

National Testing Agency

Question Paper Name: Paper I EH 8th April 2019 Shift 1
Subject Name: Paper I EH
Creation Date: 2019-04-08 14:29:50
Duration: 180
Total Marks: 360
Display Marks: Yes
Share Answer Key With Delivery Engine: Yes
Actual Answer Key: Yes

Paper I

Group Number : 1
Group Id : 416529152
Group Maximum Duration : 0
Group Minimum Duration : 180
Revisit allowed for view? : No
Revisit allowed for edit? : No
Break time: 0
Group Marks: 360

Physics

Section Id : 416529250
Section Number : 1
Section type : Online
Mandatory or Optional: Mandatory
Number of Questions: 30
Number of Questions to be attempted: 30
Section Marks: 120
Display Number Panel: Yes
Group All Questions: No

Sub-Section Number: 1
Sub-Section Id: 416529390
Question Shuffling Allowed : Yes

Question Number : 1 **Question Id : 41652912696** **Question Type : MCQ** **Option Shuffling : Yes** **Display Question Number : Yes**
Single Line Question Option : No **Option Orientation : Vertical**
Correct Marks : 4 **Wrong Marks : 1**

In SI units, the dimensions of $\sqrt{\frac{\epsilon_0}{\mu_0}}$ is :

Options :

41652949562. $AT^2M^{-1}L^{-1}$

41652949563. $A^2T^3M^{-1}L^{-2}$

41652949564. $A^{-1}TML^3$

41652949565. $AT^{-3}ML^{3/2}$

Question Number : 1 Question Id : 41652912696 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

SI इकाई में, $\sqrt{\frac{\epsilon_0}{\mu_0}}$ की विमा है :

Options :

41652949562. $AT^2M^{-1}L^{-1}$

41652949563. $A^2T^3M^{-1}L^{-2}$

41652949564. $A^{-1}TML^3$

41652949565. $AT^{-3}ML^{3/2}$

Question Number : 2 Question Id : 41652912697 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Ship A is sailing towards north-east with

velocity $\vec{v} = 30\hat{i} + 50\hat{j}$ km/hr where $\hat{i}$

points east and $\hat{j}$, north. Ship B is at a

distance of 80 km east and 150 km north of Ship A and is sailing towards west at 10 km/hr. A will be at minimum distance from B in :

Options :

41652949566. 4.2 hrs.

41652949567. 2.2 hrs.

41652949568. 2.6 hrs.

41652949569. 3.2 hrs.

Question Number : 2 Question Id : 41652912697 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

जहाज A वेग $\vec{v} = 30\hat{i} + 50\hat{j}$ km/hr से उत्तर-पूर्व

दिशा में जलयात्रा कर रहा है जहाँ $\hat{i}$ पूर्व तथा $\hat{j}$ उत्तर की ओर इंगित हैं। जहाज B, जहाज A से 80 km पूर्व की ओर और 150 km उत्तर की ओर, दूरी पर स्थित है और पश्चिम की ओर 10 km/hr की चाल से जलयात्रा कर रहा है। A से B की दूरी न्यूनतम होगी :

Options :

41652949566. 4.2 घंटे में

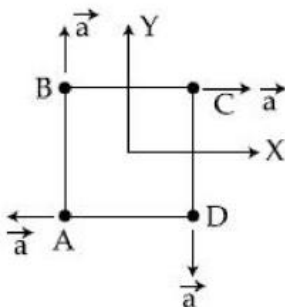
41652949567. 2.2 घंटे में

41652949568. 2.6 घंटे में

41652949569. 3.2 घंटे में

Question Number : 3 Question Id : 41652912698 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Four particles A, B, C and D with masses $m_A = m$, $m_B = 2m$, $m_C = 3m$ and $m_D = 4m$ are at the corners of a square. They have accelerations of equal magnitude with directions as shown. The acceleration of the centre of mass of the particles is :



Options :

41652949570. Zero

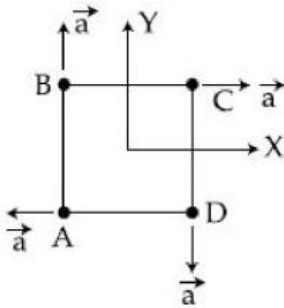
41652949571. $a(\hat{i} + \hat{j})$

41652949572. $\frac{a}{5}(\hat{i} + \hat{j})$

41652949573. $\frac{a}{5}(\hat{i} - \hat{j})$

Question Number : 3 Question Id : 41652912698 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

द्रव्यमान $m_A = m$, $m_B = 2m$, $m_C = 3m$ और $m_D = 4m$ वाले चार कण A, B, C और D एक वर्ग के कोनों पर रखे गये हैं। उनके त्वरण एकसमान परिमाण के हैं और दर्शाए गये चित्र के अनुसार हैं। कणों के द्रव्यमान केन्द्र का त्वरण है :



Options :

41652949570. शून्य

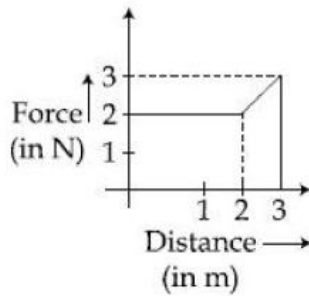
41652949571. $a(\hat{i} + \hat{j})$

41652949572. $\frac{a}{5}(\hat{i} + \hat{j})$

41652949573. $\frac{a}{5}(\hat{i} - \hat{j})$

Question Number : 4 Question Id : 41652912699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

A particle moves in one dimension from rest under the influence of a force that varies with the distance travelled by the particle as shown in the figure. The kinetic energy of the particle after it has travelled 3 m is :



Options :

41652949574. 5 J

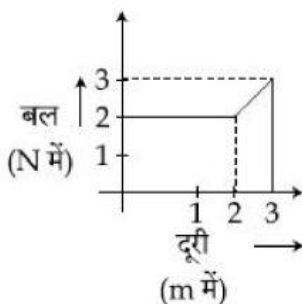
41652949575. 6.5 J

41652949576. 4 J

41652949577. 2.5 J

Question Number : 4 Question Id : 41652912699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

एक कण एक बल के प्रभाव में विराम अवस्था से गति प्रारम्भ करता है। बल, कण द्वारा चली दूरी के अनुसार इस प्रकार परिवर्तित होता है जैसा कि चित्र में दर्शाया गया है। 3 m दूरी चलने के बाद कण की गतिज ऊर्जा है :



Options :

41652949574. 5 J

41652949575. 6.5 J

41652949576. 4 J

41652949577. 2.5 J

Question Number : 5 Question Id : 41652912700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A thin circular plate of mass M and radius R has its density varying as $\rho(r) = \rho_0 r$ with ρ_0 as constant and r is the distance from its center. The moment of Inertia of the circular plate about an axis perpendicular to the plate and passing through its edge is $I = a MR^2$. The value of the coefficient a is :

Options :

41652949578. $\frac{8}{5}$

41652949579. $\frac{3}{2}$

41652949580. $\frac{3}{5}$

41652949581. $\frac{1}{2}$

Question Number : 5 Question Id : 41652912700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M और त्रिज्या R की एक वृत्तीय प्लेट का घनत्व $\rho(r) = \rho_0 r$, के अनुसार परिवर्तित हो रहा है जहाँ ρ_0 स्थिरांक है और r उसके केन्द्र से दूरी है। प्लेट के लम्बवत् और प्लेट की परिधि से जाने वाली अक्ष के परितः वृत्तीय प्लेट का जड़त्व आघूर्ण $I = a MR^2$ है। गुणांक a का मान है :

Options :

41652949578. $\frac{8}{5}$

41652949579. $\frac{3}{2}$

41652949580. $\frac{3}{5}$

41652949581. $\frac{1}{2}$

Question Number : 6 Question Id : 41652912701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Four identical particles of mass M are located at the corners of a square of side 'a'. What should be their speed if each of them revolves under the influence of others' gravitational field in a circular orbit circumscribing the square ?



Options :

41652949582. $1.21 \sqrt{\frac{GM}{a}}$

41652949583. $1.35 \sqrt{\frac{GM}{a}}$

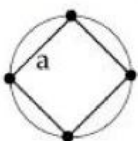
41652949584. $1.41 \sqrt{\frac{GM}{a}}$

41652949585. $1.16 \sqrt{\frac{GM}{a}}$

Question Number : 6 Question Id : 41652912701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M के चार एकसमान कण भुजा 'a' के एक वर्ग के कोनों पर स्थित हैं। यदि ये कण एक दूसरे के गुरुत्वाकर्षण प्रभाव में इस वर्ग के परिवृत्त एक वृत्तीय कक्षा में गतिशील हैं तो कण की चाल क्या होगी ?



Options :

41652949582. $1.21 \sqrt{\frac{GM}{a}}$

41652949583. $1.35 \sqrt{\frac{GM}{a}}$

41652949584. $1.41 \sqrt{\frac{GM}{a}}$

41652949585. $1.16 \sqrt{\frac{GM}{a}}$

Question Number : 7 Question Id : 41652912702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A boy's catapult is made of rubber cord which is 42 cm long, with 6 mm diameter of cross-section and of negligible mass. The boy keeps a stone weighing 0.02 kg on it and stretches the cord by 20 cm by applying a constant force. When released, the stone flies off with a velocity of 20 ms^{-1} . Neglect the change in the area of cross-section of the cord while stretched. The Young's modulus of rubber is closest to :

Options :

41652949586. 10^6 Nm^{-2}

41652949587. 10^8 Nm^{-2}

41652949588. 10^4 Nm^{-2}

41652949589. 10^3 Nm^{-2}

Question Number : 7 Question Id : 41652912702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक बालक का गुलेल 42 cm लम्बी और 6 mm अनुप्रस्थ काट के व्यास की रबड़ की डोरी का बना है, जिसका द्रव्यमान नगण्य है। बालक 0.02 kg भार का एक पत्थर इस पर रखता है और डोरी को एक नियत बल से 20 cm द्वारा तानित करता है। जब इसे छोड़ता है, तब पत्थर 20 ms^{-1} के वेग से जाता है। तानित होने पर डोरी के अनुप्रस्थ काट में परिवर्तन नगण्य है। रबड़ का यंग प्रत्यास्थता गुणांक का निकटतम मान है :

Options :

41652949586. 10^6 Nm^{-2}

41652949587. 10^8 Nm^{-2}

41652949588. 10^4 Nm^{-2}

41652949589. 10^3 Nm^{-2}

Question Number : 8 Question Id : 41652912703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Water from a pipe is coming at a rate of 100 liters per minute. If the radius of the pipe is 5 cm, the Reynolds number for the flow is of the order of : (density of water = 1000 kg/m^3 , coefficient of viscosity of water = 1 mPa s)

Options :

41652949590. 10^4

41652949591. 10^3

41652949592. 10^6

41652949593. 10^2

Question Number : 8 Question Id : 41652912703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक पाइप से पानी 100 लीटर प्रति मिनट की दर से निकल रहा है। यदि पाइप की त्रिज्या 5 cm है, तब प्रवाह की रेनोल्ड संख्या की कोटि है : (पानी का घनत्व = 1000 kg/m^3 , पानी का श्यानता गुणांक = 1 mPa s)

Options :

41652949590. 10^4

41652949591. 10^3

41652949592. 10^6

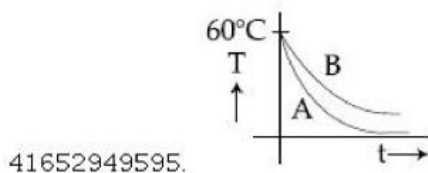
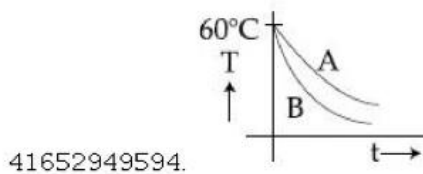
41652949593. 10^2

Question Number : 9 Question Id : 41652912704 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

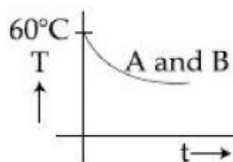
Correct Marks : 4 Wrong Marks : 1

Two identical beakers A and B contain equal volumes of two different liquids at 60°C each and left to cool down. Liquid in A has density of $8 \times 10^2 \text{ kg/m}^3$ and specific heat of $2000 \text{ J kg}^{-1} \text{ K}^{-1}$ while liquid in B has density of 10^3 kg m^{-3} and specific heat of $4000 \text{ J kg}^{-1} \text{ K}^{-1}$. Which of the following best describes their temperature versus time graph schematically ? (assume the emissivity of both the beakers to be the same)

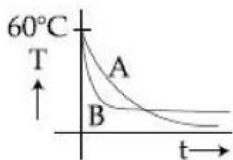
Options :



41652949596.



41652949597.

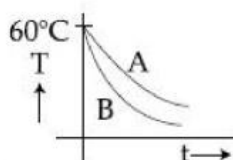


Question Number : 9 Question Id : 41652912704 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

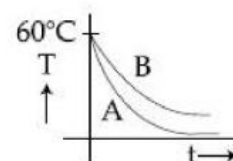
दो एकसमान बीकर A एवं B में दो भिन्न द्रवों के समान आयतन 60°C तापमान पर रखे हैं और ठंडा होने के लिए छोड़ दिए गये हैं। A में द्रव का घनत्व $8 \times 10^2 \text{ kg/m}^3$ है और विशिष्ट ऊष्मा $2000 \text{ J kg}^{-1} \text{ K}^{-1}$ जबकि B में द्रव का घनत्व 10^3 kg m^{-3} हैं और विशिष्ट ऊष्मा $4000 \text{ J kg}^{-1} \text{ K}^{-1}$ है। निम्नलिखित में से कौन-सा ग्राफ तापमान का समय के साथ परिवर्तन विधिवत् प्रदर्शित करता है? (दोनों बीकरों की उत्सर्जकता एकसमान मान लें)

Options :

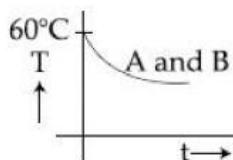
41652949594.



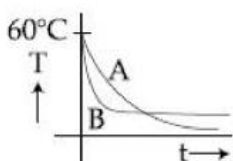
41652949595.



41652949596.



41652949597.



Question Number : 10 Question Id : 41652912705 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A thermally insulated vessel contains 150 g of water at 0°C . Then the air from the vessel is pumped out adiabatically. A fraction of water turns into ice and the rest evaporates at 0°C itself. The mass of evaporated water will be closest to :

(Latent heat of vaporization of water $= 2.10 \times 10^6 \text{ J kg}^{-1}$ and Latent heat of Fusion of water $= 3.36 \times 10^5 \text{ J kg}^{-1}$)

Options :

41652949598. 150 g

41652949599. 20 g

41652949600. 35 g

41652949601. 130 g

Question Number : 10 Question Id : 41652912705 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0°C पर 150 g पानी को ऊष्मीय विलग पात्र में रखा गया है। पात्र से वायु को रूद्धोष्म प्रक्रम द्वारा निष्कासित करते हैं। पानी का एक भाग बर्फ में तथा शेष 0°C की वाष्प में परिवर्तित हो जाता है। वाष्पित पानी के द्रव्यमान का निकटतम मान होगा :

(पानी के वाष्पीकरण की गुप्त ऊष्मा $= 2.10 \times 10^6 \text{ J kg}^{-1}$ और पानी के गलन की गुप्त ऊष्मा $= 3.36 \times 10^5 \text{ J kg}^{-1}$)

Options :

41652949598. 150 g

41652949599. 20 g

41652949600. 35 g

41652949601. 130 g

Question Number : 11 Question Id : 41652912706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If 10^{22} gas molecules each of mass 10^{-26} kg collide with a surface (perpendicular to it) elastically per second over an area 1 m^2 with a speed 10^4 m/s , the pressure exerted by the gas molecules will be of the order of :

Options :

41652949602. 10^3 N/m^2

41652949603. 10^4 N/m^2

41652949604. 10^8 N/m^2

41652949605. 10^{16} N/m^2

Question Number : 11 Question Id : 41652912706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि प्रत्येक द्रव्यमान 10^{-26} kg के 10^{22} गैस अणु 10^4 m/s की चाल से 1 m^2 क्षेत्रफल पर प्रति सेकण्ड प्रत्यास्थ संघट्ट कर रहे हैं, तब गैस अणुओं द्वारा लगाया गया दाब का कोटिमान होगा :

Options :

41652949602. 10^3 N/m^2

41652949603. 10^4 N/m^2

41652949604. 10^8 N/m^2

41652949605. 10^{16} N/m^2

Question Number : 12 Question Id : 41652912707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A steel wire having a radius of 2.0 mm , carrying a load of 4 kg , is hanging from a ceiling. Given that $g = 3.1 \pi \text{ ms}^{-2}$, what will be the tensile stress that would be developed in the wire ?

Options :

41652949606. $5.2 \times 10^6 \text{ Nm}^{-2}$

41652949607. $3.1 \times 10^6 \text{ Nm}^{-2}$

41652949608. $6.2 \times 10^6 \text{ Nm}^{-2}$

41652949609. $4.8 \times 10^6 \text{ Nm}^{-2}$

Question Number : 12 Question Id : 41652912707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

4 kg के भार को वहन करते हुए एक 2.0 mm त्रिज्या के स्टील के एक तार को छत से लटकाया गया है। दिया है $g = 3.1 \pi \text{ ms}^{-2}$ । तार में उत्पन्न तन्व्य प्रतिबल (tensile stress) का मान क्या होगा?

Options :

41652949606. $5.2 \times 10^6 \text{ Nm}^{-2}$

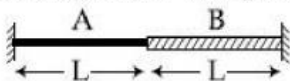
41652949607. $3.1 \times 10^6 \text{ Nm}^{-2}$

41652949608. $6.2 \times 10^6 \text{ Nm}^{-2}$

41652949609. $4.8 \times 10^6 \text{ Nm}^{-2}$

Question Number : 13 Question Id : 41652912708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1



A wire of length $2L$, is made by joining two wires A and B of same length but different radii r and $2r$ and made of the same material. It is vibrating at a frequency such that the joint of the two wires forms a node. If the number of antinodes in wire A is p and that in B is q then the ratio $p : q$ is :

Options :

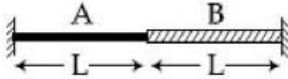
41652949610. 1 : 2

41652949611. 3 : 5

41652949612. 4 : 9

41652949613. 1 : 4

Question Number : 13 Question Id : 41652912708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1



एक ही पदार्थ के एकसमान लम्बाई परन्तु भिन्न त्रिज्या r तथा $2r$ के दो तारों को जोड़कर, $2L$ लम्बाई का एक तार बनाया जाता है। यह इस प्रकार कम्पित होता है कि दोनों तारों का जोड़ एक निस्पंद बने। यदि तार A में प्रस्पंदों की संख्या p है और B में q है, तब अनुपात $p : q$ है :

Options :

41652949610. 1 : 2

41652949611. 3 : 5

41652949612. 4 : 9

41652949613. 1 : 4

Question Number : 14 Question Id : 41652912709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The bob of a simple pendulum has mass 2 g and a charge of $5.0\text{ }\mu\text{C}$. It is at rest in a uniform horizontal electric field of intensity 2000 V/m . At equilibrium, the angle that the pendulum makes with the vertical is :
(take $g = 10\text{ m/s}^2$)

Options :

41652949614. $\tan^{-1}(0.5)$

41652949615. $\tan^{-1}(5.0)$

41652949616. $\tan^{-1}(2.0)$

41652949617. $\tan^{-1}(0.2)$

Question Number : 14 Question Id : 41652912709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

5.0 μC आवेश वाला और द्रव्यमान 2 g का एक सरल
दोलक का बॉब तीव्रता 2000 V/m के एक एकसमान
क्षैतिज विद्युत क्षेत्र में विराम अवस्था पर है। साम्यावस्था
में, ऊर्ध्वाधर से दोलक जो कोण बनाएगा, वह है :
($g = 10 \text{ m/s}^2$ लें)

Options :

41652949614. $\tan^{-1}(0.5)$

41652949615. $\tan^{-1}(5.0)$

41652949616. $\tan^{-1}(2.0)$

41652949617. $\tan^{-1}(0.2)$

Question Number : 15 Question Id : 41652912710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A solid conducting sphere, having a charge
Q, is surrounded by an uncharged
conducting hollow spherical shell. Let the
potential difference between the surface of
the solid sphere and that of the outer
surface of the hollow shell be V. If the shell
is now given a charge of $-4Q$, the new
potential difference between the same two
surfaces is :

Options :

41652949618. V

41652949619. 2 V

41652949620. $-2V$

41652949621. 4 V

Question Number : 15 Question Id : 41652912710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आवेश Q वाले एक ठोस चालकीय गोले को एक अनावेशित चालकीय खोखले गोलीय कवच से घेरा गया है। ठोस गोले के पृष्ठ और खोखले कवच के बाह्य पृष्ठ के बीच विभवान्तर V है। यदि कवच को अब एक आवेश $-4Q$ दिया जाता है, तब उन्ही दोनों पृष्ठों के बीच नया विभवान्तर होगा :

Options :

41652949618. V

41652949619. $2V$

41652949620. $-2V$

41652949621. $4V$

Question Number : 16 Question Id : 41652912711 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Voltage rating of a parallel plate capacitor is 500 V. Its dielectric can withstand a maximum electric field of 10^6 V/m. The plate area is 10^{-4} m². What is the dielectric constant if the capacitance is 15 pF ?
(given $\epsilon_0 = 8.86 \times 10^{-12}$ C²/Nm²)

Options :

41652949622. 6.2

41652949623. 3.8

41652949624. 4.5

41652949625. 8.5

Question Number : 16 Question Id : 41652912711 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समान्तर प्लेट संधारित्र की वोल्टेज श्रेणी (rating) 500 V है। इसका परावैद्युत पदार्थ अधिकतम 10^6 V/m का विद्युत क्षेत्र सहन कर सकता है। प्लेट का क्षेत्रफल 10^{-4} m² है। यदि संधारित्र की धारिता का मान 15 pF हो तो परावैद्युतांक का मान होगा :
(दिया है $\epsilon_0 = 8.86 \times 10^{-12}$ C²/Nm²)

Options :

41652949622. 6.2

41652949623. 3.8

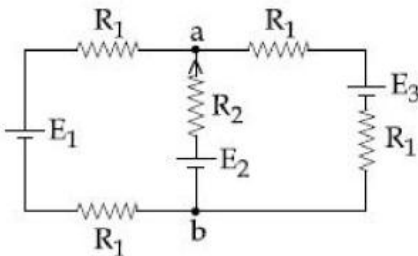
41652949624. 4.5

41652949625. 8.5

Question Number : 17 Question Id : 41652912712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the circuit shown, with $R_1 = 1.0 \Omega$,
 $R_2 = 2.0 \Omega$, $E_1 = 2 \text{ V}$ and $E_2 = E_3 = 4 \text{ V}$, the
potential difference between the points 'a'
and 'b' is approximately (in V) :



Options :

41652949626. 3.7

41652949627. 3.3

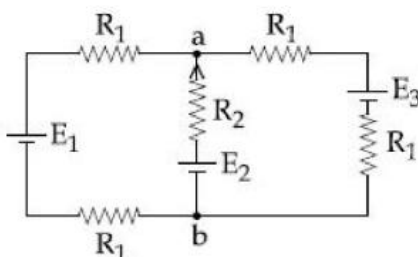
41652949628. 2.7

41652949629. 2.3

Question Number : 17 Question Id : 41652912712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिखाये गये परिपथ में, $R_1 = 1.0 \Omega$, $R_2 = 2.0 \Omega$,
 $E_1 = 2 \text{ V}$ और $E_2 = E_3 = 4 \text{ V}$ हैं। बिन्दुओं 'a' एवं
'b' के बीच विभवान्तर लगभग (V में) है :



Options :

41652949626. 3.7

41652949627. 3.3

41652949628. 2.7

41652949629. 2.3

Question Number : 18 Question Id : 41652912713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A circular coil having N turns and radius r carries a current I. It is held in the XZ plane

in a magnetic field $\hat{B} \hat{i}$. The torque on the coil due to the magnetic field is :

Options :

41652949630. $B\pi r^2 I N$

41652949631. $\frac{B\pi r^2 I}{N}$

41652949632. Zero

41652949633. $\frac{B r^2 I}{\pi N}$

Question Number : 18 Question Id : 41652912713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

त्रिज्या r और चक्कर N वाली एक वृत्तीय कुण्डली में

धारा I प्रवाहित हो रही है। इसे चुम्बकीय क्षेत्र $\hat{B} \hat{i}$ में XZ समतल में रखा जाता है। चुम्बकीय क्षेत्र के कारण कुण्डली पर बलआघूर्ण होगा :

Options :

41652949630. $B\pi r^2 I N$

41652949631. $\frac{B\pi r^2 I}{N}$

41652949632. शून्य

41652949633. $\frac{Br^2 I}{\pi N}$

Question Number : 19 Question Id : 41652912714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An alternating voltage $v(t) = 220 \sin 100\pi t$ volt is applied to a purely resistive load of 50Ω . The time taken for the current to rise from half of the peak value to the peak value is :

Options :

41652949634. 2.2 ms

41652949635. 3.3 ms

41652949636. 5 ms

41652949637. 7.2 ms

Question Number : 19 Question Id : 41652912714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रत्यावर्ती वोल्टेज स्रोत $v(t) = 220 \sin 100\pi t$ वोल्ट को एक 50Ω प्रतिरोध पर लगाया गया है। धारा का मान आधे शिखर मान से पूर्ण शिखर मान तक बढ़ने में लगे समय का मान होगा :

Options :

41652949634. 2.2 ms

41652949635. 3.3 ms

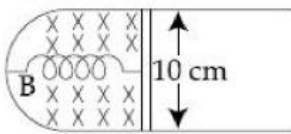
41652949636. 5 ms

41652949637. 7.2 ms

Question Number : 20 Question Id : 41652912715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A thin strip 10 cm long is on a U shaped wire of negligible resistance and it is connected to a spring of spring constant 0.5 Nm^{-1} (see figure). The assembly is kept in a uniform magnetic field of 0.1 T. If the strip is pulled from its equilibrium position and released, the number of oscillations it performs before its amplitude decreases by a factor of e is N . If the mass of the strip is 50 grams, its resistance 10Ω and air drag negligible, N will be close to :



Options :

41652949638. 1000

41652949639. 5000

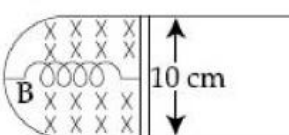
41652949640. 10000

41652949641. 50000

Question Number : 20 Question Id : 41652912715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नगण्य प्रतिरोध वाले एक U आकार के तार पर 10 cm लम्बी एक पतली पट्टी रखी है और इसे 0.5 N/m कमानी स्थिरांक वाली एक कमानी से जोड़ा गया है। (चित्र देखें)। समायोजन को एक 0.1 T के एकसमान चुम्बकीय क्षेत्र में रखा गया है। यदि पट्टी को इसकी साम्यावस्था से खींचा जाता है और फिर छोड़ दिया जाता है, तब इसके आयाम में e के गुणक से कमी आने के लिये किये गये दोलनों की संख्या N है। यदि पट्टी का द्रव्यमान 50 ग्राम है, इसका प्रतिरोध 10Ω हैं और वायु अवरोध (drag) नगण्य है, तब N का मान लगभग होगा :



Options :

41652949638. 1000

41652949639. 5000

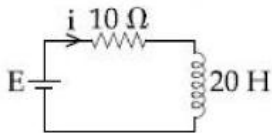
41652949640. 10000

41652949641. 50000

Question Number : 21 Question Id : 41652912716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A 20 Henry inductor coil is connected to a 10 ohm resistance in series as shown in figure. The time at which rate of dissipation of energy (Joule's heat) across resistance is equal to the rate at which magnetic energy is stored in the inductor, is :



Options :

41652949642. $\frac{1}{2} \ln 2$

41652949643. $2 \ln 2$

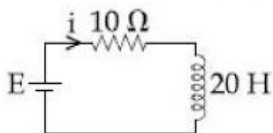
41652949644. $\frac{2}{\ln 2}$

41652949645. $\ln 2$

Question Number : 21 Question Id : 41652912716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक 20 हेनरी प्रेरण कुण्डली को 10 ओह्म प्रतिरोध से श्रेणी में जोड़ा गया है जैसा कि चित्र में दर्शाया गया है। जब प्रतिरोध में क्षय ऊर्जा (जूल ऊष्मा) की दर प्रेरण कुण्डली में संचित चुम्बकीय ऊर्जा की दर के समान हो, उस समय की गणना कीजिये।



Options :

41652949642. $\frac{1}{2} \ln 2$

41652949643. $2 \ln 2$

41652949644. $\frac{2}{\ln 2}$

41652949645. $\ln 2$

Question Number : 22 Question Id : 41652912717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A plane electromagnetic wave travels in free space along the x -direction. The electric field component of the wave at a particular point of space and time is $E = 6 \text{ Vm}^{-1}$ along y -direction. Its corresponding magnetic field component, B would be :

Options :

41652949646. $2 \times 10^{-8} \text{ T}$ along z -direction

41652949647. $6 \times 10^{-8} \text{ T}$ along x -direction

41652949648. $2 \times 10^{-8} \text{ T}$ along y -direction

41652949649. $6 \times 10^{-8} \text{ T}$ along z -direction

Question Number : 22 Question Id : 41652912717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समतल विद्युत चुम्बकीय तरंग मुक्त आकाश में x -दिशा में गतिशील है। आकाश के एक विशेष बिन्दु पर तरंग का विद्युत क्षेत्र घटक, एक समय पर $E = 6 \text{ Vm}^{-1}$ y -दिशा में है। उसके संगत इसका चुम्बकीय क्षेत्र घटक B होगा :

Options :

41652949646. z -दिशा में $2 \times 10^{-8} \text{ T}$

41652949647. x -दिशा में $6 \times 10^{-8} \text{ T}$

41652949648. y -दिशा में $2 \times 10^{-8} \text{ T}$

41652949649. z -दिशा में $6 \times 10^{-8} \text{ T}$

Question Number : 23 Question Id : 41652912718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An upright object is placed at a distance of 40 cm in front of a convergent lens of focal length 20 cm. A convergent mirror of focal length 10 cm is placed at a distance of 60 cm on the other side of the lens. The position and size of the final image will be :

Options :

41652949650. 40 cm from the convergent mirror, same size as the object

41652949651. 20 cm from the convergent mirror, same size as the object

41652949652. 20 cm from the convergent mirror, twice the size of the object

41652949653. 40 cm from the convergent lens, twice the size of the object

Question Number : 23 Question Id : 41652912718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

20 cm फोकस लम्बाई वाले एक अभिसारी लेन्स के सामने 40 cm की दूरी पर एक सीधी वस्तु को रखा गया है। लेन्स के दूसरी ओर 60 cm की दूरी पर 10 cm फोकस लम्बाई वाले एक अभिसारी दर्पण को रखा गया है। अन्तिम प्रतिबिम्ब की स्थिति और आकार होगा :

Options :

41652949650. अभिसारी दर्पण से 40 cm पर, वस्तु के समान आकार का

अभिसारी दर्पण से 20 cm पर, वस्तु के समान
आकार का

41652949651.

अभिसारी दर्पण से 20 cm पर, वस्तु के आकार
का दोगुना

41652949652.

अभिसारी लेन्स से 40 cm पर, वस्तु के आकार
का दोगुना

41652949653.

Question Number : 24 Question Id : 41652912719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

In an interference experiment the ratio of

amplitudes of coherent waves is $\frac{a_1}{a_2} = \frac{1}{3}$.

The ratio of maximum and minimum
intensities of fringes will be :

Options :

41652949654. 2

41652949655. 4

41652949656. 9

41652949657. 18

Question Number : 24 Question Id : 41652912719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

किसी व्यतिकरण के प्रयोग में कलाबद्ध स्रोतों के आयामों

का अनुपात $\frac{a_1}{a_2} = \frac{1}{3}$ हैं। फ्रिंजों की अधिकतम और

न्यूनतम तीव्रताओं का अनुपात होगा :

Options :

41652949654. 2

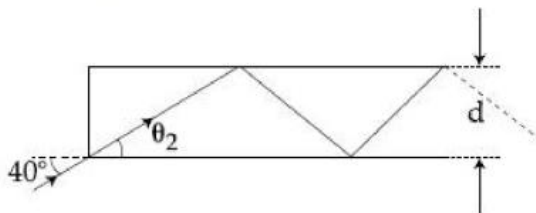
41652949655. 4

41652949656. 9

41652949657. 18

Question Number : 25 Question Id : 41652912720 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

In figure, the optical fiber is $l = 2$ m long and has a diameter of $d = 20 \mu\text{m}$. If a ray of light is incident on one end of the fiber at angle $\theta_1 = 40^\circ$, the number of reflections it makes before emerging from the other end is close to :
(refractive index of fiber is 1.31 and $\sin 40^\circ = 0.64$)

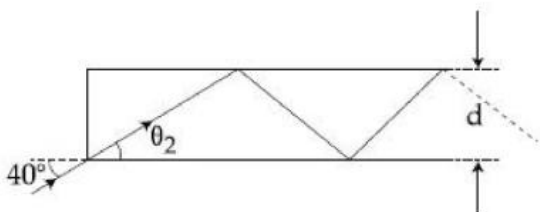


Options :

- 41652949658. 57000
- 41652949659. 66000
- 41652949660. 55000
- 41652949661. 45000

Question Number : 25 Question Id : 41652912720 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

चित्र में $l = 2$ मीटर लम्बे तथा $d = 20 \mu\text{m}$ व्यास के एक प्रकाश तन्तु को दिखाया है। यदि प्रकाश की किरण इस तन्तु के एक सिरे पर $\theta_1 = 40^\circ$ कोण पर आपतित होती है तो दूसरे सिरे से निकलने से पूर्व इसके परावर्तनों की लगभग संख्या होगी :
(फाइबर का अपवर्तनांक 1.31 है और $\sin 40^\circ = 0.64$)



Options :

- 41652949658. 57000

41652949659. 66000

41652949660. 55000

41652949661. 45000

Question Number : 26 Question Id : 41652912721 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two particles move at right angle to each other. Their de Broglie wavelengths are λ_1 and λ_2 respectively. The particles suffer perfectly *inelastic* collision. The de Broglie wavelength λ , of the final particle, is given by :

Options :

41652949662.
$$\lambda = \frac{\lambda_1 + \lambda_2}{2}$$

41652949663.
$$\lambda = \sqrt{\lambda_1 \lambda_2}$$

41652949664.
$$\frac{2}{\lambda} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$$

41652949665.
$$\frac{1}{\lambda^2} = \frac{1}{\lambda_1^2} + \frac{1}{\lambda_2^2}$$

Question Number : 26 Question Id : 41652912721 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो कण एक दूसरे से लम्बवत् दिशाओं में गतिशील हैं। इन कणों की डी-ब्राग्ली तरंग लम्बाइयाँ क्रमशः λ_1 तथा λ_2 हैं। इन कणों का पूर्णतया अप्रत्यास्थ संघट्ट होता है। परिणामी कण की डी-ब्राग्ली तरंगदैर्घ्य λ इस समीकरण से दी जाती है :

Options :

41652949662.
$$\lambda = \frac{\lambda_1 + \lambda_2}{2}$$

41652949663.
$$\lambda = \sqrt{\lambda_1 \lambda_2}$$

$$\frac{2}{\lambda} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$$

41652949664.

$$\frac{1}{\lambda^2} = \frac{1}{\lambda_1^2} + \frac{1}{\lambda_2^2}$$

41652949665.

Question Number : 27 Question Id : 41652912722 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Radiation coming from transitions $n=2$ to $n=1$ of hydrogen atoms fall on He^+ ions in $n=1$ and $n=2$ states. The possible transition of helium ions as they absorb energy from the radiation is :

Options :

41652949666. $n=2 \rightarrow n=5$

41652949667. $n=1 \rightarrow n=4$

41652949668. $n=2 \rightarrow n=3$

41652949669. $n=2 \rightarrow n=4$

Question Number : 27 Question Id : 41652912722 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन परमाणु के $n=2$ से $n=1$ संक्रमण से निकला विकिरण He^+ की $n=1$ और $n=2$ अवस्थाओं पर पड़ता है। हीलियम आयनों द्वारा इस विकिरण की ऊर्जा शोषण से संभव संक्रमण है :

Options :

41652949666. $n=2 \rightarrow n=5$

41652949667. $n=1 \rightarrow n=4$

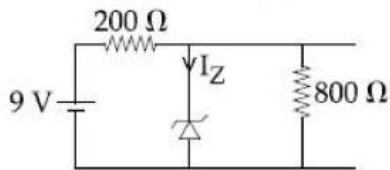
41652949668. $n=2 \rightarrow n=3$

41652949669. $n=2 \rightarrow n=4$

Question Number : 28 Question Id : 41652912723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The reverse breakdown voltage of a Zener diode is 5.6 V in the given circuit.



The current I_Z through the Zener is :

Options :

41652949670. 15 mA

41652949671. 10 mA

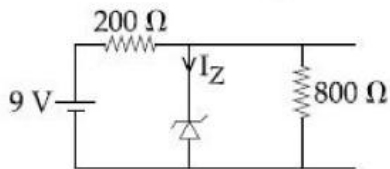
41652949672. 7 mA

41652949673. 17 mA

Question Number : 28 Question Id : 41652912723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परिपथ में, जीनर की पश्चदिशिक भंजन वोल्टता 5.6 V है। जीनर में धारा I_Z हैं :



Options :

41652949670. 15 mA

41652949671. 10 mA

41652949672. 7 mA

41652949673. 17 mA

Question Number : 29 Question Id : 41652912724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The wavelength of the carrier waves in a modern optical fiber communication network is close to :

Options :

41652949674. 1500 nm

41652949675. 900 nm

41652949676. 2400 nm

41652949677. 600 nm

Question Number : 29 Question Id : 41652912724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक आधुनिक प्रकाशीय फाइबर संचरण जाल में वाहक तरंग की निकटतम तरंगदैर्घ्य है :

Options :

41652949674. 1500 nm

41652949675. 900 nm

41652949676. 2400 nm

41652949677. 600 nm

Question Number : 30 Question Id : 41652912725 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A $200\ \Omega$ resistor has a certain color code. If one replaces the red color by green in the code, the new resistance will be :

Options :

41652949678. $100\ \Omega$

41652949679. $300\ \Omega$

41652949680. $400\ \Omega$

41652949681. $500\ \Omega$

Question Number : 30 Question Id : 41652912725 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$200\ \Omega$ के एक प्रतिरोध का एक निश्चित वर्ण संकेत (color code) है। यदि लाल वर्ण को हरे वर्ण से विस्थापित कर देते हैं तो नया प्रतिरोध होगा :

Options :

41652949678. 100 Ω

41652949679. 300 Ω

41652949680. 400 Ω

41652949681. 500 Ω

	Chemistry
Section Id :	416529251
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

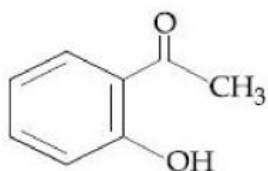
Sub-Section Number:	1
Sub-Section Id:	416529391
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 41652912726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

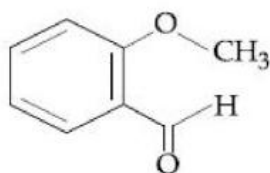
Correct Marks : 4 Wrong Marks : 1

An organic compound neither reacts with neutral ferric chloride solution nor with Fehling solution. It however, reacts with Grignard reagent and gives positive iodoform test. The compound is :

Options :

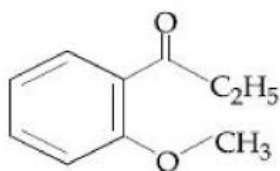


41652949682.

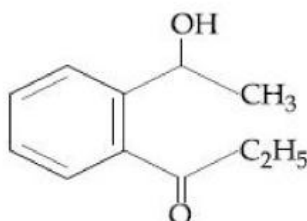


41652949683.

41652949684.



41652949685.



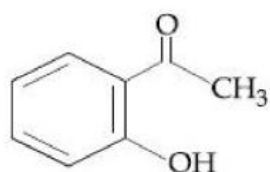
Question Number : 31 Question Id : 41652912726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

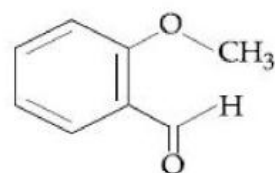
एक कार्बनिक यौगिक न तो उदासीन फेरिक क्लोराइड विलयन के साथ और न ही फेलिंग विलयन के साथ अभिक्रिया करता है। हालाँकि यह यौगिक ग्रीनियार अभिकर्मक के साथ अभिक्रिया करता है तथा सकारात्मक आयडोफार्म टेस्ट देता है। यह यौगिक है :

Options :

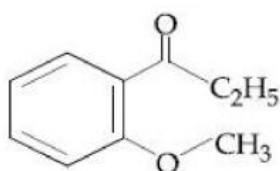
41652949682.



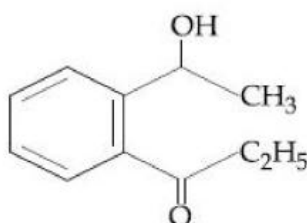
41652949683.



41652949684.



41652949685.



Question Number : 32 Question Id : 41652912727 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Maltose on treatment with dilute HCl
gives :

Options :

41652949686. D-Galactose

41652949687. D-Glucose and D-Fructose

41652949688. D-Fructose

41652949689. D-Glucose

Question Number : 32 Question Id : 41652912727 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

माल्टोस तनु HCl के साथ अभिकृत करने पर देता है :

Options :

41652949686. D-गैलेक्टोस

41652949687. D-ग्लुकोस तथा D-फ्रक्टोज

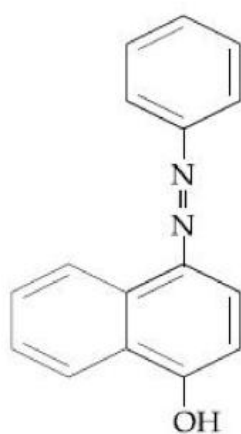
41652949688. D-फ्रक्टोज

41652949689. D-ग्लुकोस

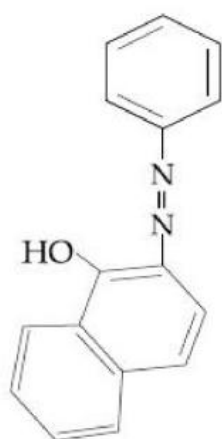
Question Number : 33 Question Id : 41652912728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Coupling of benzene diazonium chloride
with 1-naphthol in alkaline medium will
give :

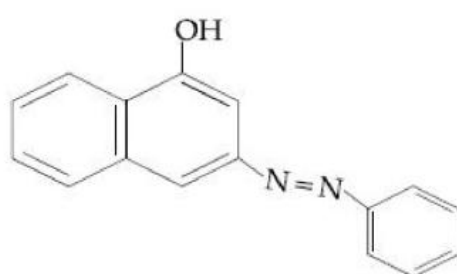
Options :



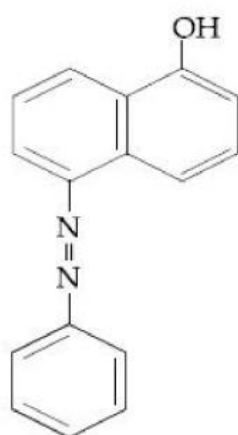
41652949690.



41652949691.



41652949692.

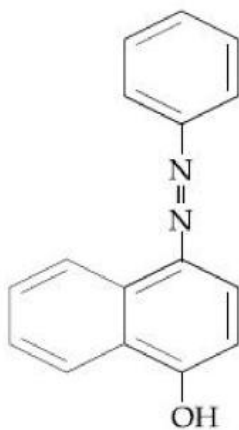


41652949693.

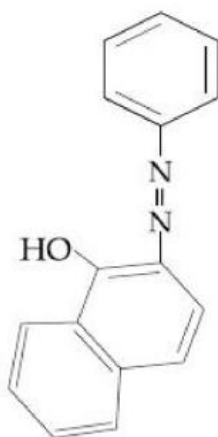
Question Number : 33 Question Id : 41652912728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

क्षारीय माध्यम में, बेंजीन डाइजोनियम क्लोराइड को
1-नैफ्थॉल के साथ युग्मित करने पर प्राप्त होता है :

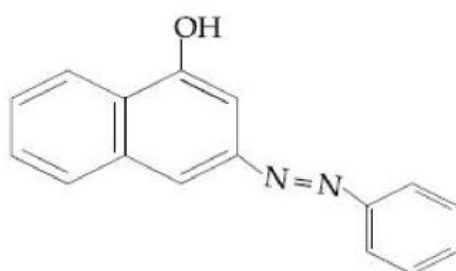
Options :



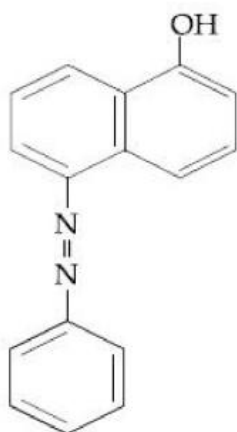
41652949690.



41652949691.



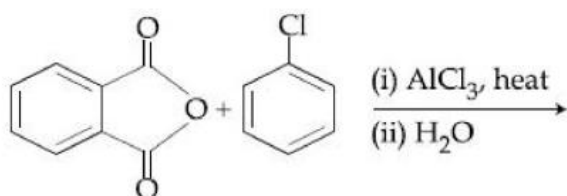
41652949692.



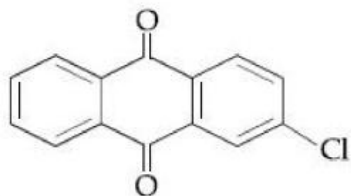
41652949693.

Question Number : 34 Question Id : 41652912729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

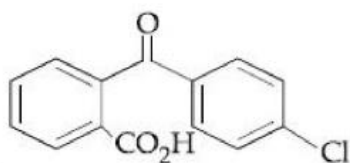
The major product of the following reaction
is :



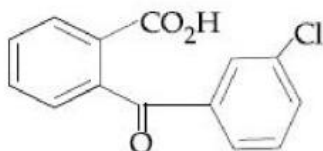
Options :



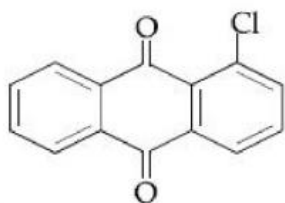
41652949694.



41652949695.



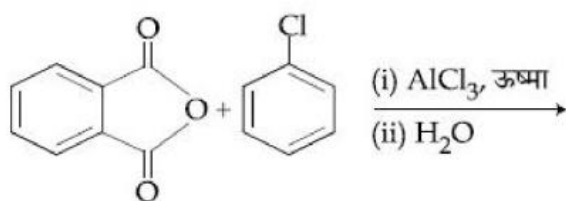
41652949696.



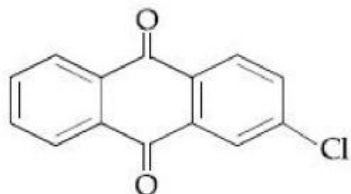
41652949697.

Question Number : 34 Question Id : 41652912729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

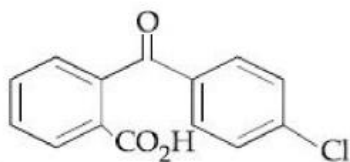
निम्न अभिक्रिया का मुख्य उत्पाद है :



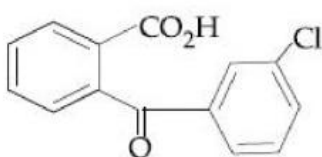
Options :



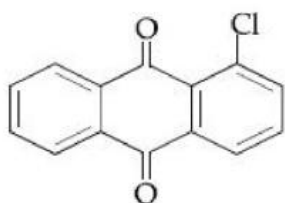
41652949694.



41652949695.



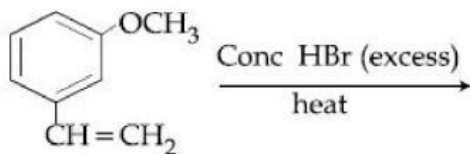
41652949696.



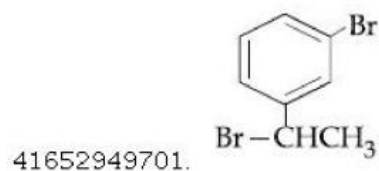
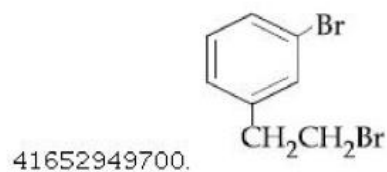
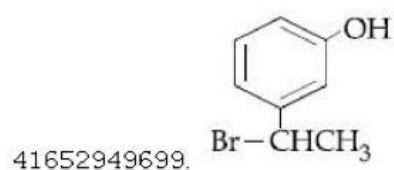
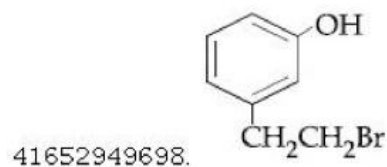
41652949697.

Question Number : 35 Question Id : 41652912730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



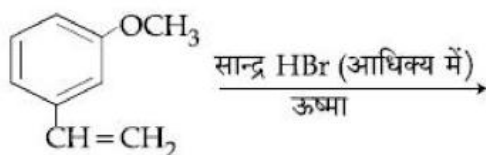
Options :



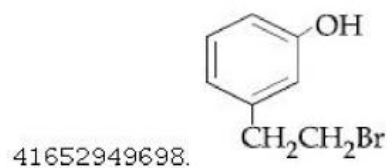
Question Number : 35 Question Id : 41652912730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

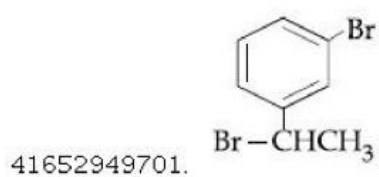
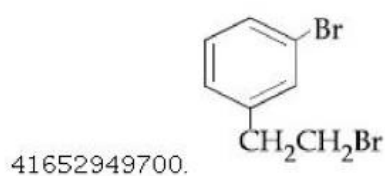
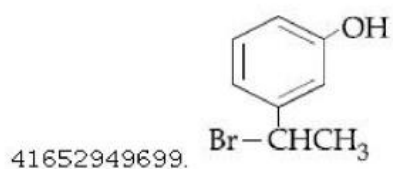
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



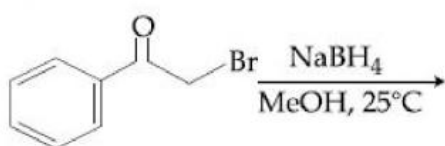
Options :



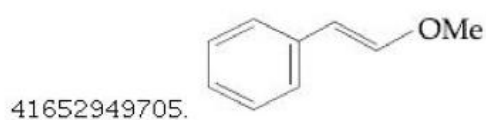
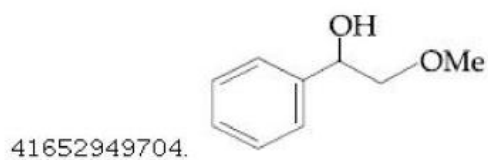
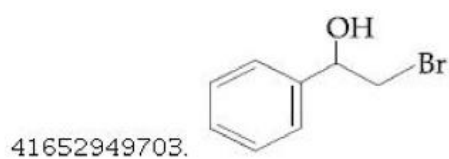
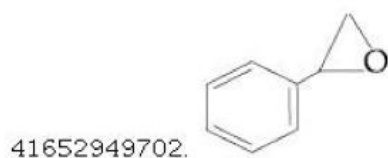


Question Number : 36 Question Id : 41652912731 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



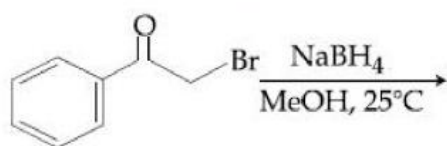
Options :



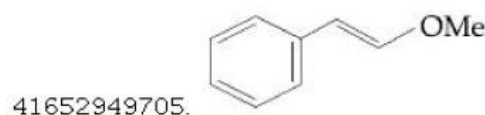
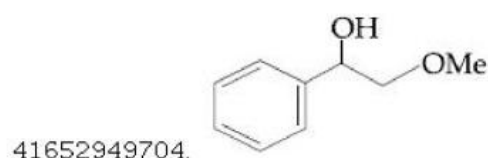
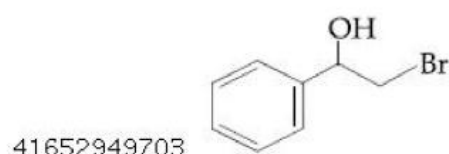
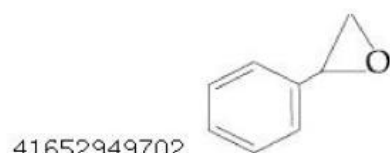
Question Number : 36 Question Id : 41652912731 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :



Options :

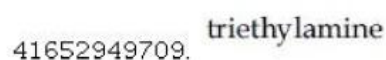
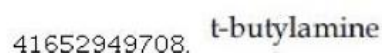
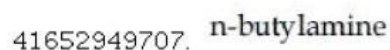
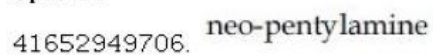


Question Number : 37 Question Id : 41652912732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following amines can be prepared by Gabriel phthalimide reaction ?

Options :



Question Number : 37 Question Id : 41652912732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सा ऐमीन गैब्रिएल थैलिमाइड अभिक्रिया द्वारा तैयार किया जा सकता है?

Options :

41652949706. निओपेन्टिलऐमीन

41652949707. n-ब्यूटिलऐमीन

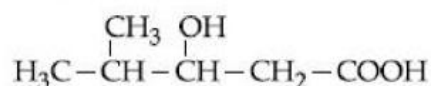
41652949708. t-ब्यूटिलऐमीन

41652949709. ट्राईएथिलऐमीन

Question Number : 38 Question Id : 41652912733 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The IUPAC name of the following compound is :



Options :

41652949710. 3-Hydroxy-4-methylpentanoic acid

41652949711. 4-Methyl-3-hydroxypentanoic acid

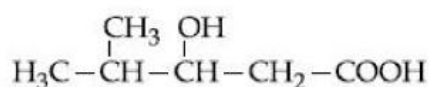
41652949712. 4,4-Dimethyl-3-hydroxybutanoic acid

41652949713. 2-Methyl-3-hydroxypentan-5-oic acid

Question Number : 38 Question Id : 41652912733 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न यौगिक का आई.यू.पी.ए.सी. (IUPAC) नाम है :



Options :

41652949710. 3-हाइड्रोक्सी-4-मेथिलपेन्टानोइक एसिड

41652949711. 4-मेथिल-3-हाइड्राक्सीपेन्टेनोइक एसिड
41652949712. 4,4-डाइमेथिल-3-हाइड्राक्सीब्यूटेनोइक एसिड
41652949713. 2-मेथिल-3-हाइड्राक्सीपेन्टेन-5-ओइक एसिड

Question Number : 39 Question Id : 41652912734 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An organic compound 'X' showing the following solubility profile is :

'X'	water	→ insoluble
	5% HCl	→ insoluble
	10% NaOH	→ soluble
	10% NaHCO ₃	→ insoluble

Options :

41652949714. Oleic acid
41652949715. m-Cresol
41652949716. o-Toluidine
41652949717. Benzamide

Question Number : 39 Question Id : 41652912734 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक कार्बनिक यौगिक 'X' जो निम्न विलेयता की रूपरेखा प्रदर्शित करता है, होगा :

'X'	जल	→ अविलेय
	5% HCl	→ अविलेय
	10% NaOH	→ विलेय
	10% NaHCO ₃	→ अविलेय

Options :

41652949714. ऑलेइक अम्ल

41652949715. m-क्रेसॉल

41652949716. o-टालूडीन

41652949717. बेंजामाइड

Question Number : 40 Question Id : 41652912735 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In the following compounds, the decreasing order of basic strength will be :

Options :

41652949718. $(\text{C}_2\text{H}_5)_2\text{NH} > \text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3$

41652949719. $\text{NH}_3 > \text{C}_2\text{H}_5\text{NH}_2 > (\text{C}_2\text{H}_5)_2\text{NH}$

41652949720. $(\text{C}_2\text{H}_5)_2\text{NH} > \text{NH}_3 > \text{C}_2\text{H}_5\text{NH}_2$

41652949721. $\text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3 > (\text{C}_2\text{H}_5)_2\text{NH}$

Question Number : 40 Question Id : 41652912735 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित यौगिकों में, क्षारीय सामर्थ्य का घटता क्रम होगा :

Options :

41652949718. $(\text{C}_2\text{H}_5)_2\text{NH} > \text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3$

41652949719. $\text{NH}_3 > \text{C}_2\text{H}_5\text{NH}_2 > (\text{C}_2\text{H}_5)_2\text{NH}$

41652949720. $(\text{C}_2\text{H}_5)_2\text{NH} > \text{NH}_3 > \text{C}_2\text{H}_5\text{NH}_2$

41652949721. $\text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3 > (\text{C}_2\text{H}_5)_2\text{NH}$

Question Number : 41 Question Id : 41652912736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The size of the iso-electronic species Cl^- , Ar and Ca^{2+} is affected by :

Options :

Principal quantum number of
41652949722. valence shell

41652949723. nuclear charge

azimuthal quantum number of
41652949724. valence shell

electron-electron interaction in the
41652949725. outer orbitals

Question Number : 41 Question Id : 41652912736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्न में से किसके द्वारा समइलेक्ट्रानी स्पीशीज़
 Cl^- , Ar तथा Ca^{2+} का आकार प्रभावित होगा :

Options :

41652949722. संयोजकता कोश की मुख्य क्वान्टम संख्या

41652949723. नाभिकीय आवेश

41652949724. संयोजकता कोश की एजीमूथल क्वान्टम संख्या

41652949725. बाह्य कक्षकों में इलेक्ट्रान-इलेक्ट्रान अन्योन्यक्रिया

Question Number : 42 Question Id : 41652912737 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

With respect to an ore, Ellingham diagram
helps to predict the feasibility of its

Options :

41652949726. Thermal reduction

41652949727. Electrolysis

41652949728. Zone refining

41652949729. Vapour phase refining

Question Number : 42 Question Id : 41652912737 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

इलिंगम आरेख एक अयस्क के निम्न में से किसके होने की सम्भावना की प्रागुक्ति करने में हमारी मदद करता है ,

Options :

41652949726. तापीय अपचयन

41652949727. विद्युत अपघटन

41652949728. जोन परिष्करण

41652949729. वाष्प प्रावस्था परिष्करण

Question Number : 43 Question Id : 41652912738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

100 mL of a water sample contains 0.81 g of calcium bicarbonate and 0.73 g of magnesium bicarbonate. The hardness of this water sample expressed in terms of equivalents of CaCO_3 is :

(molar mass of calcium bicarbonate is 162 g mol^{-1} and magnesium bicarbonate is 146 g mol^{-1})

Options :

41652949730. 1,000 ppm

41652949731. 10,000 ppm

41652949732. 100 ppm

41652949733. 5,000 ppm

Question Number : 43 Question Id : 41652912738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक जल प्रतिदर्श के 100 mL में 0.81 g कैल्शियम बाइकार्बोनेट तथा 0.73 g मैग्नीशियम बाइकार्बोनेट हैं। इस जल प्रतिदर्श की कठोरता CaCO_3 के समतुल्य रूप में व्यक्त करने पर होगी :

(कैल्शियम बाइकार्बोनेट तथा मैग्नीशियम बाइकार्बोनेट के मोलर द्रव्यमान क्रमशः 162 g mol^{-1} तथा 146 g mol^{-1} हैं)

Options :

41652949730. 1,000 ppm

41652949731. 10,000 ppm

41652949732. 100 ppm

41652949733. 5,000 ppm

Question Number : 44 Question Id : 41652912739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct order of hydration enthalpies of alkali metal ions is :

Options :

41652949734. $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$

41652949735. $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Cs}^+ > \text{Rb}^+$

41652949736. $\text{Na}^+ > \text{Li}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$

41652949737. $\text{Na}^+ > \text{Li}^+ > \text{K}^+ > \text{Cs}^+ > \text{Rb}^+$

Question Number : 44 Question Id : 41652912739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्षार धातु आयनों के जलयोजन एन्थैल्पी का सही क्रम है :

Options :

41652949734. $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$

41652949735. $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Cs}^+ > \text{Rb}^+$

41652949736. $\text{Na}^+ > \text{Li}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$

41652949737. $\text{Na}^+ > \text{Li}^+ > \text{K}^+ > \text{Cs}^+ > \text{Rb}^+$

Question Number : 45 Question Id : 41652912740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Diborane (B_2H_6) reacts independently with O_2 and H_2O to produce, respectively :

Options :

41652949738. H_3BO_3 and B_2O_3

41652949739. HBO_2 and H_3BO_3

41652949740. B_2O_3 and H_3BO_3

41652949741. B_2O_3 and $[\text{BH}_4]^-$

Question Number : 45 Question Id : 41652912740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

डाइबोरेन (B_2H_6), O_2 तथा H_2O के साथ स्वतंत्र रूप से अभिक्रिया करके क्रमशः उत्पादित करती है :

Options :

41652949738. H_3BO_3 तथा B_2O_3

41652949739. HBO_2 तथा H_3BO_3

41652949740. B_2O_3 तथा H_3BO_3

41652949741. B_2O_3 तथा $[\text{BH}_4]^-$

Question Number : 46 Question Id : 41652912741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The lanthanide ion that would show colour is :

Options :

41652949742. Gd^{3+}

41652949743. Sm^{3+}

41652949744. La^{3+}

41652949745. Lu^{3+}

Question Number : 46 Question Id : 41652912741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

वह लैन्थनायड आयन जो रंग प्रदर्शित करेगा, है :

Options :

41652949742. Gd^{3+}

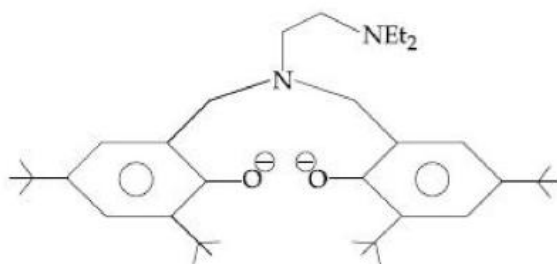
41652949743. Sm^{3+}

41652949744. La^{3+}

41652949745. Lu^{3+}

Question Number : 47 Question Id : 41652912742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The following ligand is :



Options :

41652949746. bidentate

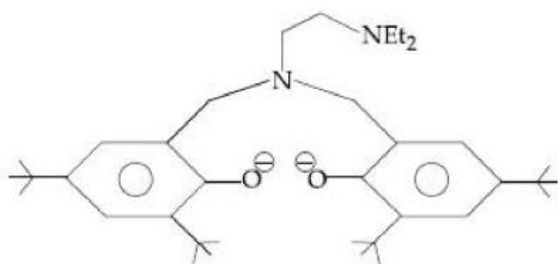
41652949747. tridentate

41652949748. tetradentate

41652949749. hexadentate

Question Number : 47 Question Id : 41652912742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित संलग्नी है :



Options :

41652949746. द्वि-दंतुर

41652949747. त्रि-दंतुर

41652949748. चतुरदंतुर

41652949749. षट्-दंतुर

Question Number : 48 Question Id : 41652912743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct order of the spin-only magnetic moment of metal ions in the following low-spin complexes, $[\text{V}(\text{CN})_6]^{4-}$, $[\text{Fe}(\text{CN})_6]^{4-}$, $[\text{Ru}(\text{NH}_3)_6]^{3+}$, and $[\text{Cr}(\text{NH}_3)_6]^{2+}$, is :

Options :

41652949750. $\text{V}^{2+} > \text{Cr}^{2+} > \text{Ru}^{3+} > \text{Fe}^{2+}$

41652949751. $\text{V}^{2+} > \text{Ru}^{3+} > \text{Cr}^{2+} > \text{Fe}^{2+}$

41652949752. $\text{Cr}^{2+} > \text{Ru}^{3+} > \text{Fe}^{2+} > \text{V}^{2+}$

41652949753. $\text{Cr}^{2+} > \text{V}^{2+} > \text{Ru}^{3+} > \text{Fe}^{2+}$

Question Number : 48 Question Id : 41652912743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिये गये निम्न-प्रचक्रण संकरो $[\text{V}(\text{CN})_6]^{4-}$, $[\text{Fe}(\text{CN})_6]^{4-}$, $[\text{Ru}(\text{NH}_3)_6]^{3+}$ तथा $[\text{Cr}(\text{NH}_3)_6]^{2+}$ में धातु आयनों के प्रचक्रण मात्र चुम्बकीय आघूर्णों का सही क्रम है :

Options :

41652949750. $V^{2+} > Cr^{2+} > Ru^{3+} > Fe^{2+}$

41652949751. $V^{2+} > Ru^{3+} > Cr^{2+} > Fe^{2+}$

41652949752. $Cr^{2+} > Ru^{3+} > Fe^{2+} > V^{2+}$

41652949753. $Cr^{2+} > V^{2+} > Ru^{3+} > Fe^{2+}$

Question Number : 49 Question Id : 41652912744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Which is wrong with respect to our responsibility as a human being to protect our environment ?

Options :

41652949754. Setting up compost tin in gardens.

41652949755. Using plastic bags.

41652949756. Restricting the use of vehicles

41652949757. Avoiding the use of floodlighted facilities.

Question Number : 49 Question Id : 41652912744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

मनुष्यता के नाते हमारे पर्यावरण के संरक्षण के लिए हमारी जिम्मेदारियों के संदर्भ में क्या गलत है ?

Options :

41652949754. बगीचों में कम्पोस्ट टिन लगाना

41652949755. प्लास्टिक बैगों का प्रयोग करना

41652949756. वाहनों के प्रयोग पर प्रतिबन्ध लगाना

41652949757. पूर-प्रदीप्ति सुविधाओं के प्रयोग से बचाव रखना

Question Number : 50 Question Id : 41652912745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Assertion : Ozone is destroyed by CFCs in the upper stratosphere.

Reason : Ozone holes increase the amount of UV radiation reaching the earth.

Options :

41652949758. Assertion and reason are correct, but the reason is not the explanation for the assertion.

41652949759. Assertion is false, but the reason is correct.

41652949760. Assertion and reason are both correct, and the reason is the correct explanation for the assertion.

41652949761. Assertion and reason are incorrect.

Question Number : 50 Question Id : 41652912745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कथन : स्ट्रेटोस्फीयर के ऊपरी भाग में CFCs द्वारा ओज़ोन का विनाश होता है।

कारण : ओज़ोनपरत छिद्रों से पृथ्वी पर पहुँचने वाले UV विकिरणों की मात्रा बढ़ती है।

Options :

41652949758. कथन तथा कारण सही हैं परन्तु कारण, कथन की सही व्याख्या नहीं है।

41652949759. कथन गलत है परन्तु कारण सही है।

41652949760. कथन तथा कारण दोनों सही हैं और कारण, कथन की सही व्याख्या करता है।

41652949761. कथन तथा कारण दोनों गलत हैं।

Question Number : 51 Question Id : 41652912746 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In order to oxidise a mixture of one mole of each of FeC_2O_4 , $\text{Fe}_2(\text{C}_2\text{O}_4)_3$, FeSO_4 and $\text{Fe}_2(\text{SO}_4)_3$ in acidic medium, the number of moles of KMnO_4 required is :

Options :

41652949762. 1

41652949763. 1.5

41652949764. 2

41652949765. 3

Question Number : 51 Question Id : 41652912746 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अम्लीय माध्यम में, FeC_2O_4 , $\text{Fe}_2(\text{C}_2\text{O}_4)_3$, FeSO_4 तथा $\text{Fe}_2(\text{SO}_4)_3$ प्रत्येक के एक मोल मिश्रण को उपचयित करने के लिए आवश्यक KMnO_4 के मोलों की संख्या होगी :

Options :

41652949762. 1

41652949763. 1.5

41652949764. 2

41652949765. 3

Question Number : 52 Question Id : 41652912747 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Element 'B' forms ccp structure and 'A' occupies half of the octahedral voids, while oxygen atoms occupy all the tetrahedral voids. The structure of bimetallic oxide is :

Options :

41652949766. A_2BO_4

41652949767. AB_2O_4

41652949768. $\text{A}_4\text{B}_2\text{O}$

41652949769. A_2B_2O

Question Number : 52 Question Id : 41652912747 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

तत्व 'B', ccp संरचना बनाता है तथा 'A' अष्टफलकीय रिक्तियों के आधे में उपस्थित है। जबकि ऑक्सीजन परमाणु सभी चतुष्फलकीय रिक्तियों में उपस्थित है।
द्विधात्विक ऑक्साइड की संरचना है :

Options :

41652949766. A_2BO_4

41652949767. AB_2O_4

41652949768. A_4B_2O

41652949769. A_2B_2O

Question Number : 53 Question Id : 41652912748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The quantum number of four electrons are given below :

I. $n=4, l=2, m_l=-2, m_s=-\frac{1}{2}$

II. $n=3, l=2, m_l=1, m_s=+\frac{1}{2}$

III. $n=4, l=1, m_l=0, m_s=+\frac{1}{2}$

IV. $n=3, l=1, m_l=1, m_s=-\frac{1}{2}$

The correct order of their increasing energies will be :

Options :

41652949770. $I < II < III < IV$

41652949771. $I < III < II < IV$

41652949772. $IV < III < II < I$

41652949773. $IV < II < III < I$

Question Number : 53 Question Id : 41652912748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चार इलेक्ट्रॉनों की क्वांटम संख्यायें नीचे दी गई हैं :

I. $n=4, l=2, m_l = -2, m_s = -\frac{1}{2}$

II. $n=3, l=2, m_l = 1, m_s = +\frac{1}{2}$

III. $n=4, l=1, m_l = 0, m_s = +\frac{1}{2}$

IV. $n=3, l=1, m_l = 1, m_s = -\frac{1}{2}$

इनकी बढ़ती ऊर्जाओं का सही क्रम होगा :

Options :

41652949770. $I < II < III < IV$

41652949771. $I < III < II < IV$

41652949772. $IV < III < II < I$

41652949773. $IV < II < III < I$

Question Number : 54 Question Id : 41652912749 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For silver, $C_p(\text{J K}^{-1} \text{mol}^{-1}) = 23 + 0.01T$. If the temperature (T) of 3 moles of silver is raised from 300 K to 1000 K at 1 atm pressure, the value of ΔH will be close to :

Options :

41652949774. 13 kJ

41652949775. 21 kJ

41652949776. 16 kJ

41652949777. 62 kJ

Question Number : 54 Question Id : 41652912749 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सिल्वर के लिए, $C_p(\text{J K}^{-1} \text{mol}^{-1}) = 23 + 0.01T$. यदि 1 atm दाब पर सिल्वर के 3 मोल का ताप (T) 300 K से बढ़कर 1000 K हो जाय तो ΔH का मान किसके नजदीक होगा ?

Options :

41652949774. 13 kJ

41652949775. 21 kJ

41652949776. 16 kJ

41652949777. 62 kJ

Question Number : 55 Question Id : 41652912750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which one of the following equations does not correctly represent the first law of thermodynamics for the given processes involving an ideal gas ? (Assume non-expansion work is zero)

Options :

41652949778. Isothermal process : $q = -w$

41652949779. Cyclic process : $q = -w$

41652949780. Isochoric process : $\Delta U = q$

41652949781. Adiabatic process : $\Delta U = -w$

Question Number : 55 Question Id : 41652912750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सा समीकरण थर्मोडायनामिक्स के प्रथम सिद्धान्त को दिये गये प्रक्रमों के लिए, जिसमें आदर्श गैस है, सही रूप में प्रस्तुत नहीं करता है (मान लें कि अप्रसारण कार्य शून्य है)

Options :

41652949778. समतापी प्रक्रम : $q = -w$

41652949779. चक्रीय प्रक्रम : $q = -w$

41652949780. समायतनिक प्रक्रम : $\Delta U = q$

41652949781. रुद्धोष्म प्रक्रम : $\Delta U = -w$

Question Number : 56 Question Id : 41652912751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The vapour pressures of pure liquids A and B are 400 and 600 mmHg, respectively at 298 K. On mixing the two liquids, the sum of their initial volumes is equal to the volume of the final mixture. The mole fraction of liquid B is 0.5 in the mixture. The vapour pressure of the final solution, the mole fractions of components A and B in vapour phase, respectively are :

Options :

41652949782. 500 mmHg, 0.4, 0.6

41652949783. 450 mmHg, 0.5, 0.5

41652949784. 500 mmHg, 0.5, 0.5

41652949785. 450 mmHg, 0.4, 0.6

Question Number : 56 Question Id : 41652912751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

298 K पर शुद्ध द्रव A तथा B के वाष्प दाब क्रमशः 400 तथा 600 mmHg हैं। दोनों द्रवों को मिलाने पर उनके प्रारम्भिक आयतनों का योग उनके अंतिम मिश्रण के आयतन के बराबर है। मिश्रण में द्रव B का मोल अणु अंश 0.5 है। अंतिम विलयन का वाष्प दाब एवं A तथा B अवयवों का वाष्प प्रावस्था में मोल अणु अंश क्रमशः होंगे :

Options :

41652949782. 500 mmHg, 0.4, 0.6

41652949783. 450 mmHg, 0.5, 0.5

41652949784. 500 mmHg, 0.5, 0.5

41652949785. 450 mmHg, 0.4, 0.6

Question Number : 57 Question Id : 41652912752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If solubility product of $Zr_3(PO_4)_4$ is denoted by K_{sp} and its molar solubility is denoted by S , then which of the following relation between S and K_{sp} is correct ?

Options :

$$S = \left(\frac{K_{sp}}{144} \right)^{1/6}$$

41652949786.

$$S = \left(\frac{K_{sp}}{929} \right)^{1/9}$$

41652949787.

$$S = \left(\frac{K_{sp}}{6912} \right)^{1/7}$$

41652949788.

$$S = \left(\frac{K_{sp}}{216} \right)^{1/7}$$

41652949789.

Question Number : 57 Question Id : 41652912752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $Zr_3(PO_4)_4$ के विलेयता गुणनफल को K_{sp} द्वारा तथा इसकी मोलर विलेयता को S द्वारा अभिव्यक्त करते हों तो S तथा K_{sp} के बीच सही सम्बन्ध है :

Options :

$$S = \left(\frac{K_{sp}}{144} \right)^{1/6}$$

41652949786.

$$S = \left(\frac{K_{sp}}{929} \right)^{1/9}$$

41652949787.

$$S = \left(\frac{K_{sp}}{6912} \right)^{1/7}$$

41652949788.

$$S = \left(\frac{K_{sp}}{216} \right)^{1/7}$$

41652949789.

Question Number : 58 Question Id : 41652912753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Given that $E_{\text{O}_2/\text{H}_2\text{O}}^\ominus = +1.23 \text{ V}$;

$E_{\text{S}_2\text{O}_8^{2-}/\text{SO}_4^{2-}}^\ominus = 2.05 \text{ V}$

$E_{\text{Br}_2/\text{Br}^-}^\ominus = +1.09 \text{ V}$;

$E_{\text{Au}^{3+}/\text{Au}}^\ominus = +1.4 \text{ V}$

The strongest oxidizing agent is :

Options :

41652949790. $\text{S}_2\text{O}_8^{2-}$

41652949791. Au^{3+}

41652949792. Br_2

41652949793. O_2

Question Number : 58 Question Id : 41652912753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

दिया गया है, $E_{\text{O}_2/\text{H}_2\text{O}}^\ominus = +1.23 \text{ V}$;

$E_{\text{S}_2\text{O}_8^{2-}/\text{SO}_4^{2-}}^\ominus = 2.05 \text{ V}$

$E_{\text{Br}_2/\text{Br}^-}^\ominus = +1.09 \text{ V}$;

$E_{\text{Au}^{3+}/\text{Au}}^\ominus = +1.4 \text{ V}$

प्रबलतम उपचायक है :

Options :

41652949790. $\text{S}_2\text{O}_8^{2-}$

41652949791. Au^{3+}

41652949792. Br_2

41652949793. O_2

Question Number : 59 Question Id : 41652912754 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the reaction $2A + B \rightarrow C$, the values of initial rate at different reactant concentrations are given in the table below.

The rate law for the reaction is :

[A] (mol L^{-1})	[B] (mol L^{-1})	Initial Rate ($\text{mol L}^{-1}\text{s}^{-1}$)
0.05	0.05	0.045
0.10	0.05	0.090
0.20	0.10	0.72

Options :

41652949794. Rate = $k[A][B]$

41652949795. Rate = $k[A]^2[B]$

41652949796. Rate = $k[A][B]^2$

41652949797. Rate = $k[A]^2[B]^2$

Question Number : 59 Question Id : 41652912754 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिक्रिया $2A + B \rightarrow C$ के लिये, अभिकारकों की विभिन्न सान्द्रताओं पर प्रारम्भिक दर के मान नीचे दी गई तालिका में दिये गये हैं। अभिक्रिया के लिए दर नियम होगा :

[A] (mol L^{-1})	[B] (mol L^{-1})	प्रारम्भिक दर ($\text{mol L}^{-1}\text{s}^{-1}$)
0.05	0.05	0.045
0.10	0.05	0.090
0.20	0.10	0.72

Options :

41652949794. दर = $k[A][B]$

41652949795. दर = $k[A]^2[B]$

41652949796. दर = $k[A][B]^2$

41652949797. दर = $k[A]^2[B]^2$

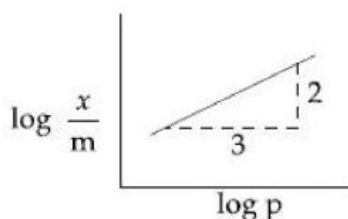
Question Number : 60 Question Id : 41652912755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Adsorption of a gas follows Freundlich adsorption isotherm. x is the mass of the gas adsorbed on mass m of the adsorbent.

The plot of $\log \frac{x}{m}$ versus $\log p$ is shown in

the given graph. $\frac{x}{m}$ is proportional to :



Options :

41652949798. p^2

41652949799. $p^{3/2}$

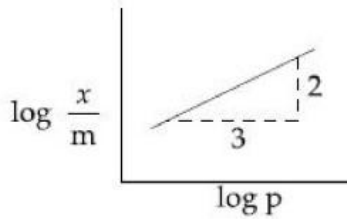
41652949800. $p^{2/3}$

41652949801. p^3

Question Number : 60 Question Id : 41652912755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक गैस का अधिशोषण, फ्रायन्डलिक अधिशोषण समताप का पालन करता है। अधिशोषक के m द्रव्यमान पर अधिशोषित गैस का द्रव्यमान x है। $\log \frac{x}{m}$ के विरुद्ध $\log p$ का प्लॉट दिये गये ग्राफ में दर्शाया गया है। $\frac{x}{m}$ जिसके अनुपातिक है, वह है :



Options :

41652949798. p^2

41652949799. $p^{3/2}$

41652949800. $p^{2/3}$

41652949801. p^3

	Mathematics
Section Id :	416529252
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No
Sub-Section Number:	1
Sub-Section Id:	416529392
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 41652912756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Single Line Question Option : No Option Orientation : Vertical
 Correct Marks : 4 Wrong Marks : 1

If $f(x) = \log_e \left(\frac{1-x}{1+x} \right)$, $|x| < 1$, then

$f\left(\frac{2x}{1+x^2}\right)$ is equal to :

Options :

41652949802. $2f(x^2)$

41652949803. $-2f(x)$

41652949804. $2f(x)$

41652949805. $(f(x))^2$

Question Number : 61 Question Id : 41652912756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $f(x) = \log_e \left(\frac{1-x}{1+x} \right)$, $|x| < 1$ है, तो

$f\left(\frac{2x}{1+x^2}\right)$ बराबर है :

Options :

41652949802. $2f(x^2)$

41652949803. $-2f(x)$

41652949804. $2f(x)$

41652949805. $(f(x))^2$

Question Number : 62 Question Id : 41652912757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If α and β be the roots of the equation $x^2 - 2x + 2 = 0$, then the least value of n for

which $\left(\frac{\alpha}{\beta}\right)^n = 1$ is :

Options :

41652949806. 5

41652949807. 4

41652949808. 3

41652949809. 2

Question Number : 62 Question Id : 41652912757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि समीकरण $x^2 - 2x + 2 = 0$ के मूल α तथा β हैं,

तो n का न्यूनतम मान, जिसके लिए $\left(\frac{\alpha}{\beta}\right)^n = 1$ है,

है :

Options :

41652949806. 5

41652949807. 4

41652949808. 3

41652949809. 2

Question Number : 63 Question Id : 41652912758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum of the solutions of the equation

$|\sqrt{x} - 2| + \sqrt{x}(\sqrt{x} - 4) + 2 = 0, (x > 0)$
is equal to :

Options :

41652949810. 4

41652949811. 9

41652949812. 10

41652949813. 12

Question Number : 63 Question Id : 41652912758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समीकरण

$|\sqrt{x} - 2| + \sqrt{x}(\sqrt{x} - 4) + 2 = 0, (x > 0)$

के हलों का योग बराबर है :

Options :

41652949810. 4

41652949811. 9

41652949812. 10

41652949813. 12

Question Number : 64 Question Id : 41652912759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $A = \begin{pmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{pmatrix}$, ($\alpha \in \mathbb{R}$) such that

$A^{32} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$. Then a value of α is :

Options :

41652949814. 0

41652949815. $\frac{\pi}{64}$

41652949816. $\frac{\pi}{32}$

41652949817. $\frac{\pi}{16}$

Question Number : 64 Question Id : 41652912759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $A = \begin{pmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{pmatrix}$, ($\alpha \in \mathbb{R}$) इस प्रकार

है कि $A^{32} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$, तो α का एक मान है :

Options :

41652949814. 0

41652949815. $\frac{\pi}{64}$

41652949816. $\frac{\pi}{32}$

41652949817. $\frac{\pi}{16}$

Question Number : 65 Question Id : 41652912760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The greatest value of $c \in \mathbb{R}$ for which the system of linear equations

$$x - cy - cz = 0$$

$$cx - y + cz = 0$$

$$cx + cy - z = 0$$

has a non-trivial solution, is :

Options :

41652949818. -1

41652949819. 0

41652949820. $\frac{1}{2}$

41652949821. 2

Question Number : 65 Question Id : 41652912760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$c \in \mathbb{R}$ का अधिकतम मान, जिसके लिए रेखिक समीकरण निकाय

$$x - cy - cz = 0$$

$$cx - y + cz = 0$$

$$cx + cy - z = 0$$

का एक अतुच्छ हल है, है :

Options :

41652949818. -1

41652949819. 0

41652949820. $\frac{1}{2}$

41652949821. 2

Question Number : 66 Question Id : 41652912761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

All possible numbers are formed using the digits 1, 1, 2, 2, 2, 2, 3, 4, 4 taken all at a time. The number of such numbers in which the odd digits occupy even places is :

Options :

41652949822. 160

41652949823. 162

41652949824. 175

41652949825. 180

Question Number : 66 Question Id : 41652912761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सभी अंकों 1, 1, 2, 2, 2, 2, 3, 4, 4 को एक साथ लेकर सभी संभव संख्याएँ बनाई गई हैं। इस प्रकार की संख्याओं, जिनमें विषम अंक सम स्थानों पर हैं, की संख्या है :

Options :

41652949822. 160

41652949823. 162

41652949824. 175

41652949825. 180

Question Number : 67 Question Id : 41652912762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum of the co-efficients of all even degree terms in x in the expansion of

$(x + \sqrt{x^3 - 1})^6 + (x - \sqrt{x^3 - 1})^6, (x > 1)$ is equal to :

Options :

41652949826. 24

41652949827. 26

41652949828. 29

41652949829. 32

Question Number : 67 Question Id : 41652912762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$(x + \sqrt{x^3 - 1})^6 + (x - \sqrt{x^3 - 1})^6, (x > 1)$$

के प्रसार में x के सभी समघातीय पदों के गुणांकों का योग बराबर है :

Options :

41652949826. 24

41652949827. 26

41652949828. 29

41652949829. 32

Question Number : 68 Question Id : 41652912763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum of all natural numbers 'n' such that $100 < n < 200$ and H.C.F. $(91, n) > 1$ is :

Options :

41652949830. 3203

41652949831. 3221

41652949832. 3121

41652949833. 3303

Question Number : 68 Question Id : 41652912763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ऐसी सभी प्राकृत संख्याओं 'n', जो इस प्रकार हैं कि $100 < n < 200$ तथा H.C.F. $(91, n) > 1$, का योग है :

Options :

41652949830. 3203

41652949831. 3221

41652949832. 3121

41652949833. 3303

Question Number : 69 Question Id : 41652912764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum of the series
 $2 \cdot {}^{20}C_0 + 5 \cdot {}^{20}C_1 + 8 \cdot {}^{20}C_2 + 11 \cdot {}^{20}C_3 + \dots +$
 $62 \cdot {}^{20}C_{20}$ is equal to :

Options :

41652949834. 2^{24}

41652949835. 2^{25}

41652949836. 2^{23}

41652949837. 2^{26}

Question Number : 69 Question Id : 41652912764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

श्रेणी $2 \cdot {}^{20}C_0 + 5 \cdot {}^{20}C_1 + 8 \cdot {}^{20}C_2 + 11 \cdot {}^{20}C_3 + \dots +$
 $62 \cdot {}^{20}C_{20}$ का योग बराबर है :

Options :

41652949834. 2^{24}

41652949835. 2^{25}

41652949836. 2^{23}

41652949837. 2^{26}

Question Number : 70 Question Id : 41652912765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow 0} \frac{\sin^2 x}{\sqrt{2} - \sqrt{1 + \cos x}}$ equals :

Options :

41652949838. $4\sqrt{2}$

41652949839. 4

41652949840. $\sqrt{2}$

41652949841. $2\sqrt{2}$

Question Number : 70 Question Id : 41652912765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow 0} \frac{\sin^2 x}{\sqrt{2} - \sqrt{1 + \cos x}}$ बराबर है :

Options :

41652949838. $4\sqrt{2}$

41652949839. 4

41652949840. $\sqrt{2}$

41652949841. $2\sqrt{2}$

Question Number : 71 Question Id : 41652912766 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If

$$2y = \left(\cot^{-1} \left(\frac{\sqrt{3} \cos x + \sin x}{\cos x - \sqrt{3} \sin x} \right) \right)^2, x \in \left(0, \frac{\pi}{2} \right)$$

then $\frac{dy}{dx}$ is equal to :

Options :

41652949842. $\frac{\pi}{6} - x$

41652949843. $\frac{\pi}{3} - x$

41652949844. $x - \frac{\pi}{6}$

41652949845. $2x - \frac{\pi}{3}$

Question Number : 71 Question Id : 41652912766 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि

$$2y = \left(\cot^{-1} \left(\frac{\sqrt{3} \cos x + \sin x}{\cos x - \sqrt{3} \sin x} \right) \right)^2, x \in \left(0, \frac{\pi}{2} \right)$$

है, तो $\frac{dy}{dx}$ बराबर है :

Options :

41652949842. $\frac{\pi}{6} - x$

41652949843. $\frac{\pi}{3} - x$

41652949844. $x - \frac{\pi}{6}$

41652949845. $2x - \frac{\pi}{3}$

Question Number : 72 Question Id : 41652912767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f: [0, 2] \rightarrow \mathbb{R}$ be a twice differentiable function such that $f''(x) > 0$, for all $x \in (0, 2)$.
If $\phi(x) = f(x) + f(2-x)$, then ϕ is :

Options :

41652949846. increasing on $(0, 1)$ and decreasing on $(1, 2)$.

41652949847. decreasing on $(0, 1)$ and increasing on $(1, 2)$.

41652949848. increasing on $(0, 2)$

41652949849. decreasing on $(0, 2)$

Question Number : 72 Question Id : 41652912767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$f: [0, 2] \rightarrow \mathbb{R}$ दो बार अवकलनीय फलन इस प्रकार है कि सभी $x \in (0, 2)$ के लिए $f''(x) > 0$ है। यदि $\phi(x) = f(x) + f(2-x)$ है, तो ϕ

Options :

41652949846. $(0, 1)$ पर वर्धमान तथा $(1, 2)$ पर हासमान है।

41652949847. $(0, 1)$ पर हासमान तथा $(1, 2)$ पर वर्धमान है।

41652949848. $(0, 2)$ पर वर्धमान है।

41652949849. $(0, 2)$ पर हासमान है।

Question Number : 73 Question Id : 41652912768 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If S_1 and S_2 are respectively the sets of local minimum and local maximum points of the function, $f(x) = 9x^4 + 12x^3 - 36x^2 + 25$, $x \in \mathbb{R}$, then :

Options :

41652949850. $S_1 = \{-2, 0\}; S_2 = \{1\}$

41652949851. $S_1 = \{-2, 1\}; S_2 = \{0\}$

41652949852. $S_1 = \{-1\}; S_2 = \{0, 2\}$

41652949853. $S_1 = \{-2\}; S_2 = \{0, 1\}$

Question Number : 73 Question Id : 41652912768 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि फलन $f(x) = 9x^4 + 12x^3 - 36x^2 + 25$, $x \in \mathbb{R}$, के स्थानीय निम्नतम तथा स्थानीय उच्चतम बिन्दुओं के समुच्चय क्रमशः S_1 तथा S_2 हैं, तो :

Options :

41652949850. $S_1 = \{-2, 0\}; S_2 = \{1\}$

41652949851. $S_1 = \{-2, 1\}; S_2 = \{0\}$

41652949852. $S_1 = \{-1\}; S_2 = \{0, 2\}$

41652949853. $S_1 = \{-2\}; S_2 = \{0, 1\}$

Question Number : 74 Question Id : 41652912769 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\int \frac{\sin \frac{5x}{2}}{\sin \frac{x}{2}} dx \text{ is equal to :}$$

(where c is a constant of integration.)

Options :

41652949854. $x + 2 \sin x + \sin 2x + c$

41652949855. $x + 2 \sin x + 2 \sin 2x + c$

41652949856. $2x + \sin x + \sin 2x + c$

41652949857. $2x + \sin x + 2 \sin 2x + c$

Question Number : 74 Question Id : 41652912769 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\int \frac{\sin \frac{5x}{2}}{\sin \frac{x}{2}} dx \text{ बराबर है :}$$

(जहाँ c एक समाकलन अचर है।)

Options :

41652949854. $x + 2 \sin x + \sin 2x + c$

41652949855. $x + 2 \sin x + 2 \sin 2x + c$

41652949856. $2x + \sin x + \sin 2x + c$

41652949857. $2x + \sin x + 2 \sin 2x + c$

Question Number : 75 Question Id : 41652912770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $f(x) = \frac{2 - x \cos x}{2 + x \cos x}$ and $g(x) = \log_e x$,

($x > 0$) then the value of the integral

$$\int_{-\pi/4}^{\pi/4} g(f(x)) dx \text{ is :}$$

Options :

41652949858. $\log_e 2$

41652949859. $\log_e 3$

41652949860. $\log_e 1$

41652949861. $\log_e e$

Question Number : 75 Question Id : 41652912770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $f(x) = \frac{2 - x \cos x}{2 + x \cos x}$ तथा $g(x) = \log_e x$,

$(x > 0)$ हैं, तो समाकल $\int_{-\pi/4}^{\pi/4} g(f(x)) dx$ का मान

है :

Options :

41652949858. $\log_e 2$

41652949859. $\log_e 3$

41652949860. $\log_e 1$

41652949861. $\log_e e$

Question Number : 76 Question Id : 41652912771 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The area (in sq.units) of the region
 $A = \{(x, y) \in \mathbb{R} \times \mathbb{R} \mid 0 \leq x \leq 3, 0 \leq y \leq 4, y \leq x^2 + 3x\}$ is :

Options :

41652949862. 8

41652949863. $\frac{26}{3}$

41652949864. $\frac{59}{6}$

41652949865. $\frac{53}{6}$

Question Number : 76 Question Id : 41652912771 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्षेत्र $A = \{(x, y) \in \mathbb{R} \times \mathbb{R} | 0 \leq x \leq 3, 0 \leq y \leq 4, y \leq x^2 + 3x\}$ का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

41652949862. 8

41652949863. $\frac{26}{3}$

41652949864. $\frac{59}{6}$

41652949865. $\frac{53}{6}$

Question Number : 77 Question Id : 41652912772 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $y = y(x)$ be the solution of the differential equation, $(x^2 + 1)^2 \frac{dy}{dx} + 2x(x^2 + 1)y = 1$ such

that $y(0) = 0$. If $\sqrt{a} y(1) = \frac{\pi}{32}$, then the value of 'a' is :

Options :

41652949866. $\frac{1}{16}$

41652949867. $\frac{1}{2}$

41652949868. 1

41652949869. $\frac{1}{4}$

Question Number : 77 Question Id : 41652912772 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $y = y(x)$, अबकल समीकरण
 $(x^2 + 1)^2 \frac{dy}{dx} + 2x(x^2 + 1)y = 1$ का हल है, जबकि

$y(0) = 0$ है। यदि $\sqrt{a} y(1) = \frac{\pi}{32}$ है, तो 'a' का मान है :

Options :

41652949866. $\frac{1}{16}$

41652949867. $\frac{1}{2}$

41652949868. 1

41652949869. $\frac{1}{4}$

Question Number : 78 Question Id : 41652912773 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let O(0, 0) and A(0, 1) be two fixed points.
Then the locus of a point P such that the
perimeter of ΔAOP is 4, is :

Options :

41652949870. $9x^2 - 8y^2 + 8y = 16$

41652949871. $9x^2 + 8y^2 - 8y = 16$

41652949872. $8x^2 - 9y^2 + 9y = 18$

41652949873. $8x^2 + 9y^2 - 9y = 18$

Question Number : 78 Question Id : 41652912773 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना O(0, 0) तथा A(0, 1) दो निश्चित बिंदु हैं, तो
ऐसे बिंदु P जिनके लिए ΔAOP का परिमाप 4 हो, का
बिंदुपथ है :

Options :

41652949870. $9x^2 - 8y^2 + 8y = 16$

41652949871. $9x^2 + 8y^2 - 8y = 16$

41652949872. $8x^2 - 9y^2 + 9y = 18$

41652949873. $8x^2 + 9y^2 - 9y = 18$

Question Number : 79 Question Id : 41652912774 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A point on the straight line, $3x + 5y = 15$
which is equidistant from the coordinate
axes will lie only in :

Options :

41652949874. 1st, 2nd and 4th quadrants

41652949875. 1st quadrant

41652949876. 1st and 2nd quadrants

41652949877. 4th quadrant

Question Number : 79 Question Id : 41652912774 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सरल रेखा $3x + 5y = 15$ पर स्थित एक बिंदु, जो
निर्देशांक अक्षों से समदूरस्थ है, केवल स्थित है :

Options :

41652949874. प्रथम, द्वितीय तथा चतुर्थ चतुर्थांशों में

41652949875. प्रथम चतुर्थांश में

41652949876. प्रथम तथा द्वितीय चतुर्थांशों में

41652949877. चतुर्थ चतुर्थांश में

Question Number : 80 Question Id : 41652912775 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum of the squares of the lengths of
the chords intercepted on the circle,
 $x^2 + y^2 = 16$, by the lines, $x + y = n$, $n \in \mathbb{N}$,
where $\mathbb{N}$ is the set of all natural numbers,
is :

Options :

41652949878. 105

41652949879. 210

41652949880. 320

41652949881. 160

Question Number : 80 Question Id : 41652912775 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वृत्त $x^2 + y^2 = 16$ पर रेखाओं $x + y = n$, $n \in \mathbb{N}$ जहाँ
N सभी प्राकृत संख्याओं का समुच्चय है, द्वारा काटी गई
जीवाओं की लंबाइयों के वर्गों का योग है :

Options :

41652949878. 105

41652949879. 210

41652949880. 320

41652949881. 160

Question Number : 81 Question Id : 41652912776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The shortest distance between the line $y = x$
and the curve $y^2 = x - 2$ is :

Options :

41652949882. $\frac{11}{4\sqrt{2}}$

41652949883. $\frac{7}{4\sqrt{2}}$

41652949884. $\frac{7}{8}$

41652949885. 2

Question Number : 81 Question Id : 41652912776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

रेखा $y=x$ तथा वक्र $y^2=x-2$ के बीच की न्यूनतम दूरी है :

Options :

41652949882. $\frac{11}{4\sqrt{2}}$

41652949883. $\frac{7}{4\sqrt{2}}$

41652949884. $\frac{7}{8}$

41652949885. 2

Question Number : 82 Question Id : 41652912777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the tangents on the ellipse $4x^2 + y^2 = 8$ at the points $(1, 2)$ and (a, b) are perpendicular to each other, then a^2 is equal to :

Options :

41652949886. $\frac{2}{17}$

41652949887. $\frac{128}{17}$

41652949888. $\frac{4}{17}$

41652949889. $\frac{64}{17}$

Question Number : 82 Question Id : 41652912777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि दीर्घवृत्त $4x^2 + y^2 = 8$ के बिंदुओं $(1, 2)$ तथा (a, b) पर खींची गई स्पर्शरेखाएँ परस्पर लंबवत हैं, तो a^2 बराबर है :

Options :

41652949886. $\frac{2}{17}$

41652949887. $\frac{128}{17}$

41652949888. $\frac{4}{17}$

41652949889. $\frac{64}{17}$

Question Number : 83 Question Id : 41652912778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The length of the perpendicular from the point $(2, -1, 4)$ on the straight line,

$$\frac{x+3}{10} = \frac{y-2}{-7} = \frac{z}{1} \text{ is :}$$

Options :

41652949890. less than 2

41652949891. greater than 2 but less than 3

41652949892. greater than 3 but less than 4

41652949893. greater than 4

Question Number : 83 Question Id : 41652912778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बिंदु $(2, -1, 4)$ से सरल रेखा

$$\frac{x+3}{10} = \frac{y-2}{-7} = \frac{z}{1} \text{ पर खींचे गए लंब की}$$

लंबाई :

Options :

41652949890. 2 से कम है।

41652949891. 2 से अधिक परंतु 3 से कम है।

41652949892. 3 से अधिक परंतु 4 से कम है।

41652949893. 4 से अधिक है।

Question Number : 84 Question Id : 41652912779 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The equation of a plane containing the line of intersection of the planes $2x - y - 4 = 0$ and $y + 2z - 4 = 0$ and passing through the point $(1, 1, 0)$ is :

Options :

41652949894. $x - y - z = 0$

41652949895. $x + 3y + z = 4$

41652949896. $x - 3y - 2z = -2$

41652949897. $2x - z = 2$

Question Number : 84 Question Id : 41652912779 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समतलों $2x - y - 4 = 0$ तथा $y + 2z - 4 = 0$ की प्रतिच्छेदन रेखा को अंतर्विष्ट करने वाले तथा बिंदु $(1, 1, 0)$ से होकर जाने वाले समतल का समीकरण है :

Options :

41652949894. $x - y - z = 0$

41652949895. $x + 3y + z = 4$

41652949896. $x - 3y - 2z = -2$

41652949897. $2x - z = 2$

Question Number : 85 Question Id : 41652912780 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The magnitude of the projection of the vector $2\hat{i} + 3\hat{j} + \hat{k}$ on the vector perpendicular to the plane containing the vectors $\hat{i} + \hat{j} + \hat{k}$ and $\hat{i} + 2\hat{j} + 3\hat{k}$, is :

Options :

41652949898. $3\sqrt{6}$

41652949899. $\frac{\sqrt{3}}{2}$

41652949900. $\sqrt{6}$

41652949901. $\sqrt{\frac{3}{2}}$

Question Number : 85 Question Id : 41652912780 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सदिश $2\hat{i} + 3\hat{j} + \hat{k}$ के सदिशों $\hat{i} + \hat{j} + \hat{k}$

तथा $\hat{i} + 2\hat{j} + 3\hat{k}$ को अंतर्विष्ट करने वाले समतल
के लंबवर्तीय सदिश पर प्रक्षेप का परिमाण है :

Options :

41652949898. $3\sqrt{6}$

41652949899. $\frac{\sqrt{3}}{2}$

41652949900. $\sqrt{6}$

41652949901. $\sqrt{\frac{3}{2}}$

Question Number : 86 Question Id : 41652912781 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The mean and variance of seven observations are 8 and 16, respectively. If 5 of the observations are 2, 4, 10, 12, 14, then the product of the remaining two observations is :

Options :

41652949902. 40

41652949903. 49

41652949904. 45

41652949905. 48

Question Number : 86 Question Id : 41652912781 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सात प्रेक्षणों के माध्य तथा प्रसरण क्रमशः 8 तथा 16 हैं।
यदि इनमें से 5 प्रेक्षण 2, 4, 10, 12, 14 हैं, तो शेष दो
प्रेक्षणों का गुणनफल है :

Options :

41652949902. 40

41652949903. 49

41652949904. 45

41652949905. 48

Question Number : 87 Question Id : 41652912782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let A and B be two non-null events such
that $A \subset B$. Then, which of the following
statements is always correct ?

Options :

41652949906. $P(A|B) = 1$

41652949907. $P(A|B) \leq P(A)$

41652949908. $P(A|B) \geq P(A)$

41652949909. $P(A|B) = P(B) - P(A)$

Question Number : 87 Question Id : 41652912782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना A तथा B दो ऐसी अरिक्त (non-null) घटनायें
हैं कि $A \subset B$ है। तो निम्न में से कौन सा कथन हमेशा
सही है ?

Options :

41652949906. $P(A|B) = 1$

41652949907. $P(A|B) \leq P(A)$

41652949908. $P(A|B) \geq P(A)$

41652949909. $P(A|B) = P(B) - P(A)$

Question Number : 88 Question Id : 41652912783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $\cos(\alpha + \beta) = \frac{3}{5}$, $\sin(\alpha - \beta) = \frac{5}{13}$ and

$0 < \alpha, \beta < \frac{\pi}{4}$, then $\tan(2\alpha)$ is equal to :

Options :

41652949910. $\frac{21}{16}$

41652949911. $\frac{63}{16}$

41652949912. $\frac{63}{52}$

41652949913. $\frac{33}{52}$

Question Number : 88 Question Id : 41652912783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\cos(\alpha + \beta) = \frac{3}{5}$, $\sin(\alpha - \beta) = \frac{5}{13}$ तथा

$0 < \alpha, \beta < \frac{\pi}{4}$ हैं, तो $\tan(2\alpha)$ बराबर है :

Options :

41652949910. $\frac{21}{16}$

41652949911. $\frac{63}{16}$

41652949912. $\frac{63}{52}$

41652949913. $\frac{33}{52}$

Question Number : 89 Question Id : 41652912784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $\alpha = \cos^{-1}\left(\frac{3}{5}\right)$, $\beta = \tan^{-1}\left(\frac{1}{3}\right)$, where

$0 < \alpha, \beta < \frac{\pi}{2}$, then $\alpha - \beta$ is equal to :

Options :

41652949914. $\tan^{-1}\left(\frac{9}{14}\right)$

41652949915. $\sin^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

41652949916. $\cos^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

41652949917. $\tan^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

Question Number : 89 Question Id : 41652912784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\alpha = \cos^{-1}\left(\frac{3}{5}\right)$, $\beta = \tan^{-1}\left(\frac{1}{3}\right)$ हैं, जहाँ

$0 < \alpha, \beta < \frac{\pi}{2}$, तो $\alpha - \beta$ बराबर है :

Options :

41652949914. $\tan^{-1}\left(\frac{9}{14}\right)$

41652949915. $\sin^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

41652949916. $\cos^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

41652949917. $\tan^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

Question Number : 90 Question Id : 41652912785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The contrapositive of the statement "If you are born in India, then you are a citizen of India", is :

Options :

41652949918. If you are born in India, then you are not a citizen of India.
41652949919. If you are a citizen of India, then you are born in India.
41652949920. If you are not born in India, then you are not a citizen of India.
41652949921. If you are not a citizen of India, then you are not born in India.

Question Number : 90 Question Id : 41652912785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कथन

“यदि आप भारत में जन्में हैं, तो आप भारत के एक नागरिक हैं” का प्रतिधनात्मक कथन है :

Options :

41652949918. यदि आप भारत में जन्में हैं, तो आप भारत के नागरिक नहीं हैं।
41652949919. यदि आप भारत के एक नागरिक हैं, तो आप भारत में जन्में हैं।
41652949920. यदि आप भारत में नहीं जन्में, तो आप भारत के नागरिक नहीं हैं।
41652949921. यदि आप भारत के नागरिक नहीं हैं, तो आप भारत में नहीं जन्में हैं।

