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Question Paper Name:	Paper I EH 10th Jan 2019 Shift 1 Set 2
Subject Name:	Paper I EH
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Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

Paper I

Group Number :	1
Group Id :	416529129
Group Maximum Duration :	0
Group Minimum Duration :	180
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	360

Physics

Section Id :	416529169
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:	416529178
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 41652910406 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 diameter and height of a cylinder are measured by a meter scale to be 12.6 ± 0.1 cm and 34.2 ± 0.1 cm, respectively. What will be the value of its volume in appropriate significant figures ?

Options :

41652941082. $4264.4 \pm 81.0\ cm^3$

41652941083. $4260 \pm 80\ cm^3$

41652941084. $4264 \pm 81\ cm^3$

41652941085. $4300 \pm 80\ cm^3$

Question Number : 1 Question Id : 41652910406 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 मीटर स्केल द्वारा नापने पर किसी बेलन का व्यास और ऊँचाई क्रमशः 12.6 ± 0.1 cm और 34.2 ± 0.1 cm आते हैं। उपयुक्त सार्थक अंकों में इसके आयतन का मान क्या होगा ?

Options :

41652941082. $4264.4 \pm 81.0\ cm^3$

41652941083. $4260 \pm 80\ cm^3$

41652941084. $4264 \pm 81\ cm^3$

41652941085. $4300 \pm 80\ cm^3$

Question Number : 2 Question Id : 41652910407 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 vectors $\vec{A}$ and $\vec{B}$ have equal magnitudes. The magnitude of $(\vec{A} + \vec{B})$ is 'n' times the magnitude of $(\vec{A} - \vec{B})$. The angle between $\vec{A}$ and $\vec{B}$ is :

Options :

41652941086. $\cos^{-1}\left[\frac{n^2 - 1}{n^2 + 1}\right]$

41652941087. $\cos^{-1}\left[\frac{n - 1}{n + 1}\right]$

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41652941088. $\sin^{-1}\left[\frac{n^2-1}{n^2+1}\right]$

41652941089. $\sin^{-1}\left[\frac{n-1}{n+1}\right]$

Question Number : 2 Question Id : 41652910407 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 सदिशों $\vec{A}$ तथा $\vec{B}$ के परिमाण बराबर हैं।
$\left(\vec{A}+\vec{B}\right)$ का परिमाण $\left(\vec{A}-\vec{B}\right)$ के परिमाण का 'n' गुना है। $\vec{A}$ तथा $\vec{B}$ के बीच का कोण है :

Options :

41652941086. $\cos^{-1}\left[\frac{n^2-1}{n^2+1}\right]$

41652941087. $\cos^{-1}\left[\frac{n-1}{n+1}\right]$

41652941088. $\sin^{-1}\left[\frac{n^2-1}{n^2+1}\right]$

41652941089. $\sin^{-1}\left[\frac{n-1}{n+1}\right]$

Question Number : 3 Question Id : 41652910408 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

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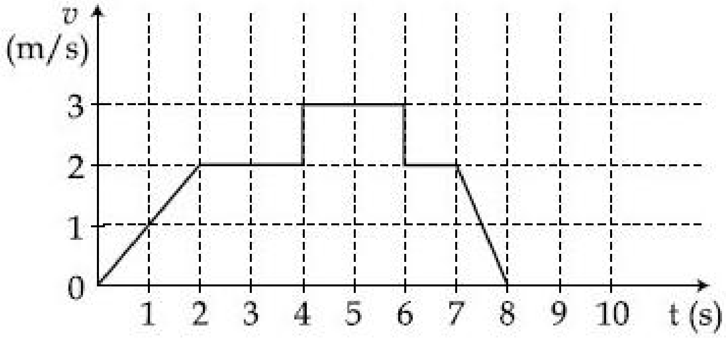
A particle starts from the origin at time t = 0 and moves along the positive *x*-axis. The graph of velocity with respect to time is shown in figure. What is the position of the particle at time t = 5s ?



Options :

41652941090. 3 m

41652941091. 6 m

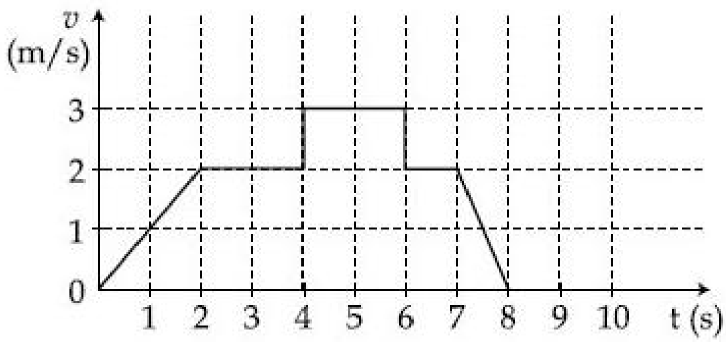
41652941092. 10 m

41652941093. 9 m

Question Number : 3 Question Id : 41652910408 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 t = 0 पर मूल बिन्दु से चलना आरम्भ करता है और धनात्मक *x*-अक्ष की दिशा में गति करता है। चित्र में वेग का समय के सापेक्ष ग्राफ दिखाया गया है। t = 5s पर कण की स्थिति क्या होगी ?



Options :

41652941090. 3 m

41652941091. 6 m

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41652941092. 10 m

41652941093. 9 m

Question Number : 4 Question Id : 41652910409 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 forces P and Q, of magnitude 2F and 3F, respectively, are at an angle θ with each other. If the force Q is doubled, then their resultant also gets doubled. Then, the angle θ is :

Options :

41652941094. 30°

41652941095. 60°

41652941096. 90°

41652941097. 120°

Question Number : 4 Question Id : 41652910409 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 बल P और Q जिनके परिमाण क्रमशः 2F और 3F हैं, परस्पर θ कोण बनाते हैं। यदि बल Q को दोगुना कर दें तो इनका परिणामी बल भी दोगुना हो जाता है। तब कोण θ होगा :

Options :

41652941094. 30°

41652941095. 60°

41652941096. 90°

41652941097. 120°

Question Number : 5 Question Id : 41652910410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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A particle which is experiencing a force, given by $\vec{F} = 3\vec{i} - 12\vec{j}$, undergoes a displacement of $\vec{d} = 4\vec{i}$. If the particle had a kinetic energy of 3 J at the beginning of the displacement, what is its kinetic energy at the end of the displacement?

Options :

41652941098. 15 J

41652941099. 12 J

41652941100. 9 J

41652941101. 10 J

Question Number : 5 Question Id : 41652910410 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 किसी एक बल $\vec{F} = 3\vec{i} - 12\vec{j}$ के अन्तर्गत $\vec{d} = 4\vec{i}$ से विस्थापित होता है। यदि कण की विस्थापन से पूर्व गतिज ऊर्जा 3 J थी तो विस्थापन के बाद उसकी गतिज ऊर्जा का मान होगा :

Options :

41652941098. 15 J

41652941099. 12 J

41652941100. 9 J

41652941101. 10 J

Question Number : 6 Question Id : 41652910411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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A rigid massless rod of length $3l$ has two masses attached at each end as shown in the figure. The rod is pivoted at point P on the horizontal axis (see figure). When released from initial horizontal position, its instantaneous angular acceleration will be :

Options :

41652941102. $\frac{g}{2l}$

41652941103. $\frac{g}{3l}$

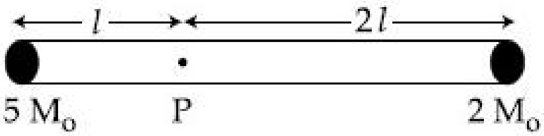
41652941104. $\frac{7g}{3l}$

41652941105. $\frac{g}{13l}$

Question Number : 6 Question Id : 41652910411 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 द्रव्यमान रहित तथा $3l$ लम्बाई की छड़ पर दो द्रव्यमान चित्रानुसार उसके सिरों पर लगाये हैं तथा उसे एक क्षैतिज अक्ष पर बिन्दु P से कीलकित किया जाता है। जब इस छड़ को क्षैतिज अवस्था से छोड़ा जाता है तो उसका तात्क्षणिक कोणीय त्वरण होगा :



Options :

41652941102. $\frac{g}{2l}$

41652941103. $\frac{g}{3l}$

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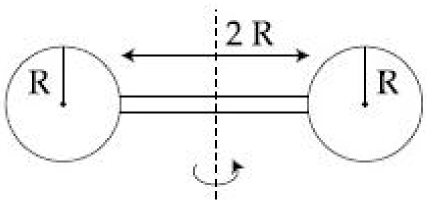
41652941104. $\frac{7g}{3l}$

41652941105. $\frac{g}{13l}$

Question Number : 7 Question Id : 41652910412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two identical spherical balls of mass M and radius R each are stuck on two ends of a rod of length 2R and mass M (see figure). The moment of inertia of the system about the axis passing perpendicularly through the centre of the rod is :



Options :

41652941106. $\frac{17}{15} MR^2$

41652941107. $\frac{137}{15} MR^2$

41652941108. $\frac{152}{15} MR^2$

41652941109. $\frac{209}{15} MR^2$

Question Number : 7 Question Id : 41652910412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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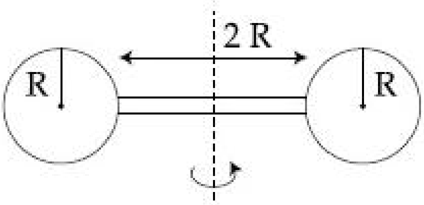
द्रव्यमान M तथा त्रिज्या R की दो एकसमान गोलाकार गेंदो को 2R लम्बाई तथा द्रव्यमान M की एक छड़ के सिरों पर चित्रानुसार जोड़ा गया है। इस संयोजन का छड़ के केन्द्र से जाने वाली तथा छड़ के लम्बवत् अक्ष के परितः जड़त्व आघूर्ण का मान होगा :



Options :

41652941106. $\frac{17}{15} MR^2$

41652941107. $\frac{137}{15} MR^2$

41652941108. $\frac{152}{15} MR^2$

41652941109. $\frac{209}{15} MR^2$

Question Number : 8 Question Id : 41652910413 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 stars of masses 3×10^{31} kg each, and at distance 2×10^{11} m rotate in a plane about their common centre of mass O. A meteorite passes through O moving perpendicular to the star's rotation plane. In order to escape from the gravitational field of this double star, the minimum speed that meteorite should have at O is :

(Take Gravitational constant $G = 6.67 \times 10^{-11}$ $Nm^2 kg^{-2}$)

Options :

41652941110. 2.8×10^5 m/s

41652941111. 3.8×10^4 m/s

41652941112. 1.4×10^5 m/s

41652941113. 2.4×10^4 m/s

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Question Number : 8 Question Id : 41652910413 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 तारे, जिनमें प्रत्येक का द्रव्यमान 3×10^{31} kg है तथा उनके बीच की दूरी 2×10^{11} m है, अपने उभयनिष्ठ द्रव्यमान केन्द्र O के परित: किसी समतल में घूम रहे हैं। एक उल्कापिण्ड O से तथा उनके घूर्णन समतल के लम्बवत् दिशा से गुजरता है। इन दो तारों के गुरुत्वाकर्षण से पलायन करने के लिए उल्कापिण्ड की बिन्दु O पर न्यूनतम गति का मान होगा :

(सार्वत्रिक गुरुत्वीय स्थिरांक $G = 6.67 \times 10^{-11}$ $Nm^2 kg^{-2}$)

Options :

41652941110. 2.8×10^5 m/s

41652941111. 3.8×10^4 m/s

41652941112. 1.4×10^5 m/s

41652941113. 2.4×10^4 m/s

Question Number : 9 Question Id : 41652910414 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 cylindrical plastic bottle of negligible mass is filled with 310 ml of water and left floating in a pond with still water. If pressed downward slightly and released, it starts performing simple harmonic motion at angular frequency ω. If the radius of the bottle is 2.5 cm then ω is close to : (density of water $= 10^3$ kg/m^3)

Options :

41652941114. 1.25 rad s^{-1}

41652941115. 2.50 rad s^{-1}

41652941116. 3.75 rad s^{-1}

41652941117. 5.00 rad s^{-1}

Question Number : 9 Question Id : 41652910414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नगण्य द्रव्यमान की प्लास्टिक की एक बेलनाकार बोतल में 310 ml पानी भरा है तथा यह बोतल शांत पानी के तालाब में तैरती है। यदि इसे थोड़ा नीचे को दबा कर छोड़ते हैं तो यह कोणीय आवृत्ति ω से सरल आवर्त गति करती है। यदि बोतल की त्रिज्या 2.5 cm है, तो ω का मान होगा :

(दिया है : पानी का घनत्व $=10^3$ kg/m^3)

Options :

41652941114. 1.25 rad s^{-1}

41652941115. 2.50 rad s^{-1}

41652941116. 3.75 rad s^{-1}

41652941117. 5.00 rad s^{-1}

Question Number : 10 Question Id : 41652910415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Half mole of an ideal monoatomic gas is heated at constant pressure of 1 atm from 20°C to 90°C. Work done by gas is close to : (Gas constant R = 8.31 J/mol·K)

Options :

41652941118. 581 J

41652941119. 291 J

41652941120. 146 J

41652941121. 73 J

Question Number : 10 Question Id : 41652910415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एकपरमाणुक आदर्श गैस के आधे मोल को 1 atm के नियत दाब पर 20°C से 90°C तक गर्म करते हैं। इस गैस द्वारा किये गये कार्य का सन्निकट मान होगा : (दिया है : R = 8.31 J/mol·K)

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Options :

41652941118. 581 J

41652941119. 291 J

41652941120. 146 J

41652941121. 73 J

Question Number : 11 Question Id : 41652910416 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 kg of a monoatomic gas is at a pressure of 4×10^4 N/m^2. The density of the gas is 8 kg/m^3. What is the order of energy of the gas due to its thermal motion ?

Options :

41652941122. 10^3 J

41652941123. 10^4 J

41652941124. 10^5 J

41652941125. 10^6 J

Question Number : 11 Question Id : 41652910416 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 kg एकपरमाणुक गैस 4×10^4 N/m^2 के दाब पर है। गैस का घनत्व 8 kg/m^3 है। इस गैस में ऊष्मीय गति के कारण ऊर्जा की परिमाण कोटि होगी :

Options :

41652941122. 10^3 J

41652941123. 10^4 J

41652941124. 10^5 J

41652941125. 10^6 J

Question Number : 12 Question Id : 41652910417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

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Correct Marks : 4 Wrong Marks : 1

A particle executes simple harmonic motion with an amplitude of 5 cm. When the particle is at 4 cm from the mean position, the magnitude of its velocity in SI units is equal to that of its acceleration. Then, its periodic time in seconds is :

Options :

41652941126. $\frac{4\pi}{3}$

41652941127. $\frac{8\pi}{3}$

41652941128. $\frac{3}{8}\pi$

41652941129. $\frac{7}{3}\pi$

Question Number : 12 Question Id : 41652910417 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 5 cm आयाम से सरल आवर्त गति कर रहा है। जब कण अपनी मध्य स्थिति से 4 cm दूरी पर है तब इसके वेग का परिमाण SI मानकों में इसके त्वरण में परिमाण के बराबर है। तो कण का सेकण्ड में आवर्तकाल होगा :

Options :

41652941126. $\frac{4\pi}{3}$

41652941127. $\frac{8\pi}{3}$

41652941128. $\frac{3}{8}\pi$

41652941129. $\frac{7}{3}\pi$

Question Number : 13 Question Id : 41652910418 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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A closed organ pipe has a fundamental frequency of 1.5 kHz. The number of overtones that can be distinctly heard by a person with this organ pipe will be : (Assume that the highest frequency a person can hear is 20,000 Hz)

Options :

41652941130. 6

41652941131. 7

41652941132. 4

41652941133. 5

Question Number : 13 Question Id : 41652910418 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 बंद ऑर्गन – पाईप की मूलभूत आवृत्ति 1.5 kHz है। इस ऑर्गन – पाईप से एक व्यक्ति को स्पष्ट सुनाई देने वाले अधिस्वरों की संख्या होगी : (व्यक्ति अधिकतम 20,000 Hz आवृत्ति की ध्वनि सुन सकता है)

Options :

41652941130. 6

41652941131. 7

41652941132. 4

41652941133. 5

Question Number : 14 Question Id : 41652910419 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 parallel plate capacitor having capacitance 12 pF is charged by a battery to a potential difference of 10 V between its plates. The charging battery is now disconnected and a porcelain slab of dielectric constant 6.5 is slipped between the plates. The work done by the capacitor on the slab is :

Options :

41652941134. 508 pJ

41652941135. 600 pJ

41652941136. 692 pJ

41652941137. 560 pJ

Question Number : 14 Question Id : 41652910419 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

12 pF धारिता के एक समानांतर पट्ट संधारित्र को 10 V विभवांतर की सेल से आवेशित किया जाता है। सेल को हटाने के पश्चात उसमें परावैद्युतांक 6.5 की एक पोर्सिलीन पट्टी को प्लेटों के ठीक बीच में डाल दिया जाता है। संधारित्र द्वारा पट्टी पर किया गया कार्य होगा :

Options :

41652941134. 508 pJ

41652941135. 600 pJ

41652941136. 692 pJ

41652941137. 560 pJ

Question Number : 15 Question Id : 41652910420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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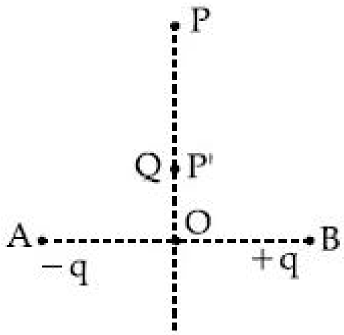
Charges $-q$ and $+q$ located at A and B, respectively, constitute an electric dipole. Distance $AB=2a$, O is the mid point of the dipole and OP is perpendicular to AB. A charge Q is placed at P where $OP=y$ and $y >> 2a$. The charge Q experiences an electrostatic force F. If Q is now moved along the equatorial line to P′ such that $OP' = \left(\frac{y}{3}\right)$, the force on Q will be close to: $\left(\frac{y}{3} >> 2a\right)$



Options :

41652941138. $\frac{F}{3}$

41652941139. 3F

41652941140. 9F

41652941141. 27F

Question Number : 15 Question Id : 41652910420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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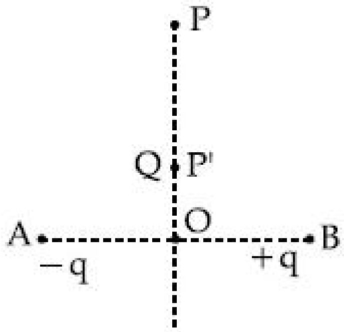
A तथा B पर रखे हुये आवेश, क्रमशः $-q$ और $+q$ एक विद्युत द्विध्रुव बनाते हैं। दूरी AB = 2a है तथा AB का मध्य बिन्दु O है। OP रेखा AB के लम्बवत् है तथा OP = y है, जहाँ $y >> 2a$, P पर रखे एक Q आवेश पर F विद्युत बल द्विध्रुव द्वारा लगता है। यदि Q को P से OP की दिशा में P' पर ले जाते हैं जहाँ $OP' = \left(\frac{y}{3}\right)$, तो इस पर लगे बल का सन्निकट मान होगा :

$\left(\text{दिया है: } \frac{y}{2} >> 2a\right)$



Options :

41652941138. $\frac{F}{3}$

41652941139. 3F

41652941140. 9F

41652941141. 27F

Question Number : 16 Question Id : 41652910421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Four equal point charges Q each are placed in the xy plane at (0, 2), (4, 2), (4, −2) and (0, −2). The work required to put a fifth charge Q at the origin of the coordinate system will be :

Options :

41652941142. $\frac{Q^2}{4\pi\epsilon_0}\left(1+\frac{1}{\sqrt{5}}\right)$

41652941143. $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

41652941144. $\frac{Q^2}{4\pi\epsilon_0}$

41652941145. $\frac{Q^2}{4\pi\epsilon_0}\left(1+\frac{1}{\sqrt{3}}\right)$

Question Number : 16 Question Id : 41652910421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चार बराबर बिन्दु आवेशों Q को xy समतल में बिन्दु (0, 2), (4, 2), (4, −2) तथा (0, −2) पर रखा है। एक पाँचवे आवेश Q को मूल बिन्दु पर रखने में किया गया कार्य होगा :

Options :

41652941142. $\frac{Q^2}{4\pi\epsilon_0}\left(1+\frac{1}{\sqrt{5}}\right)$

41652941143. $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

41652941144. $\frac{Q^2}{4\pi\epsilon_0}$

41652941145. $\frac{Q^2}{4\pi\epsilon_0}\left(1+\frac{1}{\sqrt{3}}\right)$

Question Number : 17 Question Id : 41652910422 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 current of 2 mA was passed through an unknown resistor which dissipated a power of 4.4 W. Dissipated power when an ideal power supply of 11 V is connected across it is :

Options :

41652941146. 11×10^{-3} W

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41652941147. 11×10^{-4} W

41652941148. 11×10^{-5} W

41652941149. 11×10^{5} W

Question Number : 17 Question Id : 41652910422 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 अज्ञात प्रतिरोध से जब 2 mA की धारा बहती है तो 4.4 W शक्ति का क्षय होता है। यदि इस प्रतिरोध को 11 V की एक आदर्श बैटरी से जोड़ा जाये तो शक्ति क्षय का मान होगा :

Options :

41652941146. 11×10^{-3} W

41652941147. 11×10^{-4} W

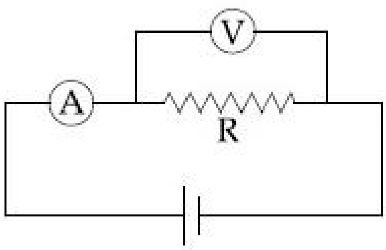
41652941148. 11×10^{-5} W

41652941149. 11×10^{5} W

Question Number : 18 Question Id : 41652910423 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 actual value of resistance R, shown in the figure is 30 Ω. This is measured in an experiment as shown using the standard formula $R = \frac{V}{I}$, where V and I are the readings of the voltmeter and ammeter, respectively. If the measured value of R is 5% less, then the internal resistance of the voltmeter is :



Options :

41652941150. 35 Ω

41652941151. 570 Ω

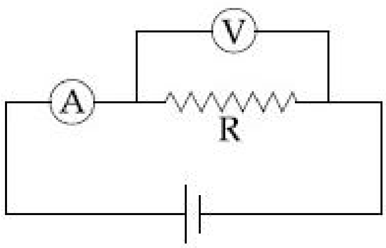
41652941152. 350 Ω

41652941153. 600 Ω

Question Number : 18 Question Id : 41652910423 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाये गये प्रतिरोध R का वास्तविक मान 30 Ω है। इसे एक मानक सूत्र $R = \frac{V}{I}$ का उपयोग करके मापा जाता है। यहाँ V तथा I, क्रमश: वोल्टमीटर तथा ऐमीटर की रीडिंग हैं। यदि R का मापा गया मान 5% कम आता है तो वोल्टमीटर के आंतरिक प्रतिरोध का मान होगा :



Options :

41652941150. 35 Ω

41652941151. 570 Ω

41652941152. 350 Ω

41652941153. 600 Ω

Question Number : 19 Question Id : 41652910424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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A hoop and a solid cylinder of same mass and radius are made of a permanent magnetic material with their magnetic moment parallel to their respective axes. But the magnetic moment of hoop is twice of solid cylinder. They are placed in a uniform magnetic field in such a manner that their magnetic moments make a small angle with the field. If the oscillation periods of hoop and cylinder are T_h and T_c respectively, then :

Options :

41652941154. $T_h = 0.5T_c$

41652941155. $T_h = 2T_c$

41652941156. $T_h = T_c$

41652941157. $T_h = 1.5T_c$

Question Number : 19 Question Id : 41652910424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

स्थायी चुम्बकीय पदार्थ से बने हुए एक छल्ले तथा एक ठोस बेलन का द्रव्यमान तथा त्रिज्या बराबर हैं। इनके चुम्बकीय आघूर्ण उनकी अपनी अक्ष के समान्तर हैं, लेकिन छल्ले का चुम्बकीय आघूर्ण बेलन से दो गुना हैं। इन दोनों को एक ही, एकसमान चुम्बकीय क्षेत्र में इस तरह छोड़ा जाता है कि इनका चुम्बकीय आघूर्ण, चुम्बकीय क्षेत्र की दिशा से एक छोटा सा कोण बनाता है। यदि छल्ले एवं बेलन के दोलन का आवर्तकाल क्रमशः T_h तथा T_c हैं तो :

Options :

41652941154. $T_h = 0.5T_c$

41652941155. $T_h = 2T_c$

41652941156. $T_h = T_c$

41652941157. $T_h = 1.5T_c$

Question Number : 20 Question Id : 41652910425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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At some location on earth the horizontal component of earth's magnetic field is 18×10^{-6} T. At this location, magnetic needle of length 0.12 m and pole strength 1.8 Am is suspended from its mid-point using a thread, it makes 45° angle with horizontal in equilibrium. To keep this needle horizontal, the vertical force that should be applied at one of its ends is :

Options :

41652941158. 6.5×10^{-5} N

41652941159. 1.8×10^{-5} N

41652941160. 1.3×10^{-5} N

41652941161. 3.6×10^{-5} N

Question Number : 20 Question Id : 41652910425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किसी स्थान पर पृथ्वी के चुम्बकीय क्षेत्र का क्षैतिज घटक 18×10^{-6} T है। इस स्थान पर 0.12 m लम्बाई तथा 1.8 Am ध्रुव की तीव्रता वाली एक चुम्बकीय सुईं को उसके मध्य बिन्दु से एक धागे द्वारा लटकाया जाता है। साम्यावस्था में यह सुईं क्षैतिज से 45° का कोण बनाती है। सुईं को क्षैतिज रखने हेतु इसके कोई एक सिरे पर ऊर्ध्वाधर बल लगाना चाहिये :

Options :

41652941158. 6.5×10^{-5} N

41652941159. 1.8×10^{-5} N

41652941160. 1.3×10^{-5} N

41652941161. 3.6×10^{-5} N

Question Number : 21 Question Id : 41652910426 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 self induced emf of a coil is 25 volts. When the current in it is changed at uniform rate from 10 A to 25 A in 1 s, the change in the energy of the inductance is :

Options :

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41652941162. 437.5 J

41652941163. 540 J

41652941164. 637.5 J

41652941165. 740 J

Question Number : 21 Question Id : 41652910426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

जब एक कुंडली में धारा को 1 s में एकसमान दर से 10 A से 25 A बढ़ाते हैं तो कुण्डली में स्वप्रेरित विद्युत वाहक बल 25 V है। कुण्डली की ऊर्जा में परिवर्तन का मान होगा :

Options :

41652941162. 437.5 J

41652941163. 540 J

41652941164. 637.5 J

41652941165. 740 J

Question Number : 22 Question Id : 41652910427 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 electric field of a plane polarized electromagnetic wave in free space at time $t=0$ is given by an expression

$$\vec{E}(x, y) = 10\,\hat{j}\cos[(6x + 8z)]$$

The magnetic field $\vec{B}(x, z, t)$ is given by : (c is the velocity of light)

Options :

41652941166. $\frac{1}{c}\left(6\hat{k} - 8\hat{i}\right)\cos[(6x + 8z - 10\,ct)]$

41652941167. $\frac{1}{c}\left(6\hat{k} + 8\hat{i}\right)\cos[(6x - 8z + 10\,ct)]$

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41652941168. $\frac{1}{c}\left(6\hat{k} + 8\hat{i}\right)\cos\left[(6x + 8z - 10\,ct)\right]$

41652941169. $\frac{1}{c}\left(6\hat{k} - 8\hat{i}\right)\cos\left[(6x + 8z + 10\,ct)\right]$

Question Number : 22 Question Id : 41652910427 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 मुक्त आकाश में समतल ध्रुवित विद्युत चुम्बकीय तरंग का $t = 0$ पर विद्युत क्षेत्र निम्न है,

$$\vec{E}(x, y) = 10\,\hat{j}\,\cos\left[(6x + 8z)\right]$$

इसका चुम्बकीय क्षेत्र $\vec{B}(x, z, t)$ होगा : (c, प्रकाश की चाल है)

Options :

41652941166. $\frac{1}{c}\left(6\hat{k} - 8\hat{i}\right)\cos\left[(6x + 8z - 10\,ct)\right]$

41652941167. $\frac{1}{c}\left(6\hat{k} + 8\hat{i}\right)\cos\left[(6x - 8z + 10\,ct)\right]$

41652941168. $\frac{1}{c}\left(6\hat{k} + 8\hat{i}\right)\cos\left[(6x + 8z - 10\,ct)\right]$

41652941169. $\frac{1}{c}\left(6\hat{k} - 8\hat{i}\right)\cos\left[(6x + 8z + 10\,ct)\right]$

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Question Number : 23 Question Id : 41652910428 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 eye can be regarded as a single refracting surface. The radius of curvature of this surface is equal to that of cornea (7.8 mm). This surface separates two media of refractive indices 1 and 1.34. Calculate the distance from the refracting surface at which a parallel beam of light will come to focus.

Options :

41652941170. 2 cm

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41652941171. 1 cm

41652941172. 3.1 cm

41652941173. 4.0 cm

Question Number : 23 Question Id : 41652910428 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 कि आँख एक एकल अपवर्तक पृष्ठ है। इस पृष्ठ की वक्रता त्रिज्या कॉर्निया की वक्रता त्रिज्या (7.8 mm) के बराबर है। यह पृष्ठ अपवर्तनांक 1 तथा 1.34 के माध्यमों को पृथक करता है। इस अपवर्तक पृष्ठ से वह दूरी जिस पर प्रकाश की समान्तर किरणें फोकस में आयेंगी, होगी :

Options :

41652941170. 2 cm

41652941171. 1 cm

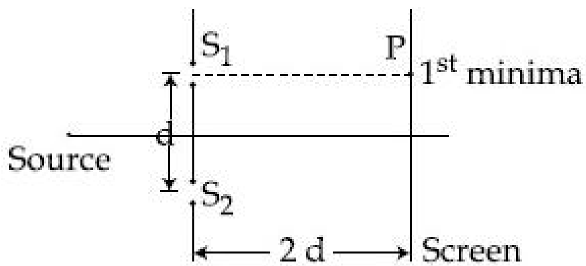
41652941172. 3.1 cm

41652941173. 4.0 cm

Question Number : 24 Question Id : 41652910429 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 a Young's double slit experiment as shown in figure. What should be the slit separation d in terms of wavelength λ such that the first minima occurs directly in front of the slit (S_1) ?



Options :

41652941174. $\frac{\lambda}{(\sqrt{5}-2)}$

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41652941175. $\frac{\lambda}{2(\sqrt{5}-2)}$

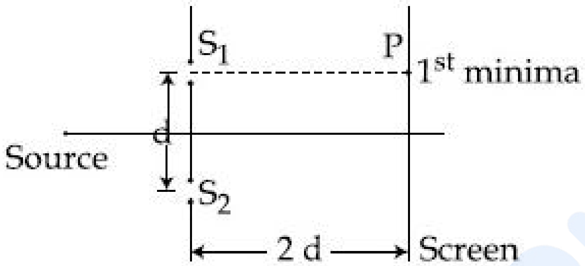
41652941176. $\frac{\lambda}{(5-\sqrt{2})}$

41652941177. $\frac{\lambda}{2(5-\sqrt{2})}$

Question Number : 24 Question Id : 41652910429 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाये गये यंग के द्विझिर्री प्रयोग के अनुसार तरंगदैर्ध्य λ के रूप में झिर्रियों के बीच की वह दूरी d क्या होगी जिससे प्रथम निम्निष्ठ झिर्री S_1 के ठीक सामने बनता है?



Options :

41652941174. $\frac{\lambda}{(\sqrt{5}-2)}$

41652941175. $\frac{\lambda}{2(\sqrt{5}-2)}$

41652941176. $\frac{\lambda}{(5-\sqrt{2})}$

41652941177. $\frac{\lambda}{2(5-\sqrt{2})}$

Question Number : 25 Question Id : 41652910430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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A metal plate of area 1×10^{-4} m^2 is illuminated by a radiation of intensity 16 mW/m^2. The work function of the metal is 5 eV. The energy of the incident photons is 10 eV and only 10% of it produces photo electrons. The number of emitted photo electrons per second and their maximum energy, respectively, will be : [1 eV $= 1.6 \times 10^{-19}$ J]

Options :

41652941178. 10^{10} and 5 eV

41652941179. 10^{11} and 5 eV

41652941180. 10^{12} and 5 eV

41652941181. 10^{14} and 10 eV

Question Number : 25 Question Id : 41652910430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1×10^{-4} m^2 क्षेत्रफल की धातु की एक प्लेट को 16 mW/m^2 तीव्रता के प्रकाश से प्रकाशित किया जाता है। धातु का कार्यफलन 5 eV है। आपतित फोटॉनों की ऊर्जा 10 eV है तथा केवल 10% फोटॉनों से इलेक्ट्रॉन उत्सर्जित होते हैं। प्रति सेकण्ड उत्सर्जित हुए कुल फोटोइलेक्ट्रॉन तथा उनकी अधिकतम ऊर्जा, क्रमश: होगी :
[दिया है : 1 eV $= 1.6 \times 10^{-19}$ J]

Options :

41652941178. 10^{10} तथा 5 eV

41652941179. 10^{11} तथा 5 eV

41652941180. 10^{12} तथा 5 eV

41652941181. 10^{14} तथा 10 eV

Question Number : 26 Question Id : 41652910431 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 nuclear fission

$Ne^{20} \rightarrow 2He^4 + C^{12}$

Given that the binding energy/nucleon of Ne^{20}, He^4 and C^{12} are, respectively, 8.03 MeV, 7.07 MeV and 7.86 MeV, identify the correct statement :

Options :

41652941182. energy of 11.9 MeV has to be supplied

41652941183. energy of 3.6 MeV will be released

41652941184. energy of 12.4 MeV will be supplied

41652941185. 8.3 MeV energy will be released

Question Number : 26 Question Id : 41652910431 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 नाभिकीय विघटन है,

$Ne^{20} \rightarrow 2He^4 + C^{12}$

यदि Ne^{20}, He^4 तथा C^{12} की प्रति न्यूक्लिऑन बन्धन ऊर्जा क्रमशः 8.03 MeV, 7.07 MeV तथा 7.86 MeV हैं तो निम्न में कौन–सा कथन सत्य है ?

Options :

41652941182. 11.9 MeV ऊर्जा को बाहर से देना पड़ेगा

41652941183. 3.6 MeV ऊर्जा उत्सर्जित होगी

41652941184. 12.4 MeV ऊर्जा को बाहर से देना पड़ेगा

41652941185. 8.3 MeV ऊर्जा उत्सर्जित होगी

Question Number : 27 Question Id : 41652910432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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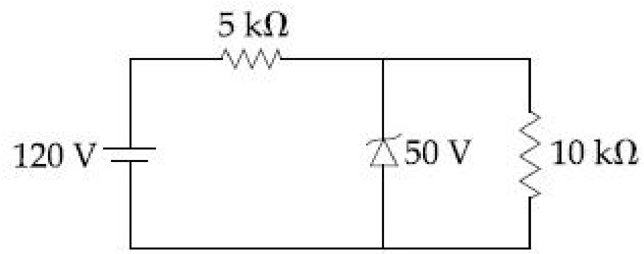
For the circuit shown below, the current through the Zener diode is :



Options :

41652941186. Zero

41652941187. 5 mA

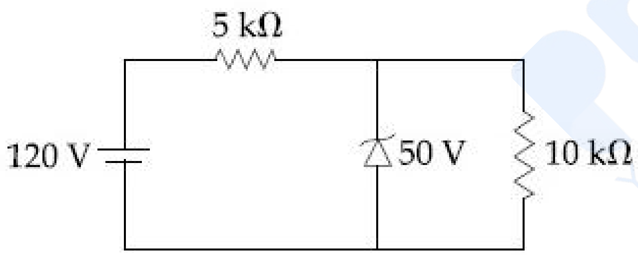
41652941188. 14 mA

41652941189. 9 mA

Question Number : 27 Question Id : 41652910432 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 ज़ीनर डायोड में धारा का मान होगा :



Options :

41652941186. Zero

41652941187. 5 mA

41652941188. 14 mA

41652941189. 9 mA

Question Number : 28 Question Id : 41652910433 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 modulation frequency of an AM radio station is 250 kHz, which is 10% of the carrier wave. If another AM station approaches you for license what broadcast frequency will you allot ?

Options :

41652941190. 2000 kHz

41652941191. 2250 kHz

41652941192. 2750 kHz

41652941193. 2900 kHz

Question Number : 28 Question Id : 41652910433 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 AM रेडियो स्टेशन की माडुलन आवृत्ति 250 kHz है, जो कि उसकी वाहक तरंग आवृत्ति की 10% है। यदि एक और रेडियो स्टेशन लाइसेंस के लिए आता है तो आप कौन-सी प्रसार आवृत्ति आबंटित करेंगे ?

Options :

41652941190. 2000 kHz

41652941191. 2250 kHz

41652941192. 2750 kHz

41652941193. 2900 kHz

Question Number : 29 Question Id : 41652910434 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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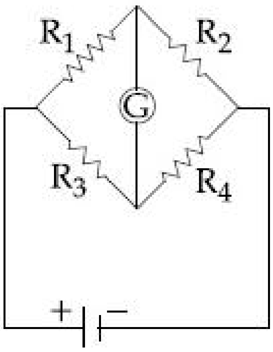
The Wheatstone bridge shown in Fig. here, gets balanced when the carbon resistor used as R_1 has the colour code (Orange, Red, Brown). The resistors R_2 and R_4 are 80 Ω and 40 Ω, respectively.

Assuming that the colour code for the carbon resistors gives their accurate values, the colour code for the carbon resistor, used as R_3, would be :



Options :

41652941194. Grey, Black, Brown

41652941195. Red, Green, Brown

41652941196. Brown, Blue, Black

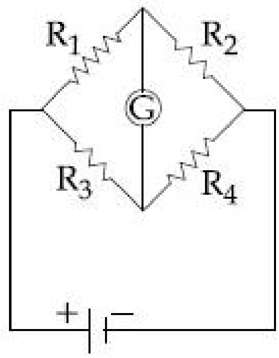
41652941197. Brown, Blue, Brown

Question Number : 29 Question Id : 41652910434 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 गया चित्र में व्हीटस्टोन सेतु संतुलित होता है जब कार्बन प्रतिरोध R_1 का कलर कोड नारंगी, लाल तथा भूरा है। प्रतिरोध R_2 व R_4 क्रमश: 80 Ω तथा 40 Ω हैं।

यह मानते हुये कि कलर कोड कार्बन प्रतिरोध का यथार्थ मान देता है, R_3 को कार्बन प्रतिरोध मानते हुए उसका कलर कोड होगा :



Options :

41652941194. सलेटी, काला, भूरा

41652941195. लाल, हरा, भूरा

41652941196. भूरा, नीला, काला

41652941197. भूरा, नीला, भूरा

Question Number : 30 Question Id : 41652910435 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 unknown metal of mass 192 g heated to a temperature of 100°C was immersed into a brass calorimeter of mass 128 g containing 240 g of water at a temperature of 8.4°C. Calculate the specific heat of the unknown metal if water temperature stabilizes at 21.5°C. (Specific heat of brass is 394 $J\ kg^{-1}\ K^{-1}$)

Options :

41652941198. 916 $J\ kg^{-1}\ K^{-1}$

41652941199. 458 $J\ kg^{-1}\ K^{-1}$

41652941200. 654 $J\ kg^{-1}\ K^{-1}$

41652941201. $1232\ J\,kg^{-1}\,K^{-1}$

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Question Number : 30 Question Id : 41652910435 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

192 g द्रव्यमान की एक अज्ञात धातु को 100°C तक गर्म करके उसे पीतल के एक कैलोरीमीटर में, जिसका द्रव्यमान 128 g है तथा इसमें 240 g पानी 8.4°C पर भरा है, डालते हैं। यदि पानी का तापमान 21.5°C पर स्थायी हो जाता है तो अज्ञात धातु की विशिष्ट ऊष्मा होगी : (पीतल की विशिष्ट ऊष्मा $394\ J\,kg^{-1}\,K^{-1}$ है)

Options :

41652941198. $916\ J\,kg^{-1}\,K^{-1}$

41652941199. $458\ J\,kg^{-1}\,K^{-1}$

41652941200. $654\ J\,kg^{-1}\,K^{-1}$

41652941201. $1232\ J\,kg^{-1}\,K^{-1}$

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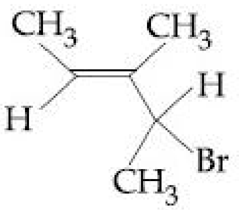
	Chemistry
Section Id :	416529170
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529179
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 41652910436 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

What is the IUPAC name of the following compound ?



Options :

41652941202. 3-Bromo-3-methyl-1, 2-dimethylprop-1-ene

41652941203. 3-Bromo-1, 2-dimethylbut-1-ene

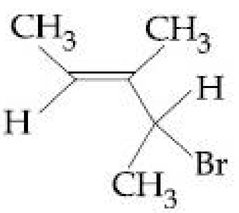
41652941204. 4-Bromo-3-methylpent-2-ene

41652941205. 2-Bromo-3-methylpent-3-ene

Question Number : 31 Question Id : 41652910436 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 यौगिक का IUPAC नाम क्या है ?



Options :

41652941202. 3-ब्रोमो-3-मेथिल-1,2-डाइमेथिलप्रोप-1-ईन

41652941203. 3-ब्रोमो-1, 2-डाइमेथिलब्यूट-1-ईन

41652941204. 4-ब्रोमो-3-मेथिलपेन्ट-2-ईन

41652941205. 2-ब्रोमो-3-मेथिलपेन्ट-3-ईन

Question Number : 32 Question Id : 41652910437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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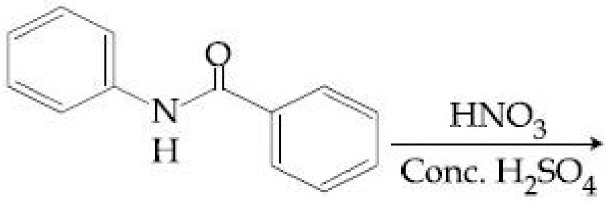
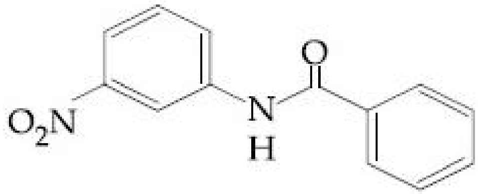
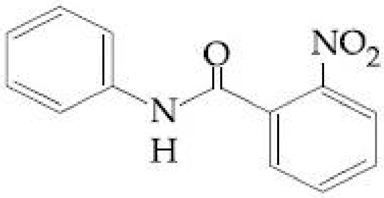
What will be the major product in the following mononitration reaction ?



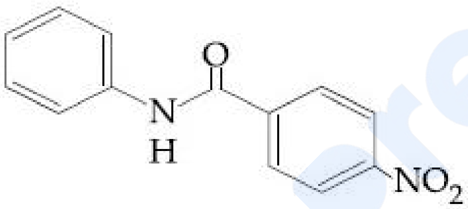
Options :



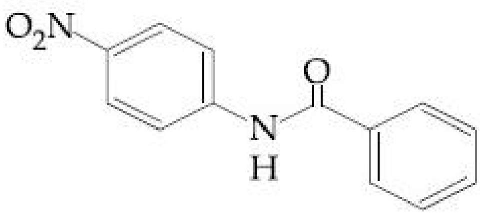
41652941206.



41652941207.



41652941208.

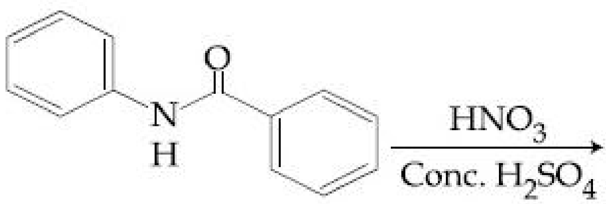


41652941209.

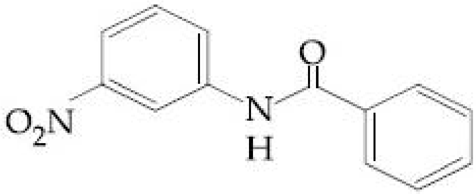
Question Number : 32 Question Id : 41652910437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

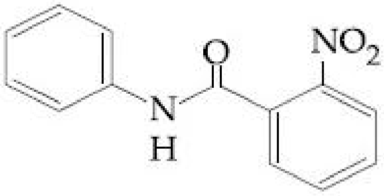
Correct Marks : 4 Wrong Marks : 1

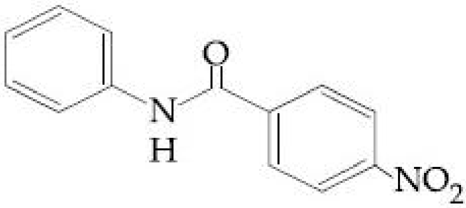
निम्नलिखित मोनोनाइट्रेशन अभिक्रिया में कौन सा मुख्य उत्पाद होगा ?

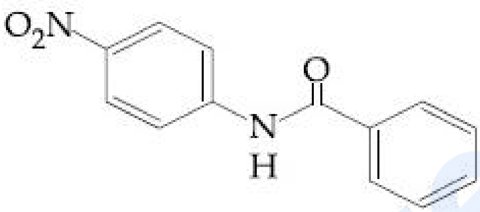


Options :

41652941206. 

41652941207. 

41652941208. 

41652941209. 

Question Number : 33 Question Id : 41652910438 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 :

41652941210.

41652941211.

41652941212.

41652941213.

Question Number : 33 Question Id : 41652910438 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 :

41652941210.

41652941211.

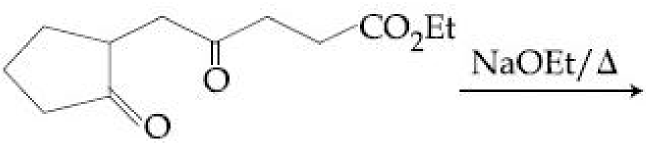
41652941212.

41652941213.

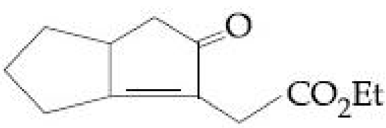
Question Number : 34 Question Id : 41652910439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

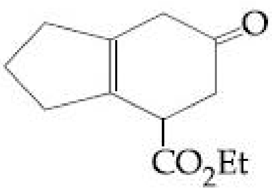
Correct Marks : 4 Wrong Marks : 1

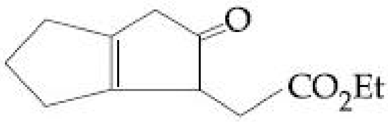
The major product obtained in the following reaction is :



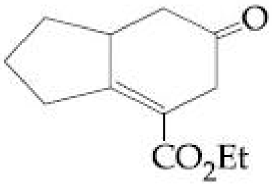
Options :

41652941214. 

41652941215. 



41652941216.

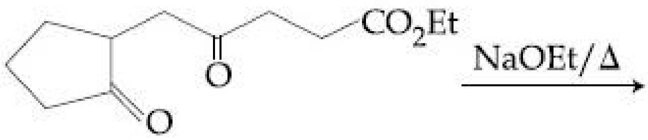


41652941217.

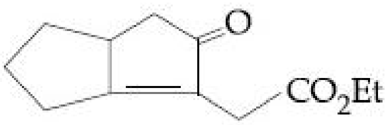
Question Number : 34 Question Id : 41652910439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

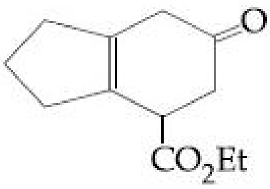
निम्नलिखित अभिक्रिया में प्राप्त होने वाला मुख्य उत्पाद है :



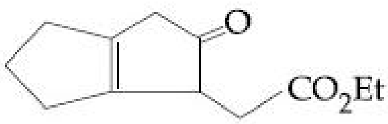
Options :



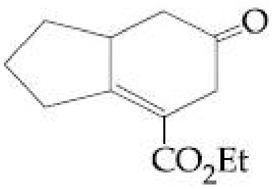
41652941214.



41652941215.



41652941216.



41652941217.

Question Number : 35 Question Id : 41652910440 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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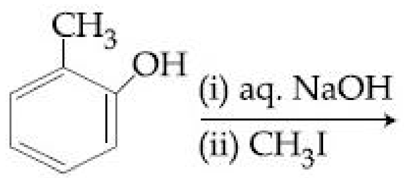
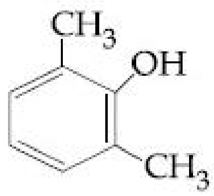
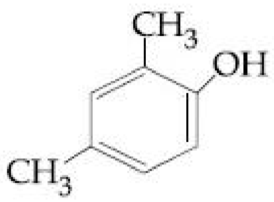
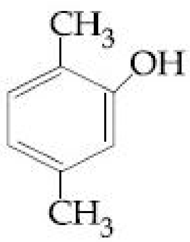
The major product of the following reaction is :



Options :

41652941218. 

41652941219. 

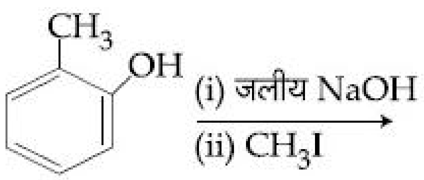
41652941220. 

41652941221.

Question Number : 35 Question Id : 41652910440 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :



Options :

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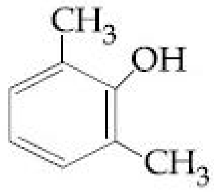
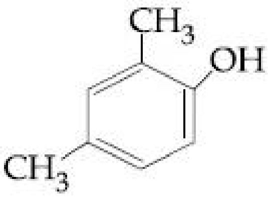
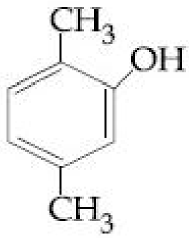
41652941218. 

41652941219. 

41652941220. 

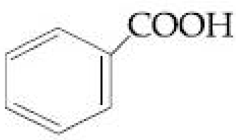
41652941221.

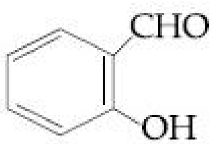
Question Number : 36 Question Id : 41652910441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

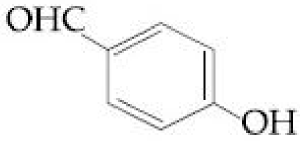
Correct Marks : 4 Wrong Marks : 1

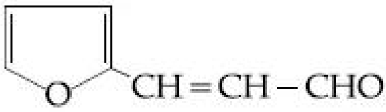
An aromatic compound 'A' having molecular formula $C_7H_6O_2$ on treating with aqueous ammonia and heating forms compound 'B'. The compound 'B' on reaction with molecular bromine and potassium hydroxide provides compound 'C' having molecular formula C_6H_7N. The structure of 'A' is :

Options :

41652941222. 

41652941223. 

41652941224. 

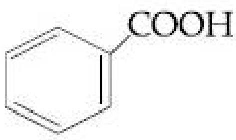
41652941225. 

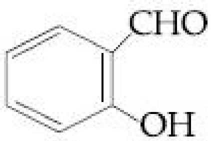
Question Number : 36 Question Id : 41652910441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

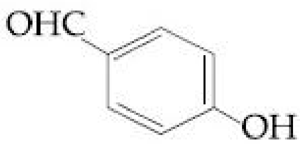
Correct Marks : 4 Wrong Marks : 1

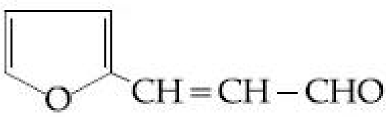
एक कार्बनिक यौगिक 'A' जिसका आण्विक सूत्र $C_7H_6O_2$ है, जलीय अमोनिया के साथ गर्म करने पर यौगिक 'B' बनाता है। यौगिक 'B' आण्विक ब्रोमीन तथा पोटेशियम हाइड्राक्साइड के साथ अभिक्रिया करके यौगिक 'C' देता हैं जिसका आण्विक सूत्र C_6H_7N है। 'A' की संरचना है :

Options :

41652941222. 

41652941223. 

41652941224. 

41652941225. 

Question Number : 37 Question Id : 41652910442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which is the most suitable reagent for the following transformation ?

$$CH_3-CH=CH-CH_2-\overset{\displaystyle OH}{\overset{|}{C}H}-CH_3 \longrightarrow$$

$$CH_3-CH=CH-CH_2CO_2H$$

Options :

41652941226. Tollen's reagent

41652941227. $I_2/NaOH$

41652941228. alkaline $KMnO_4$

41652941229. CrO_2Cl_2/CS_2

Question Number : 37 Question Id : 41652910442 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 रूपान्तरण के लिए सर्वाधिक उपयुक्त अभिकर्मक क्या है?

$$CH_3-CH=CH-CH_2-\overset{\displaystyle OH}{\overset{|}{C}H}-CH_3 \longrightarrow$$

$$CH_3-CH=CH-CH_2CO_2H$$

Options :

41652941226. टॉलेन अभिकर्मक

41652941227. $I_2/NaOH$

41652941228. क्षारीय $KMnO_4$

41652941229. CrO_2Cl_2/CS_2

Question Number : 38 Question Id : 41652910443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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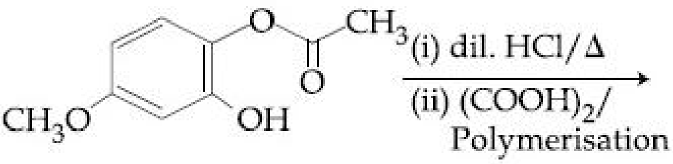
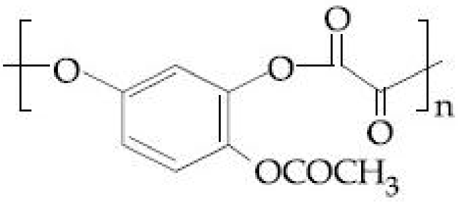
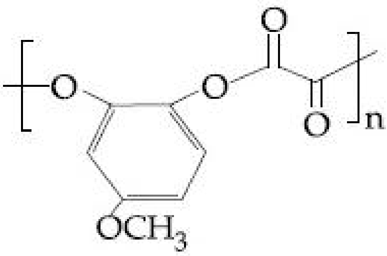
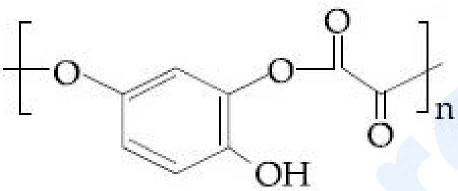
The major product of the following reaction is :

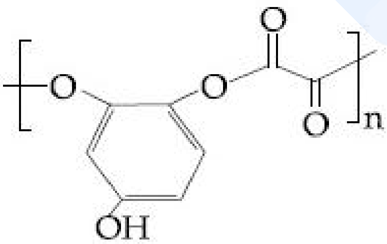


Options :

41652941230.


41652941231.


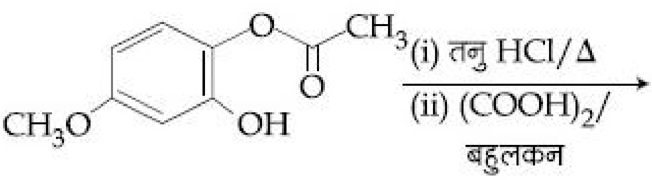
41652941232.


41652941233.


Question Number : 38 Question Id : 41652910443 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 :

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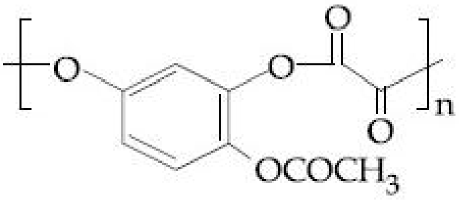
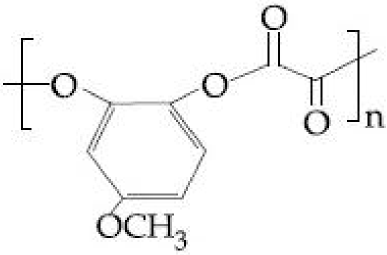
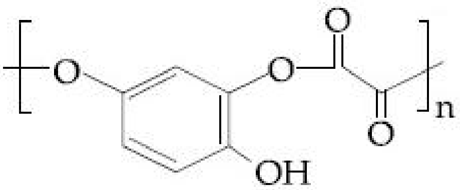
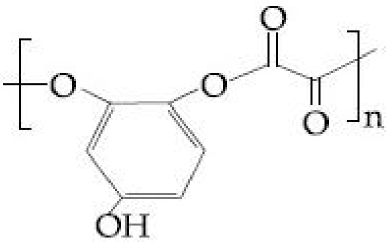
41652941230. 

41652941231. 

41652941232. 

41652941233. 

Question Number : 39 Question Id : 41652910444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following tests cannot be used for identifying amino acids ?

Options :

41652941234. Xanthoproteic test

41652941235. Barfoed test

41652941236. Biuret test

41652941237. Ninhydrin test

Question Number : 39 Question Id : 41652910444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ऐमीनो अम्लों को पहचानने के लिए निम्नलिखित में से कौन से परीक्षण का उपयोग नहीं कर सकते हैं ?

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Options :

41652941234. जैन्थोप्रोटीइक परीक्षण

41652941235. बार्फोड परीक्षण

41652941236. बाइयूरेट परीक्षण

41652941237. निनहाइड्रिन परीक्षण

Question Number : 40 Question Id : 41652910445 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' (compound)		Item 'II' (reagent)
(A)	Lysine	(P)	1-naphthol
(B)	Furfural	(Q)	ninhydrin
(C)	Benzyl alcohol	(R)	$KMnO_4$
(D)	Styrene	(S)	Ceric ammonium nitrate

Options :

41652941238. (A)→(Q); (B)→(P); (C)→(R); (D)→(S)

41652941239. (A)→(R); (B)→(P); (C)→(Q); (D)→(S)

41652941240. (A)→(Q); (B)→(P); (C)→(S); (D)→(R)

41652941241. (A)→(Q); (B)→(R); (C)→(S); (D)→(P)

Question Number : 40 Question Id : 41652910445 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 मध्य सही सुमेल है :

	मद 'I' (यौगिक)		मद 'II' (अभिकर्मक)
(A)	लाइसीन	(P)	1-नैफ्थॉल
(B)	फरफ्यूरल	(Q)	निनहाइड्रिन
(C)	बिन्ज़िल एल्कोहाल	(R)	$KMnO_4$
(D)	स्टाइरीन	(S)	सेरिक अमोनियम नाइट्रेट

Options :

41652941238. (A)→(Q); (B)→(P); (C)→(R); (D)→(S)

41652941239. (A)→(R); (B)→(P); (C)→(Q); (D)→(S)

41652941240. (A)→(Q); (B)→(P); (C)→(S); (D)→(R)

41652941241. (A)→(Q); (B)→(R); (C)→(S); (D)→(P)

Question Number : 41 Question Id : 41652910446 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 71^{st} electron of an element X with an atomic number of 71 enters into the orbital :

Options :

41652941242. 6s

41652941243. 4f

41652941244. 5d

41652941245. 6p

Question Number : 41 Question Id : 41652910446 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 तत्व X, जिसकी परमाणु संख्या 71 है, उसका 71वाँ इलेक्ट्रॉन जिस कक्षक में प्रवेश करता है, वह है :

Options :

41652941242. 6s

41652941243. 4f

41652941244. 5d

41652941245. 6p

Question Number : 42 Question Id : 41652910447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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The electrolytes usually used in the electroplating of gold and silver, respectively, are :

Options :

41652941246. $[Au(CN)_2]^-$ and $[Ag(CN)_2]^-$

41652941247. $[Au(NH_3)_2]^+$ and $[Ag(CN)_2]^-$

41652941248. $[Au(CN)_2]^-$ and $[Ag\ Cl_2]^-$

41652941249. $[Au(OH)_4]^-$ and $[Ag(OH)_2]^-$

Question Number : 42 Question Id : 41652910447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सोना तथा चाँदी के वैद्युत लेपन में उपयोग होने वाले वैद्युत अपघट्य क्रमशः हैं :

Options :

41652941246. $[Au(CN)_2]^-$ तथा $[Ag(CN)_2]^-$

41652941247. $[Au(NH_3)_2]^+$ तथा $[Ag(CN)_2]^-$

41652941248. $[Au(CN)_2]^-$ तथा $[Ag\ Cl_2]^-$

41652941249. $[Au(OH)_4]^-$ तथा $[Ag(OH)_2]^-$

Question Number : 43 Question Id : 41652910448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Among the following reactions of hydrogen with halogens, the one that requires a catalyst is :

Options :

41652941250. $H_2 + F_2 \rightarrow 2\,HF$

41652941251. $H_2 + Cl_2 \rightarrow 2\,HCl$

41652941252. $H_2 + Br_2 \rightarrow 2\,HBr$

41652941253. $H_2 + I_2 \rightarrow 2\,HI$

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Question Number : 43 Question Id : 41652910448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हैलोजन के साथ हाइड्रोजन की निम्नलिखित अभिक्रियाओं में से जिसमें एक उत्प्रेरक की आवश्यकता होती है, वह है :

Options :

41652941250. $H_2 + F_2 \rightarrow 2\,HF$

41652941251. $H_2 + Cl_2 \rightarrow 2\,HCl$

41652941252. $H_2 + Br_2 \rightarrow 2\,HBr$

41652941253. $H_2 + I_2 \rightarrow 2\,HI$

Question Number : 44 Question Id : 41652910449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Sodium metal on dissolution in liquid ammonia gives a deep blue solution due to the formation of :

Options :

41652941254. sodamide

41652941255. sodium-ammonia complex

41652941256. sodium ion-ammonia complex

41652941257. ammoniated electrons

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Question Number : 44 Question Id : 41652910449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव अमोनिया में सोडियम धातु को विलयित करने पर एक गहरे नीले रंग का विलयन देता है, इसका कारण है :

Options :

41652941254. सोडामाइड का बनना

41652941255. सोडियम-अमोनिया संकुल का बनना

41652941256. सोडियम आयन-अमोनिया संकुल का बनना

41652941257. अमोनियित इलेक्ट्रॉनों का बनना

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Question Number : 45 Question Id : 41652910450 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 pair that contains two P – H bonds in each of the oxoacids is :

Options :

41652941258. H_3PO_3 and H_3PO_2

41652941259. $H_4P_2O_5$ and H_3PO_3

41652941260. H_3PO_2 and $H_4P_2O_5$

41652941261. $H_4P_2O_5$ and $H_4P_2O_6$

Question Number : 45 Question Id : 41652910450 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 युग्मों में से जिस युग्म के प्रत्येक आक्सोअम्लों में दो P – H आबंध हैं, वह है :

Options :

41652941258. H_3PO_3 तथा H_3PO_2

41652941259. $H_4P_2O_5$ तथा H_3PO_3

41652941260. H_3PO_2 तथा $H_4P_2O_5$

41652941261. $H_4P_2O_5$ तथा $H_4P_2O_6$

Question Number : 46 Question Id : 41652910451 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 number of 2-centre-2-electron and 3-centre-2-electron bonds in B_2H_6, respectively, are :

Options :

41652941262. 2 and 2

41652941263. 4 and 2

41652941264. 2 and 4

41652941265. 2 and 1

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Question Number : 46 Question Id : 41652910451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

B_2H_6 में 2-केन्द्र-2-इलेक्ट्रॉन तथा 3-केन्द्र-2-इलेक्ट्रॉन आबंधों की संख्या क्रमशः हैं :

Options :

41652941262. 2 तथा 2

41652941263. 4 तथा 2

41652941264. 2 तथा 4

41652941265. 2 तथा 1

Question Number : 47 Question Id : 41652910452 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 reaction of oxalate with permanganate in acidic medium, the number of electrons involved in producing one molecule of CO_2 is :

Options :

41652941266. 5

41652941267. 1

41652941268. 2

41652941269. 10

Question Number : 47 Question Id : 41652910452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अम्लीय माध्यम में आक्सैलेट की परमैंगनेट के साथ अभिक्रिया में, CO_2 के एक अणु को बनाने में निहित इलेक्ट्रॉनों की संख्या है :

Options :

41652941266. 5

41652941267. 1

41652941268. 2

41652941269. 10

Question Number : 48 Question Id : 41652910453 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 difference in the number of unpaired electrons of a metal ion in its high-spin and low-spin octahedral complexes is two. The metal ion is :

Options :

41652941270. Ni^{2+}

41652941271. Mn^{2+}

41652941272. Co^{2+}

41652941273. Fe^{2+}

Question Number : 48 Question Id : 41652910453 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 धातु आयन के उच्च–प्रचक्रण तथा निम्न–प्रचक्रण वाले अष्टफलकीय संकुलों के अयुग्मित इलेक्ट्रॉनों की संख्याओं में दो का अन्तर है। धातु आयन है :

Options :

41652941270. Ni^{2+}

41652941271. Mn^{2+}

41652941272. Co^{2+}

41652941273. Fe^{2+}

Question Number : 49 Question Id : 41652910454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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A reaction of cobalt(III) chloride and ethylenediamine in a 1 : 2 mole ratio generates two isomeric products A (violet coloured) and B (green coloured). A can show optical activity, but, B is optically inactive. What type of isomers does A and B represent ?

Options :

41652941274. Coordination isomers

41652941275. Geometrical isomers

41652941276. Ionisation isomers

41652941277. Linkage isomers

Question Number : 49 Question Id : 41652910454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कोबाल्ट (III) क्लोराइड तथा ऐथिलीनडाइऐमीन की 1 : 2 मोल अनुपात में अभिक्रिया से दो समावयवी उत्पाद A (बैंगनी रंग का) तथा उत्पाद B (हरे रंग का) उत्पन्न होते हैं। A ध्रुवण घूर्णकता प्रदर्शित करता है, परन्तु B ध्रुवण घूर्णक नहीं है। किस प्रकार की समावयता A तथा B निरूपित करते हैं ?

Options :

41652941274. उपसहसंयोजन समावयता

41652941275. ज्यामितीय समावयवता

41652941276. आयनन समावयवता

41652941277. बंधनी समावयता

Question Number : 50 Question Id : 41652910455 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 reaction that is NOT involved in the ozone layer depletion mechanism in the stratosphere is :

Options :

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41652941278. $HOCl(g) \xrightarrow{h\nu} \dot{O}H(g) + \dot{C}l(g)$.

41652941279. $Cl\dot{O}(g) + O(g) \rightarrow \dot{C}l(g) + O_2(g)$

41652941280. $CH_4 + 2\,O_3 \rightarrow 3\,CH_2{=}O + 3\,H_2O$

41652941281. $CF_2Cl_2(g) \xrightarrow{uv} \dot{C}l(g) + \dot{C}F_2Cl(g)$

Question Number : 50 Question Id : 41652910455 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समतापमंडल में ओज़ोन परतों के अवक्षय में जो अभिक्रिया **नहीं** सम्मिलित होती है, वह है :

Options :

41652941278. $HOCl(g) \xrightarrow{h\nu} \dot{O}H(g) + \dot{C}l(g)$.

41652941279. $Cl\dot{O}(g) + O(g) \rightarrow \dot{C}l(g) + O_2(g)$

41652941280. $CH_4 + 2\,O_3 \rightarrow 3\,CH_2{=}O + 3\,H_2O$

41652941281. $CF_2Cl_2(g) \xrightarrow{uv} \dot{C}l(g) + \dot{C}F_2Cl(g)$

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Question Number : 51 Question Id : 41652910456 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 amount of sugar ($C_{12}H_{22}O_{11}$) required to prepare 2 L of its 0.1 M aqueous solution is :

Options :

41652941282. 34.2 g

41652941283. 68. 4 g

41652941284. 17.1 g

41652941285. 136.8 g

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Question Number : 51 Question Id : 41652910456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

शर्करा के दो लीटर 0.1 M जलीय विलयन को बनाने के लिए शर्करा ($C_{12}H_{22}O_{11}$) की आवश्यक मात्रा है :

Options :

41652941282. 34.2 g

41652941283. 68. 4 g

41652941284. 17.1 g

41652941285. 136.8 g

Question Number : 52 Question Id : 41652910457 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 compound of formula A_2B_3 has the hcp lattice. Which atom forms the hcp lattice and what fraction of tetrahedral voids is occupied by the other atoms :

Options :

41652941286. hcp lattice - A, $\frac{2}{3}$ Tetrahedral voids - B

41652941287. hcp lattice - B, $\frac{2}{3}$ Tetrahedral voids - A

41652941288. hcp lattice - A, $\frac{1}{3}$ Tetrahedral voids - B

41652941289. hcp lattice - B, $\frac{1}{3}$ Tetrahedral voids - A

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Question Number : 52 Question Id : 41652910457 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_2B_3 सूत्र वाले एक यौगिक में hcp जालक है। कौन सा परमाणु hcp जालक बनाता है तथा चतुष्फलकीय रिक्तियों का कौन सा अंश दूसरे परमाणु द्वारा अध्यासित होता है?

Options :

41652941286. hcp जालक - A, $\frac{2}{3}$ चतुष्फलकीय रिक्तियाँ - B

41652941287. hcp जालक - B, $\frac{2}{3}$ चतुष्फलकीय रिक्तियाँ - A

41652941288. hcp जालक - A, $\frac{1}{3}$ चतुष्फलकीय रिक्तियाँ - B

41652941289. hcp जालक - B, $\frac{1}{3}$ चतुष्फलकीय रिक्तियाँ - A

Question Number : 53 Question Id : 41652910458 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 ground state energy of hydrogen atom is -13.6 eV. The energy of second excited state of He^+ ion in eV is :

Options :

41652941290. -54.4

41652941291. -27.2

41652941292. -3.4

41652941293. -6.04

Question Number : 53 Question Id : 41652910458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन परमाणु की मूल अवस्था ऊर्जा -13.6 eV है। He^+ आयन की द्वितीय उत्तेजित अवस्था की ऊर्जा, eV में, है :

Options :

41652941290. -54.4

41652941291. -27.2

41652941292. -3.4

41652941293. -6.04

Question Number : 54 Question Id : 41652910459 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 ideal gas undergoes isothermal compression from 5 m^3 to 1 m^3 against a constant external pressure of 4 Nm^{-2}. Heat released in this process is used to increase the temperature of 1 mole of Al. If molar heat capacity of Al is 24 J $mol^{-1}K^{-1}$, the temperature of Al increases by :

Options :

41652941294. 1 K

41652941295. $\frac{2}{3}$ K

41652941296. 2 K

41652941297. $\frac{3}{2}$ K

Question Number : 54 Question Id : 41652910459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

4 Nm^{-2} के स्थिर बाह्य दाब के विरुद्ध, एक आदर्श गैस का समतापी संपीडन 5 m^3 से 1 m^3 तक किया जाता है। इस प्रक्रम में उत्सर्जित ऊष्मा का प्रयोग 1 मोल Al के ताप को बढ़ाने के लिए किया जाता है। यदि Al की मोलर ऊष्मा धारिता 24 J $mol^{-1}K^{-1}$ है तो Al का ताप जितना बढ़ता है, वह है :

Options :

41652941294. 1 K

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41652941295. $\frac{2}{3}$ K

41652941296. 2 K

41652941297. $\frac{3}{2}$ K

Question Number : 55 Question Id : 41652910460 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 process with negative entropy change is :

Options :

41652941298. Sublimation of dry ice

41652941299. Dissolution of iodine in water

41652941300. Dissociation of $CaSO_4(s)$ to $CaO(s)$ and $SO_3(g)$

41652941301. Synthesis of ammonia from N_2 and H_2

Question Number : 55 Question Id : 41652910460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ऋणात्मक एन्ट्रापी परिवर्तन वाला प्रक्रम है :

Options :

41652941298. शुष्क बर्फ का ऊर्ध्वपातन

41652941299. आयोडीन का जल में विलयन

41652941300. $CaSO_4(s)$ का $CaO(s)$ तथा $SO_3(g)$ में वियोजन

41652941301. N_2 तथा H_2 से अमोनिया का संश्लेषण

Question Number : 56 Question Id : 41652910461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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Elevation in the boiling point for 1 molal solution of glucose is 2 K. The depression in the freezing point for 2 molal solution of glucose in the same solvent is 2 K. The relation between K_b and K_f is :

Options :

41652941302. $K_b = 1.5\ K_f$

41652941303. $K_b = 0.5\ K_f$

41652941304. $K_b = K_f$

41652941305. $K_b = 2\ K_f$

Question Number : 56 Question Id : 41652910461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ग्लूकोस के 1 मोलल विलयन के क्वथनांक में उन्नयन 2 K है। ग्लूकोस के उसी विलायक में 2 मोलल विलयन के हिमांक में अवनमन 2 K है। K_b तथा K_f में संबंध है :

Options :

41652941302. $K_b = 1.5\ K_f$

41652941303. $K_b = 0.5\ K_f$

41652941304. $K_b = K_f$

41652941305. $K_b = 2\ K_f$

Question Number : 57 Question Id : 41652910462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

5.1 g NH_4SH is introduced in 3.0 L evacuated flask at 327°C. 30% of the solid NH_4SH decomposed to NH_3 and H_2S as gases. The K_p of the reaction at 327°C is ($R = 0.082$ L atm $mol^{-1}K^{-1}$, Molar mass of S = 32 g mol^{-1}, molar mass of N = 14 g mol^{-1})

Options :

41652941306. $1 \times 10^{-4}\ atm^2$

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41652941307. $4.9 \times 10^{-3}\ atm^2$

41652941308. $0.242\ atm^2$

41652941309. $0.242 \times 10^{-4}\ atm^2$

Question Number : 57 Question Id : 41652910462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

5.1 g NH_4SH को 327°C पर 3.0 L के एक रिक्त किये गये फ्लास्क में डाला जाता है। 30% ठोस NH_4SH, NH_3 तथा H_2S गैसों में अपघटित हो जाता है। 327°C पर इस अभिक्रिया का K_p है : ($R = 0.082\ L\ atm\ mol^{-1}K^{-1}$, मोलर द्रव्यमान $S = 32\ g\ mol^{-1}$, मोलर द्रव्यमान $N = 14\ g\ mol^{-1}$)

Options :

41652941306. $1 \times 10^{-4}\ atm^2$

41652941307. $4.9 \times 10^{-3}\ atm^2$

41652941308. $0.242\ atm^2$

41652941309. $0.242 \times 10^{-4}\ atm^2$

Question Number : 58 Question Id : 41652910463 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 cell

$Pt(s)|H_2(g, 1bar)|HCl(aq)|\ AgCl(s)|Ag(s)|\ Pt(s)$

the cell potential is 0.92 V when a 10^{-6} molal HCl solution is used. The standard electrode potential of $(AgCl/Ag, Cl^-)$ electrode is :

$$\left\{ \text{Given, } \frac{2.303RT}{F} = 0.06\ V \text{ at } 298\ K \right\}$$

Options :

41652941310. 0.40 V

41652941311. 0.76 V

41652941312. 0.20 V

41652941313. 0.94 V

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Question Number : 58 Question Id : 41652910463 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 सेल में

Pt(s)|H_2(g, 1bar)|HCl(aq)| AgCl(s)|Ag(s)| Pt(s)
यदि 10^{-6} molal HCl विलयन का उपयोग होता है तो सेल का विभव 0.92 V है। $(AgCl/Ag, Cl^-)$ इलेक्ट्रोड का मानक इलेक्ट्रोड विभव है : दिया गया है,

{दिया गया है, $\frac{2.303RT}{F} = 0.06$ V, 298 K पर}

Options :

41652941310. 0.40 V

41652941311. 0.76 V

41652941312. 0.20 V

41652941313. 0.94 V

Question Number : 59 Question Id : 41652910464 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 an elementary chemical reaction,

$A_2 \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} 2A$, the expression for $\frac{d[A]}{dt}$ is :

Options :

41652941314. $k_1[A_2] - k_{-1}[A]^2$

41652941315. $2k_1[A_2] - 2k_{-1}[A]^2$

41652941316. $2k_1[A_2] - k_{-1}[A]^2$

41652941317. $k_1[A_2] + k_{-1}[A]^2$

Question Number : 59 Question Id : 41652910464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

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एक प्रारम्भिक रासायनिक अभिक्रिया

$A_2 \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} 2A$ के लिए व्यंजक $\frac{d[A]}{dt}$ है :

Options :

41652941314. $k_1[A_2] - k_{-1}[A]^2$

41652941315. $2k_1[A_2] - 2k_{-1}[A]^2$

41652941316. $2k_1[A_2] - k_{-1}[A]^2$

41652941317. $k_1[A_2] + k_{-1}[A]^2$

Question Number : 60 Question Id : 41652910465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Haemoglobin and gold sol are examples of :

Options :

41652941318. positively charged sols

41652941319. negatively charged sols

41652941320. positively and negatively charged sols, respectively

41652941321. negatively and positively charged sols, respectively

Question Number : 60 Question Id : 41652910465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हीमोग्लोबिन तथा गोल्ड सॉल उदाहरण हैं :

Options :

41652941318. धनात्मक आवेशित सॉलों के

41652941319. ऋणात्मक आवेशित सॉलों के

41652941320. क्रमश: धनात्मक तथा ऋणात्मक आवेशित सॉलों के

41652941321. क्रमशः ऋणात्मक तथा धनात्मक आवेशित सॉलों के

Mathematics

Section Id :	416529171
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529180
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 41652910466 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 N be the set of natural numbers and two functions f and g be defined as $f, g : \mathbf{N} \rightarrow \mathbf{N}$ such that

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{if n is odd} \\ \frac{n}{2} & \text{if n is even} \end{cases}$$

and $g(n) = n - (-1)^n$. Then fog is :

Options :

41652941322. both one-one and onto.

41652941323. one-one but not onto.

41652941324. onto but not one-one.

41652941325. neither one-one nor onto.

Question Number : 61 Question Id : 41652910466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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माना समुच्चय N प्राकृत संख्याओं को दर्शाता है तथा दो फलन f और g निम्न तरीके से परिभाषित है :

$f, g : \mathrm{N} \to \mathrm{N}$

$$f(\mathrm{n}) = \begin{cases} \dfrac{\mathrm{n}+1}{2} & \text{जब n विषम है} \\ \dfrac{\mathrm{n}}{2} & \text{जब n सम है} \end{cases}$$

तथा $g(\mathrm{n}) = \mathrm{n} - (-1)^{\mathrm{n}}$; तो फलन fog

Options :

41652941322. एकैकी तथा आच्छादी दोनों हैं।

41652941323. एकैकी है परन्तु आच्छादी नहीं है।

41652941324. आच्छादी है परन्तु एकैकी नहीं है।

41652941325. न आच्छादी है और न ही एकैकी है।

Question Number : 62 Question Id : 41652910467 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 λ such that sum of the squares of the roots of the quadratic equation, $x^2 + (3-\lambda)x + 2 = \lambda$ has the least value is :

Options :

41652941326. $\frac{4}{9}$

41652941327. 2

41652941328. 1

41652941329. $\frac{15}{8}$

Question Number : 62 Question Id : 41652910467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

λ का वह मान जिसके लिए द्विघात समीकरण $x^2 + (3-\lambda)x + 2 = \lambda$ के मूलों के वर्गों के योग का मान न्यूनतम है, है :

Options :

41652941326. $\frac{4}{9}$

41652941327. 2

41652941328. 1

41652941329. $\frac{15}{8}$

Question Number : 63 Question Id : 41652910468 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 $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$. If R(z) and I(z) respectively denote the real and imaginary parts of z, then :

Options :

41652941330. $R(z) > 0$ and $I(z) > 0$

41652941331. $R(z) < 0$ and $I(z) > 0$

41652941332. $R(z) = -3$

41652941333. $I(z) = 0$

Question Number : 63 Question Id : 41652910468 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 $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$ है।

यदि R(z) तथा I(z) क्रमशः z के वास्तविक तथा काल्पनिक भागों को दर्शाता हैं, तो :

Options :

41652941330. $R(z) > 0$ तथा $I(z) > 0$

41652941331. $R(z) < 0$ तथा $I(z) > 0$

41652941332. $R(z) = -3$

41652941333. $I(z) = 0$

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Question Number : 64 Question Id : 41652910469 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 $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2+1 & b \\ 1 & b & 2 \end{bmatrix}$ where $b > 0$. Then

the minimum value of $\frac{\det(A)}{b}$ is :

Options :

41652941334. $-2\sqrt{3}$

41652941335. $-\sqrt{3}$

41652941336. $\sqrt{3}$

41652941337. $2\sqrt{3}$

Question Number : 64 Question Id : 41652910469 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 $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2+1 & b \\ 1 & b & 2 \end{bmatrix}$ जहाँ $b > 0$ है। तो

$\frac{\det(A)}{b}$ का न्यूनतम मान है :

Options :

41652941334. $-2\sqrt{3}$

41652941335. $-\sqrt{3}$

41652941336. $\sqrt{3}$

41652941337. $2\sqrt{3}$

Question Number : 65 Question Id : 41652910470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

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Correct Marks : 4 Wrong Marks : 1

The number of values of $\theta \in (0, \pi)$ for which the system of linear equations

$x + 3y + 7z = 0$

$-x + 4y + 7z = 0$

$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$

has a non-trivial solution, is :

Options :

41652941338. four

41652941339. three

41652941340. two

41652941341. one

Question Number : 65 Question Id : 41652910470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\theta \in (0, \pi)$ के ऐसे मानों की संख्या, जिनके लिए निम्न रैखिक समीकरण निकाय

$x + 3y + 7z = 0$

$-x + 4y + 7z = 0$

$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$

का एक अतुच्छ हल है, है :

Options :

41652941338. चार

41652941339. तीन

41652941340. दो

41652941341. एक

Question Number : 66 Question Id : 41652910471 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 $\sum_{r=0}^{25} \left\{ {}^{50}C_r \cdot {}^{50-r}C_{25-r} \right\} = K\left({}^{50}C_{25} \right)$,

then K is equal to :

Options :

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41652941342. $(25)^2$

41652941343. 2^{24}

41652941344. $2^{25}-1$

41652941345. 2^{25}

Question Number : 66 Question Id : 41652910471 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 $\sum_{r=0}^{25}\left\{{}^{50}C_r \cdot {}^{50-r}C_{25-r}\right\} = K\left({}^{50}C_{25}\right)$

है, तो K बराबर है :

Options :

41652941342. $(25)^2$

41652941343. 2^{24}

41652941344. $2^{25}-1$

41652941345. 2^{25}

Question Number : 67 Question Id : 41652910472 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 positive value of λ for which the co-efficient of x^2 in the expression

$x^2\left(\sqrt{x}+\frac{\lambda}{x^2}\right)^{10}$ is 720, is :

Options :

41652941346. $\sqrt{5}$

41652941347. $2\sqrt{2}$

41652941348. 3

41652941349. 4

Question Number : 67 Question Id : 41652910472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

λ का वह धनात्मक मान जिसके लिए व्यंजक

$x^2\left(\sqrt{x}+\frac{\lambda}{x^2}\right)^{10}$ में x^2 का गुणांक 720 है, है :

Options :

41652941346. $\sqrt{5}$

41652941347. $2\sqrt{2}$

41652941348. 3

41652941349. 4

Question Number : 68 Question Id : 41652910473 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 $a_1, a_2, a_3, \ldots, a_{10}$ be in G.P. with $a_i > 0$ for i=1, 2, …., 10 and S be the set of pairs (r, k), r, k∈N (the set of natural numbers) for which

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

Then the number of elements in S, is :

Options :

41652941350. 2

41652941351. 4

41652941352. 10

41652941353. infinitely many

Question Number : 68 Question Id : 41652910473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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माना $a_1, a_2, a_3, \ldots, a_{10}$ गुणोत्तर श्रेढ़ी में हैं तथा $i=1, 2, \ldots, 10$ के लिए $a_i > 0$ है और S, ऐसे युग्मों (r, k), $r, k \in N$ (प्राकृत संख्याओं का समुच्चय) का समुच्चय है जिनके लिए

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

तो S के अवयवों की संख्या है :

Options :

41652941350. 2

41652941351. 4

41652941352. 10

41652941353. अनन्त

Question Number : 69 Question Id : 41652910474 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 $\cot\left(\sum_{n=1}^{19} \cot^{-1}\left(1 + \sum_{p=1}^{n} 2p\right)\right)$ is :

Options :

41652941354. $\frac{22}{23}$

41652941355. $\frac{23}{22}$

41652941356. $\frac{21}{19}$

41652941357. $\frac{19}{21}$

Question Number : 69 Question Id : 41652910474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\cot\left(\sum_{n=1}^{19}\cot^{-1}\left(1+\sum_{p=1}^{n}2p\right)\right)$$ का मान है :

Options :

41652941354. $\frac{22}{23}$

41652941355. $\frac{23}{22}$

41652941356. $\frac{21}{19}$

41652941357. $\frac{19}{21}$

Question Number : 70 Question Id : 41652910475 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 be a differentiable function such that

$f'(x) = 7 - \frac{3}{4}\frac{f(x)}{x}, (x > 0)$ and

$f(1) \neq 4$. Then $\lim_{x\to 0^+} x f\left(\frac{1}{x}\right)$:

Options :

41652941358. does not exist.

41652941359. exists and equals 4.

41652941360. exists and equals $\frac{4}{7}$.

41652941361. exists and equals 0.

Question Number : 70 Question Id : 41652910475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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माना f एक ऐसा अवकलनीय फलन है कि

$f'(x) = 7 - \frac{3}{4}\frac{f(x)}{x}, (x > 0)$ तथा

$f(1) \neq 4$ है। तो $\lim_{x \to 0^+} x f\left(\frac{1}{x}\right)$

Options :

41652941358. का अस्तित्व नहीं है ।

41652941359. का अस्तित्व है तथा 4 के समान है।

41652941360. का अस्तित्व है तथा $\frac{4}{7}$ के समान है।

41652941361. का अस्तित्व है तथा 0 के समान है।

Question Number : 71 Question Id : 41652910476 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 $f : (-1, 1) \to \mathbf{R}$ be a function defined by $f(x) = \max\left\{-|x|, -\sqrt{1 - x^2}\right\}$. If K be the set of all points at which f is not differentiable, then K has exactly :

Options :

41652941362. one element

41652941363. two elements

41652941364. three elements

41652941365. five elements

Question Number : 71 Question Id : 41652910476 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 $f : (-1, 1) \to \mathbf{R}$ एक फलन है जो $f(x) = \max\left\{-|x|, -\sqrt{1 - x^2}\right\}$ द्वारा परिभाषित है। यदि K उन सभी बिंदुओं का समुच्चय है जिन पर f अवकलनीय नहीं है, तो K में मात्र (exactly) :

Options :

41652941362. एक अवयव है।

41652941363. दो अवयव हैं।

41652941364. तीन अवयव हैं।

41652941365. पाँच अवयव हैं।

Question Number : 72 Question Id : 41652910477 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 tangent to the curve, $y = xe^{x^2}$ passing through the point (1, e) also passes through the point :

Options :

41652941366. (2, 3e)

41652941367. (3, 6e)

41652941368. $\left(\frac{4}{3}, 2e\right)$

41652941369. $\left(\frac{5}{3}, 2e\right)$

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Question Number : 72 Question Id : 41652910477 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 $y = xe^{x^2}$ की वह स्पर्श रेखा जो बिंदु (1, e) से हो कर जाती है, निम्न में से किस बिंदु से भी होकर जाती है?

Options :

41652941366. (2, 3e)

41652941367. (3, 6e)

41652941368. $\left(\frac{4}{3}, 2e\right)$

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41652941369. $\left(\frac{5}{3}, 2e\right)$

Question Number : 73 Question Id : 41652910478 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 helicopter is flying along the curve given by $y - x^{3/2} = 7, (x \geq 0)$. A soldier positioned at the point $\left(\frac{1}{2}, 7\right)$ wants to shoot down the helicopter when it is nearest to him. Then this nearest distance is :

Options :

41652941370. $\frac{\sqrt{5}}{6}$

41652941371. $\frac{1}{2}$

41652941372. $\frac{1}{3}\sqrt{\frac{7}{3}}$

41652941373. $\frac{1}{6}\sqrt{\frac{7}{3}}$

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Question Number : 73 Question Id : 41652910478 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 हैलीकॉप्टर वक्र $y - x^{3/2} = 7, (x \geq 0)$ के अनुदिश उड़ रहा है। एक सैनिक बिंदु $\left(\frac{1}{2}, 7\right)$ पर है तथा हैलीकॉप्टर को उस समय गोली मार कर गिराना चाहता है जब यह उसके निकटतम है। तो यह निकटतम दूरी है :

Options :

41652941370. $\frac{\sqrt{5}}{6}$

41652941371. $\frac{1}{2}$

41652941372. $\frac{1}{3}\sqrt{\frac{7}{3}}$

41652941373. $\frac{1}{6}\sqrt{\frac{7}{3}}$

Question Number : 74 Question Id : 41652910479 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 $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C$,

where C is a constant of integration, then $f(x)$ is equal to :

Options :

41652941374. $-2x^3 - 1$

41652941375. $-4x^3 - 1$

41652941376. $4x^3 + 1$

41652941377. $-2x^3 + 1$

Question Number : 74 Question Id : 41652910479 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 $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C$ है,

जहाँ C एक समाकलन अचर है, तो $f(x)$ बराबर है :

Options :

41652941374. $-2x^3 - 1$

41652941375. $-4x^3 - 1$

41652941376. $4x^3 + 1$

41652941377. $-2x^3 + 1$

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Question Number : 75 Question Id : 41652910480 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 $\displaystyle\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4}$, where

[t] denotes the greatest integer less than or equal to t, is :

Options :

41652941378. $\frac{3}{20}(4\pi - 3)$

41652941379. $\frac{3}{10}(4\pi - 3)$

41652941380. $\frac{1}{12}(7\pi + 5)$

41652941381. $\frac{1}{12}(7\pi - 5)$

Question Number : 75 Question Id : 41652910480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

$\displaystyle\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4}$ का मान, जहाँ [t] वह

महत्तम पूर्णांक है जो t से कम या उसके बराबर है, है :

Options :

41652941378. $\frac{3}{20}(4\pi - 3)$

41652941379. $\frac{3}{10}(4\pi - 3)$

41652941380. $\frac{1}{12}(7\pi + 5)$

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41652941381. $\frac{1}{12}(7\pi - 5)$

Question Number : 76 Question Id : 41652910481 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 $\int_0^x f(t)\,dt = x^2 + \int_x^1 t^2 f(t)\,dt$, then

$f'(1/2)$ is :

Options :

41652941382. $\frac{18}{25}$

41652941383. $\frac{4}{5}$

41652941384. $\frac{24}{25}$

41652941385. $\frac{6}{25}$

Question Number : 76 Question Id : 41652910481 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 $\int_0^x f(t)\,dt = x^2 + \int_x^1 t^2 f(t)\,dt$ है, तो

$f'(1/2)$ है :

Options :

41652941382. $\frac{18}{25}$

41652941383. $\frac{4}{5}$

41652941384. $\frac{24}{25}$

$\frac{6}{25}$
41652941385.

Question Number : 77 Question Id : 41652910482 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 curve amongst the family of curves represented by the differential equation, $(x^2-y^2)dx+2xy\ \ dy=0$ which passes through (1, 1), is :

Options :

41652941386. a circle with centre on the x-axis.

41652941387. a circle with centre on the y-axis.

41652941388. an ellipse with major axis along the y-axis.

41652941389. a hyperbola with transverse axis along the x-axis.

Question Number : 77 Question Id : 41652910482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अवकल समीकरण $(x^2-y^2)dx+2xy\ dy=0$ द्वारा निरूपित वक्रों के कुल (family) का वह वक्र जो (1, 1) से होकर जाता है, है :

Options :

41652941386. एक वृत्त जिसका केंद्र x-अक्ष पर है।

41652941387. एक वृत्त जिसका केंद्र y-अक्ष पर है।

41652941388. एक दीर्घवृत्त जिसका दीर्घ अक्ष y-अक्ष की दिशा में है।

41652941389. एक अतिपरवलय जिसका अनुप्रस्थ-अक्ष x-अक्ष की दिशा में है।

Question Number : 78 Question Id : 41652910483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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Two vertices of a triangle are (0, 2) and (4, 3). If its orthocentre is at the origin, then its third vertex lies in which quadrant ?

Options :

41652941390. first

41652941391. second

41652941392. third

41652941393. fourth

Question Number : 78 Question Id : 41652910483 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 के दो शीर्ष (0, 2) तथा (4, 3) हैं। यदि इसका लंबकेंद्र मूलबिंदु पर है, तो इसका तीसरा शीर्ष किस चतुर्थांश में है ?

Options :

41652941390. प्रथम

41652941391. दूसरा

41652941392. तीसरा

41652941393. चौथा

Question Number : 79 Question Id : 41652910484 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 sides of a parallelogram are along the lines, $x+y=3$ and $x-y+3=0$. If its diagonals intersect at (2, 4), then one of its vertex is :

Options :

41652941394. (2, 6)

41652941395. (2, 1)

41652941396. (3, 6)

41652941397. (3, 5)

Question Number : 79 Question Id : 41652910484 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 समांतर चतुर्भुज की दो भुजाएँ, रेखाओं $x+y=3$ तथा $x-y+3=0$ के अनुदिश हैं। यदि इसके विकर्ण (2, 4) पर प्रतिच्छेद करते हैं, तो इसका एक शीर्ष है :

Options :

41652941394. (2, 6)

41652941395. (2, 1)

41652941396. (3, 6)

41652941397. (3, 5)

Question Number : 80 Question Id : 41652910485 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 area of an equilateral triangle inscribed in the circle, $x^2+y^2+10x+12y+c=0$ is $27\sqrt{3}$ sq. units then c is equal to :

Options :

41652941398. 13

41652941399. 20

41652941400. 25

41652941401. -25

Question Number : 80 Question Id : 41652910485 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 वृत्त $x^2+y^2+10x+12y+c=0$ के अंतर्गत एक समबाहु त्रिभुज का क्षेत्रफल $27\sqrt{3}$ वर्ग इकाई है, तो c बराबर है :

Options :

41652941398. 13

41652941399. 20

41652941400. 25

41652941401. -25

Question Number : 81 Question Id : 41652910486 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

$$S = \left\{(x, y) \in \mathbf{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1\right\},$$

where $r \neq \pm 1$. Then S represents :

Options :

41652941402. an ellipse whose eccentricity is $\sqrt{\frac{2}{r+1}}$, when $r > 1$.

41652941403. an ellipse whose eccentricity is $\frac{1}{\sqrt{r+1}}$, when $r > 1$.

41652941404. a hyperbola whose eccentricity is $\frac{2}{\sqrt{r+1}}$, when $0 < r < 1$.

41652941405. a hyperbola whose eccentricity is $\frac{2}{\sqrt{1-r}}$, when $0 < r < 1$.

Question Number : 81 Question Id : 41652910486 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

$$S = \left\{(x, y) \in \mathbf{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1\right\},$$

जहाँ $r \neq \pm 1$ है, तो S जिसे निरूपित करता है, वह है :

Options :

41652941402. एक दीर्घवृत्त जिसकी उत्केंद्रता $\sqrt{\frac{2}{r+1}}$ है, जबकि $r > 1$ है।

41652941403. एक दीर्घवृत्त जिसकी उत्केंद्रता $\frac{1}{\sqrt{r+1}}$ है, जबकि $r > 1$ है।

41652941404. एक अतिपरवलय जिसकी उत्केंद्रता $\frac{2}{\sqrt{r+1}}$ है, जबकि $0 < r < 1$ है।

41652941405. एक अतिपरवलय जिसकी उत्केंद्रता $\frac{2}{\sqrt{1-r}}$ है, जबकि $0 < r < 1$ है।

Question Number : 82 Question Id : 41652910487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The length of the chord of the parabola $x^2=4y$ having equation $x - \sqrt{2}\,y + 4\sqrt{2} = 0$ is :

Options :

41652941406. $3\sqrt{2}$

41652941407. $2\sqrt{11}$

41652941408. $6\sqrt{3}$

41652941409. $8\sqrt{2}$

Question Number : 82 Question Id : 41652910487 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 $x^2=4y$ की उस जीवा, जिसका समीकरण $x - \sqrt{2}\,y + 4\sqrt{2} = 0$ है, की लंबाई है :

Options :

41652941406. $3\sqrt{2}$

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41652941407. $2\sqrt{11}$

41652941408. $6\sqrt{3}$

41652941409. $8\sqrt{2}$

Question Number : 83 Question Id : 41652910488 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 which bisects the line segment joining the points $(-3, -3, 4)$ and $(3, 7, 6)$ at right angles, passes through which one of the following points ?

Options :

41652941410. $(4, -1, 7)$

41652941411. $(4, 1, -2)$

41652941412. $(2, 1, 3)$

41652941413. $(-2, 3, 5)$

Question Number : 83 Question Id : 41652910488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह समतल जो बिंदुओं $(-3, -3, 4)$ तथा $(3, 7, 6)$ को मिलाने वाले रेखाखण्ड का लंबसमद्विभाजन करता है, निम्न में से किस एक बिंदु से हो कर जाता है?

Options :

41652941410. $(4, -1, 7)$

41652941411. $(4, 1, -2)$

41652941412. $(2, 1, 3)$

41652941413. $(-2, 3, 5)$

Question Number : 84 Question Id : 41652910489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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On which of the following lines lies the point of intersection of the line, $\frac{x-4}{2}=\frac{y-5}{2}=\frac{z-3}{1}$ and the plane, $x+y+z=2$?

Options :

41652941414. $\frac{x-1}{1}=\frac{y-3}{2}=\frac{z+4}{-5}$

41652941415. $\frac{x-4}{1}=\frac{y-5}{1}=\frac{z-5}{-1}$

41652941416. $\frac{x-2}{2}=\frac{y-3}{2}=\frac{z+3}{3}$

41652941417. $\frac{x+3}{3}=\frac{4-y}{3}=\frac{z+1}{-2}$

Question Number : 84 Question Id : 41652910489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

रेखा $\frac{x-4}{2}=\frac{y-5}{2}=\frac{z-3}{1}$ तथा समतल $x+y+z=2$ का प्रतिच्छेदन बिंदु निम्न में से किस रेखा पर स्थित है?

Options :

41652941414. $\frac{x-1}{1}=\frac{y-3}{2}=\frac{z+4}{-5}$

41652941415. $\frac{x-4}{1}=\frac{y-5}{1}=\frac{z-5}{-1}$

41652941416. $\frac{x-2}{2}=\frac{y-3}{2}=\frac{z+3}{3}$

41652941417. $\frac{x+3}{3}=\frac{4-y}{3}=\frac{z+1}{-2}$

Question Number : 85 Question Id : 41652910490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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Let $\vec{\alpha} = (\lambda - 2)\vec{a} + \vec{b}$ and $\vec{\beta} = (4\lambda - 2)\vec{a} + 3\vec{b}$ be two given vectors where vectors $\vec{a}$ and $\vec{b}$ are non-collinear. The value of λ for which vectors $\vec{\alpha}$ and $\vec{\beta}$ are collinear, is :

Options :

41652941418. -3

41652941419. 3

41652941420. 4

41652941421. -4

Question Number : 85 Question Id : 41652910490 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 $\vec{\alpha} = (\lambda - 2)\vec{a} + \vec{b}$ तथा $\vec{\beta} = (4\lambda - 2)\vec{a} + 3\vec{b}$ दो दिए गए सदिश हैं, जहाँ सदिश $\vec{a}$ तथा $\vec{b}$ संरेख नहीं हैं। λ का वह मान जिसके लिए $\vec{\alpha}$ तथा $\vec{\beta}$ संरेख हैं, है :

Options :

41652941418. -3

41652941419. 3

41652941420. 4

41652941421. -4

Question Number : 86 Question Id : 41652910491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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If mean and standard deviation of 5 observations x_1, x_2, x_3, x_4, x_5 are 10 and 3, respectively, then the variance of 6 observations $x_1, x_2, \ldots, x_5$ and -50 is equal to :

Options :

41652941422. 507.5

41652941423. 582.5

41652941424. 509.5

41652941425. 586.5

Question Number : 86 Question Id : 41652910491 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 पाँच प्रेक्षणों x_1, x_2, x_3, x_4, x_5 का माध्य तथा मानक विचलन क्रमश: 10 तथा 3 है, तो 6 प्रेक्षणों $x_1, x_2, \ldots, x_5$ तथा -50 का प्रसरण है :

Options :

41652941422. 507.5

41652941423. 582.5

41652941424. 509.5

41652941425. 586.5

Question Number : 87 Question Id : 41652910492 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 probability of hitting a target by a shooter, in any shot, is $\frac{1}{3}$, then the minimum number of independent shots at the target required by him so that the probability of hitting the target at least once is greater than $\frac{5}{6}$, is :

Options :

41652941426. 3

41652941427. 4

41652941428. 5

41652941429. 6

Question Number : 87 Question Id : 41652910492 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 गोली चलाने वाले द्वारा एक लक्ष्य को किसी प्रयास में भेदने की प्रायिकता $\frac{1}{3}$ है, तो लक्ष्य को कम से कम बार भेदने की प्रायिकता $\frac{5}{6}$ से अधिक होने के लिए उसे लक्ष्य भेदने के कम से कम कितने स्वतंत्र प्रयासों की आवश्यकता है?

Options :

41652941426. 3

41652941427. 4

41652941428. 5

41652941429. 6

Question Number : 88 Question Id : 41652910493 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

$$\cos\frac{\pi}{2^2}\cdot\cos\frac{\pi}{2^3}\cdot\ldots\cdot\cos\frac{\pi}{2^{10}}\cdot\sin\frac{\pi}{2^{10}}$$

is :

Options :

41652941430. $\frac{1}{1024}$

41652941431. $\frac{1}{2}$

41652941432. $\frac{1}{512}$

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41652941433. $\frac{1}{256}$

Question Number : 88 Question Id : 41652910493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\cos\frac{\pi}{2^2}\cdot\cos\frac{\pi}{2^3}\cdot\ldots\cdot\cos\frac{\pi}{2^{10}}\cdot\sin\frac{\pi}{2^{10}}$$

का मान है :

Options :

41652941430. $\frac{1}{1024}$

41652941431. $\frac{1}{2}$

41652941432. $\frac{1}{512}$

41652941433. $\frac{1}{256}$

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Question Number : 89 Question Id : 41652910494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

With the usual notation, in ΔABC, if $\angle A + \angle B = 120°$, $a = \sqrt{3} + 1$ and $b = \sqrt{3} - 1$, then the ratio $\angle A : \angle B$, is :

Options :

41652941434. $5 : 3$

41652941435. $3 : 1$

41652941436. $9 : 7$

41652941437. $7 : 1$

Question Number : 89 Question Id : 41652910494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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सामान्य संकेतों में ΔABC में यदि $\angle A + \angle B = 120°$,
$a = \sqrt{3} + 1$ तथा $b = \sqrt{3} - 1$ है, तो अनुपात
$\angle A : \angle B$ बराबर है :

Options :

41652941434. $5 : 3$

41652941435. $3 : 1$

41652941436. $9 : 7$

41652941437. $7 : 1$

Question Number : 90 Question Id : 41652910495 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 following three statements :
P : 5 is a prime number.
Q : 7 is a factor of 192.
R : L.C.M. of 5 and 7 is 35.
Then the truth value of which one of the following statements is true ?

Options :

41652941438. $(P \wedge Q) \vee (\sim R)$

41652941439. $(\sim P) \wedge (\sim Q \wedge R)$

41652941440. $P \vee (\sim Q \wedge R)$

41652941441. $(\sim P) \vee (Q \wedge R)$

Question Number : 90 Question Id : 41652910495 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 तीन कथनों पर विचार कीजिए :
P : 5 एक अभाज्य संख्या है।
Q : सात 192 का एक गुणनखण्ड है।
R : 5 तथा 7 का L.C.M. 35 है।
तो निम्न में से कौन से एक कथन का सत्यमान (truth value) सत्य (T) है?

Options :

41652941438. $(P \wedge Q) \vee (\sim R)$

41652941439. $(\sim P) \wedge (\sim Q \wedge R)$

41652941440. $P \vee (\sim Q \wedge R)$

41652941441. $(\sim P) \vee (Q \wedge R)$

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