MOTION IIT-JEE
(Where Faith Counts the Success)

TARGET IIT-JEE

HINT & SOLUTIONS

ANSWER KEY WITH SOLUTION

PAPER-I CLASS XI (DATE 22-02-10)

MATHEMATICS

SECTION - (A)

1. B **2.** D **3.** D **4.** D **5.** B **6.** C **7.** B **8.** B

SECTION - (B)

1. D **2.** B **3.** A,B,C **4.** A,B,C,D

SECTION - (C)

1. D **2.** B **3.** D **4.** B **5.** C **6.** D

SECTION - (D)

1. (A)–P,Q,R (B)–T (C)–T (D)–Q,S **2.** (A)–Q (B)–S (C)–P (D)–R

PHYSICS

SECTION - (A)

1. C **2.** C **3.** B **4.** B **5.** B **6.** B **7.** C **8.** A

SECTION - (B)

1. A,C **2.** D **3.** B,C **4.** A,B

SECTION - (C)

1. B **2.** D **3.** A **4.** A **5.** B **6.** B

SECTION - (D)

1. (A) → P,Q,R ; (B) → P, (C) → S, (D) → S **2.** (A) → P,Q,R ; (B) → Q,S ; (C) → P,Q,R ; (D) → R

CHEMISTRY

SECTION - (A)

1. B **2.** B **3.** B **4.** C **5** A **6.** D **7.** B **8.** A

SECTION - (B)

1. B, C, D **2.** A, C **3.** C,D **4.** A, C, D

SECTION - (C)

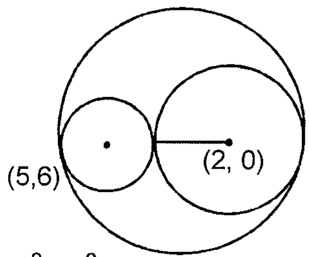
1. C **2.** D **3.** C **4.** C **5.** A **6.** B

SECTION - (D)

1. A → S ; B → Q,R ; C → Q ; D → P,S **2.** A → T ; B → Q,R ; C → P,T ; D → S

SECTION - (A)

1. **B**



$(x-2)^2 + y^2 = 4$

centre is (2,0) and radius 2

distance between (2,0) and (5, 6) is

$\sqrt{9+36} = 3\sqrt{5}$

$\therefore r_1 r_2 = \dfrac{3\sqrt{5}-2}{2} \cdot \dfrac{3\sqrt{5}+2}{2} = \dfrac{41}{4}$

2. **D**

$N = (5\sqrt{5} + 11)^{2n+1} = I + f \qquad \therefore 0 < f < 1$

Let $\quad f' = (5\sqrt{5} - 11)^{2n+1} \qquad \therefore 0 < f' < 1$

Now

$I + f - f' = (5\sqrt{5}+11)^{2n+1} - (5\sqrt{5}-11)^{2n+1}$

$= 2\left\{ {}^{(2n+1)}C_1 \left(5\sqrt{5}\right)^{2n} . 11^1 + {}^{(2n+1)}C_3 \left(5\sqrt{5}\right)^{2n-2} . 11^2 + ...\right\}$

= an even integer

$\Rightarrow f - f' = 0$ (i.e.) $f = f'$.

Hence $Nf = (I + f) f' = \left(5\sqrt{5}+11\right)^{2n+1}$.

$\left(5\sqrt{5}-11\right)^{2n+1} = (125 - 121)^{2n+1} = 4^{2n+1}$

3. **D**

$a_1 + a_3 + a_5 + ... + a_{199} = \beta$

$a_2 + a_4 + a_6 + ... + a_{200} = \alpha$

$a_2 - a_1 + a_4 - a_3 + a_6 - a_5 .... + a_{200} - a_{199}$
$= \alpha - \beta$

$d + d + d$ .... $d = \alpha - \beta$

$d = \dfrac{\alpha - \beta}{100}$

4. **D**

$x^2 + y^2 - 6x + 8y + 24 = 0$

Its centre is (3, – 4) & radius = 1

$\therefore$ least distance of (0, 0) from the circle

$= 5 - 1 = 4$

$\therefore \sqrt{x^2+y^2} = 4$ ie $x^2 + y^2 = 16$

$\therefore$ minimum value of $\log_2(x^2 + y^2) = \log_2 16 = 4$

5. **B**

For real roots $p^2 - 12q \ge 0$ ....(1)

$r^2 + 4q \ge 0$ ...(2)

$s^2 - 8q \ge 0$ ...(3)

for q > 0 equation (2) is true so

for q < 0 equation (1) & (3) is true so

so at least two real roots.

6. **C**

$\log_{\sin} \dfrac{|x|}{x} \Rightarrow \sin x \in (0, 1)$ and $x \in (0, \infty)$

$\therefore x \in \bigcup\limits_{n \in W} \left(2n\pi, 2n\pi + \dfrac{\pi}{2}\right) \cup \left(2n\pi + \dfrac{\pi}{2}, (2n+1)\pi\right)$

7. **B**

$\tan\dfrac{B-C}{2} = \dfrac{b-c}{b+c}\cot\dfrac{A}{2}$

$\dfrac{b-c}{b+c} = \dfrac{\tan\left(\dfrac{B-C}{2}\right)}{\tan\left(\dfrac{B+C}{2}\right)} \Rightarrow \dfrac{b-c}{b+c} = \dfrac{1}{3}$

By C & D rule

$\dfrac{b}{c} = \dfrac{2}{1}$

8. **B**

Let $y^2 = 4ax$, P(h, k) is middle point of a chord then its equation is $T = S_1$

$\Rightarrow yk - 2a(x + h) = k^2 - 4ah \Rightarrow yk - 2ax = k^2 - 2ah$

Making homogeneous equation of parabola with the help of equation of chord $y^2 = 4ax \dfrac{yk - 2ax}{k^2 - 2ah}$

$\Rightarrow (k^2 - 2ah) y^2 = 4ak\,xy - 8a^2x^2 \Rightarrow 8ax^2 + (k^2 - 2ah) y^2 - 4ak\,xy = 0$

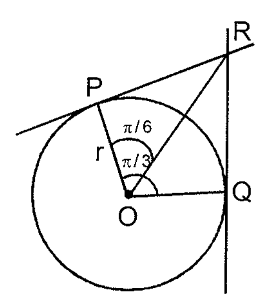
For perpendicular lines have $k^2 - 2ah + 8a = 0$

$\therefore$ Locus of P(h, k) is $y^2 - 2ax + 8a = 0$

which is a parabola.

SECTION - (B)

1. **D**



$OR = r\ \text{cosec}\ \frac{\pi}{3} = r \times \frac{2}{\sqrt{3}} = \frac{2r}{\sqrt{3}}$

Locus of R is

$$x^2 + y^2 = \left(\frac{2r}{\sqrt{3}}\right)^2 \Rightarrow x^2 + y^2 = \frac{4r^2}{3}$$

$$3(x^2 + y^2) = 4r^2$$

2. **B**

$y = x^3 + (p^2 + q^2 + r^2)\ x^2$

3. **A,B,C**

(A) $\tan A + \tan B + \tan C = \tan A \tan B \tan C = 0$

$\Rightarrow$ either of tan A, tan B or tan C is equal to zero which is not possible

(B) $\frac{\sin A}{2} = \frac{\sin B}{3} = \frac{\sin C}{1} \Rightarrow a = 2k,\ b = 3k,\ c = k$

$\Rightarrow b = a + c$ which is also not possible

(C) Since A, B, C all lie in $(0, \pi)$ hence $\sin A + \sin B$ can't be negative

(D) $(a + b)^2 = c^2 + ab \quad \Rightarrow$

$$\frac{a^2 + b^2 - c^2}{2ab} = -\frac{1}{2} = \cos C$$

$\Rightarrow \angle C = \frac{2\pi}{3}$, also $\sin A + \cos A = \frac{\sqrt{3}}{\sqrt{2}}$

$\Rightarrow 1 + \sin 2A = \frac{3}{2} \Rightarrow \sin 2A = \frac{1}{2} \Rightarrow 2A = 30^\circ$

$\Rightarrow \angle A = 15^\circ$

4. **A,B,C,D**

Since no point of the parabola is below x-axis

$\therefore\ a^2 - 4 \le 0$

$\therefore$ maximum value of a is = 2

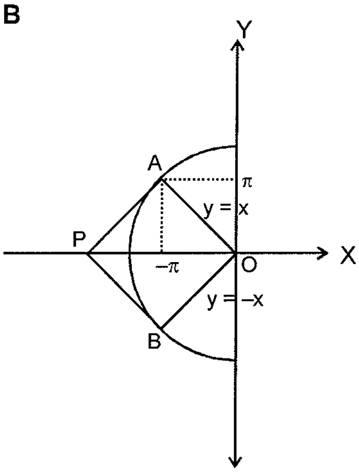
$a = [-2, 2]$

SECTION - (C)

Passage - 1 (Q. No. 1 to 3)

1. **D**

2. **B**



Centre $\left(-\sqrt{g}, -f\right)$

Given radius = $\pi\sqrt{2} \Rightarrow g + f^2 = 2\pi^2$

Now replace $-\sqrt{g} \rightarrow x (x < 0)$

$\& -f \rightarrow y$

Locus $x^2 + y^2 = 2\pi^2$; $x < 0$

Area of OAPB = $(\text{side})^2 = 2\pi^2$

3. **D**

Point obtained is A only, so no. of straight lines passing through A is infinite.

Passage-2 (Q. No. 4 to 6)

4. **B**

$$2!\frac{4!}{2!}\frac{4!}{2!2!} \div \frac{8!}{2!2!2!} = \frac{144}{5040} = \frac{1}{35}$$

5. **C**

$$^8C_4 \frac{4!}{2!} = \div \frac{8!}{2!2!2!} = \frac{840}{5040} = \frac{1}{6}$$

6. **D**

$$\frac{5!}{2!}\ {}^6C_2 \div \frac{8!}{2!2!2!} = \frac{900}{5040} = \frac{5}{28}$$

SECTION - (D)

1. **(A)–P,Q,R (B)–T (C)–T (D)–Q,S**

(A) $(e^x)^2 + (t^2 + 1)e^x - e^x - (t^2 + 1) = 0$

$e^x (e^x + t^2 + 1) - (e^x + t^2 + 1) = 0$

$e^x = 1$ or $e^x = -t^2 - 1$ not possible $(e^x > 0)$

(B) $x^2 + (\log_{\tan\theta/2} \sin 2\theta)\ x - \log_{1/\sqrt{2}} 2^7 = 0$

$\therefore\ \log_{\tan\theta/2} \sin 2\theta = 0$ at $\theta = \frac{\pi}{4}$

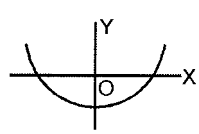
$x^2 + 14 = 0$

(C) $a^x + a^{-x} = 1$

minimum value of $a^x + a^{-x} = 2$

(D) $(s - a)\ x^2 + (2b + c)x + (r - 3R) = 0$

$f(0) < 0$



2. **(A)–Q (B)–S (C)–P (D)–R**

(A) Let the line by $y = mx$ ....(1)

solving it with

$5y = 2x^2 - 9x + 10$, we get

$5mx = 2x^2 - 9x + 10$

$2x^2 - (9 + 5m)x + 10 = 0$

sum of the roots = $\frac{9+5m}{2} = 77$

$\Rightarrow 9 + 5m = 154 \Rightarrow 5m = 145 \Rightarrow m = 29.$

(B) $\frac{\sin^4 x}{3} + \frac{(1-\sin^2 x)^4}{5} = \frac{1}{8}$

$\Rightarrow \frac{\sin^4 x}{3} + \frac{1+\sin^4 x - 2\sin^2 x}{5} = \frac{1}{8}$

$\Rightarrow 8(5\sin^4 x + 3 + 3\sin^4 x - 6\sin^2 x) = 15$

$\Rightarrow 64\sin^4 x - 48\sin^2 x + 9 = 0$

$(8\sin^2 x - 3)^2 = 0 \Rightarrow \sin^2 x = \frac{3}{8}$ and $\cos^2 x = \frac{5}{8}$

$\therefore \tan^2 x = \frac{3}{5} = \frac{24}{40}$

$\Rightarrow \frac{\sin^6 x}{9} + \frac{\cos^6 x}{25} = \frac{1}{64} = \frac{1}{24+40}$

$\Rightarrow 40 - 24 = 16$

(C) $E = x^2 + 6y^2 - 2xy + 6x - 16y + 18$

$= (x^2 + y^2 - 2xy + 6x - 6y + 9) + (5y^2 - 10y + 5) + 4$

$= (x - y + 3)^2 + 5(y - 1)^2 + 4$

Min. value for $y = 1$; $x = -2$; min. value is 4

(D) $175 = 5^2 . 7$; $245 = 5 . 7^2$; $875 = 5^3 . 7$; $1715 = 5 . 7^3$

$a = \frac{\log_5 175}{\log_5 245} = \frac{2+\log_5 7}{1+2\log_5 7}$

$\Rightarrow \log_5 7 = \frac{a-2}{1-2a}$ ....(1)

again $b = \frac{\log_5 875}{\log_5 1715} = \frac{3+\log_5 7}{1+3\log_5 7}$

$\Rightarrow \log_5 7 = \frac{b-3}{1-3b}$ ....(2)

from (1) and (2)

$\frac{a-2}{1-2a} = \frac{b-3}{1-3b} \Rightarrow \frac{1-ab}{a-b} = 5$

SECTION - (A)

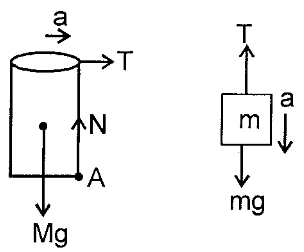
1. C

$mg - T = ma$ ...(1)

$T = Ma$ ...(2)

$a = \frac{mg}{M+m}$

$T = \frac{Mmg}{M+m}$ ...(3)



net torque about A = 0

$\Rightarrow Th = Mg\frac{h}{4}$ ...(4)

solving we get $\frac{m}{M} = \frac{1}{3}$

2. C

Let the height of point P above the ground be h.

$u\cos 53°\, t + h = \frac{1}{2}at^2$ ...(1)

$\frac{u\sin 53° - gt}{u\cos 53°} = 1$ ...(2)

$h = u\sin 53°\, t - \frac{1}{2}gt^2$ ...(3)

3. B

$\vec{F} = P\hat{i}$, $P_i = -mv_0 i$

initial force $\vec{F}_i = +mv_0\hat{i}$

power initially $= -mv_0^2$

$\frac{dP}{dt} = F = -P$

$P = P_i e^{-t}$

at $t \to \infty$

$\therefore$ Impulse $= mv_0$

also W.D. = change in K.E.

4. B

For maximum speed, acceleration is zero. i.e, forces balance.

$\Rightarrow mg = kx$

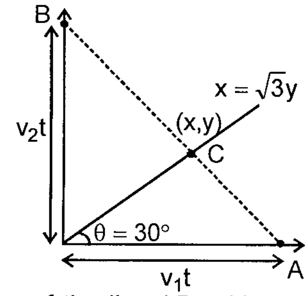
Applying conservation of energy, we have

kinetic energy = lost potential energy – strain energy in the rope

$\Rightarrow \frac{1}{2}mv^2 = mg(L + x) - \frac{1}{2}kx^2$, where $x = \frac{mg}{k}$ (by Hooke's law as it is elastic rope)

$\Rightarrow v^2 = 2g\left(L + \frac{mg}{k}\right) - \frac{mg^2}{k} \Rightarrow v = \sqrt{2gL + \frac{mg^2}{k}}$

5. B



Equation of the line AB, with coodinates $A(v_1t, 0)$ and $B(0, v_2t)$ is gtiven by

$$\frac{x}{v_1t} + \frac{y}{v_2t} = 1$$

As OC = vt, its coordinates are (vt cos 30°, vt sin 30°)

For points A, B and C to be collinear, the coordinates of C should lie on AB.

Hence.

$\frac{vt\cos 30°}{v_1t} + \frac{vt\sin 30°}{v_2t} = 1$ i.e, $\frac{\sqrt{3}v}{2v_1} + \frac{v}{2v_2} = 1$

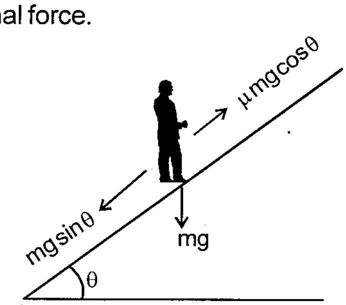
$\therefore v\left[\sqrt{3}v_2 + v_1\right] = 2v_1v_2$ $\therefore$ $v = \left(\frac{2v_1v_2}{v_1 + \sqrt{3}v_2}\right)$

6. B

7. C

Consider a man of mass m walking up the ramp. Then the forces acting on the man along the plane are

mg sin θ due to his weight and μ mg cos θ due to frictional force.



$\therefore$ mg sin θ – μ mg cos θ = 0, because the man is walking at a constant pace.

$\therefore \tan\theta = \frac{1}{\sqrt{3}}$

$\therefore$ θ = 30° which is the inclination of the plank with the horizontal.

Here $\sin\theta = \frac{2}{x}$ where x is the minimum length of the plank.

$\therefore x = \frac{2}{\sin 30°} = 4$ m

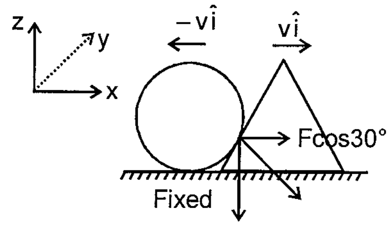
8. A

Due to expansion, the c.g. of sphere 1 will the rise while that of sphere 2 will fall.

SECTION - (B)

1. **A,C**

(i) Since, the collision is elastic, the wedge will return with velcoity $v\hat{i}$



Now, Linear impulse in x-direction = in momentum in x-direction.

$\therefore$ (F cos 30°) Δt = mv – (– mv) = 2mv

$$\therefore F = \frac{2mv}{\Delta t \cos 30^\circ} = \frac{4mv}{\sqrt{3}\,\Delta t} \Rightarrow F = \frac{4mv}{\sqrt{3}\,\Delta t}$$

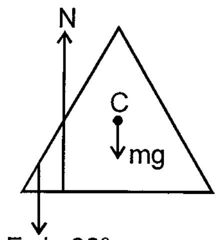
(ii) Taking the equilibrium of wedge in vertical z-direction during collision.

N = mg + F sin 30°

$$N = mg + \frac{2mv}{\sqrt{3}\,\Delta t}$$

or in vector from

$$\vec{N} = \left(mg + \frac{2mv}{\sqrt{3}\Delta t}\right)\hat{k}$$



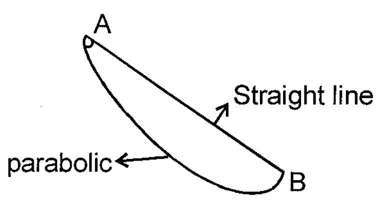
2. **D**

3. **B,C**

When a slab of ice at 273 K melts, volume of water formed is less than the volume of ice melted, i.e., volume decreases. Therefore work done by ice-water system is negative or positive. Work is done by the atmosphere on the ice-water system. This increases the internal energy of the ice water system.

4. **A,B**

Isothermal curve from A to b will be parabolic with lesser area under the curve than the area under the straight line AB. Therefore work done by the gas is going straight from A to B is more



Therefore choice (a) is correct

For the given process the equation is

$$P = \frac{P_0}{V_0}V + P_0$$

or $$\frac{RT}{V} = \frac{P_0}{V_0}V + P_0$$

or $$T = \frac{P_0}{V_0 R}V^2 + \frac{PV}{R}$$ which is the equation of a parabola. Therefore choice (B) is also correct.

SECTION - (C)

Paragraph Ques. No. 1 to 3

1. **B**
2. **D**
3. **A**

Paragraph Ques. No. 4 to 6

4. **A**

$$\omega' = \sqrt{\frac{k}{m+M}} = \sqrt{\frac{2500}{12+13}} = 10 \text{ rad/sec}$$

5. **B**

at $t = t_1 \Rightarrow x = A \sin 30^\circ = \frac{A}{2} = 0.05$ m

speed $v = \omega\sqrt{A^2 - x^2} = \sqrt{\frac{2500}{13}}\sqrt{(0.1)^2 - (0.05)^2}$

$$= \frac{1}{2}\sqrt{\frac{75}{13}}$$

from momentum conservation

$$Mv = (m + M)\, v_f$$

$$\frac{13}{2} \times \sqrt{\frac{75}{13}} = 25\, v_f \Rightarrow v_f = \frac{1}{2}\sqrt{\frac{13 \times 3}{25}}$$

$$\Rightarrow \text{T.E.} = \frac{1}{2}(m + M)\, v_f^2 + \frac{1}{2}kx^2$$

$$= \frac{1}{2} \times 25 \times \frac{1}{4} \times \frac{13 \times 3}{25} + \frac{1}{2} \times 2500 \times (0.05)^2$$

= 8 Joule

6. **B**

$$TE = \frac{1}{2}KA^2 \Rightarrow \frac{1}{2} \times 2500 \times A^2 = 8$$

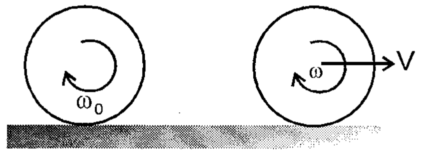
A = 8 cm

SECTION - (D)

1. **(A) → P,Q,R ; (B) → P, (C) → S, (D) → S**

(A)

(P)



$$I\,\omega_0 = I\,\omega + mvR \quad \Rightarrow \quad v = \frac{2}{7}R\omega_0$$

$v = \omega R$ for pure rolling

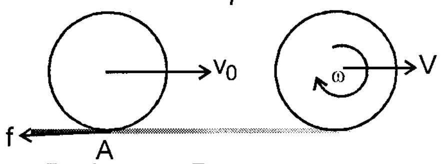
$$\omega = \frac{2}{7}\omega_0$$

$$\omega_{ft} = \frac{1}{2}mv^2 - 0 = \frac{2mR^2\omega_0^2}{49}$$

(Q) $w_{fR} = \frac{1}{2}I\omega^2 - \frac{1}{2}I\omega_0^2 = \frac{-9}{49}mR^2\omega_0^2$

(R) $w_{net} = w_{fR} + w_{fR} = -\frac{1}{7}mR^2\omega_0^2$

(B)



$mv_0R = I\,\omega + mv\,R$

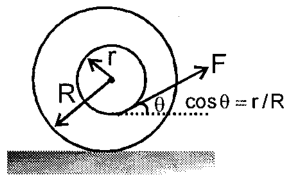
$v = \omega R$ for pure rolling

$$v = \frac{5v_0}{7}$$

$$w_{fT} = \frac{1}{2}mv^2 - \frac{1}{2}mv_0^2 = -\frac{12}{49}mv_0^2$$

(C) Pure Rolling $v_0 = R\omega_0$
work done by friction is zero.

(D)



for $\cos\theta = \frac{r}{R}$

Net work done by friction is zero.

2. (A) → P,Q,R ; (B) → Q,S ; (C) → P,Q,R ; (D) → R

(A) v increases w → +ve, T = const. $\Delta U = 0$
$\Delta Q = W > 0$

(B) Slop = const ⇒ V = const. W = 0, T increases
$\Delta U > 0$, $\Delta Q = \Delta U > 0$

(C) Clockwise W > 0 cyclic $\Delta U = 0$ $\Delta Q > 0$

(D) Anticlockwise Area > Clockwise Area W < 0,
Cyclic $\Delta U = 0$, $\Delta Q = W < 0$

CHEMISTRY

SECTION - (A)

1. B
2. B
3. B
4. C
5 A
6. D

$$CH_3Cl\,(aq) + OH^- \rightleftharpoons CH_3OH\,(aq) + Cl^-\,(aq)$$

t = 0	0.05	0.1	0	0
	y	0.1 − 0.05 = 0.05	0.05	0.05

$$\Rightarrow k = \frac{0.05\times0.05}{y\times0.05} \Rightarrow 1\times10^{16} = \frac{0.05\times0.05}{y\times0.05}$$

$$\Rightarrow y = 5\times10^{-18}$$

7. B

$$CO(g) + NO_2(g) \rightleftharpoons CO_2(g) + NO(g)$$

t = 0	1 mole	1 mole	1 mole	1 mole
Al eq.	1 − x	1 − x	1 + x	1 + x

$CO_2 + Ba(OH)_2 \rightarrow BaCO_3$

mole of $BaCO_3 = \frac{236.4}{197} = 1.2$

So mole of CO_2 at eq. = 1.2

or 1 + x = 1.2

x = 0.2

$$K_C = \left(\frac{1+x}{1-x}\right)^2 = \left(\frac{1.2}{0.8}\right)^2 = 2.25$$

8 A

Due to planarity of (A), the free radical is stabilised but in (B) steric inhibition of resonance the free radical is less stable.

SECTION - (B)

1. B, C, D

I & II : Positional isomer : I & III : cis & trans isomers ; II and III : Positional isomers.

2. A, C

$$\frac{P}{t+273} = \frac{1.2P}{t+273\times2}$$

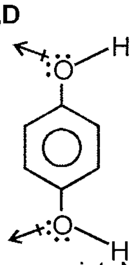
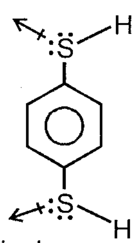
$1.2\,t + 273\times1.2 = t + 273\times2$

$\Rightarrow 0.2\,t = 273\times0.8$

$t = 273\times4 = 1092\ °C$

$= 1092 + 273 = 1365$ K

3. C,D

In  and 

there exist. Net dipole moment which is not zero.

4. A, C, D

SECTION - (C)

Paragraph for Questions Nos. 1 to 3

1. C

$$\frac{n_A/t}{n_B/t}=\frac{P_A}{P_B}\sqrt{\frac{M_B}{M_A}} \quad \frac{n_1M_1+n_2M_2}{n_1+n_2}=M_{mix}$$

$$X_1M_1+(1-X_1)M_2=M_{mix}$$

$$\Rightarrow \quad X_1=\frac{2}{5},\ \ X_2=\frac{3}{5}$$

$$\Rightarrow \quad \frac{x_A}{x_B}=\frac{2}{3}\sqrt{\frac{72}{128}}=\frac{1}{2} \Rightarrow \ X_A=\frac{1}{3},\ X_B=\frac{2}{3}$$

2. D

Initially $r_A=\frac{1000-900}{5}=20\ \text{torr/s}$

In the mix.

$$M_{mix}=X_AM_A+(1-X_A)M_B$$

$$\Rightarrow \quad \frac{472}{5}=X_A\times128+(1-X_A)72$$

$$\frac{472}{5}=56X_A+72$$

$$472=280X_A+360$$

$$X_A=\frac{112}{280}=\frac{2}{5},\ X_B=\frac{3}{5}$$

The mix.

$$\frac{r_A}{r'_A}=\frac{P_A.'A_1'}{P_AA_2}$$

$$\frac{r_A}{r_A'}=\frac{1}{2}\times\frac{x^2}{x\times\frac{3x}{2}}=\frac{1}{3}$$

$$r_A'=3r_A=3\times20=60\ \text{torr/s}$$

$$\frac{r'_{A^0}}{r'_{B^0}}=\frac{P'_A}{P'_B}\sqrt{\frac{M_B}{M_A}}=\frac{2}{3}\times\sqrt{\frac{72}{128}}=\frac{1}{2}$$

$r_B'=120\ \text{torr/s}$

After 20 sec

$$P_A''=2000-60\times20=800\ \text{torr}$$

$$P_B''=3000-120\times20=600\ \text{torr}$$

$$\frac{n''_A}{n''_B}=\frac{4}{3}$$

3. C

$2000-60t=3000-120t$

$$60t=1000 \qquad \Rightarrow \quad t=\frac{50}{3}\sec$$

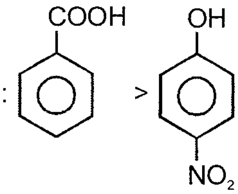
Paragraph for Questions Nos. 4 to 6

4. C

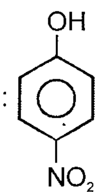
In 2, 4-Dinitrophenol both nitrosubstituents are involved in resonance stabilisation.

5. A

From first reaction Ka :

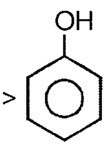


From second reaction Ka :



$> H_2CO_3$

From third reaction Ka : $H_2CO_3 >$



Since a strong acid displaces a weak acidic from its salt and forms its own salt.

6. B

$$\text{stability}\ \alpha\ \frac{1}{\text{heat of hydrogenation}}$$

(p) $H_3C-HC=CH-HC=CH_2 \longleftrightarrow$

$$H_3C-H\overset{\oplus}{C}-CH=HC-\overset{\ominus}{C}H_2$$

3.H.C.+ Resonance

(q) $H_2C=CH-HC=CH_2 \longleftrightarrow H_2\overset{\oplus}{C}-CH=HC-\overset{\ominus}{C}H_2$

Resonance

(r) $H_2C=C(CH_3)-C(CH_3)=CH_2 \longleftrightarrow H_2\overset{\ominus}{C}-C(CH_3)=C(CH_3)-\overset{\oplus}{C}H_2$

6 H – H.C. Resonance

(s) $H_2C=C=CH_2$ then the order of heat of hydro-
$s>q>p>r$

genation is

SECTION - (D)

1. **A → S ; B → Q,R ; C → Q ; D → P,S**

2. **A → T ; B → Q,R ; C → P,T ; D → S**