induced dipole forces, hydrogen bonding and dispersion forces are intermolecular forces.

62. Sol. (2)

Lewis acids are the one which accepts lone pair of electron due to presence of vacant orbital in outermost shell.



63. Sol. (1)



From 100 g CaCO₃ → 44 g CO₂ produced

As CaCO₃ is 20% pure

$$\text{So, mass of pure CaCO}_3 = 20 \times \frac{20}{100} = 4\text{g}$$

So, 100 g CaCO₃ → 44 g CO₂

$$4\text{ g CaCO}_3 \rightarrow \frac{44}{100} \times 4\text{g CO}_2$$

$$= 1.76\text{ g CO}_2$$

64. Sol. (4)

Values of *n_m*(magnetic quantum number) for given azimuthal quantum number can be calculated as following

$$n_m = 2l + 1$$

$$l = \frac{n_m - 1}{2}$$

65. Sol. (2)

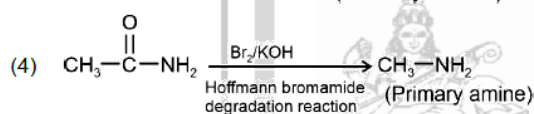
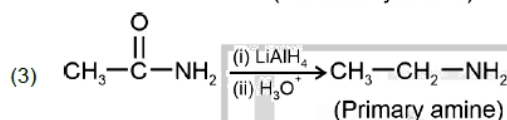
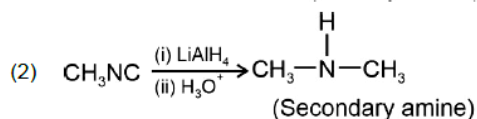
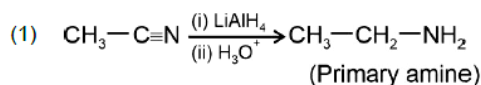
The stability of $\text{Cu}^{2+}(\text{aq})$ is more than $\text{Cu}^+(\text{aq})$ is due to the much more negative $\Delta_{\text{hyd}}H^\circ$ of $\text{Cu}^{2+}(\text{aq})$ than $\text{Cu}^+(\text{aq})$, which more than compensates for second ionisation enthalpy of Cu.

$$\Delta_{\text{hyd}}H^\circ \text{ of } \text{Cu}^{2+}(\text{aq}) = -2121 \text{ kJ mol}^{-1}$$

$$\Delta_i H_1^0 \text{ of Cu} = +745 \text{ kJ mol}^{-1}$$

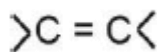
$$\Delta_i H_2^0 \text{ of Cu} = +1960 \text{ kJ mol}^{-1}$$

66. Sol. (2)



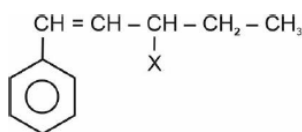
67. Sol. (2)

α -carbon is sp^3 carbon which is right next to



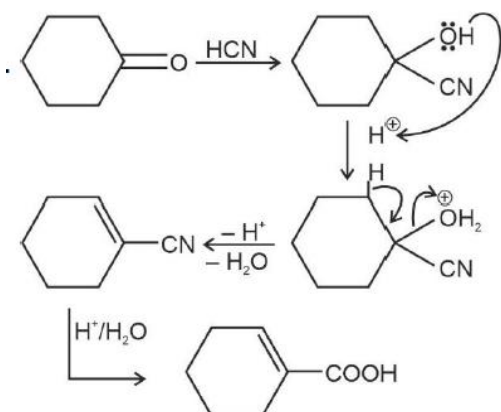
This α -position is known as allylic position

Hence,



is allylic halide

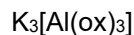
68. Sol. (3)



69. Sol. (4)

- Complexes in which a metal is bound to only one kind of donor groups are called as homoleptic complexes

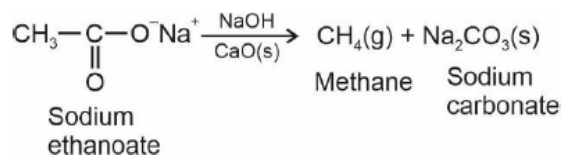
- Potassium trioxalatoaluminate (III)



It is a homoleptic complex

70. Sol. (1)

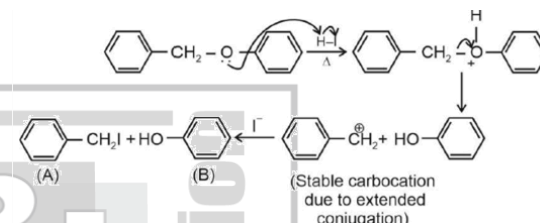
This reaction is called soda lime decarboxylation



Molar mass of $\text{CH}_4 = 16 \text{ g/mol}$

$$\text{Weight of 2 moles of } \text{CH}_4 = 16 \times 2 = 32 \text{ g}$$

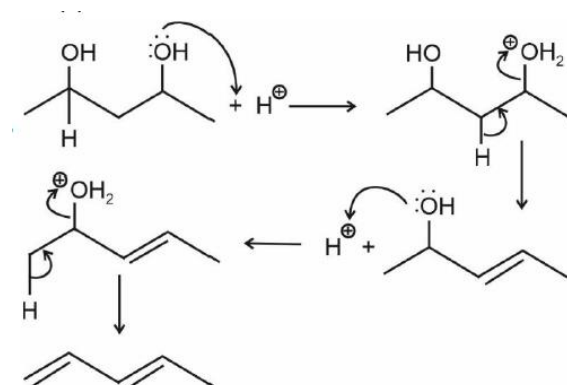
71. Sol. (2)



72. Sol. (2)

When small amount of solute is added to its solution and it does not dissolve and get precipitated then this solution is supersaturated solution.

73. Sol. (1)



74. Sol. (2)



at equilibrium 2 3 10 6

$$K_{\text{eq}} = \frac{[\text{C}][\text{D}]}{[\text{A}][\text{B}]}$$

$$K_{\text{eq}} = \frac{10 \times 6}{2 \times 3} = 10$$

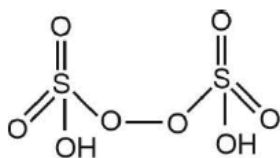
$$\Delta G^\circ = -RT \ln K$$

$$= -2.303 RT \log K$$

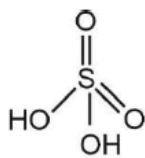
$$= -2.303 \times 2 \times 300 \times \log 10$$

$$= -1381.8 \text{ cal}$$

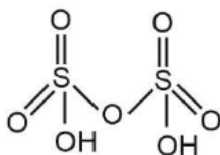
75. Sol. (1)



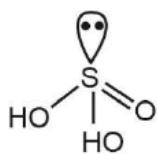
Peroxodisulphuric acid
($H_2S_2O_8$)



Sulphuric acid
(H_2SO_4)



Pyrosulphuric acid
($H_2S_2O_7$)



Sulphurous acid
(H_2SO_3)

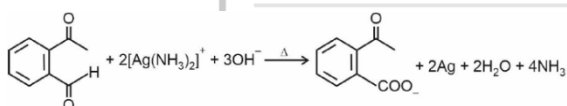
76. Sol. (1)

Correct relation between change in enthalpy and change in internal energy is

$$\Delta H = \Delta U + \Delta n_g RT$$

77. Sol. (2)

Ammoniacal silver nitrate solution is Tollens' reagent. Tollens' reagent can be used to distinguish aldehyde & ketone as aldehyde upon warming with Tollens' reagent produces a silver mirror due to formation of silver metal in alkaline medium. Aldehyde is oxidised to corresponding carboxylate anion.



78. Sol. (2)

All transition metals except Sc from MO oxides which are ionic.

- The highest oxidation number corresponding to the group number in transition metal oxides is attained in Sc_2O_3 to Mn_2O_7 .
- Acidic character increases from V_2O_3 to V_2O_4 to V_2O_5 .
- V_2O_4 dissolves in acids to give VO^{2+} .
- CrO is basic but Cr_2O_3 is amphoteric.

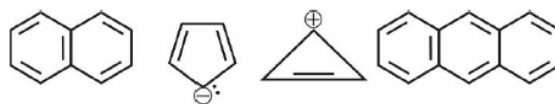
79. Sol. (4)

Criteria for Huckel's rule:

- Planarity
- Complete delocalisation of π electrons

(iii) Presence of $(4n + 2)\pi$ electrons in ring where n is an integer ($n = 0, 1, 2, \dots$)

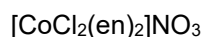
The compounds which follow Huckel's rule are:



80. Sol. (2)

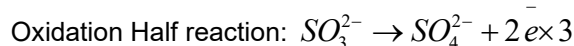
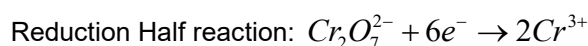
Chelating ligands in general form more stable complexes than their monodentate analogs

\therefore The most stable complex is

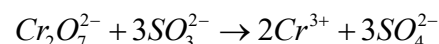


81. Sol. (4)

Using Ion electron method:



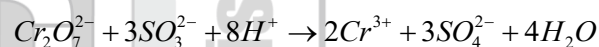
Overall reaction:



- To balance 'O' atoms, adding H_2O on LHS



- To balance 'H' atoms, adding H^+ on RHS

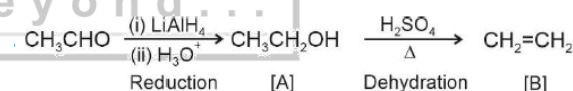


$$\therefore a = 1$$

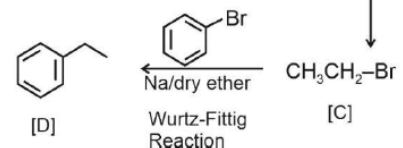
$$b = 3$$

$$c = 8$$

82. Sol. (4)



Bromination \downarrow HBr



83. Sol. (1)

For the reaction, $H_2S \rightleftharpoons H^+ + HS^-$

$$K_{a1} = \frac{[H^+][HS^-]}{[H_2S]}$$

For the reaction, $HS^- \rightleftharpoons H^+ + S^{2-}$

$$K_{a2} = \frac{[H^+][S^{2-}]}{[HS^-]}$$

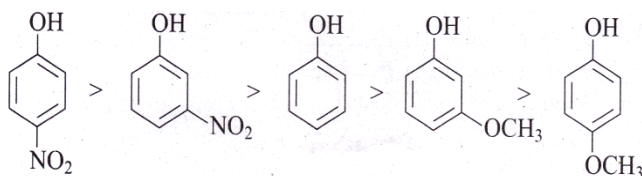
When the above two reactions are added, their equilibrium constants are multiplied. Thus

$$K_{a3} = \frac{[H^+][S^{2-}]}{[H_2S]} = K_{a1} \times K_{a2}$$

Hence, $K_{a3} = K_{a1} \times K_{a2}$

84. **Sol. (2)**

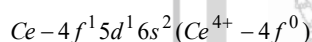
(II) > (IV) > (I) > (III) > (IV)



$-NO_2$ is an electron withdrawing group which increases the acidity of phenol and the effect is more pronounced at ortho and para positions. Similarly methoxy group is an electron releasing group which decreases the acidity of phenol and the effect is more pronounced at ortho and para positions.

85. **Sol. (3)**

Cerium shows +4 oxidation state also because it has a tendency to attain noble gas configuration and attain f^0 configuration.



86. **Sol. (3)**

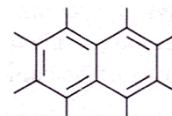
Since each period starts with the filling of electrons in a new principal quantum number, therefore, the period number in the long form of the periodic table refers to the maximum principal quantum number of any element in the period.

Period number = maximum n of any element (where, n = principal quantum number).

87. **Sol. (4)**

The probability density of electrons for 2s orbital decreases uniformly as distance from the nucleus increases.

88. **Sol. (3)**



8C – H, 11 C – C σ bond or 19 σ bonds and 5 π bonds.

89. **Sol. (4)**

Acidic strength of oxides in a group decreases down the group and increases along a period from left to right.

90. **Sol. (1)**

The value of $\Delta_r G$ depends on n value as per the equation $\Delta_r G = -nFE_{cell}$

Where E is the emf of the cell and nF is the amount of charge passed.

So, assertion statement is correct

E_{cell} is an intensive property while $\Delta_r G$ is an extensive thermodynamic property

So, reason is correct but not explaining the assertion