National Testing Agency

Question Paper Name:	Paper I EH 10th April 2019 Shift 2 S2
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Actual Answer Key:	Yes

Paper I

Group Number :	1
Group Id :	416529170
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 :	416529304
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:	416529444
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 41652914316 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 formula $X = 5YZ^2$, X and Z have dimensions of capacitance and magnetic field, respectively. What are the dimensions of Y in SI units ?

Options :

41652956042. $[M^{-1} L^{-2} T^{4} A^{2}]$

41652956043. $[M^{-3} L^{-2} T^{8} A^{4}]$

41652956044. $[M^{-2} L^{-2} T^{6} A^{3}]$

41652956045. $[M^{-2} L^{0} T^{-4} A^{-2}]$

Question Number : 1 Question Id : 41652914316 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सूत्र $X = 5YZ^2$ में X तथा Z की विमायें, क्रमशः, धारिता तथा चुम्बकीय क्षेत्र हैं। SI इकाई में Y की विमा क्या होगी?

Options :

41652956042. $[M^{-1} L^{-2} T^{4} A^{2}]$

41652956043. $[M^{-3} L^{-2} T^{8} A^{4}]$

41652956044. $[M^{-2} L^{-2} T^{6} A^{3}]$

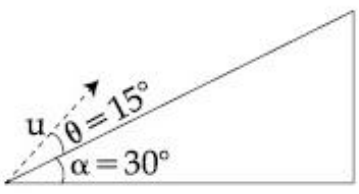
41652956045. $[M^{-2} L^{0} T^{-4} A^{-2}]$

Question Number : 2 Question Id : 41652914317 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A plane is inclined at an angle $\alpha = 30°$ with respect to the horizontal. A particle is projected with a speed $u = 2\ ms^{-1,}$ from the base of the plane, making an angle $\theta = 15°$ with respect to the plane as shown in the figure. The distance from the base, at which the particle hits the plane is close to :

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



Options :

41652956046. 14 cm

41652956047. 18 cm

41652956048. 20 cm

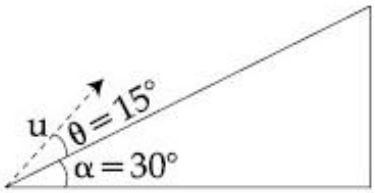
41652956049. 26 cm

Question Number : 2 Question Id : 41652914317 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समतल क्षैतिज से $\alpha = 30°$ का कोण बनाता है। एक कण को इस समतल के आधार से गति $u = 2\ ms^{-1}$ से समतल से $\theta = 15°$ के कोण पर चित्रानुसार प्रक्षेपित किया जाता है। उस बिन्दु, जहाँ कण समतल पर गिरता है, की आधार से दूरी का सन्निकट मान होगा :

($g = 10\ ms^{-2}$ लीजिए)



Options :

41652956046. 14 cm

41652956047. 18 cm

41652956048. 20 cm

41652956049. 26 cm

Question Number : 3 Question Id : 41652914318 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 time dependence of the position of a particle of mass $m = 2$ is given by $\vec{r}(t) = 2t\hat{i} - 3t^2\hat{j}$. Its angular momentum, with respect to the origin, at time $t = 2$ is :

Options :

41652956050. $36\ \hat{k}$

41652956051. $-48\ \hat{k}$

41652956052. $-34\left(\hat{k}-\hat{i}\right)$

41652956053. $48\left(\hat{i}+\hat{j}\right)$

Question Number : 3 Question Id : 41652914318 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान $\mathrm{m}=2$ के एक कण की स्थिति, समय (t) के अनुसार, $\vec{\mathrm{r}}(\mathrm{t})=2\mathrm{t}\hat{i}-3\mathrm{t}^2\hat{j}$ है। इस कण का मूलबिन्दु के सापेक्ष $\mathrm{t}=2$ पर कोणीय संवेग होगा :

Options :

41652956050. $36\ \hat{k}$

41652956051. $-48\ \hat{k}$

41652956052. $-34\left(\hat{k}-\hat{i}\right)$

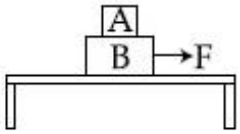
41652956053. $48\left(\hat{i}+\hat{j}\right)$

Question Number : 4 Question Id : 41652914319 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two blocks A and B of masses $m_A = 1$ kg and $m_B = 3$ kg are kept on the table as shown in figure. The coefficient of friction between A and B is 0.2 and between B and the surface of the table is also 0.2. The maximum force F that can be applied on B horizontally, so that the block A does not slide over the block B is :

[Take $g = 10\ m/s^2$]



Options :

41652956054. 8 N

41652956055. 12 N

41652956056. 16 N

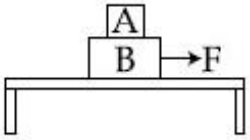
41652956057. 40 N

Question Number : 4 Question Id : 41652914319 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान $m_A = 1\ kg$ तथा $m_B = 3\ kg$ के दो गुटकों, A तथा B, को चित्रानुसार एक मेज पर रखा गया है। A तथा B के बीच घर्षण गुणांक 0.2 एवं B तथा मेज के बीच भी घर्षण गुणांक 0.2 है। गुटके B पर लगाये गये क्षैतिज बल F का अधिकतम मान, जिससे गुटका A गुटका B के ऊपर नहीं फिसले, होगा :

[दिया है, $g = 10\ m/s^2$]



Options :

41652956054. 8 N

41652956055. 12 N

41652956056. 16 N

41652956057. $40\ N$

Question Number : 5 Question Id : 41652914320 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 bullet of mass 20 g has an initial speed of $1\ ms^{-1}$, just before it starts penetrating a mud wall of thickness 20 cm. If the wall offers a mean resistance of $2.5 \times 10^{-2} N$, the speed of the bullet after emerging from the other side of the wall is close to :

Options :

41652956058. $0.7\ ms^{-1}$

41652956059. $0.3\ ms^{-1}$

41652956060. $0.4\ ms^{-1}$

41652956061. $0.1\ ms^{-1}$

Question Number : 5 Question Id : 41652914320 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

20 cm मोटाई की मिट्टी की दीवार भेदने से ठीक पहले 20 g द्रव्यमान की एक गोली की चाल $1\ ms^{-1}$ है। यदि दीवार 2.5×10^{-2} N का औसत अवरोध लगाती है तो दीवार के दूसरे तरफ से निर्गत गोली की चाल का सन्निकट मान होगा :

Options :

41652956058. $0.7\ ms^{-1}$

41652956059. $0.3\ ms^{-1}$

41652956060. $0.4\ ms^{-1}$

41652956061. $0.1\ ms^{-1}$

Question Number : 6 Question Id : 41652914321 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A solid sphere of mass M and radius R is divided into two unequal parts. The first part has a mass of $\frac{7M}{8}$ and is converted into a uniform disc of radius 2R. The second part is converted into a uniform solid sphere. Let I_1 be the moment of inertia of the disc about its axis and I_2 be the moment of inertia of the new sphere about its axis. The ratio I_1/I_2 is given by :

Options :

41652956062. 140

41652956063. 65

41652956064. 285

41652956065. 185

Question Number : 6 Question Id : 41652914321 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M तथा त्रिज्या R के एक ठोस गोले को दो असमान हिस्सों में बाँटा जाता है। $\frac{7M}{8}$ द्रव्यमान के पहले हिस्से को एक 2R त्रिज्या की एकसमान डिस्क में बदला जाता है। बचे हुये हिस्से से एक एकसमान ठोस गोला बनाया जाता है। मानाकि I_1 डिस्क का उसकी अक्ष के परित: जड़त्व आघूर्ण है तथा I_2 नये गोले का उसके अक्ष के परित: जड़त्व आघूर्ण है। अनुपात I_1/I_2 होगा :

Options :

41652956062. 140

41652956063. 65

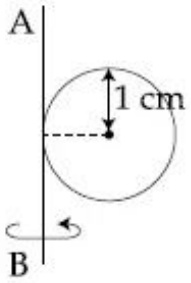
41652956064. 285

41652956065. 185

Question Number : 7 Question Id : 41652914322 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 metal coin of mass 5 g and radius 1 cm is fixed to a thin stick AB of negligible mass as shown in the figure. The system is initially at rest. The constant torque, that will make the system rotate about AB at 25 rotations per second in 5 s, is close to :



Options :

41652956066. 4.0×10^{-6} Nm

41652956067. 7.9×10^{-6} Nm

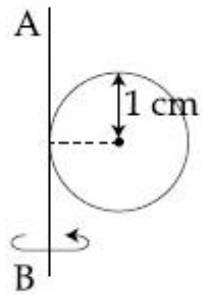
41652956068. 1.6×10^{-5} Nm

41652956069. 2.0×10^{-5} Nm

Question Number : 7 Question Id : 41652914322 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

5 g द्रव्यमान तथा 1 cm त्रिज्या के धातु के एक सिक्के को एक पतली नगण्य द्रव्यमान की छड़ AB से चित्रानुसार जोड़ा जाता है। यह निकाय आरम्भ में स्थिरावस्था में है। इसे AB के परितः 5 s तक 25 चक्कर प्रति सेकण्ड की गति से घुमाने के लिये नियत बल आघूर्ण का सन्निकट मान होगा :



Options :

41652956066. 4.0×10^{-6} Nm

41652956067. 7.9×10^{-6} Nm

41652956068. 1.6×10^{-5} Nm

41652956069. 2.0×10^{-5} Nm

Question Number : 8 Question Id : 41652914323 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 spaceship orbits around a planet at a height of 20 km from its surface. Assuming that only gravitational field of the planet acts on the spaceship, what will be the number of complete revolutions made by the spaceship in 24 hours around the planet ?

[Given : Mass of planet $=8\times10^{22}$ kg,

Radius of planet $=2\times10^{6}$ m,

Gravitational constant $G=6.67\times10^{-11}$ Nm^2/kg^2]

Options :

41652956070. 13

41652956071. 17

41652956072. 9

41652956073. 11

Question Number : 8 Question Id : 41652914323 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 ग्रह की सतह से 20 km ऊँचाई पर एक अंतरिक्षयान ग्रह के परित: कक्षा में घूम रहा है। यदि यान पर सिर्फ ग्रह का गुरुत्वीय क्षेत्र प्रभावी है तो यान द्वारा 24 hrs में लगाये गये पूरे चक्करों की संख्या का मान होगा :

[दिया है, ग्रह का द्रव्यमान $=8\times10^{22}$ kg,

ग्रह की त्रिज्या $=2\times10^{6}$ m,

गुरुत्वीय नियतांक $G=6.67\times10^{-11}$ Nm^2/kg^2]

Options :

41652956070. 13

41652956071. 17

41652956072. 9

41652956073. 11

Question Number : 9 Question Id : 41652914324 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 elastic limit of brass is 379 MPa. What should be the minimum diameter of a brass rod if it is to support a 400 N load without exceeding its elastic limit ?

Options :

41652956074. 1.00 mm

41652956075. 0.90 mm

41652956076. 1.16 mm

41652956077. 1.36 mm

Question Number : 9 Question Id : 41652914324 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पीतल की प्रत्यास्थता सीमा 379 MPa है। 400 N बल को बिना प्रत्यास्थता सीमा पार किये सह सकने वाली पीतल की छड़ का न्यूनतम व्यास क्या होगा ?

Options :

41652956074. 1.00 mm

41652956075. 0.90 mm

41652956076. 1.16 mm

41652956077. 1.36 mm

Question Number : 10 Question Id : 41652914325 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Water from a tap emerges vertically downwards with an initial speed of 1.0 ms^{-1}. The cross-sectional area of the tap is 10^{-4} m^2. Assume that the pressure is constant throughout the stream of water and that the flow is streamlined. The cross-sectional area of the stream, 0.15 m below the tap would be :
(Take $g = 10\ ms^{-2}$)

Options :

41652956078. $1 \times 10^{-5}\ m^2$

41652956079. $2 \times 10^{-5}\ m^2$

41652956080. $5 \times 10^{-4}\ m^2$

41652956081. $5 \times 10^{-5}\ m^2$

Question Number : 10 Question Id : 41652914325 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 नल से पानी ऊर्ध्वाधर नीचे की ओर $1.0\ ms^{-1}$ की आरम्भिक गति से निकलता है। नल के अनुप्रस्थ काट का क्षेत्रफल 10^{-4} m^2 है। पानी की धारा में दाब को नियत तथा बहाव को धारारेखीय मानिये। नल से 0.15 m नीचे धारा का अनुप्रस्थ काट का क्षेत्रफल होगा :
($g = 10\ ms^{-2}$ लीजिए)

Options :

41652956078. $1 \times 10^{-5}\ m^2$

41652956079. $2 \times 10^{-5}\ m^2$

41652956080. $5 \times 10^{-4}\ m^2$

41652956081. $5 \times 10^{-5}\ m^2$

Question Number : 11 Question Id : 41652914326 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

One mole of an ideal gas passes through a process where pressure and volume obey the relation $P=P_o\left[1-\frac{1}{2}\left(\frac{V_o}{V}\right)^2\right]$. Here P_o and V_o are constants. Calculate the change in the temperature of the gas if its volume changes from V_o to $2V_o$.

Options :

41652956082. $\frac{1}{2}\frac{P_o V_o}{R}$

41652956083. $\frac{1}{4}\frac{P_o V_o}{R}$

41652956084. $\frac{3}{4}\frac{P_o V_o}{R}$

41652956085. $\frac{5}{4}\frac{P_o V_o}{R}$

Question Number : 11 Question Id : 41652914326 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 आदर्श गैस का एक मोल एक ऐसे प्रक्रम से गुजरता है जिसमें दाब तथा आयतन सूत्र $P=P_o\left[1-\frac{1}{2}\left(\frac{V_o}{V}\right)^2\right]$ से सम्बन्धित हैं। यहाँ P_o तथा V_o नियतांक हैं। यदि गैस का आयतन V_o से $2V_o$ होता है तो इसके तापमान का बदलाव होगा :

Options :

41652956082. $\frac{1}{2}\frac{P_o V_o}{R}$

41652956083. $\frac{1}{4}\frac{P_o V_o}{R}$

41652956084. $\frac{3}{4}\frac{P_o V_o}{R}$

41652956085. $\frac{5}{4}\frac{P_o V_o}{R}$

Question Number : 12 Question Id : 41652914327 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

When heat Q is supplied to a diatomic gas of rigid molecules, at constant volume its temperature increases by ΔT. The heat required to produce the same change in temperature, at a constant pressure is :

Options :

41652956086. $\frac{5}{3}Q$

41652956087. $\frac{7}{5}Q$

41652956088. $\frac{2}{3}Q$

41652956089. $\frac{3}{2}Q$

Question Number : 12 Question Id : 41652914327 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दृढ़ अणुओं वाली एक द्विपरमाणुक गैस को जब Q ऊष्मा नियत आयतन पर दी जाती है तो उसके तापमान में ΔT की वृद्धि होती है। इसी तापमान वृद्धि को नियत दाब पर सुनिश्चित करने के लिये आवश्यक ऊष्मा होगी :

Options :

41652956086. $\frac{5}{3}Q$

41652956087. $\frac{7}{5}Q$

41652956088. $\frac{2}{3}Q$

41652956089. $\frac{3}{2}Q$

Question Number : 13 Question Id : 41652914328 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 submarine experiences a pressure of 5.05×10^6 Pa at a depth of d_1 in a sea. When it goes further to a depth of d_2, it experiences a pressure of 8.08×10^6 Pa. Then $d_2 - d_1$ is approximately (density of water $= 10^3$ kg/m^3 and acceleration due to gravity $= 10$ ms^{-2}):

Options :

41652956090. 300 m

41652956091. 600 m

41652956092. 500 m

41652956093. 400 m

Question Number : 13 Question Id : 41652914328 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समुद्र में d_1 गहराई पर एक पनडुब्बी 5.05×10^6 Pa का दाब अनुभव करती है। जब यह पनडुब्बी और गहराई d_2 पर जाती है तो 8.08×10^6 Pa का दाब अनुभव करती है। तब $d_2 - d_1$ का निकटतम मान होगा (दिया है : पानी का घनत्व $= 10^3$ kg/m^3 तथा गुरुत्वीय त्वरण $= 10$ ms^{-2}) :

Options :

41652956090. 300 m

41652956091. 600 m

41652956092. 500 m

41652956093. 400 m

Question Number : 14 Question Id : 41652914329 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 source of sound S is moving with a velocity of 50 m/s towards a stationary observer. The observer measures the frequency of the source as 1000 Hz. What will be the apparent frequency of the source when it is moving away from the observer after crossing him ? (Take velocity of sound in air is 350 m/s)

Options :

41652956094. 857 Hz

41652956095. 1143 Hz

41652956096. 750 Hz

41652956097. 807 Hz

Question Number : 14 Question Id : 41652914329 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 ध्वनि स्रोत S 50 m/s की गति से एक स्थिर श्रोता की तरफ बढ़ रहा है। श्रोता को ध्वनि की आवृत्ति 1000 Hz सुनाई देती है। जब स्रोत उसी गति से श्रोता को पार करके उससे दूर जाता है तो श्रोता द्वारा सुनी गयी ध्वनि की आवृत्ति का मान होगा : [मानो वायु में ध्वनि की गति =350 m/s]

Options :

41652956094. 857 Hz

41652956095. 1143 Hz

41652956096. 750 Hz

41652956097. 807 Hz

Question Number : 15 Question Id : 41652914330 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 free space, a particle A of charge 1 μC is held fixed at a point P. Another particle B of the same charge and mass 4 μg is kept at a distance of 1 mm from P. If B is released, then its velocity at a distance of 9 mm from P is :

$\left[\text{Take } \frac{1}{4\pi\epsilon_o} = 9\times10^9 \text{ Nm}^2\text{C}^{-2}\right]$

Options :

41652956098. 3.0×10^4 m/s

41652956099. 2.0×10^3 m/s

41652956100. 1.5×10^2 m/s

41652956101. 1.0 m/s

Question Number : 15 Question Id : 41652914330 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निर्वात में एक 1 μC आवेश के एक कण A को बिन्दु P पर दृढ़ रखा है। उसी आवेश तथा 4 μg द्रव्यमान के दूसरे कण B को P से 1 mm दूरी पर रखा है। B को छोड़ने पर P से 9 mm दूरी पर उसकी गति का मान होगा : $\left[\text{दिया है } \frac{1}{4\pi\epsilon_o} = 9\times10^9 \text{ Nm}^2\text{C}^{-2}\right]$

Options :

41652956098. 3.0×10^4 m/s

41652956099. 2.0×10^3 m/s

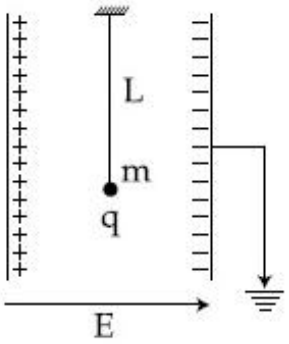
41652956100. 1.5×10^2 m/s

41652956101. 1.0 m/s

Question Number : 16 Question Id : 41652914331 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 simple pendulum of length L is placed between the plates of a parallel plate capacitor having electric field E, as shown in figure. Its bob has mass m and charge q. The time period of the pendulum is given by :



Options :

41652956102. $2\pi\sqrt{\frac{L}{\left(g+\frac{qE}{m}\right)}}$

41652956103. $2\pi\sqrt{\frac{L}{\left(g-\frac{qE}{m}\right)}}$

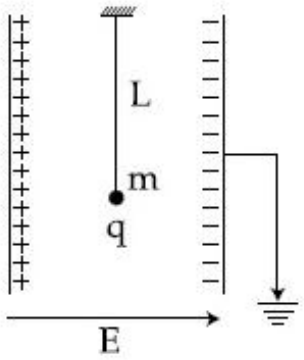
41652956104. $2\pi\sqrt{\frac{L}{\sqrt{g^2+\left(\frac{qE}{m}\right)^2}}}$

41652956105. $2\pi\sqrt{\frac{L}{\sqrt{g^2-\frac{q^2E^2}{m^2}}}}$

Question Number : 16 Question Id : 41652914331 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

L लम्बाई के एक सरल दोलक को चित्रानुसार एक समांतर प्लेट संधारित्र के मध्य, जिसमें विद्युत क्षेत्र E है, में रखा है। इसके लोलक का द्रव्यमान m तथा आवेश q है। इस दोलक का आवर्तकाल होगा :



Options :

41652956102. $2\pi\sqrt{\frac{L}{\left(g+\frac{qE}{m}\right)}}$

41652956103. $2\pi\sqrt{\frac{L}{\left(g-\frac{qE}{m}\right)}}$

41652956104. $2\pi\sqrt{\frac{L}{\sqrt{g^2+\left(\frac{qE}{m}\right)^2}}}$

41652956105. $2\pi\sqrt{\frac{L}{\sqrt{g^2-\frac{q^2E^2}{m^2}}}}$

Question Number : 17 Question Id : 41652914332 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Space between two concentric conducting spheres of radii a and b (b > a) is filled with a medium of resistivity ρ. The resistance between the two spheres will be :

Options :

41652956106. $\frac{\rho}{4\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$

41652956107. $\frac{\rho}{4\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$

41652956108. $\frac{\rho}{2\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$

41652956109. $\frac{\rho}{2\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$

Question Number : 17 Question Id : 41652914332 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

त्रिज्याओं a तथा b (b > a) के दो समकेन्द्रीय चालक गोलों के बीच एक ρ प्रतिरोधकता का पदार्थ भर दिया जाता है। इन गोलों के बीच प्रतिरोध का मान होगा :

Options :

41652956106. $\frac{\rho}{4\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$

41652956107. $\frac{\rho}{4\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$

41652956108. $\frac{\rho}{2\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$

41652956109. $\frac{\rho}{2\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$

Question Number : 18 Question Id : 41652914333 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The magnitude of the magnetic field at the center of an equilateral triangular loop of side 1 m which is carrying a current of 10 A is :

[Take $\mu_o = 4\pi \times 10^{-7}\ NA^{-2}$]

Options :

41652956110. $1\ \mu T$

41652956111. $3\ \mu T$

41652956112. $9\ \mu T$

41652956113. $18\ \mu T$

Question Number : 18 Question Id : 41652914333 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 m भुजा वाले एक समबाहु त्रिभुजाकार वलय में 10 A धारा प्रवाहित होती है। इसके केन्द्र पर चुम्बकीय क्षेत्र के परिमाण का मान होगा :

[$\mu_o = 4\pi \times 10^{-7}\ NA^{-2}$ लीजिए]

Options :

41652956110. $1\ \mu T$

41652956111. $3\ \mu T$

41652956112. $9\ \mu T$

41652956113. $18\ \mu T$

Question Number : 19 Question Id : 41652914334 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A square loop is carrying a steady current I and the magnitude of its magnetic dipole moment is m. If this square loop is changed to a circular loop and it carries the same current, the magnitude of the magnetic dipole moment of circular loop will be :

Options :

41652956114. $\frac{m}{\pi}$

41652956115. $\frac{2m}{\pi}$

41652956116. $\frac{3m}{\pi}$

41652956117. $\frac{4m}{\pi}$

Question Number : 19 Question Id : 41652914334 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 वर्गाकार वलय में धारा I प्रवाहित करने पर इसके चुम्बकीय द्विध्रुव आघूर्ण का परिमाण m होता है। यदि इस वर्गाकार वलय को मोड़कर एक वृत्ताकार वलय में परिवर्तित किया जाये और उसमें वही धारा प्रवाहित की जाए तो इस वृत्ताकार वलय के चुम्बकीय द्विध्रुव आघूर्ण का परिमाण होगा :

Options :

41652956114. $\frac{m}{\pi}$

41652956115. $\frac{2m}{\pi}$

41652956116. $\frac{3m}{\pi}$

41652956117. $\frac{4m}{\pi}$

Question Number : 20 Question Id : 41652914335 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 coil of self inductance 10 mH and resistance 0.1 Ω is connected through a switch to a battery of internal resistance 0.9 Ω. After the switch is closed, the time taken for the current to attain 80% of the saturation value is : [take $ln\,5 = 1.6$]

Options :

41652956118. 0.016 s

41652956119. 0.002 s

41652956120. 0.103 s

41652956121. 0.324 s

Question Number : 20 Question Id : 41652914335 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

10 mH स्वप्रेरकत्व एवं 0.1 Ω प्रतिरोध की एक कुंडली को एक कुंजी के साथ एक 0.9 Ω आंतरिक प्रतिरोध के सेल से जोड़ते हैं। कुंजी को बंद करने के पश्चात इस परिपथ में धारा का मान संतृप्त धारा के 80% होने में लगा समय होगा :
[दिया है : $ln\,5 = 1.6$]

Options :

41652956118. 0.016 s

41652956119. 0.002 s

41652956120. 0.103 s

41652956121. 0.324 s

Question Number : 21 Question Id : 41652914336 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Light is incident normally on a completely absorbing surface with an energy flux of 25 Wcm^{-2}. If the surface has an area of 25 cm^2, the momentum transferred to the surface in 40 min time duration will be :

Options :

41652956122. 1.4×10^{-6} Ns

41652956123. 3.5×10^{-6} Ns

41652956124. 5.0×10^{-3} Ns

41652956125. 6.3×10^{-4} Ns

Question Number : 21 Question Id : 41652914336 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 सम्पूर्ण अवशोषक पृष्ठ पर 25 Wcm^{-2} ऊर्जा प्रवाह (flux) का प्रकाश लम्बवत् आपतित होता है। यदि पृष्ठ का क्षेत्रफल 25 cm^2 है तो 40 min समयान्तराल में उस पर हुआ संवेग अंतरण (transfer) होगा :

Options :

41652956122. 1.4×10^{-6} Ns

41652956123. 3.5×10^{-6} Ns

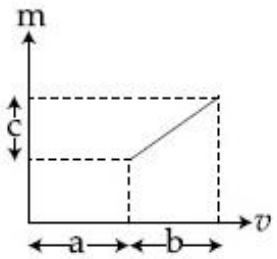
41652956124. 5.0×10^{-3} Ns

41652956125. 6.3×10^{-4} Ns

Question Number : 22 Question Id : 41652914337 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 graph shows how the magnification m produced by a thin lens varies with image distance v. What is the focal length of the lens used ?



Options :

41652956126. $\frac{b^2}{ac}$

41652956127. $\frac{a}{c}$

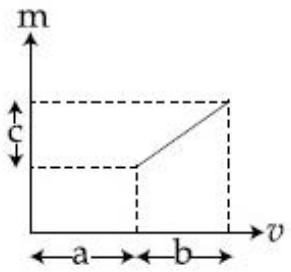
41652956128. $\frac{b^2c}{a}$

41652956129. $\frac{b}{c}$

Question Number : 22 Question Id : 41652914337 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 ग्राफ में एक पतले लेंस के आवर्धन m को प्रतिबिम्ब की दूरी v के साथ दर्शाया गया है। इस लेंस की फोकस दूरी क्या होगी?



Options :

41652956126. $\frac{b^2}{ac}$

41652956127. $\frac{a}{c}$

41652956128. $\frac{b^2c}{a}$

41652956129. $\frac{b}{c}$

Question Number : 23 Question Id : 41652914338 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In a Young's double slit experiment, the ratio of the slit's width is 4 : 1. The ratio of the intensity of maxima to minima, close to the central fringe on the screen, will be :

Options :

41652956130. $4:1$

41652956131. $9:1$

41652956132. $\left(\sqrt{3}+1\right)^4:16$

41652956133. $25:9$

Question Number : 23 Question Id : 41652914338 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यंग के एक द्विझिरी प्रयोग में स्लिट की चौड़ाइयों का अनुपात 4 : 1 है। स्क्रीन पर केन्द्रीय फ्रिंज के निकट देखी गयी उच्चतम तथा न्यूनतम प्रकाश तीव्रता का अनुपात होगा :

Options :

41652956130. $4:1$

41652956131. $9:1$

41652956132. $(\sqrt{3}+1)^4 : 16$

41652956133. $25:9$

Question Number : 24 Question Id : 41652914339 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 2 mW laser operates at a wavelength of 500 nm. The number of photons that will be emitted per second is :

[Given Planck's constant $h = 6.6 \times 10^{-34}$ Js, speed of light $c = 3.0 \times 10^8$ m/s]

Options :

41652956134. 5×10^{15}

41652956135. 1×10^{16}

41652956136. 1.5×10^{16}

41652956137. 2×10^{16}

Question Number : 24 Question Id : 41652914339 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 2 mW लेज़र की तरंगदैर्घ्य 500 nm है। इससे निकलने वाले प्रति सेकण्ड फोटॉनों की संख्या होगी :

[दिया है, प्लांक नियतांक $h = 6.6 \times 10^{-34}$ Js, प्रकाश की चाल $c = 3.0 \times 10^8$ m/s]

Options :

41652956134. 5×10^{15}

41652956135. 1×10^{16}

41652956136. 1.5×10^{16}

41652956137. 2×10^{16}

Question Number : 25 Question Id : 41652914340 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 Li^{++}, electron in first Bohr orbit is excited to a level by a radiation of wavelength λ. When the ion gets deexcited to the ground state in all possible ways (including intermediate emissions), a total of six spectral lines are observed. What is the value of λ ?

(Given : $h=6.63\times10^{-34}$ Js; $c=3\times10^{8}$ ms^{-1})

Options :

41652956138. 9.4 nm

41652956139. 10.8 nm

41652956140. 11.4 nm

41652956141. 12.3 nm

Question Number : 25 Question Id : 41652914340 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Li^{++} आयन में इलैक्ट्रॉन को उसकी प्रथम बोहर कक्षा से λ तरंगदैर्घ्य के विकिरण से एक ऊँची कक्षा में उत्तेजित कर दिया जाता है। जब यह आयन अपनी न्यूनतम ऊर्जा अवस्था में सभी संभव तरीकों (मध्यवर्ती उत्सर्जनों को मिलाकर) से आता है तो कुल 6 स्पेक्ट्रल लाइनें पायी जाती हैं। λ का मान क्या होगा?

(दिया है : $h=6.63\times10^{-34}$ Js ; $c=3\times10^{8}$ ms^{-1})

Options :

41652956138. 9.4 nm

41652956139. 10.8 nm

41652956140. 11.4 nm

41652956141. 12.3 nm

Question Number : 26 Question Id : 41652914341 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 radioactive substances A and B have decay constants 5λ and λ respectively. At $t=0$, a sample has the same number of the two nuclei. The time taken for the ratio of the number of nuclei to become $\left(\frac{1}{e}\right)^2$ will be :

Options :

41652956142. $1/\lambda$

41652956143. $2/\lambda$

41652956144. $1/2\lambda$

41652956145. $1/4\lambda$

Question Number : 26 Question Id : 41652914341 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 रेडियोधर्मी पदार्थों A तथा B के क्षय नियतांक, क्रमशः, 5λ तथा λ हैं। $t=0$ पर एक नमूने में इन दो नाभिकों की बराबर संख्या है। नाभिकों की संख्या का अनुपात $\left(\frac{1}{e}\right)^2$ होने में लगे समय का मान होगा :

Options :

41652956142. $1/\lambda$

41652956143. $2/\lambda$

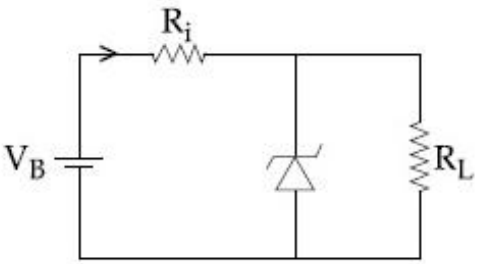
41652956144. $1/2\lambda$

41652956145. $1/4\lambda$

Question Number : 27 Question Id : 41652914342 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 figure represents a voltage regulator circuit using a Zener diode. The breakdown voltage of the Zener diode is 6 V and the load resistance is, $R_L = 4\ k\Omega$. The series resistance of the circuit is $R_i = 1\ k\Omega$. If the battery voltage V_B varies from 8 V to 16 V, what are the minimum and maximum values of the current through Zener diode ?



Options :

41652956146. 0.5 mA; 6 mA

41652956147. 1.5 mA; 8.5 mA

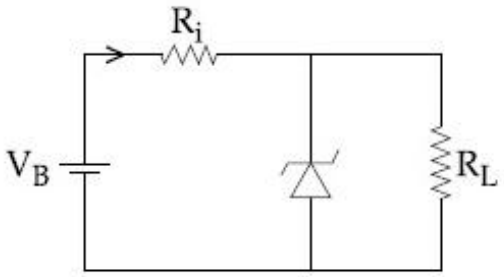
41652956148. 0.5 mA; 8.5 mA

41652956149. 1 mA; 8.5 mA

Question Number : 27 Question Id : 41652914342 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 ज़ेनर डायोड से बनाया हुआ वोल्टेज नियंत्रण परिपथ दिखाया गया है। ज़ेनर डायोड की भंजन वोल्टता 6 V तथा लोड प्रतिरोध $R_L = 4\,k\Omega$ है। श्रेणी प्रतिरोध $R_i = 1\,k\Omega$ है। यदि सेल का विभव V_B, 8 V से 16 V के बीच बदलता है तो ज़ेनर डायोड की धारा के न्यूनतम तथा अधिकतम मान क्या होंगे ?



Options :

41652956146. 0.5 mA; 6 mA

41652956147. 1.5 mA; 8.5 mA

41652956148. 0.5 mA; 8.5 mA

41652956149. 1 mA; 8.5 mA

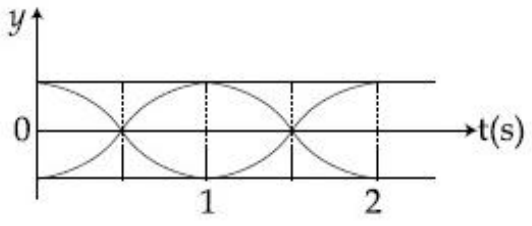
Question Number : 28 Question Id : 41652914343 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

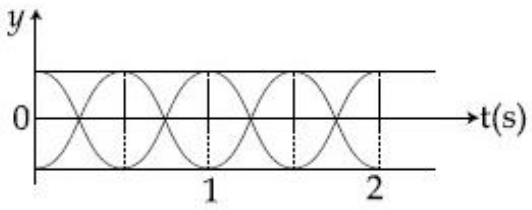
The correct figure that shows, schematically, the wave pattern produced by superposition of two waves of frequencies 9 Hz and 11 Hz, is :

Options :

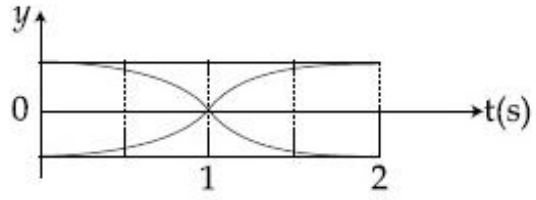
41652956150.



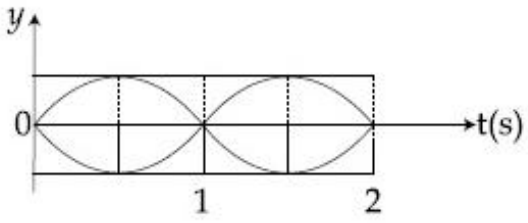
41652956151.



41652956152.



41652956153.



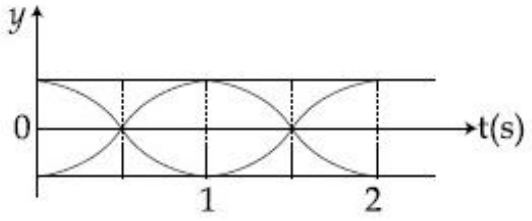
Question Number : 28 Question Id : 41652914343 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

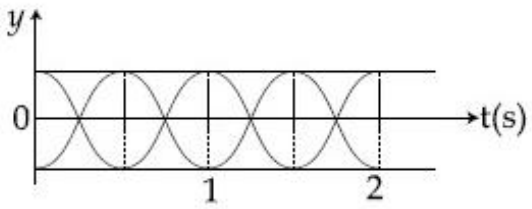
11 Hz तथा 9 Hz आवृत्ति की दो तरंगों के अध्यारोपण को निम्न में कौन चित्र योजनाबद्ध तरीके से सही दर्शाता है?

Options :

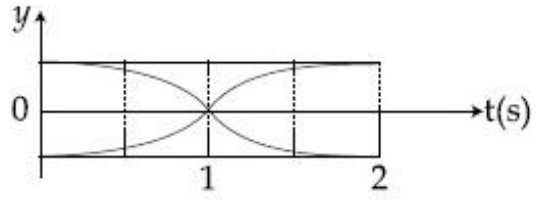
41652956150.



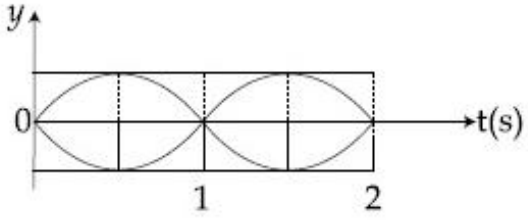
41652956151.



41652956152.



41652956153.



Question Number : 29 Question Id : 41652914344 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In an experiment, brass and steel wires of length 1 m each with areas of cross section 1 mm^2 are used. The wires are connected in series and one end of the combined wire is connected to a rigid support and other end is subjected to elongation. The stress required to produce a net elongation of 0.2 mm is,

[Given, the Young's Modulus for steel and brass are, respectively, 120×10^9 N/m^2 and 60×10^9 N/m^2]

Options :

41652956154. 0.2×10^6 N/m^2

41652956155. 4.0×10^6 N/m^2

41652956156. 1.2×10^6 N/m^2

41652956157. 1.8×10^6 N/m^2

Question Number : 29 Question Id : 41652914344 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रयोग में, पीतल तथा स्टील के दो तारों का प्रयोग किया गया है जिनमें प्रत्येक की लम्बाई 1 m तथा अनुप्रस्थ काट का क्षेत्रफल 1 mm^2 हैं। इन तारों को श्रेणीक्रम में जोड़ते हैं तथा संयुक्त तार के एक सिरे को दृढ़ स्तम्भ से जोड़ते हैं एवं दूसरे सिरे को खींचा जाता है। 0.2 mm की कुल वृद्धि के लिये प्रतिबल का मान होगा :

(दिया है, स्टील तथा पीतल के यंग प्रत्यास्थता गुणांक, क्रमशः, 120×10^9 N/m^2 तथा 60×10^9 N/m^2 हैं)

Options :

41652956154. 0.2×10^6 N/m^2

41652956155. 4.0×10^6 N/m^2

41652956156. 1.2×10^6 N/m^2

41652956157. $1.8 \times 10^6\ N/m^2$

Question Number : 30 Question Id : 41652914345 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 cubical block of side 0.5 m floats on water with 30% of its volume under water. What is the maximum weight that can be put on the block without fully submerging it under water ?

[Take, density of water = $10^3\ kg/m^3$]

Options :

41652956158. 30.1 kg

41652956159. 87.5 kg

41652956160. 46.3 kg

41652956161. 65.4 kg

Question Number : 30 Question Id : 41652914345 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.5 m भुजा लम्बाई का एक घनाकार गुटका पानी में तैरता है जिससे उसका 30% आयतन पानी में डूबा है। इस गुटके के ऊपर अधिकतम कितना भार, गुटके को बिना पूरी तरह डुबाये, रखा जा सकता है ?

[दिया है : पानी का घनत्व = $10^3\ kg/m^3$]

Options :

41652956158. 30.1 kg

41652956159. 87.5 kg

41652956160. 46.3 kg

41652956161. 65.4 kg

Chemistry

Section Id : 416529305

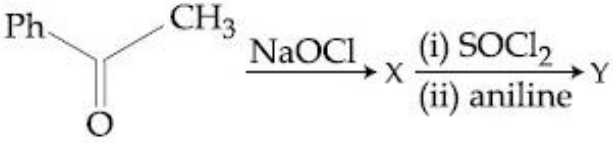
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529445
Question Shuffling Allowed :	Yes

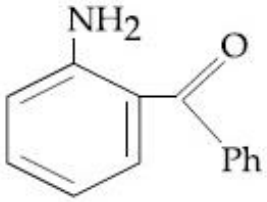
Question Number : 31 Question Id : 41652914346 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

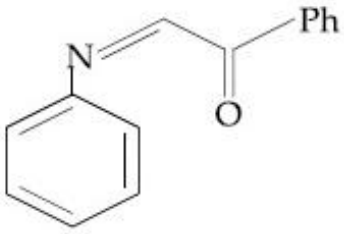
The major product 'Y' in the following reaction is :



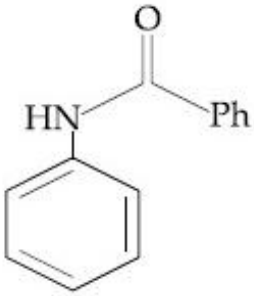
Options :



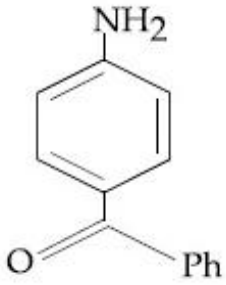
41652956162.



41652956163.



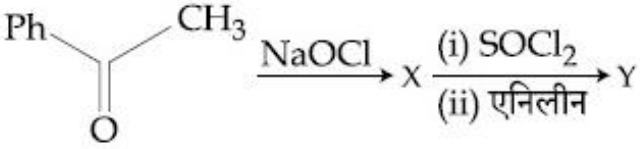
41652956164.

41652956165. 

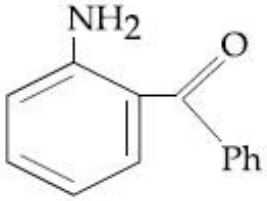
Question Number : 31 Question Id : 41652914346 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

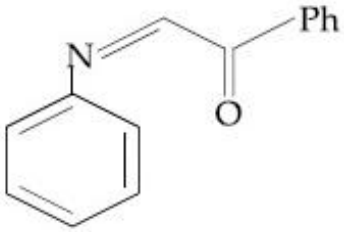
Correct Marks : 4 Wrong Marks : 1

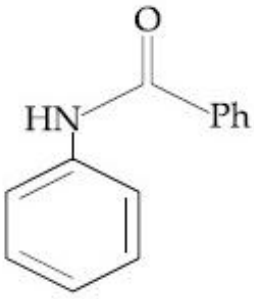
निम्न अभिक्रिया में मुख्य उत्पाद 'Y' है :

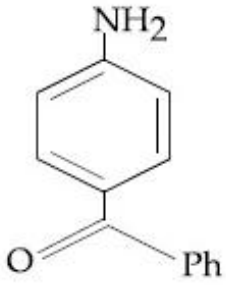


Options :

41652956162. 

41652956163. 

41652956164. 

41652956165. 

Question Number : 32 Question Id : 41652914347 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 these factors does not govern the stability of a conformation in acyclic compounds ?

Options :

41652956166. Steric interactions

41652956167. Angle strain

41652956168. Torsional strain

41652956169. Electrostatic forces of interaction

Question Number : 32 Question Id : 41652914347 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अचक्रीय यौगिकों में इनमें कौन सा कारक संरूपणों के स्थायित्व के लिये नहीं लागू होगा ?

Options :

41652956166. त्रिविमी अन्योन्यक्रिया

41652956167. कोणीय विकृति

41652956168. मरोड़ी विकृति

41652956169. अन्योन्यक्रिया का स्थिर वैद्युत बल

Question Number : 33 Question Id : 41652914348 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 chromatography, which of the following statements is INCORRECT for R_f?

Options :

41652956170. Higher R_f value means higher adsorption.

41652956171. R_f value depends on the type of chromatography.

41652956172. The value of R_f can not be more than one.

41652956173. R_f value is dependent on the mobile phase.

Question Number : 33 Question Id : 41652914348 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्रोमेटोग्राफी में, R_f के लिये निम्न कथनों में से कौन सा **गलत** है?

Options :

41652956170. उच्चतर R_f मान का अर्थ है उच्चतर अधिशोषण।

41652956171. R_f का मान क्रोमेटोग्राफी के प्रकार पर निर्भर करता है।

41652956172. R_f का मान 1 से अधिक नहीं हो सकता है।

41652956173. R_f का मान गतिशील प्रावस्था पर निर्भर करता है।

Question Number : 34 Question Id : 41652914349 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Number of stereo centers present in linear and cyclic structures of glucose are respectively :

Options :

41652956174. 4 & 4

41652956175. 4 & 5

41652956176. 5 & 4

41652956177. 5 & 5

Question Number : 34 Question Id : 41652914349 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ग्लुकोज़ के रैखिक तथा चक्रीय संरचनाओं में उपस्थित त्रिविम केन्द्रों की संख्या क्रमशः होगी :

Options :

41652956174. 4 तथा 4

41652956175. 4 तथा 5

41652956176. 5 तथा 4

41652956177. 5 तथा 5

Question Number : 35 Question Id : 41652914350 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct match between Item - I and Item - II is :

	Item - I		Item - II
(a)	High density polythene	(I)	Peroxide catalyst
(b)	Polyacrylonitrile	(II)	Condensation at high temperature & pressure
(c)	Novolac	(III)	Ziegler-Natta Catalyst
(d)	Nylon 6	(IV)	Acid or base catalyst

Options :

41652956178. $(a) \rightarrow (IV), \quad (b) \rightarrow (II), \quad (c) \rightarrow (I), \quad (d) \rightarrow (III)$

41652956179. $(a) \rightarrow (II), \quad (b) \rightarrow (IV), \quad (c) \rightarrow (I), \quad (d) \rightarrow (III)$

41652956180. $(a) \rightarrow (III), \quad (b) \rightarrow (I), \quad (c) \rightarrow (II), \quad (d) \rightarrow (IV)$

41652956181. $(a) \rightarrow (III), \quad (b) \rightarrow (I), \quad (c) \rightarrow (IV), \quad (d) \rightarrow (II)$

Question Number : 35 Question Id : 41652914350 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

मद - I तथा मद - II के बीच सही सुमेल है :

	मद - I		मद - II
(a)	उच्च घनत्व पालीथीन	(I)	पराक्साइड उत्प्रेरक
(b)	पालीएक्रिलोनाइट्राइल	(II)	उच्च ताप तथा दाब पर संघनन
(c)	नोवोलेक	(III)	जिगलर-नाटा उत्प्रेरक
(d)	नायलान 6	(IV)	अम्ल अथवा क्षारक उत्प्रेरक

Options :

41652956178. (a) → (IV), (b) → (II), (c) → (I), (d) → (III)

41652956179. (a) → (II), (b) → (IV), (c) → (I), (d) → (III)

41652956180. (a) → (III), (b) → (I), (c) → (II), (d) → (IV)

41652956181. (a) → (III), (b) → (I), (c) → (IV), (d) → (II)

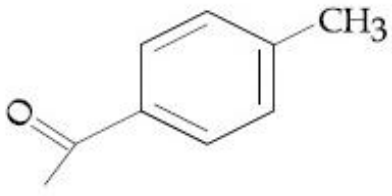
Question Number : 36 Question Id : 41652914351 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

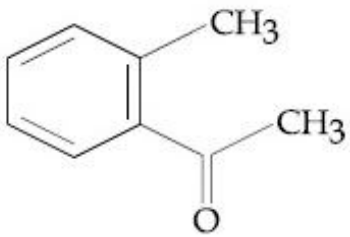
Compound A($C_9H_{10}O$) shows positive iodoform test. Oxidation of A with $KMnO_4/KOH$ gives acid B($C_8H_6O_4$). Anhydride of B is used for the preparation of phenolphthalein. Compound A is :

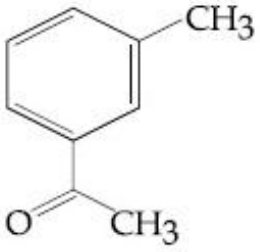
Options :

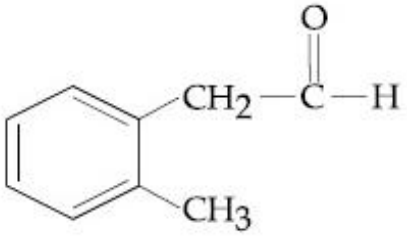
41652956182.



41652956183.



41652956184. 

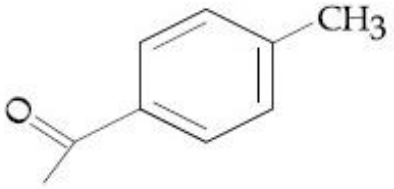
41652956185. 

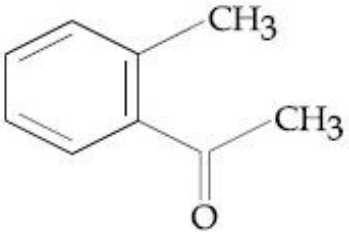
Question Number : 36 Question Id : 41652914351 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

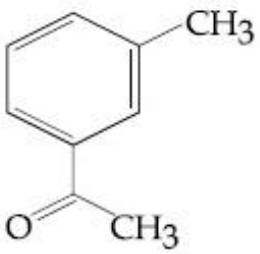
Correct Marks : 4 Wrong Marks : 1

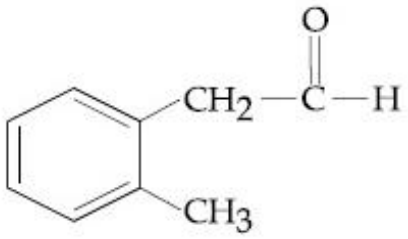
यौगिक A($C_9H_{10}O$) सकारात्मक आयडोफार्म परीक्षण प्रदर्शित करता है। $KMnO_4$/KOH के साथ A का आक्सीकरण एक अम्ल B($C_8H_6O_4$) देता है। B के एनहाइड्राइड को फेनाल्फथैलीन को बनाने के लिए प्रयोग करते हैं। यौगिक A है :

Options :

41652956182. 

41652956183. 

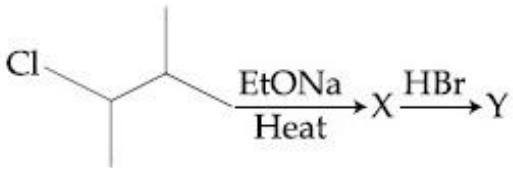
41652956184. 

41652956185. 

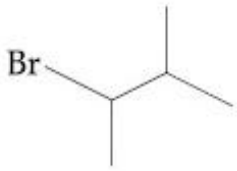
Question Number : 37 Question Id : 41652914352 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

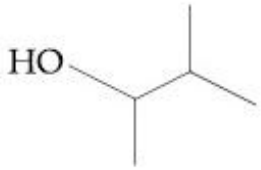
Correct Marks : 4 Wrong Marks : 1

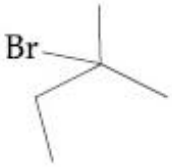
The major product 'Y' in the following reaction is :

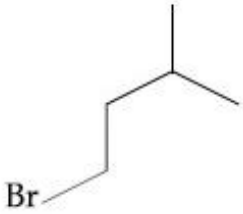


Options :

41652956186. 

41652956187. 

41652956188. 

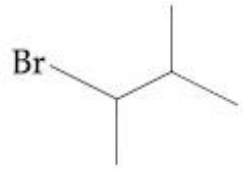
41652956189. 

Question Number : 37 Question Id : 41652914352 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

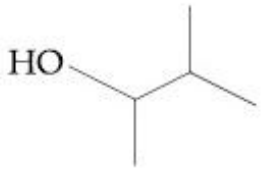
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में मुख्य उत्पाद 'Y' है :

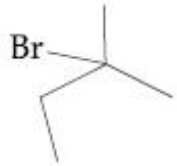
Options :



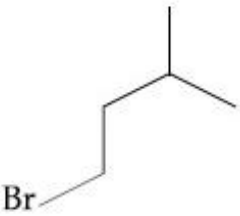
41652956186.



41652956187.



41652956188.

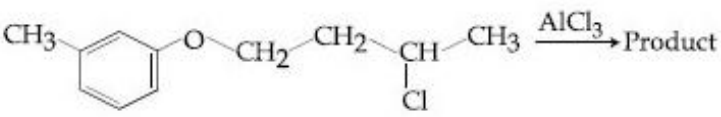


41652956189.

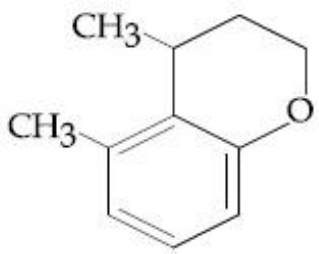
Question Number : 38 Question Id : 41652914353 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

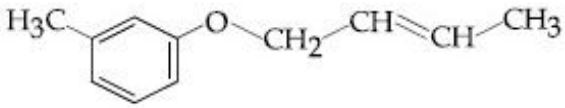
The major product obtained in the given reaction is :

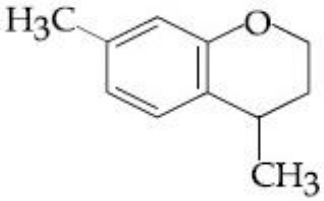


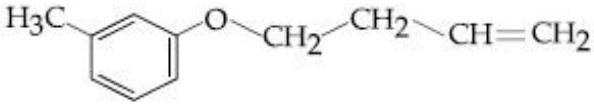
Options :



41652956190.

41652956191. 

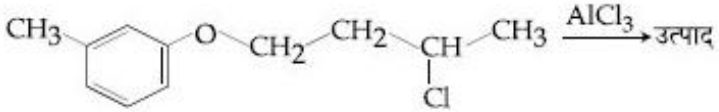
41652956192. 

41652956193. 

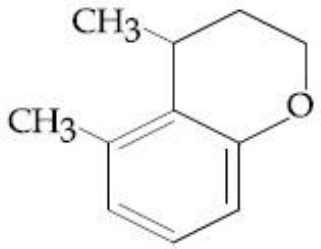
Question Number : 38 Question Id : 41652914353 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

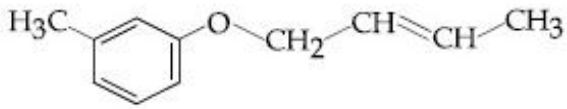
Correct Marks : 4 Wrong Marks : 1

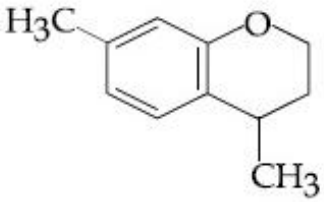
दी गयी अभिक्रिया में प्राप्त मुख्य उत्पाद है :

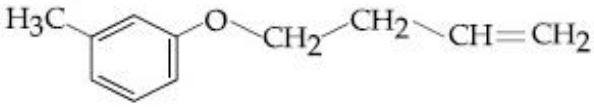


Options :

41652956190. 

41652956191. 

41652956192. 

41652956193. 

Question Number : 39 Question Id : 41652914354 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 increasing order of nucleophilicity of the following nucleophiles is :

(a) $CH_3CO_2^{\ominus}$

(b) H_2O

(c) $CH_3SO_3^{\ominus}$

(d) $\overset{\ominus}{O}H$

Options :

41652956194. (b) < (c) < (d) < (a)

41652956195. (a) < (d) < (c) < (b)

41652956196. (b) < (c) < (a) < (d)

41652956197. (d) < (a) < (c) < (b)

Question Number : 39 Question Id : 41652914354 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 नाभिकरागियों के नाभिकरागिता का बढ़ता क्रम है :

(a) $CH_3CO_2^{\ominus}$

(b) H_2O

(c) $CH_3SO_3^{\ominus}$

(d) $\overset{\ominus}{O}H$

Options :

41652956194. (b) < (c) < (d) < (a)

41652956195. (a) < (d) < (c) < (b)

41652956196. (b) < (c) < (a) < (d)

41652956197. (d) < (a) < (c) < (b)

Question Number : 40 Question Id : 41652914355 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 is NOT a correct method of the preparation of benzylamine from cyanobenzene ?

Options :

41652956198. (i) HCl/H_2O (ii) $NaBH_4$

41652956199. (i) $LiAlH_4$ (ii) H_3O^+

41652956200. H_2/Ni

41652956201. (i) $SnCl_2 + HCl(gas)$ (ii) $NaBH_4$

Question Number : 40 Question Id : 41652914355 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सायनोबेंजीन से बेंजिलएमीन के बनाने का सही तरीका **नहीं** है ?

Options :

41652956198. (i) HCl/H_2O (ii) $NaBH_4$

41652956199. (i) $LiAlH_4$ (ii) H_3O^+

41652956200. H_2/Ni

41652956201. (i) $SnCl_2 + HCl(gas)$ (ii) $NaBH_4$

Question Number : 41 Question Id : 41652914356 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct order of the first ionization enthalpies is :

Options :

41652956202. $Ti < Mn < Ni < Zn$

41652956203. $Mn < Ti < Zn < Ni$

41652956204. $Ti < Mn < Zn < Ni$

41652956205. $Zn < Ni < Mn < Ti$

Question Number : 41 Question Id : 41652914356 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रथम आयनन एन्थैल्पियों का सही क्रम है :

Options :

41652956202. Ti < Mn < Ni < Zn

41652956203. Mn < Ti < Zn < Ni

41652956204. Ti < Mn < Zn < Ni

41652956205. Zn < Ni < Mn < Ti

Question Number : 42 Question Id : 41652914357 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 statement is :

Options :

41652956206. aniline is a froth stabilizer.

41652956207. sodium cyanide cannot be used in the metallurgy of silver.

41652956208. zincite is a carbonate ore.

41652956209. zone refining process is used for the refining of titanium.

Question Number : 42 Question Id : 41652914357 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सही कथन है :

Options :

41652956206. एनिलीन एक फेन-स्थायीकारक है।

41652956207. सोडियम सायनाइड का उपयोग सिल्वर (चाँदी) के धातुकर्म में नहीं कर सकते हैं।

41652956208. जिंसाइट एक कार्बोनेट अयस्क है।

41652956209. जोन परिष्करण प्रक्रम टाइटेनियम के परिष्करण के लिए प्रयुक्त होता है।

Question Number : 43 Question Id : 41652914358 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct statements among (a) to (d) are :

(a) saline hydrides produce H_2 gas when reacted with H_2O.

(b) reaction of $LiAlH_4$ with BF_3 leads to B_2H_6.

(c) PH_3 and CH_4 are electron - rich and electron - precise hydrides, respectively.

(d) HF and CH_4 are called as molecular hydrides.

Options :

41652956210. (c) and (d) only.

41652956211. (a), (c) and (d) only.

41652956212. (a), (b) and (c) only.

41652956213. (a), (b), (c) and (d).

Question Number : 43 Question Id : 41652914358 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) से (d) के बीच, सही कथन हैं :

(a) लवण हाइड्राइड्स H_2O के साथ अभिक्रिया करने पर H_2 गैस देते हैं।

(b) BF_3 के साथ $LiAlH_4$ की अभिक्रिया से B_2H_6 बनता है।

(c) PH_3 तथा CH_4 क्रमशः इलेक्ट्रॉन-सम्पन्न तथा इलेक्ट्रॉन-परिशुद्ध हाइड्राइड्स हैं।

(d) HF तथा CH_4 आण्विक हाइड्राइड कहे जाते हैं।

Options :

41652956210. (c) तथा (d) मात्र

41652956211. (a), (c) तथा (d) मात्र

41652956212. (a), (b) तथा (c) मात्र

41652956213. (a), (b), (c) तथा (d)

Question Number : 44 Question Id : 41652914359 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 hydrated solid X on heating initially gives a monohydrated compound Y. Y upon heating above 373 K leads to an anhydrous white powder Z. X and Z, respectively, are :

Options :

41652956214. Baking soda and soda ash.

41652956215. Washing soda and dead burnt plaster.

41652956216. Washing soda and soda ash.

41652956217. Baking soda and dead burnt plaster.

Question Number : 44 Question Id : 41652914359 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 जलयोजित ठोस X गर्म करने पर प्रारम्भ में एक एकल-जलयोजित यौगिक Y देता है। 373 K के ऊपर Y को गर्म करने पर एक निर्जल सफेद पाउडर Z मिलता है। X तथा Z क्रमशः हैं :

Options :

41652956214. बेकिंग सोडा तथा सोडा ऐश

41652956215. वाशिंग सोडा तथा पूर्णदग्ध प्लास्टर

41652956216. वाशिंग सोडा तथा सोडा ऐश

41652956217. बेकिंग सोडा तथा पूर्णदग्ध प्लास्टर

Question Number : 45 Question Id : 41652914360 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 noble gas that does NOT occur in the atmosphere is :

Options :

41652956218. He

41652956219. Ne

41652956220. Kr

41652956221. Ra

Question Number : 45 Question Id : 41652914360 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 उत्कृष्ट गैस जो वायुमंडल में उपस्थित नहीं है, होगी :

Options :

41652956218. He

41652956219. Ne

41652956220. Kr

41652956221. Ra

Question Number : 46 Question Id : 41652914361 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 pentagons in C_{60} and trigons (triangles) in white phosphorus, respectively, are :

Options :

41652956222. 12 and 4

41652956223. 12 and 3

41652956224. 20 and 3

41652956225. 20 and 4

Question Number : 46 Question Id : 41652914361 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

C_{60} में पंचभुजों तथा सफेद फास्फोरस में त्रिभुजों (त्रिकोणों) की संख्या क्रमश: हैं :

Options :

41652956222. 12 तथा 4

41652956223. 12 तथा 3

41652956224. 20 तथा 3

41652956225. 20 तथा 4

Question Number : 47 Question Id : 41652914362 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 highest possible oxidation states of uranium and plutonium, respectively, are :

Options :

41652956226. 7 and 6

41652956227. 6 and 7

41652956228. 6 and 4

41652956229. 4 and 6

Question Number : 47 Question Id : 41652914362 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यूरेनियम तथा प्लुटोनियम की उच्चतम सम्भव ऑक्सीकरण अवस्थायें क्रमश: हैं :

Options :

41652956226. 7 तथा 6

41652956227. 6 तथा 7

41652956228. 6 तथा 4

41652956229. 4 तथा 6

Question Number : 48 Question Id : 41652914363 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 crystal field stabilization energy (CFSE) of $[Fe(H_2O)_6]Cl_2$ and $K_2[NiCl_4]$, respectively, are :

Options :

41652956230. $-0.6\Delta_o$ and $-0.8\Delta_t$

41652956231. $-0.4\Delta_o$ and $-0.8\Delta_t$

41652956232. $-2.4\Delta_o$ and $-1.2\Delta_t$

41652956233. $-0.4\Delta_o$ and $-1.2\Delta_t$

Question Number : 48 Question Id : 41652914363 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$[Fe(H_2O)_6]Cl_2$ तथा $K_2[NiCl_4]$ की क्रिस्टल क्षेत्र स्थायीकरण ऊर्जा (सी.एफ.एस.ई.) क्रमश: हैं :

Options :

41652956230. $-0.6\Delta_o$ तथा $-0.8\Delta_t$

41652956231. $-0.4\Delta_o$ तथा $-0.8\Delta_t$

41652956232. $-2.4\Delta_o$ तथा $-1.2\Delta_t$

41652956233. $-0.4\Delta_o$ तथा $-1.2\Delta_t$

Question Number : 49 Question Id : 41652914364 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 INCORRECT statement is :

Options :

41652956234. the spin-only magnetic moment of $[Ni(NH_3)_4(H_2O)_2]^{2+}$ is 2.83 BM.

41652956235. the spin-only magnetic moments of $[Fe(H_2O)_6]^{2+}$ and $[Cr(H_2O)_6]^{2+}$ are nearly similar.

41652956236. the color of $[CoCl(NH_3)_5]^{2+}$ is violet as it absorbs the yellow light.

41652956237. the gemstone, ruby, has Cr^{3+} ions occupying the octahedral sites of beryl.

Question Number : 49 Question Id : 41652914364 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

गलत कथन है :

Options :

41652956234. $[Ni(NH_3)_4(H_2O)_2]^{2+}$ का स्पिनमात्र-चुम्बकीय आघूर्ण 2.83 BM है।

41652956235. $[Fe(H_2O)_6]^{2+}$ तथा $[Cr(H_2O)_6]^{2+}$ के स्पिनमात्र-चुम्बकीय आघूर्ण लगभग एक जैसे हैं।

41652956236. जब $[CoCl(NH_3)_5]^{2+}$ पीला प्रकाश शोषित करता है तो इसका रंग बैंगनी हो जाता है।

41652956237. जेमस्टोन, रूबी, में Cr^{3+} आयन होता है जो बेरिल के अष्टफलकीय स्थल में उपस्थित रहता है।

Question Number : 50 Question Id : 41652914365 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Air pollution that occurs in sunlight is :

Options :

41652956238. acid rain

41652956239. fog

41652956240. reducing smog

41652956241. oxidising smog

Question Number : 50 Question Id : 41652914365 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 वायु प्रदूषण जो सूर्य के प्रकाश में होता है, है :

Options :

41652956238. अम्लीय वर्षा

41652956239. फॉग

41652956240. अपचायी स्मॉग (धूमकुहा)

41652956241. आक्सीकारक धूमकुहा

Question Number : 51 Question Id : 41652914366 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 minimum amount of $O_2(g)$ consumed per gram of reactant is for the reaction :

(Given atomic mass : Fe = 56, O = 16, Mg = 24, P = 31, C = 12, H = 1)

Options :

41652956242. $4\,Fe(s) + 3\,O_2(g) \rightarrow 2\,Fe_2O_3(s)$

41652956243. $2\,Mg(s) + O_2(g) \rightarrow 2\,MgO(s)$

41652956244. $P_4(s) + 5\,O_2(g) \rightarrow P_4O_{10}(s)$

41652956245. $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4\,H_2O(l)$

Question Number : 51 Question Id : 41652914366 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिकारक के प्रतिग्राम के लिए $O_2(g)$ की लगनेवाली अल्पतम मात्रा निम्न में से किस अभिक्रिया के लिए होगी ?

(दिया गया परमाणु द्रव्यमान : Fe = 56, O = 16, Mg = 24, P = 31, C = 12, H = 1)

Options :

41652956242. $4\,Fe(s) + 3\,O_2(g) \rightarrow 2\,Fe_2O_3(s)$

41652956243. $2\,Mg(s) + O_2(g) \rightarrow 2\,MgO(s)$

41652956244. $P_4(s) + 5\,O_2(g) \rightarrow P_4O_{10}(s)$

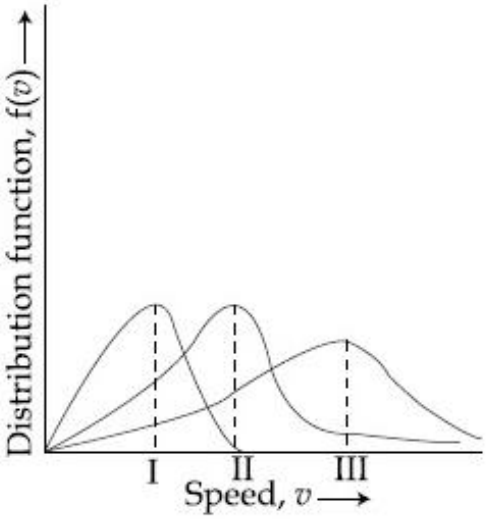
41652956245. $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4\,H_2O(l)$

Question Number : 52 Question Id : 41652914367 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Points I, II and III in the following plot respectively correspond to

(V_{mp} : most probable velocity)



Options :

41652956246. V_{mp} of H_2 (300 K); V_{mp} of N_2 (300 K); V_{mp} of O_2 (400 K)

41652956247. V_{mp} of O_2 (400 K); V_{mp} of N_2 (300 K); V_{mp} of H_2 (300 K)

41652956248. V_{mp} of N_2 (300 K); V_{mp} of O_2 (400 K); V_{mp} of H_2 (300 K)

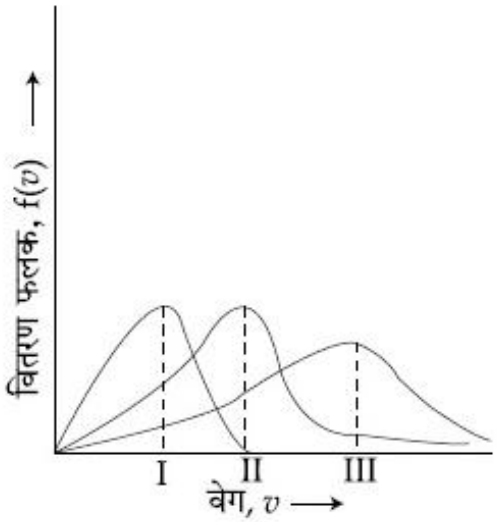
41652956249. V_{mp} of N_2 (300 K); V_{mp} of H_2 (300 K); V_{mp} of O_2 (400 K)

Question Number : 52 Question Id : 41652914367 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आलेख में बिन्दु I, II तथा III क्रमशः इनसे सम्बन्धित हैं,

(V_{mp} : प्रायिकतम वेग)



Options :

41652956246. H_2 का V_{mp} (300 K); N_2 का V_{mp} (300 K); O_2 का V_{mp} (400 K)

41652956247. O_2 का V_{mp} (400 K); N_2 का V_{mp} (300 K); H_2 का V_{mp} (300 K)

41652956248. N_2 का V_{mp} (300 K); O_2 का V_{mp} (400 K); H_2 का V_{mp} (300 K)

41652956249. N_2 का V_{mp} (300 K); H_2 का V_{mp} (300 K); O_2 का V_{mp} (400 K)

Question Number : 53 Question Id : 41652914368 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 ratio of the shortest wavelength of two spectral series of hydrogen spectrum is found to be about 9. The spectral series are :

Options :

41652956250. Balmer and Brackett

41652956251. Lyman and Paschen

41652956252. Paschen and Pfund

41652956253. Brackett and Pfund

Question Number : 53 Question Id : 41652914368 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 स्पेक्ट्रम के दो स्पेक्ट्रमी श्रेणियों के लघुतम तरंगदैर्घ्य का अनुपात लगभग 9 पाया गया। स्पेक्ट्रमी श्रेणियाँ हैं :

Options :

41652956250. बामर तथा ब्रैकेट

41652956251. लाइमन तथा पाश्चेन

41652956252. पाश्चेन तथा फुन्ड

41652956253. ब्रैकेट तथा फुंड

Question Number : 54 Question Id : 41652914369 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 between ΔH and ΔU ($\Delta H - \Delta U$), when the combustion of one mole of heptane(l) is carried out at a temperature T, is equal to :

Options :

41652956254. $4\,RT$

41652956255. $3\,RT$

41652956256. $-4\,RT$

41652956257. $-3\,RT$

Question Number : 54 Question Id : 41652914369 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 मोल हेप्टेन (l) का दहन T ताप पर किया जाता है तो ΔH तथा ΔU का अन्तर, ($\Delta H - \Delta U$), निम्न के बराबर होगा :

Options :

41652956254. $4\,RT$

41652956255. $3\,RT$

41652956256. $-4\,RT$

41652956257. $-3\,RT$

Question Number : 55 Question Id : 41652914370 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 g of a non-volatile non-electrolyte solute is dissolved in 100 g of two different solvents A and B whose ebullioscopic constants are in the ratio of 1 : 5. The ratio of the elevation in their boiling points, $\frac{\Delta T_b(A)}{\Delta T_b(B)}$, is :

Options :

41652956258. $1 : 0.2$

41652956259. $5 : 1$

41652956260. $1 : 5$

41652956261. $10 : 1$

Question Number : 55 Question Id : 41652914370 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 अवाष्पशील वैद्युत-अनुपघट्य के 1 g को दो अलग-अलग विलायकों (A तथा B), जिनके इब्यूलियोस्कोपिक स्थिरांक 1 : 5 अनुपात में हैं, के 100 g में घोला जाय तो उनके क्वथनांकों के उन्नयन का अनुपात $\frac{\Delta T_b(A)}{\Delta T_b(B)}$, होगा :

Options :

41652956258. $1 : 0.2$

41652956259. $5 : 1$

41652956260. $1:5$

41652956261. $10:1$

Question Number : 56 Question Id : 41652914371 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the reaction,

$2\,SO_2(g) + O_2(g) \rightleftharpoons 2\,SO_3(g)$,

$\Delta H = -57.2\ kJ\ mol^{-1}$ and

$K_c = 1.7 \times 10^{16}$.

Which of the following statement is INCORRECT ?

Options :

41652956262. The equilibrium constant decreases as the temperature increases.

41652956263. The equilibrium will shift in forward direction as the pressure increases.

41652956264. The addition of inert gas at constant volume will not affect the equilibrium constant.

41652956265. The equilibrium constant is large suggestive of reaction going to completion and so no catalyst is required.

Question Number : 56 Question Id : 41652914371 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिक्रिया $2\,SO_2(g) + O_2(g) \rightleftharpoons 2\,SO_3(g)$ के लिए

$\Delta H = -57.2\ kJ\ mol^{-1}$ तथा

$K_c = 1.7 \times 10^{16}$

निम्न में से कौन सा कथन **गलत** है?

Options :

41652956262. जब ताप बढ़ता है तो साम्य स्थिरांक घटता है।

41652956263. जब दाब बढ़ता है तो साम्य अग्र दिशा में विस्थापित होती है।

41652956264. स्थिर आयतन पर, निष्क्रिय गैस के मिलाने पर साम्य स्थिरांक प्रभावित नहीं होगा।

41652956265. साम्य स्थिरांक बड़ा होना बताता है कि अभिक्रिया पूर्णता को जा रही है और उत्प्रेरक की आवश्यकता नहीं है।

Question Number : 57 Question Id : 41652914372 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 pH of a 0.02 M NH_4Cl solution will be
[given $K_b(NH_4OH) = 10^{-5}$ and $\log 2 = 0.301$]

Options :

41652956266. 4.65

41652956267. 2.65

41652956268. 5.35

41652956269. 4.35

Question Number : 57 Question Id : 41652914372 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.02 M NH_4Cl विलयन का pH होगा : [दिया गया है : $K_b(NH_4OH) = 10^{-5}$ तथा $\log 2 = 0.301$]

Options :

41652956266. 4.65

41652956267. 2.65

41652956268. 5.35

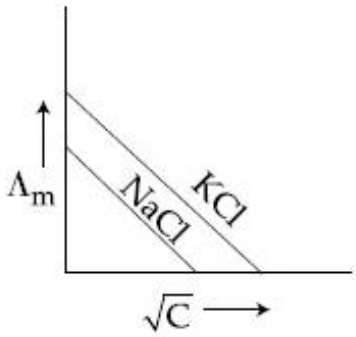
41652956269. 4.35

Question Number : 58 Question Id : 41652914373 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

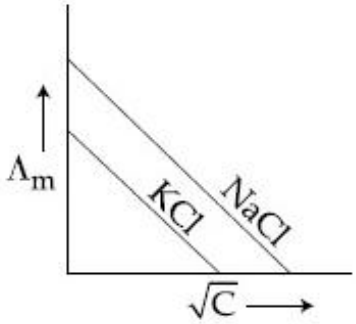
Correct Marks : 4 Wrong Marks : 1

Which one of the following graphs between molar conductivity(Λ_m) versus $\sqrt{C}$ is correct ?

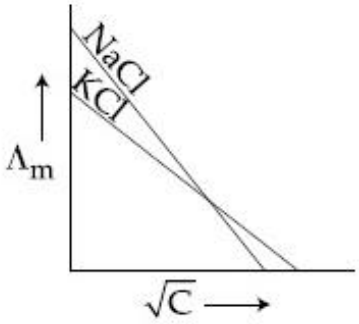
Options :



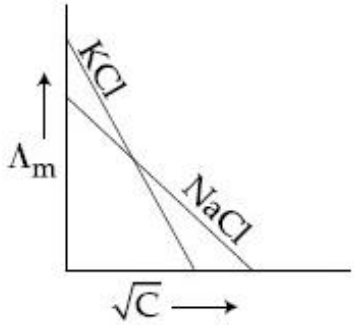
41652956270.



41652956271.



41652956272.



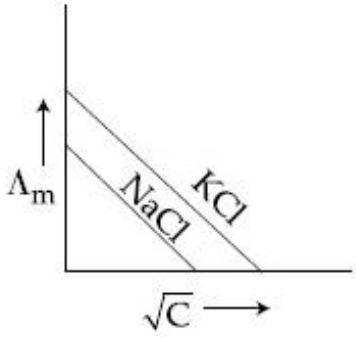
41652956273.

Question Number : 58 Question Id : 41652914373 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

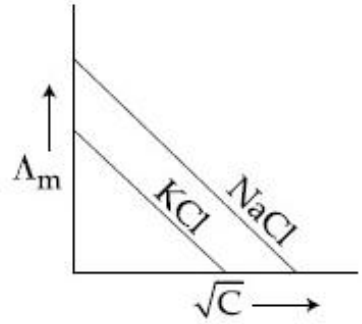
Correct Marks : 4 Wrong Marks : 1

मोलर चालकता (Λ_m) तथा $\sqrt{C}$ के बीच बने ग्राफों में से कौन सा सही है?

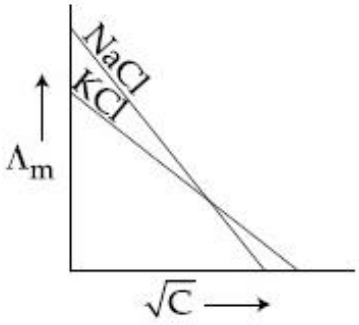
Options :



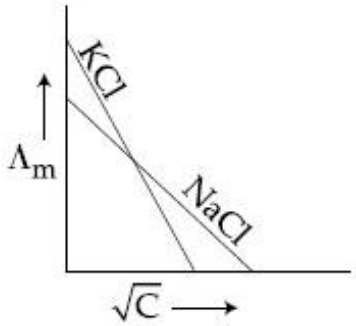
41652956270.



41652956271.



41652956272.



41652956273.

Question Number : 59 Question Id : 41652914374 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the reaction of H_2 with I_2, the rate constant is 2.5×10^{-4} dm^3 mol^{-1} s^{-1} at 327 °C and 1.0 dm^3 mol^{-1} s^{-1} at 527 °C. The activation energy for the reaction, in kJ mol^{-1} is :

($R = 8.314$ J K^{-1} mol^{-1})

Options :

41652956274. 59

41652956275. 72

41652956276. 150

41652956277. 166

Question Number : 59 Question Id : 41652914374 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

I_2 के साथ H_2 की अभिक्रिया के लिये दर नियतांक 327 °C पर $2.5\times10^{-4}\ dm^3\ mol^{-1}\ s^{-1}$ तथा 527 °C पर $1.0\ dm^3\ mol^{-1}\ s^{-1}$ है। अभिक्रिया की सक्रियण ऊर्जा (kJ mol^{-1} में) होगी :

($R = 8.314\ J\ K^{-1}\ mol^{-1}$)

Options :

41652956274. 59

41652956275. 72

41652956276. 150

41652956277. 166

Question Number : 60 Question Id : 41652914375 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 option among the following is :

Options :

41652956278. Addition of alum to water makes it unfit for drinking.

41652956279. Colloidal medicines are more effective because they have small surface area.

41652956280. Colloidal particles in lyophobic sols can be precipitated by electrophoresis.

41652956281. Brownian motion in colloidal solution is faster if the viscosity of the solution is very high.

Question Number : 60 Question Id : 41652914375 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से **सही** विकल्प है :

Options :

41652956278. पानी में फिटकिरी मिलाने से वह (पानी) पीने के अयोग्य हो जाता है।

41652956279. कोलाइडी औषधियाँ ज्यादा प्रभावशाली हैं क्योंकि उनका पृष्ठीय क्षेत्रफल छोटा होता है।

41652956280. द्रवविरागी सॉल में कोलाइडी कण वैद्युत कण संचलन द्वारा अवक्षेपित किये जा सकते हैं।

41652956281. कोलाइडी विलयन में यदि विलयन की श्यानता बहुत ज्यादा है तो ब्राउनियन गति तीव्रतर होती है।

Mathematics

Section Id :	416529306
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:	416529446
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 41652914376 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f(x)=\log_e(\sin x)$, $(0 < x < \pi)$ and $g(x)=\sin^{-1}(e^{-x})$, $(x \geq 0)$. If α is a positive real number such that $a=(fog)'(\alpha)$ and $b=(fog)(\alpha)$, then :

Options :

41652956282. $a\alpha^2-b\alpha-a=0$

41652956283. $a\alpha^2+b\alpha+a=0$

41652956284. $a\alpha^2+b\alpha-a=-2\alpha^2$

41652956285. $a\alpha^2-b\alpha-a=1$

Question Number : 61 Question Id : 41652914376 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f(x)=\log_e(\sin x)$, $(0 < x < \pi)$ तथा $g(x)=\sin^{-1}(e^{-x})$, $(x \geq 0)$ हैं। यदि एक धनात्मक वास्तविक संख्या α के लिए $a=(fog)'(\alpha)$ तथा $b=(fog)(\alpha)$ है, तो :

Options :

41652956282. $a\alpha^2-b\alpha-a=0$

41652956283. $a\alpha^2+b\alpha+a=0$

41652956284. $a\alpha^2+b\alpha-a=-2\alpha^2$

41652956285. $a\alpha^2-b\alpha-a=1$

Question Number : 62 Question Id : 41652914377 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 z and w are two complex numbers such that $|zw| = 1$ and $\arg(z)-\arg(w)=\frac{\pi}{2}$, then :

Options :

41652956286. $\overline{z}w=-i$

41652956287. $z\overline{w}=\frac{-1+i}{\sqrt{2}}$

41652956288. $\overline{z}w = i$

41652956289. $z\overline{w} = \frac{1-i}{\sqrt{2}}$

Question Number : 62 Question Id : 41652914377 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 z तथा w दो ऐसी सम्मिश्र संख्याएँ हैं कि

$|zw| = 1$ तथा $\arg(z) - \arg(w) = \frac{\pi}{2}$, तो :

Options :

41652956286. $\overline{z}w = -i$

41652956287. $z\overline{w} = \frac{-1+i}{\sqrt{2}}$

41652956288. $\overline{z}w = i$

41652956289. $z\overline{w} = \frac{1-i}{\sqrt{2}}$

Question Number : 63 Question Id : 41652914378 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 real roots of the equation

$5 + \left|2^x - 1\right| = 2^x(2^x - 2)$ is :

Options :

41652956290. 4

41652956291. 1

41652956292. 2

41652956293. 3

Question Number : 63 Question Id : 41652914378 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समीकरण $5 + \left|2^x - 1\right| = 2^x(2^x - 2)$ के

वास्तविक मूलों की संख्या है :

Options :

41652956290. 4

41652956291. 1

41652956292. 2

41652956293. 3

Question Number : 64 Question Id : 41652914379 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum of the real roots of the equation

$$\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0, \text{ is equal to :}$$

Options :

41652956294. -4

41652956295. 0

41652956296. 1

41652956297. 6

Question Number : 64 Question Id : 41652914379 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समीकरण $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0$, के

वास्तविक मूलों का योगफल है :

Options :

41652956294. -4

41652956295. 0

41652956296. 1

41652956297. 6

Question Number : 65 Question Id : 41652914380 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 λ be a real number for which the system of linear equations

$x+y+z=6$

$4x+\lambda y-\lambda z=\lambda-2$

$3x+2y-4z=-5$

has infinitely many solutions. Then λ is a root of the quadratic equation :

Options :

41652956298. $\lambda^2+3\lambda-4=0$

41652956299. $\lambda^2-3\lambda-4=0$

41652956300. $\lambda^2+\lambda-6=0$

41652956301. $\lambda^2-\lambda-6=0$

Question Number : 65 Question Id : 41652914380 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 λ एक ऐसी वास्तविक संख्या है जिसके लिए रैखिक समीकरण निकाय

$x+y+z=6$

$4x+\lambda y-\lambda z=\lambda-2$

$3x+2y-4z=-5$

के अनन्त हल हैं। तो λ जिस द्विघात समीकरण का एक मूल है, वह है :

Options :

41652956298. $\lambda^2+3\lambda-4=0$

41652956299. $\lambda^2-3\lambda-4=0$

41652956300. $\lambda^2+\lambda-6=0$

41652956301. $\lambda^2-\lambda-6=0$

Question Number : 66 Question Id : 41652914381 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Suppose that 20 pillars of the same height have been erected along the boundary of a circular stadium. If the top of each pillar has been connected by beams with the top of all its non-adjacent pillars, then the total number of beams is :

Options :

41652956302. 170

41652956303. 190

41652956304. 180

41652956305. 210

Question Number : 66 Question Id : 41652914381 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 एक वृत्तीय स्टेडियम की सीमा पर एक ही ऊँचाई के 20 खम्भे खड़े किए गए हैं। यदि प्रत्येक खम्भे के शिखर को सभी असंलग्न खम्भों के शिखरों से कड़ियों (beams) द्वारा जोड़ा गया है, तो ऐसी कड़ियों की कुल संख्या है :

Options :

41652956302. 170

41652956303. 190

41652956304. 180

41652956305. 210

Question Number : 67 Question Id : 41652914382 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 smallest natural number n, such that the coefficient of x in the expansion of

$\left(x^2+\frac{1}{x^3}\right)^n$ is ${}^nC_{23}$, is :

Options :

41652956306. 23

41652956307. 38

41652956308. 35

41652956309. 58

Question Number : 67 Question Id : 41652914382 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 न्यूनतम प्राकृत संख्या n, जिसके लिए

$\left(x^2+\frac{1}{x^3}\right)^n$ के प्रसार में x का गुणांक ${}^nC_{23}$ है, है :

Options :

41652956306. 23

41652956307. 38

41652956308. 35

41652956309. 58

Question Number : 68 Question Id : 41652914383 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, b and c be in G.P. with common ratio r, where $a \neq 0$ and $0 < r \leq \frac{1}{2}$. If 3a, 7b and 15c are the first three terms of an A.P., then the 4^{th} term of this A.P. is :

Options :

41652956310. $\frac{2}{3}a$

41652956311. a

41652956312. $\frac{7}{3}a$

41652956313. 5 a

Question Number : 68 Question Id : 41652914383 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, b तथा c गुणोत्तर श्रेढ़ी में हैं जिसका सार्वअनुपात r है, जहाँ $a \neq 0$ और $0 < r \leq \frac{1}{2}$ है। यदि 3a, 7b तथा 15c एक समांतर श्रेढ़ी के प्रथम तीन पद हैं, तो इस समांतर श्रेढ़ी का चौथा पद है :

Options :

41652956310. $\frac{2}{3}a$

41652956311. a

41652956312. $\frac{7}{3}a$

41652956313. $5a$

Question Number : 69 Question Id : 41652914384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum $1 + \frac{1^3+2^3}{1+2} + \frac{1^3+2^3+3^3}{1+2+3} + ...$

$+ \frac{1^3+2^3+3^3+...+15^3}{1+2+3+...+15} - \frac{1}{2}(1+2+3+...+15)$

is equal to :

Options :

41652956314. 620

41652956315. 660

41652956316. 1240

41652956317. 1860

Question Number : 69 Question Id : 41652914384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

योगफल $1 + \frac{1^3+2^3}{1+2} + \frac{1^3+2^3+3^3}{1+2+3} + ...$

$+ \frac{1^3+2^3+3^3+...+15^3}{1+2+3+...+15} - \frac{1}{2}(1+2+3+...+15)$

बराबर है :

Options :

41652956314. 620

41652956315. 660

41652956316. 1240

41652956317. 1860

Question Number : 70 Question Id : 41652914385 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 $\lim_{x \to 1} \frac{x^2 - ax + b}{x - 1} = 5$, then $a + b$ is equal to :

Options :

41652956318. 1

41652956319. 5

41652956320. -4

41652956321. -7

Question Number : 70 Question Id : 41652914385 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 $\lim_{x \to 1} \frac{x^2 - ax + b}{x - 1} = 5$ है, तो $a + b$ बराबर है :

Options :

41652956318. 1

41652956319. 5

41652956320. -4

41652956321. -7

Question Number : 71 Question Id : 41652914386 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 $a_1, a_2, a_3, \ldots$ be an A.P. with $a_6 = 2$. Then the common difference of this A.P., which maximises the product $a_1\, a_4\, a_5$, is :

Options :

41652956322. $\frac{2}{3}$

41652956323. $\frac{8}{5}$

41652956324. $\frac{6}{5}$

41652956325. $\frac{3}{2}$

Question Number : 71 Question Id : 41652914386 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $a_1, a_2, a_3, \ldots$ एक समांतर श्रेढ़ी है जिसमें $a_6 = 2$ है। तो इस समांतर श्रेढ़ी का वह सार्वअंतर जो गुणनफल $a_1\, a_4\, a_5$ को अधिकतम करता है, है :

Options :

41652956322. $\frac{2}{3}$

41652956323. $\frac{8}{5}$

41652956324. $\frac{6}{5}$

41652956325. $\frac{3}{2}$

Question Number : 72 Question Id : 41652914387 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 spherical iron ball of radius 10 cm is coated with a layer of ice of uniform thickness that melts at a rate of 50 cm^3/min. When the thickness of the ice is 5 cm, then the rate at which the thickness (in cm/min) of the ice decreases, is :

Options :

41652956326. $\frac{1}{36\pi}$

41652956327. $\frac{5}{6\pi}$

41652956328. $\frac{1}{18\pi}$

41652956329. $\frac{1}{9\pi}$

Question Number : 72 Question Id : 41652914387 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

10 सेमी त्रिज्या की लोहे की एक गोलाकार गेंद के चारों ओर समान मोटाई की बर्फ की तह चढ़ाई गई है, जो 50 घन सेमी/मिनट की दर से पिघल रही है। जब बर्फ की मोटाई 5 सेमी है, तब बर्फ की मोटाई के घटने की दर (सेमी/मिनट) में, है :

Options :

41652956326. $\frac{1}{36\pi}$

41652956327. $\frac{5}{6\pi}$

41652956328. $\frac{1}{18\pi}$

41652956329. $\frac{1}{9\pi}$

Question Number : 73 Question Id : 41652914388 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 tangent to the curve $y = \frac{x}{x^2-3}$, $x \in \mathbf{R}$, $\left(x \neq \pm\sqrt{3}\right)$, at a point $(\alpha, \beta) \neq (0, 0)$ on it is parallel to the line $2x+6y-11=0$, then :

Options :

41652956330. $|6\alpha + 2\beta| = 19$

41652956331. $|2\alpha + 6\beta| = 11$

41652956332. $|6\alpha + 2\beta| = 9$

41652956333. $|2\alpha + 6\beta| = 19$

Question Number : 73 Question Id : 41652914388 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 वक्र $y = \frac{x}{x^2-3}$, $x \in \mathbf{R}$, $\left(x \neq \pm\sqrt{3}\right)$ के एक बिंदु $(\alpha, \beta) \neq (0, 0)$ पर खींची गई स्पर्शरेखा, रेखा $2x+6y-11=0$ के समांतर है, तो :

Options :

41652956330. $|6\alpha + 2\beta| = 19$

41652956331. $|2\alpha + 6\beta| = 11$

41652956332. $|6\alpha + 2\beta| = 9$

41652956333. $|2\alpha + 6\beta| = 19$

Question Number : 74 Question Id : 41652914389 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 $\int x^5 e^{-x^2} dx = g(x)e^{-x^2} + c$, where c is a constant of integration, then $g(-1)$ is equal to :

Options :

41652956334. $-\frac{5}{2}$

41652956335. -1

41652956336. $-\frac{1}{2}$

41652956337. 1

Question Number : 74 Question Id : 41652914389 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 $\int x^5 e^{-x^2} dx = g(x)e^{-x^2} + c$ है, जहाँ c एक समाकलन अचर है, तो $g(-1)$ बराबर है :

Options :

41652956334. $-\frac{5}{2}$

41652956335. -1

41652956336. $-\frac{1}{2}$

41652956337. 1

Question Number : 75 Question Id : 41652914390 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 integral $\int_{\pi/6}^{\pi/3} \sec^{2/3} x \operatorname{cosec}^{4/3} x \, dx$ is

equal to :

Options :

41652956338. $3^{5/3} - 3^{1/3}$

41652956339. $3^{4/3} - 3^{1/3}$

41652956340. $3^{5/6} - 3^{2/3}$

41652956341. $3^{7/6} - 3^{5/6}$

Question Number : 75 Question Id : 41652914390 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समाकल $\int_{\pi/6}^{\pi/3} \sec^{2/3} x \operatorname{cosec}^{4/3} x \, dx$ बराबर है :

Options :

41652956338. $3^{5/3} - 3^{1/3}$

41652956339. $3^{4/3} - 3^{1/3}$

41652956340. $3^{5/6} - 3^{2/3}$

41652956341. $3^{7/6} - 3^{5/6}$

Question Number : 76 Question Id : 41652914391 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The area (in sq. units) of the region bounded by the curves $y=2^x$ and $y = |x+1|$, in the first quadrant is :

Options :

41652956342. $\log_e 2 + \frac{3}{2}$

41652956343. $\frac{3}{2} - \frac{1}{\log_e 2}$

41652956344. $\frac{1}{2}$

41652956345. $\frac{3}{2}$

Question Number : 76 Question Id : 41652914391 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वक्रों $y=2^x$ तथा $y=|x+1|$ द्वारा प्रथम चतुर्थांश में परिबद्ध क्षेत्र का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

41652956342. $\log_e 2+\frac{3}{2}$

41652956343. $\frac{3}{2}-\frac{1}{\log_e 2}$

41652956344. $\frac{1}{2}$

41652956345. $\frac{3}{2}$

Question Number : 77 Question Id : 41652914392 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $y=y(x)$ be the solution of the differential equation, $\frac{dy}{dx}+y\tan x=2x+x^2\tan x$, $x\in\left(-\frac{\pi}{2},\frac{\pi}{2}\right)$, such that $y(0)=1$. Then :

Options :

41652956346. $y\left(\frac{\pi}{4}\right)-y\left(-\frac{\pi}{4}\right)=\sqrt{2}$

41652956347. $y\left(\frac{\pi}{4}\right)+y\left(-\frac{\pi}{4}\right)=\frac{\pi^2}{2}+2$

41652956348. $y'\left(\frac{\pi}{4}\right)-y'\left(-\frac{\pi}{4}\right)=\pi-\sqrt{2}$

41652956349. $y'\left(\frac{\pi}{4}\right)+y'\left(-\frac{\pi}{4}\right)=-\sqrt{2}$

Question Number : 77 Question Id : 41652914392 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $y=y(x)$, अवकल समीकरण

$\frac{dy}{dx} + y\tan x = 2x + x^2\tan x,$

$x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, जबकि $y(0)=1$ है, का हल है।

तो :

Options :

41652956346. $y\left(\frac{\pi}{4}\right) - y\left(-\frac{\pi}{4}\right) = \sqrt{2}$

41652956347. $y\left(\frac{\pi}{4}\right) + y\left(-\frac{\pi}{4}\right) = \frac{\pi^2}{2} + 2$

41652956348. $y'\left(\frac{\pi}{4}\right) - y'\left(-\frac{\pi}{4}\right) = \pi - \sqrt{2}$

41652956349. $y'\left(\frac{\pi}{4}\right) + y'\left(-\frac{\pi}{4}\right) = -\sqrt{2}$

Question Number : 78 Question Id : 41652914393 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Lines are drawn parallel to the line $4x-3y+2=0$, at a distance $\frac{3}{5}$ from the origin. Then which one of the following points lies on any of these lines ?

Options :

41652956350. $\left(\frac{1}{4}, \frac{1}{3}\right)$

41652956351. $\left(\frac{1}{4}, -\frac{1}{3}\right)$

41652956352. $\left(-\frac{1}{4}, -\frac{2}{3}\right)$

41652956353. $\left(-\frac{1}{4}, \frac{2}{3}\right)$

Question Number : 78 Question Id : 41652914393 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 $4x-3y+2=0$ के समांतर रेखाएँ खींची गई हैं जो मूलबिंदु से $\frac{3}{5}$ की दूरी पर हैं। तो निम्न में से कौन-सा एक बिंदु इनमें से किसी रेखा पर स्थित हैं?

Options :

41652956350. $\left(\frac{1}{4}, \frac{1}{3}\right)$

41652956351. $\left(\frac{1}{4}, -\frac{1}{3}\right)$

41652956352. $\left(-\frac{1}{4}, -\frac{2}{3}\right)$

41652956353. $\left(-\frac{1}{4}, \frac{2}{3}\right)$

Question Number : 79 Question Id : 41652914394 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 locus of the centres of the circles, which touch the circle, $x^2+y^2=1$ externally, also touch the y-axis and lie in the first quadrant, is :

Options :

41652956354. $y = \sqrt{1+2x},\ x \geq 0$

41652956355. $y = \sqrt{1+4x},\ x \geq 0$

41652956356. $x = \sqrt{1+4y},\ y \geq 0$

41652956357. $x = \sqrt{1+2y},\ y \geq 0$

Question Number : 79 Question Id : 41652914394 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ऐसे वृत्तों, जो वृत्त $x^2+y^2=1$ को बाह्य स्पर्श करते हैं, y-अक्ष को भी स्पर्श करते हैं तथा प्रथम चतुर्थांश में स्थित हैं, के केंद्रों का बिन्दुपथ है :

Options :

41652956354. $y = \sqrt{1+2x},\ x \geq 0$

41652956355. $y = \sqrt{1+4x},\ x \geq 0$

41652956356. $x = \sqrt{1+4y},\ y \geq 0$

41652956357. $x = \sqrt{1+2y},\ y \geq 0$

Question Number : 80 Question Id : 41652914395 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 line $ax+y=c$, touches both the curves $x^2+y^2=1$ and $y^2 = 4\sqrt{2}x$, then $|c|$ is equal to :

Options :

41652956358. $\sqrt{2}$

41652956359. $\frac{1}{\sqrt{2}}$

41652956360. $\frac{1}{2}$

41652956361. 2

Question Number : 80 Question Id : 41652914395 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 रेखा $ax+y=c$, दोनों वक्रों $x^2+y^2=1$ तथा $y^2 = 4\sqrt{2}x$, को स्पर्श करती है, तो $|c|$ बराबर है :

Options :

41652956358. $\sqrt{2}$

41652956359. $\frac{1}{\sqrt{2}}$

41652956360. $\frac{1}{2}$

41652956361. 2

Question Number : 81 Question Id : 41652914396 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 and normal to the ellipse $3x^2+5y^2=32$ at the point P(2, 2) meet the x-axis at Q and R, respectively. Then the area (in sq. units) of the triangle PQR is :

Options :

41652956362. $\frac{34}{15}$

41652956363. $\frac{16}{3}$

41652956364. $\frac{14}{3}$

41652956365. $\frac{68}{15}$

Question Number : 81 Question Id : 41652914396 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दीर्घवृत्त $3x^2+5y^2=32$ के बिंदु P(2, 2) पर खींची गई स्पर्श रेखा तथा अभिलंब, x-अक्ष को क्रमश: Q तथा R पर काटते हैं। तो त्रिभुज PQR का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

41652956362. $\frac{34}{15}$

41652956363. $\frac{16}{3}$

41652956364. $\frac{14}{3}$

41652956365. $\frac{68}{15}$

Question Number : 82 Question Id : 41652914397 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 $5x+9=0$ is the directrix of the hyperbola $16x^2-9y^2=144$, then its corresponding focus is :

Options :

41652956366. $(-5,0)$

41652956367. $(5,0)$

41652956368. $\left(-\frac{5}{3},0\right)$

41652956369. $\left(\frac{5}{3},0\right)$

Question Number : 82 Question Id : 41652914397 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 अतिपरवलय $16x^2-9y^2=144$ की नियता (directrix) $5x+9=0$ है, तो इसका संगत नाभिकेंद्र है :

Options :

41652956366. $(-5,0)$

41652956367. $(5,0)$

41652956368. $\left(-\frac{5}{3},0\right)$

41652956369. $\left(\frac{5}{3},0\right)$

Question Number : 83 Question Id : 41652914398 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 perpendicular is drawn from a point on the line $\frac{x-1}{2}=\frac{y+1}{-1}=\frac{z}{1}$ to the plane $x+y+z=3$ such that the foot of the perpendicular Q also lies on the plane $x-y+z=3$. Then the co-ordinates of Q are :

Options :

41652956370. $(2,0,1)$

41652956371. $(1,0,2)$

41652956372. $(-1,0,4)$

41652956373. $(4,0,-1)$

Question Number : 83 Question Id : 41652914398 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 $\frac{x-1}{2}=\frac{y+1}{-1}=\frac{z}{1}$ के एक बिंदु से समतल $x+y+z=3$ पर एक लंब इस प्रकार डाला गया कि इसका लंबपाद Q, समतल $x-y+z=3$ पर भी स्थित है। तो Q के निर्देशांक हैं :

Options :

41652956370. $(2,0,1)$

41652956371. $(1,0,2)$

41652956372. $(-1,0,4)$

41652956373. $(4,0,-1)$

Question Number : 84 Question Id : 41652914399 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 plane $2x-y+2z+3=0$ has the distances $\frac{1}{3}$ and $\frac{2}{3}$ units from the planes $4x-2y+4z+\lambda=0$ and $2x-y+2z+\mu=0$, respectively, then the maximum value of $\lambda+\mu$ is equal to :

Options :

41652956374. 5

41652956375. 9

41652956376. 13

41652956377. 15

Question Number : 84 Question Id : 41652914399 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 समतल $2x-y+2z+3=0$ की समतलों $4x-2y+4z+\lambda=0$ तथा $2x-y+2z+\mu=0$ से दूरियाँ क्रमशः $\frac{1}{3}$ तथा $\frac{2}{3}$ इकाइयाँ हैं, तो $\lambda+\mu$ का अधिकतम मान है :

Options :

41652956374. 5

41652956375. 9

41652956376. 13

41652956377. 15

Question Number : 85 Question Id : 41652914400 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 distance of the point having position vector $-\hat{i}+2\hat{j}+6\hat{k}$ from the straight line passing through the point $(2,\ 3,\ -4)$ and parallel to the vector, $6\hat{i}+3\hat{j}-4\hat{k}$ is :

Options :

41652956378. 6

41652956379. 7

41652956380. $2\sqrt{13}$

41652956381. $4\sqrt{3}$

Question Number : 85 Question Id : 41652914400 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 बिंदु जिसका स्थिति सदिश $-\hat{i} + 2\hat{j} + 6\hat{k}$ है, की एक सरल रेखा, जो बिंदु $(2, 3, -4)$ से होकर जाती है तथा सदिश $6\hat{i} + 3\hat{j} - 4\hat{k}$ के समांतर है, से दूरी है :

Options :

41652956378. 6

41652956379. 7

41652956380. $2\sqrt{13}$

41652956381. $4\sqrt{3}$

Question Number : 86 Question Id : 41652914401 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 both the mean and the standard deviation of 50 observations $x_1, x_2, ..., x_{50}$ are equal to 16, then the mean of $(x_1-4)^2, (x_2-4)^2, ...,$ $(x_{50}-4)^2$ is :

Options :

41652956382. 380

41652956383. 400

41652956384. 480

41652956385. 525

Question Number : 86 Question Id : 41652914401 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 50 प्रेक्षणों $x_1, x_2, ..., x_{50}$ का माध्य तथा मानक विचलन दोनों 16 हैं, तो $(x_1-4)^2, (x_2-4)^2, ...,$ $(x_{50}-4)^2$ का माध्य है :

Options :

41652956382. 380

41652956383. 400

41652956384. 480

41652956385. 525

Question Number : 87 Question Id : 41652914402 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Minimum number of times a fair coin must be tossed so that the probability of getting at least one head is more than 99% is :

Options :

41652956386. 5

41652956387. 6

41652956388. 7

41652956389. 8

Question Number : 87 Question Id : 41652914402 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 न्याय्य सिक्के को न्यूनतम कितनी बार उछालें कि कम से कम एक चित्त आने की प्रायिकता 99% से अधिक हो?

Options :

41652956386. 5

41652956387. 6

41652956388. 7

41652956389. 8

Question Number : 88 Question Id : 41652914403 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $\cos^{-1}x-\cos^{-1}\frac{y}{2}=\alpha$, where $-1\le x\le 1$,

$-2\le y\le 2$, $x\le\frac{y}{2}$, then for all x, y,

$4x^2-4xy\cos\alpha+y^2$ is equal to :

Options :

41652956390. $2\sin^2\alpha$

41652956391. $4\sin^2\alpha-2x^2y^2$

41652956392. $4\sin^2\alpha$

41652956393. $4\cos^2\alpha+2x^2y^2$

Question Number : 88 Question Id : 41652914403 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\cos^{-1}x-\cos^{-1}\frac{y}{2}=\alpha$, जहाँ $-1\le x\le 1$,

$-2\le y\le 2$, $x\le\frac{y}{2}$ है, तो सभी x, y, के लिए,

$4x^2-4xy\cos\alpha+y^2$ बराबर है :

Options :

41652956390. $2\sin^2\alpha$

41652956391. $4\sin^2\alpha-2x^2y^2$

41652956392. $4\sin^2\alpha$

41652956393. $4\cos^2\alpha+2x^2y^2$

Question Number : 89 Question Id : 41652914404 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 angles A, B and C of a triangle ABC are in A.P. and $a : b = 1 : \sqrt{3}$. If $c = 4$ cm, then the area (in sq.cm) of this triangle is :

Options :

41652956394. $4\sqrt{3}$

41652956395. $2\sqrt{3}$

41652956396. $\frac{4}{\sqrt{3}}$

41652956397. $\frac{2}{\sqrt{3}}$

Question Number : 89 Question Id : 41652914404 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 ABC के कोण A, B तथा C समांतर श्रेणी में हैं तथा $a : b = 1 : \sqrt{3}$ है। यदि $c = 4$ सेमी है, तो इस त्रिभुज का क्षेत्रफल (वर्ग सेमी में) है :

Options :

41652956394. $4\sqrt{3}$

41652956395. $2\sqrt{3}$

41652956396. $\frac{4}{\sqrt{3}}$

41652956397. $\frac{2}{\sqrt{3}}$

Question Number : 90 Question Id : 41652914405 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 negation of the Boolean expression $\sim s \vee (\sim r \wedge s)$ is equivalent to :

Options :

41652956398. $s \vee r$

41652956399. $s \wedge r$

41652956400. r

41652956401. $\sim s \wedge \sim r$

Question Number : 90 Question Id : 41652914405 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बूले व्यंजक $\sim s \vee (\sim r \wedge s)$ का निषेधन निम्न में से किस के समतुल्य है?

Options :

41652956398. $s \vee r$

41652956399. $s \wedge r$

41652956400. r

41652956401. $\sim s \wedge \sim r$