

## JEE April 2024

Application No	240310426561
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Subject	B. Tech

Section : Mathematics Section A

**Q.1**

The values of m, n, for which the system of equations

$$\begin{aligned}x + y + z &= 4, \\2x + 5y + 5z &= 17, \\x + 2y + mz &= n\end{aligned}$$

has infinitely many solutions, satisfy the equation :

**Options**

1.  $m^2 + n^2 + mn = 68$
2.  $m^2 + n^2 + m + n = 64$
3.  $m^2 + n^2 - m - n = 46$
4.  $m^2 + n^2 - mn = 39$

Question Type : MCQ

Question ID : 87827055701

Option 1 ID : 878270219063

Option 2 ID : 878270219065

Option 3 ID : 878270219066

Option 4 ID : 878270219064

Status : Not Answered

Chosen Option : --

**Q.2**

Let  $\alpha\beta \neq 0$  and  $A = \begin{bmatrix} \beta & \alpha & 3 \\ \alpha & \alpha & \beta \\ -\beta & \alpha & 2\alpha \end{bmatrix}$ . If  $B = \begin{bmatrix} 3\alpha & -9 & 3\alpha \\ -\alpha & 7 & -2\alpha \\ -2\alpha & 5 & -2\beta \end{bmatrix}$  is the matrix of cofactors of the elements

of A, then  $\det(AB)$  is equal to :

**Options**

1. 64
2. 343
3. 216
4. 125

Question Type : MCQ

Question ID : 87827055702

Option 1 ID : 878270219068

Option 2 ID : 878270219070

Option 3 ID : 878270219069

Option 4 ID : 878270219067

Status : Not Answered

Chosen Option : --

**Q.3** Let the set  $S = \{2, 4, 8, 16, \dots, 512\}$  be partitioned into 3 sets A, B, C with equal number of elements such that  $A \cup B \cup C = S$  and  $A \cap B = B \cap C = A \cap C = \emptyset$ . The maximum number of such possible partitions of S is equal to :

**Options**

1. 1520
2. 1710
3. 1640
4. 1680

Question Type : **MCQ**  
Question ID : **87827055698**  
Option 1 ID : **878270219052**  
Option 2 ID : **878270219051**  
Option 3 ID : **878270219054**  
Option 4 ID : **878270219053**  
Status : **Not Answered**  
Chosen Option : --

**Q.4** The differential equation of the family of circles passing through the origin and having centre at the line  $y=x$  is :

**Options**

1.  $(x^2 - y^2 + 2xy)dx = (x^2 - y^2 + 2xy)dy$
2.  $(x^2 + y^2 + 2xy)dx = (x^2 + y^2 - 2xy)dy$
3.  $(x^2 + y^2 - 2xy)dx = (x^2 + y^2 + 2xy)dy$
4.  $(x^2 - y^2 + 2xy)dx = (x^2 - y^2 - 2xy)dy$

Question Type : **MCQ**  
Question ID : **87827055710**  
Option 1 ID : **878270219101**  
Option 2 ID : **878270219102**  
Option 3 ID : **878270219100**  
Option 4 ID : **878270219099**  
Status : **Not Answered**  
Chosen Option : --

**Q.5** The area enclosed between the curves  $y=x|x|$  and  $y=x-|x|$  is :

Options

1.  $\frac{8}{3}$
2. 1
3.  $\frac{4}{3}$
4.  $\frac{2}{3}$

Question Type : MCQ

Question ID : 87827055709

Option 1 ID : 878270219098

Option 2 ID : 878270219095

Option 3 ID : 878270219097

Option 4 ID : 878270219096

Status : Not Answered

Chosen Option : --

**Q.6** 60 words can be made using all the letters of the word BHBJO, with or without meaning. If these words are written as in a dictionary, then the 50<sup>th</sup> word is :

Options

1. OBBHJ
2. JBBOH
3. OBBJH
4. HBBJO

Question Type : MCQ

Question ID : 87827055703

Option 1 ID : 878270219071

Option 2 ID : 878270219074

Option 3 ID : 878270219072

Option 4 ID : 878270219073

Status : Answered

Chosen Option : 3

**Q.7**

If the constant term in the expansion of  $\left(\frac{\sqrt[5]{3}}{x} + \frac{2x}{\sqrt[3]{5}}\right)^{12}$ ,  $x \neq 0$ , is  $\alpha \times 2^8 \times \sqrt[5]{3}$ , then  $25\alpha$  is equal to :

**Options**

1. 742
2. 693
3. 724
4. 639

Question Type : MCQ

Question ID : 87827055706

Option 1 ID : 878270219083

Option 2 ID : 878270219086

Option 3 ID : 878270219085

Option 4 ID : 878270219084

Status : Not Answered

Chosen Option : --

**Q.8**

Let  $f: [-1, 2] \rightarrow \mathbb{R}$  be given by  $f(x) = 2x^2 + x + [x^2] - [x]$ , where  $[t]$  denotes the greatest integer less than or equal to  $t$ . The number of points, where  $f$  is not continuous, is :

**Options**

1. 3
2. 4
3. 6
4. 5

Question Type : MCQ

Question ID : 87827055707

Option 1 ID : 878270219090

Option 2 ID : 878270219089

Option 3 ID : 878270219087

Option 4 ID : 878270219088

Status : Not Answered

Chosen Option : --

**Q.9**

For  $x \geq 0$ , the least value of  $K$ , for which  $4^{1+x} + 4^{1-x}$ ,  $\frac{K}{2}$ ,  $16^x + 16^{-x}$  are three consecutive terms of an A.P., is equal to :

**Options**

1. 8
2. 10
3. 4
4. 16

Question Type : MCQ

Question ID : 87827055705

Option 1 ID : 878270219080

Option 2 ID : 878270219079

Option 3 ID : 878270219081

Option 4 ID : 878270219082

Status : Not Answered

Chosen Option : --

**Q.10**

Let  $\beta(m, n) = \int_0^1 x^{m-1} (1-x)^{n-1} dx$ ,  $m, n > 0$ . If  $\int_0^1 (1-x^{10})^{20} dx = a \times \beta(b, c)$ , then  $100(a+b+c)$  equals \_\_\_\_\_.

**Options**

1. 2120
2. 1120
3. 2012
4. 1021

Question Type : **MCQ**Question ID : **87827055708**Option 1 ID : **878270219091**Option 2 ID : **878270219094**Option 3 ID : **878270219092**Option 4 ID : **878270219093**Status : **Not Answered**

Chosen Option : --

**Q.11**

If  $y(\theta) = \frac{2 \cos \theta + \cos 2\theta}{\cos 3\theta + 4 \cos 2\theta + 5 \cos \theta + 2}$ , then at  $\theta = \frac{\pi}{2}$ ,  $y'' + y' + y$  is equal to :

**Options**

1.  $\frac{1}{2}$
2. 2
3. 1
4.  $\frac{3}{2}$

Question Type : **MCQ**Question ID : **87827055717**Option 1 ID : **878270219127**Option 2 ID : **878270219130**Option 3 ID : **878270219128**Option 4 ID : **878270219129**Status : **Not Answered**

Chosen Option : --

**Q.12** Let A(-1, 1) and B(2, 3) be two points and P be a variable point above the line AB such that the area of  $\Delta PAB$  is 10. If the locus of P is  $ax + by = 15$ , then  $5a + 2b$  is :

**Options**

1. 4

2.  $-\frac{6}{5}$

3.  $-\frac{12}{5}$

4. 6

Question Type : MCQ

Question ID : 87827055713

Option 1 ID : 878270219111

Option 2 ID : 878270219113

Option 3 ID : 878270219114

Option 4 ID : 878270219112

Status : Not Answered

Chosen Option : --

**Q.13** Let the circle  $C_1 : x^2 + y^2 - 2(x + y) + 1 = 0$  and  $C_2$  be a circle having centre at (-1, 0) and radius 2. If the line of the common chord of  $C_1$  and  $C_2$  intersects the y-axis at the point P, then the square of the distance of P from the centre of  $C_1$  is :

**Options**

1. 4

2. 1

3. 2

4. 6

Question Type : MCQ

Question ID : 87827055712

Option 1 ID : 878270219109

Option 2 ID : 878270219107

Option 3 ID : 878270219108

Option 4 ID : 878270219110

Status : Not Answered

Chosen Option : --

**Q.14** Let ABCD and AEFG be squares of side 4 and 2 units, respectively. The point E is on the line segment AB and the point F is on the diagonal AC. Then the radius r of the circle passing through the point F and touching the line segments BC and CD satisfies :

**Options**

1.  $r = 1$
2.  $2r^2 - 4r + 1 = 0$
3.  $2r^2 - 8r + 7 = 0$
4.  $r^2 - 8r + 8 = 0$

Question Type : **MCQ**

Question ID : **87827055711**

Option 1 ID : **878270219103**

Option 2 ID : **878270219106**

Option 3 ID : **878270219105**

Option 4 ID : **878270219104**

Status : **Not Answered**

Chosen Option : --

**Q.15** Let  $\vec{a} = 2\hat{i} + 5\hat{j} - \hat{k}$ ,  $\vec{b} = 2\hat{i} - 2\hat{j} + 2\hat{k}$  and  $\vec{c}$  be three vectors such that

$(\vec{c} + \hat{i}) \times (\vec{a} + \vec{b} + \hat{i}) = \vec{a} \times (\vec{c} + \hat{i})$ . If  $\vec{a} \cdot \vec{c} = -29$ , then  $\vec{c} \cdot (-2\hat{i} + \hat{j} + \hat{k})$  is equal to :

**Options**

1. 15
2. 12
3. 5
4. 10

Question Type : **MCQ**

Question ID : **87827055715**

Option 1 ID : **878270219119**

Option 2 ID : **878270219120**

Option 3 ID : **878270219122**

Option 4 ID : **878270219121**

Status : **Not Answered**

Chosen Option : --

**Q.16**

Let  $(\alpha, \beta, \gamma)$  be the image of the point  $(8, 5, 7)$  in the line  $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-2}{5}$ . Then  $\alpha + \beta + \gamma$  is equal to :

**Options**

1. 16
2. 20
3. 14
4. 18

Question Type : MCQ

Question ID : 87827055714

Option 1 ID : 878270219117

Option 2 ID : 878270219115

Option 3 ID : 878270219118

Option 4 ID : 878270219116

Status : Not Answered

Chosen Option : --

**Q.17**

Consider three vectors  $\vec{a}, \vec{b}, \vec{c}$ . Let  $|\vec{a}| = 2, |\vec{b}| = 3$  and  $\vec{a} = \vec{b} \times \vec{c}$ . If  $\alpha \in \left[0, \frac{\pi}{3}\right]$  is the angle

between the vectors  $\vec{b}$  and  $\vec{c}$ , then the minimum value of  $27|\vec{c} - \vec{a}|^2$  is equal to :

**Options**

1. 105
2. 121
3. 124
4. 110

Question Type : MCQ

Question ID : 87827055716

Option 1 ID : 878270219123

Option 2 ID : 878270219126

Option 3 ID : 878270219124

Option 4 ID : 878270219125

Status : Not Answered

Chosen Option : --

**Q.18** The coefficients a, b, c in the quadratic equation  $ax^2 + bx + c = 0$  are from the set {1, 2, 3, 4, 5, 6}. If the probability of this equation having one real root bigger than the other is p, then  $216p$  equals :

Options

1. 19
2. 38
3. 57
4. 76

Question Type : MCQ

Question ID : 87827055704

Option 1 ID : 878270219075

Option 2 ID : 878270219076

Option 3 ID : 878270219077

Option 4 ID : 878270219078

Status : Not Answered

Chosen Option : --

**Q.19**

Let  $S_1 = \{z \in \mathbb{C} : |z| \leq 5\}$ ,  $S_2 = \left\{ z \in \mathbb{C} : \operatorname{Im}\left(\frac{z+1-\sqrt{3}i}{1-\sqrt{3}i}\right) \geq 0 \right\}$  and  $S_3 = \{z \in \mathbb{C} : \operatorname{Re}(z) \geq 0\}$ . Then  
the area of the region  $S_1 \cap S_2 \cap S_3$  is :

Options

1.  $\frac{125\pi}{24}$
2.  $\frac{125\pi}{4}$
3.  $\frac{125\pi}{12}$
4.  $\frac{125\pi}{6}$

Question Type : MCQ

Question ID : 87827055700

Option 1 ID : 878270219059

Option 2 ID : 878270219060

Option 3 ID : 878270219062

Option 4 ID : 878270219061

Status : Not Answered

Chosen Option : --

**Q.20** Let  $f, g : \mathbf{R} \rightarrow \mathbf{R}$  be defined as :

$$f(x) = |x - 1| \text{ and } g(x) = \begin{cases} e^x, & x \geq 0 \\ x + 1, & x \leq 0. \end{cases}$$

Then the function  $f(g(x))$  is

**Options**

1. onto but not one-one.
2. neither one-one nor onto.
3. one-one but not onto.
4. both one-one and onto.

Question Type : **MCQ**

Question ID : **87827055699**

Option 1 ID : **878270219057**

Option 2 ID : **878270219058**

Option 3 ID : **878270219056**

Option 4 ID : **878270219055**

Status : **Not Answered**

Chosen Option : --

Section : Mathematics Section B

**Q.21**

If  $1 + \frac{\sqrt{3} - \sqrt{2}}{2\sqrt{3}} + \frac{5 - 2\sqrt{6}}{18} + \frac{9\sqrt{3} - 11\sqrt{2}}{36\sqrt{3}} + \frac{49 - 20\sqrt{6}}{180} + \dots$  upto  $\infty = 2 + \left(\sqrt{\frac{b}{a}} + 1\right) \log_e\left(\frac{a}{b}\right)$ , where a and b are integers with  $\gcd(a, b) = 1$ , then  $11a + 18b$  is equal to \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055719**

Status : **Not Answered**

**Q.22**

The number of solutions of  $\sin^2 x + (2 + 2x - x^2) \sin x - 3(x-1)^2 = 0$ , where  $-\pi \leq x \leq \pi$ , is \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055718**

Status : **Not Answered**

**Q.23**

Let the point  $(-1, \alpha, \beta)$  lie on the line of the shortest distance between the lines

$$\frac{x+2}{-3} = \frac{y-2}{4} = \frac{z-5}{2} \text{ and } \frac{x+2}{-1} = \frac{y+6}{2} = \frac{z-1}{0}. \text{ Then } (\alpha - \beta)^2 \text{ is equal to } _____.$$

Given --

Answer :

Question Type : **SA**

Question ID : **87827055725**

Status : **Not Answered**

- Q.24** Let a line perpendicular to the line  $2x - y = 10$  touch the parabola  $y^2 = 4(x - 9)$  at the point P. The distance of the point P from the centre of the circle  $x^2 + y^2 - 14x - 8y + 56 = 0$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055724**  
Status : **Not Answered**

- Q.25** Let the maximum and minimum values of  $(\sqrt{8x - x^2 - 12} - 4)^2 + (x - 7)^2$ ,  $x \in \mathbb{R}$  be M and m, respectively. Then  $M^2 - m^2$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055721**  
Status : **Not Answered**

- Q.26** Let the mean and the standard deviation of the probability distribution

X	$\alpha$	1	0	-3
P(X)	$\frac{1}{3}$	K	$\frac{1}{6}$	$\frac{1}{4}$

be  $\mu$  and  $\sigma$ , respectively. If  $\sigma - \mu = 2$ , then  $\sigma + \mu$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055726**  
Status : **Not Answered**

- Q.27** Let  $y = y(x)$  be the solution of the differential equation

$$\frac{dy}{dx} + \frac{2x}{(1+x^2)^2} y = xe^{\frac{1}{(1+x^2)}} ; y(0) = 0 .$$

Then the area enclosed by the curve  $f(x) = y(x) e^{-\frac{1}{(1+x^2)}}$  and the line  $y - x = 4$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055723**  
Status : **Not Answered**

- Q.28** The number of real solutions of the equation  $x|x+5| + 2|x+7| - 2 = 0$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055727**  
Status : **Not Answered**

**Q.29**

If  $f(t) = \int_0^{\pi} \frac{2x \, dx}{1 - \cos^2 t \sin^2 x}$ ,  $0 < t < \pi$ , then the value of  $\int_0^{\frac{\pi}{2}} \frac{\pi^2 \, dt}{f(t)}$  equals \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055722**Status : **Not Answered****Q.30**

Let  $a > 0$  be a root of the equation  $2x^2 + x - 2 = 0$ . If  $\lim_{x \rightarrow \frac{1}{a}} \frac{16(1 - \cos(2 + x - 2x^2))}{(1 - ax)^2} = \alpha + \beta \sqrt{17}$ ,  
where  $\alpha, \beta \in \mathbb{Z}$ , then  $\alpha + \beta$  is equal to \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055720**Status : **Not Answered**

## Section : Physics Section A

**Q.31**

A series LCR circuit is subjected to an ac signal of 200 V, 50 Hz. If the voltage across the inductor ( $L = 10 \text{ mH}$ ) is 31.4 V, then the current in this circuit is \_\_\_\_\_.

**Options 1.**1.  63 A2.  10 mA3.  10 A4.  68 A

Physics English

Physics English

Physics English

Physics English

Question Type : **MCQ**Question ID : **87827055738**Option 1 ID : **878270219183**Option 2 ID : **878270219182**Option 3 ID : **878270219181**Option 4 ID : **878270219184**Status : **Not Answered**

Chosen Option : --

**Q.32**

- A man carrying a monkey on his shoulder does cycling smoothly on a circular track of radius 9 m and completes 120 revolutions in 3 minutes. The magnitude of centripetal acceleration of monkey is (in  $\text{m/s}^2$ ) :

**Options 1.**

1.  $16\pi^2 \text{ ms}^{-2}$

2.

3.  $4\pi^2 \text{ ms}^{-2}$

4.

5.  $57600\pi^2 \text{ ms}^{-2}$

6. Zero

Question Type : MCQ

Question ID : 87827055729

Option 1 ID : 878270219147

Option 2 ID : 878270219146

Option 3 ID : 878270219148

Option 4 ID : 878270219145

Status : Not Answered

Chosen Option : --

**Q.33**

- What is the dimensional formula of  $ab^{-1}$  in the equation  $\left(P + \frac{a}{V^2}\right)(V - b) = RT$ , where letters have their usual meaning.

**Options 1.**

1.  $[\text{ML}^2\text{T}^{-2}]$

2.

3.  $[\text{M}^{-1}\text{L}^5\text{T}^3]$

4.

5.  $[\text{M}^6\text{L}^7\text{T}^4]$

6.

7.  $[\text{M}^0\text{L}^3\text{T}^{-2}]$

Question Type : MCQ

Question ID : 87827055728

Option 1 ID : 878270219141

Option 2 ID : 878270219142

Option 3 ID : 878270219144

Option 4 ID : 878270219143

Status : Answered

Chosen Option : 1

**Q.34**

- A vernier callipers has 20 divisions on the vernier scale, which coincides with 19<sup>th</sup> division on the main scale. The least count of the instrument is 0.1 mm. One main scale division is equal to \_\_\_\_\_ mm.

**Options 1.**

- 5
- 1
- 0.5
- 2

Physics English

Physics English

Physics English

Physics English

Physics English

Question Type : MCQ

Question ID : 87827055733

Option 1 ID : 878270219161

Option 2 ID : 878270219163

Option 3 ID : 878270219164

Option 4 ID : 878270219162

Status : Not Attempted and  
Marked For Review

Chosen Option : --

**Q.35**

- During an adiabatic process, if the pressure of a gas is found to be proportional to the cube of its absolute temperature, then the ratio of  $\frac{C_p}{C_v}$  for the gas is :

**Options 1.**

- $\frac{3}{2}$
- $\frac{9}{7}$
- $\frac{5}{3}$
- $\frac{7}{5}$

Physics English

Physics English

Physics English

Physics English

Question Type : MCQ

Question ID : 87827055746

Option 1 ID : 878270219213

Option 2 ID : 878270219216

Option 3 ID : 878270219214

Option 4 ID : 878270219215

Status : Not Answered

Chosen Option : --

**Q.36**

If  $n$  is the number density and  $d$  is the diameter of the molecule, then the average distance covered by a molecule between two successive collisions (i.e. mean free path) is represented by :

**Options 1.**

$$\frac{1}{\sqrt{2} n \pi d^2}$$

2.

$$\sqrt{2} n \pi d^2$$

3.

$$\frac{1}{\sqrt{2} n^2 \pi^2 d^2}$$

4.

$$\frac{1}{\sqrt{2n\pi d^2}}$$

Question Type : MCQ

Question ID : 87827055736

Option 1 ID : 878270219173

Option 2 ID : 878270219175

Option 3 ID : 878270219176

Option 4 ID : 878270219174

Status : Not Answered

Chosen Option : --

**Q.37**

A body is moving unidirectionally under the influence of a constant power source. Its displacement in time  $t$  is proportional to :

**Options 1.**

$$t^{3/2}$$

2.

$$t^2$$

3.

$$t^{2/3}$$

4.

$$t$$

Question Type : MCQ

Question ID : 87827055732

Option 1 ID : 878270219158

Option 2 ID : 878270219160

Option 3 ID : 878270219159

Option 4 ID : 878270219157

Status : Not Answered

Chosen Option : --

**Q.38**

The angular momentum of an electron in a hydrogen atom is proportional to :  
(Where  $r$  is the radius of orbit of electron)

**Options 1.**

1.  $\sqrt{r}$

2.

$\frac{1}{\sqrt{r}}$

3.

$\frac{1}{r}$

4.

$r$

Physics English

Physics English

Physics English

Physics English

Physics English

Question Type : **MCQ**Question ID : **87827055745**Option 1 ID : **878270219209**Option 2 ID : **878270219210**Option 3 ID : **878270219212**Option 4 ID : **878270219211**Status : **Marked For Review**Chosen Option : **3****Q.39**

Match List-I with List-II :

**List-I**

- (A) A force that restores an elastic body of unit area to its original state (I) Bulk modulus
- (B) Two equal and opposite forces parallel to opposite faces (II) Young's modulus
- (C) Forces perpendicular everywhere to the surface per unit area (III) Stress
- (D) Two equal and opposite forces perpendicular to opposite faces (IV) Shear modulus

Choose the **correct** answer from the options given below :**Options 1.**

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

2.

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

3.

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

4.

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

Physics English

Physics English

Physics English

Physics English

Physics English

Question Type : **MCQ**Question ID : **87827055735**Option 1 ID : **878270219172**Option 2 ID : **878270219171**Option 3 ID : **878270219169**Option 4 ID : **878270219170**Status : **Not Answered**

Chosen Option : --

**Q.40**

Given below are two statements :

**Statement I :** When the white light passed through a prism, the red light bends lesser than yellow and violet.

**Statement II :** The refractive indices are different for different wavelengths in dispersive medium.

In the light of the above statements, chose the **correct** answer from the options given below :

**Options 1.**

1. Both Statement I and Statement II are false

2.

Both Statement I and Statement II are true

3.

Statement I is false but Statement II is true

4.

Statement I is true but Statement II is false

Question Type : **MCQ**

Question ID : **87827055742**

Option 1 ID : **878270219198**

Option 2 ID : **878270219197**

Option 3 ID : **878270219200**

Option 4 ID : **878270219199**

Status : **Marked For Review**

Chosen Option : **2**

**Q.41**

A heavy box of mass 50 kg is moving on a horizontal surface. If co-efficient of kinetic friction between the box and horizontal surface is 0.3 then force of kinetic friction is :

**Options 1.**

1. 14.7 N

2.

1470 N

3.

1.47 N

4.

147 N

Question Type : **MCQ**

Question ID : **87827055730**

Option 1 ID : **878270219150**

Option 2 ID : **878270219152**

Option 3 ID : **878270219149**

Option 4 ID : **878270219151**

Status : **Not Answered**

Chosen Option : --

**Q.42**

The electrostatic force  $(\vec{F}_1)$  and magnetic force  $(\vec{F}_2)$  acting on a charge  $q$  moving with velocity  $v$  can be written :

**Options 1.**

1.  $\vec{F}_1 = q \vec{E}, \vec{F}_2 = q(\vec{V} \times \vec{B})$

2.

2.  $\vec{F}_1 = q \vec{B}, \vec{F}_2 = q(\vec{B} \times \vec{V})$

3.

3.  $\vec{F}_1 = q \vec{E}, \vec{F}_2 = q(\vec{B} \times \vec{V})$

4.

4.  $\vec{F}_1 = q \vec{V} \cdot \vec{E}, \vec{F}_2 = q(\vec{B} \cdot \vec{V})$

Question Type : MCQ

Question ID : 87827055740

Option 1 ID : 878270219190

Option 2 ID : 878270219191

Option 3 ID : 878270219189

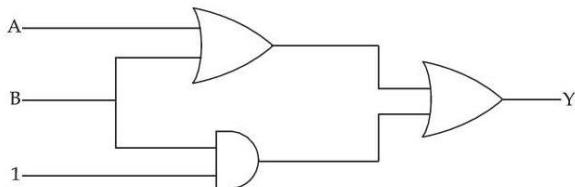
Option 4 ID : 878270219192

Status : Answered

Chosen Option : 1

**Q.43**

The output ( $Y$ ) of logic circuit given below is 0 only when :

**Options 1.**

1.  $A = 1, B = 0$

2.

2.  $A = 0, B = 1$

3.

3.  $A = 0, B = 0$

4.

4.  $A = 1, B = 1$

Question Type : MCQ

Question ID : 87827055747

Option 1 ID : 878270219218

Option 2 ID : 878270219219

Option 3 ID : 878270219217

Option 4 ID : 878270219220

Status : Answered

Chosen Option : 3

**Q.44**

A galvanometer of resistance  $100 \Omega$  when connected in series with  $400 \Omega$  measures a voltage of upto 10 V. The value of resistance required to convert the galvanometer into ammeter to read upto 10 A is  $x \times 10^{-2} \Omega$ . The value of  $x$  is :

**Options 1.**

- 2
- 20
- 800
- 200

Physics English

Physics English

Physics English

Physics English

Physics English

Question Type : MCQ

Question ID : 87827055743

Option 1 ID : 878270219202

Option 2 ID : 878270219201

Option 3 ID : 878270219204

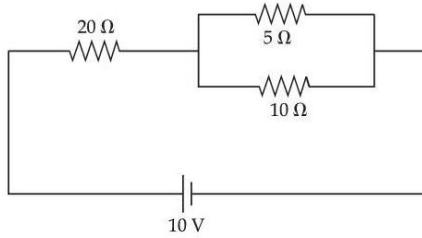
Option 4 ID : 878270219203

Status : Marked For Review

Chosen Option : 4

**Q.45**

The ratio of heat dissipated per second through the resistance  $5 \Omega$  and  $10 \Omega$  in the circuit given below is :

**Options 1.**

- 2 : 1
- 1 : 2
- 1 : 1
- 4 : 1

Physics English

Physics English

Physics English

Physics English

Question Type : MCQ

Question ID : 87827055739

Option 1 ID : 878270219186

Option 2 ID : 878270219185

Option 3 ID : 878270219187

Option 4 ID : 878270219188

Status : Answered

Chosen Option : 2

**Q.46**

Which of the following statement is **not** true about stopping potential ( $V_0$ ) ?

**Options 1.**

1. It is  $1/e$  times the maximum kinetic energy of electrons emitted.
2. It depends upon frequency of the incident light.
3. It increases with increase in intensity of the incident light.
4. It depends on the nature of emitter material.

Question Type : MCQ

Question ID : 87827055744

Option 1 ID : 878270219208

Option 2 ID : 878270219205

Option 3 ID : 878270219207

Option 4 ID : 878270219206

Status : Marked For Review

Chosen Option : 4

**Q.47**

The vehicles carrying inflammable fluids usually have metallic chains touching the ground :

**Options 1.**

1. To conduct excess charge due to air friction to ground and prevent sparking
2. To protect tyres from catching dirt from ground
3. It is a custom
4. To alert other vehicles

Question Type : MCQ

Question ID : 87827055737

Option 1 ID : 878270219179

Option 2 ID : 878270219177

Option 3 ID : 878270219180

Option 4 ID : 878270219178

Status : Marked For Review

Chosen Option : 1

**Q.48**

A satellite revolving around a planet in stationary orbit has time period 6 hours. The mass of planet is one-fourth the mass of earth. The radius orbit of planet is :  
 (Given = Radius of geo-stationary orbit for earth is  $4.2 \times 10^4$  km)

**Options 1.**

- 1.  $8.4 \times 10^4$  km
- 2.  $1.4 \times 10^4$  km
- 3.  $1.68 \times 10^5$  km
- 4.  $1.05 \times 10^4$  km

Question Type : MCQ

Question ID : 87827055734

Option 1 ID : 878270219166

Option 2 ID : 878270219165

Option 3 ID : 878270219168

Option 4 ID : 878270219167

Status : Marked For Review

Chosen Option : 2

**Q.49**

A particle moves in  $x-y$  plane under the influence of a force  $\vec{F}$  such that its linear momentum is  $\vec{p}(t) = \hat{i} \cos(kt) - \hat{j} \sin(kt)$ . If  $k$  is constant, the angle between  $\vec{F}$  and  $\vec{p}$  will be :

**Options 1.**

- 1.  $\frac{\pi}{2}$
- 2.  $\frac{\pi}{3}$
- 3.  $\frac{\pi}{4}$
- 4.  $\frac{\pi}{6}$

Question Type : MCQ

Question ID : 87827055731

Option 1 ID : 878270219153

Option 2 ID : 878270219154

Option 3 ID : 878270219155

Option 4 ID : 878270219156

Status : Not Answered

Chosen Option : --

**Q.50**

Match List-I with List-II :

List-I	List-II
EM-Wave	Wavelength Range
(A) Infra-red	(I) $< 10^{-3}$ nm
(B) Ultraviolet	(II) 400 nm to 1 nm
(C) X-rays	(III) 1 mm to 700 nm
(D) Gamma rays	(IV) 1 nm to $10^{-3}$ nm

Choose the correct answer from the options given below :

**Options 1.**

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

**2.**

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

**3.**

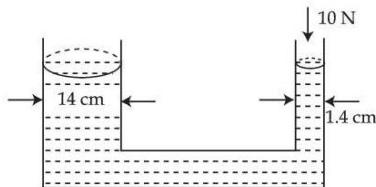
(A)-(II), (B)-(I), (C)-(IV), (D)-(III)

**4.**

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

Question Type : **MCQ**Question ID : **87827055741**Option 1 ID : **878270219196**Option 2 ID : **878270219194**Option 3 ID : **878270219193**Option 4 ID : **878270219195**Status : **Answered**Chosen Option : **2**

Section : Physics Section B

**Q.51**

A hydraulic press containing water has two arms with diameters as mentioned in the figure. A force of 10 N is applied on the surface of water in the thinner arm. The force required to be applied on the surface of water in the thicker arm to maintain equilibrium of water is \_\_\_\_\_ N.

Given --

Answer :

Question Type : **SA**Question ID : **87827055751**Status : **Not Answered****Q.52**

A sonometer wire of resonating length 90 cm has a fundamental frequency of 400 Hz when kept under some tension. The resonating length of the wire with fundamental frequency of 600 Hz under same tension \_\_\_\_\_ cm.

Given --

Answer :

Question Type : **SA**Question ID : **87827055752**Status : **Not Answered**

**Q.53**

- The shortest wavelength of the spectral lines in the Lyman series of hydrogen spectrum is 915 Å. The longest wavelength of spectral lines in the Balmer series will be \_\_\_\_\_ Å.

Given **6588**

Answer :

Question Type : **SA**Question ID : **87827055757**Status : **Answered****Q.54**

- A solenoid of length 0.5 m has a radius of 1 cm and is made up of 'm' number of turns. It carries a current of 5 A. If the magnitude of the magnetic field inside the solenoid is  $6.28 \times 10^{-3}$  T then the value of m is \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055754**Status : **Not Answered****Q.55**

- The current in an inductor is given by  $I = (3t + 8)$  where t is in second. The magnitude of induced emf produced in the inductor is 12 mV. The self-inductance of the inductor \_\_\_\_\_ mH.

Given --

Answer :

Question Type : **SA**Question ID : **87827055756**Status : **Not Answered****Q.56**

- A hollow sphere is rolling on a plane surface about its axis of symmetry. The ratio of rotational kinetic energy to its total kinetic energy is  $\frac{x}{5}$ . The value of x is \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055749**Status : **Not Answered****Q.57**

- In a single slit experiment, a parallel beam of green light of wavelength 550 nm passes through a slit of width 0.20 mm. The transmitted light is collected on a screen 100 cm away. The distance of first order minima from the central maximum will be  $x \times 10^{-5}$  m. The value of x is :

Given --

Answer :

Question Type : **SA**Question ID : **87827055750**Status : **Not Answered****Q.58**

- The maximum height reached by a projectile is 64 m. If the initial velocity is halved, the new maximum height of the projectile is \_\_\_\_\_ m.

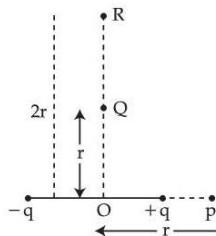
Given **16**

Answer :

Question Type : **SA**Question ID : **87827055748**Status : **Answered**

**Q.59**

- The electric field at point p due to an electric dipole is E. The electric field at point R on equitorial line will be  $\frac{E}{x}$ . The value of x :



Given --

Answer :

Question Type : **SA**Question ID : **87827055755**Status : **Not Answered****Q.60**

- A wire of resistance  $20 \Omega$  is divided into 10 equal parts, resulting pairs. A combination of two parts are connected in parallel and so on. Now resulting pairs of parallel combination are connected in series. The equivalent resistance of final combination is \_\_\_\_\_  $\Omega$ .

Given 25

Answer :

Question Type : **SA**Question ID : **87827055753**Status : **Answered**

Section : Chemistry Section A

**Q.61**

Given below are two statements :

**Statement I :** The metallic radius of Na is  $1.86 \text{ \AA}$  and the ionic radius of  $\text{Na}^+$  is lesser than  $1.86 \text{ \AA}$ .

**Statement II :** Ions are always smaller in size than the corresponding elements.

In the light of the above statements, choose the correct answer from the options given below :

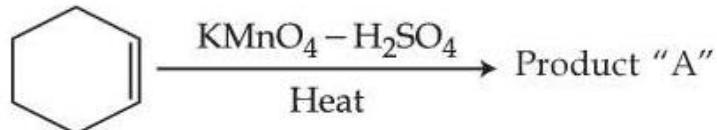
Options

1. Both **Statement I** and **Statement II** are true
2. **Statement I** is incorrect but **Statement II** is true
3. **Statement I** is correct but **Statement II** is false
4. Both **Statement I** and **Statement II** are false

Question Type : **MCQ**Question ID : **87827055763**Option 1 ID : **878270219251**Option 2 ID : **878270219254**Option 3 ID : **878270219253**Option 4 ID : **878270219252**Status : **Marked For Review**Chosen Option : **3**

Q.62

Consider the given chemical reaction :



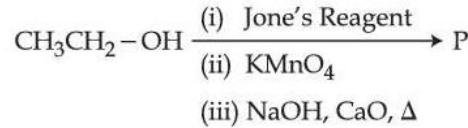
Product "A" is :

Options

1. picric acid
2. acetic acid
3. adipic acid
4. oxalic acid

Question Type : MCQ  
 Question ID : 87827055776  
 Option 1 ID : 878270219306  
 Option 2 ID : 878270219303  
 Option 3 ID : 878270219305  
 Option 4 ID : 878270219304  
 Status : Not Answered  
 Chosen Option : --

Q.63



Consider the above reaction sequence and identify the major product P.

Options

1. Methanoic acid
2. Methoxymethane
3. Methanal
4. Methane

Question Type : MCQ  
 Question ID : 87827055775  
 Option 1 ID : 878270219301  
 Option 2 ID : 878270219302  
 Option 3 ID : 878270219299  
 Option 4 ID : 878270219300  
 Status : Not Answered  
 Chosen Option : --

**Q.64** Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

**Assertion (A) :** NH<sub>3</sub> and NF<sub>3</sub> molecule have pyramidal shape with a lone pair of electrons on nitrogen atom. The resultant dipole moment of NH<sub>3</sub> is greater than that of NF<sub>3</sub>.

**Reason (R) :** In NH<sub>3</sub>, the orbital dipole due to lone pair is in the same direction as the resultant dipole moment of the N – H bonds. F is the most electronegative element.

In the light of the above statements, choose the **correct** answer from the options given below :

**Options 1.**

Both **(A)** and **(R)** are true but **(R)** is NOT the correct explanation of **(A)**

2. **(A)** is true but **(R)** is false

3. **(A)** is false but **(R)** is true

4.

Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**

Question Type : **MCQ**

Question ID : **87827055759**

Option 1 ID : **878270219236**

Option 2 ID : **878270219237**

Option 3 ID : **878270219238**

Option 4 ID : **878270219235**

Status : **Answered**

Chosen Option : **2**

**Q.65** The metal atom present in the complex MABXL (where A, B, X and L are unidentate ligands and M is metal) involves sp<sup>3</sup> hybridization. The number of geometrical isomers exhibited by the complex is :

**Options**

1. **4**

2. **2**

3. **0**

4. **3**

Question Type : **MCQ**

Question ID : **87827055767**

Option 1 ID : **878270219270**

Option 2 ID : **878270219268**

Option 3 ID : **878270219267**

Option 4 ID : **878270219269**

Status : **Not Answered**

Chosen Option : --

**Q.66****Match List - I with List - II.**

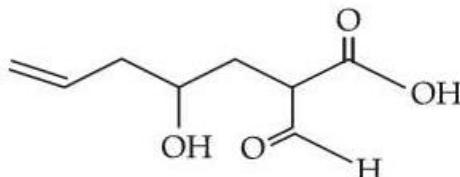
List - I	List - II
(A) $\text{ICl}$	(I) T - shape
(B) $\text{ICl}_3$	(II) Square pyramidal
(C) $\text{ClF}_5$	(III) Pentagonal bipyramidal
(D) $\text{IF}_7$	(IV) Linear

Choose the **correct** answer from the options given below :**Options**

1. (A)-(IV), (B)-(I), (C)-(II), (D)-(III)
2. (A)-(I), (B)-(IV), (C)-(III), (D)-(II)
3. (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
4. (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

Question Type : **MCQ**Question ID : **87827055764**Option 1 ID : **878270219258**Option 2 ID : **878270219256**Option 3 ID : **878270219257**Option 4 ID : **878270219255**Status : **Marked For Review**Chosen Option : **1****Q.67**

The correct nomenclature for the following compound is :

**Options**

1. 2-formyl-4-hydroxyhept-6-enoic acid
2. 2-carboxy-4-hydroxyhept-7-enal
3. 2-carboxy-4-hydroxyhept-6-enal
4. 2-formyl-4-hydroxyhept-7-enoic acid

Question Type : **MCQ**Question ID : **87827055770**Option 1 ID : **878270219281**Option 2 ID : **878270219279**Option 3 ID : **878270219280**Option 4 ID : **878270219282**Status : **Answered**Chosen Option : **1**

**Q.68** While preparing crystals of Mohr's salt, dil  $H_2SO_4$  is added to a mixture of ferrous sulphate and ammonium sulphate, before dissolving this mixture in water, dil  $H_2SO_4$  is added here to :

**Options**

1. prevent the hydrolysis of ammonium sulphate
2. make the medium strongly acidic
3. prevent the hydrolysis of ferrous sulphate
4. increase the rate of formation of crystals

Question Type : **MCQ**

Question ID : **87827055769**

Option 1 ID : **878270219275**

Option 2 ID : **878270219276**

Option 3 ID : **878270219277**

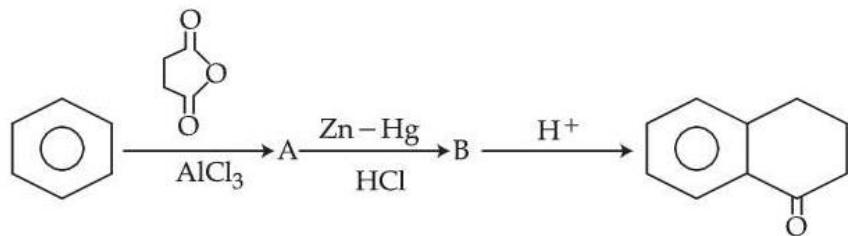
Option 4 ID : **878270219278**

Status : **Not Answered**

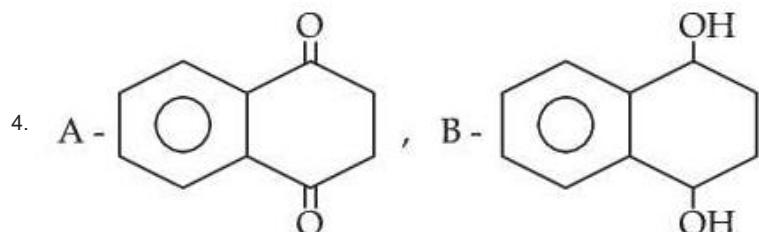
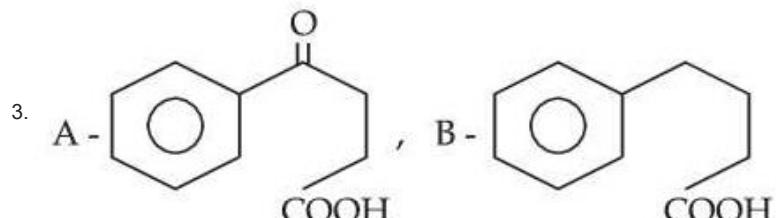
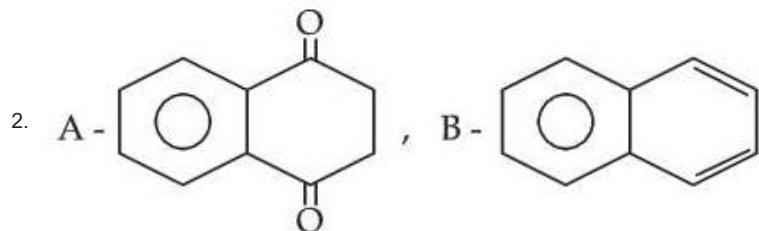
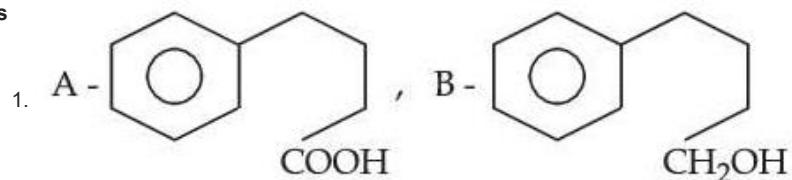
Chosen Option : --

**Q.69**

Identify A and B in the given chemical reaction sequence :



Options



Question Type : MCQ

Question ID : 87827055772

Option 1 ID : 878270219288

Option 2 ID : 878270219290

Option 3 ID : 878270219287

Option 4 ID : 878270219289

Status : Not Answered

Chosen Option : --

**Q.70** The number of complexes from the following with no electrons in the  $t_2$  orbital is \_\_\_\_\_.  
 $\text{TiCl}_4^-$ ,  $[\text{MnO}_4]^-$ ,  $[\text{FeO}_4]^{2-}$ ,  $[\text{FeCl}_4]^-$ ,  $[\text{CoCl}_4]^{2-}$

**Options**

1. 2
2. 3
3. 4
4. 1

Question Type : MCQ

Question ID : 87827055768

Option 1 ID : 878270219273

Option 2 ID : 878270219272

Option 3 ID : 878270219271

Option 4 ID : 878270219274

Status : Not Attempted and  
Marked For Review

Chosen Option : --

**Q.71** The number of ions from the following that have the ability to liberate hydrogen from a dilute acid is \_\_\_\_\_.  
 $\text{Ti}^{2+}$ ,  $\text{Cr}^{2+}$  and  $\text{V}^{2+}$

**Options**

1. 3
2. 0
3. 2
4. 1

Question Type : MCQ

Question ID : 87827055766

Option 1 ID : 878270219266

Option 2 ID : 878270219263

Option 3 ID : 878270219265

Option 4 ID : 878270219264

Status : Not Answered

Chosen Option : --

**Q.72** Match List - I with List - II.

List - I (Pair of Compounds)	List - II (Isomerism)
(A) n-propanol and Isopropanol	(I) Metamerism
(B) Methoxypropane and ethoxyethane	(II) Chain Isomerism
(C) Propanone and propanal	(III) Position Isomerism
(D) Neopentane and Isopentane	(IV) Functional Isomerism

Choose the **correct** answer from the options given below :

**Options**

1. (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
2. (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
3. (A)-(III), (B)-(I), (C)-(II), (D)-(IV)
4. (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

Question Type : **MCQ**

Question ID : **87827055771**

Option 1 ID : **878270219285**

Option 2 ID : **878270219286**

Option 3 ID : **878270219284**

Option 4 ID : **878270219283**

Status : **Answered**

Chosen Option : **4**

**Q.73** Given below are two statements :

**Statement I :** On passing  $\text{HCl}_{(\text{g})}$  through a saturated solution of  $\text{BaCl}_2$ , at room temperature white turbidity appears.

**Statement II :** When HCl gas is passed through a saturated solution of NaCl, sodium chloride is precipitated due to common ion effect.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

**Options** 1.

**Statement I** is correct but **Statement II** is incorrect

2. Both **Statement I** and **Statement II** are incorrect
3. Both **Statement I** and **Statement II** are correct
- 4.

**Statement I** is incorrect but **Statement II** is correct

Question Type : **MCQ**

Question ID : **87827055760**

Option 1 ID : **878270219241**

Option 2 ID : **878270219240**

Option 3 ID : **878270219239**

Option 4 ID : **878270219242**

Status : **Not Answered**

Chosen Option : --

**Q.74**

Coagulation of egg, on heating is because of :

**Options 1.**

Breaking of the peptide linkage in the primary structure of protein occurs

2. Denaturation of protein occurs
3. Biological property of protein remains unchanged
- 4.

The secondary structure of protein remains unchanged

Question Type : MCQ

Question ID : 87827055777

Option 1 ID : 878270219307

Option 2 ID : 878270219310

Option 3 ID : 878270219308

Option 4 ID : 878270219309

Status : Answered

Chosen Option : 2

**Q.75**

The quantity of silver deposited when one coulomb charge is passed through  $\text{AgNO}_3$  solution :

**Options**

1. 1 chemical equivalent of silver
2. 1 g of silver
3. 0.1 g atom of silver
4. 1 electrochemical equivalent of silver

Question Type : MCQ

Question ID : 87827055762

Option 1 ID : 878270219250

Option 2 ID : 878270219247

Option 3 ID : 878270219248

Option 4 ID : 878270219249

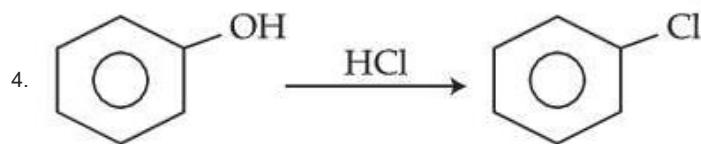
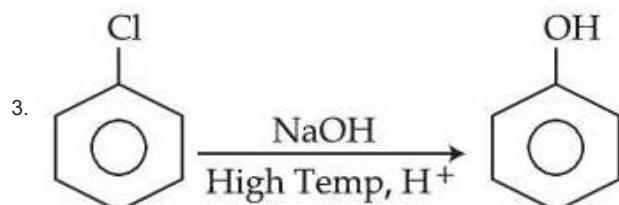
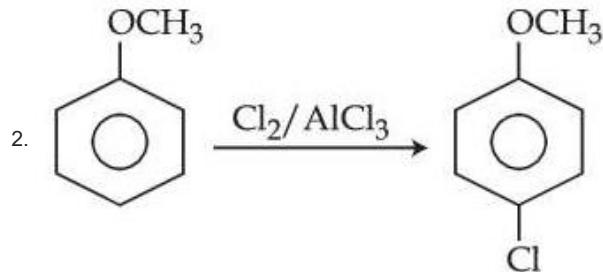
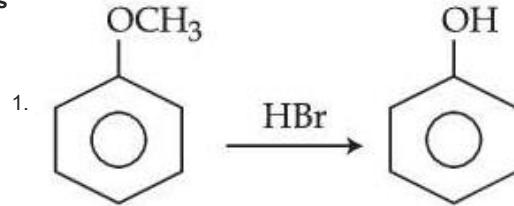
Status : Marked For Review

Chosen Option : 4

**Q.76**

Which one of the following reactions is NOT possible ?

Options



Question Type : MCQ

Question ID : 87827055773

Option 1 ID : 878270219294

Option 2 ID : 878270219293

Option 3 ID : 878270219292

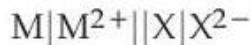
Option 4 ID : 878270219291

Status : Marked For Review

Chosen Option : 1

**Q.77**

For the electro chemical cell



If  $E_{(\text{M}^{2+}/\text{M})}^0 = 0.46 \text{ V}$  and  $E_{(\text{X}/\text{X}^{2-})}^0 = 0.34 \text{ V}$ .

Which of the following is **correct** ?

**Options**

1.  $\text{M}^{2+} + \text{X}^{2-} \rightarrow \text{M} + \text{X}$  is a spontaneous reaction
2.  $E_{\text{cell}} = 0.80 \text{ V}$
3.  $E_{\text{cell}} = -0.80 \text{ V}$
4.  $\text{M} + \text{X} \rightarrow \text{M}^{2+} + \text{X}^{2-}$  is a spontaneous reaction

Question Type : **MCQ**

Question ID : **87827055761**

Option 1 ID : **878270219244**

Option 2 ID : **878270219245**

Option 3 ID : **878270219246**

Option 4 ID : **878270219243**

Status : **Not Answered**

Chosen Option : --

**Q.78**

The **correct** statements from the following are :

- (A) The decreasing order of atomic radii of group 13 elements is Tl > In > Ga > Al > B.
- (B) Down the group 13 electronegativity decreases from top to bottom.
- (C) Al dissolves in dil. HCl and liberates  $\text{H}_2$  but conc.  $\text{HNO}_3$  renders Al passive by forming a protective oxide layer on the surface.
- (D) All elements of group 13 exhibits highly stable +1 oxidation state.
- (E) Hybridisation of Al in  $[\text{Al}(\text{H}_2\text{O})_6]^{3+}$  ion is  $\text{sp}^3\text{d}^2$ .

Choose the **correct** answer from the options given below :

**Options**

1. (A), (B), (C) and (E) only
2. (C) and (E) only
3. (A), (C) and (E) only
4. (A) and (C) only

Question Type : **MCQ**

Question ID : **87827055765**

Option 1 ID : **878270219261**

Option 2 ID : **878270219260**

Option 3 ID : **878270219262**

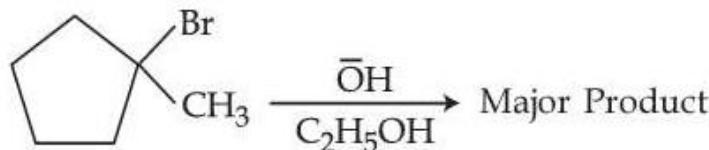
Option 4 ID : **878270219259**

Status : **Marked For Review**

Chosen Option : **1**

**Q.79**

Identify the major product in the following reaction.

**Options**

- 1.
- 2.
- 3.
- 4.

Question Type : MCQ

Question ID : 87827055774

Option 1 ID : 878270219298

Option 2 ID : 878270219296

Option 3 ID : 878270219297

Option 4 ID : 878270219295

Status : Marked For Review

Chosen Option : 2

**Q.80** The number of moles of methane required to produce 11 g  $CO_2(g)$  after complete combustion is :  
(Given molar mass of methane in  $g\ mol^{-1}$  : 16)

**Options**

1. 0.5
2. 0.25
3. 0.75
4. 0.35

Question Type : MCQ

Question ID : 87827055758

Option 1 ID : 878270219232

Option 2 ID : 878270219231

Option 3 ID : 878270219233

Option 4 ID : 878270219234

Status : Not Answered

Chosen Option : --

- Q.81** In the Claisen-Schmidt reaction to prepare 351 g of dibenzalacetone using 87 g of acetone, the amount of benzaldehyde required is \_\_\_\_\_ g. (Nearest integer)

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055784**  
Status : **Not Answered**

- Q.82** The fusion of chromite ore with sodium carbonate in the presence of air leads to the formation of products A and B along with the evolution of  $\text{CO}_2$ . The sum of spin-only magnetic moment values of A and B is \_\_\_\_\_ B.M. (Nearest integer)  
[Given atomic number : C : 6, Na : 11, O : 8, Fe : 26, Cr : 24]

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055783**  
Status : **Not Answered**

- Q.83** Using the given figure, the ratio of  $R_f$  values of sample A and sample C is  $x \times 10^{-2}$ . Value of x is \_\_\_\_\_.

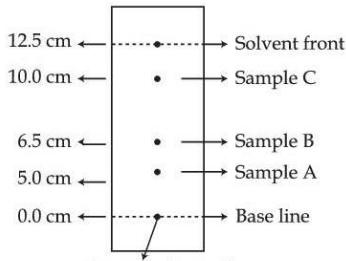


Fig : Paper chromatography of Samples

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055785**  
Status : **Not Answered**

- Q.84** Number of compounds from the following with zero dipole moment is \_\_\_\_\_.  
 $\text{HF}$ ,  $\text{H}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{CO}_2$ ,  $\text{NH}_3$ ,  $\text{BF}_3$ ,  $\text{CH}_4$ ,  $\text{CHCl}_3$ ,  $\text{SiF}_4$ ,  $\text{H}_2\text{O}$ ,  $\text{BeF}_2$

Given 5  
Answer :

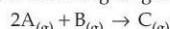
Question Type : **SA**  
Question ID : **87827055779**  
Status : **Answered**

- Q.85** In an atom, total number of electrons having quantum numbers  $n=4$ ,  $|m_l|=1$  and  $m_s = -\frac{1}{2}$  is \_\_\_\_\_.

Given 3  
Answer :

Question Type : **SA**  
Question ID : **87827055778**  
Status : **Marked For Review**

**Q.86** Consider the following single step reaction in gas phase at constant temperature.



The initial rate of the reaction is recorded as  $r_1$  when the reaction starts with 1.5 atm pressure of A and 0.7 atm pressure of B. After some time, the rate  $r_2$  is recorded when the pressure of C becomes 0.5 atm. The ratio  $r_1 : r_2$  is \_\_\_\_\_  $\times 10^{-1}$ . (Nearest integer)

Given --

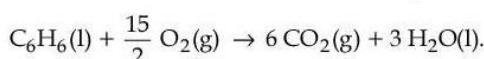
Answer :

Question Type : **SA**

Question ID : **87827055782**

Status : **Not Answered**

**Q.87** Combustion of 1 mole of benzene is expressed at

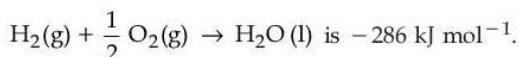


The standard enthalpy of combustion of 2 mol of benzene is  $-'x'$  kJ.

$$x = \text{_____}.$$

Given :

1. standard Enthalpy of formation of 1 mol of  $C_6H_6(l)$ , for the reaction  $6 C$  (graphite) +  $3 H_2(g)$   $\rightarrow C_6H_6(l)$  is  $48.5 \text{ kJ mol}^{-1}$ .
2. Standard Enthalpy of formation of 1 mol of  $CO_2(g)$ , for the reaction  $C$  (graphite) +  $O_2(g)$   $\rightarrow CO_2(g)$  is  $-393.5 \text{ kJ mol}^{-1}$ .
3. Standard and Enthalpy of formation of 1 mol of  $H_2O(l)$ , for the reaction



Given --

Answer :

Question Type : **SA**

Question ID : **87827055780**

Status : **Not Answered**

**Q.88** Considering acetic acid dissociates in water, its dissociation constant is  $6.25 \times 10^{-5}$ . If 5 mL of acetic acid is dissolved in 1 litre water, the solution will freeze at  $-x \times 10^{-2} \text{ }^{\circ}\text{C}$ , provided pure water freezes at  $0 \text{ }^{\circ}\text{C}$ .

$$x = \text{_____}. \text{ (Nearest integer)}$$

$$\text{Given : } (K_f)_{\text{water}} = 1.86 \text{ K kg mol}^{-1}.$$

density of acetic acid is  $1.2 \text{ g mol}^{-1}$ .

molar mass of water =  $18 \text{ g mol}^{-1}$ .

molar mass of acetic acid =  $60 \text{ g mol}^{-1}$ .

density of water =  $1 \text{ g cm}^{-3}$



Given --

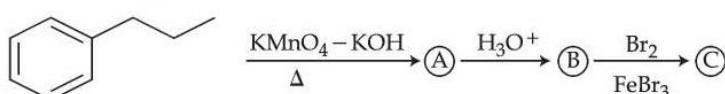
Answer :

Question Type : **SA**

Question ID : **87827055781**

Status : **Not Answered**

**Q.89** The product **(C)** in the following sequence of reactions has \_\_\_\_\_  $\pi$  bonds.



Given --

Answer :

Question Type : **SA**

Question ID : **87827055786**

Status : **Not Answered**

**Q.90**

X g of ethanamine was subjected to reaction with  $\text{NaNO}_2/\text{HCl}$  followed by hydrolysis to liberate  $\text{N}_2$  and  $\text{HCl}$ . The  $\text{HCl}$  generated was completely neutralised by 0.2 moles of  $\text{NaOH}$ . X is \_\_\_\_\_ g.

Given --

Answer :

Question Type : **SA**Question ID : **87827055787**Status : **Not Answered**