

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

Application No	
Candidate Name	
Roll No	
Test Date	01/02/2023
Test Time	9:00 AM - 12:00 PM
Subject	B TECH

Section : Physics Section A

Q.1 Match List I with List II:

List I	List II
A. Intrinsic semiconductor	I. Fermi-level near the valence band
B. n-type semiconductor	II. Fermi-level in the middle of valence and conduction band.
C. p-type semiconductor	III. Fermi-level near the conduction band
D. Metals	IV. Fermi-level inside the conduction band

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

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

Question Type : MCQ

Question ID : 3666942483

Option 1 ID : 3666947821

Option 2 ID : 3666947822

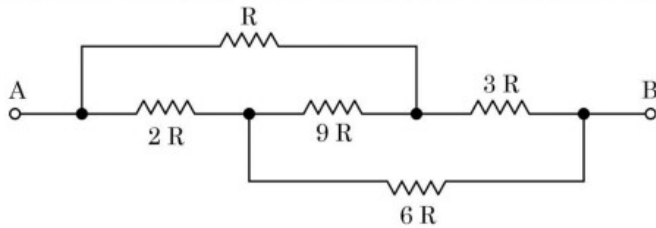
Option 3 ID : 3666947820

Option 4 ID : 3666947819

Status : Answered

Chosen Option : 4

Q.2 The equivalent resistance between  $A$  and  $B$  of the network shown in figure:



Options

1.  $11\frac{2}{3} R$
2.  $14 R$
3.  $21 R$
4.  $\frac{8}{3} R$

Question Type : MCQ

Question ID : 3666942491

Option 1 ID : 3666947852

Option 2 ID : 3666947854

Option 3 ID : 3666947851

Option 4 ID : 3666947853

Status : Answered

Chosen Option : 4

Q.3 The average kinetic energy of a molecule of the gas is

- Options
1. proportional to absolute temperature
  2. proportional to volume
  3. proportional to pressure
  4. dependent on the nature of the gas

Question Type : MCQ

Question ID : 3666942500

Option 1 ID : 3666947887

Option 2 ID : 3666947890

Option 3 ID : 3666947888

Option 4 ID : 3666947889

Status : Not Answered

Chosen Option : --

**Q.4** A child stands on the edge of the cliff 10 m above the ground and throws a stone horizontally with an initial speed of  $5 \text{ ms}^{-1}$ . Neglecting the air resistance, the speed with which the stone hits the ground will be \_\_\_\_  $\text{ms}^{-1}$  (given,  $g = 10 \text{ ms}^{-2}$ ).

- Options
1. 20
  2. 25
  3. 15
  4. 30

Question Type : **MCQ**

Question ID : **3666942490**

Option 1 ID : **3666947847**

Option 2 ID : **3666947849**

Option 3 ID : **3666947848**

Option 4 ID : **3666947850**

Status : **Not Answered**

Chosen Option : --

**Q.5** A block of mass 5 kg is placed at rest on a table of rough surface. Now, if a force of 30N is applied in the direction parallel to surface of the table, the block slides through a distance of 50 m in an interval of time 10s. Coefficient of kinetic friction is (given,  $g = 10 \text{ ms}^{-2}$ ):

- Options
1. 0.25
  2. 0.60
  3. 0.50
  4. 0.75

Question Type : **MCQ**

Question ID : **3666942495**

Option 1 ID : **3666947868**

Option 2 ID : **3666947869**

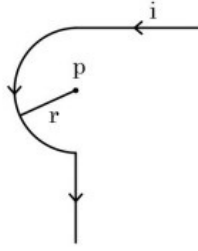
Option 3 ID : **3666947867**

Option 4 ID : **3666947870**

Status : **Answered**

Chosen Option : **3**

- Q.6 Find the magnetic field at the point P in figure. The curved portion is a semicircle connected to two long straight wires.



Options

1.  $\frac{\mu_0 i}{2r} \left(1 + \frac{2}{\pi}\right)$
2.  $\frac{\mu_0 i}{2r} \left(\frac{1}{2} + \frac{1}{\pi}\right)$
3.  $\frac{\mu_0 i}{2r} \left(1 + \frac{1}{\pi}\right)$
4.  $\frac{\mu_0 i}{2r} \left(\frac{1}{2} + \frac{1}{2\pi}\right)$

Question Type : MCQ

Question ID : 3666942489

Option 1 ID : 3666947843

Option 2 ID : 3666947845

Option 3 ID : 3666947844

Option 4 ID : 3666947846

Status : Answered

Chosen Option : 3

- Q.7 The mass of proton, neutron and helium nucleus are respectively  $1.0073 u$ ,  $1.0087 u$  and  $4.0015 u$ . The binding energy of helium nucleus is:

- Options
1. 14.2 MeV
  2. 56.8 MeV
  3. 28.4 MeV
  4. 7.1 MeV

Question Type : MCQ

Question ID : 3666942484

Option 1 ID : 3666947824

Option 2 ID : 3666947826

Option 3 ID : 3666947825

Option 4 ID : 3666947823

Status : Answered

Chosen Option : 3

**Q.8** Which of the following frequencies does not belong to FM broadcast.

- Options**
1. 99 MHz
  2. 64 MHz
  3. 106 MHz
  4. 89 MHz

Question Type : **MCQ**

Question ID : **3666942482**

Option 1 ID : **3666947818**

Option 2 ID : **3666947817**

Option 3 ID : **3666947815**

Option 4 ID : **3666947816**

Status : **Answered**

Chosen Option : **4**

**Q.9** Match List I with List II:

<b>List I</b>	<b>List II</b>
A. AC generator	I. Presence of both L and C
B. Transformer	II. Electromagnetic Induction
C. Resonance phenomenon to occur	III. Quality factor
D. Sharpness of resonance	IV. Mutual Induction

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

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

Question Type : **MCQ**

Question ID : **3666942488**

Option 1 ID : **3666947841**

Option 2 ID : **3666947839**

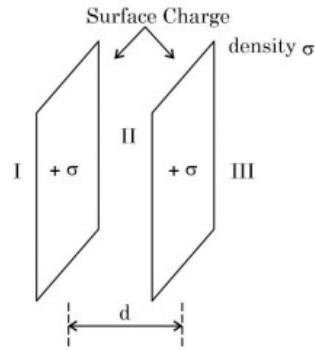
Option 3 ID : **3666947840**

Option 4 ID : **3666947842**

Status : **Answered**

Chosen Option : **2**

- Q.10** Let  $\sigma$  be the uniform surface charge density of two infinite thin plane sheets shown in figure. Then the electric fields in three different region  $E_I$ ,  $E_{II}$  and  $E_{III}$  are:



Options

1.  $\vec{E}_I = \frac{\sigma}{2\epsilon_0} \hat{n}$ ,  $\vec{E}_{II} = 0$ ,  $\vec{E}_{III} = \frac{\sigma}{2\epsilon_0} \hat{n}$
2.  $\vec{E}_I = 0$ ,  $\vec{E}_{II} = \frac{\sigma}{\epsilon_0} \hat{n}$ ,  $E_{III} = 0$
3.  $\vec{E}_I = \frac{2\sigma}{\epsilon_0} \hat{n}$ ,  $\vec{E}_{II} = 0$ ,  $\vec{E}_{III} = \frac{2\sigma}{\epsilon_0} \hat{n}$
4.  $\vec{E}_I = -\frac{\sigma}{\epsilon_0} \hat{n}$ ,  $\vec{E}_{II} = 0$ ,  $\vec{E}_{III} = \frac{\sigma}{\epsilon_0} \hat{n}$

Question Type : MCQ

Question ID : 3666942492

Option 1 ID : 3666947857

Option 2 ID : 3666947855

Option 3 ID : 3666947858

Option 4 ID : 3666947856

Status : Answered

Chosen Option : 1

- Q.11** A proton moving with one tenth of velocity of light has a certain de Broglie wavelength of  $\lambda$ . An alpha particle having certain kinetic energy has the same de-Broglie wavelength  $\lambda$ . The ratio of kinetic energy of proton and that of alpha particle is:

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

Question Type : MCQ

Question ID : 3666942485

Option 1 ID : 3666947830

Option 2 ID : 3666947827

Option 3 ID : 3666947829

Option 4 ID : 3666947828

Status : Answered

Chosen Option : 1

**Q.12** Given below are two statements:

**Statement I:** Acceleration due to gravity is different at different places on the surface of earth.

**Statement II:** Acceleration due to gravity increases as we go down below the earth's surface.

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

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

Question Type : MCQ

Question ID : 3666942497

Option 1 ID : 3666947875

Option 2 ID : 3666947878

Option 3 ID : 3666947876

Option 4 ID : 3666947877

Status : Answered

Chosen Option : 2

**Q.13** A steel wire with mass per unit length  $7.0 \times 10^{-3} \text{ kg m}^{-1}$  is under tension of 70 N. The speed of transverse waves in the wire will be:

- Options
1.  $200\pi \text{ m/s}$
  2. 50 m/s
  3. 100 m/s
  4. 10 m/s

Question Type : MCQ

Question ID : 3666942493

Option 1 ID : 3666947862

Option 2 ID : 3666947860

Option 3 ID : 3666947861

Option 4 ID : 3666947859

Status : Answered

Chosen Option : 3

Q.14 Match List I with List II:

List I	List II
A. Microwaves	I. Radio active decay of the nucleus
B. Gamma rays	II. Rapid acceleration and deceleration of electron in aerials
C. Radio waves	III. Inner shell electrons
D. X-rays	IV. Klystron valve

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

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

Question Type : MCQ

Question ID : 3666942487

Option 1 ID : 3666947835

Option 2 ID : 3666947836

Option 3 ID : 3666947838

Option 4 ID : 3666947837

Status : Answered

Chosen Option : 3

Q.15 A mercury drop of radius  $10^{-3}$  m is broken into 125 equal size droplets. Surface tension of mercury is  $0.45 \text{ Nm}^{-1}$ . The gain in surface energy is:

- Options
1.  $17.5 \times 10^{-5} \text{ J}$
  2.  $2.26 \times 10^{-5} \text{ J}$
  3.  $28 \times 10^{-5} \text{ J}$
  4.  $5 \times 10^{-5} \text{ J}$

Question Type : MCQ

Question ID : 3666942498

Option 1 ID : 3666947882

Option 2 ID : 3666947879

Option 3 ID : 3666947881

Option 4 ID : 3666947880

Status : Answered

Chosen Option : 3



Q.16 'n' polarizing sheets are arranged such that each makes an angle  $45^\circ$  with the preceding sheet. An unpolarized light of intensity  $I$  is incident into this arrangement. The output intensity is found to be  $\frac{I}{64}$ . The value of  $n$  will be:

- Options
1. 3
  2. 4
  3. 5
  4. 6

Question Type : MCQ

Question ID : 3666942486

Option 1 ID : 3666947833

Option 2 ID : 3666947834

Option 3 ID : 3666947831

Option 4 ID : 3666947832

Status : Answered

Chosen Option : 2

Q.17 An object moves with speed  $v_1, v_2$  and  $v_3$  along a line segment AB, BC and CD respectively as shown in figure. Where  $AB=BC$  and  $AD=3AB$ , then average speed of the object will be:



Options

1.  $\frac{3v_1v_2v_3}{(v_1v_2 + v_2v_3 + v_3v_1)}$
2.  $\frac{(v_1 + v_2 + v_3)}{3v_1v_2v_3}$
3.  $\frac{v_1v_2v_3}{3(v_1v_2 + v_2v_3 + v_3v_1)}$
4.  $\frac{(v_1 + v_2 + v_3)}{3}$

Question Type : MCQ

Question ID : 3666942494

Option 1 ID : 3666947863

Option 2 ID : 3666947866

Option 3 ID : 3666947865

Option 4 ID : 3666947864

Status : Answered

Chosen Option : 2

Q.18

$\left(P + \frac{a}{V^2}\right)(V - b) = RT$  represents the equation of state of some gases. Where  $P$  is the pressure,  $V$  is the volume,  $T$  is the temperature and  $a, b, R$  are the constants. The physical quantity, which has dimensional formula as that of  $\frac{b^2}{a}$ , will be:

- Options
1. Bulk modulus
  2. Modulus of rigidity
  3. Compressibility
  4. Energy density

Question Type : MCQ

Question ID : 3666942481

Option 1 ID : 3666947811

Option 2 ID : 3666947814

Option 3 ID : 3666947812

Option 4 ID : 3666947813

Status : Answered

Chosen Option : 1

Q.19 If earth has a mass nine times and radius twice to that of a planet P. Then  $\frac{v_e}{3} \sqrt{x} \text{ ms}^{-1}$  will be the minimum velocity required by a rocket to pull out of gravitational force of P, where  $v_e$  is escape velocity on earth. The value of  $x$  is

- Options
1. 1
  2. 2
  3. 18
  4. 3

Question Type : MCQ

Question ID : 3666942496

Option 1 ID : 3666947871

Option 2 ID : 3666947872

Option 3 ID : 3666947874

Option 4 ID : 3666947873

Status : Answered

Chosen Option : 4

**Q.20** A sample of gas at temperature  $T$  is adiabatically expanded to double its volume. The work done by the gas in the process is (given,  $\gamma = \frac{3}{2}$ ):

Options

1.  $W = \frac{R}{T} [2 - \sqrt{2}]$
2.  $W = \frac{T}{R} [\sqrt{2} - 2]$
3.  $W = RT [2 - \sqrt{2}]$
4.  $W = TR [\sqrt{2} - 2]$

Question Type : MCQ

Question ID : 3666942499

Option 1 ID : 3666947884

Option 2 ID : 3666947885

Option 3 ID : 3666947883

Option 4 ID : 3666947886

Status : Not Answered

Chosen Option : --

Section : Physics Section B

**Q.21** A light of energy 12.75 eV is incident on a hydrogen atom in its ground state. The atom absorbs the radiation and reaches to one of its excited states. The angular momentum of the atom in the excited state is  $\frac{x}{\pi} \times 10^{-17}$  eVs. The value of  $x$  is \_\_\_\_\_ (use  $h = 4.14 \times 10^{-15}$  eVs,  $c = 3 \times 10^8$  ms<sup>-1</sup>).

Given --  
Answer :

Question Type : SA

Question ID : 3666942503

Status : Not Answered

**Q.22** A charge particle of 2  $\mu$ C accelerated by a potential difference of 100V enters a region of uniform magnetic field of magnitude 4 mT at right angle to the direction of field. The charge particle completes semicircle of radius 3 cm inside magnetic field. The mass of the charge particle is \_\_\_\_\_  $\times 10^{-18}$  kg.

Given --  
Answer :

Question Type : SA

Question ID : 3666942506

Status : Not Answered

**Q.23** A certain pressure 'P' is applied to 1 litre of water and 2 litre of a liquid separately. Water gets compressed to 0.01% whereas the liquid gets compressed to 0.03%. The ratio of Bulk modulus of water to that of the liquid is  $\frac{3}{x}$ . The value of  $x$  is \_\_\_\_\_.

Given --  
Answer :

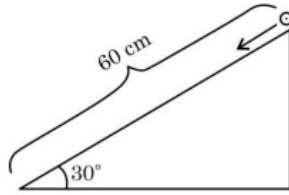
Question Type : SA

Question ID : 3666942509

Status : Not Answered

- Q.24** A solid cylinder is released from rest from the top of an inclined plane of inclination  $30^\circ$  and length 60 cm. If the cylinder rolls without slipping, its speed upon reaching the bottom of the inclined plane is \_\_\_\_\_  $\text{ms}^{-1}$ .

(Given  $g = 10 \text{ ms}^{-2}$ )



Given --  
Answer :

Question Type : SA  
Question ID : 3666942508  
Status : Not Answered

- Q.25** A small particle moves to position  $5\hat{i} - 2\hat{j} + \hat{k}$  from its initial position  $2\hat{i} + 3\hat{j} - 4\hat{k}$  under the action of force  $5\hat{i} + 2\hat{j} + 7\hat{k}$  N. The value of work done will be \_\_\_\_\_ J.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942507  
Status : Not Answered

- Q.26** A series LCR circuit is connected to an ac source of 220V, 50Hz. The circuit contain a resistance  $R = 100\Omega$  and an inductor of inductive reactance  $X_L = 79.6\Omega$ . The capacitance of the capacitor needed to maximize the average rate at which energy is supplied will be \_\_\_\_\_  $\mu\text{F}$ .

Given --  
Answer :

Question Type : SA  
Question ID : 3666942505  
Status : Not Answered

- Q.27** Two equal positive point charges are separated by a distance  $2a$ . The distance of a point from the centre of the line joining two charges on the equatorial line (perpendicular bisector) at which force experienced by a test charge  $q_0$  becomes maximum is  $\frac{a}{\sqrt{x}}$ . The value of  $x$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942501  
Status : Not Answered

**Q.28** A thin cylindrical rod of length 10 cm is placed horizontally on the principle axis of a concave mirror of focal length 20 cm. The rod is placed in a such a way that mid point of the rod is at 40 cm from the pole of mirror. The length of the image formed by the mirror will be  $\frac{x}{3}$  cm. The value of  $x$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942504  
Status : Not Answered

**Q.29** In an experiment to find emf of a cell using potentiometer, the length of null point for a cell of emf 1.5 V is found to be 60 cm. If this cell is replaced by another cell of emf  $E$ , the length-of null point increases by 40 cm. The value of  $E$  is  $\frac{x}{10}$  V. The value of  $x$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942502  
Status : Not Answered

**Q.30** The amplitude of a particle executing SHM is 3 cm. The displacement at which its kinetic energy will be 25% more than the potential energy is: \_\_\_\_\_ cm.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942510  
Status : Not Answered

Section : Chemistry Section A

Q.31

Highest oxidation state of Mn is exhibited in  $Mn_2O_7$ . The correct statements about  $Mn_2O_7$  are

- (A) Mn is tetrahedrally surrounded by oxygen atoms.
- (B) Mn is octahedrally surrounded by oxygen atoms.
- (C) Contains Mn-O-Mn bridge.
- (D) Contains Mn-Mn bond.

Choose the correct answer from the options given below:

Options

- 1. A and D only
- 2. B and D only
- 3. B and C only
- 4. A and C only

Question Type : MCQ

Question ID : 3666942519

Option 1 ID : 3666947933

Option 2 ID : 3666947936

Option 3 ID : 3666947934

Option 4 ID : 3666947935

Status : Answered

Chosen Option : 4

Q.32

A solution of  $FeCl_3$  when treated with  $K_4[Fe(CN)_6]$  gives a prussian blue precipitate due to the formation of

Options

- 1.  $K[Fe_2(CN)_6]$
- 2.  $Fe_4[Fe(CN)_6]_3$
- 3.  $Fe_3[Fe(CN)_6]_2$
- 4.  $Fe[Fe(CN)_6]$

Question Type : MCQ

Question ID : 3666942523

Option 1 ID : 3666947950

Option 2 ID : 3666947952

Option 3 ID : 3666947951

Option 4 ID : 3666947949

Status : Answered

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:** In an Ellingham diagram, the oxidation of carbon to carbon monoxide shows a negative slope with respect to temperature.

**Reason R:** CO tends to get decomposed at higher temperature.

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

Options

1. **A** is correct but **R** is not correct
2. Both **A** and **R** are correct but **R** is **NOT** the correct explanation of **A**
3. Both **A** and **R** are correct and **R** is the correct explanation of **A**
4. **A** is not correct but **R** is correct

Question Type : MCQ

Question ID : 3666942515

Option 1 ID : 3666947919

Option 2 ID : 3666947918

Option 3 ID : 3666947917

Option 4 ID : 3666947920

Status : Answered

Chosen Option : 1

Q.34

How can photochemical smog be controlled?

Options

1. By using tall chimneys.
2. By using catalyst.
3. By complete combustion of fuel.
4. By using catalytic convertors in the automobiles/industry.

Question Type : MCQ

Question ID : 3666942521

Option 1 ID : 3666947943

Option 2 ID : 3666947944

Option 3 ID : 3666947941

Option 4 ID : 3666947942

Status : Answered

Chosen Option : 3

Q.35

Which of the following complex will show largest splitting of d-orbitals?

Options

1.  $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-}$
2.  $[\text{Fe}(\text{NH}_3)_6]^{3+}$
3.  $[\text{FeF}_6]^{3-}$
4.  $[\text{Fe}(\text{CN})_6]^{3-}$

Question Type : MCQ

Question ID : 3666942520

Option 1 ID : 3666947938

Option 2 ID : 3666947940

Option 3 ID : 3666947937

Option 4 ID : 3666947939

Status : Not Answered

Chosen Option : --

Q.36

Match List I with List II

List I	List II
(A) Slaked lime	(I) NaOH
(B) Dead burnt plaster	(II) $\text{Ca}(\text{OH})_2$
(C) Caustic soda	(III) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
(D) Washing soda	(IV) $\text{CaSO}_4$

Choose the correct answer from the options given below:

Options

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

Question Type : MCQ

Question ID : 3666942518

Option 1 ID : 3666947930

Option 2 ID : 3666947931

Option 3 ID : 3666947932

Option 4 ID : 3666947929

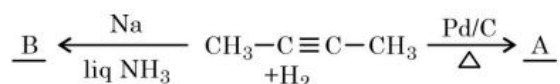
Status : Answered

Chosen Option : 3



Q.37

But-2-yne is reacted separately with one mole of Hydrogen as shown below:



- A. A is more soluble than B.  
 B. The boiling point & melting point of A are higher and lower than B respectively.  
 C. A is more polar than B because dipole moment of A is zero.  
 D. Br<sub>2</sub> adds easily to B than A.

Identify the incorrect statements from the options given below:

- Options
1. A and B only
  2. B and C only
  3. B, C & D only
  4. A, C & D only

Question Type : MCQ

Question ID : 3666942528

Option 1 ID : 3666947969

Option 2 ID : 3666947970

Option 3 ID : 3666947971

Option 4 ID : 3666947972

Status : Not Answered

Chosen Option : --

Q.38

Given below are two statements:

**Statement I:** Chlorine can easily combine with oxygen to form oxides; and the product has a tendency to explode.

**Statement II:** Chemical reactivity of an element can be determined by its reaction with oxygen and halogens.

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 the Statements I and II are true
  4. Both the Statements I and II are false

Question Type : MCQ

Question ID : 3666942514

Option 1 ID : 3666947915

Option 2 ID : 3666947916

Option 3 ID : 3666947913

Option 4 ID : 3666947914

Status : Answered

Chosen Option : 1

Q.39

Match List I with List II

List I	List II
Test	Functional group / Class of Compound
(A) Molisch's Test	(I) Peptide
(B) Biuret Test	(II) Carbohydrate
(C) Carbylamine Test	(III) Primary amine
(D) Schiff's Test	(IV) Aldehyde

Choose the correct answer from the options given below:

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

Question Type : MCQ

Question ID : 3666942524

Option 1 ID : 3666947954

Option 2 ID : 3666947953

Option 3 ID : 3666947955

Option 4 ID : 3666947956

Status : Answered

Chosen Option : 4

Q.40

Choose the correct statement(s):

- Beryllium oxide is purely acidic in nature.
- Beryllium carbonate is kept in the atmosphere of  $\text{CO}_2$ .
- Beryllium sulphate is readily soluble in water.
- Beryllium shows anomalous behavior.

Choose the correct answer from the options given below:

- Options
- B, C and D only
  - A only
  - A, B and C only
  - A and B only

Question Type : MCQ

Question ID : 3666942517

Option 1 ID : 3666947928

Option 2 ID : 3666947925

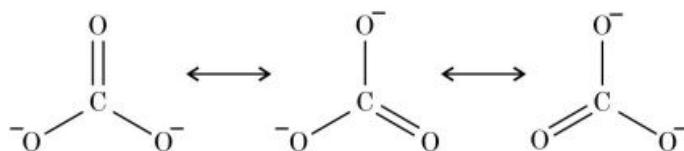
Option 3 ID : 3666947927

Option 4 ID : 3666947926

Status : Answered

Chosen Option : 1

Q.41

Resonance in carbonate ion ( $\text{CO}_3^{2-}$ ) is

Which of the following is true?

Options

1. Each structure exists for equal amount of time.
2.  $\text{CO}_3^{2-}$  has a single structure i.e., resonance hybrid of the above three structures.
3. It is possible to identify each structure individually by some physical or chemical method.
4. All these structures are in dynamic equilibrium with each other.

Question Type : MCQ

Question ID : 3666942512

Option 1 ID : 3666947906

Option 2 ID : 3666947907

Option 3 ID : 3666947908

Option 4 ID : 3666947905

Status : Not Answered

Chosen Option : --

Q.42

Which of the following are the example of double salt?

- A.  $\text{FeSO}_4 \cdot (\text{NH}_4)_2 \text{SO}_4 \cdot 6\text{H}_2\text{O}$
- B.  $\text{CuSO}_4 \cdot 4\text{NH}_3 \cdot \text{H}_2\text{O}$
- C.  $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
- D.  $\text{Fe}(\text{CN})_2 \cdot 4\text{KCN}$

Choose the correct answer

- Options
1. B and D only
  2. A and C only
  3. A, B and D only
  4. A and B only

Question Type : MCQ

Question ID : 3666942522

Option 1 ID : 3666947948

Option 2 ID : 3666947946

Option 3 ID : 3666947947

Option 4 ID : 3666947945

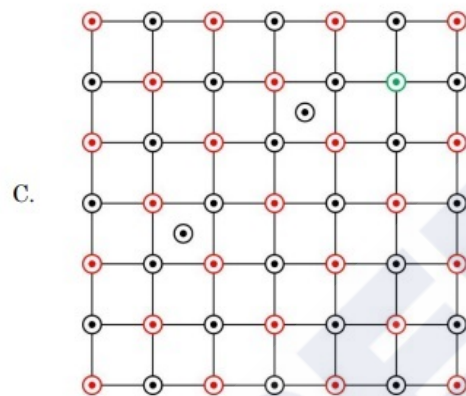
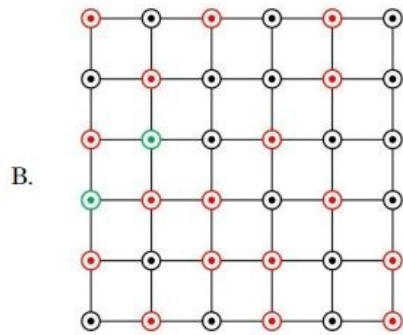
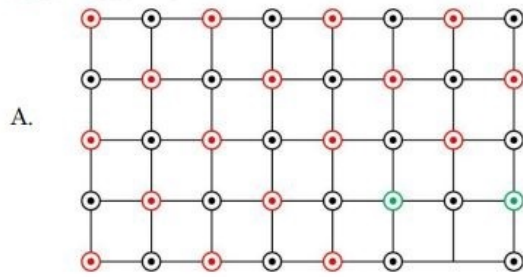
Status : Answered

Chosen Option : 2

Q.43

Which of the following represents the lattice structure of  $A_{0.95}O$  containing  $A^{2+}$ ,  $A^{3+}$  and  $O^{2-}$  ions?

●  $A^{2+}$  ●  $A^{3+}$  ●  $O^{2-}$



Options

1. B only
2. B and C only
3. A and B only
4. A only

Question Type : MCQ

Question ID : 3666942511

Option 1 ID : 3666947902

Option 2 ID : 3666947904

Option 3 ID : 3666947903

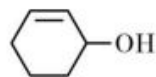
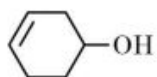
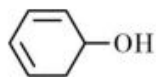
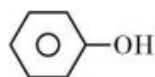
Option 4 ID : 3666947901

Status : Not Answered

Chosen Option : --

Q.44

Decreasing order of dehydration of the following alcohols is



Options

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

Question Type : MCQ

Question ID : 3666942527

Option 1 ID : 3666947966

Option 2 ID : 3666947968

Option 3 ID : 3666947967

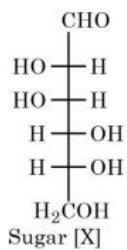
Option 4 ID : 3666947965

Status : Answered

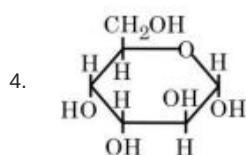
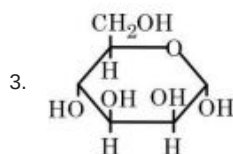
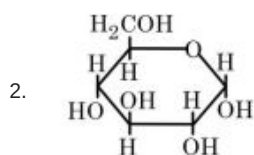
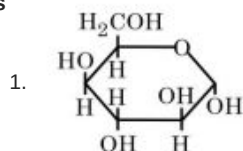
Chosen Option : 4

Q.45

The correct representation in six membered pyranose form for the following sugar [X] is



Options



Question Type : MCQ

Question ID : 3666942529

Option 1 ID : 3666947976

Option 2 ID : 3666947973

Option 3 ID : 3666947975

Option 4 ID : 3666947974

Status : Not Answered

Chosen Option : --

Q.46

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

**Assertion A:** Hydrogen is an environment friendly fuel.

**Reason R:** Atomic number of hydrogen is 1 and it is a very light element.

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.

**Both A and R are true and R is the correct explanation of A**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 : 3666942516

Option 1 ID : 3666947924

Option 2 ID : 3666947921

Option 3 ID : 3666947923

Option 4 ID : 3666947922

Status : Answered

Chosen Option : 4

Q.47

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

**Assertion A:** Amongst He, Ne, Ar and Kr;  
1g of activated charcoal adsorbs more of Kr.

**Reason R:** The critical volume  $V_c$  ( $\text{cm}^3 \text{mol}^{-1}$ ) and critical pressure  $P_c$  (atm) is highest for Krypton but the compressibility factor at critical point  $Z_c$  is lowest for Krypton.

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

Options

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

2.

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

4.

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

Question Type : MCQ

Question ID : 3666942513

Option 1 ID : 3666947911

Option 2 ID : 3666947909

Option 3 ID : 3666947912

Option 4 ID : 3666947910

Status : Not Answered

Chosen Option : --



Q.48 Match List I with List II

List I	List II
(A) Tranquilizers	(I) Anti blood clotting
(B) Aspirin	(II) Salvarsan
(C) Antibiotic	(III) antidepressant drugs
(D) Antiseptic	(IV) soframycin

Choose the correct answer from the options given below:

Options

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

Question Type : MCQ

Question ID : 3666942530

Option 1 ID : 3666947978

Option 2 ID : 3666947980

Option 3 ID : 3666947977

Option 4 ID : 3666947979

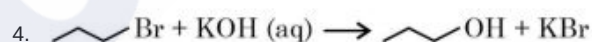
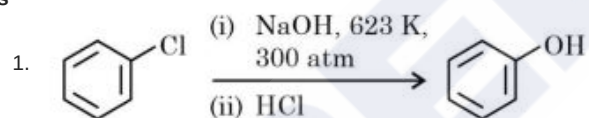
Status : Answered

Chosen Option : 2

Q.49

Identify the incorrect option from the following:

Options



Question Type : MCQ

Question ID : 3666942525

Option 1 ID : 3666947958

Option 2 ID : 3666947959

Option 3 ID : 3666947960

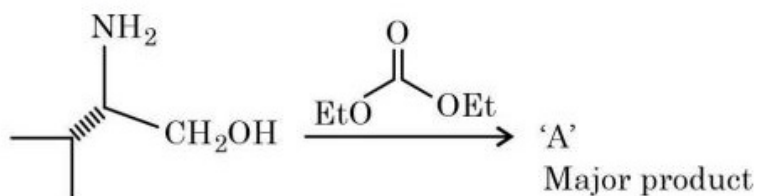
Option 4 ID : 3666947957

Status : Answered

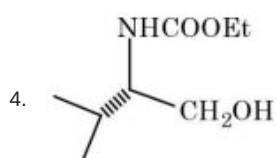
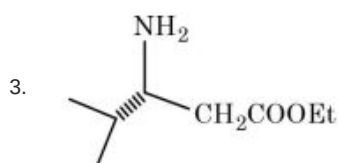
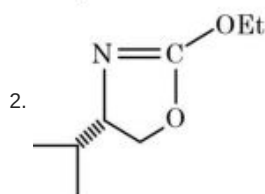
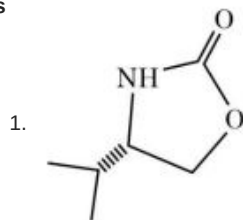
Chosen Option : 2

Q.50

In the following reaction, 'A' is



Options



Question Type : MCQ

Question ID : 3666942526

Option 1 ID : 3666947964

Option 2 ID : 3666947961

Option 3 ID : 3666947962

Option 4 ID : 3666947963

Status : Not Answered

Chosen Option : --

Section : Chemistry Section B

Q.51

The density of 3 M solution of NaCl is  $1.0 \text{ g mL}^{-1}$ . Molality of the solution is \_\_\_\_\_  $\times 10^{-2} \text{ m}$ . (Nearest integer).

Given: Molar mass of Na and Cl is 23 and  $35.5 \text{ g mol}^{-1}$  respectively.

Given --  
Answer :

Question Type : SA

Question ID : 3666942531

Status : Not Answered

Q.52

A and B are two substances undergoing radioactive decay in a container. The half life of A is 15 min and that of B is 5 min. If the initial concentration of B is 4 times that of A and they both start decaying at the same time, how much time will it take for the concentration of both of them to be same? \_\_\_\_\_ min.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942537  
Status : Not Answered

Q.53

Number of isomeric compounds with molecular formula  $C_9H_{10}O$  which (i) do not dissolve in NaOH (ii) do not dissolve in HCl. (iii) do not give orange precipitate with 2,4-DNP (iv) on hydrogenation give identical compound with molecular formula  $C_9H_{12}O$  is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942540  
Status : Not Answered

Q.54

25 mL of an aqueous solution of KCl was found to require 20 mL of 1 M  $AgNO_3$  solution when titrated using  $K_2CrO_4$  as an indicator. What is the depression in freezing point of KCl solution of the given concentration? \_\_\_\_\_ (Nearest integer).

(Given:  $K_f = 2.0 \text{ K kg mol}^{-1}$ )

Assume 1) 100% ionization and

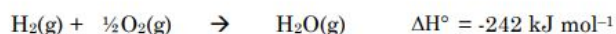
2) density of the aqueous solution as  $1 \text{ g mL}^{-1}$

Given --  
Answer :

Question Type : SA  
Question ID : 3666942534  
Status : Not Answered

Q.55

At 25°C, the enthalpy of the following processes are given:



What would be the value of X for the following reaction? \_\_\_\_\_  
(Nearest integer)



Given--  
Answer :

Question Type : SA  
Question ID : 3666942533  
Status : Not Answered

Q.56

Electrons in a cathode ray tube have been emitted with a velocity of  $1000 \text{ m s}^{-1}$ . The number of following statements which is/are true about the emitted radiation is \_\_\_\_\_.

Given :  $h = 6 \times 10^{-34} \text{ J s}$ ,  $m_e = 9 \times 10^{-31} \text{ kg}$ .

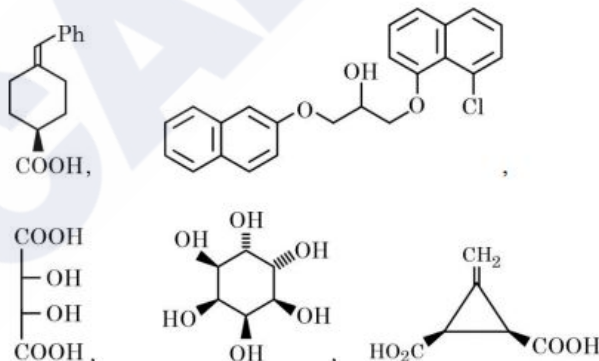
- (A) The deBroglie wavelength of the electron emitted is 666.67 nm.  
(B) The characteristic of electrons emitted depend upon the material of the electrodes of the cathode ray tube.  
(C) The cathode rays start from cathode and move towards anode.  
(D) The nature of the emitted electrons depends on the nature of the gas present in cathode ray tube.

Given--  
Answer :

Question Type : SA  
Question ID : 3666942532  
Status : Not Answered

Q.57

The total number of chiral compound/s from the following is \_\_\_\_\_.



Given--  
Answer :

Question Type : SA  
Question ID : 3666942539  
Status : Not Answered

Q.58

Sum of oxidation states of bromine in bromic acid and perbromic acid is \_\_\_\_\_.

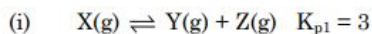
Given --  
Answer :

Question Type : SA

Question ID : 3666942538

Status : Not Answered

Q.59



If the degree of dissociation and initial concentration of both the reactants X(g) and A(g) are equal, then the ratio of the total pressure at equilibrium

 $\left(\frac{p_1}{p_2}\right)$  is equal to x:1. The value of x is \_\_\_\_\_ (Nearest integer)Given --  
Answer :

Question Type : SA

Question ID : 3666942535

Status : Not Answered

Q.60

At what pH, given half cell  $MnO_4^-$  (0.1 M) |  $Mn^{2+}$  (0.001 M) will have electrode potential of 1.282 V? \_\_\_\_\_ (Nearest Integer)

Given  $E^\circ_{MnO_4^-/Mn^{2+}} = 1.54V$ ,  $\frac{2.303RT}{F} = 0.059V$

Given --  
Answer :

Question Type : SA

Question ID : 3666942536

Status : Not Answered

Section : Mathematics Section A

Q.61 Let  $S$  be the set of all solutions of the equation  $\cos^{-1}(2x) - 2\cos^{-1}(\sqrt{1-x^2}) = \pi$ ,  
 $x \in \left[-\frac{1}{2}, \frac{1}{2}\right]$ . Then  $\sum_{x \in S} 2 \sin^{-1}(x^2 - 1)$  is equal to

Options

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

2.  $\pi - 2 \sin^{-1}\left(\frac{\sqrt{3}}{4}\right)$

3. 0

4.  $\pi - \sin^{-1}\left(\frac{\sqrt{3}}{4}\right)$

Question Type : MCQ

Question ID : 3666942559

Option 1 ID : 3666948064

Option 2 ID : 3666948066

Option 3 ID : 3666948063

Option 4 ID : 3666948065

Status : Answered

Chosen Option : 2

Q.62 If  $y = y(x)$  is the solution curve of the differential equation

$$\frac{dy}{dx} + y \tan x = x \sec x, \quad 0 \leq x \leq \frac{\pi}{3}, \quad y(0) = 1,$$

then  $y\left(\frac{\pi}{6}\right)$  is equal to

Options

1.  $\frac{\pi}{12} - \frac{\sqrt{3}}{2} \log_e\left(\frac{2}{e\sqrt{3}}\right)$

2.  $\frac{\pi}{12} - \frac{\sqrt{3}}{2} \log_e\left(\frac{2\sqrt{3}}{e}\right)$

3.  $\frac{\pi}{12} + \frac{\sqrt{3}}{2} \log_e\left(\frac{2}{e\sqrt{3}}\right)$

4.  $\frac{\pi}{12} + \frac{\sqrt{3}}{2} \log_e\left(\frac{2\sqrt{3}}{e}\right)$

Question Type : MCQ

Question ID : 3666942554

Option 1 ID : 3666948043

Option 2 ID : 3666948044

Option 3 ID : 3666948045

Option 4 ID : 3666948046

Status : Not Answered

Chosen Option : --

Q.63 The sum to 10 terms of the series

$$\frac{1}{1+1^2+1^4} + \frac{2}{1+2^2+2^4} + \frac{3}{1+3^2+3^4} + \dots \text{ is}$$

- Options
1.  $\frac{55}{111}$
  2.  $\frac{58}{111}$
  3.  $\frac{59}{111}$
  4.  $\frac{56}{111}$

Question Type : MCQ

Question ID : 3666942548

Option 1 ID : 3666948019

Option 2 ID : 3666948021

Option 3 ID : 3666948022

Option 4 ID : 3666948020

Status : Not Answered

Chosen Option : --

Q.64 The value of

$$\frac{1}{1!50!} + \frac{1}{3!48!} + \frac{1}{5!46!} + \dots + \frac{1}{49!2!} + \frac{1}{51!1!} \text{ is :}$$

- Options
1.  $\frac{2^{51}}{50!}$
  2.  $\frac{2^{51}}{51!}$
  3.  $\frac{2^{50}}{51!}$
  4.  $\frac{2^{50}}{50!}$

Question Type : MCQ

Question ID : 3666942547

Option 1 ID : 3666948018

Option 2 ID : 3666948015

Option 3 ID : 3666948016

Option 4 ID : 3666948017

Status : Not Answered

Chosen Option : --

Q.65 If the orthocentre of the triangle, whose vertices are (1, 2), (2, 3) and (3, 1) is  $(\alpha, \beta)$ , then the quadratic equation whose roots are  $\alpha + 4\beta$  and  $4\alpha + \beta$ , is

- Options
1.  $x^2 - 20x + 99 = 0$
  2.  $x^2 - 22x + 120 = 0$
  3.  $x^2 - 18x + 80 = 0$
  4.  $x^2 - 19x + 90 = 0$

Question Type : MCQ

Question ID : 3666942553

Option 1 ID : 3666948040

Option 2 ID : 3666948039

Option 3 ID : 3666948041

Option 4 ID : 3666948042

Status : Not Answered

Chosen Option : --

Q.66 The negation of the expression  $q \vee ((\sim q) \wedge p)$  is equivalent to

- Options
1.  $(\sim p) \vee q$
  2.  $(\sim p) \wedge (\sim q)$
  3.  $(\sim p) \vee (\sim q)$
  4.  $p \wedge (\sim q)$

Question Type : MCQ

Question ID : 3666942560

Option 1 ID : 3666948070

Option 2 ID : 3666948067

Option 3 ID : 3666948068

Option 4 ID : 3666948069

Status : Not Answered

Chosen Option : --

Q.67 Let  $f(x) = 2x + \tan^{-1} x$  and  $g(x) = \log_e(\sqrt{1+x^2} + x)$ ,  $x \in [0, 3]$ .

Then

- Options
1.  $\min f'(x) = 1 + \max g'(x)$
  2. there exists  $\hat{x} \in [0, 3]$  such that  $f'(\hat{x}) < g'(\hat{x})$
  3.  $\max f(x) > \max g(x)$
  4. there exist  $0 < x_1 < x_2 < 3$  such that  $f(x) < g(x)$ ,  $\forall x \in (x_1, x_2)$

Question Type : MCQ

Question ID : 3666942549

Option 1 ID : 3666948024

Option 2 ID : 3666948026

Option 3 ID : 3666948023

Option 4 ID : 3666948025

Status : Answered

Chosen Option : 3



**Q.68** The area enclosed by the closed curve  $C$  given by the differential equation  $\frac{dy}{dx} + \frac{x+a}{y-2} = 0$ ,  $y(1) = 0$  is  $4\pi$ .

Let  $P$  and  $Q$  be the points of intersection of the curve  $C$  and the  $y$ -axis. If normals at  $P$  and  $Q$  on the curve  $C$  intersect  $x$ -axis at points  $R$  and  $S$  respectively, then the length of the line segment  $RS$  is

Options

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

Question Type : MCQ

Question ID : 3666942551

Option 1 ID : 3666948033

Option 2 ID : 3666948031

Option 3 ID : 3666948034

Option 4 ID : 3666948032

Status : Not Answered

Chosen Option : --

**Q.69** Let  $S = \{x : x \in \mathbb{R} \text{ and } (\sqrt{3} + \sqrt{2})^{x^2-4} + (\sqrt{3} - \sqrt{2})^{x^2-4} = 10\}$ .

Then  $n(S)$  is equal to

- Options
1. 0
  2. 6
  3. 2
  4. 4

Question Type : MCQ

Question ID : 3666942543

Option 1 ID : 3666947999

Option 2 ID : 3666948002

Option 3 ID : 3666948001

Option 4 ID : 3666948000

Status : Answered

Chosen Option : 2

Q.70 Let the image of the point  $P(2, -1, 3)$  in the plane  $x + 2y - z = 0$  be  $Q$ . Then the distance of the plane  $3x + 2y + z + 29 = 0$  from the point  $Q$  is

Options

1.  $\frac{22\sqrt{2}}{7}$
2.  $3\sqrt{14}$
3.  $\frac{24\sqrt{2}}{7}$
4.  $2\sqrt{14}$

Question Type : MCQ

Question ID : 3666942555

Option 1 ID : 3666948047

Option 2 ID : 3666948049

Option 3 ID : 3666948048

Option 4 ID : 3666948050

Status : Answered

Chosen Option : 1

Q.71

$\lim_{n \rightarrow \infty} \left[ \frac{1}{1+n} + \frac{1}{2+n} + \frac{1}{3+n} + \dots + \frac{1}{2n} \right]$  is equal to

Options

1.  $\log_e \left( \frac{3}{2} \right)$
2.  $\log_e 2$
3.  $\log_e \left( \frac{2}{3} \right)$
4. 0

Question Type : MCQ

Question ID : 3666942550

Option 1 ID : 3666948029

Option 2 ID : 3666948030

Option 3 ID : 3666948028

Option 4 ID : 3666948027

Status : Answered

Chosen Option : 3

Q.72

$$\text{Let } f(x) = \begin{vmatrix} 1 + \sin^2 x & \cos^2 x & \sin 2x \\ \sin^2 x & 1 + \cos^2 x & \sin 2x \\ \sin^2 x & \cos^2 x & 1 + \sin 2x \end{vmatrix}, \quad x \in \left[ \frac{\pi}{6}, \frac{\pi}{3} \right]. \quad \text{If } \alpha \text{ and } \beta$$

respectively are the maximum and the minimum values of  $f$ , then

Options

1.  $\alpha^2 + \beta^2 = \frac{9}{2}$
2.  $\alpha^2 - \beta^2 = 4\sqrt{3}$
3.  $\beta^2 + 2\sqrt{\alpha} = \frac{19}{4}$
4.  $\beta^2 - 2\sqrt{\alpha} = \frac{19}{4}$

Question Type : MCQ

Question ID : 3666942544

Option 1 ID : 3666948005

Option 2 ID : 3666948003

Option 3 ID : 3666948006

Option 4 ID : 3666948004

Status : Not Answered

Chosen Option : --

Q.73

The combined equation of the two lines  $ax + by + c = 0$  and  $a'x + b'y + c' = 0$  can be written as  $(ax + by + c)(a'x + b'y + c') = 0$ .

The equation of the angle bisectors of the lines represented by the equation  $2x^2 + xy - 3y^2 = 0$  is

Options

1.  $x^2 - y^2 - 10xy = 0$
2.  $3x^2 + xy - 2y^2 = 0$
3.  $3x^2 + 5xy + 2y^2 = 0$
4.  $x^2 - y^2 + 10xy = 0$

Question Type : MCQ

Question ID : 3666942552

Option 1 ID : 3666948037

Option 2 ID : 3666948036

Option 3 ID : 3666948035

Option 4 ID : 3666948038

Status : Answered

Chosen Option : 1

Q.74 Let  $R$  be a relation on  $\mathbb{R}$ , given by  
 $R = \{(a, b) : 3a - 3b + \sqrt{7} \text{ is an irrational number}\}.$

Then  $R$  is

- Options
1. reflexive and transitive but not symmetric
  2. an equivalence relation
  3. reflexive but neither symmetric nor transitive
  4. reflexive and symmetric but not transitive

Question Type : MCQ

Question ID : 3666942541

Option 1 ID : 3666947993

Option 2 ID : 3666947994

Option 3 ID : 3666947991

Option 4 ID : 3666947992

Status : Answered

Chosen Option : 2

Q.75 The mean and variance of 5 observations are 5 and 8 respectively. If 3 observations are 1, 3, 5, then the sum of cubes of the remaining two observations is

- Options
1. 1456
  2. 1072
  3. 1216
  4. 1792

Question Type : MCQ

Question ID : 3666942558

Option 1 ID : 3666948060

Option 2 ID : 3666948062

Option 3 ID : 3666948061

Option 4 ID : 3666948059

Status : Not Answered

Chosen Option : --

Q.76 In a binomial distribution  $B(n, p)$ , the sum and the product of the mean and the variance are 5 and 6 respectively, then  $6(n+p-q)$  is equal to

- Options
1. 50
  2. 51
  3. 52
  4. 53

Question Type : MCQ

Question ID : 3666942545

Option 1 ID : 3666948007

Option 2 ID : 3666948008

Option 3 ID : 3666948009

Option 4 ID : 3666948010

Status : Not Answered

Chosen Option : --

Q.77

The shortest distance between the lines

$$\frac{x-5}{1} = \frac{y-2}{2} = \frac{z-4}{-3} \text{ and } \frac{x+3}{1} = \frac{y+5}{4} = \frac{z-1}{-5} \text{ is}$$

- Options
1.  $5\sqrt{3}$
  2.  $4\sqrt{3}$
  3.  $7\sqrt{3}$
  4.  $6\sqrt{3}$

Question Type : MCQ

Question ID : 3666942556

Option 1 ID : 3666948052

Option 2 ID : 3666948051

Option 3 ID : 3666948054

Option 4 ID : 3666948053

Status : Answered

Chosen Option : 1

Q.78

Let  $S$  denote the set of all real values of  $\lambda$  such that the system of equations

$$\lambda x + y + z = 1$$

$$x + \lambda y + z = 1$$

$$x + y + \lambda z = 1$$

is inconsistent, then  $\sum_{\lambda \in S} (|\lambda|^2 + |\lambda|)$  is equal to

- Options
1. 12
  2. 6
  3. 4
  4. 2

Question Type : MCQ

Question ID : 3666942546

Option 1 ID : 3666948011

Option 2 ID : 3666948012

Option 3 ID : 3666948014

Option 4 ID : 3666948013

Status : Not Answered

Chosen Option : --

**Q.79** For a triangle  $ABC$ , the value of  $\cos 2A + \cos 2B + \cos 2C$  is least. If its inradius is 3 and incentre is  $M$ , then which of the following is NOT correct?

- Options
1.  $\sin 2A + \sin 2B + \sin 2C = \sin A + \sin B + \sin C$
  2. perimeter of  $\Delta ABC$  is  $18\sqrt{3}$
  3.  $\overline{MA} \cdot \overline{MB} = -18$
  4. area of  $\Delta ABC$  is  $\frac{27\sqrt{3}}{2}$

Question Type : MCQ

Question ID : 3666942557

Option 1 ID : 3666948058

Option 2 ID : 3666948057

Option 3 ID : 3666948056

Option 4 ID : 3666948055

Status : Not Answered

Chosen Option : --

**Q.80** If the center and radius of the circle  $\left| \frac{z-2}{z-3} \right| = 2$  are respectively  $(\alpha, \beta)$  and  $\gamma$ , then  $3(\alpha + \beta + \gamma)$  is equal to

- Options
1. 9
  2. 10
  3. 11
  4. 12

Question Type : MCQ

Question ID : 3666942542

Option 1 ID : 3666947998

Option 2 ID : 3666947995

Option 3 ID : 3666947997

Option 4 ID : 3666947996

Status : Not Answered

Chosen Option : --

Section : Mathematics Section B

**Q.81** The number of words, with or without meaning, that can be formed using all the letters of the word ASSASSINATION so that the vowels occur together, is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA

Question ID : 3666942562

Status : Not Answered

**Q.82** Let  $\vec{v} = \alpha\hat{i} + 2\hat{j} - 3\hat{k}$ ,  $\vec{w} = 2\alpha\hat{i} + \hat{j} - \hat{k}$  and  $\vec{u}$  be a vector such that  $|\vec{u}| = \alpha > 0$ . If the minimum value of the scalar triple product  $[\vec{u} \vec{v} \vec{w}]$  is  $-\alpha\sqrt{3401}$ , and  $|\vec{u} \cdot \hat{i}|^2 = \frac{m}{n}$  where  $m$  and  $n$  are coprime natural numbers, then  $m+n$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942570  
Status : Not Answered

**Q.83** If  $f(x) = x^2 + g'(1)x + g''(2)$  and  $g(x) = f(1)x^2 + xf'(x) + f''(x)$ , then the value of  $f(4) - g(4)$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942561  
Status : Not Answered

**Q.84** If  $\int_0^1 (x^{2l} + x^{14} + x^7)(2x^{14} + 3x^7 + 6)^{1/7} dx = \frac{1}{l}(11)^{m/n}$  where  $l, m, n \in \mathbb{N}$ ,  $m$  and  $n$  are coprime then  $l+m+n$  is equal to \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942565  
Status : Not Answered

**Q.85** Let  $a_1 = 8, a_2, a_3, \dots, a_n$  be an A.P. If the sum of its first four terms is 50 and the sum of its last four terms is 170, then the product of its middle two terms is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942566  
Status : Not Answered

**Q.86** The remainder, when  $19^{200} + 23^{200}$  is divided by 49, is \_\_\_\_\_.

Given --  
Answer :

Question Type : SA  
Question ID : 3666942564  
Status : Not Answered

**Q.87** Let  $A$  be the area bounded by the curve  $y = x|x-3|$ , the  $x$ -axis and the ordinates  $x = -1$  and  $x = 2$ . Then  $12A$  is equal to \_\_\_\_\_

Given--  
Answer :

Question Type : SA  
Question ID : 3666942567  
Status : Not Answered

**Q.88**  $A(2, 6, 2)$ ,  $B(-4, 0, \lambda)$ ,  $C(2, 3, -1)$  and  $D(4, 5, 0)$ ,  $|\lambda| \leq 5$  are the vertices of a quadrilateral  $ABCD$ . If its area is 18 square units, then  $5-6\lambda$  is equal to \_\_\_\_\_.

Given--  
Answer :

Question Type : SA  
Question ID : 3666942569  
Status : Not Answered

**Q.89** The number of 3-digit numbers, that are divisible by either 2 or 3 but not divisible by 7, is \_\_\_\_\_.

Given--  
Answer :

Question Type : SA  
Question ID : 3666942563  
Status : Not Answered

**Q.90** Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be a differentiable function such that  $f'(x) + f(x) = \int_0^2 f(t) dt$ .  
If  $f(0) = e^{-2}$ , then  $2f(0) - f(2)$  is equal to \_\_\_\_\_

Given--  
Answer :

Question Type : SA  
Question ID : 3666942568  
Status : Not Answered