

**JEE April 2024**

Application No	240310591416
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Test Date	05/04/2024
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Subject	B. Tech

## Section : Mathematics Section A

**Q.1** Let  $A = \{1, 3, 7, 9, 11\}$  and  $B = \{2, 4, 5, 7, 8, 10, 12\}$ . Then the total number of one-one maps  $f: A \rightarrow B$ , such that  $f(1) + f(3) = 14$ , is :

**Options**

- 1. 240
- 2. 180
- 3. 120
- 4. 480

Question Type : **MCQ**Question ID : **87827055608**Option 1 ID : **878270218783**Option 2 ID : **878270218782**Option 3 ID : **878270218781**Option 4 ID : **878270218784**Status : **Not Answered**

Chosen Option : --

**Q.2**

For the function

$$f(x) = \sin x + 3x - \frac{2}{\pi}(x^2 + x), \text{ where } x \in \left[0, \frac{\pi}{2}\right],$$

consider the following two statements :

(I)  $f$  is increasing in  $\left(0, \frac{\pi}{2}\right)$ .(II)  $f'$  is decreasing in  $\left(0, \frac{\pi}{2}\right)$ .

Between the above two statements,

**Options**

1. both (I) and (II) are true.
2. neither (I) nor (II) is true.
3. only (I) is true.
4. only (II) is true.

Question Type : **MCQ**Question ID : **87827055612**Option 1 ID : **878270218800**Option 2 ID : **878270218799**Option 3 ID : **878270218797**Option 4 ID : **878270218798**Status : **Not Answered**

Chosen Option : --

**Q.3**

The integral  $\int_0^{\frac{\pi}{4}} \frac{136 \sin x}{3 \sin x + 5 \cos x} dx$  is equal to :

**Options**

1.  $3\pi - 30 \log_e 2 + 20 \log_e 5$
2.  $3\pi - 25 \log_e 2 + 10 \log_e 5$
3.  $3\pi - 10 \log_e(2\sqrt{2}) + 10 \log_e 5$
4.  $3\pi - 50 \log_e 2 + 20 \log_e 5$

Question Type : MCQ

Question ID : 87827055618

Option 1 ID : 878270218822

Option 2 ID : 878270218823

Option 3 ID : 878270218821

Option 4 ID : 878270218824

Status : Not Answered

Chosen Option : --

**Q.4**

Suppose  $\theta \in \left[0, \frac{\pi}{4}\right]$  is a solution of  $4 \cos \theta - 3 \sin \theta = 1$ . Then  $\cos \theta$  is equal to :

**Options**

1.  $\frac{4}{(3\sqrt{6} - 2)}$
2.  $\frac{6 - \sqrt{6}}{(3\sqrt{6} - 2)}$
3.  $\frac{4}{(3\sqrt{6} + 2)}$
4.  $\frac{6 + \sqrt{6}}{(3\sqrt{6} + 2)}$

Question Type : MCQ

Question ID : 87827055627

Option 1 ID : 878270218858

Option 2 ID : 878270218857

Option 3 ID : 878270218859

Option 4 ID : 878270218860

Status : Not Answered

Chosen Option : --

**Q.5** Let A and B be two square matrices of order 3 such that  $|A| = 3$  and  $|B| = 2$ . Then  $\left| A^T A (\text{adj}(2A))^{-1} (\text{adj}(4B)) (\text{adj}(AB))^{-1} A A^T \right|$  is equal to :

**Options**

1. 32
2. 81
3. 64
4. 108

Question Type : MCQ

Question ID : 87827055610

Option 1 ID : 878270218789

Option 2 ID : 878270218791

Option 3 ID : 878270218790

Option 4 ID : 878270218792

Status : Answered

Chosen Option : 3

**Q.6** Let a circle C of radius 1 and closer to the origin be such that the lines passing through the point (3, 2) and parallel to the coordinate axes touch it. Then the shortest distance of the circle C from the point (5, 5) is :

**Options**

1.  $4\sqrt{2}$
2. 4
3.  $2\sqrt{2}$
4. 5

Question Type : MCQ

Question ID : 87827055620

Option 1 ID : 878270218832

Option 2 ID : 878270218831

Option 3 ID : 878270218830

Option 4 ID : 878270218829

Status : Not Answered

Chosen Option : --

**Q.7** Let the line  $2x + 3y - k = 0$ ,  $k > 0$ , intersect the  $x$ -axis and  $y$ -axis at the points A and B, respectively. If the equation of the circle having the line segment AB as a diameter is  $x^2 + y^2 - 3x - 2y = 0$  and the length of the latus rectum of the ellipse  $x^2 + 9y^2 = k^2$  is  $\frac{m}{n}$ , where m and n are coprime, then  $2m+n$  is equal to

- Options**
1. 13
  2. 11
  3. 10
  4. 12

Question Type : MCQ

Question ID : 87827055622

Option 1 ID : 878270218840

Option 2 ID : 878270218838

Option 3 ID : 878270218837

Option 4 ID : 878270218839

Status : Not Answered

Chosen Option : --

**Q.8** Let  $f(x) = x^5 + 2x^3 + 3x + 1$ ,  $x \in \mathbb{R}$ , and  $g(x)$  be a function such that  $g(f(x)) = x$  for all  $x \in \mathbb{R}$ . Then

$\frac{g(7)}{g'(7)}$  is equal to :

- Options**
1. 42
  2. 14
  3. 1
  4. 7

Question Type : MCQ

Question ID : 87827055615

Option 1 ID : 878270218812

Option 2 ID : 878270218811

Option 3 ID : 878270218809

Option 4 ID : 878270218810

Status : Answered

Chosen Option : 3

**Q.9** Let  $d$  be the distance of the point of intersection of the lines  $\frac{x+6}{3} = \frac{y}{2} = \frac{z+1}{1}$  and

$\frac{x-7}{4} = \frac{y-9}{3} = \frac{z-4}{2}$  from the point  $(7, 8, 9)$ . Then  $d^2 + 6$  is equal to :

**Options**

1. 78
2. 69
3. 75
4. 72

Question Type : **MCQ**

Question ID : **87827055624**

Option 1 ID : **878270218848**

Option 2 ID : **878270218845**

Option 3 ID : **878270218847**

Option 4 ID : **878270218846**

Status : **Not Answered**

Chosen Option : --

**Q.10** The coefficients  $a, b, c$  in the quadratic equation  $ax^2 + bx + c = 0$  are chosen from the set  $\{1, 2, 3, 4, 5, 6, 7, 8\}$ . The probability of this equation having repeated roots is :

**Options**

1.  $\frac{3}{128}$
2.  $\frac{1}{64}$
3.  $\frac{1}{128}$
4.  $\frac{3}{256}$

Question Type : **MCQ**

Question ID : **87827055626**

Option 1 ID : **878270218855**

Option 2 ID : **878270218856**

Option 3 ID : **878270218854**

Option 4 ID : **878270218853**

Status : **Not Answered**

Chosen Option : --

**Q.11**

If the line  $\frac{2-x}{3} = \frac{3y-2}{4\lambda+1} = 4-z$  makes a right angle with the line  $\frac{x+3}{3\mu} = \frac{1-2y}{6} = \frac{5-z}{7}$ ,  
then  $4\lambda + 9\mu$  is equal to :

**Options**

1. 6
2. 4
3. 5
4. 13

Question Type : MCQ

Question ID : 87827055623

Option 1 ID : 878270218843

Option 2 ID : 878270218841

Option 3 ID : 878270218842

Option 4 ID : 878270218844

Status : Not Answered

Chosen Option : --

**Q.12**

Let a rectangle ABCD of sides 2 and 4 be inscribed in another rectangle PQRS such that the vertices of the rectangle ABCD lie on the sides of the rectangle PQRS. Let a and b be the sides of the rectangle PQRS when its area is maximum. Then  $(a+b)^2$  is equal to :

**Options**

1. 60
2. 72
3. 80
4. 64

Question Type : MCQ

Question ID : 87827055616

Option 1 ID : 878270218816

Option 2 ID : 878270218813

Option 3 ID : 878270218815

Option 4 ID : 878270218814

Status : Not Answered

Chosen Option : --

**Q.13** If A(1, -1, 2), B(5, 7, -6), C(3, 4, -10) and D(-1, -4, -2) are the vertices of a quadrilateral ABCD, then its area is :

Options

1.  $24\sqrt{29}$
2.  $24\sqrt{7}$
3.  $12\sqrt{29}$
4.  $48\sqrt{7}$

Question Type : MCQ

Question ID : 87827055625

Option 1 ID : 878270218850

Option 2 ID : 878270218852

Option 3 ID : 878270218849

Option 4 ID : 878270218851

Status : Answered

Chosen Option : 3

**Q.14**

The value of  $\int_{-\pi}^{\pi} \frac{2y(1 + \sin y)}{1 + \cos^2 y} dy$  is :

Options

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

Question Type : MCQ

Question ID : 87827055617

Option 1 ID : 878270218818

Option 2 ID : 878270218817

Option 3 ID : 878270218820

Option 4 ID : 878270218819

Status : Not Answered

Chosen Option : --

**Q.15**

If the system of equations

$$11x + y + \lambda z = -5$$

$$2x + 3y + 5z = 3$$

$$8x - 19y - 39z = \mu$$

has infinitely many solutions, then  $\lambda^4 - \mu$  is equal to :

**Options**

1. 49
2. 45
3. 47
4. 51

Question Type : MCQ

Question ID : 87827055611

Option 1 ID : 878270218795

Option 2 ID : 878270218793

Option 3 ID : 878270218794

Option 4 ID : 878270218796

Status : Answered

Chosen Option : 3

**Q.16**

Let two straight lines drawn from the origin O intersect the line  $3x + 4y = 12$  at the points P and Q such that  $\Delta OPQ$  is an isosceles triangle and  $\angle POQ = 90^\circ$ . If  $l = OP^2 + PQ^2 + QO^2$ , then the greatest integer less than or equal to  $l$  is :

**Options**

1. 44
2. 42
3. 46
4. 48

Question Type : MCQ

Question ID : 87827055621

Option 1 ID : 878270218835

Option 2 ID : 878270218834

Option 3 ID : 878270218836

Option 4 ID : 878270218833

Status : Not Answered

Chosen Option : --

**Q.17**

If  $\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \dots + \frac{1}{\sqrt{99} + \sqrt{100}} = m$  and  $\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \dots + \frac{1}{99 \cdot 100} = n$ , then the point  $(m, n)$  lies on the line

**Options**

1.  $11(x - 1) - 100y = 0$
2.  $11(x - 2) - 100(y - 1) = 0$
3.  $11(x - 1) - 100(y - 2) = 0$
4.  $11x - 100y = 0$

Question Type : MCQ

Question ID : 87827055613

Option 1 ID : 878270218802

Option 2 ID : 878270218803

Option 3 ID : 878270218804

Option 4 ID : 878270218801

Status : Not Answered

Chosen Option : --

**Q.18**

If  $y = y(x)$  is the solution of the differential equation  $\frac{dy}{dx} + 2y = \sin(2x)$ ,  $y(0) = \frac{3}{4}$ , then  $y\left(\frac{\pi}{8}\right)$  is equal to :

**Options**

1.  $e^{\pi/8}$
2.  $e^{\pi/4}$
3.  $e^{-\pi/4}$
4.  $e^{-\pi/8}$

Question Type : MCQ

Question ID : 87827055619

Option 1 ID : 878270218827

Option 2 ID : 878270218826

Option 3 ID : 878270218825

Option 4 ID : 878270218828

Status : Not Answered

Chosen Option : --

**Q.19**

Consider the following two statements :

**Statement I :** For any two non-zero complex numbers  $z_1, z_2$

$$(|z_1| + |z_2|) \left| \frac{z_1}{|z_1|} + \frac{z_2}{|z_2|} \right| \leq 2 (|z_1| + |z_2|), \text{ and}$$

**Statement II :** If  $x, y, z$  are three distinct complex numbers and  $a, b, c$  are three positive real

numbers such that  $\frac{a}{|y - z|} = \frac{b}{|z - x|} = \frac{c}{|x - y|}$ , then

$$\frac{a^2}{y - z} + \frac{b^2}{z - x} + \frac{c^2}{x - y} = 1.$$

Between the above two statements,

**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 : **87827055609**

Option 1 ID : **878270218787**

Option 2 ID : **878270218786**

Option 3 ID : **878270218785**

Option 4 ID : **878270218788**

Status : **Not Answered**

Chosen Option : --

**Q.20**

If the function  $f(x) = \frac{\sin 3x + \alpha \sin x - \beta \cos 3x}{x^3}$ ,  $x \in \mathbb{R}$ , is continuous at  $x=0$ , then  $f(0)$  is equal to :

**Options**

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

Question Type : **MCQ**

Question ID : **87827055614**

Option 1 ID : **878270218805**

Option 2 ID : **878270218807**

Option 3 ID : **878270218808**

Option 4 ID : **878270218806**

Status : **Not Answered**

Chosen Option : --

Section : Mathematics Section B

**Q.21**

Let  $f$  be a differentiable function in the interval  $(0, \infty)$  such that  $f(1)=1$  and  $\lim_{t \rightarrow x} \frac{t^2 f(x) - x^2 f(t)}{t - x} = 1$   
for each  $x > 0$ . Then  $2 f(2) + 3 f(3)$  is equal to \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055633**Status : **Not Answered****Q.22**

Let  $\vec{a} = \hat{i} - 3\hat{j} + 7\hat{k}$ ,  $\vec{b} = 2\hat{i} - \hat{j} + \hat{k}$  and  $\vec{c}$  be a vector such that  $(\vec{a} + 2\vec{b}) \times \vec{c} = 3(\vec{c} \times \vec{a})$ .

If  $\vec{a} \cdot \vec{c} = 130$ , then  $\vec{b} \cdot \vec{c}$  is equal to \_\_\_\_\_.

Given 30

Answer :

Question Type : **SA**Question ID : **87827055636**Status : **Answered****Q.23**

If the constant term in the expansion of  $(1 + 2x - 3x^3) \left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^9$  is  $p$ , then  $108p$  is equal to \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055631**Status : **Not Answered****Q.24**

The area of the region enclosed by the parabolas  $y = x^2 - 5x$  and  $y = 7x - x^2$  is \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055634**Status : **Not Answered****Q.25**

The number of ways of getting a sum 16 on throwing a dice four times is \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**Question ID : **87827055630**Status : **Not Answered**

**Q.26** Let  $a_1, a_2, a_3, \dots$  be in an arithmetic progression of positive terms.

$$\text{Let } A_k = a_1^2 - a_2^2 + a_3^2 - a_4^2 + \dots + a_{2k-1}^2 - a_{2k}^2.$$

If  $A_3 = -153$ ,  $A_5 = -435$  and  $a_1^2 + a_2^2 + a_3^2 = 66$ , then  $a_{17} - A_7$  is equal to \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055632**

Status : **Not Answered**

**Q.27** From a lot of 10 items, which include 3 defective items, a sample of 5 items is drawn at random. Let the random variable  $X$  denote the number of defective items in the sample. If the variance of  $X$  is  $\sigma^2$ , then  $96\sigma^2$  is equal to \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055637**

Status : **Not Answered**

**Q.28** If  $S = \{a \in \mathbb{R} : |2a - 1| = 3[a] + 2\{a\}\}$ , where  $[t]$  denotes the greatest integer less than or equal to  $t$  and  $\{t\}$  represents the fractional part of  $t$ , then  $72 \sum_{a \in S} a$  is equal to \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055628**

Status : **Not Answered**

**Q.29** The number of distinct real roots of the equation  $|x| |x+2| - 5|x+1| - 1 = 0$  is \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055629**

Status : **Not Answered**

**Q.30** Suppose AB is a focal chord of the parabola  $y^2 = 12x$  of length  $l$  and slope  $m < \sqrt{3}$ . If the distance of the chord AB from the origin is  $d$ , then  $ld^2$  is equal to \_\_\_\_\_.

Given --

Answer :

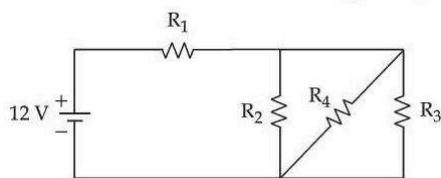
Question Type : **SA**

Question ID : **87827055635**

Status : **Not Answered**

Section : Physics Section A

- Q.31** In the given figure  $R_1 = 10\Omega$ ,  $R_2 = 8\Omega$ ,  $R_3 = 4\Omega$  and  $R_4 = 8\Omega$ . Battery is ideal with emf 12V. Equivalent resistance of the circuit and current supplied by battery are respectively :



**Options**

1.  $12 \Omega$  and  $11.4 \text{ A}$
2.  $12 \Omega$  and  $1 \text{ A}$
3.  $10.5 \Omega$  and  $1.14 \text{ A}$
4.  $10.5 \Omega$  and  $1 \text{ A}$

Question Type : **MCQ**

Question ID : **87827055649**

Option 1 ID : **878270218916**

Option 2 ID : **878270218917**

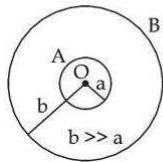
Option 3 ID : **878270218915**

Option 4 ID : **878270218918**

Status : **Answered**

Chosen Option : **2**

- Q.32** Two conducting circular loops A and B are placed in the same plane with their centres coinciding as shown in figure. The mutual inductance between them is :



Options

1.  $\frac{\mu_0 \pi a^2}{2b}$

2.  $\frac{\mu_0}{2\pi} \cdot \frac{a^2}{b}$

3.  $\frac{\mu_0}{2\pi} \cdot \frac{b^2}{a}$

4.  $\frac{\mu_0 \pi b^2}{2a}$

Question Type : MCQ

Question ID : 87827055651

Option 1 ID : 878270218926

Option 2 ID : 878270218924

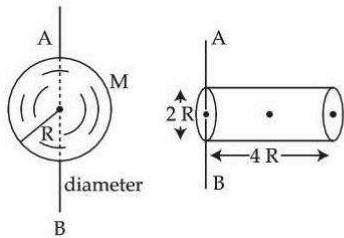
Option 3 ID : 878270218923

Option 4 ID : 878270218925

Status : Not Answered

Chosen Option : --

- Q.33** Ratio of radius of gyration of a hollow sphere to that of a solid cylinder of equal mass, for moment of Inertia about their diameter axis AB as shown in figure is  $\sqrt{\frac{8}{x}}$ . The value of x is :



Options

1. 17
2. 51
3. 67
4. 34

Question Type : MCQ

Question ID : 87827055642

Option 1 ID : 878270218887

Option 2 ID : 878270218889

Option 3 ID : 878270218888

Option 4 ID : 878270218890

Status : Not Answered

Chosen Option : --

- Q.34** Given below are two statements :

**Statement I :** When a capillary tube is dipped into a liquid, the liquid neither rises nor falls in the capillary. The contact angle may be  $0^\circ$ .

**Statement II :** The contact angle between a solid and a liquid is a property of the material of the solid and liquid as well.

In the light of the above statement, choose the **correct** answer from the options given below.

Options

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

Question Type : MCQ

Question ID : 87827055644

Option 1 ID : 878270218896

Option 2 ID : 878270218897

Option 3 ID : 878270218895

Option 4 ID : 878270218898

Status : Answered

Chosen Option : 3

**Q.35** In hydrogen like system the ratio of coulombian force and gravitational force between an electron and a proton is in the order of :

Options

1.  $10^{29}$
2.  $10^{19}$
3.  $10^{36}$
4.  $10^{39}$

Question Type : MCQ

Question ID : 87827055648

Option 1 ID : 878270218913

Option 2 ID : 878270218914

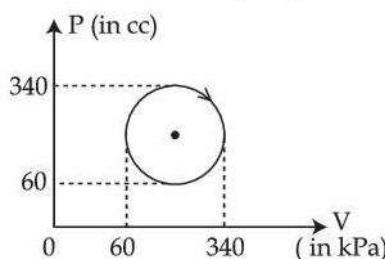
Option 3 ID : 878270218911

Option 4 ID : 878270218912

Status : Not Answered

Chosen Option : --

**Q.36** The heat absorbed by a system in going through the given cyclic process is :



Options

1. 616 J
2. 19.6 J
3. 61.6 J
4. 431.2 J

Question Type : MCQ

Question ID : 87827055645

Option 1 ID : 878270218900

Option 2 ID : 878270218902

Option 3 ID : 878270218901

Option 4 ID : 878270218899

Status : Answered

Chosen Option : 1

**Q.37** In a co-axial straight cable, the central conductor and the outer conductor carry equal currents in opposite directions. The magnetic field is zero :

Options

1. outside the cable
2. in between the two conductors
3. inside the outer conductor
4. inside the inner conductor

Question Type : MCQ

Question ID : 87827055650

Option 1 ID : 878270218919

Option 2 ID : 878270218922

Option 3 ID : 878270218921

Option 4 ID : 878270218920

Status : Answered

Chosen Option : 2

**Q.38**

The angle between vector  $\vec{Q}$  and the resultant of  $(2\vec{Q} + 2\vec{P})$  and  $(2\vec{Q} - 2\vec{P})$  is :

Options

1.  $0^\circ$
2.  $\tan^{-1}\left(\frac{P}{Q}\right)$
3.  $\tan^{-1}\left(2\frac{Q}{P}\right)$
4.  $\tan^{-1}\frac{(2\vec{Q} - 2\vec{P})}{(2\vec{Q} + 2\vec{P})}$

Question Type : MCQ

Question ID : 87827055639

Option 1 ID : 878270218878

Option 2 ID : 878270218876

Option 3 ID : 878270218875

Option 4 ID : 878270218877

Status : Not Answered

Chosen Option : --

**Q.39** An alternating voltage of amplitude 40 V and frequency 4 kHz is applied directly across the capacitor of  $12 \mu\text{F}$ . The maximum displacement current between the plates of the capacitor is nearly :

Options

1. 13 A
2. 12 A
3. 10 A
4. 8 A

Question Type : MCQ

Question ID : 87827055652

Option 1 ID : 878270218929

Option 2 ID : 878270218928

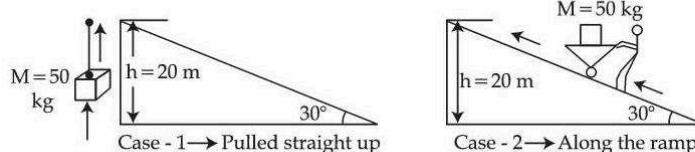
Option 3 ID : 878270218927

Option 4 ID : 878270218930

Status : Not Answered

Chosen Option : --

**Q.40** A body of mass 50 kg is lifted to a height of 20 m from the ground in the two different ways as shown in the figures. The ratio of work done against the gravity in both the respective cases, will be :



Options

1. 1 : 2
2.  $\sqrt{3} : 2$
3. 2 : 1
4. 1 : 1

Question Type : MCQ

Question ID : 87827055641

Option 1 ID : 878270218883

Option 2 ID : 878270218885

Option 3 ID : 878270218884

Option 4 ID : 878270218886

Status : Not Answered

Chosen Option : --

**Q.41** If G be the gravitational constant and u be the energy density then which of the following quantity have the dimensions as that of the  $\sqrt{uG}$  :

**Options**

1. Force per unit mass
2. Gravitational potential
3. pressure gradient per unit mass
4. Energy per unit mass

Question Type : **MCQ**

Question ID : **87827055638**

Option 1 ID : **878270218871**

Option 2 ID : **878270218872**

Option 3 ID : **878270218874**

Option 4 ID : **878270218873**

Status : **Not Answered**

Chosen Option : --

**Q.42** Time periods of oscillation of the same simple pendulum measured using four different measuring clocks were recorded as 4.62 s, 4.632 s, 4.6 s and 4.64 s. The arithmetic mean of these readings in correct significant figure is :

**Options**

1. 4.623 s
2. 4.6 s
3. 5 s
4. 4.62 s

Question Type : **MCQ**

Question ID : **87827055657**

Option 1 ID : **878270218947**

Option 2 ID : **878270218949**

Option 3 ID : **878270218950**

Option 4 ID : **878270218948**

Status : **Answered**

Chosen Option : **2**

**Q.43** A simple pendulum doing small oscillations at a place R height above earth surface has time period of  $T_1 = 4$  s.  $T_2$  would be it's time period if it is brought to a point which is at a height  $2R$  from earth surface. Choose the correct relation [R = radius of earth] :

**Options**

1.  $3T_1 = 2T_2$
2.  $T_1 = T_2$
3.  $2T_1 = T_2$
4.  $2T_1 = 3T_2$

Question Type : MCQ

Question ID : 87827055647

Option 1 ID : 878270218909

Option 2 ID : 878270218907

Option 3 ID : 878270218908

Option 4 ID : 878270218910

Status : Not Answered

Chosen Option : --

**Q.44** Match List I with List II :

List I	List II
(A) Kinetic energy of planet	(I) $-\frac{GMm}{a}$
(B) Gravitation Potential energy of sun-planet system	(II) $\frac{GMm}{2a}$
(C) Total mechanical energy of planet	(III) $\frac{Gm}{r}$
(D) Escape energy at the surface of planet for unit mass object	(IV) $-\frac{GMm}{2a}$

(Where a = radius of planet orbit, r = radius of planet, M = mass of Sun, m = mass of planet)

Choose the correct answer from the options given below :

**Options**

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

Question Type : MCQ

Question ID : 87827055643

Option 1 ID : 878270218893

Option 2 ID : 878270218891

Option 3 ID : 878270218894

Option 4 ID : 878270218892

Status : Answered

Chosen Option : 4

**Q.45** If the collision frequency of hydrogen molecules in a closed chamber at 27°C is Z, then the collision frequency of the same system at 127°C is :

Options

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

Question Type : MCQ

Question ID : 87827055646

Option 1 ID : 878270218904

Option 2 ID : 878270218905

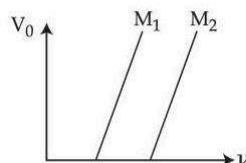
Option 3 ID : 878270218906

Option 4 ID : 878270218903

Status : Not Answered

Chosen Option : --

**Q.46** Given below are two statements :



**Statement I :** Figure shows the variation of stopping potential with frequency ( $\nu$ ) for the two photosensitive materials  $M_1$  and  $M_2$ . The slope gives value of  $\frac{h}{e}$ , where  $h$  is Planck's constant,  $e$  is the charge of electron.

**Statement II :**  $M_2$  will emit photoelectrons of greater kinetic energy for the incident radiation having same frequency.

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

**Options 1.**

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

2.

**Statement I is correct and Statement II is incorrect**

3.

**Both Statement I and Statement II are incorrect**

4.

**Both Statement I and Statement II are correct**

Question Type : MCQ

Question ID : 87827055654

Option 1 ID : 878270218938

Option 2 ID : 878270218937

Option 3 ID : 878270218936

Option 4 ID : 878270218935

Status : Answered

Chosen Option : 2

**Q.47**

A wooden block of mass 5 kg rests on a soft horizontal floor. When an iron cylinder of mass 25 kg is placed on the top of the block, the floor yields and the block and the cylinder together go down with an acceleration of  $0.1 \text{ ms}^{-2}$ . The action force of the system on the floor is equal to :

**Options**

1. 196 N

2. 297 N

3. 294 N

4. 291 N

Question Type : MCQ

Question ID : 87827055640

Option 1 ID : 878270218882

Option 2 ID : 878270218879

Option 3 ID : 878270218880

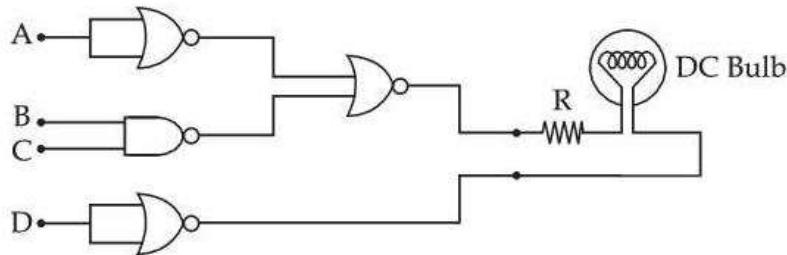
Option 4 ID : 878270218881

Status : Not Answered

Chosen Option : --

**Q.48**

Following gates section is connected in a complete suitable circuit.



For which of the following combination, bulb will glow (ON) :

**Options**

1.  $A = 1, B = 1, C = 1, D = 0$
2.  $A = 0, B = 1, C = 1, D = 1$
3.  $A = 0, B = 0, C = 0, D = 1$
4.  $A = 1, B = 0, C = 0, D = 0$

Question Type : MCQ

Question ID : 87827055656

Option 1 ID : 878270218943

Option 2 ID : 878270218944

Option 3 ID : 878270218946

Option 4 ID : 878270218945

Status : Answered

Chosen Option : 3

**Q.49**

An electron rotates in a circle around a nucleus having positive charge  $Ze$ . Correct relation between total energy ( $E$ ) of electron to its potential energy ( $U$ ) is :

**Options**

1.  $E = U$
2.  $2E = U$
3.  $2E = 3U$
4.  $E = 2U$

Question Type : MCQ

Question ID : 87827055655

Option 1 ID : 878270218940

Option 2 ID : 878270218941

Option 3 ID : 878270218942

Option 4 ID : 878270218939

Status : Answered

Chosen Option : 2

**Q.50** Light emerges out of a convex lens when a source of light kept at its focus. The shape of wavefront of the light is :

Options

1. plane
2. cylindrical
3. both spherical and cylindrical
4. spherical

Question Type : MCQ

Question ID : 87827055653

Option 1 ID : 878270218934

Option 2 ID : 878270218932

Option 3 ID : 878270218933

Option 4 ID : 878270218931

Status : Not Answered

Chosen Option : --

### Section : Physics Section B

**Q.51** In Young's double slit experiment, carried out with light of wavelength  $5000 \text{ \AA}$ , the distance between the slits is  $0.3 \text{ mm}$  and the screen is at  $200 \text{ cm}$  from the slits. The central maximum is at  $x = 0 \text{ cm}$ . The value of  $x$  for third maxima is \_\_\_\_\_ mm.

Given --

Answer :

Question Type : SA

Question ID : 87827055665

Status : Not Answered

**Q.52** The electric field between the two parallel plates of a capacitor of  $1.5 \mu\text{F}$  capacitance drops to one third of its initial value in  $6.6 \mu\text{s}$  when the plates are connected by a thin wire.

The resistance of this wire is \_\_\_\_\_  $\Omega$ . (Given,  $\log 3 = 1.1$ )

Given --

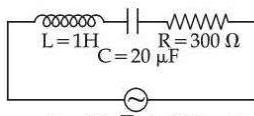
Answer :

Question Type : SA

Question ID : 87827055662

Status : Not Answered

**Q.53** An ac source is connected in given series LCR circuit. The rms potential difference across the capacitor of  $20 \mu\text{F}$  is \_\_\_\_\_ V.



$$V = 50\sqrt{2} \sin 100t \text{ volt}$$

Given --

Answer :

Question Type : SA

Question ID : 87827055664

Status : Not Answered

- Q.54** A body moves on a frictionless plane starting from rest. If  $S_n$  is distance moved between  $t=n-1$  and  $t=n$  and  $S_{n-1}$  is distance moved between  $t=n-2$  and  $t=n-1$ , then the ratio  $\frac{S_{n-1}}{S_n}$  is  $\left(1 - \frac{2}{x}\right)$  for  $n=10$ . The value of  $x$  is \_\_\_\_\_.

Given --  
Answer :

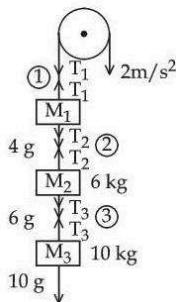
Question Type : **SA**  
Question ID : **87827055658**  
Status : **Not Answered**

- Q.55** If three helium nuclei combine to form a carbon nucleus then the energy released in this reaction is \_\_\_\_\_  $\times 10^{-2}$  MeV. (Given  $1 u = 931 \text{ MeV}/c^2$ , atomic mass of helium =  $4.002603 u$ )

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055666**  
Status : **Not Answered**

- Q.56** Three blocks  $M_1$ ,  $M_2$ ,  $M_3$  having masses 4 kg, 6 kg and 10 kg respectively are hanging from a smooth pully using rope 1, 2 and 3 as shown in figure. The tension in the rope 1,  $T_1$  when they are moving upward with acceleration of  $2 \text{ ms}^{-2}$  is \_\_\_\_\_ N (if  $g = 10 \text{ m/s}^2$ ).



Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055659**  
Status : **Not Answered**

- Q.57** A  $2\text{A}$  current carrying straight metal wire of resistance  $1 \Omega$ , resistivity  $2 \times 10^{-6} \Omega\text{m}$ , area of cross-section  $10 \text{ mm}^2$  and mass  $500 \text{ g}$  is suspended horizontally in mid air by applying a uniform magnetic field  $\vec{B}$ . The magnitude of  $B$  is \_\_\_\_\_  $\times 10^{-1} \text{ T}$  (given,  $g = 10 \text{ m/s}^2$ ).

Given --  
Answer :

Question Type : **SA**  
Question ID : **87827055663**  
Status : **Not Answered**

- Q.58** Three capacitors of capacitances  $25 \mu\text{F}$ ,  $30 \mu\text{F}$  and  $45 \mu\text{F}$  are connected in parallel to a supply of  $100 \text{ V}$ . Energy stored in the above combination is  $E$ . When these capacitors are connected in series

to the same supply, the stored energy is  $\frac{9}{x} E$ . The value of  $x$  is \_\_\_\_\_.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055661**

Status : **Not Answered**

- Q.59** The density and breaking stress of a wire are  $6 \times 10^4 \text{ kg/m}^3$  and  $1.2 \times 10^8 \text{ N/m}^2$  respectively. The wire is suspended from a rigid support on a planet where acceleration due to gravity is  $\frac{1}{3}$ <sup>rd</sup> of the value on the surface of earth. The maximum length of the wire with breaking is \_\_\_\_\_ m (take,  $g = 10 \text{ m/s}^2$ ).

Given --

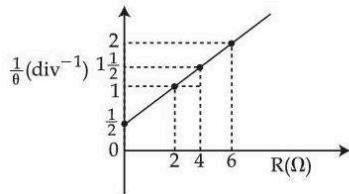
Answer :

Question Type : **SA**

Question ID : **87827055660**

Status : **Not Answered**

- Q.60** In the experiment to determine the galvanometer resistance by half-deflection method, the plot of  $\frac{1}{\theta}$  vs the resistance ( $R$ ) of the resistance box is shown in the figure. The figure of merit of the galvanometer is \_\_\_\_\_  $\times 10^{-1} \text{ A/division}$ . [The source has emf 2V]



Given --

Answer :

Question Type : **SA**

Question ID : **87827055667**

Status : **Not Answered**

Section : Chemistry Section A

**Q.61** Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

**Assertion (A) :** Cis form of alkene is found to be more polar than the trans form.

**Reason (R) :** Dipole moment of trans isomer of 2-butene is zero.

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

**Options 1.**

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

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

3.

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

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

Question Type : **MCQ**

Question ID : **87827055683**

Option 1 ID : **878270219021**

Option 2 ID : **878270219024**

Option 3 ID : **878270219022**

Option 4 ID : **878270219023**

Status : **Answered**

Chosen Option : **3**

**Q.62** The correct order of ligands arranged in increasing field strength.

**Options**

1.  $\text{F}^- < \text{Br}^- < \text{I}^- < \text{NH}_3$

2.  $\text{Br}^- < \text{F}^- < \text{H}_2\text{O} < \text{NH}_3$

3.  $\text{Cl}^- < \text{OH}^- < \text{Br}^- < \text{CN}^-$

4.  $\text{H}_2\text{O} < \text{OH}^- < \text{CN}^- < \text{NH}_3$

Question Type : **MCQ**

Question ID : **87827055677**

Option 1 ID : **878270218998**

Option 2 ID : **878270218997**

Option 3 ID : **878270219000**

Option 4 ID : **878270218999**

Status : **Answered**

Chosen Option : **2**

**Q.63** An organic compound has 42.1% carbon, 6.4% hydrogen and remainder is oxygen. If its molecular weight is 342, then its molecular formula is :

**Options**

1.  $C_{12}H_{20}O_{12}$
2.  $C_{12}H_{22}O_{11}$
3.  $C_{14}H_{20}O_{10}$
4.  $C_{11}H_{18}O_{12}$

Question Type : **MCQ**

Question ID : **87827055680**

Option 1 ID : **878270219012**

Option 2 ID : **878270219009**

Option 3 ID : **878270219011**

Option 4 ID : **878270219010**

Status : **Answered**

Chosen Option : **2**

**Q.64** The **incorrect** postulates of the Dalton's atomic theory are :

- (A) Atoms of different elements differ in mass.
- (B) Matter consists of divisible atoms.
- (C) Compounds are formed when atoms of different element combine in a fixed ratio.
- (D) All the atoms of given element have different properties including mass.
- (E) Chemical reactions involve reorganisation of atoms.

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

**Options**

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

Question Type : **MCQ**

Question ID : **87827055668**

Option 1 ID : **878270218964**

Option 2 ID : **878270218961**

Option 3 ID : **878270218962**

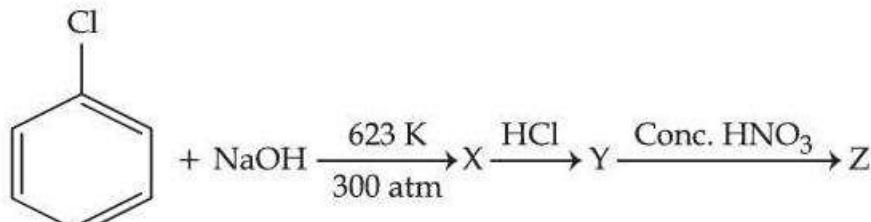
Option 4 ID : **878270218963**

Status : **Not Answered**

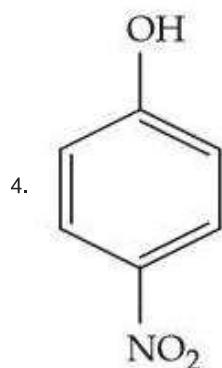
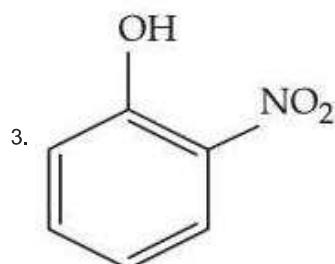
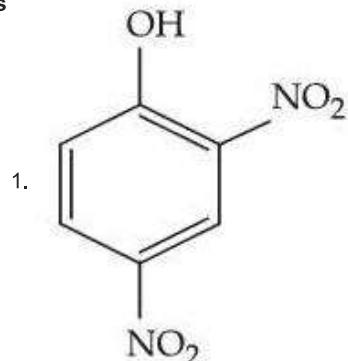
Chosen Option : --

Q.65

Identify compound (Z) in the following reaction sequence.



Options



Question Type : MCQ

Question ID : 87827055685

Option 1 ID : 878270219029

Option 2 ID : 878270219032

Option 3 ID : 878270219030

Option 4 ID : 878270219031

Status : Answered

Chosen Option : 2

**Q.66** Given below are two statements :**Statement I :** In group 13, the stability of +1 oxidation state increases down the group.**Statement II :** The atomic size of gallium is greater than that of aluminium.In the light of the above statements, choose the **most appropriate** answer from the options given below :

Options 1.

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

2. Both **Statement I** and **Statement II** are correct

3.

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

4. Both **Statement I** and **Statement II** are incorrect

Question Type : MCQ

Question ID : 87827055674

Option 1 ID : 878270218988

Option 2 ID : 878270218985

Option 3 ID : 878270218987

Option 4 ID : 878270218986

Status : Answered

Chosen Option : 3

**Q.67** Which one of the following complexes will exhibit the least paramagnetic behaviour ?

[Atomic number, Cr = 24, Mn = 25, Fe = 26, Co = 27]

Options

1.  $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$
2.  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
3.  $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$
4.  $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$

Question Type : MCQ

Question ID : 87827055678

Option 1 ID : 878270219002

Option 2 ID : 878270219003

Option 3 ID : 878270219004

Option 4 ID : 878270219001

Status : Answered

Chosen Option : 3

**Q.68** The number of neutrons present in the more abundant isotope of boron is 'x'. Amorphous boron upon heating with air forms a product, in which the oxidation state of boron is 'y'. The value of  $x+y$  is \_\_\_\_\_.

**Options**

1. 6
2. 9
3. 4
4. 3

Question Type : MCQ

Question ID : 87827055675

Option 1 ID : 878270218989

Option 2 ID : 878270218991

Option 3 ID : 878270218992

Option 4 ID : 878270218990

Status : Answered

Chosen Option : 2

**Q.69** Given below are two statements :

**Statements I :** Bromination of phenol in solvent with low polarity such as  $\text{CHCl}_3$  or  $\text{CS}_2$  requires Lewis acid catalyst.

**Statements II :** The Lewis acid catalyst polarises the bromine to generate  $\text{Br}^+$ .

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

**Options**

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

Question Type : MCQ

Question ID : 87827055684

Option 1 ID : 878270219027

Option 2 ID : 878270219028

Option 3 ID : 878270219026

Option 4 ID : 878270219025

Status : Not Answered

Chosen Option : --

**Q.70** Number of  $\sigma$  and  $\pi$  bonds present in ethylene molecule is respectively :

Options

1. 4 and 1
2. 5 and 1
3. 5 and 2
4. 3 and 1

Question Type : MCQ

Question ID : 87827055669

Option 1 ID : 878270218967

Option 2 ID : 878270218966

Option 3 ID : 878270218968

Option 4 ID : 878270218965

Status : Answered

Chosen Option : 2

**Q.71** The reaction at cathode in the cells commonly used in clocks involves.

Options

1. oxidation of Mn from +2 to +7
2. oxidation of Mn from +3 to +4
3. reduction of Mn from +7 to +2
4. reduction of Mn from +4 to +3

Question Type : MCQ

Question ID : 87827055671

Option 1 ID : 878270218976

Option 2 ID : 878270218975

Option 3 ID : 878270218973

Option 4 ID : 878270218974

Status : Not Answered

Chosen Option : --

**Q.72**

For the Compounds :

- (A)  $\text{H}_3\text{C}-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_2-\text{CH}_3$   
(B)  $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$   
(C)  $\text{CH}_3-\text{CH}_2-\underset{\underset{\text{O}}{\parallel}}{\text{C}}-\text{CH}_2-\text{CH}_3$   
(D)  $\text{H}_3\text{C}-\underset{\underset{\text{OH}}{\mid}}{\text{CH}}-\text{CH}_2-\text{CH}_2-\text{CH}_3$

The increasing order of boiling point is :

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

1. (D) < (C) < (A) < (B)
2. (B) < (A) < (D) < (C)
3. (B) < (A) < (C) < (D)
4. (A) < (B) < (C) < (D)

Question Type : **MCQ**Question ID : **87827055682**Option 1 ID : **878270219019**Option 2 ID : **878270219020**Option 3 ID : **878270219018**Option 4 ID : **878270219017**Status : **Answered**Chosen Option : **2**

**Q.73**

The statement(s) that are **correct** about the species  $O^{2-}$ ,  $F^-$ ,  $Na^+$  and  $Mg^{2+}$ .

- (A) All are isoelectronic
- (B) All have the same nuclear charge
- (C)  $O^{2-}$  has the largest ionic radii
- (D)  $Mg^{2+}$  has the smallest ionic radii

Choose the **most appropriate** answer from the options given below :

**Options**

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

Question Type : MCQ

Question ID : 87827055673

Option 1 ID : 878270218981

Option 2 ID : 878270218982

Option 3 ID : 878270218983

Option 4 ID : 878270218984

Status : Answered

Chosen Option : 2

**Q.74**

Molar ionic conductivities of divalent cation and anion are  $57 \text{ S cm}^2 \text{ mol}^{-1}$  and  $73 \text{ S cm}^2 \text{ mol}^{-1}$  respectively. The molar conductivity of solution of an electrolyte with the above cation and anion will be :

**Options**

1.  $65 \text{ S cm}^2 \text{ mol}^{-1}$
2.  $260 \text{ S cm}^2 \text{ mol}^{-1}$
3.  $187 \text{ S cm}^2 \text{ mol}^{-1}$
4.  $130 \text{ S cm}^2 \text{ mol}^{-1}$

Question Type : MCQ

Question ID : 87827055672

Option 1 ID : 878270218978

Option 2 ID : 878270218979

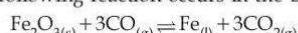
Option 3 ID : 878270218980

Option 4 ID : 878270218977

Status : Not Answered

Chosen Option : --

**Q.75** The following reaction occurs in the Blast furnace where iron ore is reduced to iron metal



Using the Le-chatelier's principle, predict which one of the following will not disturb the equilibrium.

Options

1. Addition of  $\text{Fe}_2\text{O}_3$
2. Removal of CO
3. Addition of  $\text{CO}_2$
4. Removal of  $\text{CO}_2$

Question Type : MCQ

Question ID : 87827055670

Option 1 ID : 878270218972

Option 2 ID : 878270218969

Option 3 ID : 878270218971

Option 4 ID : 878270218970

Status : Not Answered

Chosen Option : --

**Q.76**

Which of the following gives a positive test with ninhydrin ?

Options

1. Cellulose
2. Polyvinyl chloride
3. Starch
4. Egg albumin

Question Type : MCQ

Question ID : 87827055687

Option 1 ID : 878270219039

Option 2 ID : 878270219037

Option 3 ID : 878270219038

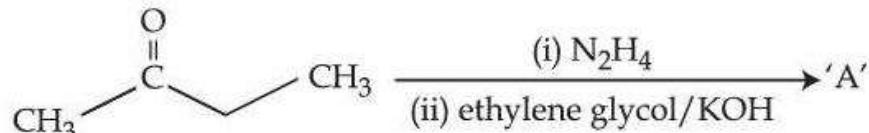
Option 4 ID : 878270219040

Status : Not Answered

Chosen Option : --

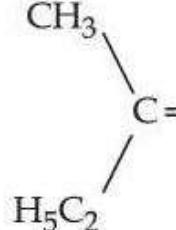
Q.77

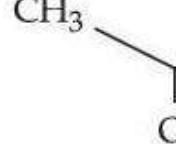
Identify 'A' in the following reaction :

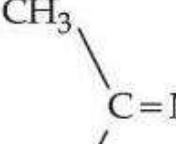


## Options

1. 

2. 

3. 

4. 

Question Type : **MCQ**

Question ID : 87827055686

Option 1 ID : 878270219034

Option 2 ID : 878270219035

Option 3 ID : 878270219036

Option 4 ID : 878270219033

Status : **Answered**

Chosen Option : 1

**Q.78** Given below are two statements : One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**

**Assertion (A) :** Enthalpy of neutralisation of strong monobasic acid with strong monoacidic base is always  $-57 \text{ kJ mol}^{-1}$

**Reason (R) :** Enthalpy of neutralisation is the amount of heat liberated when one mole of  $\text{H}^+$  ions furnished by acid combine with one mole of  $\text{OH}^-$  ions furnished by base to form one mole of water.

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

Options 1.

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

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

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

4.

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

Question Type : **MCQ**

Question ID : **87827055679**

Option 1 ID : **878270219005**

Option 2 ID : **878270219008**

Option 3 ID : **878270219007**

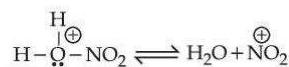
Option 4 ID : **878270219006**

Status : **Not Answered**

Chosen Option : --

**Q.79** Given below are two statements :

**Statement I :** Nitration of benzene involves the following step -



**Statement II :** Use of Lewis base promotes the electrophilic substitution of benzene.

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

Options 1.

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

2. Both **Statement I** and **Statement II** are correct

3.

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

4. Both **Statement I** and **Statement II** are incorrect

Question Type : **MCQ**

Question ID : **87827055681**

Option 1 ID : **878270219016**

Option 2 ID : **878270219013**

Option 3 ID : **878270219015**

Option 4 ID : **878270219014**

Status : **Answered**

Chosen Option : **2**

**Q.80** The metal that shows highest and maximum number of oxidation state is :

Options

1. Fe
2. Ti
3. Mn
4. Co

Question Type : MCQ

Question ID : 87827055676

Option 1 ID : 878270218993

Option 2 ID : 878270218994

Option 3 ID : 878270218995

Option 4 ID : 878270218996

Status : Answered

Chosen Option : 3

Section : Chemistry Section B

**Q.81** The heat of combustion of solid benzoic acid at constant volume is  $-321.30 \text{ kJ}$  at  $27^\circ\text{C}$ . The heat of combustion at constant pressure is  $(-321.30 - xR) \text{ kJ}$ , the value of  $x$  is \_\_\_\_\_.

Given --

Answer :

Question Type : SA

Question ID : 87827055690

Status : Not Answered

**Q.82** In the lewis dot structure for  $\text{NO}_2^-$ , total number of valence electrons around nitrogen is \_\_\_\_\_.

Given --

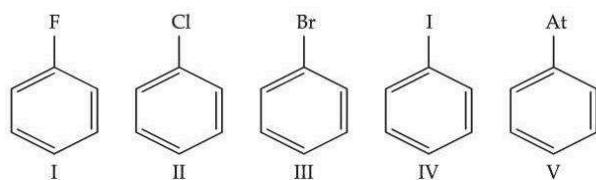
Answer :

Question Type : SA

Question ID : 87827055689

Status : Not Answered

**Q.83** The number of halobenzenes from the following that can be prepared by Sandmeyer's reaction is \_\_\_\_\_.



Given --

Answer :

Question Type : SA

Question ID : 87827055695

Status : Not Answered

**Q.84** 9.3 g of pure aniline is treated with bromine water at room temperature to give a white precipitate of the product 'P'. The mass of product 'P' obtained is \_\_\_\_\_ %.

Given --

Answer :

Question Type : **SA**

Question ID : **87827055697**

Status : **Not Answered**

**Q.85** An artificial cell is made by encapsulating 0.2 M glucose solution within a semipermeable membrane. The osmotic pressure developed when the artificial cell is placed within a 0.05 M solution of NaCl at 300 K is \_\_\_\_\_  $\times 10^{-1}$  bar. (nearest integer).

[Given : R = 0.083 L bar mol<sup>-1</sup> K<sup>-1</sup>]

Assume complete dissociation of NaCl

Given --

Answer :

Question Type : **SA**

Question ID : **87827055691**

Status : **Not Answered**

**Q.86** The spin-only magnetic moment value of the ion among Ti<sup>2+</sup>, V<sup>2+</sup>, Co<sup>3+</sup> and Cr<sup>2+</sup>, that acts as strong oxidising agent in aqueous solution is \_\_\_\_\_ BM (Near integer).

(Given atomic numbers : Ti : 22, V : 23, Cr : 24, Co : 27)

Given --

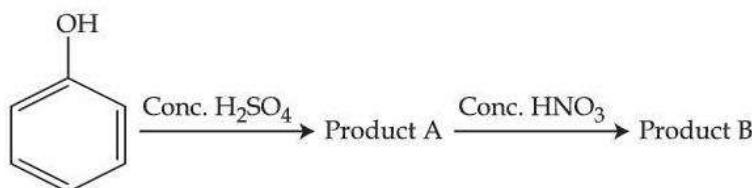
Answer :

Question Type : **SA**

Question ID : **87827055693**

Status : **Not Answered**

**Q.87** Consider the given chemical reaction sequence :



Total sum of oxygen atoms in Product A and Product B are \_\_\_\_\_.

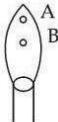
Given 17

Answer :

Question Type : **SA**

Question ID : **87827055696**

Status : **Answered**

**Q.88**

In a borax bead test under hot condition, a metal salt (one from the given) is heated at point B of the flame, resulted in green colour salt bead. The spin-only magnetic moment value of the salt is \_\_\_\_\_ BM (Nearest integer)

[Given atomic number of Cu = 29, Ni = 28, Mn = 25, Fe = 26]

Given --

Answer :

Question Type : SA

Question ID : 87827055694

Status : Not Answered

**Q.89**

The value of Rydberg constant ( $R_H$ ) is  $2.18 \times 10^{-18}$  J. The velocity of electron having mass  $9.1 \times 10^{-31}$  kg in Bohr's first orbit of hydrogen atom = \_\_\_\_\_  $\times 10^5$  ms $^{-1}$  (nearest integer).

Given --

Answer :

Question Type : SA

Question ID : 87827055688

Status : Not Answered

**Q.90**

During Kinetic study of reaction  $2A + B \rightarrow C + D$ , the following results were obtained :

	A [M]	B [M]	initial rate of formation of D
I	0.1	0.1	$6.0 \times 10^{-3}$
II	0.3	0.2	$7.2 \times 10^{-2}$
III	0.3	0.4	$2.88 \times 10^{-1}$
IV	0.4	0.1	$2.40 \times 10^{-2}$

Based on above data, overall order of the reaction is \_\_\_\_\_.

Given --

Answer :

Question Type : SA

Question ID : 87827055692

Status : Not Answered