

National Testing Agency

Question Paper Name : B TECH 4th Aug 2021 Shift 1
Subject Name : B TECH
Creation Date : 2021-08-04 12:59:17
Duration : 180
Total Marks : 300 **Display Marks:** Yes

B TECH

Group Number : 1
Group Id : 67603318
Group Maximum Duration : 0
Group Minimum Duration : 180
Show Attended Group? : No
Edit Attended Group? : No
Break time : 0
Group Marks : 300
Is this Group for Examiner? : No

Physics Section A

Section Number :

16

Section type : OnlineMandatory or Optional : MandatoryNumber of Questions :

16

16

Number of Questions to be attempted :

16

Section Id : 676033103
Section Marks : 80
Enable Mark as Answered Mark for Review and Clear Response : Yes
Sub-Section Number : 1
Sub-Section Id : 676033103
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 6760331531 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A wave of wavelength 0.75 cm is produced in air and travels at a speed of 300 m/s. Which of the following is most appropriate option ?

Options :

6760334591. It is a sound wave.

6760334592. It is an ultrasonic wave.

6760334593. It is not audible.

6760334594. It is an ultrasonic wave and It is not audible both are correct.

Question Number : 2 Question Id : 6760331532 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A ship's anchor of density 7500 kg/m^3 appears 196N lighter when completely submerged in water of density 1000 kg/m^3 than in air. The anchor's weight in air will be _____ N.

(Take $g = 9.8 \text{ m/s}^2$)

Options :

6760334595. 6500

6760334596. 1960

6760334597. 5540

6760334598. 1470

Question Number : 3 Question Id : 6760331533 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In a hydrogen atom, if energy of the n^{th} level is denoted by E_n and

$\Delta E_n = E_{n+1} - E_n$, then for very large values of 'n' the ratio $\left| \frac{\Delta E_n}{E_n} \right|$

Options :

6760334599. Does not vary with n

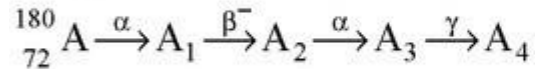
6760334600. Varies as $\frac{1}{n}$

6760334601. Varies as $\frac{1}{n^2}$

6760334602. Varies as $\frac{1}{n^3}$

Question Number : 4 Question Id : 6760331534 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A hypothetical radioactive nuclei decays according to the following series



The atomic number and mass number of A_4 will be respectively

Options :

6760334603. 69, 172

6760334604. 69, 171

6760334605. 70, 172

6760334606. 68, 171

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Question Number : 5 Question Id : 6760331535 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Consider a Hydrogen atom in its first excited state, what is the expression of magnetic field at the centre due to the circular motion of electron in its orbit?

Options :

6760334607. $\frac{\mu_0 e^5 \pi m_e^2}{256 \epsilon_0^3 h^5}$

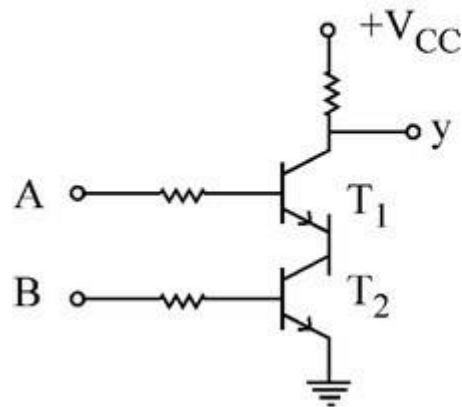
6760334608. $\frac{\mu_0 e^7 \pi m_e^2}{8 \epsilon_0^2 h^5}$

6760334609. $\frac{\mu_0 e^7 \pi m_e^2}{256 \epsilon_0^3 h^5}$

6760334610. Zero

Question Number : 6 Question Id : 6760331536 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which logic gate will be realised by the following circuit ?



Options :

6760334611. AND

6760334612. NAND

6760334613. NOR

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6760334614. OR

Question Number : 7 Question Id : 6760331537 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The refractive index of a prism is 1.6. When prism is immersed in a liquid of 1.2 refractive index, then the change in the angle of minimum deviation will be _____.

(Assume prism is equilateral) Given $\sin^{-1}\left(\frac{4}{5}\right) = 53^\circ$

$$\sin^{-1}\left(\frac{2}{3}\right) = 41^\circ$$

Options :

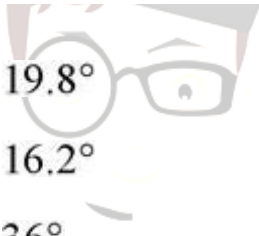
6760334615. 19.8°

6760334616. 16.2°

6760334617. 36°

6760334618. 24°

Question Number : 8 Question Id : 6760331538 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1



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A television transmission tower has a height of 250 m. The approximate distance upto which the broadcast can be received is
(Assume the radius of earth = 6.4×10^6 m)

Options :

6760334619. 0 km

6760334620. 56 km

6760334621. 6400 km

6760334622. 64 km

Question Number : 9 Question Id : 6760331539 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Assume there is a possibility of constant Electric field and Magnetic field and a charged particle under the influence of these forces tries to move along a circle. Identify which of the following are possible.

Options :

6760334623. $E \neq 0, B \neq 0$

6760334624. $E = 0, B = 0$

6760334625. $E \neq 0, B = 0$

6760334626. $E = 0, B \neq 0$

Question Number : 10 Question Id : 6760331540 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A metal rod of 10 cm length is moving with a velocity 5 m/s at the centre of a current carrying circular coil of radius 4 cm and 2A current. The induced emf at the ends of the rod is _____.

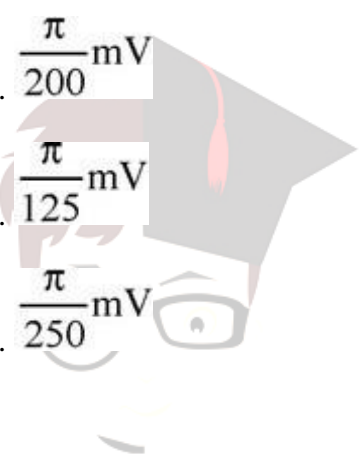
Options :

6760334627. $\frac{\pi}{100}$ mV

6760334628. $\frac{\pi}{200}$ mV

6760334629. $\frac{\pi}{125}$ mV

6760334630. $\frac{\pi}{250}$ mV



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Question Number : 11 Question Id : 6760331541 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A piece of wood has dimensions l , b and h . Its relative density is 'd'. It is floating in water such that the side 'h' is vertical. If it is pushed down gently and released, the angular frequency will be

Options :

6760334631. $\sqrt{\frac{g}{dh}}$

6760334632. $\sqrt{\frac{\ell bg}{dh}}$

6760334633. $\sqrt{\frac{dg}{h}}$

6760334634. $\sqrt{\frac{dg}{\ell bh}}$

Question Number : 12 Question Id : 6760331542 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The force on mass 'm' due to gravity is ' \vec{F}_1 ' at a height $h = \frac{R_e}{3}$ from the Earth's

surface. At what depth 'd' inside Earth the body will experience a force ' \vec{F}_2 ' such

that $|\vec{F}_1| = |\vec{F}_2| = \vec{F}$

Options :

6760334635. $\frac{5}{9}R_e$

6760334636. $\frac{7}{9}R_e$

6760334637. $\frac{7}{16}R_e$

6760334638. $\frac{5}{16}R_e$

Question Number : 13 Question Id : 6760331543 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Choose the correct option for the centre of mass of a uniform disc of radius 'R' from which a circular section of radius r ($2r < R$) has been removed.

The centre of the hole is at a distance 'a' from the centre of the disc.

[Take the centre of the whole disc as the origin]

Options :

6760334639. $\frac{ar^2}{(R^2 - r^2)}$

6760334640. $\frac{ar}{R - r}$

6760334641. $\frac{ar}{R + r}$

6760334642. $\frac{ar^2}{(R^2 + r^2)}$

Question Number : 14 Question Id : 6760331544 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The magnetic field in any region is given by $\vec{B} = B_0 \left(2 + \frac{x}{a} \right) \hat{k}$. A square loop of edge length ' l ' is placed with its edge along x and y axis. The loop is moved with a constant velocity $\vec{v} = v_0 \hat{i}$.

The emf induced in the loop will be -

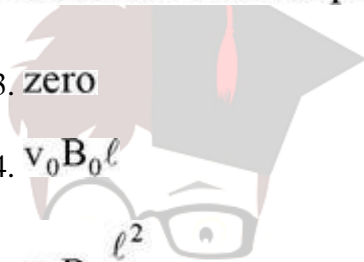
Options :

6760334643. zero

6760334644. $v_0 B_0 l$

6760334645. $v_0 B_0 \frac{l^2}{a}$

6760334646. $v_0 B_0 \frac{l^2}{2a}$



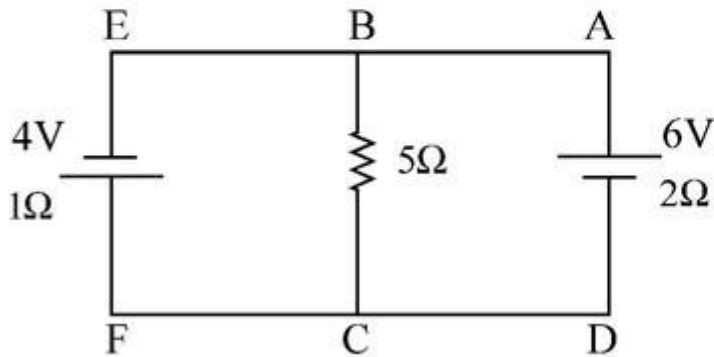
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Question Number : 15 Question Id : 6760331545 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A 4V battery with internal resistance 1Ω and a 6V battery with 2Ω internal resistance are connected to a resistor of 5Ω as shown in fig. The current in the 5Ω resistor is



Options :

6760334647. $\frac{2}{17}$ A from B to C

6760334648. $\frac{1}{17}$ A from B to C

6760334649. $\frac{2}{17}$ A from C to B

6760334650. $\frac{1}{17}$ A from C to B

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Question Number : 16 Question Id : 6760331546 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A steel wire of 1 mm^2 cross-sectional area having Young's modulus $2 \times 10^{11} \text{ N/m}^2$ is stretched between two fixed points at a temperature of 40°C . The tension developed in the wire when its temperature falls to 30°C is given by (Coefficient of linear expansion of steel = $11 \times 10^{-6}/^\circ\text{C}$)

Options :

6760334651. 22 N

6760334652. 11 N

6760334653. 2×10^6 N

6760334654. 10^5 N

Question Number : 17 Question Id : 6760331547 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If a particle of mass 'm' moves in x-y plane according to the equation

$$\vec{r} = (\hat{i} + \hat{j}) (A \sin 314 t + B \cos 314 t) m$$

The frequency of SHM in Hz will be given by

Options :

6760334655. 100 Hz

6760334656. 50 Hz

6760334657. 157 Hz

6760334658. 314 Hz

Question Number : 18 Question Id : 6760331548 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The actual length, breadth and thickness l , b and h of a rectangular slab are 0.2 m, 0.12 m and 0.13 m respectively. If ' l ' is measured by a vernier callipers (zero is on the right of the main scale zero and 8th vernier division coincides with main scale division when its jaws coincide with each other) ' b ' and ' h ' are measured by another vernier scale (4th vernier division coincide with the main scale but zero on vernier shifts towards left when jaws are closed). The least count for both is 0.01 cm. What is the positive and negative zero error of the instruments (in cm) respectively.

Options :

6760334659. 0.08, 0.02

6760334660. 0.04, 0.08

6760334661. 0.08, 0.04

6760334662. 0.02, 0.04

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Question Number : 19 Question Id : 6760331549 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The moment of force $\vec{F} = 2\hat{i} + \hat{j} + 2\hat{k}$ acting at a point $-\hat{i} + 2\hat{j} + \hat{k}$ about the point

$3\hat{i} + \hat{j} + 4\hat{k}$ is given by

Options :

6760334663. $10\hat{i} + 4\hat{j} - 12\hat{k}$

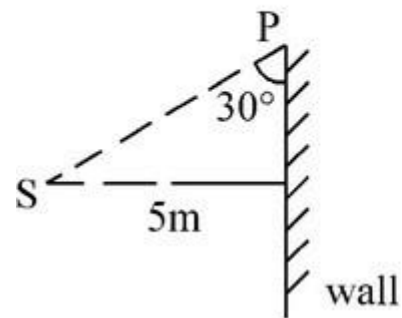
6760334664. $10\hat{i}-4\hat{j}+12\hat{k}$

6760334665. $5\hat{i}+2\hat{j}-6\hat{k}$

6760334666. $5\hat{i}-2\hat{j}+6\hat{k}$

Question Number : 20 Question Id : 6760331550 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In the given figure, S is a spot light, it rotates in a horizontal plane with a constant angular velocity of 0.1 rad/s. The velocity of spot P will be given by



Options :

6760334667. 0.1 m/s

6760334668. 0.5 m/s

6760334669. 2 m/s

6760334670. 5 m/s

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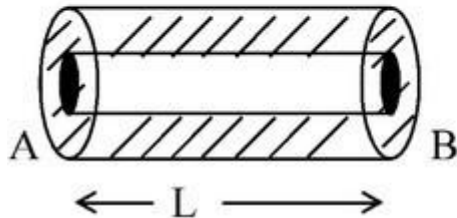
Physics Section B

Section Id :	676033104
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	676033104
Question Shuffling Allowed :	Yes

Question Number : 21 Question Id : 6760331551 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A wire of length L is coated by another conducting material of double resistivity and the thickness of the layer is equal to the radius of the wire. The resistance of the wire between its ends after coating will decrease by _____%.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

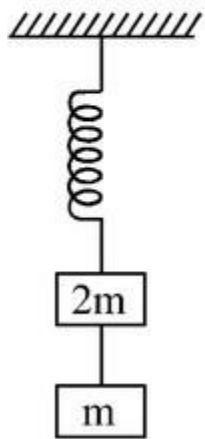
Possible Answers :

100

Question Number : 22 **Question Id :** 6760331552 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

A system shown in the figure is in equilibrium and at rest. The spring and string are massless. When the string is cut, the acceleration of mass '2m' will be _____ m/s^2 . (given $g = 10 \text{ m/s}^2$)



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 23 Question Id : 6760331553 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A drop of liquid of mass 1.8×10^{-5} kg falls away from the bottom of a charged conducting sphere of radius 20 cm, carrying with it a charge of 1nC and leaving on the sphere a uniformly distributed charge of $2.5\mu\text{C}$. The speed of the drop,

after it has fallen 30 cm is $\sqrt{\frac{x^3}{2}}$ m/s. The value of x will be _____.

(g = 10 m/s²)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

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Question Number : 24 Question Id : 6760331554 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A solid cylinder and a spherical shell of identical mass and radius roll down the same inclined plane without slipping. They start from rest. The ratio of angular

velocity of spherical shell to angular velocity of cylinder is $\frac{3}{\sqrt{x}}$ when they reach the ground. The value of x will be _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 25 Question Id : 6760331555 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1 g of water at 100°C is converted into steam at the same temperature and at 1 atmospheric pressure. The change in internal energy is _____ J.

[Consider latent heat of vaporisation is 2256 J/g and 1 atm = 10⁵ Pa]

[Volume of water and steam at 1 atm = 1 cm³ and 1671 cm³ respectively]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

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Question Number : 26 Question Id : 6760331556 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The ratio of average speed to the rms speed of oxygen molecule is $\sqrt{\frac{8}{x\pi}}$.

The value of 'x' is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 27 Question Id : 6760331557 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A one paise coin made of magnesium and weighing 0.5g is electrically neutral and contain equal number of positive and negative charge. The magnitude of positive or negative charge in it will be _____ kC.

Response Type : Numeric

Evaluation Required For SA : Yes

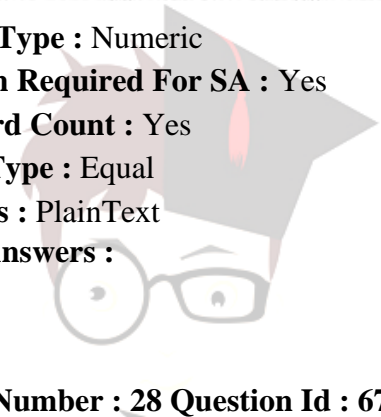
Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100



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Question Number : 28 Question Id : 6760331558 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A potential difference of 800 V is applied across the plates of a parallel plate capacitor. The separation between the plates is 5 mm and a uniform magnetic field is applied parallel to the plates horizontally. An electron projected vertically parallel to the plates, with a velocity of 2×10^6 m/s moves undeflected between the plates. The magnitude of the magnetic field will be _____ $\times 10^{-2}$ T.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 29 Question Id : 6760331559 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A magnetic material of volume 25 cm^3 is placed in a magnetic intensity $5 \times 10^4 \text{ A/m}$. The magnetic moment generated due to the field is 5 Am^2 . The value of magnetic induction will be _____ mT.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

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Question Number : 30 Question Id : 6760331560 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A parallel beam of light incident on a solid glass sphere of radius 50 cm and refractive index 1.5. The distance of image from the outer edge of sphere is _____ cm.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Chemistry Section A

Section Id : 676033105

Section Number : 3

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 20

Number of Questions to be attempted : 20

Section Marks : 80

Enable Mark as Answered Mark for Review and Clear Response : Yes

Sub-Section Number : 1

Sub-Section Id : 676033105

Question Shuffling Allowed : Yes

Question Number : 31 Question Id : 6760331561 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :

No

Correct Marks : 4 Wrong Marks : 1

Match List I with List II

List I	List II
A. Frenkel defect	I. CsCl
B. Schottky defect	II. Pink LiCl
C. Impurity defect	III. ZnS
D. Metal excess defect	IV. Solid solution of CdCl ₂ and AgCl

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

Options :

6760334681. A-I, B-IV, C-II, D-III

6760334682. A-IV, B-II, C-III, D-I

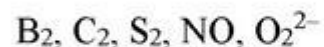
6760334683. A-III, B-I, C-IV, D-II

6760334684. A-II, B-III, C-I, D-IV

Question Number : 32 Question Id : 6760331562 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the following species



Which set represents all paramagnetic species?

Options :

6760334685. B₂, C₂, O₂²⁻

6760334686. C₂, S₂, O₂²⁻

6760334687. B₂, S₂, NO

6760334688. C₂, S₂, NO

Question Number : 33 Question Id : 6760331563 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

For a gaseous reaction, $A_{(g)} \rightarrow 2B_{(g)} + C_{(g)}$, the rate of decomposition of $A_{(g)}$ may be studied by measuring the pressure (P) in a system at constant volume (V) and temperature (T). If all the gaseous species follow ideal gas equation, then which of the relation is correct?

Options :

6760334689. Rate of reaction = $2RT \frac{dP}{dT}$

6760334690. Rate of reaction = $RT \frac{dP}{dT}$

6760334691. Rate of reaction = $\frac{1}{2RT} \frac{dP}{dT}$

6760334692. Rate of reaction = $\frac{1}{RT} \frac{dP}{dT}$

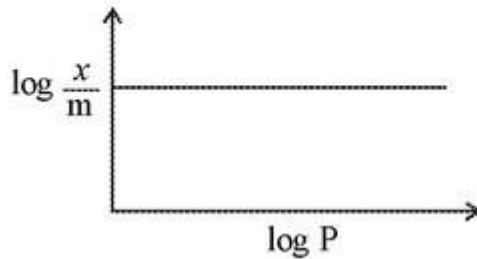
Question Number : 34 Question Id : 6760331564 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Graph between $\log \frac{x}{m}$, ('x' is mass of gas adsorbed and 'm' is the mass of adsorbent)

versus $\log P$ (P-pressure of gas adsorbed) is a straight line (as depicted in the figure).

It is applicable when



Options :

6760334693. Freundlich isotherm is not satisfied

6760334694. Freundlich isotherm is satisfied with $\frac{1}{n} = 0$

6760334695. Freundlich isotherm is satisfied with $\frac{1}{n} = \infty$

6760334696. Freundlich isotherm is satisfied with $\frac{1}{n} = 1$.

Question Number : 35 Question Id : 6760331565 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct order of first ionization enthalpy is :

Options :

6760334697. $\text{Be} > \text{B} > \text{C} > \text{N} > \text{O}$

6760334698. $\text{O} > \text{N} > \text{C} > \text{B} > \text{Be}$

6760334699. $\text{N} > \text{O} > \text{C} > \text{Be} > \text{B}$

6760334700. $\text{N} > \text{O} > \text{C} > \text{B} > \text{Be}$

Question Number : 36 Question Id : 6760331566 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The concentrated ores siderite and copper glance are converted to their oxides by

Options :

6760334701. calcination of both.

6760334702. roasting of both.

6760334703. calcination and roasting respectively.

6760334704. roasting and calcination respectively.

Question Number : 37 Question Id : 6760331567 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Naturally occurring hydrogen contains three isotopes, protium (H), deuterium (D) and tritium (T). What is correct order of heat of dissociation for H_2 , D_2 and T_2 ?

Options :

6760334705. $H_2 > D_2 > T_2$

6760334706. $T_2 > D_2 > H_2$

6760334707. $H_2 = D_2 = T_2$

6760334708. $D_2 > T_2 > H_2$

Question Number : 38 Question Id : 6760331568 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :

No Correct Marks : 4 Wrong Marks : 1

Choose the correct statement from the following :

Options :

6760334709. All group I compounds are diamagnetic.

6760334710. Pure KO_2 is white and paramagnetic.

6760334711. KO_2 is more stable than LiO_2 .

6760334712. Among the alkali metal super oxides, LiO_2 has the highest lattice energy.

Question Number : 39 Question Id : 6760331569 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :

No Correct Marks : 4 Wrong Marks : 1

Which among the following cannot be prepared from Diborane?

Options :

6760334713. H_3BO_3

6760334714. $NaBH_4$

6760334715. $Na_2B_4O_7$

6760334716. $B_2(CH_3)_6$

Question Number : 40 Question Id : 6760331570 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List I with List II

List I	List II
A. Gadolinium (At. No. 64)	I. $5f^7, 6d^1, 7s^2$
B. Holmium (At. No. 67)	II. $5f^4, 6d^1, 7s^2$
C. Neptunium (At. No. 93)	III. $4f^{11}, 6s^2$
D. Curium (At. No. 96)	IV. $4f^7, 5d^1, 6s^2$

Choose the correct answer from the options given below :

Options :

6760334717. A-I, B-II, C-III, D-IV

6760334718. A-IV, B-III, C-II, D-I

6760334719. A-III, B-IV, C-I, D-II

6760334720. A-II, B-I, C-IV, D-III

Question Number : 41 Question Id : 6760331571 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In stratosphere, chlorofluorocarbon compounds break down by UV radiations, releasing 'X' free radical, which further causes ozone layer depletion. Identify 'X'.

Options :

6760334721. $O_2^{\bullet-}$

6760334722. $\bullet Cl$

6760334723. ClO^{\bullet}

6760334724. $\bullet F$

Question Number : 42 Question Id : 6760331572 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :

No Correct Marks : 4 Wrong Marks : 1

In Carius method of halogen estimation, the halogen containing compound is heated with

Options :

6760334725. sodium element followed by addition of water.

6760334726. fuming HNO_3 in the presence of silver nitrate.

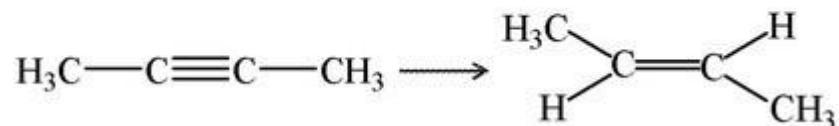
6760334727. barium chloride solution.

6760334728. ammonia and ammonium molybdate

Question Number : 43 Question Id : 6760331573 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :

No Correct Marks : 4 Wrong Marks : 1

Select the most suitable reagent for the following reduction reaction



Options :

6760334729. H_2 , Pd/C, Quinoline

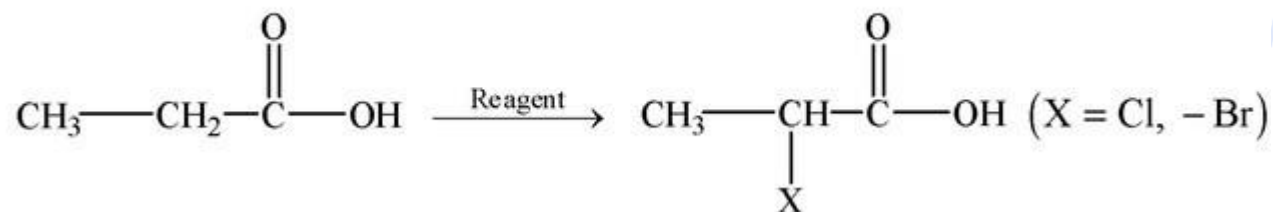
6760334730. H_2 , Na/Liq. NH_3

6760334731. $\text{LiAlH}_4/\text{H}_3\text{O}^+$

6760334732. Pt/ H_2

Question Number : 44 Question Id : 6760331574 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Identify the reagent in the following reaction.



Options :

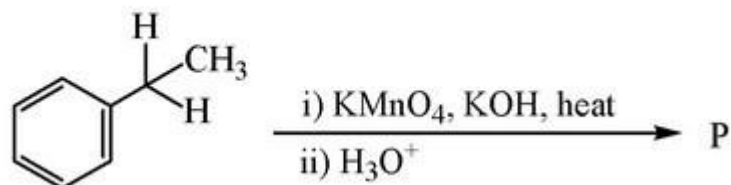
6760334733. SOCl_2

6760334734. NBS/hv or heat

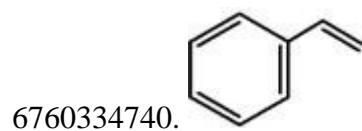
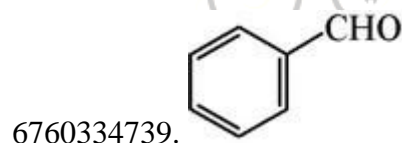
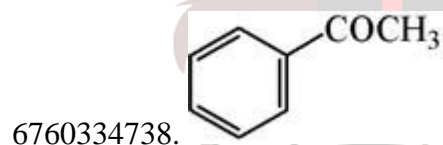
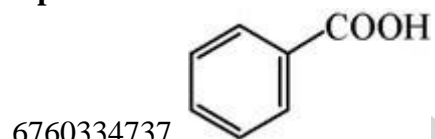
6760334735. X_2 /Red Phosphorus, H_2O

6760334736. Halogen at high temperature (400-500°C)

Question Number : 45 Question Id : 6760331575 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :
No Correct Marks : 4 Wrong Marks : 1
Identify P in the given chemical reaction



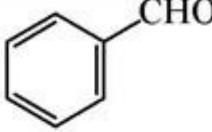
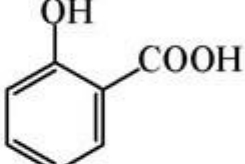
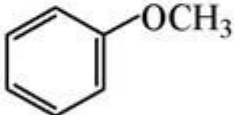
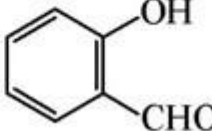
Options :



Question Number : 46 Question Id : 6760331576 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :
No
Correct Marks : 4 Wrong Marks : 1

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Match List I with List II

List I	List II
A. Kolbe's Reaction	I. 
B. Gatterman-Koch Reaction	II. 
C. Reimer-Tiemann Reaction	III. 
D. Williamson Synthesis	IV. 

Choose the correct answer from the options given below :

Options :

6760334741. A – IV, B – II, C – III, D – I

6760334742. A – IV, B – III, C – II, D – I

6760334743. A – II, B – I, C – IV, D – III

6760334744. A – III, B – I, C – IV, D – II

Question Number : 47 Question Id : 6760331577 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : Benzenediazonium chloride is a colored crystalline solid.

Statement II : Benzenediazonium fluoroborate is water soluble and stable at room temperature.

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

Options :

6760334745. Both Statement I and Statement II are correct

6760334746. Both Statement I and Statement II are incorrect

6760334747. Statement I is correct but Statement II is incorrect

6760334748. Statement I is incorrect but Statement II is correct

Question Number : 48 Question Id : 6760331578 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory :

No Correct Marks : 4 Wrong Marks : 1

Which one of the following compound gives Biuret Test?

Options :

6760334749. Aspartame

6760334750. Saccharin

6760334751. Sucralose

6760334752. Sucrose

Question Number : 49 Question Id : 6760331579 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which C-atom in α -D-glucopyranose is attached with two oxygens?

Options :

6760334753. C – 1

6760334754. C – 2

6760334755. C – 3 and C – 1

6760334756. C – 5

Question Number : 50 Question Id : 6760331580 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Match List I with List II

List I (Metal salt)	List II (Colour to the flame)
A. Cu^{2+}	I. Brick Red
B. Sr^{2+}	II. Apple Green
C. Ba^{2+}	III. Green Flame with blue center
D. Ca^{2+}	IV. Crimson Red.

Choose the correct answer from the options given below :

Options :

6760334757. A – I, B – II, C – III, D – IV

6760334758. A – IV, B – III, C – II, D – I

6760334759. A – II, B – I, C – IV, D – III

6760334760. A – III, B – IV, C – II, D – I

Chemistry Section B

Section Id :	676033106
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	676033106
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 6760331581 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A solution of H_2SO_4 has 30% H_2SO_4 by mass and a density of 1.25 g mL^{-1} .

The molarity of the solution is _____ M. (Nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 52 Question Id : 6760331582 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The wavelength of a tennis ball of mass 57 g travelling at 80 km h^{-1} is _____
 $\times 10^{-34} \text{ m}$. (Nearest integer)

[Use : $h = 6.6 \times 10^{-34} \text{ J s}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

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Question Number : 53 Question Id : 6760331583 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A lead bullet weighing 18 g and travelling with a velocity of 500 m/s^{-1} is embedded in a wooden block weighing 1 kg. If both the block and the bullet were initially at 25°C , the final temperature of the block containing the bullet is _____ $^\circ\text{C}$. (Nearest integer)

[Assume no heat is lost to the surroundings, heat capacity of wood and lead are $0.5 \text{ kcal kg}^{-1} \text{ K}^{-1}$, $0.03 \text{ kcal kg}^{-1} \text{ K}^{-1}$ respectively.]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 54 Question Id : 6760331584 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

One mole of glucose was added to 1.0L of water (density = 1 g mL^{-1}). The elevation in boiling point is $x K_b$. The value of x is _____. (Nearest integer)

(K_b is molal elevation constant for water.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 55 Question Id : 6760331585 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If K_{SP} of CaSO_4 is 9.0×10^{-6} at 298K, the molar solubility of CaSO_4 in 0.2M $\text{Ca}(\text{NO}_3)_2$ is _____ $\times 10^{-6}$ M. (Nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

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Answers Type : Equal

Text Areas : PlainText

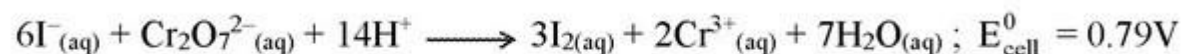
Possible Answers :

100

Question Number : 56 Question Id : 6760331586 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

For the reaction,



The standard reduction potential for $\text{I}_{2(\text{aq})}$ is $x \times 10^{-2}$ V. The value of x is _____.

(Nearest integer)

[Given : The standard reduction potential for $(\text{Cr}_2\text{O}_7^{2-}_{(\text{aq})} \rightarrow 2\text{Cr}^{3+}$ is 1.33 V]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

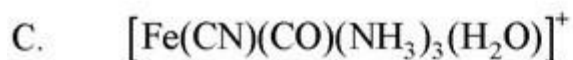
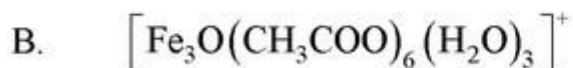
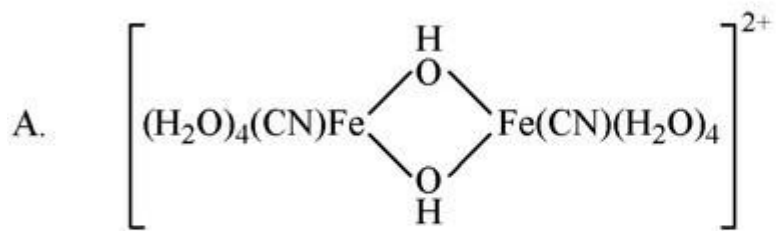
Possible Answers :

100

Question Number : 57 Question Id : 6760331587 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following species, the number of species with oxidation state of Fe in +3 is _____.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 58 **Question Id :** 6760331588 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

Sum of unpaired electrons in $[\text{NiCl}_4]^{2-}$ and $[\text{Ni}(\text{CN})_4]^{2-}$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

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Text Areas : PlainText

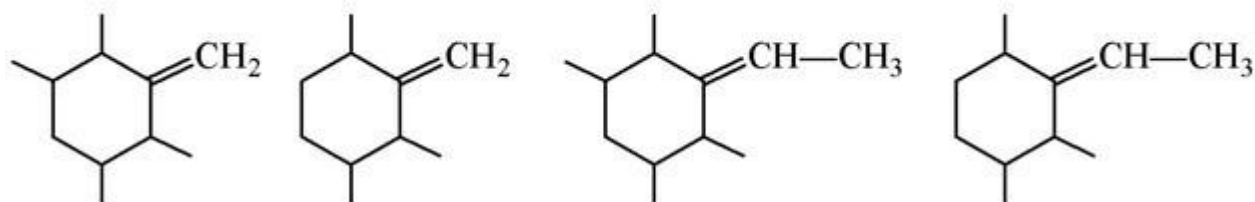
Possible Answers :

100

Question Number : 59 Question Id : 6760331589 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

From the following compounds, the total number of compound(s) which will show Geometrical isomerism is _____.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 60 Question Id : 6760331590 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Number of isomeric compounds with molecular formula C₄H₁₁N that will give carbylamine test is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

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Answers Type : Equal
Text Areas : PlainText
Possible Answers :

100

Mathematics Section A

Section Id :	676033107
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	676033107
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 6760331591 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The number of roots of the equation $(3 + \sqrt{5})^{|x^2-4|} + 4\left(\frac{3-\sqrt{5}}{4}\right)^{|x^2-4|} = 6$ is

Options :

6760334771. 2

6760334772. 4

6760334773. 6

6760334774. 8

Question Number : 62 Question Id : 6760331592 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $z = x + iy$ and $\omega = \frac{z-1}{3(z-2)}$, then the set of points z satisfying $|z|=1=|\omega|$ Platform

contains

Options :

6760334775. no point

6760334776. exactly one point

6760334777. exactly two points

6760334778. exactly three points

Question Number : 63 Question Id : 6760331593 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Let $A = \begin{bmatrix} x & 3 & 2 \\ 1 & y & 4 \\ 2 & 2 & z \end{bmatrix}$, $xyz = 60$ and $8x + 4y + 3z = 20$. If $A(\text{adj } A) = k I$, then k is equal to

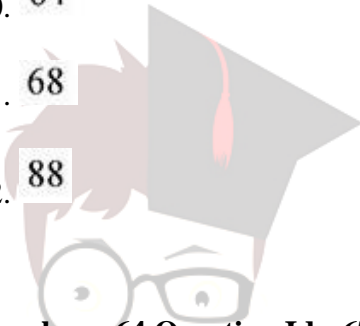
Options :

6760334779. 36

6760334780. 64

6760334781. 68

6760334782. 88



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Question Number : 64 Question Id : 6760331594 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If the system of linear equations

$$x + y + z = 3$$

$$x + by + b^2z = 7$$

and $ax + a^2y + a^3z = 1$

has infinitely many solutions, then the ordered pair (a, b) is

Options :

6760334783. $(2, 2)$

6760334784. $(1, 1)$

6760334785. $\left(\frac{2}{7}, \frac{2}{7}\right)$

6760334786. $\left(\frac{1}{7}, \frac{1}{7}\right)$

Question Number : 65 Question Id : 6760331595 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $(1 + x + x^2)^4 = a_0 + a_1x + a_2x^2 + \dots + a_8x^8$, then the value of

$a_0 + 4a_2 + 16a_4 + \dots + 2^8 a_8$ is equal to

Options :

6760334787. 1191

6760334788. 1214

6760334789. 1241

6760334790. 1261

Question Number : 66 Question Id : 6760331596 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The value of $\frac{\sum_{k=1}^{22} (-1)^{k-1} \cos k^\circ + \sum_{k=23}^{44} (-1)^k \cos k^\circ}{\sum_{k=1}^{22} (-1)^{k-1} \sin k^\circ + \sum_{k=23}^{44} (-1)^k \sin k^\circ}$, where k° denotes k degree, is

Options :

6760334791. 1

6760334792. $\sqrt{2} - 1$

6760334793. $\sqrt{2} + 2$

6760334794. $\sqrt{2} + 1$

Question Number : 67 Question Id : 6760331597 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$$\lim_{x \rightarrow 2} (x^3 - x^2 - 8x + 13)^{\frac{1}{x^3 - 3x^2 + 4}}$$

Options :

6760334795. does not exist

6760334796. exists and it is equal to $e^{\frac{3}{5}}$

6760334797. exists and it is equal to $e^{\frac{5}{3}}$

6760334798. exists and it is equal to $2^{1/3}$

Question Number : 68 Question Id : 6760331598 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The equation of the normal to the curve $y = e^{-|x|}$ at a point, where the curve cuts the line $x = -1$ is

Options :

6760334799. $e^2x + ey - (e^2 - 1) = 0$

6760334800. $ex + ey + e - 1 = 0$

6760334801. $e^2x + ey + (e^2 - 1) = 0$

6760334802. $e^2x - ey + (e^2 + 1) = 0$

Question Number : 69 Question Id : 6760331599 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $I_1 = \int_0^{\pi} xe^{\cos \operatorname{csc} x} dx$ and $I_2 = \int_0^{\pi} e^{\cos \operatorname{csc} x} dx$, then the ratio $I_1 : I_2$ is equal to

Options :

6760334803. $\pi : 2$

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6760334804. $2 : \pi$

6760334805. $\pi : 3$

6760334806. $3 : \pi$

Question Number : 70 Question Id : 6760331600 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The equation of the tangent to the curve $y = \int_{x^2}^{x^3} \frac{dt}{\sqrt{1+t^2}}$ at the point whose abscissa is 1, is

Options :

6760334807. $x + \sqrt{2}y - 1 = 0$

6760334808. $\sqrt{3}x - y - \sqrt{3} = 0$

6760334809. $x - y - 1 = 0$

6760334810. $x - \sqrt{2}y - 1 = 0$

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Question Number : 71 Question Id : 6760331601 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $y = y(x)$ is the solution of the differential equation, $\sqrt{1-e^{2x}} dy - \sqrt{4-y^2} \cdot e^x dx = 0$ such that $y(0) = 1$, then $y(-\log_e 2)$ is equal to

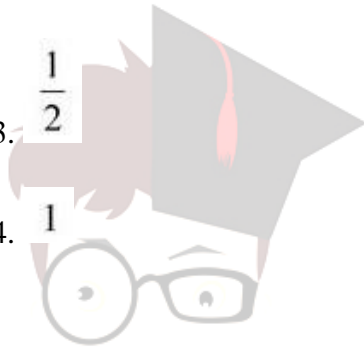
Options :

6760334811. $-\frac{\pi}{3}$

6760334812. -1

6760334813. $\frac{1}{2}$

6760334814. 1



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Question Number : 72 Question Id : 6760331602 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $(k, 3)$ is an interior point of the triangle formed by the lines, $x + y = 4$, $x - y = 5$ and $x - 2y + 2 = 0$, then the set of all values of k is the interval

Options :

6760334815. $(3, 4)$

6760334816. $(3, 8)$

6760334817. $(4, 8)$

6760334818. (8, 12)

Question Number : 73 Question Id : 6760331603 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Consider a family of circles which pass through the point (1, 1) and touch the axis of y . If the centre of such a circle is at (h, k) , then the set of all values of h is the interval

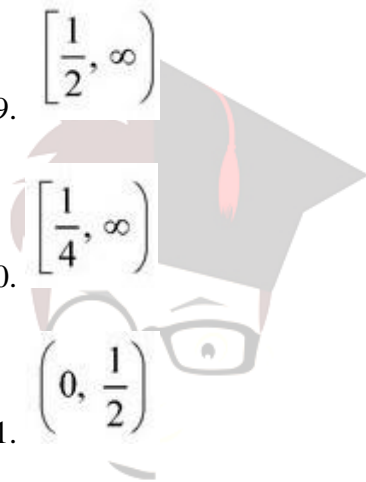
Options :

6760334819. $\left[\frac{1}{2}, \infty\right)$

6760334820. $\left[\frac{1}{4}, \infty\right)$

6760334821. $\left(0, \frac{1}{2}\right)$

6760334822. $\left[\frac{1}{2}, 1\right]$



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Question Number : 74 Question Id : 6760331604 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The locus of the mid-points of the perpendiculars to the directrix of the parabola, $y^2 = 2x$ from points on it, is

Options :

6760334823. $y^2 = 4x - 1$

6760334824. $y^2 = 4x + 1$

6760334825. $y^2 = 8x + 2$

6760334826. $y^2 = 2x + \frac{1}{2}$

Question Number : 75 Question Id : 6760331605 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If the ellipse $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the circle $x^2 + y^2 = 4b$ intersect at an angle $\frac{\pi}{3}$, then a value of 'b' is

Options :

6760334827. $10 + 2\sqrt{21}$

6760334828. $20 + 2\sqrt{21}$

6760334829. $10 - 3\sqrt{21}$

6760334830. $20 - 3\sqrt{21}$

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Question Number : 76 Question Id : 6760331606 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = 4\hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{c} = \hat{i} - 2\hat{j} + \hat{k}$ are three vectors, then a vector of magnitude 6 units, which is parallel to the vector $2\vec{a} - \vec{b} + 3\vec{c}$, is

Options :

6760334831. $2\hat{i} + 4\hat{j} + 4\hat{k}$

6760334832. $4\hat{i} + 2\hat{j} - 4\hat{k}$

6760334833. $2\hat{i} - 4\hat{j} + 4\hat{k}$

6760334834. $4\hat{i} + 4\hat{j} - 2\hat{k}$

Question Number : 77 Question Id : 6760331607 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Four persons work independently of each other on a task. If the probabilities that they will complete the task are : $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{5}$, then the probability, that at least one of them will complete it, is

Options :

6760334835. 0.2

6760334836. 0.8

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6760334837. 0.4

6760334838. 0.6

Question Number : 78 Question Id : 6760331608 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Two players A and B play a game. Player A first throws a fair die and if 5 or 6 appears, he wins; otherwise player B throws a fair coin and wins if head comes. The process continues till someone wins. The probability that B wins after completion of 3 or more throws of the die, is

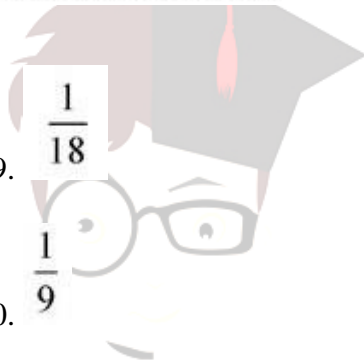
Options :

6760334839. $\frac{1}{18}$

6760334840. $\frac{1}{9}$

6760334841. $\frac{4}{9}$

6760334842. $\frac{1}{2}$



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Question Number : 79 Question Id : 6760331609 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Ten vertical poles of different height standing at equal distances on a straight line, subtend the same angle 30° at a point O on the line. If the height of the tallest pole is 12 units and the distance of the foot of the shortest pole from O is 1 unit, then the distance between two consecutive poles is

Options :

6760334843. $\frac{12\sqrt{3}-1}{9}$

6760334844. $\frac{4\sqrt{3}-1}{9}$

6760334845. $\frac{12\sqrt{3}-1}{3\sqrt{3}}$

6760334846. $\frac{12\sqrt{3}+1}{9}$

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Question Number : 80 Question Id : 6760331610 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $r \in \{p, q, \sim p, \sim q\}$ such that the Boolean expression $(\sim(p \vee q)) \vee (p \wedge r)$ is equivalent to r , then r is equal to

Options :

6760334847. p

6760334848. q

6760334849. $\sim p$

6760334850. $\sim q$

Mathematics Section B

Section Id :	676033108
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	676033108
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 6760331611 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let p , q and r be the first three terms of a G.P. such that $|p + q + r| = 15$, and the common ratio of this G.P. is negative. If $p < r$ and $q = 10$, then the product of the second and the fourth terms in it is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 82 Question Id : 6760331612 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $M = (a_{ij})_{3 \times 3}$, where $a_{ij} = \begin{cases} -1, & i = j, \\ i^2 - j^2, & i < j, \\ 2i - j, & i > j. \end{cases} (i, j = 1, 2, 3)$

If $X = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$, then value of $-X^T M X$ is _____. (Here, X^T denotes transpose of X).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 83 Question Id : 6760331613 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Each of the numbers 1, 0, -1 is written on two different opposite faces of a six faces fair die. This die is thrown three times. The number of ways in which the sum of the numbers appearing is zero, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 84 Question Id : 6760331614 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $f(x) = |3 - x| + |2 + x| + |5 - x|$, $x \in \mathbb{R}$, then the minimum value of $f(x)$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 85 Question Id : 6760331615 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The local minimum value of $\frac{(5+x)(2+x)}{(1+x)}$, $(x \neq -1)$, is _____.

Response Type : Numeric

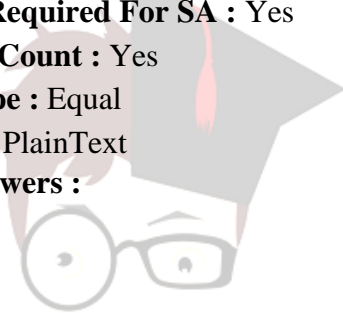
Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :



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Question Number : 86 Question Id : 6760331616 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$$\text{If } \int (\sqrt{\tan x} + \sqrt{\cot x}) dx = a \tan^{-1} \left(\frac{\tan x - 1}{\sqrt{b \tan x}} \right) + C,$$

then the value of $a^4 + b^5$ is _____.

(Here, C is a constant of integration).

Response Type : Numeric

Evaluation Required For SA : Yes

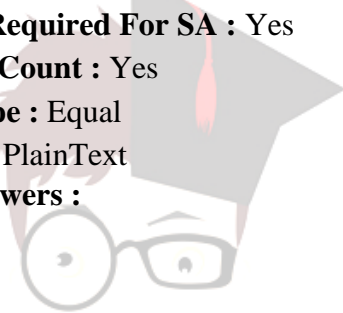
Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100



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Question Number : 87 Question Id : 6760331617 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Maximum number of lines, through the origin which make equal angles with the three coordinate axes in XYZ-space, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 88 Question Id : 6760331618 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the distance between the point $(a, -1, 1)$ ($a > 0$) and the plane passing through the points $(1, -2, 1)$, $(3, 1, 0)$ and $(2, 0, 1)$ is $\frac{7}{\sqrt{6}}$, then the value of 'a' is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 89 Question Id : 6760331619 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of points in $(0, 2\pi)$, where the function $f : \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = |\sin x| + |\cos x|$ is **NOT** differentiable, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 90 Question Id : 6760331620 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $\tan A$ is equal to the integral solution of the inequality $4x^2 - 24x + 35 < 0$ and $\sin B$ is equal to the slope of the angle bisector of the second quadrant, then $40 \sin(A + B) \sin(B - A)$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100



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