

Question Paper Name: Paper I EH 11th Jan 2019 Shift 1
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Actual Answer Key: Yes

Paper I

Group Number : 1
Group Id : 416529115
Group Maximum Duration : 0
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Revisit allowed for edit? : No
Break time: 0
Group Marks: 360

Physics

Section Id : 416529127
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: 416529136
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 4165299146 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 force of interaction between two atoms

is given by $F = \alpha\beta \exp\left(-\frac{x^2}{\alpha kt}\right)$; where x

is the distance, k is the Boltzmann constant and T is temperature and α and β are two constants. The dimension of β is :

Options :

41652936042. MLT^{-2}

41652936043. $M^2L^2T^{-2}$

41652936044. $M^0L^2T^{-4}$

41652936045. M^2LT^{-4}

Question Number : 1 Question Id : 4165299146 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 परमाणुओं के मध्य अन्योन्यक्रिया बल सम्बन्ध

$F = \alpha\beta \exp\left(-\frac{x^2}{\alpha kt}\right)$ से दिया जाता है जहाँ x दूरी

है, k बोल्ट्जमैन नियतांक तथा T तापमान है और α तथा β दो स्थिरांक हैं। β की विमा होगी :

Options :

41652936042. MLT^{-2}

41652936043. $M^2L^2T^{-2}$

41652936044. $M^0L^2T^{-4}$

41652936045. M^2LT^{-4}

Question Number : 2 Question Id : 4165299147 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 is moving along a circular path with a constant speed of 10 ms^{-1} . What is the magnitude of the change in velocity of the particle, when it moves through an angle of 60° around the centre of the circle ?

Options :

41652936046. zero

41652936047. $10\sqrt{3} \text{ m/s}$

41652936048. $10\sqrt{2} \text{ m/s}$

41652936049. 10 m/s

Question Number : 2 Question Id : 4165299147 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 वृत्ताकार पथ पर 10 ms^{-1} की नियत गति से चल रहा है। जब यह कण वृत्त के केन्द्र के परितः 60° चलता है तो इसके वेग में हुये परिवर्तन का परिमाण होगा :

Options :

41652936046. शून्य

41652936047. $10\sqrt{3} \text{ m/s}$

41652936048. $10\sqrt{2} \text{ m/s}$

41652936049. 10 m/s

Question Number : 3 Question Id : 4165299148 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 body is projected at $t=0$ with a velocity 10 ms^{-1} at an angle of 60° with the horizontal. The radius of curvature of its trajectory at $t=1\text{s}$ is R . Neglecting air resistance and taking acceleration due to gravity $g=10 \text{ ms}^{-2}$, the value of R is :

Options :

41652936050. 2.5 m

41652936051. 5.1 m

41652936052. 2.8 m

41652936053. 10.3 m

Question Number : 3 Question Id : 4165299148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

$t = 0$ पर क्षैतिज से 60° के कोण पर 10 ms^{-1} के वेग से एक पिण्ड को प्रक्षेपित करते हैं। $t = 1 \text{ s}$ पर प्रक्षेप पथ की वक्रता त्रिज्या R है। वायु प्रतिरोध को नगण्य मानकर तथा गुरुत्वीय त्वरण $g = 10 \text{ ms}^{-2}$ लेकर R का मान है :

Options :

41652936050. 2.5 m

41652936051. 5.1 m

41652936052. 2.8 m

41652936053. 10.3 m

Question Number : 4 Question Id : 4165299149 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 liquid of density ρ is coming out of a hose pipe of radius a with horizontal speed v and hits a mesh. 50% of the liquid passes through the mesh unaffected. 25% loses all of its momentum and 25% comes back with the same speed. The resultant pressure on the mesh will be :

Options :

41652936054. $\frac{1}{4} \rho v^2$

41652936055. $\frac{1}{2} \rho v^2$

41652936056. $\frac{3}{4} \rho v^2$

41652936057. ρv^2

Question Number : 4 Question Id : 4165299149 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ρ घनत्व का द्रव a त्रिज्या वाले होज पाईप में से क्षैतिज चाल v से निकल रहा है और एक जाल से टकराता है। 50% द्रव जाल से अप्रभावित निकल जाता है, 25% द्रव का संवेग शून्य हो जाता है तथा 25% द्रव उसी चाल से वापस आ जाता है। जाल पर परिणामी दाब होगा :

Options :

41652936054. $\frac{1}{4} \rho v^2$

41652936055. $\frac{1}{2} \rho v^2$

41652936056. $\frac{3}{4} \rho v^2$

41652936057. ρv^2

Question Number : 5 Question Id : 4165299150 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 body of mass 1 kg falls freely from a height of 100 m, on a platform of mass 3 kg which is mounted on a spring having spring constant $k = 1.25 \times 10^6$ N/m. The body sticks to the platform and the spring's maximum compression is found to be x . Given that $g = 10 \text{ ms}^{-2}$, the value of x will be close to :

Options :

41652936058. 4 cm

41652936059. 8 cm

41652936060. 40 cm

41652936061. 80 cm

Question Number : 5 Question Id : 4165299150 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1 kg द्रव्यमान का एक पिण्ड 100 m ऊँचाई से स्वतंत्र रूप से 3 kg द्रव्यमान के एक प्लेटफार्म पर गिरता है यह प्लेटफार्म एक स्प्रिंग नियतांक $k = 1.25 \times 10^6$ N/m की स्प्रिंग पर लगा है। पिण्ड प्लेटफार्म पर चिपक जाता है और स्प्रिंग का अधिकतम संपीडन x पाया जाता है। x का निकटतम मान होगा : ($g = 10 \text{ ms}^{-2}$)

Options :

41652936058. 4 cm

41652936059. 8 cm

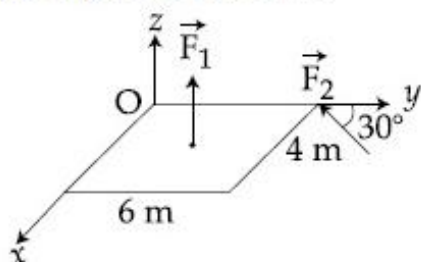
41652936060. 40 cm

41652936061. 80 cm

Question Number : 6 Question Id : 4165299151 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 slab is subjected to two forces $\vec{F}_1$ and $\vec{F}_2$ of same magnitude F as shown in the figure. Force $\vec{F}_2$ is in XY-plane while force $\vec{F}_1$ acts along z-axis at the point $(2\vec{i} + 3\vec{j})$. The moment of these forces about point O will be :



Options :

41652936062. $(3\hat{i} + 2\hat{j} - 3\hat{k})F$

41652936063. $(3\hat{i} - 2\hat{j} + 3\hat{k})F$

41652936064.

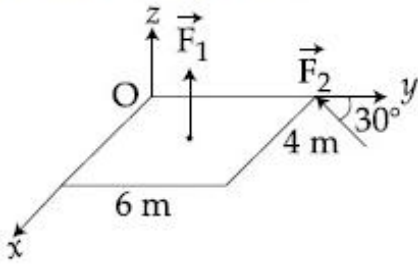
$$\left(3\hat{i} + 2\hat{j} + 3\hat{k} \right) F$$

41652936065.

$$\left(3\hat{i} - 2\hat{j} - 3\hat{k} \right) F$$

Question Number : 6 Question Id : 4165299151 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 चित्रानुसार एक तख्त पर समान परिमाण F के दो बल $\vec{F}_1$ तथा $\vec{F}_2$ लगाये गये हैं। बल $\vec{F}_2$ XY-समतल में है जबकि बल $\vec{F}_1$ z-दिशा के अनुदिश बिन्दु $\left(2\vec{i} + 3\vec{j} \right)$ पर लगा है। बिन्दु O के सापेक्ष इन बलों का आघूर्ण होगा :



Options :

41652936062.

$$\left(3\hat{i} + 2\hat{j} - 3\hat{k} \right) F$$

41652936063.

$$\left(3\hat{i} - 2\hat{j} + 3\hat{k} \right) F$$

41652936064.

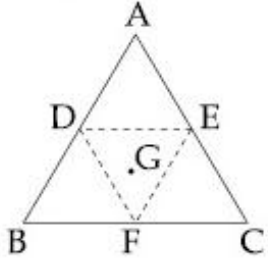
$$\left(3\hat{i} + 2\hat{j} + 3\hat{k} \right) F$$

41652936065.

$$\left(3\hat{i} - 2\hat{j} - 3\hat{k} \right) F$$

Question Number : 7 Question Id : 4165299152 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 equilateral triangle ABC is cut from a thin solid sheet of wood. (See figure) D, E and F are the mid-points of its sides as shown and G is the centre of the triangle. The moment of inertia of the triangle about an axis passing through G and perpendicular to the plane of the triangle is I_0 . If the smaller triangle DEF is removed from ABC, the moment of inertia of the remaining figure about the same axis is I. Then :



Options :

$$I = \frac{I_0}{4}$$

41652936066.

$$I = \frac{3}{4}I_0$$

41652936067.

$$I = \frac{9}{16}I_0$$

41652936068.

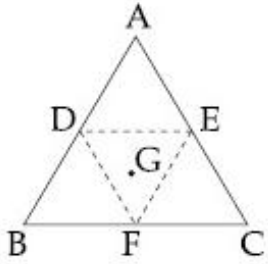
$$I = \frac{15}{16}I_0$$

41652936069.

Question Number : 7 Question Id : 4165299152 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 पतले ठोस लकड़ी के फलक से एक त्रिभुज ABC काटा गया है (चित्र देखिए)। दर्शाये गये अनुसार D, E तथा F इसकी भुजाओं के मध्य बिन्दु है तथा G त्रिभुज का केन्द्र है। G से गुजरने वाली तथा त्रिभुज के समतल के लम्बवत् अक्ष के सापेक्ष त्रिभुज का जड़त्व आघूर्ण I_0 है। यदि छोटा त्रिभुज DEF त्रिभुज ABC में से निकाल लिया जाये तो शेष बचे हुए भाग का उसी अक्ष के सापेक्ष जड़त्व आघूर्ण I है। तब :



Options :

$$I = \frac{I_0}{4}$$

41652936066.

$$I = \frac{3}{4}I_0$$

41652936067.

$$I = \frac{9}{16}I_0$$

41652936068.

$$I = \frac{15}{16}I_0$$

41652936069.

Question Number : 8 Question Id : 4165299153 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 satellite is revolving in a circular orbit at a height h from the earth surface, such that $h \ll R$ where R is the radius of the earth. Assuming that the effect of earth's atmosphere can be neglected the minimum increase in the speed required so that the satellite could escape from the gravitational field of earth is :

Options :

$$\sqrt{gR}$$

41652936070.

41652936071. $\sqrt{2gR}$

41652936072. $\sqrt{gR}(\sqrt{2}-1)$

41652936073. $\sqrt{\frac{gR}{2}}$

Question Number : 8 Question Id : 4165299153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पृथ्वी की सतह से h ऊँचाई पर एक उपग्रह एक वृत्तीय कक्षा में इस प्रकार घूम रहा है कि $h \ll R$ जहाँ R पृथ्वी की त्रिज्या है। माना कि पृथ्वी के वायुमण्डल का प्रभाव नगण्य है। कक्षीय चाल में कितनी न्यूनतम वृद्धि होनी चाहिए जिससे कि उपग्रह पृथ्वी के गुरुत्वीय क्षेत्र से पलायन कर सके :

Options :

41652936070. $\sqrt{gR}$

41652936071. $\sqrt{2gR}$

41652936072. $\sqrt{gR}(\sqrt{2}-1)$

41652936073. $\sqrt{\frac{gR}{2}}$

Question Number : 9 Question Id : 4165299154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Ice at -20°C is added to 50 g of water at 40°C . When the temperature of the mixture reaches 0°C , it is found that 20 g of ice is still unmelted. The amount of ice added to the water was close to

(Specific heat of water = $4.2 \text{ J/g/}^\circ\text{C}$

Specific heat of Ice = $2.1 \text{ J/g/}^\circ\text{C}$

Heat of fusion of water at $0^\circ\text{C} = 334 \text{ J/g}$)

Options :

41652936074. 60 g

41652936075. 40 g

41652936076. 50 g

41652936077. 100 g

Question Number : 9 Question Id : 4165299154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

40°C पर 50 g पानी में -20°C पर रखी बर्फ मिलाते हैं। जब मिश्रण का तापमान 0°C हो जाता है तो देखा जाता है कि 20 g बर्फ अभी भी जमी हुई है। पानी में मिलायी गयी बर्फ की मात्रा का सन्निकट मान था :

(जल की विशिष्ट ऊष्मा = $4.2 \text{ J/g}^{\circ}\text{C}$

बर्फ की विशिष्ट ऊष्मा = $2.1 \text{ J/g}^{\circ}\text{C}$

0°C पर जल की संगलन ऊष्मा = 334 J/g)

Options :

41652936074. 60 g

41652936075. 40 g

41652936076. 50 g

41652936077. 100 g

Question Number : 10 Question Id : 4165299155 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 rigid diatomic ideal gas undergoes an adiabatic process at room temperature. The relation between temperature and volume for this process is $TV^x = \text{constant}$, then x is :

Options :

41652936078. $\frac{2}{3}$

41652936079. $\frac{2}{5}$

41652936080. $\frac{5}{3}$

41652936081. $\frac{3}{5}$

Question Number : 10 Question Id : 4165299155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कक्षीय तापमान पर एक दृढ़ द्विपरमाणुक आदर्श गैस एक रुद्धोष्म प्रक्रम से गुजरती है। इस प्रक्रम के लिए तापमान और आयतन में, $TV^x = \text{नियतांक सम्बन्ध है}$ तो x होगा :

Options :

41652936078. $\frac{2}{3}$

41652936079. $\frac{2}{5}$

41652936080. $\frac{5}{3}$

41652936081. $\frac{3}{5}$

Question Number : 11 Question Id : 4165299156 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 gas mixture consists of 3 moles of oxygen and 5 moles of argon at temperature T . Considering only translational and rotational modes, the total internal energy of the system is :

Options :

41652936082. $4 RT$

41652936083. $12 RT$

41652936084. $15 RT$

41652936085. $20 RT$

Question Number : 11 Question Id : 4165299156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

गैस के एक मिश्रण में ऑक्सीजन के 3 मोल तथा आर्गन के 5 मोल तापमान T पर हैं। केवल स्थानांतरीय और घूर्णन विधा मानें तो संकाय की कुल आन्तरिक ऊर्जा होगी :

Options :

41652936082. 4 RT

41652936083. 12 RT

41652936084. 15 RT

41652936085. 20 RT

Question Number : 12 Question Id : 4165299157 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 undergoing simple harmonic motion has time dependent displacement

given by $x(t) = A \sin \frac{\pi t}{90}$. The ratio of kinetic to potential energy of this particle at $t = 210$ s will be :

Options :

41652936086. 1

41652936087. 3

41652936088. $\frac{1}{9}$

41652936089. 2

Question Number : 12 Question Id : 4165299157 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 आवर्त गति करते हुए एक कण का समय पर

निर्भर विस्थापन सम्बन्ध $x(t) = A \sin \frac{\pi t}{90}$ से दिया

गया है। $t = 210$ s पर इस कण की गतिज एवं स्थितिज ऊर्जाओं का अनुपात होगा :

Options :

41652936086. 1

41652936087. 3

41652936088. $\frac{1}{9}$

41652936089. 2

Question Number : 13 Question Id : 4165299158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Equation of travelling wave on a stretched string of linear density 5 g/m is $y = 0.03 \sin(450 t - 9x)$ where distance and time are measured in SI units. The tension in the string is :

Options :

41652936090. 5 N

41652936091. 7.5 N

41652936092. 10 N

41652936093. 12.5 N

Question Number : 13 Question Id : 4165299158 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 g/m रेखीय घनत्व वाली तनी हुई डोरी में प्रगामी तरंग का समीकरण निम्न है :

$y = 0.03 \sin(450 t - 9x)$ जहाँ दूरी और समय SI मात्रकों में हैं। डोरी में तनाव है :

Options :

41652936090. 5 N

41652936091. 7.5 N

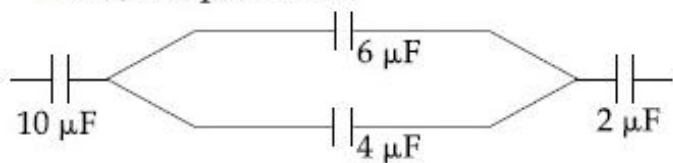
41652936092. 10 N

41652936093. 12.5 N

Question Number : 14 Question Id : 4165299159 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 figure shown below, the charge on the left plate of the $10\ \mu\text{F}$ capacitor is $-30\ \mu\text{C}$. The charge on the right plate of the $6\ \mu\text{F}$ capacitor is :



Options :

41652936094. $+18\ \mu\text{C}$

41652936095. $-18\ \mu\text{C}$

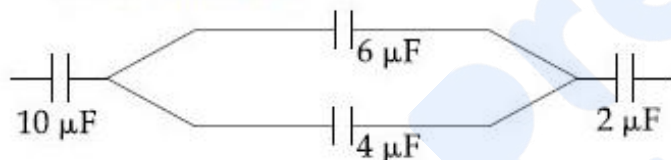
41652936096. $+12\ \mu\text{C}$

41652936097. $-12\ \mu\text{C}$

Question Number : 14 Question Id : 4165299159 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 चित्र में $10\ \mu\text{F}$ के संधारित्र की बाँयी प्लेट पर $-30\ \mu\text{C}$ आवेश है। $6\ \mu\text{F}$ के संधारित्र की दाँयी प्लेट पर आवेश होगा :



Options :

41652936094. $+18\ \mu\text{C}$

41652936095. $-18\ \mu\text{C}$

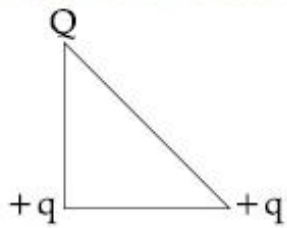
41652936096. $+12\ \mu\text{C}$

41652936097. $-12\ \mu\text{C}$

Question Number : 15 Question Id : 4165299160 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Three charges Q , $+q$ and $+q$ are placed at the vertices of a right-angle isosceles triangle as shown below. The net electrostatic energy of the configuration is zero, if the value of Q is :



Options :

41652936098. $\frac{-q}{1+\sqrt{2}}$

41652936099. $\frac{-\sqrt{2}q}{\sqrt{2}+1}$

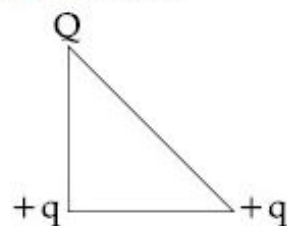
41652936100. $-2q$

41652936101. $+q$

Question Number : 15 Question Id : 4165299160 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 समकोणीय समद्विबाहु त्रिभुज के कोनों पर तीन आवेश Q , $+q$ तथा $+q$ रखे गये हैं। इस विन्यास की कुल विद्युत्स्थैतिक ऊर्जा शून्य होगी यदि Q का मान है :



Options :

41652936098. $\frac{-q}{1+\sqrt{2}}$

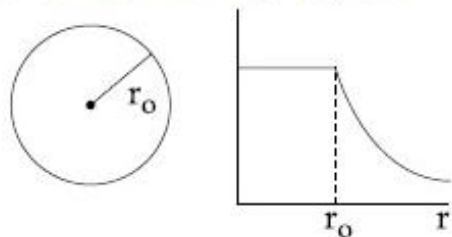
41652936099. $\frac{-\sqrt{2}q}{\sqrt{2}+1}$

41652936100. $-2q$

Question Number : 16 Question Id : 4165299161 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 given graph shows variation (with distance r from centre) of :



Options :

41652936102. Potential of a uniformly charged spherical shell

41652936103. Potential of a uniformly charged sphere

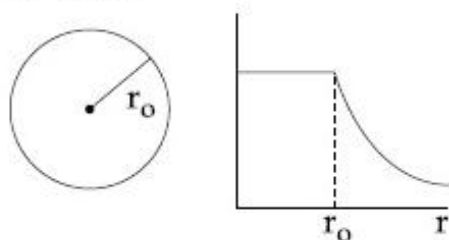
41652936104. Electric field of a uniformly charged spherical shell

41652936105. Electric field of a uniformly charged sphere

Question Number : 16 Question Id : 4165299161 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 ग्राफ (केन्द्र से दूरी r के साथ) बदलाव दिखाता है :



Options :

41652936102. समावेशित गोलीय कोश का विभव

41652936103. समावेशित गोले का विभव

41652936104. समावेशित गोलीय कोश का विद्युत क्षेत्र

41652936105. समावेशित गोले का विद्युत क्षेत्र

Correct Marks : 4 Wrong Marks : 1

Two equal resistances when connected in series to a battery, consume electric power of 60 W. If these resistances are now connected in parallel combination to the same battery, the electric power consumed will be :

Options :

41652936106. 60 W

41652936107. 240 W

41652936108. 120 W

41652936109. 30 W

Question Number : 17 Question Id : 4165299162 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 बराबर प्रतिरोधों को जब श्रेणीक्रम में एक बैटरी से जोड़ते हैं तो ये 60 W विद्युत शक्ति का उपभोग करते हैं। यदि इन प्रतिरोधों को अब समान्तर क्रम में इसी बैटरी से जोड़ा जाये तो उपभोग की गयी शक्ति होगी :

Options :

41652936106. 60 W

41652936107. 240 W

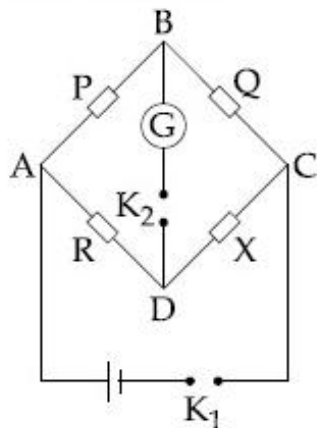
41652936108. 120 W

41652936109. 30 W

Question Number : 18 Question Id : 4165299163 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 a Wheatstone bridge(see fig.), Resistances P and Q are approximately equal. When $R=400\ \Omega$, the bridge is balanced. On interchanging P and Q, the value of R, for balance, is $405\ \Omega$. The value of X is close to :



Options :

41652936110. 401.5 ohm

41652936111. 404.5 ohm

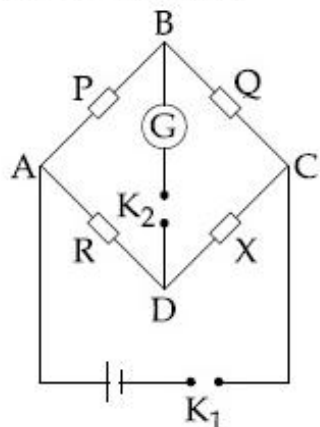
41652936112. 402.5 ohm

41652936113. 403.5 ohm

Question Number : 18 Question Id : 4165299163 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 व्हीटस्टोन सेतु में (चित्र देखिये) प्रतिरोध P तथा Q लगभग बराबर है। जब $R=400\ \Omega$ है तो सेतु संतुलित है। P तथा Q को परस्पर बदलने पर, सेतु को संतुलित रखने के लिए R का मान $405\ \Omega$ है। X का सन्निकट मान होगा :



Options :

41652936110. 401.5 ohm

41652936111. 404.5 ohm

41652936112. 402.5 ohm

41652936113. 403.5 ohm

Question Number : 19 Question Id : 4165299164 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 experiment, electrons are accelerated, from rest, by applying a voltage of 500 V. Calculate the radius of the path if a magnetic field 100 mT is then applied.

[Charge of the electron = 1.6×10^{-19} C

Mass of the electron = 9.1×10^{-31} kg]

Options :

41652936114. 7.5 m

41652936115. 7.5×10^{-2} m

41652936116. 7.5×10^{-4} m

41652936117. 7.5×10^{-3} m

Question Number : 19 Question Id : 4165299164 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 प्रयोग में इलेक्ट्रॉन को विराम अवस्था से 500 V वोल्टेज लगाकर त्वरित करते हैं। पथ की त्रिज्या ज्ञात कीजिए यदि लगाया गया चुम्बकीय क्षेत्र 100 mT है।

(इलेक्ट्रॉन का आवेश = 1.6×10^{-19} C, इलेक्ट्रॉन का द्रव्यमान = 9.1×10^{-31} kg)

Options :

41652936114. 7.5 m

41652936115. 7.5×10^{-2} m

41652936116. 7.5×10^{-4} m

41652936117. 7.5×10^{-3} m

Question Number : 20 Question Id : 4165299165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

There are two long co-axial solenoids of same length l . The inner and outer coils have radii r_1 and r_2 and number of turns per unit length n_1 and n_2 , respectively. The ratio of mutual inductance to the self-inductance of the inner-coil is :

Options :

41652936118. $\frac{n_2}{n_1}$

41652936119. $\frac{n_2}{n_1} \cdot \frac{r_2^2}{r_1^2}$

41652936120. $\frac{n_2}{n_1} \cdot \frac{r_1}{r_2}$

41652936121. $\frac{n_1}{n_2}$

Question Number : 20 Question Id : 4165299165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समान लम्बाई l की दो लम्बी सम-अक्षीय परिनालिकाये हैं। आन्तरिक एवं बाह्य कुण्डलियों की त्रिज्यायें क्रमशः r_1 तथा r_2 हैं और प्रति इकाई लम्बाई फेरों की संख्या क्रमशः n_1 तथा n_2 हैं। आन्तरिक कुण्डली के अन्योन्य प्रेरकत्व तथा स्व प्रेरकत्व का अनुपात होगा :

Options :

41652936118. $\frac{n_2}{n_1}$

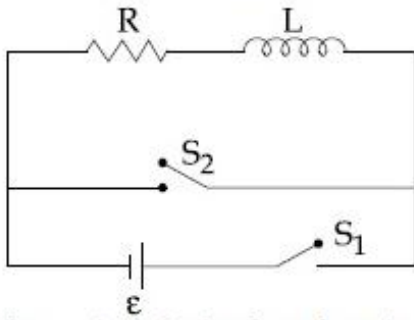
41652936119. $\frac{n_2}{n_1} \cdot \frac{r_2^2}{r_1^2}$

41652936120. $\frac{n_2}{n_1} \cdot \frac{r_1}{r_2}$

41652936121. $\frac{n_1}{n_2}$

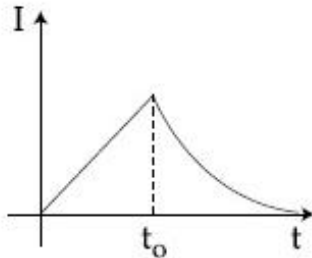
Correct Marks : 4 Wrong Marks : 1

In the circuit shown,

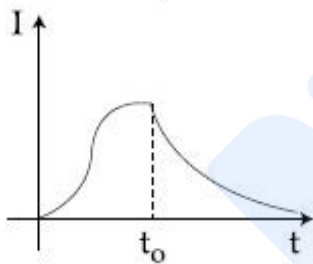


the switch S_1 is closed at time $t = 0$ and the switch S_2 is kept open. At some later time (t_0), the switch S_1 is opened and S_2 is closed. The behaviour of the current I as a function of time ' t ' is given by :

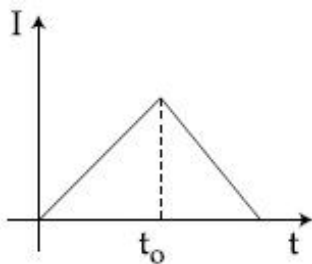
Options :



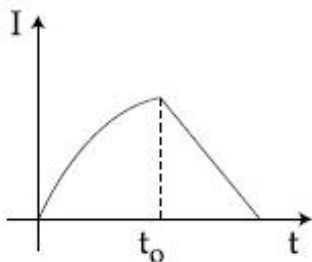
41652936122.



41652936123.

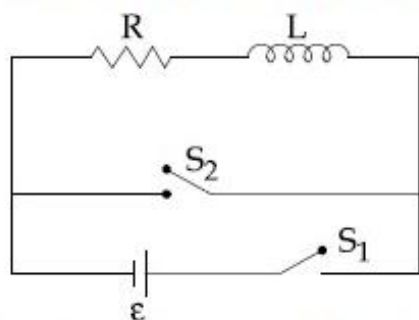


41652936124.



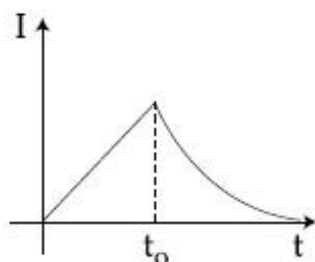
41652936125.

एक परिपथ को निम्न चित्र में दिखाया गया है :

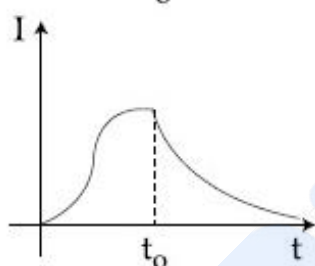


$t=0$ पर स्विच S_1 बन्द है जबकि स्विच S_2 खुला रहता है। किसी समय (t_0) के पश्चात् स्विच S_1 खुला है और S_2 बन्द है। धारा I में समय ' t ' के साथ परिवर्तन इससे दिखाया जा सकता है :

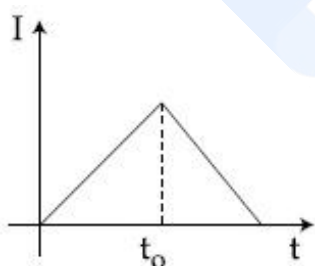
Options :



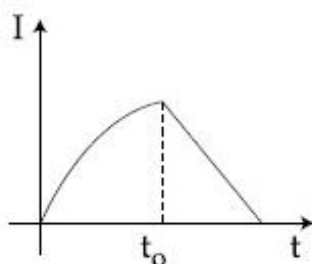
41652936122.



41652936123.



41652936124.



41652936125.

An electromagnetic wave of intensity 50 Wm^{-2} enters in a medium of refractive index 'n' without any loss. The ratio of the magnitudes of electric fields, and the ratio of the magnitudes of magnetic fields of the wave before and after entering into the medium are respectively, given by :

Options :

41652936126. $\left(\frac{1}{\sqrt{n}}, \sqrt{n} \right)$

41652936127. $\left(\sqrt{n}, \frac{1}{\sqrt{n}} \right)$

41652936128. $(\sqrt{n}, \sqrt{n})$

41652936129. $\left(\frac{1}{\sqrt{n}}, \frac{1}{\sqrt{n}} \right)$

Question Number : 22 Question Id : 4165299167 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

50 Wm^{-2} तीव्रता की एक विद्युत चुम्बकीय तरंग 'n' अपवर्तनांक के एक माध्यम में बिना किसी क्षय के प्रवेश करती है। तरंग के माध्यम में प्रवेश करने के पूर्व तथा पश्चात् विद्युत क्षेत्रों का अनुपात तथा चुम्बकीय क्षेत्रों का अनुपात क्रमशः होंगे :

Options :

41652936126. $\left(\frac{1}{\sqrt{n}}, \sqrt{n} \right)$

41652936127. $\left(\sqrt{n}, \frac{1}{\sqrt{n}} \right)$

41652936128. $(\sqrt{n}, \sqrt{n})$

41652936129. $\left(\frac{1}{\sqrt{n}}, \frac{1}{\sqrt{n}} \right)$

Correct Marks : 4 Wrong Marks : 1

An object is at a distance of 20 m from a convex lens of focal length 0.3 m. The lens forms an image of the object. If the object moves away from the lens at a speed of 5 m/s, the speed and direction of the image will be :

Options :

41652936130. 2.26×10^{-3} m/s away from the lens

41652936131. 1.16×10^{-3} m/s towards the lens

41652936132. 3.22×10^{-3} m/s towards the lens

41652936133. 0.92×10^{-3} m/s away from the lens

Question Number : 23 Question Id : 4165299168 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.3 m फोकस दूरी के एक उत्तल लेन्स से कोई वस्तु 20 m की दूरी पर है। लेन्स द्वारा वस्तु का प्रतिबिम्ब बनता है। यदि यह वस्तु लेन्स से दूर 5 m/s की चाल से जाती है तो प्रतिबिम्ब की चाल और दिशा होगी :

Options :

41652936130. 2.26×10^{-3} m/s, लेन्स से दूर

41652936131. 1.16×10^{-3} m/s, लेन्स की ओर

41652936132. 3.22×10^{-3} m/s, लेन्स की ओर

41652936133. 0.92×10^{-3} m/s, लेन्स से दूर

Question Number : 24 Question Id : 4165299169 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 a Young's double slit experiment, the path difference, at a certain point on the screen, between two interfering waves is

$\frac{1}{8}$ th of wavelength. The ratio of the intensity at this point to that at the centre of a bright fringe is close to :

Options :

41652936134. 0.74

41652936135. 0.80

41652936136. 0.85

41652936137. 0.94

Question Number : 24 Question Id : 4165299169 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यंग के द्वि-झिरी प्रयोग में, पर्दे के एक बिन्दु पर व्यतिकरण

करने वाली दो तरंगों का पथान्तर तरंगदैर्घ्य का $\frac{1}{8}$ गुना

है। इस बिन्दु पर तीव्रता तथा दीप्त फ्रिन्ज के केन्द्र पर तीव्रता का अनुपात लगभग होगा :

Options :

41652936134. 0.74

41652936135. 0.80

41652936136. 0.85

41652936137. 0.94

Question Number : 25 Question Id : 4165299170 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 deBroglie wavelength of an electron is equal to 10^{-3} times the wavelength of a photon of frequency 6×10^{14} Hz, then the speed of electron is equal to :

(Speed of light = 3×10^8 m/s

Planck's constant = 6.63×10^{-34} J.s

Mass of electron = 9.1×10^{-31} kg)

Options :

41652936138. 1.8×10^6 m/s

41652936139. 1.45×10^6 m/s

41652936140. 1.1×10^6 m/s

41652936141. 1.7×10^6 m/s

Question Number : 25 Question Id : 4165299170 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 इलेक्ट्रॉन की डी-ब्रॉग्लि तरंगदैर्घ्य 6×10^{14} Hz आवृत्ति के फोटॉन की तरंगदैर्घ्य के 10^{-3} गुना है तो इलेक्ट्रॉन की चाल होगी :
(दिया है प्रकाश की चाल $= 3 \times 10^8$ m/s
प्लांक नियतांक $= 6.63 \times 10^{-34}$ J.s
इलेक्ट्रॉन का द्रव्यमान $= 9.1 \times 10^{-31}$ kg)

Options :

41652936138. 1.8×10^6 m/s

41652936139. 1.45×10^6 m/s

41652936140. 1.1×10^6 m/s

41652936141. 1.7×10^6 m/s

Question Number : 26 Question Id : 4165299171 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 hydrogen atom, initially in the ground state is excited by absorbing a photon of wavelength $980 \text{ \AA}$. The radius of the atom in the excited state, in terms of Bohr radius a_0 , will be :
($hc = 12500 \text{ eV-}\text{\AA}$)

Options :

41652936142. $4a_0$

41652936143. $9a_0$

41652936144. $16a_0$

41652936145. $25a_0$

Question Number : 26 Question Id : 4165299171 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आरम्भिक मूल अवस्था में हाइड्रोजन परमाणु $980 \text{ \AA}$ तरंगदैर्घ्य का फोटॉन अवशोषित कर उत्तेजित हो जाता है। इस उत्तेजित स्तर में परमाणु की त्रिज्या बोर त्रिज्या a_0 के मात्रक में होगी :
($hc = 12500 \text{ eV-}\text{\AA}$)

Options :

41652936142. $4a_0$

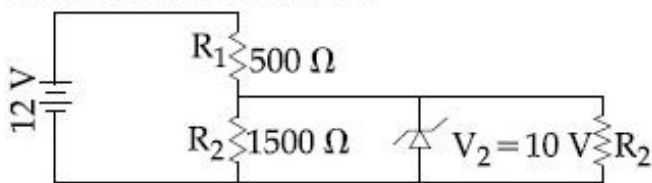
41652936143. $9a_0$

41652936144. $16a_0$

41652936145. $25a_0$

Question Number : 27 Question Id : 4165299172 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 given circuit the current through Zener Diode is close to :



Options :

41652936146. 6.7 mA

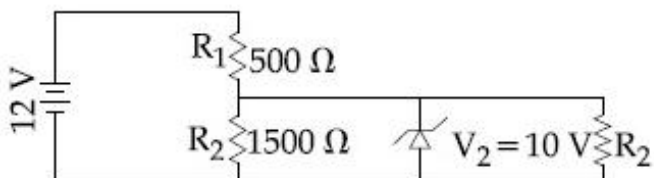
41652936147. 4.0 mA

41652936148. 0.0 mA

41652936149. 6.0 mA

Question Number : 27 Question Id : 4165299172 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 परिपथ में जेनर डायोड में धारा का लगभग मान होगा :



Options :

41652936146. 6.7 mA

41652936147. 4.0 mA

41652936148. 0.0 mA

Question Number : 28 Question Id : 4165299173 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 amplitude modulated signal is given by
 $V(t) = 10[1 + 0.3\cos(2.2 \times 10^4 t)]\sin(5.5 \times 10^5 t)$.

Here t is in seconds. The sideband frequencies (in kHz) are, [Given $\pi = 22/7$]

Options :

41652936150. 892.5 and 857.5

41652936151. 89.25 and 85.75

41652936152. 178.5 and 171.5

41652936153. 1785 and 1715

Question Number : 28 Question Id : 4165299173 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 आयाम मॉडुलित सिग्नल निम्नवत् दिया गया है

$$V(t) = 10[1 + 0.3\cos(2.2 \times 10^4 t)]\sin(5.5 \times 10^5 t)$$

यहाँ t सेकण्ड में है। पार्श्व बैंड की आवृत्तियाँ

(kHz में) होंगी : [दिया है $\pi = 22/7$]

Options :

41652936150. 892.5 तथा 857.5

41652936151. 89.25 तथा 85.75

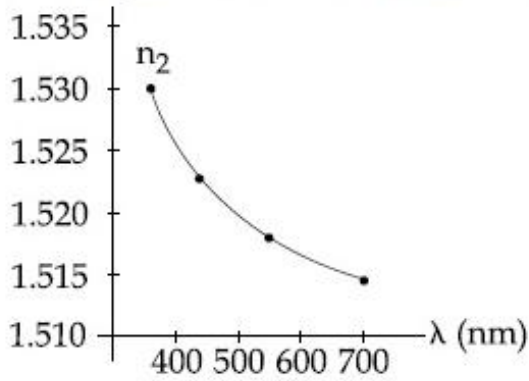
41652936152. 178.5 तथा 171.5

41652936153. 1785 तथा 1715

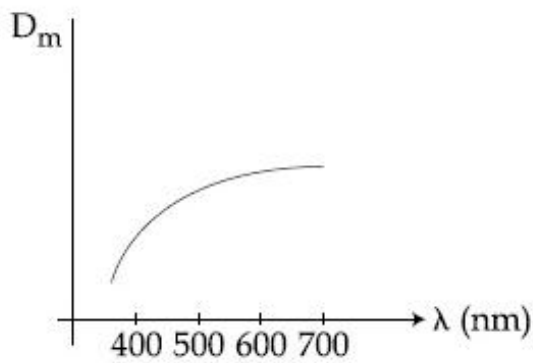
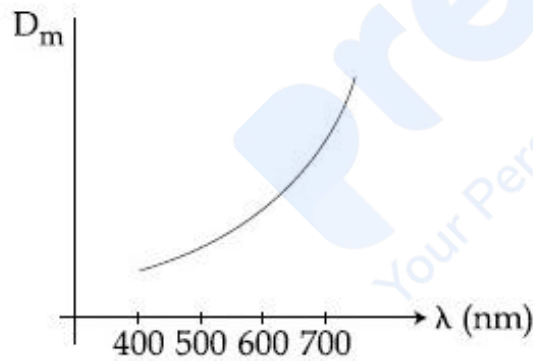
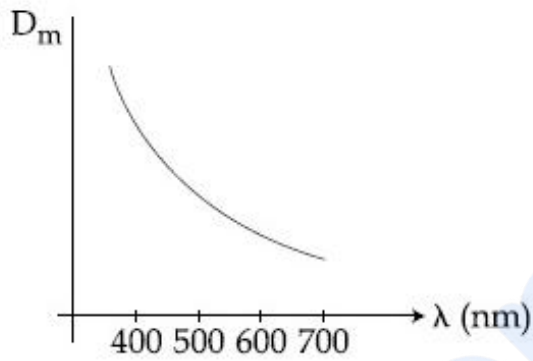
Question Number : 29 Question Id : 4165299174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
 Single Line Question Option : No Option Orientation : Vertical

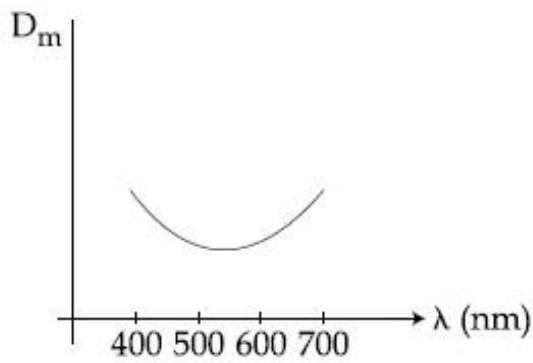
Correct Marks : 4 Wrong Marks : 1

The variation of refractive index of a crown glass thin prism with wavelength of the incident light is shown. Which of the following graphs is the correct one, if D_m is the angle of minimum deviation?



Options :



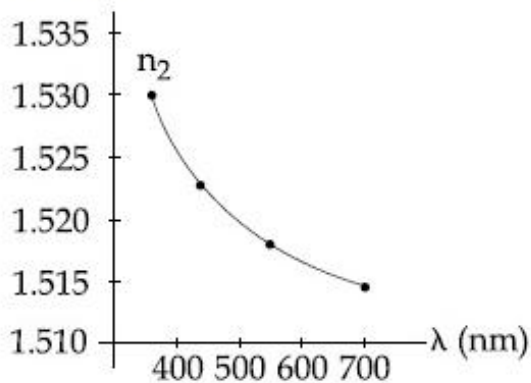


41652936157.

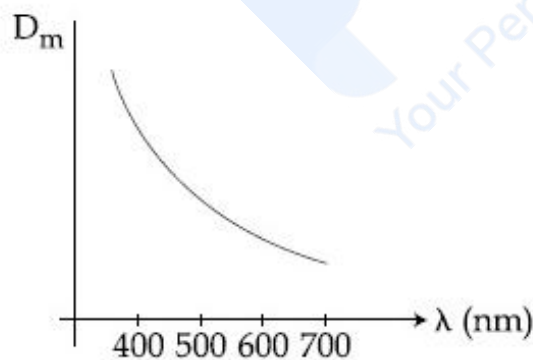
Question Number : 29 Question Id : 4165299174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

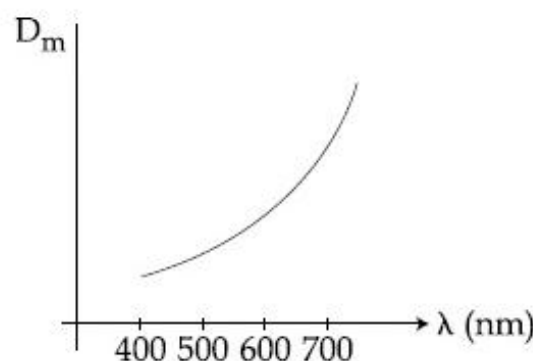
क्राऊन काँच के प्रिज्म के अपवर्तनांक परिवर्तन को आपतित प्रकाश की तरंगदैर्घ्य के साथ दिखाया गया है। यदि D_m न्यूनतम विचलन कोण है तो निम्न में से कौन सा ग्राफ सही है?



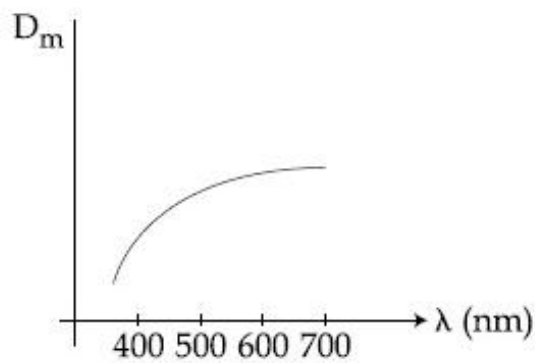
Options :



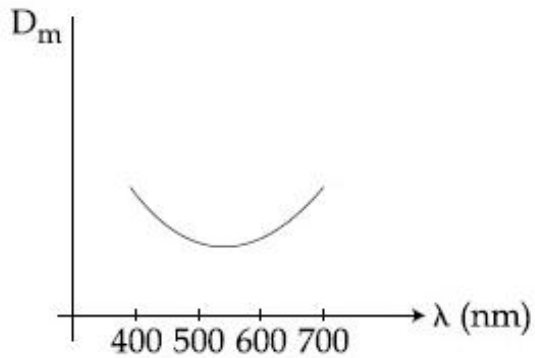
41652936154.



41652936155.



41652936156.

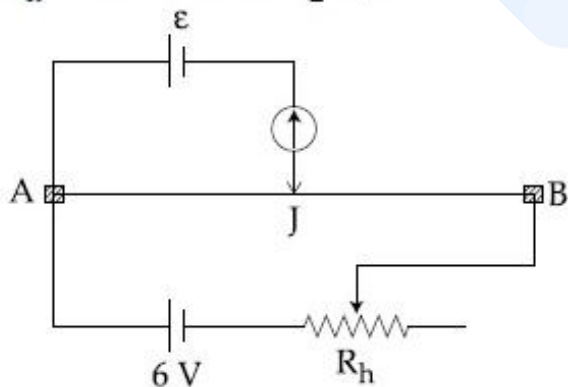


41652936157.

Question Number : 30 Question Id : 4165299175 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 resistance of the meter bridge AB in given figure is $4\ \Omega$. With a cell of emf $\varepsilon = 0.5\text{ V}$ and rheostat resistance $R_h = 2\ \Omega$ the null point is obtained at some point J. When the cell is replaced by another one of emf $\varepsilon = \varepsilon_2$ the same null point J is found for $R_h = 6\ \Omega$. The emf ε_2 is, :



Options :

41652936158. 0.3 V

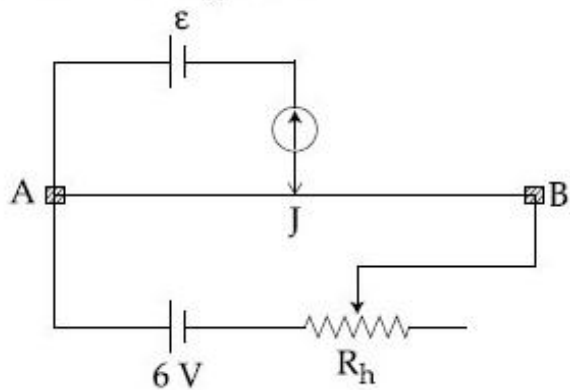
41652936159. 0.5 V

41652936160. 0.4 V

41652936161. 0.6 V

Correct Marks : 4 Wrong Marks : 1

दिये गये परिपथ में मीटर सेतु AB का प्रतिरोध 4Ω है।
वि.वा.बल $\mathcal{E} = 0.5\text{ V}$ तथा धारा नियंत्रक के प्रतिरोध $R_h = 2\Omega$ के लिये शून्य बिन्दु J पर प्राप्त होता है। जब इस सेल को वि.वा.बल $\mathcal{E} = \mathcal{E}_2$ की सेल से बदल देते हैं तो $R_h = 6\Omega$ के लिये शून्य बिन्दु पुनः J पर मिलता है। वि.वा.बल $\mathcal{E}_2$ होगा :



Options :

41652936158. 0.3 V

41652936159. 0.5 V

41652936160. 0.4 V

41652936161. 0.6 V

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

Chemistry

416529128

2

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

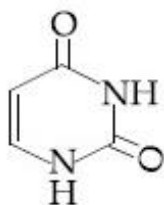
416529137

Question Shuffling Allowed :

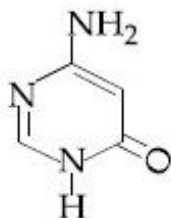
Yes

Among the following compounds, which one is found in RNA ?

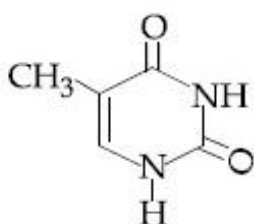
Options :



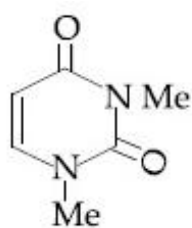
41652936162.



41652936163.



41652936164.



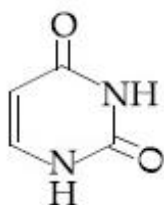
41652936165.

Question Number : 31 Question Id : 4165299176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

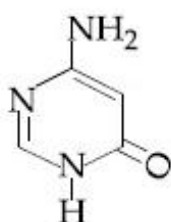
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित यौगिकों में से कौन सा एक RNA में पाया जाता है ?

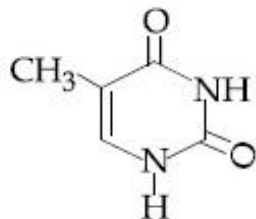
Options :



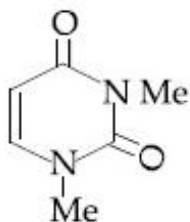
41652936162.



41652936163.



41652936164.

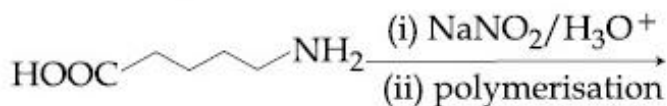


41652936165.

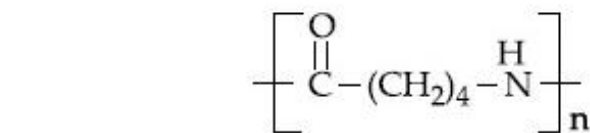
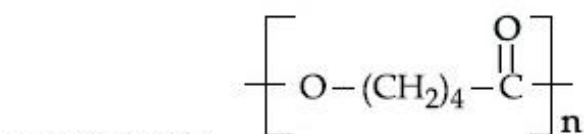
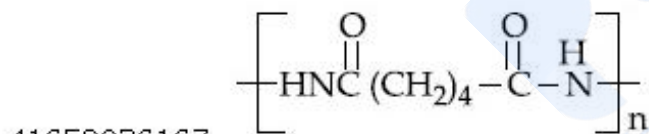
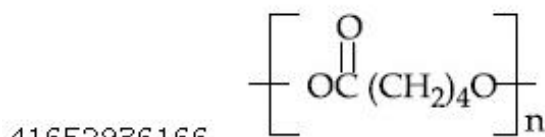
Question Number : 32 Question Id : 4165299177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The polymer obtained from the following reactions is :



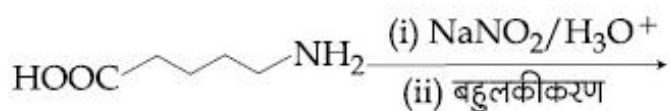
Options :



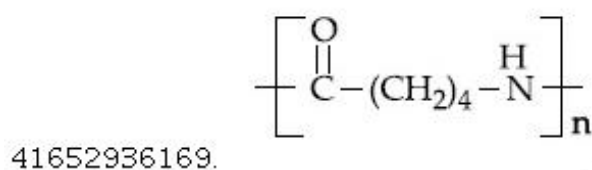
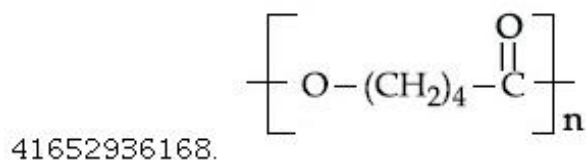
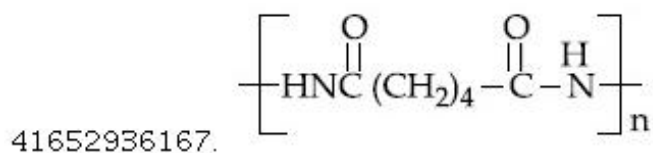
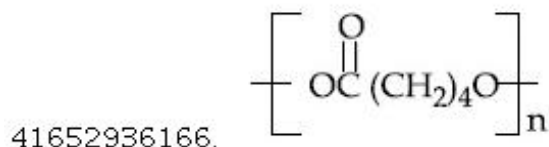
Question Number : 32 Question Id : 4165299177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं से प्राप्त होने वाला बहुलक है :



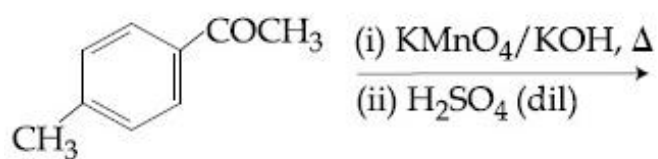
Options :



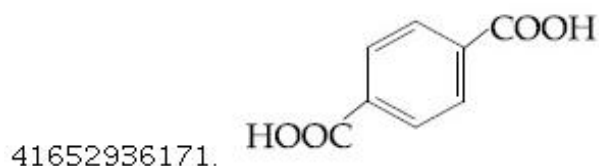
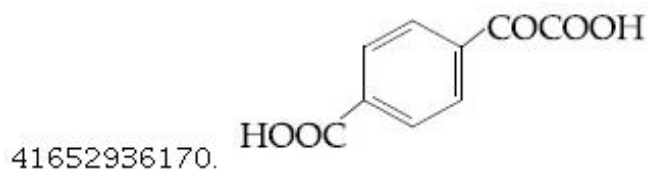
Question Number : 33 Question Id : 4165299178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

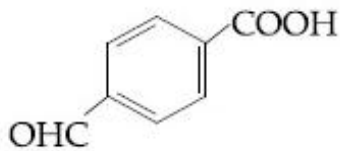
The major product of the following reaction is



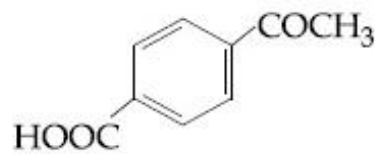
Options :



41652936172.

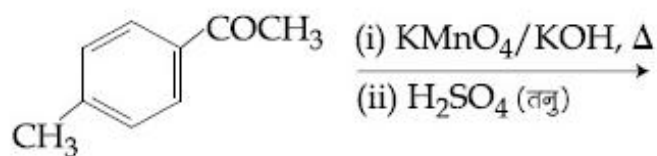


41652936173.



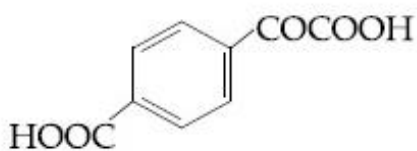
Question Number : 33 Question Id : 4165299178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :

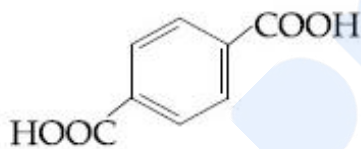


Options :

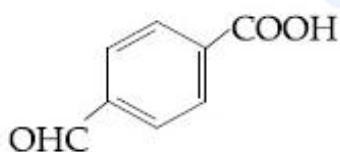
41652936170.



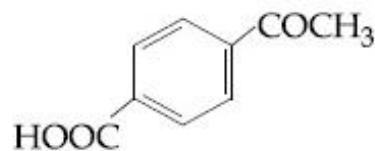
41652936171.



41652936172.

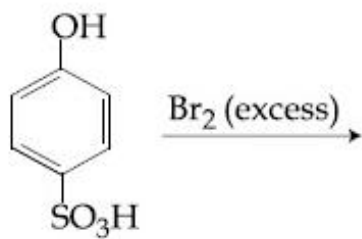


41652936173.



Question Number : 34 Question Id : 4165299179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

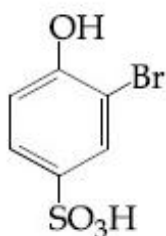
The major product of the following reaction is :



Options :



41652936174.



41652936175.



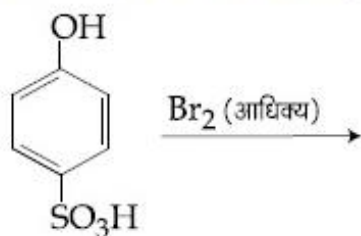
41652936176.



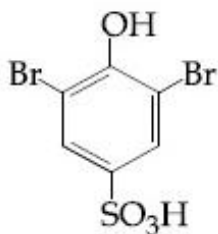
41652936177.

Question Number : 34 Question Id : 4165299179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

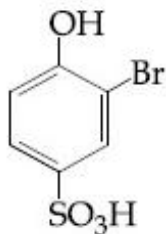
निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



Options :



41652936174.



41652936175.



41652936176.

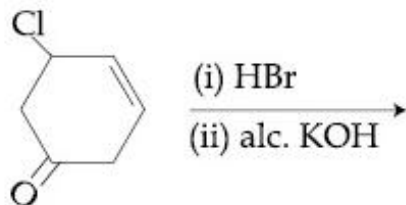


41652936177.

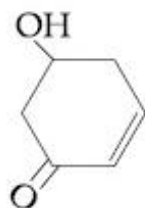
Question Number : 35 Question Id : 4165299180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

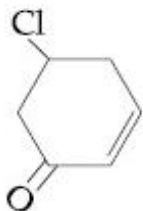


Options :



41652936178.

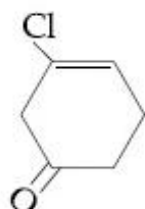
41652936179.



41652936180.



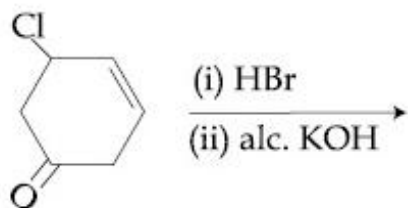
41652936181.



Question Number : 35 Question Id : 4165299180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

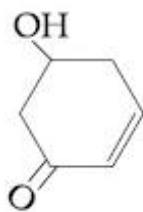
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :

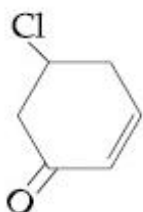


Options :

41652936178.

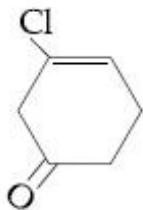


41652936179.



41652936180.



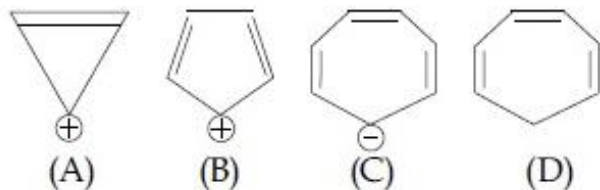


41652936181.

Question Number : 36 Question Id : 4165299181 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 compound (s) out of the following is/are not aromatic ?



Options :

41652936182. (B)

41652936183. (A) and (C)

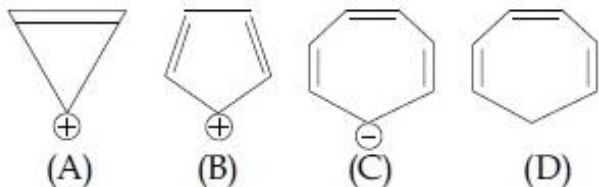
41652936184. (B), (C) and (D)

41652936185. (C) and (D)

Question Number : 36 Question Id : 4165299181 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 में से कौन सा/से यौगिक ऐरोमैटिक नहीं है/हैं ?



Options :

41652936182. (B)

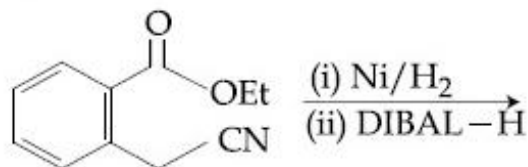
41652936183. (A) तथा (C)

41652936184. (B), (C) तथा (D)

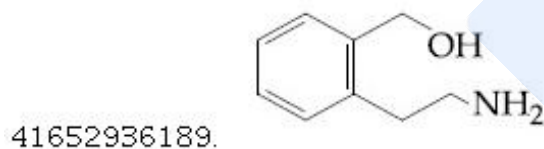
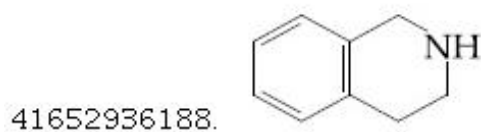
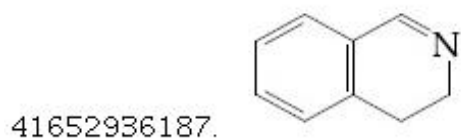
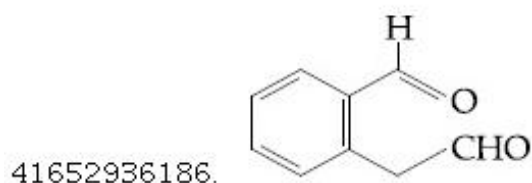
41652936185. (C) तथा (D)

Question Number : 37 Question Id : 4165299182 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 :

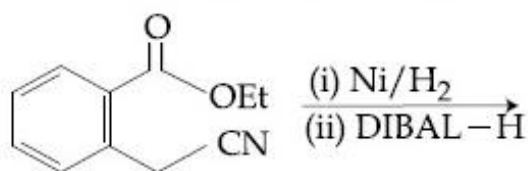


Options :

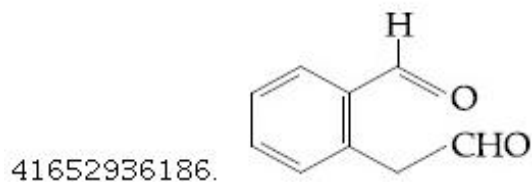


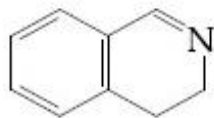
Question Number : 37 Question Id : 4165299182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया से प्राप्त होनेवाला मुख्य उत्पाद है :

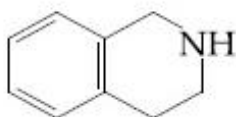


Options :

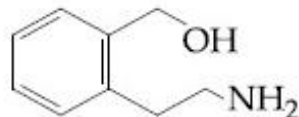




41652936187.



41652936188.



41652936189.

Question Number : 38 Question Id : 4165299183 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 match between items I and II is :

Item - I (Mixture)	Item - II (Seperation method)
(A) H_2O : Sugar	(P) Sublimation
(B) H_2O : Aniline	(Q) Recrystallization
(C) H_2O : Toluene	(R) Steam distillation
	(S) Differential extraction

Options :

41652936190. (A)→(R); (B)→(P); (C)→(S)

41652936191. (A)→(S); (B)→(R); (C)→(P)

41652936192. (A)→(Q); (B)→(R); (C)→(S)

41652936193. (A)→(Q); (B)→(R); (C)→(P)

Question Number : 38 Question Id : 4165299183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

मदों I तथा II के बीच सही सुमेल है :

मद I (मिश्रण)	मद II (पृथक्करण विधि)
(A) H_2O : शर्करा	(P) ऊर्ध्वपातन
(B) H_2O : एनिलीन	(Q) पुनः क्रिस्टलन
(C) H_2O : टॉलूईन	(R) भाप आसवन
	(S) प्रभाजी आसवन

Options :

41652936190. (A)→(R); (B)→(P); (C)→(S)

41652936191. (A)→(S); (B)→(R); (C)→(P)

41652936192. (A)→(Q); (B)→(R); (C)→(S)

41652936193. (A)→(Q); (B)→(R); (C)→(P)

Question Number : 39 Question Id : 4165299184 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 match between item (I) and item (II) is :

Item - I	Item - II
(A) Norethindrone	(P) Anti-biotic
(B) Ofloxacin	(Q) Anti-fertility
(C) Equanil	(R) Hypertension
	(S) Analgesics

Options :

41652936194. (A)→(R); (B)→(P); (C)→(S)

41652936195. (A)→(R); (B)→(P); (C)→(R)

41652936196. (A)→(Q); (B)→(R); (C)→(S)

41652936197. (A)→(Q); (B)→(P); (C)→(R)

Question Number : 39 Question Id : 4165299184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

मदों (I) तथा (II) के बीच सही सुमेल है :

मद I	मद II
(A) नॉरएथिनड्रान	(P) प्रतिजैविक
(B) आफ्लोक्सासिन	(Q) प्रतिजनन क्षमता
(C) इक्वैनिल	(R) अतितनाव
	(S) पीड़ाहारी

Options :

41652936194. (A)→(R); (B)→(P); (C)→(S)

41652936195. (A)→(R); (B)→(P); (C)→(R)

41652936196. (A)→(Q); (B)→(R); (C)→(S)

41652936197. (A)→(Q); (B)→(P); (C)→(R)

Question Number : 40 Question Id : 4165299185 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 is estimated through Dumus method and was found to evolve 6 moles of CO_2 , 4 moles of H_2O and 1 mole of nitrogen gas. The formula of the compound is :

Options :

41652936198. $\text{C}_{12}\text{H}_8\text{N}_2$

41652936199. $\text{C}_{12}\text{H}_8\text{N}$

41652936200. $\text{C}_6\text{H}_8\text{N}_2$

41652936201. $\text{C}_6\text{H}_8\text{N}$

Question Number : 40 Question Id : 4165299185 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 का ड्यूमा विधि से आकलन करने पर पाया गया कि 6 मोल CO_2 , 4 मोल H_2O तथा 1 मोल नाइट्रोजन उत्सर्जित होते हैं। इस यौगिक का सूत्र है :

Options :

41652936198. $\text{C}_{12}\text{H}_8\text{N}_2$

41652936199. $C_{12}H_8N$

41652936200. $C_6H_8N_2$

41652936201. C_6H_8N

Question Number : 41 Question Id : 4165299186 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 atomic radii of C, Cs, Al, and S is :

Options :

41652936202. $S < C < Cs < Al$

41652936203. $C < S < Al < Cs$

41652936204. $C < S < Cs < Al$

41652936205. $S < C < Al < Cs$

Question Number : 41 Question Id : 4165299186 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, Cs, Al एवं S के परमाण्वीय त्रिज्याओं का सही अनुक्रम है :

Options :

41652936202. $S < C < Cs < Al$

41652936203. $C < S < Al < Cs$

41652936204. $C < S < Cs < Al$

41652936205. $S < C < Al < Cs$

Question Number : 42 Question Id : 4165299187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Match the ores (column A) with the metals (column B) :

(Column A)	(Column B)
Ores	Metals
(I) Siderite	(a) Zinc
(II) Kaolinite	(b) Copper
(III) Malachite	(c) Iron
(IV) Calamine	(d) Aluminium

Options :

41652936206. (I) - (a); (II) - (b); (III) - (c); (IV) - (d)

41652936207. (I) - (c); (II) - (d); (III) - (b); (IV) - (a)

41652936208. (I) - (b); (II) - (c); (III) - (d); (IV) - (a)

41652936209. (I) - (c); (II) - (d); (III) - (a); (IV) - (b)

Question Number : 42 Question Id : 4165299187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अयस्कों (कालम A) को धातुओं (कालम B) के साथ सुमेलित कीजिए :

(कालम A)	(कालम B)
अयस्क	धातु
(I) सिडेराइट	(a) जिंक
(II) केओलिनाइट	(b) कॉपर
(III) मैलेकाइट	(c) आयरन
(IV) कैलामाइन	(d) एल्यूमीनियम

Options :

41652936206. (I) - (a); (II) - (b); (III) - (c); (IV) - (d)

41652936207. (I) - (c); (II) - (d); (III) - (b); (IV) - (a)

41652936208. (I) - (b); (II) - (c); (III) - (d); (IV) - (a)

41652936209. (I) - (c); (II) - (d); (III) - (a); (IV) - (b)

Question Number : 43 Question Id : 4165299188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

NaH is an example of :

Options :

41652936210. metallic hydride

41652936211. molecular hydride

41652936212. saline hydride

41652936213. electron-rich hydride

Question Number : 43 Question Id : 4165299188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

NaH एक उदाहरण है :

Options :

41652936210. धात्विक हाइड्राइड का

41652936211. आण्विक हाइड्राइड का

41652936212. लवण हाइड्राइड का

41652936213. इलेक्ट्रॉन-धनी हाइड्राइड का

Question Number : 44 Question Id : 4165299189 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 statements among (a) to (d) regarding H_2 as a fuel are :

- (a) It produces less pollutants than petrol.
- (b) A cylinder of compressed dihydrogen weighs ~30 times more than a petrol tank producing the same amount of energy.
- (c) Dihydrogen is stored in tanks of metal alloys like $NaNi_5$.
- (d) On combustion, values of energy released per gram of liquid dihydrogen and LPG are 50 and 142 kJ, respectively.

Options :

41652936214. (a) and (c) only

41652936215. (b), (c) and (d) only

41652936216. (b) and (d) only

41652936217. (a), (b) and (c) only

Question Number : 44 Question Id : 4165299189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ईंधन के रूप में H_2 के बारे में, (a) से (d) में से सही कथन हैं :

- (a) यह पेट्रोल की अपेक्षा कम प्रदूषकों को बनाता है।
- (b) उसी मात्रा की ऊर्जा उत्पन्न करने के लिए एक पेट्रोल टैंक की तुलना में एक संपीड़ित डाइहाइड्रोजन का सिलिंडर ~30 गुना अधिक भारी होता है।
- (c) डाइहाइड्रोजन को $NaNH_2$ की तरह के धातु मिश्रण के टैंक में रखा जाता है।
- (d) दहन के उपरांत, प्रति ग्राम द्रवित डाइहाइड्रोजन तथा LPG से उत्सर्जित ऊर्जा के मान क्रमशः 50 तथा 142 kJ हैं।

Options :

41652936214. (a) तथा (c) मात्र

41652936215. (b), (c) तथा (d) मात्र

41652936216. (b) तथा (d) मात्र

41652936217. (a), (b) तथा (c) मात्र

Question Number : 45 Question Id : 4165299190 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 amphoteric hydroxide is :

Options :

41652936218. $Be(OH)_2$

41652936219. $Mg(OH)_2$

41652936220. $Ca(OH)_2$

41652936221. $\text{Sr}(\text{OH})_2$

Question Number : 45 Question Id : 4165299190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

उभयधर्मी हाइड्रॉक्साइड है :

Options :

41652936218. $\text{Be}(\text{OH})_2$

41652936219. $\text{Mg}(\text{OH})_2$

41652936220. $\text{Ca}(\text{OH})_2$

41652936221. $\text{Sr}(\text{OH})_2$

Question Number : 46 Question Id : 4165299191 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 chloride that CANNOT get hydrolysed
is :

Options :

41652936222. CCl_4

41652936223. SiCl_4

41652936224. SnCl_4

41652936225. PbCl_4

Question Number : 46 Question Id : 4165299191 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्लोराइड जिसका जल-अपघटन नहीं हो सकता है,
वह है :

Options :

41652936222. CCl_4

41652936223. SiCl_4

41652936224. SnCl_4



41652936225.

Question Number : 47 Question Id : 4165299192 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 element that usually does NOT show variable oxidation states is :

Options :

41652936226. Sc

41652936227. Cu

41652936228. Ti

41652936229. V

Question Number : 47 Question Id : 4165299192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सामान्य रूप से परिवर्तनीय आक्सीकरण अवस्था नहीं
प्रदर्शित करने वाला तत्व है :

Options :

41652936226. Sc

41652936227. Cu

41652936228. Ti

41652936229. V

Question Number : 48 Question Id : 4165299193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Match the metals (column I) with the coordination compound(s)/enzyme(s) (column II) :

(column I)	(column II)
Metals	Coordination compound(s)/enzyme(s)
(A) Co	(i) Wilkinson catalyst
(B) Zn	(ii) Chlorophyll
(C) Rh	(iii) Vitamin B ₁₂
(D) Mg	(iv) Carbonic anhydrase

Options :

41652936230. (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)

41652936231. (A)-(iv); (B)-(iii); (C)-(i); (D)-(ii)

41652936232. (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)

41652936233. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

Question Number : 48 Question Id : 4165299193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

धातुओं (कालम I) को उपसहसंयोजन यौगिकों/
एन्जाइम (कालम II) के साथ सुमेलित कीजिए :

(कालम I) (कालम II)

धातु	उपसहसंयोजन यौगिक/एन्जाइम
(A) Co	(i) विलिंकसन उत्प्रेरक
(B) Zn	(ii) क्लोरोफिल
(C) Rh	(iii) विटामिन B ₁₂
(D) Mg	(iv) कार्बोनिक एन्हाइड्रेज

Options :

41652936230. (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)

41652936231. (A)-(iv); (B)-(iii); (C)-(i); (D)-(ii)

41652936232. (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)

41652936233. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

Question Number : 49 Question Id : 4165299194 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 concentration of dissolved oxygen
(DO) in cold water can go upto :

Options :

41652936234. 8 ppm

41652936235. 10 ppm

41652936236. 14 ppm

41652936237. 16 ppm

Question Number : 49 Question Id : 4165299194 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ठंडे जल में घुलित ऑक्सीजन (DO) के सान्द्रता की
ऊपरी सीमा हो सकती है :

Options :

41652936234. 8 ppm

41652936235. 10 ppm

41652936236. 14 ppm

41652936237. 16 ppm

Question Number : 50 Question Id : 4165299195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Peroxyacetyl nitrate (PAN), an eye irritant
is produced by :

Options :

41652936238. acid rain

41652936239. organic waste

41652936240. photochemical smog

41652936241. classical smog

Question Number : 50 Question Id : 4165299195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पराक्सीएसीटाइल नाइट्रेट (PAN), एक नेत्र उत्तेजक,
निम्नलिखित में से किससे उत्पन्न होता है?

Options :

41652936238. अम्ल वर्षा

41652936239. कार्बनिक अपशिष्ट

41652936240. प्रकाश रासायनिक धूमकुहा

41652936241.

Question Number : 51 Question Id : 4165299196 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 10 mg effervescent tablet containing sodium bicarbonate and oxalic acid releases 0.25 ml of CO_2 at $T = 298.15 \text{ K}$ and $p = 1 \text{ bar}$. If molar volume of CO_2 is 25.0 L under such condition, what is the percentage of sodium bicarbonate in each tablet ?

[Molar mass of $\text{NaHCO}_3 = 84 \text{ g mol}^{-1}$]

Options :

41652936242. 8.4

41652936243. 0.84

41652936244. 16.8

41652936245. 33.6

Question Number : 51 Question Id : 4165299196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सोडियम बाइकार्बोनेट तथा आक्सैलिक अम्ल युक्त एक 10 mg का बुदबुदाने वाला टैबलेट $T = 298.15 \text{ K}$ तथा $p = 1 \text{ bar}$ पर 0.25 ml CO_2 उत्सर्जित करता है। ऐसी दशा में, यदि CO_2 का मोलर आयतन 25.0 L है, तो प्रत्येक टैबलेट में सोडियम बाइकार्बोनेट का क्या प्रतिशत है? (NaHCO_3 का मोलर द्रव्यमान = 84 g mol^{-1})

Options :

41652936242. 8.4

41652936243. 0.84

41652936244. 16.8

41652936245. 33.6

Question Number : 52 Question Id : 4165299197 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 having density of $9 \times 10^3 \text{ kg m}^{-3}$ forms face centred cubic crystals of edge length $200\sqrt{2} \text{ pm}$. What is the molar mass of the solid ?

[Avogadro constant $\cong 6 \times 10^{23} \text{ mol}^{-1}$, $\pi \cong 3$]

Options :

41652936246. $0.0432 \text{ kg mol}^{-1}$

41652936247. $0.4320 \text{ kg mol}^{-1}$

41652936248. $0.0216 \text{ kg mol}^{-1}$

41652936249. $0.0305 \text{ kg mol}^{-1}$

Question Number : 52 Question Id : 4165299197 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 ठोस, जिसका घनत्व $9 \times 10^3 \text{ kg m}^{-3}$ है, फलक केन्द्रित घनीय क्रिस्टल बनाता है जिसके कोर की लम्बाई $200\sqrt{2} \text{ pm}$ है। ठोस का मोलर द्रव्यमान क्या है?
[अवागाद्रो नियतांक $\cong 6 \times 10^{23} \text{ mol}^{-1}$, $\pi \cong 3$]

Options :

41652936246. $0.0432 \text{ kg mol}^{-1}$

41652936247. $0.4320 \text{ kg mol}^{-1}$

41652936248. $0.0216 \text{ kg mol}^{-1}$

41652936249. $0.0305 \text{ kg mol}^{-1}$

Question Number : 53 Question Id : 4165299198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Heat treatment of muscular pain involves radiation of wavelength of about 900 nm . Which spectral line of H-atom is suitable for this purpose ?

[$R_H = 1 \times 10^5 \text{ cm}^{-1}$, $h = 6.6 \times 10^{-34} \text{ Js}$,
 $c = 3 \times 10^8 \text{ ms}^{-1}$]

Options :

41652936250. Lyman, $\infty \rightarrow 1$

41652936251. Balmer, $\infty \rightarrow 2$

41652936252. Paschen, $5 \rightarrow 3$

41652936253. Paschen, $\infty \rightarrow 3$

Question Number : 53 Question Id : 4165299198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

मांसपेशीय दर्द के ऊष्मा उपचार के लिए लगभग 900 nm के तरंगदैर्घ्य के विकिरण का उपयोग होता है। इसके लिए H-परमाणु की कौनसी स्पेक्ट्रल लाइन उपयुक्त है?

$$[R_H = 1 \times 10^5 \text{ cm}^{-1}, h = 6.6 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ ms}^{-1}]$$

Options :

41652936250. लाईमैन, $\infty \rightarrow 1$

41652936251. बामर, $\infty \rightarrow 2$

41652936252. पाशन, $5 \rightarrow 3$

41652936253. पाशन, $\infty \rightarrow 3$

Question Number : 54 Question Id : 4165299199 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 chemical reaction $X \rightleftharpoons Y$, the standard reaction Gibbs energy depends on temperature T (in K) as

$$\Delta_r G^\circ (\text{in kJ mol}^{-1}) = 120 - \frac{3}{8} T.$$

The major component of the reaction mixture at T is :

Options :

41652936254. X if $T = 350 \text{ K}$

41652936255. Y if $T = 300 \text{ K}$

41652936256. X if $T = 315 \text{ K}$

41652936257. Y if $T = 280 \text{ K}$

Correct Marks : 4 Wrong Marks : 1

रासायनिक अभिक्रिया $X \rightleftharpoons Y$ के लिए, मानक अभिक्रिया गिब्स ऊर्जा ताप (K में) पर निम्नलिखित की तरह आश्रित होती है :

$$\Delta_r G^\circ \text{ (in kJ mol}^{-1}\text{)} = 120 - \frac{3}{8} T$$

अभिक्रिया मिश्रण का मुख्य संघटक T पर है :

Options :

41652936254. X यदि $T = 350 \text{ K}$

41652936255. Y यदि $T = 300 \text{ K}$

41652936256. X यदि $T = 315 \text{ K}$

41652936257. Y यदि $T = 280 \text{ K}$

Question Number : 55 Question Id : 4165299200 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 blocks of the same metal having same mass and at temperature T_1 and T_2 , respectively, are brought in contact with each other and allowed to attain thermal equilibrium at constant pressure. The change in entropy, ΔS , for this process is :

Options :

41652936258. $2C_p \ln \left(\frac{T_1 + T_2}{4T_1 T_2} \right)$

41652936259. $C_p \ln \left[\frac{(T_1 + T_2)^2}{4T_1 T_2} \right]$

41652936260. $2C_p \ln \left[\frac{T_1 + T_2}{2T_1 T_2} \right]$

$$2C_p \ln \left[\frac{(T_1 + T_2)^{\frac{1}{2}}}{T_1 T_2} \right]$$

41652936261.

Question Number : 55 Question Id : 4165299200 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 धातु के समान संहति वाले दो ब्लॉकों को क्रमशः ताप T_1 तथा T_2 पर परस्पर एक दूसरे के सम्पर्क में लाया गया तथा नियत दाब पर ऊष्मीय साम्य प्राप्त करने दिया गया। इस प्रक्रम में, एन्ट्रॉपी परिवर्तन ΔS है :

Options :

$$2C_p \ln \left(\frac{T_1 + T_2}{4T_1 T_2} \right)$$

41652936258.

$$C_p \ln \left[\frac{(T_1 + T_2)^2}{4T_1 T_2} \right]$$

41652936259.

$$2C_p \ln \left[\frac{T_1 + T_2}{2T_1 T_2} \right]$$

41652936260.

$$2C_p \ln \left[\frac{(T_1 + T_2)^{\frac{1}{2}}}{T_1 T_2} \right]$$

41652936261.

Question Number : 56 Question Id : 4165299201 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 freezing point of a diluted milk sample is found to be -0.2°C , while it should have been -0.5°C for pure milk. How much water has been added to pure milk to make the diluted sample ?

Options :

41652936262. 1 cup of water to 2 cups of pure milk

41652936263. 2 cups of water to 3 cups of pure milk

41652936264. 3 cups of water to 2 cups of pure milk

41652936265. 1 cup of water to 3 cups of pure milk

Question Number : 56 Question Id : 4165299201 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 तनुकृत दुग्ध प्रतिदर्श का हिमांक -0.2°C पाया गया, जबकि विशुद्ध दुग्ध का हिमांक -0.5°C होना चाहिए। तनुकृत दुग्ध प्रतिदर्श को बनाने के लिए विशुद्ध दुग्ध में कितना जल मिलाया गया है?

Options :

41652936262. 2 कप विशुद्ध दुग्ध में 1 कप जल

41652936263. 3 कप विशुद्ध दुग्ध में 2 कप जल

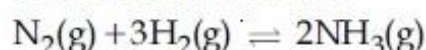
41652936264. 2 कप विशुद्ध दुग्ध में 3 कप जल

41652936265. 3 कप विशुद्ध दुग्ध में 1 कप जल

Question Number : 57 Question Id : 4165299202 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the reaction



The equilibrium constant of the above reaction is K_p . If pure ammonia is left to dissociate, the partial pressure of ammonia at equilibrium is given by (Assume that

$P_{\text{NH}_3} \ll P_{\text{total}}$ at equilibrium)

Options :

41652936266. $\frac{K_p^{1/2} P^2}{16}$

41652936267. $\frac{3^{3/2} K_p^{1/2} P^2}{4}$

41652936268.

$$\frac{K_p^{1/2} P^2}{4}$$

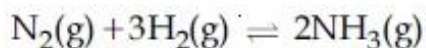
41652936269.

$$\frac{3^{3/2} K_p^{1/2} P^2}{16}$$

Question Number : 57 Question Id : 4165299202 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 पर विचार कीजिए :



उपर्युक्त अभिक्रिया का साम्य स्थिरांक K_p है। यदि विशुद्ध अमोनिया को वियोजित होने दिया जाता है, तो साम्यावस्था पर अमोनिया का आंशिक दाब है :

(मान लीजिए साम्यावस्था पर $P_{\text{NH}_3} \ll P_{\text{सम्पूर्ण}}$)

Options :

41652936266.

$$\frac{K_p^{1/2} P^2}{16}$$

41652936267.

$$\frac{3^{3/2} K_p^{1/2} P^2}{4}$$

41652936268.

$$\frac{K_p^{1/2} P^2}{4}$$

41652936269.

$$\frac{3^{3/2} K_p^{1/2} P^2}{16}$$

Question Number : 58 Question Id : 4165299203 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 cell $\text{Zn(s)}|\text{Zn}^{2+}(\text{aq})||\text{M}^{x+}(\text{aq})|\text{M(s)}$, different half cells and their standard electrode potentials are given below :

$\text{M}^{x+}(\text{aq})/\text{M(s)}$	$\text{Au}^{3+}(\text{aq})/\text{Au(s)}$	$\text{Ag}^{+}(\text{aq})/\text{Ag(s)}$	$\text{Fe}^{3+}(\text{aq})/\text{Fe}^{2+}(\text{aq})$	$\text{Fe}^{2+}(\text{aq})/\text{Fe(s)}$
$E^\circ_{\text{M}^{x+}/\text{M}}(\text{V})$	1.40	0.80	0.77	-0.44

If $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$, which cathode will give a maximum value of E°_{cell} per electron transferred ?

Options :

41652936270. Au^{3+}/Au

41652936271. Ag^{+}/Ag

41652936272. $\text{Fe}^{3+}/\text{Fe}^{2+}$

41652936273. Fe^{2+}/Fe

Question Number : 58 Question Id : 4165299203 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

सेल $\text{Zn(s)}|\text{Zn}^{2+}(\text{aq})||\text{M}^{x+}(\text{aq})|\text{M(s)}$ के लिए विभिन्न अर्द्ध-सेल तथा उनके मानक इलेक्ट्रोड विभव नीचे दिये गये हैं

$\text{M}^{x+}(\text{aq})/\text{M(s)}$	$\text{Au}^{3+}(\text{aq})/\text{Au(s)}$	$\text{Ag}^{+}(\text{aq})/\text{Ag(s)}$	$\text{Fe}^{3+}(\text{aq})/\text{Fe}^{2+}(\text{aq})$	$\text{Fe}^{2+}(\text{aq})/\text{Fe(s)}$
$E^\circ_{\text{M}^{x+}/\text{M}}(\text{V})$	1.40	0.80	0.77	-0.44

यदि $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$, तो प्रति इलेक्ट्रॉन स्थानांतरण के लिए कौन से कैथोड का E°_{cell} सर्वाधिक होगा :

Options :

41652936270. Au^{3+}/Au

41652936271. Ag^{+}/Ag

41652936272. $\text{Fe}^{3+}/\text{Fe}^{2+}$

41652936273. Fe^{2+}/Fe

Question Number : 59 Question Id : 4165299204 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 a reaction follows the Arrhenius equation, the plot $\ln k$ vs $\frac{1}{RT}$ gives straight line with a gradient $(-y)$ unit. The energy required to activate the reactant is :

Options :

41652936274. yR unit

41652936275. y unit

41652936276. $-y$ unit

41652936277. y/R unit

Question Number : 59 Question Id : 4165299204 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 एक अभिक्रिया आर्हेनियस समीकरण का अनुसरण करती है, तो प्लॉट $\ln k$ vs $\frac{1}{RT}$, तो प्रवणता $(-y)$ मात्रक के साथ एक सीधी रेखा देता है। अभिकारकों को सक्रिय करने के लिए आवश्यक ऊर्जा है :

Options :

41652936274. yR मात्रक

41652936275. y मात्रक

41652936276. $-y$ मात्रक

41652936277. y/R मात्रक

Question Number : 60 Question Id : 4165299205 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 example of solid sol is :

Options :

41652936278. Gem stones

41652936279. Paint

41652936280. Butter

41652936281. Hair cream

Question Number : 60 Question Id : 4165299205 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

ठोस सॉल किसका एक उदाहरण है?

Options :

41652936278. जेम स्टोन

41652936279. पेन्ट

41652936280. मक्खन

41652936281. हेयर क्रीम

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

Mathematics

416529129

3

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

416529138

Question Shuffling Allowed :

Yes

Question Number : 61 Question Id : 4165299206 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 $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = \frac{x}{1+x^2}$,

$x \in \mathbb{R}$. Then the range of f is :

Options :

41652936282. $\mathbb{R} - \left[-\frac{1}{2}, \frac{1}{2} \right]$

41652936283. $\mathbb{R} - [-1, 1]$

41652936284. $(-1, 1) - \{0\}$

41652936285. $\left[-\frac{1}{2}, \frac{1}{2}\right]$

Question Number : 61 Question Id : 4165299206 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 $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = \frac{x}{1+x^2}$, $x \in \mathbb{R}$ द्वारा परिभाषित

किया गया है, तो f का परिसर है :

Options :

41652936282. $\mathbb{R} - \left[-\frac{1}{2}, \frac{1}{2}\right]$

41652936283. $\mathbb{R} - [-1, 1]$

41652936284. $(-1, 1) - \{0\}$

41652936285. $\left[-\frac{1}{2}, \frac{1}{2}\right]$

Question Number : 62 Question Id : 4165299207 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 one real root of the quadratic equation
 $81x^2 + kx + 256 = 0$ is cube of the other root,
then a value of k is :

Options :

41652936286. -300

41652936287. 100

41652936288. 144

41652936289. -81

Correct Marks : 4 Wrong Marks : 1

यदि द्विघात समीकरण $81x^2 + kx + 256 = 0$ का एक मूल दूसरे मूल का घन (cube) है, तो k का एक मान है :

Options :

41652936286. -300

41652936287. 100

41652936288. 144

41652936289. -81

Question Number : 63 Question Id : 4165299208 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 $\left(-2 - \frac{1}{3}i\right)^3 = \frac{x+iy}{27}$ ($i = \sqrt{-1}$), where

x and y are real numbers, then $y - x$ equals :

Options :

41652936290. 91

41652936291. 85

41652936292. -91

41652936293. -85

Question Number : 63 Question Id : 4165299208 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 $\left(-2 - \frac{1}{3}i\right)^3 = \frac{x+iy}{27}$ ($i = \sqrt{-1}$), जहाँ

x तथा y वास्तविक संख्यायें हैं, तो $y - x$ बराबर है :

Options :

41652936290. 91

41652936291. 85

41652936292. -91

Question Number : 64 Question Id : 4165299209 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 $A = \begin{pmatrix} 0 & 2q & r \\ p & q & -r \\ p & -q & r \end{pmatrix}$. If $AA^T = I_3$, then

$|p|$ is :

Options :

41652936294. $\frac{1}{\sqrt{2}}$

41652936295. $\frac{1}{\sqrt{3}}$

41652936296. $\frac{1}{\sqrt{5}}$

41652936297. $\frac{1}{\sqrt{6}}$

Question Number : 64 Question Id : 4165299209 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 $A = \begin{pmatrix} 0 & 2q & r \\ p & q & -r \\ p & -q & r \end{pmatrix}$. यदि $AA^T = I_3$, तो

$|p|$ बराबर है :

Options :

41652936294. $\frac{1}{\sqrt{2}}$

41652936295. $\frac{1}{\sqrt{3}}$

41652936296. $\frac{1}{\sqrt{5}}$

$$\frac{1}{\sqrt{6}}$$

41652936297.

Question Number : 65 Question Id : 4165299210 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 system of linear equations

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

$$3x - y + 5z = b$$

$$x - 3y + 2z = c$$

where a, b, c are non-zero real numbers, has more than one solution, then :

Options :

41652936298. $b + c - a = 0$

41652936299. $b - c + a = 0$

41652936300. $b - c - a = 0$

41652936301. $a + b + c = 0$

Question Number : 65 Question Id : 4165299210 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 रैखिक समीकरण निकाय

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

$$3x - y + 5z = b$$

$$x - 3y + 2z = c$$

जहाँ a, b, c शून्येतर वास्तविक संख्यायें हैं, के एक से अधिक हल हैं, तो :

Options :

41652936298. $b + c - a = 0$

41652936299. $b - c + a = 0$

41652936300. $b - c - a = 0$

41652936301. $a + b + c = 0$

Question Number : 66 Question Id : 4165299211 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 real values of x for which the middle term in the binomial expansion

of $\left(\frac{x^3}{3} + \frac{3}{x}\right)^8$ equals 5670 is :

Options :

41652936302. 0

41652936303. 4

41652936304. 6

41652936305. 8

Question Number : 66 Question Id : 4165299211 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 के उन वास्तविक मानों जिनके लिए $\left(\frac{x^3}{3} + \frac{3}{x}\right)^8$ के

द्विपद प्रसार का मध्य पद 5670 है, का योग है :

Options :

41652936302. 0

41652936303. 4

41652936304. 6

41652936305. 8

Question Number : 67 Question Id : 4165299212 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 $a_1, a_2, \dots, a_{10}$ be a G.P. If $\frac{a_3}{a_1} = 25$, then

$\frac{a_9}{a_5}$ equals :

Options :

41652936306. $2(5^2)$

41652936307. $4(5^2)$

41652936308. 5^3

41652936309. 5^4

Question Number : 67 Question Id : 4165299212 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 $a_1, a_2, \dots, a_{10}$ एक गुणोत्तर श्रेणी है। यदि

$$\frac{a_3}{a_1} = 25, \text{ तो } \frac{a_9}{a_5} \text{ बराबर है :}$$

Options :

41652936306. $2(5^2)$

41652936307. $4(5^2)$

41652936308. 5^3

41652936309. 5^4

Question Number : 68 Question Id : 4165299213 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 an infinite geometric series with positive terms is 3 and the sum of the cubes

of its terms is $\frac{27}{19}$. Then the common ratio of this series is :

Options :

41652936310. $\frac{4}{9}$

41652936311. $\frac{2}{9}$

41652936312. $\frac{1}{3}$

41652936313. $\frac{2}{3}$

Question Number : 68 Question Id : 4165299213 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

धन पदों की एक अनन्त गुणोत्तर श्रेणी का योग 3 है
तथा इसके पदों के घनों (cubes) का योग $\frac{27}{19}$ है, तो
इस श्रेणी का सार्व अनुपात है :

Options :

41652936310. $\frac{4}{9}$

41652936311. $\frac{2}{9}$

41652936312. $\frac{1}{3}$

41652936313. $\frac{2}{3}$

Question Number : 69 Question Id : 4165299214 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 value of r for which
 ${}^{20}C_0 {}^{20}C_0 + {}^{20}C_{r-1} {}^{20}C_1 + {}^{20}C_{r-2} {}^{20}C_2 + \dots$
 $+ {}^{20}C_0 {}^{20}C_r$
is maximum, is :

Options :

41652936314. 11

41652936315. 15

41652936316. 10

41652936317. 20

Question Number : 69 Question Id : 4165299214 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

r का वह मान, जिसके लिए
 ${}^{20}C_r {}^{20}C_0 + {}^{20}C_{r-1} {}^{20}C_1 + {}^{20}C_{r-2} {}^{20}C_2 + \dots$
 $+ {}^{20}C_0 {}^{20}C_r$
अधिकतम है, है :

Options :

41652936314. 11

41652936315. 15

41652936316. 10

41652936317. 20

Question Number : 70 Question Id : 4165299215 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 $[x]$ denote the greatest integer less than or equal to x . Then :

$$\lim_{x \rightarrow 0} \frac{\tan(\pi \sin^2 x) + (|x| - \sin(x[x]))^2}{x^2} :$$

Options :

41652936318. equals π

41652936319. equals 0

41652936320. equals $\pi + 1$

41652936321. does not exist

Question Number : 70 Question Id : 4165299215 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 $[x], x$ के समान या उससे कम महत्तम पूर्णांक को दर्शाता है, तो

$$\lim_{x \rightarrow 0} \frac{\tan(\pi \sin^2 x) + (|x| - \sin(x[x]))^2}{x^2} :$$

Options :

41652936318. π के बराबर है

41652936319. 0 के बराबर है

41652936320. $\pi + 1$ के बराबर है

41652936321. का अस्तित्व नहीं है

Correct Marks : 4 Wrong Marks : 1

If $x \log_e (\log_e x) - x^2 + y^2 = 4$ ($y > 0$), then

$\frac{dy}{dx}$ at $x=e$ is equal to :

Options :

41652936322. $\frac{(2e-1)}{2\sqrt{4+e^2}}$

41652936323. $\frac{e}{\sqrt{4+e^2}}$

41652936324. $\frac{(1+2e)}{2\sqrt{4+e^2}}$

41652936325. $\frac{(1+2e)}{\sqrt{4+e^2}}$

Question Number : 71 Question Id : 4165299216 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 $x \log_e (\log_e x) - x^2 + y^2 = 4$ ($y > 0$), तो

$x=e$ पर $\frac{dy}{dx}$ बराबर है :

Options :

41652936322. $\frac{(2e-1)}{2\sqrt{4+e^2}}$

41652936323. $\frac{e}{\sqrt{4+e^2}}$

41652936324. $\frac{(1+2e)}{2\sqrt{4+e^2}}$

41652936325. $\frac{(1+2e)}{\sqrt{4+e^2}}$

Question Number : 72 Question Id : 4165299217 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 $f(x) = \begin{cases} -1, & -2 \leq x < 0 \\ x^2 - 1, & 0 \leq x \leq 2 \end{cases}$ and

$g(x) = |f(x)| + f(|x|)$. Then, in the interval $(-2, 2)$, g is :

Options :

41652936326. not continuous
41652936327. not differentiable at one point
41652936328. not differentiable at two points
41652936329. differentiable at all points

Question Number : 72 Question Id : 4165299217 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 $f(x) = \begin{cases} -1, & -2 \leq x < 0 \\ x^2 - 1, & 0 \leq x \leq 2 \end{cases}$ तथा

$g(x) = |f(x)| + f(|x|)$, तो अंतराल $(-2, 2)$ में g :

Options :

41652936326. संतत नहीं है
41652936327. एक बिन्दु पर अवकलनीय नहीं है
41652936328. दो बिन्दुओं पर अवकलनीय नहीं है
41652936329. सभी बिन्दुओं पर अवकलनीय है

Question Number : 73 Question Id : 4165299218 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 maximum value of the function $f(x) = 3x^3 - 18x^2 + 27x - 40$ on the set $S = \{x \in \mathbb{R} : x^2 + 30 \leq 11x\}$ is :

Options :

41652936330. 122

41652936331. -122

41652936332. 222

41652936333. -222

Question Number : 73 Question Id : 4165299218 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समुच्चय $S = \{x \in \mathbb{R} : x^2 + 30 \leq 11x\}$ पर फलन

$f(x) = 3x^3 - 18x^2 + 27x - 40$ का अधिकतम मान है :

Options :

41652936330. 122

41652936331. -122

41652936332. 222

41652936333. -222

Question Number : 74 Question Id : 4165299219 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 $\int \frac{\sqrt{1-x^2}}{x^4} dx = A(x) \left(\sqrt{1-x^2} \right)^m + C$,

for a suitable chosen integer m and a function $A(x)$, where C is a constant of integration, then $(A(x))^m$ equals :

Options :

41652936334. $\frac{1}{9x^4}$

41652936335. $\frac{-1}{3x^3}$

41652936336. $\frac{-1}{27x^9}$

41652936337. $\frac{1}{27x^6}$

Question Number : 74 Question Id : 4165299219 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

उपयुक्त पूर्णांक m तथा एक फलन $A(x)$ के लिए यदि

$$\int \frac{\sqrt{1-x^2}}{x^4} dx = A(x) \left(\sqrt{1-x^2} \right)^m + C,$$

जहाँ C एक समाकलन अचर है, तो $(A(x))^m$ बराबर है :

Options :

41652936334. $\frac{1}{9x^4}$

41652936335. $\frac{-1}{3x^3}$

41652936336. $\frac{-1}{27x^9}$

41652936337. $\frac{1}{27x^6}$

Question Number : 75 Question Id : 4165299220 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 value of the integral $\int_{-2}^2 \frac{\sin^2 x}{\left[\frac{x}{\pi} \right] + \frac{1}{2}} dx$

(where $[x]$ denotes the greatest integer less than or equal to x) is :

Options :

41652936338. $4 - \sin 4$

41652936339. 0

41652936340. 4

41652936341. $\sin 4$

Question Number : 75 Question Id : 4165299220 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समाकल $\int_{-2\left[\frac{x}{\pi}\right] + \frac{1}{2}}^2 \frac{\sin^2 x}{dx}$

(जहाँ $[x]$, x के समान या उससे कम महत्तम पूर्णांक को दर्शाता है) का मान है :

Options :

41652936338. $4 - \sin 4$

41652936339. 0

41652936340. 4

41652936341. $\sin 4$

Question Number : 76 Question Id : 4165299221 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 bounded by the curve $x^2 = 4y$ and the straight line $x = 4y - 2$ is :

Options :

41652936342. $\frac{3}{4}$

41652936343. $\frac{9}{8}$

41652936344. $\frac{5}{4}$

41652936345. $\frac{7}{8}$

Question Number : 76 Question Id : 4165299221 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वक्र $x^2 = 4y$ तथा सरल रेखा $x = 4y - 2$ द्वारा घिरे क्षेत्र का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

41652936342. $\frac{3}{4}$

41652936343. $\frac{9}{8}$

41652936344. $\frac{5}{4}$

41652936345. $\frac{7}{8}$

Question Number : 77 Question Id : 4165299222 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 $y(x)$ is the solution of the differential

equation $\frac{dy}{dx} + \left(\frac{2x+1}{x}\right)y = e^{-2x}, x > 0,$

where $y(1) = \frac{1}{2}e^{-2}$, then :

Options :

41652936346. $y(\log_e 2) = \frac{\log_e 2}{4}$

41652936347. $y(\log_e 2) = \log_e 4$

41652936348. $y(x)$ is decreasing in $(0, 1)$

41652936349. $y(x)$ is decreasing in $\left(\frac{1}{2}, 1\right)$

Question Number : 77 Question Id : 4165299222 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 अवकल समीकरण

$$\frac{dy}{dx} + \left(\frac{2x+1}{x} \right) y = e^{-2x}, x > 0 \text{ का हल } y(x)$$

है, जहाँ $y(1) = \frac{1}{2}e^{-2}$, तो :

Options :

41652936346. $y(\log_e 2) = \frac{\log_e 2}{4}$

41652936347. $y(\log_e 2) = \log_e 4$

41652936348. $(0, 1)$ में $y(x)$ ह्रासमान है।

41652936349. $\left(\frac{1}{2}, 1 \right)$ में $y(x)$ ह्रासमान है।

Question Number : 78 Question Id : 4165299223 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 circles with equal radii are intersecting at the points $(0, 1)$ and $(0, -1)$. The tangent at the point $(0, 1)$ to one of the circles passes through the centre of the other circle. Then the distance between the centres of these circles is :

Options :

41652936350. $2\sqrt{2}$

41652936351. 1

41652936352. 2

41652936353. $\sqrt{2}$

Question Number : 78 Question Id : 4165299223 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बराबर त्रिज्या के दो वृत्त, बिन्दुओं $(0, 1)$ तथा $(0, -1)$ पर काटते हैं। इनमें से एक वृत्त के बिन्दु $(0, 1)$ पर स्पर्श रेखा दूसरे वृत्त के केन्द्र से होकर जाती है, तो इन वृत्तों के केन्द्रों के बीच की दूरी है :

Options :

41652936350. $2\sqrt{2}$

41652936351. 1

41652936352. 2

41652936353. $\sqrt{2}$

Question Number : 79 Question Id : 4165299224 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 straight line $x + 2y = 1$ meets the coordinate axes at A and B. A circle is drawn through A, B and the origin. Then the sum of perpendicular distances from A and B on the tangent to the circle at the origin is :

Options :

41652936354. $4\sqrt{5}$

41652936355. $\frac{\sqrt{5}}{4}$

41652936356. $2\sqrt{5}$

41652936357. $\frac{\sqrt{5}}{2}$

Question Number : 79 Question Id : 4165299224 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 $x + 2y = 1$ निदेशांक अक्षों को A तथा B पर काटती है। मूल बिन्दु, A तथा B से होकर जाने वाला वृत्त खींचा गया है, तो मूल बिन्दु पर वृत्त की स्पर्श रेखा की A तथा B से लम्बवत दूरियों का योग है :

Options :

41652936354. $4\sqrt{5}$

41652936355. $\frac{\sqrt{5}}{4}$

41652936356. $2\sqrt{5}$

41652936357. $\frac{\sqrt{5}}{2}$

Question Number : 80 Question Id : 4165299225 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 square is inscribed in the circle $x^2 + y^2 - 6x + 8y - 103 = 0$ with its sides parallel to the coordinate axes. Then the distance of the vertex of this square which is nearest to the origin is :

Options :

41652936358. 6

41652936359. $\sqrt{41}$

41652936360. 13

41652936361. $\sqrt{137}$

Question Number : 80 Question Id : 4165299225 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निदेशांक अक्षों के समान्तर भुजाओं का एक वर्ग, वृत्त $x^2 + y^2 - 6x + 8y - 103 = 0$ के अंतर्गत है, तो इस वर्ग का वह शीर्ष जो मूल बिन्दु के सबसे निकट है, की दूरी है :

Options :

41652936358. 6

41652936359. $\sqrt{41}$

41652936360. 13

41652936361. $\sqrt{137}$

Question Number : 81 Question Id : 4165299226 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Equation of a common tangent to the parabola $y^2 = 4x$ and the hyperbola $xy = 2$ is :

Options :

41652936362. $x - 2y + 4 = 0$

41652936363. $x + y + 1 = 0$

41652936364. $4x + 2y + 1 = 0$

41652936365. $x + 2y + 4 = 0$

Question Number : 81 Question Id : 4165299226 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परवलय $y^2 = 4x$ तथा अतिपरवलय $xy = 2$ की एक उभयनिष्ठ स्पर्श रेखा का समीकरण है :

Options :

41652936362. $x - 2y + 4 = 0$

41652936363. $x + y + 1 = 0$

41652936364. $4x + 2y + 1 = 0$

41652936365. $x + 2y + 4 = 0$

Question Number : 82 Question Id : 4165299227 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 tangents are drawn to the ellipse $x^2 + 2y^2 = 2$ at all points on the ellipse other than its four vertices then the mid points of the tangents intercepted between the coordinate axes lie on the curve :

Options :

41652936366. $\frac{1}{2x^2} + \frac{1}{4y^2} = 1$

$$\frac{1}{4x^2} + \frac{1}{2y^2} = 1$$

41652936367.

$$\frac{x^2}{2} + \frac{y^2}{4} = 1$$

41652936368.

$$\frac{x^2}{4} + \frac{y^2}{2} = 1$$

41652936369.

Question Number : 82 Question Id : 4165299227 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 $x^2 + 2y^2 = 2$ के चार शीर्षों के अतिरिक्त इसके सभी बिन्दुओं पर स्पर्श रेखायें खींची गई हैं, तो इन स्पर्श रेखाओं के निदेशांक अक्षों के बीच के अंतःखंडों के मध्य बिन्दु निम्न में से किस वक्र पर हैं?

Options :

$$\frac{1}{2x^2} + \frac{1}{4y^2} = 1$$

41652936366.

$$\frac{1}{4x^2} + \frac{1}{2y^2} = 1$$

41652936367.

$$\frac{x^2}{2} + \frac{y^2}{4} = 1$$

41652936368.

$$\frac{x^2}{4} + \frac{y^2}{2} = 1$$

41652936369.

Question Number : 83 Question Id : 4165299228 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 direction ratios of normal to the plane through the points $(0, -1, 0)$ and $(0, 0, 1)$

and making an angle $\frac{\pi}{4}$ with the plane

$y - z + 5 = 0$ are :

Options :

41652936370. $\sqrt{2}, 1, -1$

41652936371. $2\sqrt{3}, 1, -1$

41652936372. $2, -1, 1$

41652936373. $2, \sqrt{2}, -\sqrt{2}$

Question Number : 83 Question Id : 4165299228 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बिन्दुओं $(0, -1, 0)$ तथा $(0, 0, 1)$ से होकर जाने वाले

तथा समतल $y - z + 5 = 0$ के साथ $\frac{\pi}{4}$ का कोण

बनाने वाले समतल के अभिलम्ब के दिक् अनुपात
(direction ratios) हैं :

Options :

41652936370. $\sqrt{2}, 1, -1$

41652936371. $2\sqrt{3}, 1, -1$

41652936372. $2, -1, 1$

41652936373. $2, \sqrt{2}, -\sqrt{2}$

Question Number : 84 Question Id : 4165299229 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 plane containing the line

$$\frac{x-3}{2} = \frac{y+2}{-1} = \frac{z-1}{3} \quad \text{and also}$$

containing its projection on the plane
 $2x + 3y - z = 5$, contains which one of the
following points ?

Options :

41652936374. $(0, -2, 2)$

41652936375. $(2, 0, -2)$

41652936376. (2, 2, 0)

41652936377. (-2, 2, 2)

Question Number : 84 Question Id : 4165299229 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समतल, जिसमें रेखा

$$\frac{x-3}{2} = \frac{y+2}{-1} = \frac{z-1}{3}$$

अन्तर्विष्ट है तथा इस रेखा का समतल $2x+3y-z=5$

पर प्रक्षेप (projection) भी अन्तर्विष्ट है, पर निम्न में से कौन सा बिन्दु स्थित है?

Options :

41652936374. (0, -2, 2)

41652936375. (2, 0, -2)

41652936376. (2, 2, 0)

41652936377. (-2, 2, 2)

Question Number : 85 Question Id : 4165299230 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 $\vec{a} = \hat{i} + 2\hat{j} + 4\hat{k}$, $\vec{b} = \hat{i} + \lambda\hat{j} + 4\hat{k}$ and

$\vec{c} = 2\hat{i} + 4\hat{j} + (\lambda^2 - 1)\hat{k}$ be coplanar

vectors. Then the non-zero vector $\vec{a} \times \vec{c}$ is :

Options :

41652936378. $-10\hat{i} - 5\hat{j}$

41652936379. $-14\hat{i} - 5\hat{j}$

41652936380. $-10\hat{i} + 5\hat{j}$

$$-14\hat{i} + 5\hat{j}$$

41652936381.

Question Number : 85 Question Id : 4165299230 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 $\vec{a} = \hat{i} + 2\hat{j} + 4\hat{k}$, $\vec{b} = \hat{i} + \lambda\hat{j} + 4\hat{k}$ तथा

$\vec{c} = 2\hat{i} + 4\hat{j} + (\lambda^2 - 1)\hat{k}$ समतलीय सदिश हैं, तो

शून्येतर सदिश $\vec{a} \times \vec{c}$ है :

Options :

41652936378. $-10\hat{i} - 5\hat{j}$

41652936379. $-14\hat{i} - 5\hat{j}$

41652936380. $-10\hat{i} + 5\hat{j}$

41652936381. $-14\hat{i} + 5\hat{j}$

Question Number : 86 Question Id : 4165299231 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 outcome of each of 30 items was observed ; 10 items gave an outcome

$\frac{1}{2} - d$ each, 10 items gave outcome

$\frac{1}{2}$ each and the remaining 10 items gave

outcome $\frac{1}{2} + d$ each. If the variance of this

outcome data is $\frac{4}{3}$ then $|d|$ equals :

Options :

41652936382. $\sqrt{2}$

41652936383. 2

41652936384. $\frac{\sqrt{5}}{2}$

41652936385. $\frac{2}{3}$

Question Number : 86 Question Id : 4165299231 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

30 आइटम (items) का परिणाम देखा गया; इनमें से

10 आइटम में प्रत्येक ने परिणाम $\frac{1}{2} - d$ दिया,

10 आइटम में प्रत्येक ने परिणाम $\frac{1}{2}$ दिया तथा बाकी

10 आइटम में प्रत्येक ने परिणाम $\frac{1}{2} + d$ दिया। यदि

इन आँकड़ों का प्रसरण $\frac{4}{3}$ है, तो $|d|$ बराबर है :

Options :

41652936382. $\sqrt{2}$

41652936383. 2

41652936384. $\frac{\sqrt{5}}{2}$

41652936385. $\frac{2}{3}$

Question Number : 87 Question Id : 4165299232 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 integers are selected at random from the set $\{1, 2, \dots, 11\}$. Given that the sum of selected numbers is even, the conditional probability that both the numbers are even is :

Options :

41652936386. $\frac{2}{5}$

41652936387. $\frac{1}{2}$

41652936388. $\frac{3}{5}$

41652936389. $\frac{7}{10}$

Question Number : 87 Question Id : 4165299232 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समुच्चय $\{1, 2, \dots, 11\}$ से दो पूर्णांक यादृच्छिक लिए गये हैं। दिया है कि ली गई संख्याओं का योग सम है, दोनों संख्याओं के सम होने की सप्रतिबंध (conditional) प्रायिकता है :

Options :

41652936386. $\frac{2}{5}$

41652936387. $\frac{1}{2}$

41652936388. $\frac{3}{5}$

41652936389. $\frac{7}{10}$

Question Number : 88 Question Id : 4165299233 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 $f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$ for

$k = 1, 2, 3, \dots$ Then for all $x \in \mathbb{R}$, the value of $f_4(x) - f_6(x)$ is equal to :

Options :

41652936390. $\frac{1}{12}$

41652936391. $\frac{-1}{12}$

41652936392. $\frac{1}{4}$

41652936393. $\frac{5}{12}$

Question Number : 88 Question Id : 4165299233 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 $k = 1, 2, 3, \dots$ के लिए

$$f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$$

तो सभी $x \in \mathbb{R}$ के लिए, $f_4(x) - f_6(x)$ का मान बराबर है :

Options :

41652936390. $\frac{1}{12}$

41652936391. $\frac{-1}{12}$

41652936392. $\frac{1}{4}$

41652936393. $\frac{5}{12}$

Question Number : 89 Question Id : 4165299234 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 a triangle, the sum of lengths of two sides is x and the product of the lengths of the same two sides is y . If $x^2 - c^2 = y$, where c is the length of the third side of the triangle, then the circumradius of the triangle is :

Options :

41652936394. $\frac{c}{3}$

41652936395. $\frac{c}{\sqrt{3}}$

41652936396. $\frac{y}{\sqrt{3}}$

41652936397. $\frac{3}{2}y$

Question Number : 89 Question Id : 4165299234 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 त्रिभुज की दो भुजाओं की लम्बाई का योग x है
और इन्हीं दो भुजाओं की लम्बाई का गुणनफल y है।
यदि $x^2 - c^2 = y$, जहाँ c त्रिभुज की तीसरी भुजा की
लम्बाई है, तब त्रिभुज के परिवृत्त की त्रिज्या है :

Options :

41652936394. $\frac{c}{3}$

41652936395. $\frac{c}{\sqrt{3}}$

41652936396. $\frac{y}{\sqrt{3}}$

41652936397. $\frac{3}{2}y$

Question Number : 90 Question Id : 4165299235 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 q is false and $p \wedge q \leftrightarrow r$ is true, then which
one of the following statements is a
tautology ?

Options :

41652936398. $p \wedge r$

41652936399. $p \vee r$

41652936400. $(p \wedge r) \rightarrow (p \vee r)$

41652936401. $(p \vee r) \rightarrow (p \wedge r)$

Question Number : 90 Question Id : 4165299235 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 q असत्य है तथा $p \wedge q \leftrightarrow r$ सत्य है, तो निम्न में से कौन सा कथन एक पुनरुक्ति (tautology) है?

Options :

41652936398. $p \wedge r$

41652936399. $p \vee r$

41652936400. $(p \wedge r) \rightarrow (p \vee r)$

41652936401. $(p \vee r) \rightarrow (p \wedge r)$