

## JEE 2023 Session-1 24th Jan to 1st Feb 2023

Application No	230310233745
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Test Date	30/01/2023
Test Time	3:00 PM - 6:00 PM
Subject	B TECH

Section : Physics Section A

Q.1

A vehicle travels 4 km with speed of 3 km / h and another 4 km with speed of 5 km / h, then its average speed is

- Options
1. 4.00 km / h
  2. 3.75 km / h
  3. 3.50 km / h
  4. 4.25 km / h

Question Type : MCQ

Question ID : 3666942397

Option 1 ID : 3666947567

Option 2 ID : 3666947566

Option 3 ID : 3666947565

Option 4 ID : 3666947568

Status : Answered

Chosen Option : 2

Q.2

A point source of 100 W emits light with 5% efficiency. At a distance of 5 m from the source, the intensity produced by the electric field component is:

Options

1.  $\frac{1}{2\pi} \frac{W}{m^2}$
2.  $\frac{1}{40\pi} \frac{W}{m^2}$
3.  $\frac{1}{10\pi} \frac{W}{m^2}$
4.  $\frac{1}{20\pi} \frac{W}{m^2}$

Question Type : MCQ

Question ID : 3666942405

Option 1 ID : 3666947598

Option 2 ID : 3666947599

Option 3 ID : 3666947600

Option 4 ID : 3666947597

Status : Not Answered

Chosen Option : --

Q.3

other is labelled as **Reason R**

**Assertion A:** Efficiency of a reversible heat engine will be highest at  $-273^\circ\text{C}$  temperature of cold reservoir.

**Reason R:** The efficiency of Carnot's engine depends not only on temperature of cold reservoir but it depends on the temperature of hot reservoir too and is given as

$$\eta = \left(1 - \frac{T_2}{T_1}\right).$$

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 : 3666942392

Option 1 ID : 3666947545

Option 2 ID : 3666947548

Option 3 ID : 3666947546

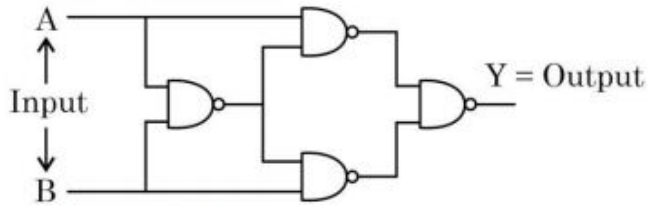
Option 4 ID : 3666947547

Status : Not Answered

Chosen Option : --

Q.4

The output Y for the inputs A and B of circuit is given by



Truth table of the shown circuit is:

Options

1.

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

2.

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

3.

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

4.

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

Question Type : MCQ

Question ID : 3666942409

Option 1 ID : 3666947614

Option 2 ID : 3666947616

Option 3 ID : 3666947613

Option 4 ID : 3666947615

Status : Answered

Chosen Option : 3

**Q.5** Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R**

**Assertion A:** The nuclear density of nuclides  ${}^{10}_5\text{B}$ ,  ${}^6_3\text{Li}$ ,  ${}^{56}_{26}\text{Fe}$ ,  ${}^{20}_{10}\text{Ne}$  and  ${}^{209}_{83}\text{Bi}$  can be arranged as  $\rho_{\text{Bi}}^{\text{N}} > \rho_{\text{Fe}}^{\text{N}} > \rho_{\text{Ne}}^{\text{N}} > \rho_{\text{B}}^{\text{N}} > \rho_{\text{Li}}^{\text{N}}$

**Reason R:** The radius  $R$  of nucleus is related to its mass number  $A$  as  $R = R_0 A^{1/3}$ , where  $R_0$  is a constant.

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 : **3666942408**

Option 1 ID : **3666947610**

Option 2 ID : **3666947611**

Option 3 ID : **3666947612**

Option 4 ID : **3666947609**

Status : **Answered**

Chosen Option : **3**

**Q.6** A machine gun of mass 10 kg fires 20 g bullets at the rate of 180 bullets per minute with a speed of 100 m s<sup>-1</sup> each. The recoil velocity of the gun is

Options 1.

2.5 m/s

2. 1.5 m/s

3. 0.6 m/s

4. 0.02 m/s

Question Type : **MCQ**

Question ID : **3666942395**

Option 1 ID : **3666947560**

Option 2 ID : **3666947559**

Option 3 ID : **3666947558**

Option 4 ID : **3666947557**

Status : **Answered**

Chosen Option : **3**

Q.7 Match List I with List II:

List I	List II
A. Torque	I. $\text{kg m}^{-1} \text{s}^{-2}$
B. Energy density	II. $\text{kg ms}^{-1}$
C. Pressure gradient	III. $\text{kg m}^{-2} \text{s}^{-2}$
D. Impulse	IV. $\text{kg m}^2 \text{s}^{-2}$

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

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

Question Type : MCQ

Question ID : 3666942391

Option 1 ID : 3666947542

Option 2 ID : 3666947541

Option 3 ID : 3666947544

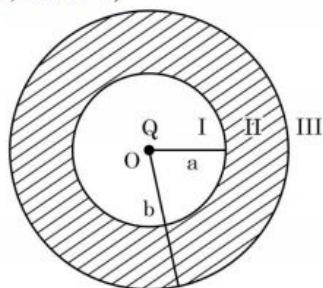
Option 4 ID : 3666947543

Status : Answered

Chosen Option : 1

Q.8 As shown in the figure, a point charge  $Q$  is placed at the centre of conducting spherical shell of inner radius  $a$  and outer radius  $b$ . The electric field due to charge  $Q$  in three different regions I, II and III is given by:

(I :  $r < a$ , II :  $a < r < b$ , III:  $r > b$ )



- Options
1.  $E_I = 0, E_{II} = 0, E_{III} \neq 0$
  2.  $E_I = 0, E_{II} = 0, E_{III} = 0$
  3.  $E_I \neq 0, E_{II} = 0, E_{III} \neq 0$
  4.  $E_I \neq 0, E_{II} = 0, E_{III} = 0$

Question Type : MCQ

Question ID : 3666942399

Option 1 ID : 3666947574

Option 2 ID : 3666947576

Option 3 ID : 3666947573

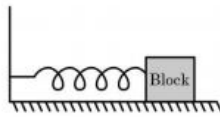
Option 4 ID : 3666947575

Status : Answered

Chosen Option : 3

Q.9

For a simple harmonic motion in a mass spring system shown, the surface is frictionless. When the mass of the block is 1 kg, the angular frequency is  $\omega_1$ . When the mass block is 2 kg the angular frequency is  $\omega_2$ . The ratio  $\omega_2/\omega_1$  is



Options

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

Question Type : MCQ

Question ID : 3666942410

Option 1 ID : 3666947620

Option 2 ID : 3666947618

Option 3 ID : 3666947617

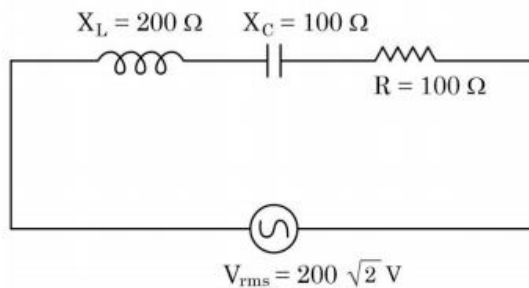
Option 4 ID : 3666947619

Status : Not Answered

Chosen Option : --

Q.10

In the given circuit, rms value of current ( $I_{\text{rms}}$ ) through the resistor R is:



Options

1. 2 A
2.  $2\sqrt{2}$  A
3. 20 A
4.  $\frac{1}{2}$  A

Question Type : MCQ

Question ID : 3666942404

Option 1 ID : 3666947596

Option 2 ID : 3666947593

Option 3 ID : 3666947595

Option 4 ID : 3666947594

Status : Not Answered

Chosen Option : --

**Q.11**

A thin prism  $P_1$  with an angle  $6^\circ$  and made of glass of refractive index 1.54 is combined with another prism  $P_2$  made from glass of refractive index 1.72 to produce dispersion without average deviation. The angle of prism  $P_2$  is

**Options**

1.  $1.3^\circ$
2.  $7.8^\circ$
3.  $6^\circ$
4.  $4.5^\circ$

Question Type : **MCQ**

Question ID : **3666942406**

Option 1 ID : **3666947601**

Option 2 ID : **3666947604**

Option 3 ID : **3666947602**

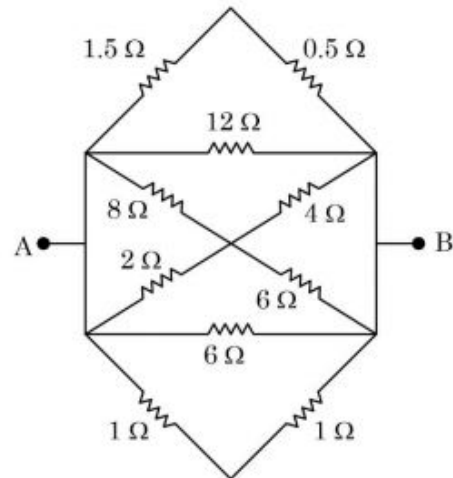
Option 4 ID : **3666947603**

Status : **Not Answered**

Chosen Option : --

Q.12

The equivalent resistance between  $A$  and  $B$  is \_\_\_\_\_.



Options

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

Question Type : MCQ

Question ID : 3666942401

Option 1 ID : 3666947582

Option 2 ID : 3666947583

Option 3 ID : 3666947584

Option 4 ID : 3666947581

Status : Answered

Chosen Option : 2



**Q.13** An object is allowed to fall from a height  $R$  above the earth, where  $R$  is the radius of earth. Its velocity when it strikes the earth's surface, ignoring air resistance, will be

- Options
1.  $2\sqrt{gR}$
  2.  $\sqrt{2gR}$
  3.  $\sqrt{gR}$
  4.  $\sqrt{\frac{gR}{2}}$

Question Type : **MCQ**

Question ID : **3666942394**

Option 1 ID : **3666947555**

Option 2 ID : **3666947553**

Option 3 ID : **3666947554**

Option 4 ID : **3666947556**

Status : **Not Attempted and  
Marked For Review**

Chosen Option : --

**Q.14** An electron accelerated through a potential difference  $V_1$  has a de-Broglie wavelength of  $\lambda$ . When the potential is changed to  $V_2$ , its de-Broglie wavelength increases by 50%. The value of  $\left(\frac{V_1}{V_2}\right)$  is equal to

- Options
1. 4
  2.  $\frac{3}{2}$
  3. 3
  4.  $\frac{9}{4}$

Question Type : **MCQ**

Question ID : **3666942407**

Option 1 ID : **3666947608**

Option 2 ID : **3666947606**

Option 3 ID : **3666947607**

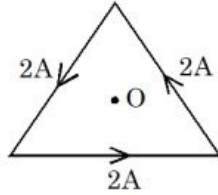
Option 4 ID : **3666947605**

Status : **Answered**

Chosen Option : **4**

Q.15

As shown in the figure, a current of  $2A$  flowing in an equilateral triangle of side  $4\sqrt{3}$  cm. The magnetic field at the centroid  $O$  of the triangle is



(Neglect the effect of earth's magnetic field)

Options

1.  $3\sqrt{3} \times 10^{-5}$  T
2.  $4\sqrt{3} \times 10^{-4}$  T
3.  $4\sqrt{3} \times 10^{-5}$  T
4.  $\sqrt{3} \times 10^{-4}$  T

Question Type : MCQ

Question ID : 3666942402

Option 1 ID : 3666947585

Option 2 ID : 3666947588

Option 3 ID : 3666947586

Option 4 ID : 3666947587

Status : Answered

Chosen Option : 1

Q.16

Match List I with List II:

List I	List II
A. Attenuation	I. Combination of a receiver and transmitter.
B. Transducer	II. process of retrieval of information from the carrier wave at receiver
C. Demodulation	III. converts one form of energy into another
D. Repeater	IV. Loss of strength of a signal while propogating through a medium.

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

Options

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

Question Type : MCQ

Question ID : 3666942398

Option 1 ID : 3666947569

Option 2 ID : 3666947571

Option 3 ID : 3666947572

Option 4 ID : 3666947570

Status : Answered

Chosen Option : 2

Q.17

A force is applied to a steel wire 'A', rigidly clamped at one end. As a result elongation in the wire is 0.2 mm. If same force is applied to another steel wire 'B' of double the length and a diameter 2.4 times that of the wire 'A', the elongation in the wire 'B' will be (wires having uniform circular cross sections)

Options

1.  $2.77 \times 10^{-2}$  mm
2.  $3.0 \times 10^{-2}$  mm
3.  $6.9 \times 10^{-2}$  mm
4.  $6.06 \times 10^{-2}$  mm

Question Type : MCQ

Question ID : 3666942393

Option 1 ID : 3666947550

Option 2 ID : 3666947551

Option 3 ID : 3666947549

Option 4 ID : 3666947552

Status : Not Answered

Chosen Option : --

Q.18

A flask contains hydrogen and oxygen in the ratio of 2:1 by mass at temperature  $27^{\circ}\text{C}$ . The ratio of average kinetic energy per molecule of hydrogen and oxygen respectively is:

- Options
1. 1 : 4
  2. 4 : 1
  3. 2 : 1
  4. 1 : 1

Question Type : MCQ

Question ID : 3666942400

Option 1 ID : 3666947578

Option 2 ID : 3666947579

Option 3 ID : 3666947577

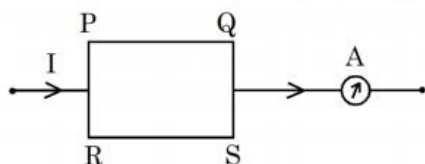
Option 4 ID : 3666947580

Status : Not Answered

Chosen Option : --

Q.19

A current carrying rectangular loop  $PQRS$  is made of uniform wire. The length  $PR = QS = 5\text{ cm}$  and  $PQ = RS = 100\text{ cm}$ . If ammeter current reading changes from  $I$  to  $2I$ , the ratio of magnetic forces per unit length on the wire  $PQ$  due to wire  $RS$  in the two cases respectively ( $f_{PQ}^I : f_{PQ}^{2I}$ ) is:



- Options
1. 1 : 5
  2. 1 : 2
  3. 1 : 4
  4. 1 : 3

Question Type : MCQ

Question ID : 3666942403

Option 1 ID : 3666947592

Option 2 ID : 3666947589

Option 3 ID : 3666947590

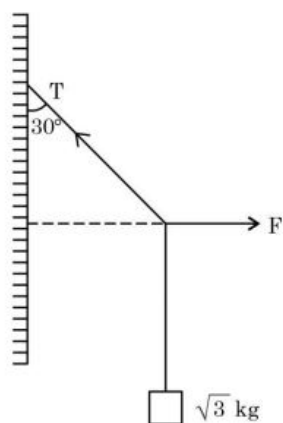
Option 4 ID : 3666947591

Status : Not Answered

Chosen Option : --

**Q.20**

A block of  $\sqrt{3}$  kg is attached to a string whose other end is attached to the wall. An unknown force  $F$  is applied so that the string makes an angle of  $30^\circ$  with the wall. The tension  $T$  is: (Given  $g = 10 \text{ ms}^{-2}$ )



**Options**

1. 20 N
2. 10 N
3. 25 N
4. 15 N

Question Type : **MCQ**

Question ID : **3666942396**

Option 1 ID : **3666947563**

Option 2 ID : **3666947561**

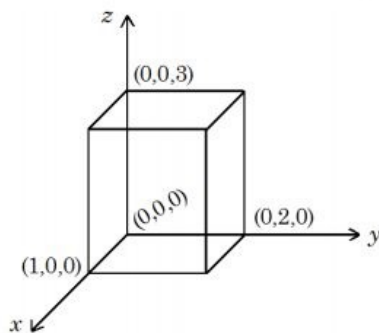
Option 3 ID : **3666947564**

Option 4 ID : **3666947562**

Status : **Answered**

Chosen Option : **1**

- Q.21** As shown in figure, a cuboid lies in a region with electric field  $E = 2x^2\hat{i} - 4y\hat{j} + 6\hat{k} \text{ N/C}$ . The magnitude of charge within the cuboid is  $n\epsilon_0 C$ . The value of  $n$  is \_\_\_\_\_ (if dimension of cuboid is  $1 \times 2 \times 3 \text{ m}^3$ ).



Given --  
Answer :

Question Type : SA  
Question ID : 3666942415  
Status : Not Answered

- Q.22** In an ac generator, a rectangular coil of 100 turns each having area  $14 \times 10^{-2} \text{ m}^2$  is rotated at 360 rev/min about an axis perpendicular to a uniform magnetic field of magnitude 3.0 T. The maximum value of the emf produced will be \_\_\_\_\_ V.

(Take  $\pi = \frac{22}{7}$ )

Given --  
Answer :

Question Type : SA  
Question ID : 3666942417  
Status : Not Answered

- Q.23** A stone tied to 180 cm long string at its end is making 28 revolutions in horizontal circle in every minute. The magnitude of acceleration of stone is  $\frac{1936}{x} \text{ ms}^{-2}$ . The value of  $x$  \_\_\_\_\_. (Take  $\pi = \frac{22}{7}$ )

Given 125  
Answer :

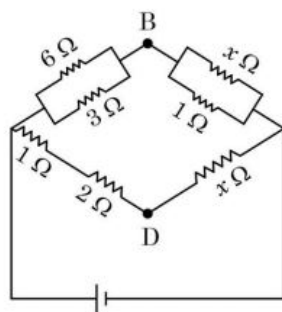
Question Type : SA  
Question ID : 3666942414  
Status : Answered

- Q.24** A radioactive nucleus decays by two different process. The half life of the first process is 5 minutes and that of the second process is 30 s. The effective half-life of the nucleus is calculated to be  $\frac{\alpha}{11}$  s. The value of  $\alpha$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : **SA**  
Question ID : **3666942419**  
Status : **Not Answered**

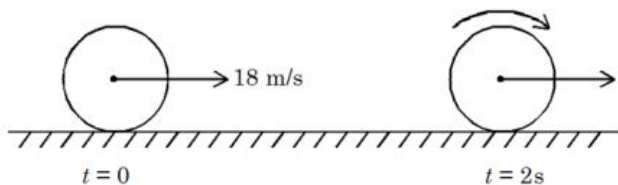
- Q.25** If the potential difference between B and D is zero, the value of  $x$  is  $\frac{1}{n}\Omega$ . The value of  $n$  is \_\_\_\_\_.



Given 2  
Answer :

Question Type : **SA**  
Question ID : **3666942416**  
Status : **Answered**

- Q.26** A uniform disc of mass 0.5 kg and radius  $r$  is projected with velocity 18 m/s at  $t = 0$ s on a rough horizontal surface. It starts off with a purely sliding motion at  $t = 0$ s. After 2s it acquires a purely rolling motion (see figure). The total kinetic energy of the disc after 2s will be \_\_\_\_\_ J (given, coefficient of friction is 0.3 and  $g = 10 \text{ m/s}^2$ ).



Given --  
Answer :

Question Type : **SA**  
Question ID : **3666942412**  
Status : **Not Answered**

Q.27

A body of mass 2 kg is initially at rest. It starts moving unidirectionally under the influence of a source of constant power P. Its displacement in 4s is

$\frac{1}{3}\alpha^2\sqrt{P} m$ . The value of  $\alpha$  will be \_\_\_\_\_.

Given --  
Answer :

Question Type : SA

Question ID : 3666942413

Status : Not Answered

Q.28

In a Young's double slit experiment, the intensities at two points, for the path differences  $\frac{\lambda}{4}$  and  $\frac{\lambda}{3}$  ( $\lambda$  being the wavelength of light used) are  $I_1$  and  $I_2$  respectively. If  $I_0$  denotes the intensity produced by each one of the individual slits, then  $\frac{I_1 + I_2}{I_0} =$  \_\_\_\_\_.

Given --  
Answer :

Question Type : SA

Question ID : 3666942418

Status : Not Answered

Q.29

The velocity of a particle executing SHM varies with displacement ( $x$ ) as

$4v^2 = 50 - x^2$ . The time period of oscillations is  $\frac{x}{7} s$ . The value of  $x$  is \_\_\_\_\_.

(Take  $\pi = \frac{22}{7}$ )

Given --  
Answer :

Question Type : SA

Question ID : 3666942420

Status : Not Answered

Q.30

A faulty thermometer reads  $5^\circ\text{C}$  in melting ice and  $95^\circ\text{C}$  in steam. The correct temperature on absolute scale will be \_\_\_\_\_ K when the faulty thermometer reads  $41^\circ\text{C}$ .

Given 313  
Answer :

Question Type : SA

Question ID : 3666942411

Status : Answered



**Q.31** 1 L, 0.02 M solution of  $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$  is mixed with 1 L, 0.02 M solution of  $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ . The resulting solution is divided into two equal parts (X) and treated with excess of  $\text{AgNO}_3$  solution and  $\text{BaCl}_2$  solution respectively as shown below:

1 L Solution (X) +  $\text{AgNO}_3$  solution (excess)  $\longrightarrow$  Y

1 L Solution (X) +  $\text{BaCl}_2$  solution (excess)  $\longrightarrow$  Z

The number of moles of Y and Z respectively are

- Options**
1. 0.02, 0.01
  2. 0.02, 0.02
  3. 0.01, 0.01
  4. 0.01, 0.02

Question Type : **MCQ**

Question ID : **3666942421**

Option 1 ID : **3666947632**

Option 2 ID : **3666947634**

Option 3 ID : **3666947631**

Option 4 ID : **3666947633**

Status : **Not Answered**

Chosen Option : --

**Q.32** Match List I with List II:

List I (Mixture)	List II (Separation Technique)
A. $\text{CHCl}_3 + \text{C}_6\text{H}_5\text{NH}_2$	I. Steam distillation
B. $\text{C}_6\text{H}_{14} + \text{C}_5\text{H}_{12}$	II. Differential extraction
C. $\text{C}_6\text{H}_5\text{NH}_2 + \text{H}_2\text{O}$	III. Distillation
D. Organic compound in $\text{H}_2\text{O}$	IV. Fractional distillation

- Options**
1. A-II, B-I, C-III, D-IV
  2. A-III, B-I, C-IV, D-II
  3. A-III, B-IV, C-I, D-II
  4. A-IV, B-I, C-III, D-II

Question Type : **MCQ**

Question ID : **3666942434**

Option 1 ID : **3666947683**

Option 2 ID : **3666947686**

Option 3 ID : **3666947684**

Option 4 ID : **3666947685**

Status : **Marked For Review**

Chosen Option : **3**

**Q.33** Given below are two statements: One is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A:** Antihistamines do not affect the secretion of acid in stomach.

**Reason R** : Antiallergic and antacid drugs work on different receptors.

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 : **3666942440**

Option 1 ID : **3666947707**

Option 2 ID : **3666947710**

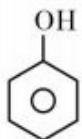
Option 3 ID : **3666947709**

Option 4 ID : **3666947708**

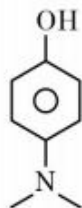
Status : **Not Answered**

Chosen Option : --

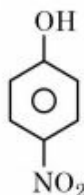
**Q.34** The correct order of  $pK_a$  values for the following compounds is:



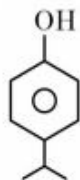
a



b



c



d

- Options**
1.  $a > b > c > d$
  2.  $c > a > d > b$
  3.  $b > a > d > c$
  4.  $b > d > a > c$

Question Type : **MCQ**

Question ID : **3666942437**

Option 1 ID : **3666947695**

Option 2 ID : **3666947697**

Option 3 ID : **3666947698**

Option 4 ID : **3666947696**

Status : **Not Answered**

Chosen Option : --

**Q.35** Bond dissociation energy of "E-H" bond of the "H<sub>2</sub>E" hydrides of group 16 elements (given below), follows order.

- A. O
- B. S
- C. Se
- D. Te

Choose the correct from the options given below:

**Options** 1.  $B > A > C > D$

2.  $A > B > D > C$

3.  $D > C > B > A$

4.  $A > B > C > D$

Question Type : **MCQ**

Question ID : **3666942428**

Option 1 ID : **3666947660**

Option 2 ID : **3666947661**



Option 3 ID : **3666947659**

Option 4 ID : **3666947662**

Status : **Not Answered**

Chosen Option : --

**Q.36** Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.

Assertion A:  can be easily reduced using Zn-Hg/HCl to .

Reason R: Zn-Hg/HCl is used to reduce carbonyl group to  $-\text{CH}_2-$  group.

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

**Options** 1. A is false but R is true

2. A is true but R is false

3. Both A and R are true and R is the correct explanation of A

4.

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

Question Type : **MCQ**

Question ID : **3666942438**

Option 1 ID : **3666947702**

Option 2 ID : **3666947701**

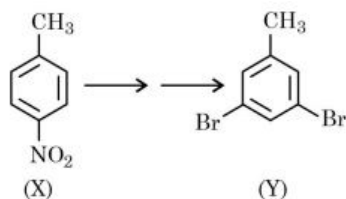
Option 3 ID : **3666947699**

Option 4 ID : **3666947700**

Status : **Not Answered**

Chosen Option : --

Q.37



In the above conversion of compound (X) to product (Y), the sequence of reagents to be used will be:

- Options
1. (i)  $\text{Br}_2(\text{aq})$  (ii)  $\text{LiAlH}_4$  (iii)  $\text{H}_3\text{O}^+$
  2. (i)  $\text{Fe}, \text{H}^+$  (ii)  $\text{Br}_2(\text{aq})$  (iii)  $\text{HNO}_2$  (iv)  $\text{CuBr}$
  3. (i)  $\text{Br}_2, \text{Fe}$  (ii)  $\text{Fe}, \text{H}^+$  (iii)  $\text{LiAlH}_4$
  4. (i)  $\text{Fe}, \text{H}^+$  (ii)  $\text{Br}_2(\text{aq})$  (iii)  $\text{HNO}_2$  (iv)  $\text{H}_3\text{PO}_2$

Question Type : MCQ

Question ID : 3666942439

Option 1 ID : 3666947704

Option 2 ID : 3666947705

Option 3 ID : 3666947703

Option 4 ID : 3666947706

Status : Not Answered

Chosen Option : --

Q.38

Given below are two statements:

**Statement I:** During Electrolytic refining, the pure metal is made to act as anode and its impure metallic form is used as cathode.

**Statement II:** During the Hall-Heroult electrolysis process, purified  $\text{Al}_2\text{O}_3$  is mixed with  $\text{Na}_3\text{AlF}_6$  to lower the melting point of the mixture.

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 but 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 : 3666942425

Option 1 ID : 3666947650

Option 2 ID : 3666947649

Option 3 ID : 3666947648

Option 4 ID : 3666947647

Status : Not Answered

Chosen Option : --

**Q.39** Maximum number of electrons that can be accommodated in shell with  $n = 4$  are:

- Options
1. 32
  2. 16
  3. 72
  4. 50

Question Type : MCQ

Question ID : 3666942424

Option 1 ID : 3666947644

Option 2 ID : 3666947643

Option 3 ID : 3666947646

Option 4 ID : 3666947645

Status : Answered

Chosen Option : 1

**Q.40**  $\text{KMnO}_4$  oxidises  $\text{I}^-$  in acidic and neutral/faintly alkaline solution, respectively, to

- Options
1.  $\text{IO}_3^-$  &  $\text{I}_2$
  2.  $\text{I}_2$  &  $\text{I}_2$
  3.  $\text{I}_2$  &  $\text{IO}_3^-$
  4.  $\text{IO}_3^-$  &  $\text{IO}_3^-$

Question Type : MCQ

Question ID : 3666942429

Option 1 ID : 3666947666

Option 2 ID : 3666947663

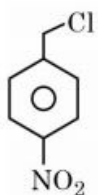
Option 3 ID : 3666947664

Option 4 ID : 3666947665

Status : Not Answered

Chosen Option : --

Q.41 Decreasing order towards SN 1 reaction for the following compounds is:



- Options
1.  $a > c > d > b$
  2.  $d > b > c > a$
  3.  $a > b > c > d$
  4.  $b > d > c > a$

Question Type : MCQ

Question ID : 3666942436

Option 1 ID : 3666947692

Option 2 ID : 3666947694

Option 3 ID : 3666947693

Option 4 ID : 3666947691

Status : Not Answered

Chosen Option : --

Q.42 Chlorides of which metal are soluble in organic solvents:

- Options
1. Mg
  2. Ca
  3. K
  4. Be

Question Type : MCQ

Question ID : 3666942426

Option 1 ID : 3666947654

Option 2 ID : 3666947653

Option 3 ID : 3666947651

Option 4 ID : 3666947652

Status : Not Answered

Chosen Option : --

Q.43 Which of the following reaction is correct?

- Options
1.  $4 \text{LiNO}_3 \xrightarrow{\Delta} 2\text{Li}_2\text{O} + 2\text{N}_2\text{O}_4 + \text{O}_2$
  2.  $4 \text{LiNO}_3 \xrightarrow{\Delta} 2\text{Li}_2\text{O} + 4\text{NO}_2 + \text{O}_2$
  3.  $2 \text{LiNO}_3 \xrightarrow{\Delta} 2\text{NaNO}_2 + \text{O}_2$
  4.  $2 \text{LiNO}_3 \longrightarrow 2\text{Li} + 2\text{NO}_2 + \text{O}_2$

Question Type : MCQ

Question ID : 3666942427

Option 1 ID : 3666947655

Option 2 ID : 3666947656

Option 3 ID : 3666947657

Option 4 ID : 3666947658

Status : Not Answered

Chosen Option : --

Q.44 Match List I with List II:

List I (Complexes)	List II (Hybridisation)
A. $[\text{Ni}(\text{CO})_4]$	I. $\text{sp}^3$
B. $[\text{Cu}(\text{NH}_3)_4]^{2+}$	II. $\text{dsp}^2$
C. $[\text{Fe}(\text{NH}_3)_6]^{2+}$	III. $\text{sp}^3\text{d}^2$
D. $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$	IV. $\text{d}^2\text{sp}^3$

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

Question Type : MCQ

Question ID : 3666942432

Option 1 ID : 3666947675

Option 2 ID : 3666947677

Option 3 ID : 3666947678

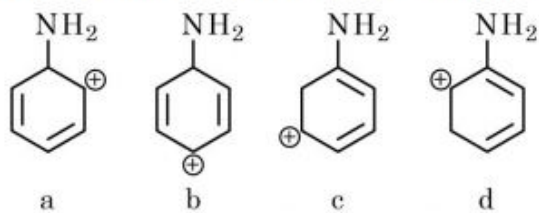
Option 4 ID : 3666947676

Status : Not Answered

Chosen Option : --



Q.45 The most stable carbocation for the following is:



- Options
1. a
  2. c
  3. b
  4. d

Question Type : MCQ

Question ID : 3666942435

Option 1 ID : 3666947687

Option 2 ID : 3666947689

Option 3 ID : 3666947688

Option 4 ID : 3666947690

Status : Answered

Chosen Option : 3

Q.46 The  $\text{Cl}-\text{Co}-\text{Cl}$  bond angle values in a fac- $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$  complex is/are:

- Options
1.  $90^\circ$  &  $180^\circ$
  2.  $90^\circ$
  3.  $180^\circ$
  4.  $90^\circ$  &  $120^\circ$

Question Type : MCQ

Question ID : 3666942430

Option 1 ID : 3666947668

Option 2 ID : 3666947667

Option 3 ID : 3666947670

Option 4 ID : 3666947669

Status : Not Answered

Chosen Option : --



Q.47 The wave function ( $\Psi$ ) of 2s is given by

$$\Psi_{2s} = \frac{1}{2\sqrt{2\pi}} \left( \frac{1}{a_0} \right)^{1/2} \left( 2 - \frac{r}{a_0} \right) e^{-r/2a_0}$$

At  $r = r_0$ , radial node is formed. Thus,  $r_0$  in terms of  $a_0$

Options

1.  $r_0 = a_0$
2.  $r_0 = \frac{a_0}{2}$
3.  $r_0 = 2a_0$
4.  $r_0 = 4a_0$

Question Type : MCQ

Question ID : 3666942422

Option 1 ID : 3666947635

Option 2 ID : 3666947637

Option 3 ID : 3666947636

Option 4 ID : 3666947638

Status : Answered

Chosen Option : 3

Q.48 Formulae for Nessler's reagent is:

Options

1.  $K_2HgI_4$
2.  $HgI_2$
3.  $KHg_2I_2$
4.  $KHgI_3$

Question Type : MCQ

Question ID : 3666942433

Option 1 ID : 3666947681

Option 2 ID : 3666947679

Option 3 ID : 3666947680

Option 4 ID : 3666947682

Status : Not Answered

Chosen Option : --

**Q.49** Boric acid is solid, whereas  $\text{BF}_3$  is gas at room temperature because of

- Options
1. Strong hydrogen bond in Boric acid
  2. Strong van der Waal's interaction in Boric acid
  3. Strong covalent bond in  $\text{BF}_3$
  4. Strong ionic bond in Boric acid

Question Type : **MCQ**

Question ID : **3666942423**

Option 1 ID : **3666947640**

Option 2 ID : **3666947641**

Option 3 ID : **3666947639**

Option 4 ID : **3666947642**

Status : **Not Attempted and  
Marked For Review**

Chosen Option : --

**Q.50** The water quality of a pond was analysed and its BOD was found to be 4. The pond has

- Options
1. Very clean water
  2. Highly polluted water
  3. Slightly polluted water
  4. Water has high amount of fluoride compounds

Question Type : **MCQ**

Question ID : **3666942431**

Option 1 ID : **3666947671**

Option 2 ID : **3666947673**

Option 3 ID : **3666947672**

Option 4 ID : **3666947674**

Status : **Not Answered**

Chosen Option : --

**Q.51** The electrode potential of the following half cell at 298 K  
 $X|X^{2+}(0.001\text{ M})||Y^{2+}(0.01\text{ M})|Y$  is \_\_\_\_\_  $\times 10^{-2}\text{ V}$  (Nearest integer).

Given:  $E^\circ_{X^{2+}|X} = -2.36\text{ V}$

$E^\circ_{Y^{2+}|Y} = +0.36\text{ V}$

$$\frac{2.303RT}{F} = 0.06\text{ V}$$

Given --  
Answer :

Question Type : **SA**  
Question ID : **3666942445**  
Status : **Not Answered**

**Q.52** 1 mole of ideal gas is allowed to expand reversibly and adiabatically from a temperature of  $27^\circ\text{C}$ . The work done is  $3\text{ kJ mol}^{-1}$ . The final temperature of the gas is \_\_\_\_\_ K (Nearest integer). Given  $C_V = 20\text{ J mol}^{-1}\text{ K}^{-1}$

Given --  
Answer :

Question Type : **SA**  
Question ID : **3666942442**  
Status : **Not Answered**

**Q.53** The graph of  $\log \frac{x}{m}$  vs  $\log p$  for an adsorption process is a straight line inclined at an angle of  $45^\circ$  with intercept equal to 0.6020. The mass of gas adsorbed per unit mass of adsorbent at the pressure of 0.4 atm is \_\_\_\_\_  $\times 10^{-1}$  (Nearest integer).

Given:  $\log 2 = 0.3010$

Given --  
Answer :

Question Type : **SA**  
Question ID : **3666942447**  
Status : **Not Answered**

**Q.54** A short peptide on complete hydrolysis produces 3 moles of glycine (G), two moles of leucine (L) and two moles of valine (V) per mole of peptide. The number of peptide linkages in it are \_\_\_\_\_.

Given 6  
Answer :

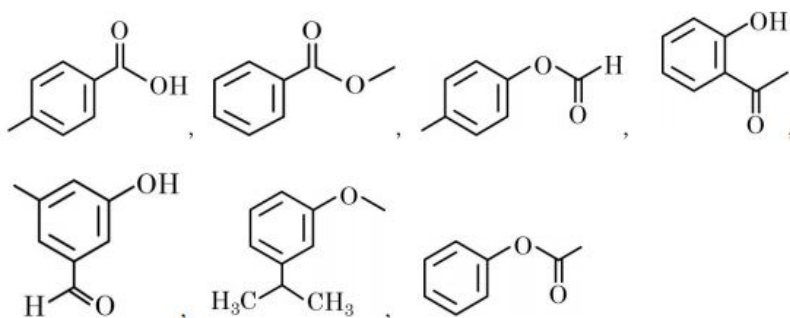
Question Type : **SA**  
Question ID : **3666942450**  
Status : **Answered**

- Q.55** Lead storage battery contains 38% by weight solution of  $\text{H}_2\text{SO}_4$ . The van't Hoff factor is 2.67 at this concentration. The temperature in Kelvin at which the solution in the battery will freeze is \_\_\_\_\_. (Nearest integer).  
Given  $K_f = 1.8 \text{ K kg mol}^{-1}$

Given --  
Answer :

Question Type : **SA**  
Question ID : **3666942443**  
Status : **Not Answered**

- Q.56** Number of compounds from the following which will not dissolve in cold  $\text{NaHCO}_3$  and  $\text{NaOH}$  solutions but will dissolve in hot  $\text{NaOH}$  solution is \_\_\_\_\_



Given --  
Answer :

Question Type : **SA**  
Question ID : **3666942449**  
Status : **Not Answered**

- Q.57** Iron oxide  $\text{FeO}$ , crystallises in a cubic lattice with a unit cell edge length of  $5.0 \text{ \AA}$ . If density of the  $\text{FeO}$  in the crystal is  $4.0 \text{ g cm}^{-3}$ , then the number of  $\text{FeO}$  units present per unit cell is \_\_\_\_\_. (Nearest integer)

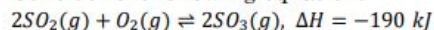
Given: Molar mass of Fe and O is 56 and  $16 \text{ g mol}^{-1}$  respectively.  
 $N_A = 6.0 \times 10^{23} \text{ mol}^{-1}$

Given 4  
Answer :

Question Type : **SA**  
Question ID : **3666942441**  
Status : **Answered**

**Q.58**

Consider the following equation:



The number of factors which will increase the yield of  $\text{SO}_3$  at equilibrium from the following is \_\_\_\_\_

- A. Increasing temperature
- B. Increasing pressure
- C. Adding more  $\text{SO}_2$
- D. Adding more  $\text{O}_2$
- E. Addition of catalyst

Given **3**

Answer :

Question Type : **SA**

Question ID : **3666942444**

Status : **Answered**

**Q.59**

An organic compound undergoes first order decomposition. If the time taken for the 60% decomposition is 540 s, then the time required for 90% decomposition will be is \_\_\_\_\_ s. (Nearest integer).

Given:  $\ln 10 = 2.3$ ;  $\log 2 = 0.3$

Given **1350**

Answer :

Question Type : **SA**

Question ID : **3666942446**

Status : **Answered**

**Q.60**

The strength of 50 volume solution of hydrogen peroxide is \_\_\_\_\_ g/L (Nearest integer).

Given:

Molar mass of  $\text{H}_2\text{O}_2$  is  $34 \text{ g mol}^{-1}$

Molar volume of gas at STP =  $22.7 \text{ L}$ .

Given --

Answer :

Question Type : **SA**

Question ID : **3666942448**

Status : **Not Answered**

Q.61

A vector  $\vec{v}$  in the first octant is inclined to the x-axis at  $60^\circ$ , to the y-axis at  $45^\circ$  and to the z-axis at an acute angle. If a plane passing through the points  $(\sqrt{2}, -1, 1)$  and  $(a, b, c)$ , is normal to  $\vec{v}$ , then

Options

1.  $\sqrt{2}a - b + c = 1$
2.  $a + b + \sqrt{2}c = 1$
3.  $\sqrt{2}a + b + c = 1$
4.  $a + \sqrt{2}b + c = 1$

Question Type : MCQ

Question ID : 3666942464

Option 1 ID : 3666947774

Option 2 ID : 3666947776

Option 3 ID : 3666947773

Option 4 ID : 3666947775

Status : Not Answered

Chosen Option : --

Q.62

Let  $x = (8\sqrt{3} + 13)^{13}$  and  $y = (7\sqrt{2} + 9)^9$ . If  $[t]$  denotes the greatest integer  $\leq t$ , then

Options

1.  $[x]$  is even but  $[y]$  is odd
2.  $[x]$  is odd but  $[y]$  is even
3.  $[x]$  and  $[y]$  are both odd
4.  $[x] + [y]$  is even

Question Type : MCQ

Question ID : 3666942456

Option 1 ID : 3666947742

Option 2 ID : 3666947743

Option 3 ID : 3666947741

Option 4 ID : 3666947744

Status : Not Answered

Chosen Option : --

Q.63

Let  $a_1 = 1, a_2, a_3, a_4, \dots$  be consecutive natural numbers.

Then  $\tan^{-1}\left(\frac{1}{1+a_1a_2}\right) + \tan^{-1}\left(\frac{1}{1+a_2a_3}\right) + \dots + \tan^{-1}\left(\frac{1}{1+a_{2021}a_{2022}}\right)$  is equal to

Options

1.  $\tan^{-1}(2022) - \frac{\pi}{4}$
2.  $\cot^{-1}(2022) - \frac{\pi}{4}$
3.  $\frac{\pi}{4} - \tan^{-1}(2022)$
4.  $\frac{\pi}{4} - \cot^{-1}(2022)$

Question Type : MCQ

Question ID : 3666942468

Option 1 ID : 3666947789

Option 2 ID : 3666947791

Option 3 ID : 3666947790

Option 4 ID : 3666947792

Status : Not Answered

Chosen Option : --

Q.64

$\lim_{n \rightarrow \infty} \frac{3}{n} \left\{ 4 + \left(2 + \frac{1}{n}\right)^2 + \left(2 + \frac{2}{n}\right)^2 + \dots + \left(3 - \frac{1}{n}\right)^2 \right\}$  is equal to

Options

1. 0
2.  $\frac{19}{3}$
3. 12
4. 19

Question Type : MCQ

Question ID : 3666942460

Option 1 ID : 3666947759

Option 2 ID : 3666947758

Option 3 ID : 3666947760

Option 4 ID : 3666947757

Status : Answered

Chosen Option : 1

Q.65

The solution of the differential equation  $\frac{dy}{dx} = -\left(\frac{x^2 + 3y^2}{3x^2 + y^2}\right)$ ,  $y(1) = 0$  is

Options

1.  $\log_e |x + y| - \frac{xy}{(x + y)^2} = 0$
2.  $\log_e |x + y| + \frac{2xy}{(x + y)^2} = 0$
3.  $\log_e |x + y| + \frac{xy}{(x + y)^2} = 0$
4.  $\log_e |x + y| - \frac{2xy}{(x + y)^2} = 0$

Question Type : MCQ

Question ID : 3666942461

Option 1 ID : 3666947761

Option 2 ID : 3666947764

Option 3 ID : 3666947763

Option 4 ID : 3666947762

Status : Not Answered

Chosen Option : --

Q.66

If  $P$  is a  $3 \times 3$  real matrix such that  $P^T = aP + (a - 1)I$ , where  $a > 1$ , then

Options

1.  $|Adj P| = \frac{1}{2}$
2.  $|Adj P| = 1$
3.  $|Adj P| > 1$
4.  $P$  is a singular matrix

Question Type : MCQ

Question ID : 3666942454

Option 1 ID : 3666947736

Option 2 ID : 3666947735

Option 3 ID : 3666947734

Option 4 ID : 3666947733

Status : Not Answered

Chosen Option : --



Q.67

Let  $a, b, c > 1$ ,  $a^3, b^3$  and  $c^3$  be in A.P., and  $\log_a b, \log_c a$  and  $\log_b c$  be in G.P. If the sum of first 20 terms of an A.P., whose first term is  $\frac{a+4b+c}{3}$  and the common difference is  $\frac{a-8b+c}{10}$  is  $-444$ , then  $abc$  is equal to:

Options

1. 216
2.  $\frac{343}{8}$
3.  $\frac{125}{8}$
4. 343

Question Type : MCQ

Question ID : 3666942457

Option 1 ID : 3666947747

Option 2 ID : 3666947748

Option 3 ID : 3666947746

Option 4 ID : 3666947745

Status : Not Answered

Chosen Option : --

Q.68

The number of ways of selecting two numbers  $a$  and  $b$ ,  $a \in \{2, 4, 6, \dots, 100\}$  and  $b \in \{1, 3, 5, \dots, 99\}$  such that 2 is the remainder when  $a+b$  is divided by 23 is

Options

1. 186
2. 54
3. 268
4. 108

Question Type : MCQ

Question ID : 3666942455

Option 1 ID : 3666947737

Option 2 ID : 3666947740

Option 3 ID : 3666947738

Option 4 ID : 3666947739

Status : Answered

Chosen Option : 4

Q.69

If the functions  $f(x) = \frac{x^3}{3} + 2bx + \frac{ax^2}{2}$  and  $g(x) = \frac{x^3}{3} + ax + bx^2$ ,  $a \neq 2b$  have a common extreme point, then  $a + 2b + 7$  is equal to:

Options

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

Question Type : MCQ

Question ID : 3666942459

Option 1 ID : 3666947753

Option 2 ID : 3666947754

Option 3 ID : 3666947755

Option 4 ID : 3666947756

Status : Not Answered

Chosen Option : --

Q.70

If a plane passes through the points  $(-1, k, 0)$ ,  $(2, k, -1)$ ,  $(1, 1, 2)$  and is parallel to the line  $\frac{x-1}{1} = \frac{2y+1}{2} = \frac{z+1}{-1}$ , then the value of  $\frac{k^2+1}{(k-1)(k-2)}$  is

Options

1.  $\frac{5}{17}$
2.  $\frac{6}{13}$
3.  $\frac{17}{5}$
4.  $\frac{13}{6}$

Question Type : MCQ

Question ID : 3666942465

Option 1 ID : 3666947778

Option 2 ID : 3666947779

Option 3 ID : 3666947780

Option 4 ID : 3666947777

Status : Not Answered

Chosen Option : --

Q.71

Let  $\lambda \in \mathbb{R}$ ,  $\vec{a} = \lambda \hat{i} + 2\hat{j} - 3\hat{k}$ ,  $\vec{b} = \hat{i} - \lambda \hat{j} + 2\hat{k}$ .

If  $\left( (\vec{a} + \vec{b}) \times (\vec{a} \times \vec{b}) \right) \times (\vec{a} - \vec{b}) = 8\hat{i} - 40\hat{j} - 24\hat{k}$ , then  $\left| \lambda(\vec{a} + \vec{b}) \times (\vec{a} - \vec{b}) \right|^2$  is equal to

Options

1. 132
2. 140
3. 136
4. 144

Question Type : MCQ

Question ID : 3666942469

Option 1 ID : 3666947793

Option 2 ID : 3666947795

Option 3 ID : 3666947794

Option 4 ID : 3666947796

Status : Not Answered

Chosen Option : --

Q.72

Let  $A$  be a point on the  $x$ -axis. Common tangents are drawn from  $A$  to the curves  $x^2 + y^2 = 8$  and  $y^2 = 16x$ . If one of these tangents touches the two curves at  $Q$  and  $R$ , then  $(QR)^2$  is equal to

Options

1. 76
2. 72
3. 81
4. 64

Question Type : MCQ

Question ID : 3666942463

Option 1 ID : 3666947771

Option 2 ID : 3666947770

Option 3 ID : 3666947772

Option 4 ID : 3666947769

Status : Not Answered

Chosen Option : --

Q.73

Let  $f, g$  and  $h$  be the real valued functions defined on  $\mathbb{R}$  as

$$f(x) = \begin{cases} \frac{x}{[x]}, & x \neq 0 \\ 1, & x = 0 \end{cases}, \quad g(x) = \begin{cases} \frac{\sin(x+1)}{(x+1)}, & x \neq -1 \\ 1, & x = -1 \end{cases}$$

and  $h(x) = 2[x] - f(x)$ , where  $[x]$  is the greatest integer  $\leq x$ .

Then the value of  $\lim_{x \rightarrow 1} g(h(x-1))$  is

Options

1. 0
2.  $\sin(1)$
3. -1
4. 1

Question Type : MCQ

Question ID : 3666942458

Option 1 ID : 3666947752

Option 2 ID : 3666947750

Option 3 ID : 3666947751

Option 4 ID : 3666947749

Status : Answered

Chosen Option : 4

Q.74

Let  $\vec{a}$  and  $\vec{b}$  be two vectors, Let  $|\vec{a}| = 1$ ,  $|\vec{b}| = 4$  and  $\vec{a} \cdot \vec{b} = 2$ . If  $\vec{c} = (2\vec{a} \times \vec{b}) - 3\vec{b}$ , then the value of  $\vec{b} \cdot \vec{c}$  is

Options

1. -48
2. -60
3. -84
4. -24

Question Type : MCQ

Question ID : 3666942466

Option 1 ID : 3666947782

Option 2 ID : 3666947783

Option 3 ID : 3666947784

Option 4 ID : 3666947781

Status : Answered

Chosen Option : 1

**Q.75** Let  $q$  be the maximum integral value of  $p$  in  $[0, 10]$  for which the roots of the equation  $x^2 - px + \frac{5}{4}p = 0$  are rational. Then the area of the region  $\{(x, y) : 0 \leq y \leq (x - q)^2, 0 \leq x \leq q\}$  is

- Options**
1. 164
  2. 243
  3.  $\frac{125}{3}$
  4. 25

Question Type : **MCQ**  
 Question ID : **3666942452**  
 Option 1 ID : **3666947727**  
 Option 2 ID : **3666947728**  
 Option 3 ID : **3666947725**  
 Option 4 ID : **3666947726**  
 Status : **Answered**  
 Chosen Option : **2**

**Q.76** Consider the following statements:

P : I have fever

Q : I will not take medicine

R : I will take rest.

The statement "If I have fever, then I will take medicine and I will take rest" is equivalent to:

- Options**
1.  $(P \vee \sim Q) \wedge (P \vee \sim R)$
  2.  $(P \vee Q) \wedge ((\sim P) \vee R)$
  3.  $((\sim P) \vee \sim Q) \wedge ((\sim P) \vee \sim R)$
  4.  $((\sim P) \vee \sim Q) \wedge ((\sim P) \vee R)$

Question Type : **MCQ**  
 Question ID : **3666942470**  
 Option 1 ID : **3666947800**  
 Option 2 ID : **3666947797**  
 Option 3 ID : **3666947799**  
 Option 4 ID : **3666947798**  
 Status : **Not Answered**  
 Chosen Option : **--**

Q.77

The parabolas :  $ax^2 + 2bx + cy = 0$  and  $dx^2 + 2ex + fy = 0$  intersect on the line  $y = 1$ . If  $a, b, c, d, e, f$  are positive real numbers and  $a, b, c$  are in G.P., then

Options

1.  $d, e, f$  are in G.P.
2.  $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$  are in A.P.
3.  $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$  are in G.P.
4.  $d, e, f$  are in A.P.

Question Type : MCQ

Question ID : 3666942462

Option 1 ID : 3666947768

Option 2 ID : 3666947766

Option 3 ID : 3666947765

Option 4 ID : 3666947767

Status : Not Answered

Chosen Option : --

Q.78

The range of the function  $f(x) = \sqrt{3-x} + \sqrt{2+x}$  is:

Options

1.  $[\sqrt{2}, \sqrt{7}]$
2.  $[2\sqrt{2}, \sqrt{11}]$
3.  $[\sqrt{5}, \sqrt{13}]$
4.  $[\sqrt{5}, \sqrt{10}]$

Question Type : MCQ

Question ID : 3666942451

Option 1 ID : 3666947723

Option 2 ID : 3666947721

Option 3 ID : 3666947724

Option 4 ID : 3666947722

Status : Answered

Chosen Option : 4

Q.79

For  $\alpha, \beta \in \mathbb{R}$ , suppose the system of linear equations

$$x - y + z = 5$$

$$2x + 2y + \alpha z = 8$$

$$3x - y + 4z = \beta$$

has infinitely many solutions. Then  $\alpha$  and  $\beta$  are the roots of

Options

1.  $x^2 + 18x + 56 = 0$

2.  $x^2 + 14x + 24 = 0$

3.  $x^2 - 10x + 16 = 0$

4.  $x^2 - 18x + 56 = 0$

Question Type : MCQ

Question ID : 3666942453

Option 1 ID : 3666947729

Option 2 ID : 3666947732

Option 3 ID : 3666947731

Option 4 ID : 3666947730

Status : Not Answered

Chosen Option : --

Q.80

Let  $S$  be the set of all values of  $a_1$  for which the mean deviation about the mean of 100 consecutive positive integers  $a_1, a_2, a_3, \dots, a_{100}$  is 25. Then  $S$  is

Options

1.  $\phi$

2.  $\mathbb{N}$

3.  $\{9\}$

4.  $\{99\}$

Question Type : MCQ

Question ID : 3666942467

Option 1 ID : 3666947788

Option 2 ID : 3666947787

Option 3 ID : 3666947785

Option 4 ID : 3666947786

Status : Answered

Chosen Option : 2

Q.81

If  $\int \sqrt{\sec 2x - 1} dx = \alpha \log_e \left| \cos 2x + \beta + \sqrt{\cos 2x \left( 1 + \cos \frac{1}{\beta} x \right)} \right| + \text{constant}$ , then  $\beta - \alpha$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942477  
Status : Not Answered

Q.82

A bag contains six balls of different colours. Two balls are drawn in succession with replacement. The probability that both the balls are of the same colour is  $p$ . Next four balls are drawn in succession with replacement and the probability that exactly three balls are of the same colour is  $q$ . If  $p : q = m : n$ , where  $m$  and  $n$  are coprime, then  $m + n$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942480  
Status : Not Answered

Q.83

The 8<sup>th</sup> common term of the series

$$S_1 = 3 + 7 + 11 + 15 + 19 + \dots,$$

$$S_2 = 1 + 6 + 11 + 16 + 21 + \dots$$

is \_\_\_\_\_.

Given 151  
Answer :

Question Type : SA  
Question ID : 3666942475  
Status : Answered

Q.84

The number of seven digits odd numbers, that can be formed using all the seven digits 1, 2, 2, 2, 3, 3, 5 is \_\_\_\_\_.

Given 240  
Answer :

Question Type : SA  
Question ID : 3666942473  
Status : Answered



**Q.85** Let a line  $L$  pass through the point  $P(2, 3, 1)$  and be parallel to the line  $x + 3y - 2z - 2 = 0 = x - y + 2z$ . If the distance of  $L$  from the point  $(5, 3, 8)$  is  $\alpha$ , then  $3\alpha^2$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942479  
Status : Not Answered

**Q.86** If the value of real number  $a > 0$  for which  $x^2 - 5ax + 1 = 0$  and  $x^2 - ax - 5 = 0$  have a common real root is  $\frac{3}{\sqrt{2\beta}}$  then  $\beta$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942472  
Status : Not Answered

**Q.87**  $50^{\text{th}}$  root of a number  $x$  is 12 and  $50^{\text{th}}$  root of another number  $y$  is 18. Then the remainder obtained on dividing  $(x + y)$  by 25 is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942474  
Status : Not Answered

**Q.88** Let  $P(a_1, b_1)$  and  $Q(a_2, b_2)$  be two distinct points on a circle with center  $C(\sqrt{2}, \sqrt{3})$ . Let O be the origin and OC be perpendicular to both CP and CQ. If the area of the triangle OCP is  $\frac{\sqrt{35}}{2}$ , then  $a_1^2 + a_2^2 + b_1^2 + b_2^2$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942478  
Status : Not Answered

**Q.89** Let  $A$  be the area of the region  $\{(x, y) : y \geq x^2, y \geq (1-x)^2, y \leq 2x(1-x)\}$ . Then  $540A$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942476  
Status : Not Answered

**Q.90**

Let  $A = \{1, 2, 3, 5, 8, 9\}$ . Then the number of possible functions  $f : A \rightarrow A$  such that  $f(m \cdot n) = f(m) \cdot f(n)$  for every  $m, n \in A$  with  $m \cdot n \in A$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : **SA**

Question ID : **3666942471**

Status : **Not Answered**