



Rao IIT Academy

Symbol of Excellence and Perfection

JEE | MEDICAL-UG | BOARDS | KVPY | NTSE | OLYMPIADS

Target -2018

MHT - CET 2018

Date: 10 May 2018

Physics & Chemistry Solutions

1.

Difficulty : Medium

Topics :

Oscillations and Waves,

Path length = 16 cm

∴ Amplitude $a = 8$ cm

—————

$$\text{Period } T = 2\pi\sqrt{\frac{l}{g}}$$

$$= 2\pi\sqrt{\frac{1}{\pi^2}}$$

$$= 2\pi \times \frac{1}{\pi} = 2s$$

Maximum velocity $V_{max} = a\omega$

$$= a \times \frac{2\pi}{T}$$

$$= 8 \times \frac{2\pi}{2}$$

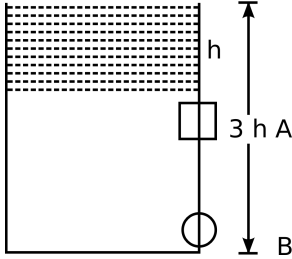
$$= 8\pi \text{ cm/s}$$



2.

C

Difficulty : Medium

Topics :
Friction,


$$A_1 V_1 = A_2 V_2$$

$$L^2 \sqrt{2gh} = \pi r^2 \sqrt{6gh}$$

$$L^4 gh = \pi^2 r^4 6gh$$

$$L = (\pi)^{\frac{1}{2}} (r)(3)^{\frac{1}{4}}$$

$$L = (r)(\pi)^{\frac{1}{2}} (3)^{\frac{1}{4}}$$

3.

Difficulty : Easy

Topics :
Semiconductors,

$$\begin{aligned} \text{Voltage gain} &= \frac{V_o}{V_i} = \frac{R_o \times I_C}{R_i \times I_B} \\ &= \frac{2000 \times 1.5 \times 10^{-3}}{150 \times 20 \times 10^{-6}} = \frac{3}{3000 \times 10^{-6}} \\ &= \frac{1}{(1000)^{-1}} = 1000 \end{aligned}$$



4.

Difficulty : Easy

Topics :

Rotational Motion,

$$\tau = I\alpha$$

$$F \times R = \frac{MR^2}{2} \times \frac{\omega}{t}$$

$$F = \frac{MR}{2} \times \frac{\omega}{t}$$

5.

Difficulty : Easy

Topics :

Magnetic Effects of Current,

$$B = \frac{\mu_0 n I a^2}{(a^2 + x^2)^{3/2}} = \frac{\mu_0 n I a^2}{a^3} = \frac{\mu_0 n I}{a}$$

$$\frac{B}{8} = \frac{\mu_0 n I a^2}{(a^2 + x^2)^{3/2}}$$

$$\frac{\mu_0 n I}{8a} = \frac{8 \times \mu_0 n I a^2}{(a^2 + x^2)^{3/2}}$$

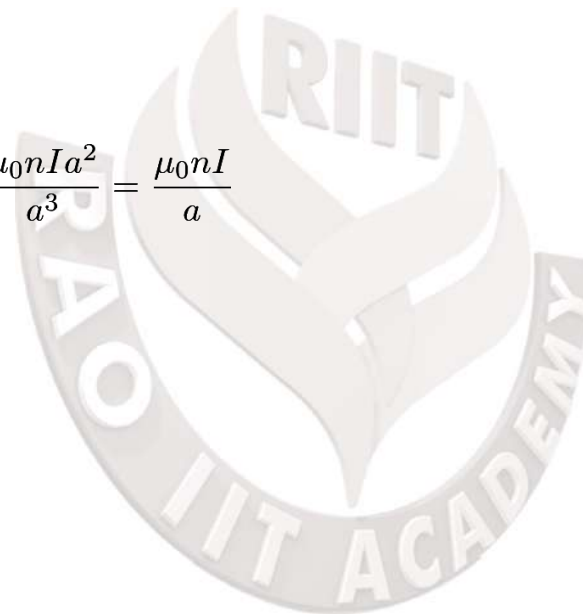
$$\frac{1}{8a^3} = \frac{1}{(a^2 + x^2)^{3/2}}$$

$$\frac{1}{2a} = \frac{1}{(a^2 + x^2)/2}$$

$$4a^2 = a^2 + x^2$$

$$x^2 = 3a^2$$

$$x = \sqrt{3}a$$



6.

Difficulty : Medium

Topics :

Interference and Diffraction,

$$I_{max} = (a_1 + a_2)^2$$

$$I_{min} = (a_1 - a_2)^2$$

$$I_{max} + I_{min} = a_1^2 + a_2^2 + a_1^2 + a_2^2$$

$$= 2(a_1^2 + a_2^2)$$

$$= 2(I_1 + I_2)$$

7.

Difficulty : Easy

Topics :

Electromagnetic Induction(EMI),

$$e = e_0 \sin \omega t$$

$$E_0 = 200\sqrt{2}V, \omega = 100$$

$$I_{rms} = \frac{v_{rms}}{X_C} = \frac{V_0 \omega C}{\sqrt{2}}$$

$$= \frac{200\sqrt{2} \times 100 \times 10^{-6}}{\sqrt{2}}$$

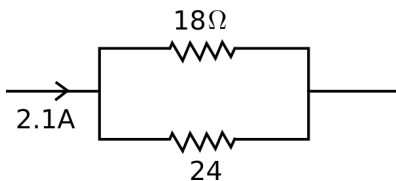
$$= 2 \times 10^{-2} = 20mA$$

8.

Difficulty : Easy

Topics :

Current electricity,



$$I_1 + I_2 = 2.1A$$

$$18I_1 = 24I_2$$

$$3I_1 = 4I_2 = 4(2.1 - I_1)$$

$$7I_1 = 8.4 - 4I_1$$

$$7I_1 = 8.4$$

$$I_1 = \frac{8.4}{7} = 1.2A$$

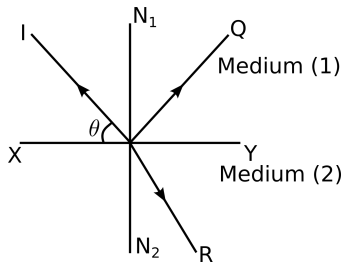
9.

Difficulty : Easy

Topics :

Physics,

Topic : Refraction of light



10.

Difficulty : Easy

Topics :

Circular motion,

$$\text{Tangential acceleration} = \alpha r$$

$$\text{Radial acceleration} = \frac{v^2}{r}$$

$$\text{Ratio} = \frac{\alpha a}{v^2/r} = \frac{\alpha r^2}{v^2}$$



11.

Difficulty : Medium

Topics :

Interference and Diffraction,

$$d = \frac{\lambda}{2\mu \sin \alpha} = \frac{\lambda}{2N.A}$$

N.A limit of resolution is decrease(d).

12.

Difficulty : Medium

Topics :

Communication systems,

In amplitude modulation amplitude of the carrier wave changes according to information signal.

13.

Difficulty : Medium

Topics :
MAGNETISM,

$$M_z = \frac{M_{ext}}{V}$$

$$M_z = \frac{CB}{T} \dots \text{(Paramagnetic)}$$

 where, $C = C$ Curie constant.

14.

Difficulty : Medium

Topics :
Atoms & Molecules,

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

$$\frac{1}{\lambda} = R \left[\frac{1}{1} - \frac{1}{16} \right]$$

$$\frac{1}{\lambda} = \frac{15 - R}{16}$$

$$\lambda = \frac{16}{15R}$$

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

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

$$V = \frac{h}{m\lambda} = \frac{15hR}{m16}$$

$$V = \frac{15 hR}{16 m}$$

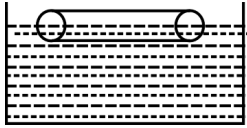


15.

Difficulty : Medium

Topics :

Surface tension,



$$mg = T.l$$

$$\pi r^2 \rho g = Tl$$

$$r^2 = \frac{T}{\pi \rho g}$$

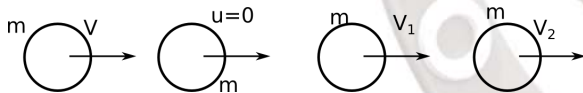
$$r = \sqrt{\frac{T}{\pi \rho g}}$$

16.

Difficulty : Difficult

Topics :

Forces,



$$mV + 0 = mV_1 + mV_2$$

$$V_1 + V_2 = V$$

$$e = \frac{V_2 - V_1}{u_1 - u_2}$$

$$e = \frac{V_2 - V_1}{V - 0}$$

$$eV = V_2 - V_1$$

$$eV + V = 2V_2$$

$$V_2 = \frac{V(e + 1)}{2}$$

$$\frac{V_2}{V} = \frac{e + 1}{2}$$

17.

Difficulty : Medium

Topics :
Oscillations and Waves,

 Distance travelled in one oscillation is $4a$ and time is period is T velocity = $\frac{4a}{T} = 4 \text{ an}$

18.

Difficulty : Medium

Topics :
Electromagnetic Induction(EMI),

$$V_{in} = 220 \text{ V} \quad V_{out} = 3.3 \times 10^3 \text{ V}$$

$$\text{Power} = 4.4 \text{ kW}$$

$$N_p = 600 \quad R_{out}$$

$$P = V_{in} \times R_{in}$$

$$R_{in} = \frac{4.4 \times 1000}{220} = \frac{44 \times 10}{22} = 20 \text{ A}$$

$$\frac{e_s}{e_p} = \frac{R_p}{R_s}$$

$$R_s = R_p = \frac{e_p}{e_s} = \frac{20 \times 220}{3.3 \times 1000} = \frac{44}{33} = \frac{4}{3} \text{ A}$$

19.

Difficulty : Medium

Topics :
Electrostatics,

$$\frac{R_1}{R_2} = \frac{L_1}{L_2} \times \frac{A_2}{l_2} = \frac{L_1}{L_2} \times \frac{\frac{\pi d^2}{4}}{\frac{\pi d_1^2}{4}}$$

$$R_1 = \frac{\rho l l}{[Al]} = \frac{l^2}{V}$$

$$X_1 = X_2$$

$$L - 1 \frac{\pi d_1^2}{4} = L_2 \frac{\pi d_2^2}{4}$$

$$\frac{L_1}{L_2} = \frac{d_2^2}{d_1^2}$$

20.

Difficulty : Medium

Topics :

Kinetic theory of gases,

$$C_P - C_V = R, \quad \frac{C_P}{C_V} = \gamma \Rightarrow C_P = \gamma C_V$$

$$\gamma C_V - C_V = R$$

$$C_V = \frac{R}{(\gamma - 1)}$$

21.

Difficulty : Easy

Topics :

Surface tension,

$$rh = \text{constant}$$

$$r_1 h_1 = r_2 h_2$$

$$\frac{r_1}{r_2} = \frac{h_2}{h_1}$$

$$3 = \frac{h_2}{h_1} = \frac{h_2}{h_1}$$

$$h_2 = 3h_1 = 3h$$

$$A_1 = \pi r_1^2$$

$$A_2 = \pi r_2^2$$

$$\frac{\pi r_1^2}{9} = \pi r_2^2$$

$$\frac{r_1^2}{r_2^2} = 9 \Rightarrow \frac{r_1}{r_2} = 3$$

22.

Difficulty : Easy

Topics :

Semiconductors,

acts as closed switch

23.

Difficulty : Medium

Topics :

Magnetic Effects of Current,

$$t = 1/V = \frac{2\pi m}{eB} \quad R = \frac{mv}{eB} = \frac{P}{eB}$$

$$B = \frac{2\pi m}{\rho} v \quad P = eBR = e \times \frac{2\pi mu}{e} R$$

$$= 2\pi mvR$$

$$K.E = \frac{P^2}{2m} = \frac{(2\pi mvR)^2}{2m}$$

$$= 2\pi^2 mv^2 R^2$$

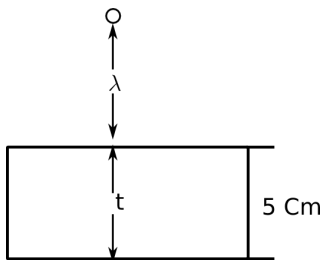
24.

Difficulty : Easy

Topics :

Physics,

Topic : Refraction of light



$$V = \frac{5}{t}$$

$$t = \frac{5}{V} \quad \frac{x}{c} = \frac{5\mu}{c}$$

$$x = 5\mu = 5 \times 1.6$$

$$x = 8 \text{ cm}$$



25.

Difficulty : Medium

Topics :
Stationary waves,

Fifth overtone

$$2.4 = 6n$$

$$A = 0.4m$$

$$\frac{\lambda}{2} = 0.4$$

$$\lambda = 0.8$$

$$\frac{\lambda}{4} = \frac{0.8}{4}$$

$$= 0.2$$

26.

Difficulty : Medium

Topics :
Dot or Scalar Product of Vectors,

$$|A| = \sqrt{9 + 4 + 1} = \sqrt{14}$$

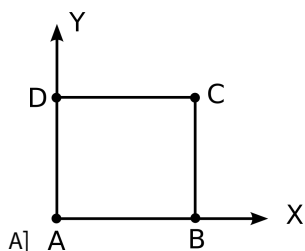
$$|B| = \sqrt{1 + 9 + 25} = \sqrt{35}$$

$$|C| = \sqrt{4 + 1 + 16} = \sqrt{21}$$

$$B^2 = A^2 + C^2$$

27.

Difficulty : Medium

Topics :
Rotational Motion,


$$\frac{ml^2}{3} + \frac{ml^2}{3} + ml^2$$

$$I = \frac{5}{3}ml^2$$

28.

Difficulty : Easy

Topics :

Unit vector,

$$\sqrt{(0.8)^2 + (b)^2 + (0.4)^2} = 1$$

$$\sqrt{64 + b^2 + 0.16} = 1$$

$$\sqrt{0.80 + b^2} = 1$$

$$0.8 + b^2 = 1$$

$$b^2 = 0.2$$

$$b = \sqrt{0.2}$$

29.

Difficulty : Easy

Topics :

MAGNETISM,

$$B = (1 + \chi)H$$

χ = for paramagnetic Positive and small

χ = for diamagnetic Positive and small



30.

Difficulty : Difficult

Topics :

Oscillations and Waves,

$$T = 2\pi\sqrt{\frac{m}{k}}$$

$$n = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$$

$$25 = \frac{1}{4\pi^2} \frac{k}{m}$$

$$k = 100\pi^2 m$$

$$kA = mg$$

$$A = \frac{mg}{k}$$

$$V_{max} = \omega A$$

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

$$= 2\pi n A$$

$$= \frac{2\pi \times 5 \times mg}{k}$$

$$V_{max} = \frac{10\pi \times m \times 10}{100\pi^2 m} = \frac{1}{\pi}$$

31.

Difficulty : Medium

Topics :

Rotational Motion,

$$I_1\omega_1 = I_2\omega_2$$

$$I\omega = 2I\omega_1$$

$$\omega_1 = \frac{\omega}{2}$$

$$\text{New } KE = \frac{1}{2}I\omega^2$$

$$= \frac{1}{2}2I\left(\frac{\omega}{2}\right)^2$$

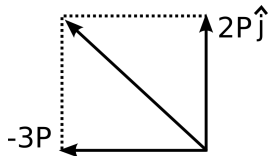
$$= \frac{I\omega^2}{4}$$

$$\text{Change in } KE = \frac{1}{2}I\omega^2 - \frac{I\omega^2}{4} = \frac{I\omega^2}{4}$$



32.

Difficulty : Medium

Topics :
Forces,


$$\sqrt{9P^2 + 4P^2} = \sqrt{13P}$$

33.

Difficulty : Easy

Topics :
Electrons and Photons,

$$eV_0 = h\nu - h\nu_0$$

$$eV_0 = h(\nu - \nu_0)$$

$$V_0 = \frac{h}{e}(\nu - \nu_0)$$

 Stopping potential directly proportional to frequency of incident radiation ν increases.

34.

Difficulty : Easy

Topics :
Circular motion,

$$v = \sqrt{3rg}$$

$$\text{centripetal acceleration} = \frac{v^2}{r} = \frac{3rg}{r} = 3g$$

35.

Difficulty : Medium

Topics :
Electrostatics,

 Electric field intensity outside sheet is $\frac{\sigma}{2\epsilon_0}$

 So it is independent of d

36.

Difficulty : Medium

Topics :**Wave Motion,**

$$n_a = n \left[\frac{v \pm v_0}{v \mp v_s} \right]$$

$$v_0 = 0$$

$$n_a = n \left[\frac{v}{v - v_s} \right]$$

So frequency increase, wavelength decreases.

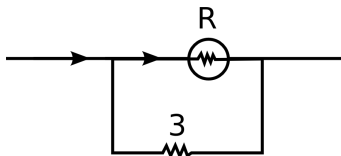


37.

Difficulty : Difficult

Topics :

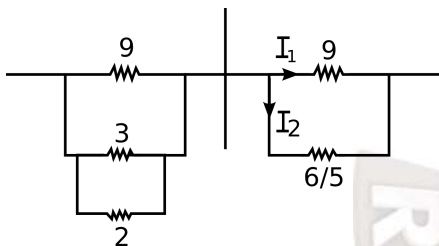
Magnetic Effects of Current,



$$I - \frac{I}{4} = \frac{3I}{4}$$

$$\frac{RI}{4} = \frac{3I}{4} \times 3$$

$$R = 9\Omega$$



$$I = I_1 + I_2$$

$$9I_1 = \frac{6}{5}I_2$$

$$\frac{15}{2}I_1 = I_2$$

$$I = I_1 + \frac{15}{2}I_1 = \frac{17}{2}I_1$$

$$I_1 = \frac{2I}{17}$$

$$\frac{I}{17/2} = \frac{I}{8.5}$$



38.

Difficulty : Difficult

Topics :

Gravitation,

$$\frac{GMm}{R} + \frac{1}{2}mu^2 = 0 + -\frac{GMm}{(R+h)}$$

$$\frac{GM}{R+h} = \frac{Gm}{R} - \frac{u^2}{2}$$

$$\frac{GM}{(R+h)} = \frac{2Gm - Ru^2}{2R}$$

$$\frac{R+h}{GM} = \frac{2R}{2GM - Ru^2}$$

$$h = \frac{2GMR}{2GM - Ru^2} - R$$

$$= \frac{2GMR - 2GMR + R^2u^2}{2GM - Ru^2}$$

$$= \frac{R^2u^2}{2GM - Ru^2} = \frac{Ru^2}{2gR - u^2}$$

39.

Difficulty : Difficult

Topics :

Electrostatics,

$$C_{eq} = \frac{C_1}{N_1} \quad V = 3V$$

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

$$= \frac{1}{2} \frac{C_1}{N_1} 9V^2$$

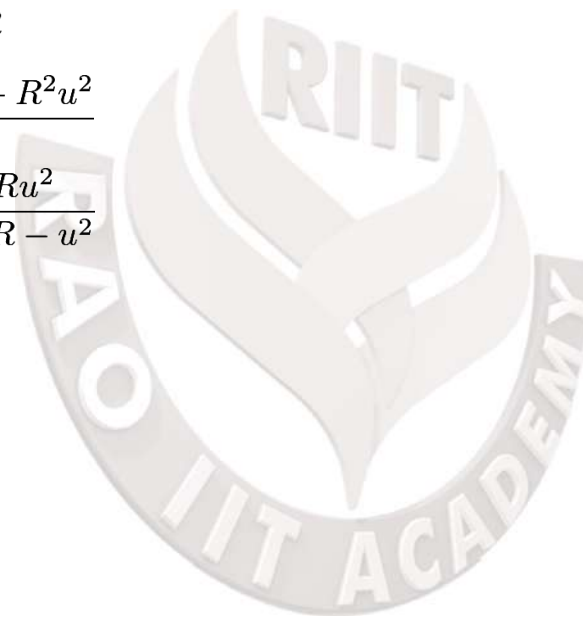
$$= \frac{9}{2} \frac{C_1}{N_1} V^2$$

$$C_{eq} = N_2C_2 \quad V = V$$

$$E = \frac{1}{2}CV^2 = \frac{1}{2}C_2N_2V^2$$

$$\frac{9}{2} \frac{C_1}{N_1} V^2 = \frac{C_2N_2V^2}{2}$$

$$C_1 = C_2 \frac{N_2N_1}{9}$$



40.

Difficulty : Easy

Topics :

Kinetic theory of gases,

$$Q_i = 1000J/m$$

$$1 = r + a + t$$

$$t = 1 - 0.1 - 0.8 = 0.1$$

$$Q_t = 0.1 \times 1000 \times 5$$

$$= 500J$$

41.

Difficulty : Medium

Topics :

Elasticity,

$$m_1 : m_2$$

$$Y = \frac{Fl}{A\Delta l}$$

$$\Delta l = \frac{Fl}{YA}$$

$$m = \rho V = \rho \times A \times l$$

$$A \propto m$$

$$\frac{\Delta l_1}{\Delta l_2} = \frac{A_2}{A_1} = \frac{m_2}{m_1}$$



42.

Difficulty : Easy

Topics :

MEASUREMENT,

$$\frac{\Delta x}{x} = 2 \frac{\Delta a}{a} + 2 \frac{\Delta b}{b} + \frac{\Delta c}{c}$$

$$\frac{\Delta x}{y} = 2 \times 2 + 2 \times 3 + 4$$

$$= 4 + 6 + 4$$

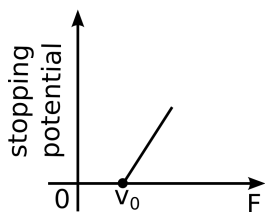
$$\frac{\Delta x}{x} = 14\%$$

43.

Difficulty : Easy

Topics :

Electrons and Photons,



44.

Difficulty : Easy

Topics :

Ray Optics,

In compound microscope, the focal length and aperture of the objective used is respectively large and small.

45.

Difficulty : Medium

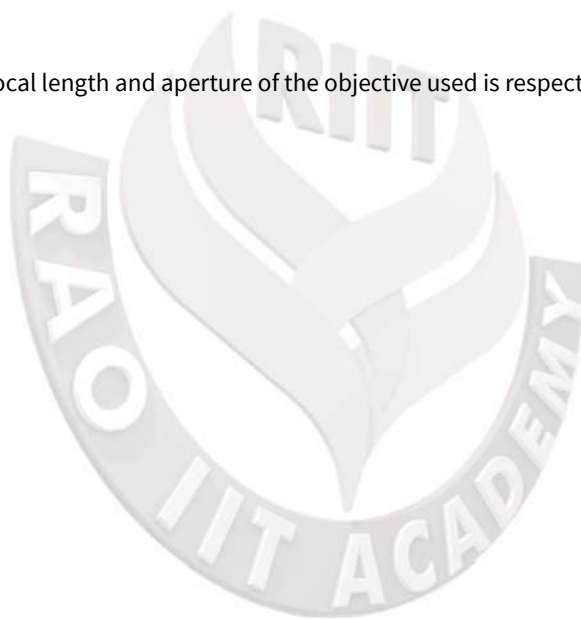
Topics :

Atoms & Molecules,

$$\lambda = \frac{h}{\sqrt{2mK.E}}$$

$$\lambda^2 = \frac{h^2}{2m(K.E)}$$

$$(K.E) = \frac{h^2}{2m\lambda^2}$$



46.

Difficulty : Medium

Topics :

Stationary waves,

$$n = \frac{1}{2L} \sqrt{\frac{T}{m}}$$

$$n' = \frac{1}{2L} \sqrt{\frac{2T}{m}}$$

$$= \sqrt{2} \frac{1}{2L} \sqrt{\frac{T}{m}}$$

$$n' = \sqrt{2}n$$

47.

Difficulty : Medium

Topics :

Elasticity,

$$Y = \frac{FL}{Al}$$

$$l = \frac{FL}{AY}$$

48.

Difficulty : Difficult

Topics :

MAGNETISM,

$$\frac{B_1}{B_2} = \frac{25}{2}$$

$$\frac{\frac{\mu_0}{4\pi} \frac{Md_1}{(d_1^2 - l^2)^2}}{\frac{\mu_0}{4\pi} \frac{Md_2}{(d_2^2 - l^2)^2}} = \frac{25}{2}$$

$$\frac{d_1}{d_2} \times \frac{(d_2^2 - l^2)^2}{(d_1^2 - l^2)^2} = \frac{25}{2}$$

$$d_1 = 10 \text{ cm}, d_2 = 20 \text{ cm}$$

$$\frac{10}{20} \times \left(\frac{20^2 - l^2}{10^2 - l^2} \right) = \frac{25}{2}$$

$$400 - l^2 = 5(100 - l^2)$$

$$4l^2 = 100 \Rightarrow l^2 = 25$$

$$l = 5 \text{ cm}$$



49.

Difficulty : Medium

Topics :
Gravitation,

$$v_c = \frac{1}{4}v_e$$

$$\sqrt{\frac{GM}{(R+h)}} = \frac{1}{4}\sqrt{\frac{2GM}{(R+h)}}$$

$$\frac{GM}{(R+h)} = \frac{1}{16} \times \frac{2GM}{(R+h)}$$

$$R+h = 8(R)$$

$$R+h = 8R$$

$$7R = h$$

50.

Difficulty : Medium

Topics :
Stationary waves,

$$n = \frac{V}{4L} = \frac{332}{4 \times 83 \times 10^{-2}}$$

$$n = 100$$

$$n_1 = 300$$

$$n_2 = 500$$

$$n_3 = 700$$

$$n_5 = 900$$

51.

Difficulty : Easy

Topics :
Chemical Kinetics,

Factual



52.

Difficulty : Easy

Topics :
Thermodynamics,

$$\begin{aligned}\Delta U &= q + W \\ &= q + (-P_{ex} \cdot \Delta V) \quad (\because W = -P_{ex} \cdot \Delta V) \\ \Delta U &= q - P_{ex} \cdot \Delta V\end{aligned}$$

53.

Difficulty : Easy

Topics :
Electrochemistry,

Because zinc get oxidized first when comes in contact with moisture and hence iron surface is protected from corrosion.

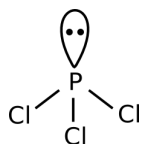
54.

Difficulty : Easy

Topics :
P-block,

PCl_3 - has 3 sigma bond and 1 lone pair

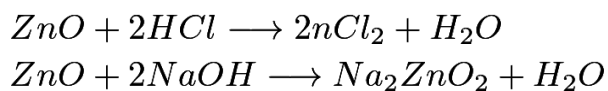
$$3 + 1 = 4$$



Hence hybridization = sp^3

55.

Difficulty : Easy

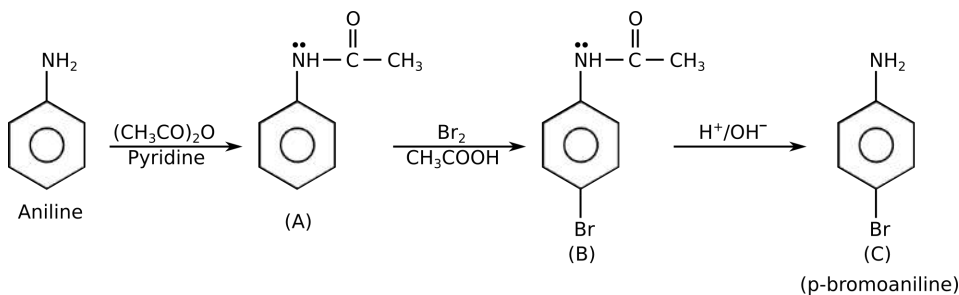
Topics :
d-block,


56.

Difficulty : Medium

Topics :

Nitrogen containing compounds,



57.

Difficulty : Easy

Topics :

Basic Principles & Techniques in Organic Chemistry,

 $-\text{CH}_3$ is electron donating group which shows $+I$ effect.

58.

Difficulty : Easy

Topics :

Solid State,

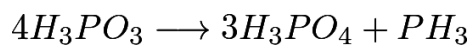
Polonium

59.

Difficulty : Medium

Topics :

P-block,



(phosphonic acid)

60. Difficulty : Medium

Topics :

Redox reactions,

$$Au = x$$

$$x + 4(-1) = -1$$

$$x - 4 = -1$$

$$x = -1 + 4$$

$$x = +3$$

61. Difficulty : Easy

Topics :

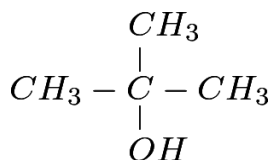
Basic concepts of chemistry,

'u'

62. Difficulty : Easy

Topics :

Alcohols,



3° alcohol reacts with lucas reagent ($HCl + \text{anhydrous } ZnCl_2$) immediately & gives two separate layers.

63. Difficulty : Easy

Topics :

P-block,

Nitric oxide

64. Difficulty : Medium

Topics :

Electrochemistry,

$$\frac{2 \times 20 \times 60}{96500} = 0.02487$$

65.

Difficulty : Easy

Topics :
Solutions and its colligative properties,

 Urea molar mass = 60 g/mol

$$\text{molarity} = \frac{15 \times 1000}{60 \times 500} = \frac{15}{6 \times 5} = \frac{1}{2}$$

$$= 0.5 \text{ mol dm}^{-3}$$

66.

Difficulty : Easy

Topics :
BIOMOLECULES,
 $C_2 \rightarrow$ factual

67.

Difficulty : Medium

Topics :
CARBOXYLIC ACIDS AND ITS DERIVATIVES,

Bulkier group near the site of reaction, slows down esterification.

68.

Difficulty : Easy

Topics :
Solutions and its colligative properties,

$$\text{molarity : } (M) = \frac{\text{no. of moles of solute}}{\text{vol. of solution of } dm^3}$$

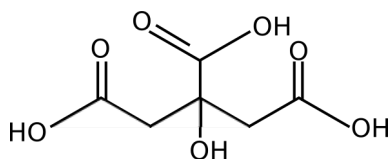
69.

Difficulty : Easy

Topics :
CARBOXYLIC ACIDS AND ITS DERIVATIVES,

Citric Acid

Structure : -

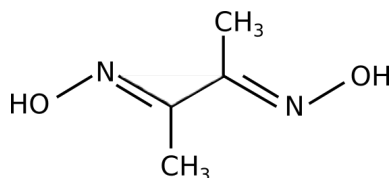


70.

Difficulty : Easy

Topics :

Coordination Compounds,



71.

Difficulty : Easy

Topics :

P-block,

Nitrous oxide (N_2O)

72.

Difficulty : Medium

Topics :

Aldehydes,

Formaldehyde (electrophilicity of carbocation, decreases reactivity decreases)

73.

Difficulty : Easy

Topics :

F-block,

$La(OH)_3$ ($Z = 57$)

Due to lanthanide contraction.

74.

Difficulty : Easy

Topics :

Some basic concepts of Chemistry,

$kg\ m^{-3}$



75.

Difficulty : Easy

Topics :
**Aldehydes,
Ketones,**

Haloform is given by compound containing $CH_3 - \overset{\overset{O}{\parallel}}{C} - \text{group}$ or $R - \underset{\underset{OH}{|}}{CH} - CH_3$

76.

Difficulty : Medium

Topics :
Thermodynamics,

$$v_1 = 10 \text{ dm}^3 = 10^{-2} \text{ m}^3$$

$$v_2 = 2 \text{ m}^3$$

$$p = 101.325 \times 10^3 \text{ pa}$$

$$W = -101.325 \times 10^3 (1.99)$$

$$= -201.6 \text{ kJ}$$

77.

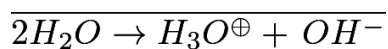
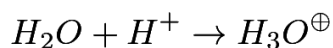
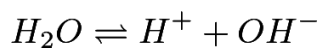
Difficulty : Easy

Topics :
Solid State,

ZNS - Shows Frenkel defects

78.

Difficulty : Easy

Topics :
Hydrogen,


79.

Difficulty : Easy

Topics :

General Principles & Processes of Isolation of Metals,

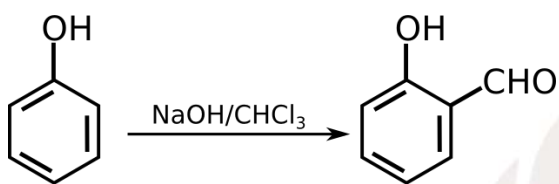
Hall's process

80.

Difficulty : Medium

Topics :

**Phenols,
Alcohols,**



Reimer-Tiermann

81.

Difficulty : Easy

Topics :

P-block,

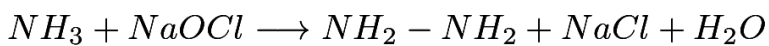
Be - belongs to second period

82.

Difficulty : Easy

Topics :

P-block,



83.

Difficulty : Medium

Topics :

Electrochemistry,

1.2 gmL^{-1}

84. Difficulty : Medium

Topics :

Polymers,

Nomex

85. Difficulty : Easy

Topics :

General Principles & Processes of Isolation of Metals,

Titanium - Van Arkel method

86. Difficulty : Easy

Topics :

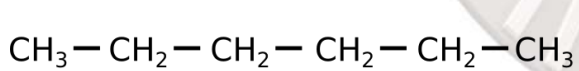
CHEMISTRY IN EVERYDAY LIFE,

Bromopheniiramine - Antihistamine

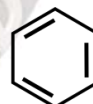
87. Difficulty : Easy

Topics :

Alkanes,



Dehydrogenation



88. Difficulty : Easy

Topics :

P-block,

Bismuth

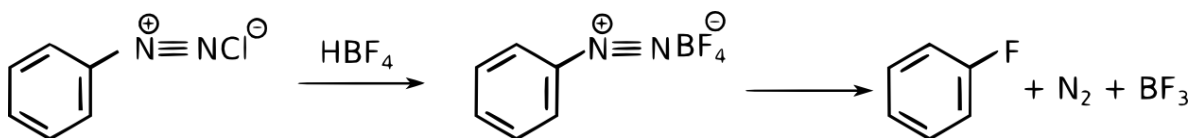
89.

Difficulty : Medium

Topics :

Halogen derivatives of Alkanes & Arenes,

Balz-Schiemann reaction



90.

Difficulty : Easy

Topics :

Solutions and its colligative properties,

$$\Delta T_b = \frac{K_b \times W_2 \times 1000}{W_1 \times M_2}$$

$$M_2 = \frac{K_b \times W_2}{\Delta T_b \times W_1}$$

91.

Difficulty : Easy

Topics :

P-block,

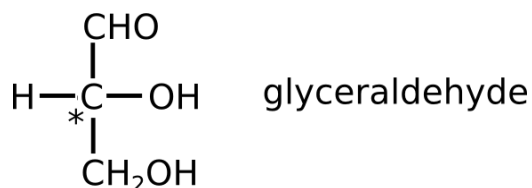
 Nitrogen exists as N_2

92.

Difficulty : Easy

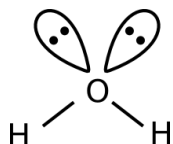
Topics :

BIOMOLECULES,



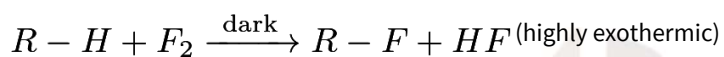
97.

Difficulty : Easy

Topics :
Nature of Chemical bond,


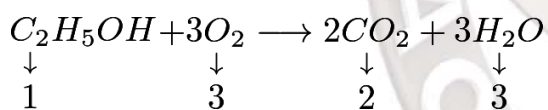
98.

Difficulty : Easy

Topics :
Alkanes,


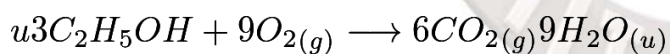
99.

Difficulty : Medium

Topics :
Thermodynamics,


$$0.138 \text{ kg} = 138/46 = 3 \text{ mole}$$

138 gm



$$\Delta H = 6 - 9 = -3$$

$$\text{Work} = -\Delta n RT$$

$$= -(-3) \times 8.314 \times 300$$

$$= 7482 \text{ J}$$

100.

Difficulty : Easy

Topics :

Chemical Kinetics,

$$K = Ae^{-E_a/RT}$$

$$= \ln k = \ln A - \frac{E_a}{RT}$$

$$\log k = \log A - \frac{E_a}{2.303R} \times \frac{1}{T}$$

$$y = mx + C$$

$$y = \log k \quad x = \frac{1}{T} \quad \text{Slope} = \frac{-E_a}{2.303R}$$

$$m = \frac{-E_a}{2.303R}$$

