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B TECH EG

Group Number :	1
Group Id :	708191193
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300
Is this Group for Examiner? :	No

Physics Section A

Section Id :	708191736
Section Number :	1
Section type :	Online

Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911016
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 70819117944 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : The escape velocities of planet A and B are same. But A and B are of unequal mass.

Reason R : The product of their mass and radius must be same. $M_1R_1 = M_2R_2$

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

Options :

70819158981. Both A and R are correct and R is the correct explanation of A

70819158982. Both A and R are correct but R is NOT the correct explanation of A

70819158983. A is correct but R is not correct

70819158984. A is not correct but R is correct

Question Number : 1 Question Id : 70819117944 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલ છે : એક કથન A અને બીજું કારણ R તરીકે દર્શાવેલ છે :

કથન A : ગ્રહ A અને B નાં નિષ્ક્રમણ વેગ સમાન છે. પણ A અને B નાં દળ જુદા-જુદા છે.

કારણ R : તેમનાં દળ અને ત્રિજ્યાઓનો ગુણાકાર સમાન હોવો જોઈએ. $M_1R_1 = M_2R_2$

ઉપરોક્ત વિધાનોનાં સંદર્ભમાં, નીચે આપેલા વિકલ્પો પૈકી સૌથી યોગ્ય ઉત્તર પસંદ કરો.

Options :

70819158981. બંને A અને R સાચાં છે અને R એ A નું સાચું સ્પષ્ટીકરણ કરે છે.

70819158982. બંને A અને R સાચાં છે પરંતુ R એ A નું સાચું સ્પષ્ટીકરણ કરતું નથી.

70819158983. A સાચું છે પણ R સાચું નથી.

70819158984. A સાચું નથી પણ R સાચું છે.

Question Number : 2 Question Id : 70819117945 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

List - I

List - II

- | | |
|----------------------------|------------------------------|
| (a) h (Planck's constant) | (i) $[M L T^{-1}]$ |
| (b) E (kinetic energy) | (ii) $[M L^2 T^{-1}]$ |
| (c) V (electric potential) | (iii) $[M L^2 T^{-2}]$ |
| (d) P (linear momentum) | (iv) $[M L^2 I^{-1} T^{-3}]$ |

Choose the correct answer from the options given below :

Options :

70819158985. (a) \rightarrow (i), (b) \rightarrow (ii), (c) \rightarrow (iv), (d) \rightarrow (iii)

70819158986. (a) \rightarrow (iii), (b) \rightarrow (iv), (c) \rightarrow (ii), (d) \rightarrow (i)

70819158987. (a) \rightarrow (ii), (b) \rightarrow (iii), (c) \rightarrow (iv), (d) \rightarrow (i)

70819158988. (a) \rightarrow (iii), (b) \rightarrow (ii), (c) \rightarrow (iv), (d) \rightarrow (i)

Question Number : 2 Question Id : 70819117945 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સૂચી - I ને સૂચી - II સાથે મેળવો.

સૂચી - I	સૂચી - II
(a) h (પ્લાન્કનો અચળાંક)	(i) $[M L T^{-1}]$
(b) E (ગતિ ઊર્જા)	(ii) $[M L^2 T^{-1}]$
(c) V (વિદ્યુત સ્થિતિમાન)	(iii) $[M L^2 T^{-2}]$
(d) P (રેખીય વેગમાન)	(iv) $[M L^2 I^{-1} T^{-3}]$

નીચે આપેલા વિકલ્પોમાંથી સાચાં જવાબનું ચયન કરો.

Options :

70819158985. (a) \rightarrow (i), (b) \rightarrow (ii), (c) \rightarrow (iv), (d) \rightarrow (iii)

70819158986. (a) \rightarrow (iii), (b) \rightarrow (iv), (c) \rightarrow (ii), (d) \rightarrow (i)

70819158987. (a) \rightarrow (ii), (b) \rightarrow (iii), (c) \rightarrow (iv), (d) \rightarrow (i)

70819158988. (a) \rightarrow (iii), (b) \rightarrow (ii), (c) \rightarrow (iv), (d) \rightarrow (i)

Question Number : 3 Question Id : 70819117946 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the time period of a two meter long simple pendulum is 2 s, the acceleration due to gravity at the place where pendulum is executing S.H.M. is :

Options :

70819158989. 16 m/s^2

70819158990. $\pi^2 \text{ ms}^{-2}$

70819158991. 9.8 ms^{-2}

70819158992. $2\pi^2 \text{ ms}^{-2}$

Question Number : 3 Question Id : 70819117946 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો બે મીટર લંબાઈ ધરાવતાં સાદા લોલકનો આવર્તકાળ 2 s હોય, જ્યાં લોલક સ.આ.ગ. કરે છે તે જગ્યાએ ગુરુત્વીય પ્રવેગ _____ હશે.

Options :

70819158989. 16 m/s^2

70819158990. $\pi^2 \text{ ms}^{-2}$

70819158991. 9.8 ms^{-2}

70819158992. $2\pi^2 \text{ ms}^{-2}$

Question Number : 4 Question Id : 70819117947 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A student is performing the experiment of resonance column. The diameter of the column tube is 6 cm. The frequency of the tuning fork is 504 Hz. Speed of the sound at the given temperature is 336 m/s. The zero of the metre scale coincides with the top end of the resonance column tube. The reading of the water level in the column when the first resonance occurs is:

Options :

70819158993. 16.6 cm

70819158994. 18.4 cm

70819158995. 14.8 cm

70819158996. 13 cm

Question Number : 4 Question Id : 70819117947 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક વિદ્યાર્થી અનુનાદ નળીનો પ્રયોગ કરે છે. અનુનાદ નળીનો વ્યાસ 6 cm છે. સ્વરકાંટાની આવૃત્તિ 504 Hz છે. આપેલ તાપમાને ધ્વનીની ઝડપ 336 m/s છે. મીટર પટ્ટીનો શૂન્ય અંક અનુનાદીય નળીનાં ઉપરનાં છેડા સાથે બંધ બેસે છે. જ્યારે પ્રથમ અનુનાદ ઉત્પન્ન થાય તે વખતનું પાણીના સ્તરનું નળીમાં અવલોકન _____ હશે.

Options :

70819158993. 16.6 cm

70819158994. 18.4 cm

70819158995. 14.8 cm

70819158996. 13 cm

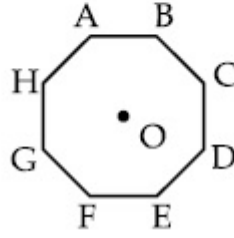
Question Number : 5 Question Id : 70819117948 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In an octagon ABCDEFGH of equal side, what is the sum of

$$\vec{AB} + \vec{AC} + \vec{AD} + \vec{AE} + \vec{AF} + \vec{AG} + \vec{AH},$$

if, $\vec{AO} = 2\hat{i} + 3\hat{j} - 4\hat{k}$



Options :

70819158997. $16\hat{i} + 24\hat{j} + 32\hat{k}$

70819158998. $-16\hat{i} - 24\hat{j} + 32\hat{k}$

70819158999. $16\hat{i} - 24\hat{j} + 32\hat{k}$

70819159000. $16\hat{i} + 24\hat{j} - 32\hat{k}$

Question Number : 5 Question Id : 70819117948 Question Type : MCQ Option Shuffling : Yes Is

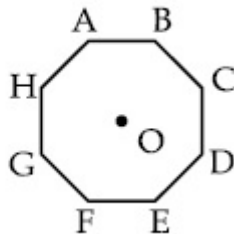
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

समान बाजूं धरावतां अष्टकोण ABCDEFGH माटे

$$\vec{AB} + \vec{AC} + \vec{AD} + \vec{AE} + \vec{AF} + \vec{AG} + \vec{AH},$$

सर्वाणो केंद्रो हसे जे, $\vec{AO} = 2\hat{i} + 3\hat{j} - 4\hat{k}$ होय ?



Options :

70819158997. $16\hat{i} + 24\hat{j} + 32\hat{k}$

70819158998. $-16\hat{i} - 24\hat{j} + 32\hat{k}$

70819158999. $16\hat{i} - 24\hat{j} + 32\hat{k}$

70819159000. $16\hat{i} + 24\hat{j} - 32\hat{k}$

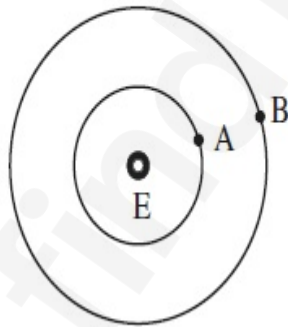
Question Number : 6 Question Id : 70819117949 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two satellites A and B of masses 200 kg and 400 kg are revolving round the earth at height of 600 km and 1600 km respectively.

If T_A and T_B are the time periods of A and B respectively then the value of $T_B - T_A$:



[Given : radius of earth = 6400 km, mass of earth = 6×10^{24} kg]

Options :

70819159001. 1.33×10^3 s

70819159002. 4.24×10^3 s

70819159003. 4.24×10^2 s

70819159004.

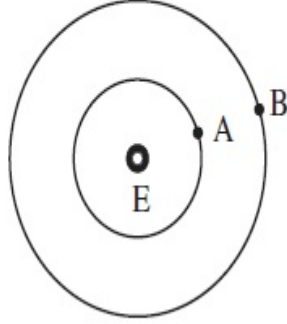
3.33×10^2 s

Question Number : 6 Question Id : 70819117949 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

200 kg અને 400 kg નાં બે ઉપગ્રહો A અને B પૃથ્વીને ફરતે અનુક્રમે 600 km અને 1600 km ઊંચાઈએ પરિક્રમણ કરે છે. જો T_A અને T_B એ અનુક્રમે A અને B નાં આવર્તકાળ હોય તો મૂલ્ય $T_B - T_A = \underline{\hspace{2cm}}$ હશે.



[પૃથ્વીની ત્રિજ્યા = 6400 km, પૃથ્વીનું દળ = 6×10^{24} kg]

Options :

70819159001. 1.33×10^3 s

70819159002. 4.24×10^3 s

70819159003. 4.24×10^2 s

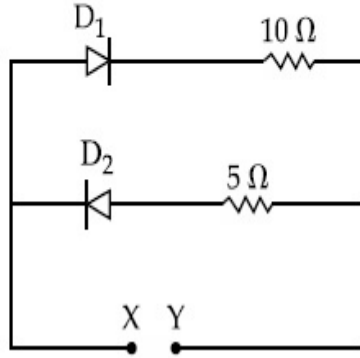
70819159004. 3.33×10^2 s

Question Number : 7 Question Id : 70819117950 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A 5 V battery is connected across the points X and Y. Assume D_1 and D_2 to be silicon diodes. Find the current supplied by the battery if the +ve terminal of the battery is connected to point X.



Options :

70819159005. ~ 0.5 A

70819159006. ~ 0.43 A

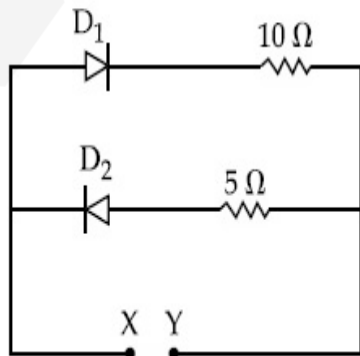
70819159007. ~ 0.86 A

70819159008. ~ 1.5 A

Question Number : 7 Question Id : 70819117950 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

X અને Y ને સમાંતર એક 5 V ની બેટરી જોડવામાં આવેલ છે. D_1 અને D_2 એક સામાન્ય સિલિકોન ડાયોડ છે તેમ ધારો. જો બેટરીનો ધન છેડો બિંદુ X સાથે જોડેલો હોય તો બેટરી દ્વારા પૂરો પડતો વિદ્યુતપ્રવાહ શોધો.



Options :

70819159005. ~0.5 A

70819159006. ~0.43 A

70819159007. ~0.86 A

70819159008. ~1.5 A

Question Number : 8 Question Id : 70819117951 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : A speech signal of 2 kHz is used to modulate a carrier signal of 1 MHz. The bandwidth requirement for the signal is 4 kHz.

Statement II : The side band frequencies are 1002 kHz and 998 kHz.

In the light of the above statements, choose the correct answer from the options given below :

Options :

70819159009. Both Statement I and Statement II are true

70819159010. Both Statement I and Statement II are false

70819159011. Statement I is true but Statement II is false

70819159012. Statement I is false but Statement II is true

Question Number : 8 Question Id : 70819117951 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : 2 kHz નાં ધ્વનિ સિગ્નલનો 1 MHz કેરીયરને અધિમિશ્રિત કરવા માટે વપરાય છે. સિગ્નલ માટે બેન્ડ-વિથ્ (ગાળો) 4 kHz છે.

વિધાન II : સાઈડ બેન્ડ (પાસેની) આવૃત્તિઓ 1002 kHz અને 998 kHz છે.

ઉપરોક્ત વિધાનોનાં સંદર્ભમાં, નીચે આપેલ વિકલ્પો પૈકી સૌથી યોગ્ય ઉત્તર પસંદ કરો.

Options :

70819159009. બંને વિધાન I અને વિધાન II સાચાં છે.

70819159010. બંને વિધાન I અને વિધાન II ખોટાં છે.

70819159011. વિધાન I સાચું છે પરંતુ વિધાન II ખોટું છે.

70819159012. વિધાન I ખોટું છે પરંતુ વિધાન II સાચું છે.

Question Number : 9 Question Id : 70819117952 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : When a rod lying freely is heated, no thermal stress is developed in it.

Reason R : On heating, the length of the rod increases.

In the light of the above statements, choose the correct answer from the options given below :

Options :

70819159013. Both A and R are true and R is the correct explanation of A

70819159014. Both A and R are true but R is NOT the correct explanation of A

70819159015. A is true but R is false

70819159016. A is false but R is true

Question Number : 9 Question Id : 70819117952 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલ છે : એક વિધાનને કથન A અને બીજાને કારણ R તરીકે દર્શાવ્યા છે.

કથન A : જ્યારે મુક્ત રહેલા સળિયાને ગરમ કરવામાં આવે છે ત્યારે તેમાં ઉષ્મીય પ્રતિબળ ઉત્પન્ન થતું નથી.

કારણ R : ગરમ કરવાથી સળિયાની લંબાઈ વધે છે.

ઉપરોક્ત વિધાનોનાં સંદર્ભમાં, આપેલા વિકલ્પો પૈકી સૌથી યોગ્ય ઉત્તર પસંદ કરો.

Options :

70819159013. બંને A અને R સાચાં છે અને R એ A નું સાચું સ્પષ્ટીકરણ આપે છે.

70819159014. બંને A અને R સાચાં છે પરંતુ R એ A નું સાચું સ્પષ્ટીકરણ નથી.

70819159015. A એ સાચું પણ R ખોટું છે.

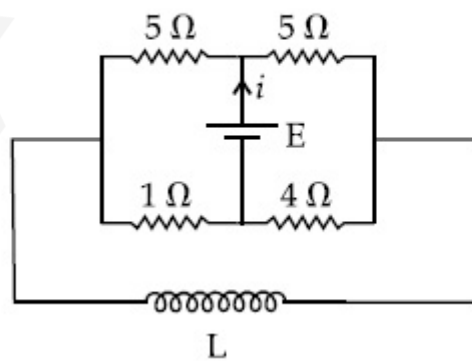
70819159016. A એ ખોટું પણ R સાચું છે.

Question Number : 10 Question Id : 70819117953 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The current (i) at time $t=0$ and $t=\infty$ respectively for the given circuit is :



Options :

70819159017. $\frac{18E}{55}, \frac{5E}{18}$

70819159018. $\frac{5E}{18}, \frac{18E}{55}$

70819159019. $\frac{10E}{33}, \frac{5E}{18}$

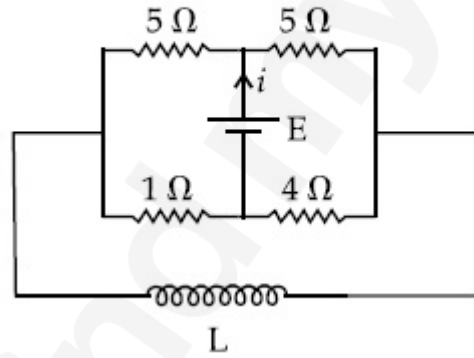
70819159020. $\frac{5E}{18}, \frac{10E}{33}$

Question Number : 10 Question Id : 70819117953 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આપેલ પરિપથ માટે $t=0$ અને $t=\infty$ સમયે પ્રવાહ (i) શોધો.



Options :

70819159017. $\frac{18E}{55}, \frac{5E}{18}$

70819159018. $\frac{5E}{18}, \frac{18E}{55}$

70819159019. $\frac{10E}{33}, \frac{5E}{18}$

70819159020. $\frac{5E}{18}, \frac{10E}{33}$

Question Number : 11 Question Id : 70819117954 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The pitch of the screw gauge is 1 mm and there are 100 divisions on the circular scale. When nothing is put in between the jaws, the zero of the circular scale lies 8 divisions below the reference line. When a wire is placed between the jaws, the first linear scale division is clearly visible while 72nd division on circular scale coincides with the reference line. The radius of the wire is :

Options :

70819159021. 1.64 mm

70819159022. 0.90 mm

70819159023. 0.82 mm

70819159024. 1.80 mm

Question Number : 11 Question Id : 70819117954 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સ્ક્રૂ ગેજ માટે પીચ 1 mm અને તેના વર્તુળાકાર સ્કેલ ઉપર 100 કાપા છે. જ્યારે સ્ક્રૂગેજના જડબા વચ્ચે કશુંજ ના મૂકવામાં આવે ત્યારે વર્તુળાકાર સ્કેલનો શૂન્યનો કાપો સંદર્ભ રેખાથી 8 કાપા નીચે રહે છે. જ્યારે તાર ને ગેજના જડબાની વચ્ચે મૂકવામાં આવે છે ત્યારે એક રેખીય કાપો સ્પષ્ટ રીતે જોઈ શકાય છે, જ્યારે વર્તુળાકાર સ્કેલ પરનો 72 મો કાપો સંદર્ભ રેખા સાથે સંપાત થાય છે. તારની ત્રિજ્યા _____ છે. (દ્વિતીય દશાંશ સ્થાન સુધી)

Options :

70819159021. 1.64 mm

70819159022. 0.90 mm

70819159023. 0.82 mm

70819159024. 1.80 mm

Question Number : 12 Question Id : 70819117955 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An α particle and a proton are accelerated from rest by a potential difference of 200 V. After

this, their de Broglie wavelengths are λ_α and λ_p respectively. The ratio $\frac{\lambda_p}{\lambda_\alpha}$ is :

Options :

70819159025. 2.8

70819159026. 8

70819159027. 7.8

70819159028. 3.8

Question Number : 12 Question Id : 70819117955 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

વિરામ સ્થિતિમાંથી એક α -કણ અને એક પ્રોટોન 200 V નાં સ્થિતિમાન તફાવતથી પ્રવેગીત થાય છે. ત્યારબાદ, તેઓની

ડી-બ્રોગ્લી તરંગ લંબાઈઓ અનુક્રમે λ_α અને λ_p છે. ગુણોત્તર $\frac{\lambda_p}{\lambda_\alpha}$ _____ થશે.

Options :

70819159025. 2.8

70819159026. 8

70819159027. 7.8

70819159028. 3.8

**Question Number : 13 Question Id : 70819117956 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Two coherent light sources having intensity in the ratio $2x$ produce an interference pattern.

The ratio $\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}}$ will be :

Options :

70819159029. $\frac{\sqrt{2x}}{2x+1}$

70819159030. $\frac{2\sqrt{2x}}{2x+1}$

70819159031. $\frac{\sqrt{2x}}{x+1}$

70819159032. $\frac{2\sqrt{2x}}{x+1}$

**Question Number : 13 Question Id : 70819117956 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

બે મની તીવ્રતાઓનો ગુણોત્તર $2x$ હોય તેવા બે સુસંબધ પ્રકાશ ઉદ્ગમો વ્યતિકરણ ભાત ઉત્પન્ન કરે છે. તો ગુણોત્તર

$\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}}$ થશે.

Options :

70819159029. $\frac{\sqrt{2x}}{2x+1}$

70819159030. $\frac{2\sqrt{2x}}{2x+1}$

70819159031. $\frac{\sqrt{2x}}{x+1}$

70819159032. $\frac{2\sqrt{2x}}{x+1}$

Question Number : 14 Question Id : 70819117957 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An engine of a train, moving with uniform acceleration, passes the signal-post with velocity u and the last compartment with velocity v . The velocity with which middle point of the train passes the signal post is :

Options :

70819159033. $\frac{u+v}{2}$

70819159034. $\frac{v-u}{2}$

70819159035. $\sqrt{\frac{v^2+u^2}{2}}$

70819159036. $\sqrt{\frac{v^2-u^2}{2}}$

Question Number : 14 Question Id : 70819117957 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

અચળ પ્રવેગથી ગતિ કરતી ટ્રેનનું એન્જિન સિગ્નલ પોસ્ટ (થાંભલા) ને u વેગથી અને છેલ્લો ડબ્બો v જોડલા વેગથી પસાર થાય છે. ટ્રેનનો મધ્યભાગ આ સિગ્નલ પોસ્ટને કેટલા વેગથી પસાર થશે ?

Options :

70819159033. $\frac{u+v}{2}$

70819159034. $\frac{v-u}{2}$

70819159035. $\sqrt{\frac{v^2+u^2}{2}}$

70819159036. $\sqrt{\frac{v^2-u^2}{2}}$

Question Number : 15 Question Id : 70819117958 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A proton, a deuteron and an α particle are moving with same momentum in a uniform magnetic field. The ratio of magnetic forces acting on them is _____ and their speed is _____, in the ratio.

Options :

70819159037. 4 : 2 : 1 and 2 : 1 : 1

70819159038. 2 : 1 : 1 and 4 : 2 : 1

70819159039. 1 : 2 : 4 and 1 : 1 : 2

70819159040. 1 : 2 : 4 and 2 : 1 : 1

Question Number : 15 Question Id : 70819117958 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક પ્રોટોન, એક ડ્યુટેરોન અને એક α -કણ સમાન ચુંબકીય ક્ષેત્રમાં સમાન વેગમાન સાથે ગતિ કરે છે. તેમના પર લાગતા ચુંબકીય બળોનો અને તેમની ઝડપનો ગુણોત્તર, આપેલ ક્રમમાં, અનુક્રમે _____ અને _____ છે.

Options :

70819159037. 4 : 2 : 1 અને 2 : 1 : 1

70819159038. 2 : 1 : 1 અને 4 : 2 : 1

70819159039. 1 : 2 : 4 અને 1 : 1 : 2

70819159040. 1 : 2 : 4 અને 2 : 1 : 1

Question Number : 16 Question Id : 70819117959 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Magnetic fields at two points on the axis of a circular coil at a distance of 0.05 m and 0.2 m from the centre are in the ratio 8 : 1. The radius of coil is _____.

Options :

70819159041. 0.1 m

70819159042. 0.15 m

70819159043. 0.2 m

70819159044. 1.0 m

Question Number : 16 Question Id : 70819117959 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

વર્તુળાકાર ગુંચળાની અક્ષ પર કેન્દ્રથી અનુક્રમે 0.05 m અને 0.2 m અંતરે રહેલ બે બિંદુઓ આગળ ચુંબકીય ક્ષેત્રો 8 : 1 નાં ગુણોત્તરમાં છે. ગુંચળાની ત્રિજ્યા _____ છે.

Options :

70819159041. 0.1 m

70819159042. 0.15 m

70819159043. 0.2 m

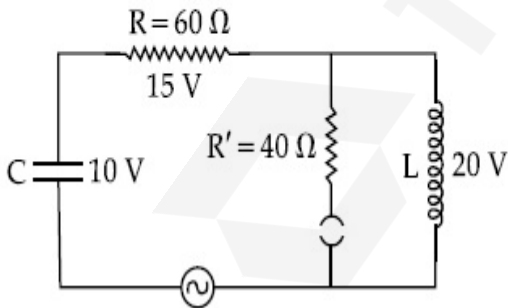
70819159044. 1.0 m

Question Number : 17 Question Id : 70819117960 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The angular frequency of alternating current in a L-C-R circuit is 100 rad/s. The components connected are shown in the figure. Find the value of inductance of the coil and capacity of condenser.



Options :

70819159045. 1.33 H and 250 μ F

70819159046. 1.33 H and 150 μ F

70819159047. 0.8 H and 150 μ F

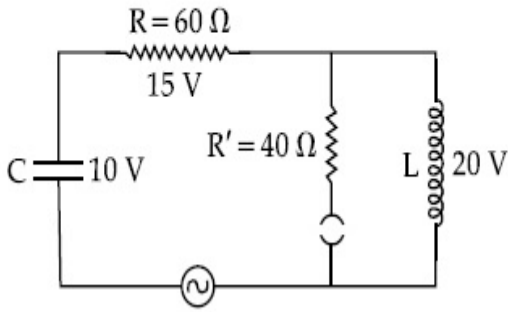
70819159048. 0.8 H and 250 μ F

Question Number : 17 Question Id : 70819117960 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

L-C-R પરિપથમાં ઉલટસૂલટ પ્રવાહની કોણીય આવૃત્તિ 100 rad/s છે. વીજ પરિપથમાં જોડેલ વિદ્યુત-ઘટકો આકૃત્તિમાં દર્શાવ્યા છે. ગુંચળાનું આત્મપ્રેરણ અને સંઘારકની સંઘારકતા (કેપેસિટી) શોધો.



Options :

70819159045. 1.33 H અને 250 μ F

70819159046. 1.33 H અને 150 μ F

70819159047. 0.8 H અને 150 μ F

70819159048. 0.8 H અને 250 μ F

Question Number : 18 Question Id : 70819117961 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A diatomic gas, having $C_p = \frac{7}{2}R$ and $C_v = \frac{5}{2}R$, is heated at constant pressure. The ratio $dU : dQ : dW$:

Options :

70819159049. 5 : 7 : 2

70819159050. 3 : 7 : 2

70819159051. 3 : 5 : 2

70819159052. 5 : 7 : 3

Question Number : 18 Question Id : 70819117961 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$C_P = \frac{7}{2}R$ અને $C_V = \frac{5}{2}R$ ધરાવતા એક દ્વિ-પરમાણ્વીય વાયુને અચળ દબાણે ગરમ કરવામાં આવે છે. ગુણોત્તર

$dU : dQ : dW$ _____ થશે.

Options :

70819159049. 5 : 7 : 2

70819159050. 3 : 7 : 2

70819159051. 3 : 5 : 2

70819159052. 5 : 7 : 3

Question Number : 19 Question Id : 70819117962 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two radioactive substances X and Y originally have N_1 and N_2 nuclei respectively. Half life of X is half of the half life of Y. After three half lives of Y, number of nuclei of both are equal.

The ratio $\frac{N_1}{N_2}$ will be equal to :

Options :

70819159053. $\frac{3}{1}$

70819159054. $\frac{1}{3}$

70819159055. $\frac{8}{1}$

70819159056. $\frac{1}{8}$

Question Number : 19 Question Id : 70819117962 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બે X અને Y રેડીયોએક્ટિવ પદાર્થો પાસે પ્રારંભમાં અનુક્રમે N_1 અને N_2 ન્યુક્લિયસો રહેલા છે. X નો અર્ધ-આયુ Y ના અર્ધ-આયુ કરતા અડધો છે. Y ના ત્રણ અર્ધ-આયુ જેટલા સમય બાદ બંનેમાં ન્યુક્લિયસોની સંખ્યા સમાન બને છે. $\frac{N_1}{N_2}$

ગુણોત્તર _____ થશે.

Options :

70819159053. $\frac{3}{1}$

70819159054. $\frac{1}{3}$

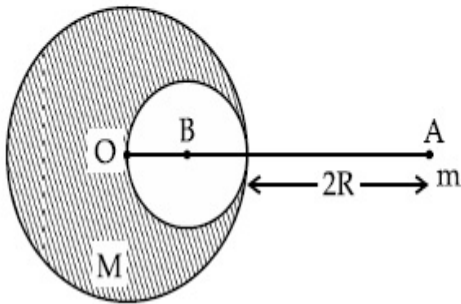
70819159055. $\frac{8}{1}$

Question Number : 20 Question Id : 70819117963 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A solid sphere of radius R gravitationally attracts a particle placed at $3R$ from its centre with a force F_1 . Now a spherical cavity of radius $\left(\frac{R}{2}\right)$ is made in the sphere (as shown in figure) and the force becomes F_2 . The value of $F_1 : F_2$ is :



Options :

70819159057. 41 : 50

70819159058. 50 : 41

70819159059. 36 : 25

70819159060. 25 : 36

Question Number : 20 Question Id : 70819117963 Question Type : MCQ Option Shuffling : Yes

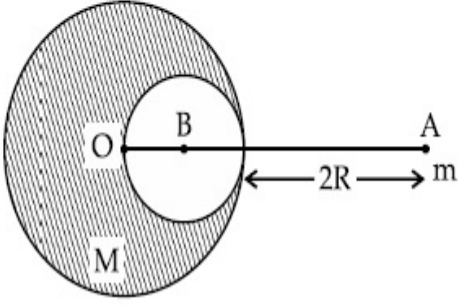
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

R ત્રિજ્યા ધરાવતો એક ઘન ગોળો તેના કેન્દ્રથી $3R$ અંતરે રહેલા કણને F_1 જેટલા બળ દ્વારા ગુરુત્વાકર્ષણ બળથી આકર્ષે છે.

હવે, ગોળામાં $\left(\frac{R}{2}\right)$ જેટલી ગોલીય બખોલ (છિદ્ર) કરવામાં આવે છે (આકૃત્તિમાં દર્શાવ્યા મુજબ) અને બળ F_2 થાય છે.

$F_1 : F_2$ નું મૂલ્ય _____ છે.



Options :

70819159057. 41 : 50

70819159058. 50 : 41

70819159059. 36 : 25

70819159060. 25 : 36

Physics Section B

Section Id :	708191737
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1

Sub-Section Id :

70819110

Question Shuffling Allowed :

Yes

Question Number : 21 Question Id : 70819117964 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A monoatomic gas of mass 4.0 u is kept in an insulated container. Container is moving with velocity 30 m/s . If container is suddenly stopped then change in temperature of the gas

($R =$ gas constant) is $\frac{x}{3R}$. Value of x is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 21 Question Id : 70819117964 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

4.0 u દળ ધરાવતો એક પરમાણ્વિક વાયુને એક અવાહક પાત્રમાં રાખવામાં આવે છે. પાત્ર 30 m/s નાં વેગ થી ગતિ કરે

છે. જો પાત્રને અચાનક અટકાવવામાં આવે તો વાયુનાં તાપમાનમાં ફેરફાર $\frac{x}{3R}$ ($R =$ વાયુ નિયતાંક) છે, x નું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 22 Question Id : 70819117965 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

512 identical drops of mercury are charged to a potential of 2 V each. The drops are joined to form a single drop. The potential of this drop is _____ V.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 22 Question Id : 70819117965 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

પારાના એકસમાન દરેક 512 ટીપાંઓને 2 V ના સ્થિતિમાનથી વીજભારિત કરવામાં આવે છે. ટીપાંઓને જોડીને એક ટીપું બનાવવામાં આવે છે. આ ટીપાંનું સ્થિતિમાન _____ V થશે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 Question Id : 70819117966 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A coil of inductance 2 H having negligible resistance is connected to a source of supply whose voltage is given by $V = 3t$ volt. (where t is in second). If the voltage is applied when $t = 0$, then the energy stored in the coil after 4 s is _____ J.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 Question Id : 70819117966 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

2 H પ્રેરણ અને અવગણ્ય અવરોધ ધરાવતા એક ગુંચળાને જેનો વોલ્ટેજ $V = 3t$ વોલ્ટ થી દર્શાવી શકાય તેવા ઉદ્ગમ સાથે બેડવામાં આવે છે. (જ્યાં, t એ સેકન્ડમાં છે). જ્યારે $t=0$ સમયે વોલ્ટેજ લગાડવામાં આવે છે ત્યારે 4 સેકન્ડ બાદ ગુંચળામાં સંગ્રહિત ઊર્જા _____ J થશે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 24 Question Id : 70819117967 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A small bob tied at one end of a thin string of length 1 m is describing a vertical circle so that the maximum and minimum tension in the string are in the ratio 5 : 1. The velocity of the bob at the highest position is _____ m/s. (Take $g = 10 \text{ m/s}^2$)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 24 Question Id : 70819117967 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1 m લંબાઈ સાથે બાંધેલ એક નાનો ગોળો એક ઉર્ધ્વ વર્તુળ દર્શાવે છે કે જેથી દોરીઓમાં મહત્તમ અને ન્યૂનતમ તણાવનો ગુણોત્તર 5 : 1 છે. ગોળાનો સૌથી ઉચ્ચતમ સ્થાન પાસે વેગ _____ m/s છે. ($g = 10 \text{ m/s}^2$ લો.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 25 Question Id : 70819117968 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The potential energy (U) of a diatomic molecule is a function dependent on r (interatomic distance) as

$$U = \frac{\alpha}{r^{10}} - \frac{\beta}{r^5} - 3$$

where, α and β are positive constants. The equilibrium distance between two atoms will be

$$\left(\frac{2\alpha}{\beta}\right)^{\frac{a}{b}}, \text{ where } a = \underline{\hspace{2cm}}.$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 25 Question Id : 70819117968 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

દ્વિ-પરમાણ્વીય અણુ માટે સ્થિતિ ઊર્જા (U) આંતર આણ્વીય અંતર r નું વિધેય છે, કે જે

$$U = \frac{\alpha}{r^{10}} - \frac{\beta}{r^5} - 3$$

જ્યાં, α અને β ધન અચળાંકો છે. બે પરમાણુઓ વચ્ચેનું સંતુલન અંતર $\left(\frac{2\alpha}{\beta}\right)^{\frac{a}{b}}$ હશે જ્યાં $a = \underline{\hspace{2cm}}$ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 26 Question Id : 70819117969 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The electric field in a region is given by $\vec{E} = \left(\frac{3}{5}E_0 \hat{i} + \frac{4}{5}E_0 \hat{j}\right) \frac{N}{C}$. The ratio of flux of reported

field through the rectangular surface of area 0.2 m^2 (parallel to $y-z$ plane) to that of the surface of area 0.3 m^2 (parallel to $x-z$ plane) is $a : b$, where $a = \underline{\hspace{2cm}}$.

[Here \hat{i} , \hat{j} and \hat{k} are unit vectors along x , y and z -axes respectively]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 26 Question Id : 70819117969 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

આપેલ વિસ્તારમાં વિદ્યુતક્ષેત્ર $\vec{E} = \left(\frac{3}{5} E_0 \hat{i} + \frac{4}{5} E_0 \hat{j} \right) \frac{N}{C}$ વડે આપવામાં આવે છે. ($y-z$ સમતલને સમાંતર)

0.2 m^2 ક્ષેત્રફળ ધરાવતી અને ($x-z$ સમતલને સમાંતર) 0.3 m^2 ક્ષેત્રફળ ધરાવતી લંબચોરસ સપાટીમાંથી બતાવેલ ક્ષેત્ર પસાર થતાં મળતા ફ્લક્સનો ગુણોત્તર $a : b$ છે, જ્યાં $a =$ _____ છે.

[અત્રે \hat{i} , \hat{j} અને \hat{k} એ અનુક્રમે x , y અને z -અક્ષોની દિશામાં એકમ સદિશ છે.]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 27 Question Id : 70819117970 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A transmitting station releases waves of wavelength 960 m. A capacitor of $2.56 \mu\text{F}$ is used in the resonant circuit. The self inductance of coil necessary for resonance is _____ $\times 10^{-8}$ H.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 27 Question Id : 70819117970 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક ટ્રાન્સમીટીંગ સ્ટેશન 960 m તરંગલંબાઈ ધરાવતા તરંગોનું ઉત્સર્જન કરે છે. એક અનુનાદીય પરિપથમાં $2.56 \mu\text{F}$ નાં સંધારકનો ઉપયોગ થાય છે. અનુનાદ માટે જરૂરી ગુંચળાનું આત્મપ્રેરકત્વ _____ $\times 10^{-8}$ H થશે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819117971 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The same size images are formed by a convex lens when the object is placed at 20 cm or at 10 cm from the lens. The focal length of convex lens is _____ cm.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819117971 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

લેન્સથી વસ્તુને 20 cm અથવા 10 cm અંતરે રાખવામાં આવે છે ત્યારે બહિર્ગોળ લેન્સ દ્વારા સમાન કદના પ્રતિબિંબો રચાય છે. બહિર્ગોળ લેન્સની કેન્દ્રલંબાઈ _____ cm છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

Question Number : 29 Question Id : 70819117972 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In a certain thermodynamical process, the pressure of a gas depends on its volume as kV^3 . The work done when the temperature changes from 100°C to 300°C will be _____ nR , where n denotes number of moles of a gas.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 29 Question Id : 70819117972 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

કોઈ ચોક્કસ થર્મોડાયનેમિક પ્રક્રિયામાં, વાયુનું દબાણ તેના પ્રારંભિક કદ પર kV^3 જેટલો આધાર રાખે છે. જ્યારે તાપમાન 100°C થી 300°C બદલવામાં આવે છે ત્યારે થતું કાર્ય _____ nR થશે, જ્યાં n એ વાયુ માટે મોલ સંખ્યા દર્શાવે છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

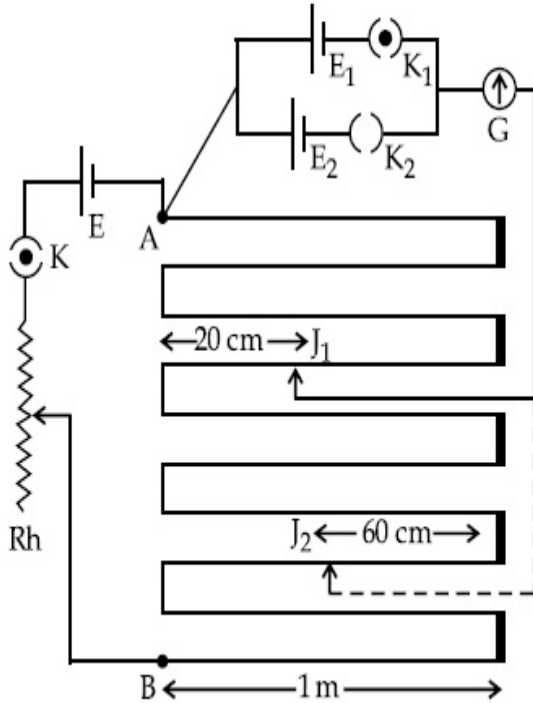
Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819117973 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In the given circuit of potentiometer, the potential difference E across AB (1 m length) is larger than E_1 and E_2 as well. For key K_1 (closed), the jockey is adjusted to touch the wire at point J_1 so that there is no deflection in the galvanometer. Now the first battery (E_1) is replaced by second battery (E_2) for working by making K_1 open and K_2 closed. The galvanometer gives then null deflection at J_2 . The value of $\frac{E_1}{E_2}$ is $\frac{a}{b}$, where $a = \dots$.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

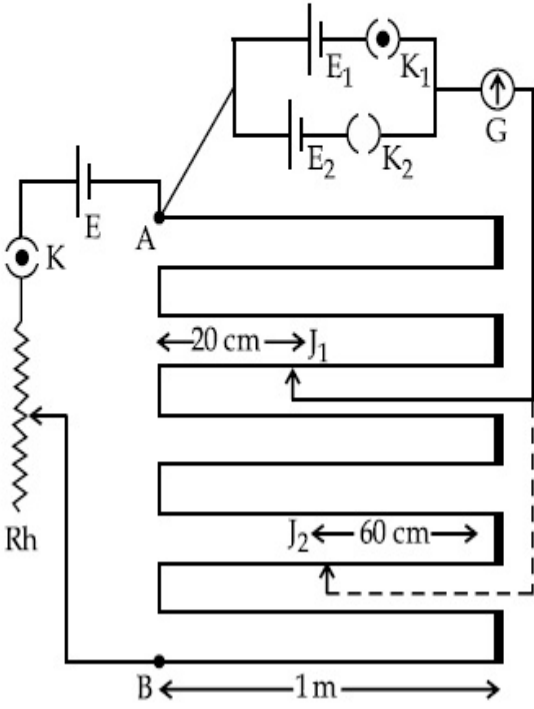
5 to 5.001

Question Number : 30 **Question Id :** 70819117973 **Question Type :** SA

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

આપેલ પોટેન્શીયોમીટર પરિપથમાં, AB (10 m લંબાઈ) ને સમાંતર સ્થિતિમાન E એ E_1 અને E_2 કરી શકાય છે. કળ K_1 (બંધ), જોડી (કળ) ને એવી રીતે બિંદુ J_1 આગળ ગોઠવવામાં આવે છે કે જોથી ગેલ્વેનોમીટરમાં આવર્તન ના મળે. હવે K_1 ને ખુલ્લી કરીને પ્રથમ બેટરી (E_1) ને બદલે બીજી બેટરી (E_2) જોડવામાં આવે છે, જ્યારે K_2 બંધ છે. હવે ગેલ્વેનોમીટર

J_2 સ્થાન માટે શૂન્ય કોણાવર્તન આપે છે. $\frac{E_1}{E_2}$ નું મૂલ્ય $\frac{a}{b}$ થશે જ્યાં $a = \underline{\hspace{2cm}}$ છે.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Chemistry Section A

Section Id :	708191738
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20

Number of Questions to be attempted : 20

Section Marks : 80

Mark As Answered Required? : Yes

Sub-Section Number : 1

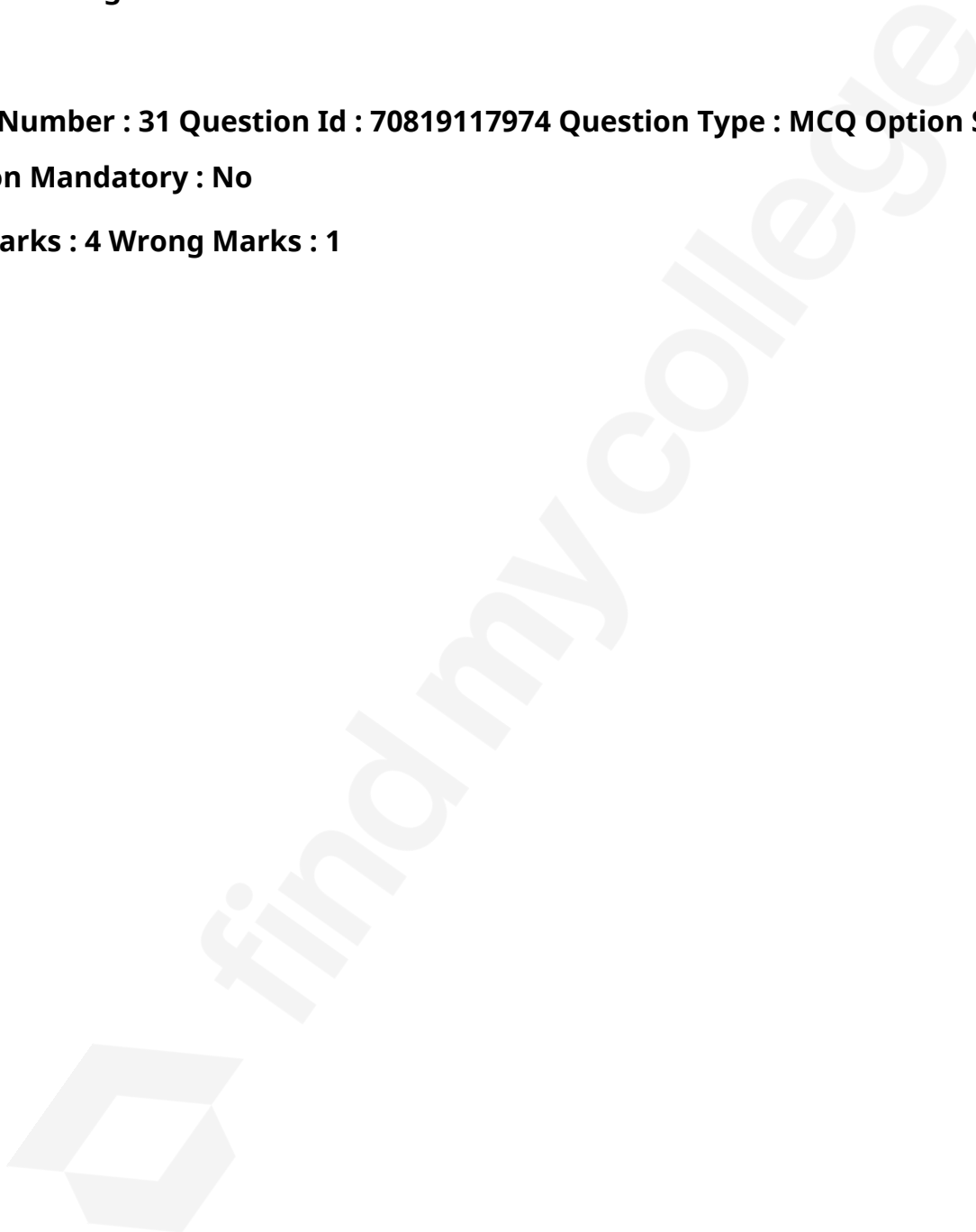
Sub-Section Id : 7081911018

Question Shuffling Allowed : Yes

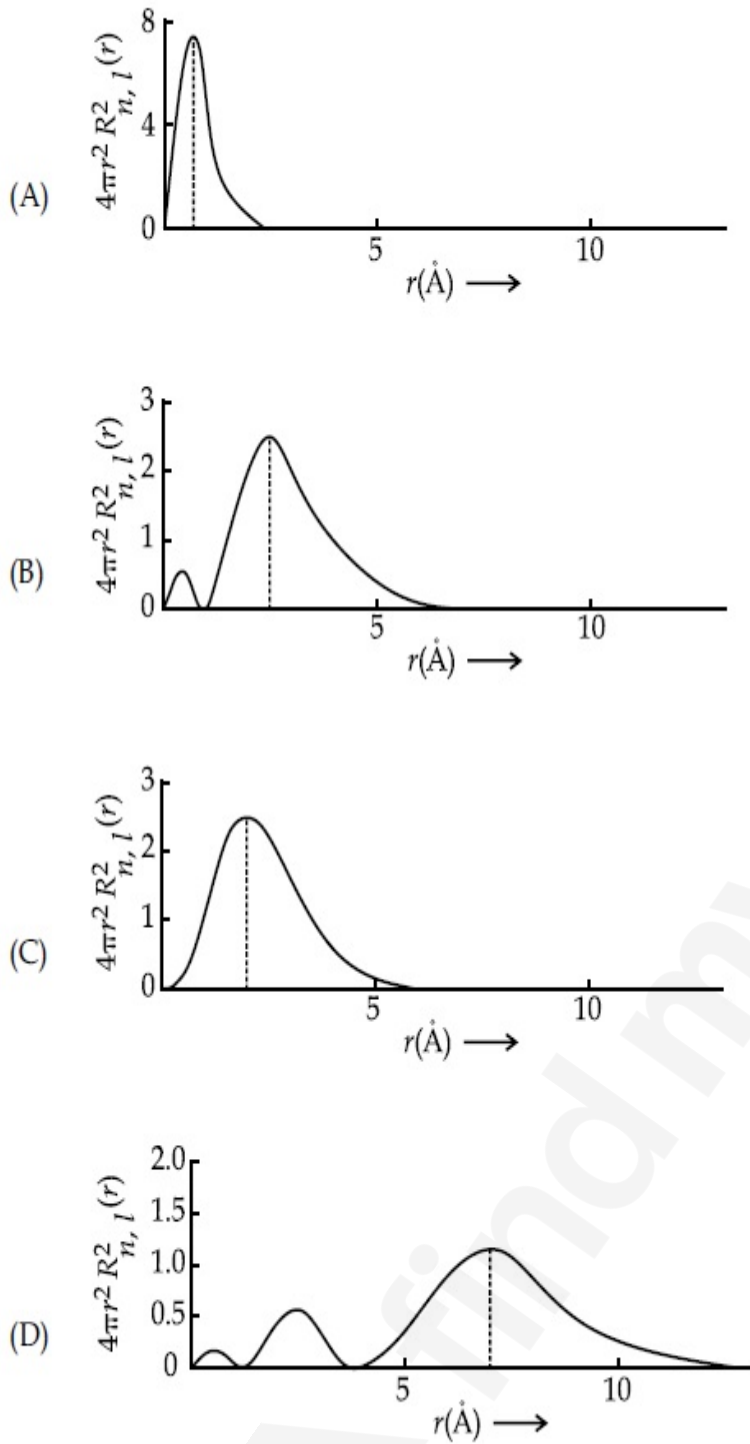
Question Number : 31 Question Id : 70819117974 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1



The plots of radial distribution functions for various orbitals of hydrogen atom are given below :



The correct plot for 3s orbital is :

Options :

70819159071. (A)

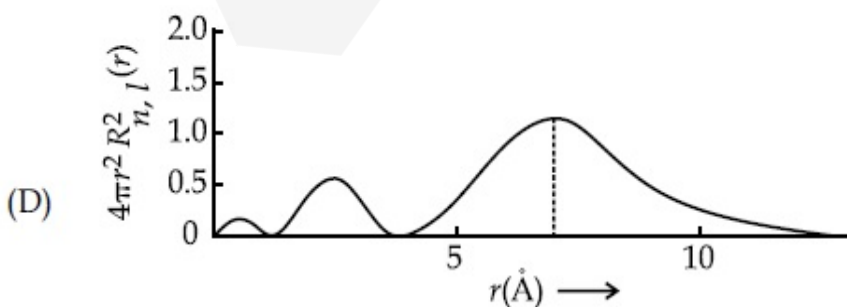
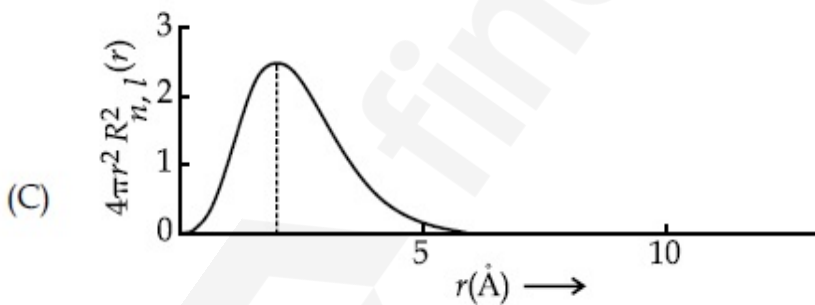
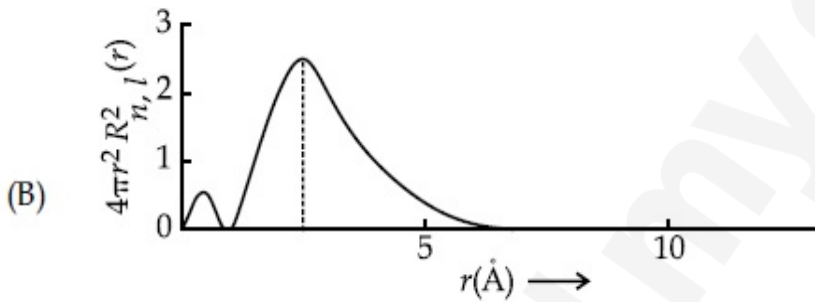
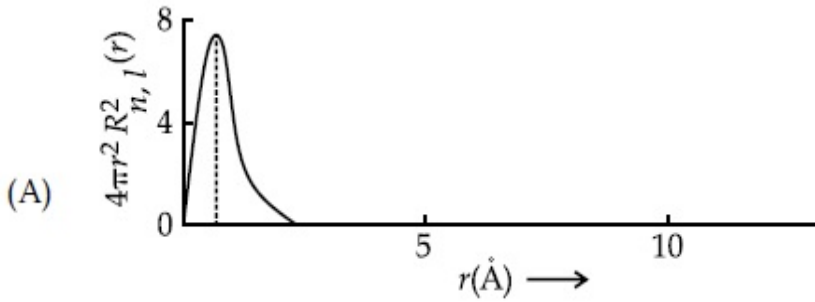
70819159072. (B)

70819159073. (C)

Question Number : 31 Question Id : 70819117974 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

હાઈડ્રોજન પરમાણુની વિવિધ કક્ષકો માટે રેડિયલ વિતરણ વિધેય વિરૂદ્ધ 'r'ના આલેખ નીચે આપેલ છે :



તો, 3s કક્ષક માટે સાચો આલેખ શોધો :

Options :

70819159071. (A)

70819159072. (B)

70819159073. (C)

70819159074. (D)

Question Number : 32 Question Id : 70819117975 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

According to molecular orbital theory, the species among the following that does not exist is :

Options :

70819159075. O_2^{2-}

70819159076. He_2^-

70819159077. Be_2

70819159078. He_2^+

Question Number : 32 Question Id : 70819117975 Question Type : MCQ Option Shuffling : Yes

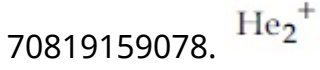
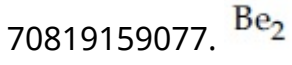
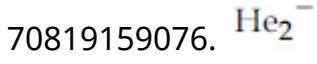
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આણ્વિક કક્ષક વાદ મુજબ, નીચેનાં પૈકી કઈ સ્પીસીઝ અસ્તિત્વ ધરાવતી નથી ?

Options :

70819159075.



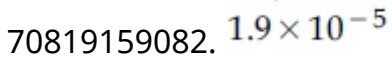
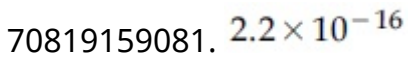
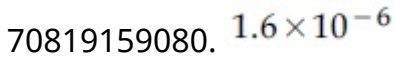
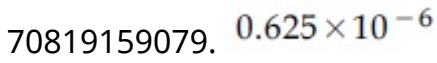
Question Number : 33 Question Id : 70819117976 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The solubility of AgCN in a buffer solution of pH=3 is x . The value of x is :
[Assume : No cyano complex is formed ; $K_{sp}(AgCN) = 2.2 \times 10^{-16}$ and $K_a(HCN) = 6.2 \times 10^{-10}$]

Options :



Question Number : 33 Question Id : 70819117976 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

pH=3 ધરાવતા બફર દ્રાવણમાં AgCN ની દ્રાવ્યતા x છે. તો x નું મૂલ્ય _____ છે. [ધારી લો, કોઈ સાયનો સંકિર્ણ બનતો નથી] [$K_{sp}(AgCN) = 2.2 \times 10^{-16}$ અને $K_a(HCN) = 6.2 \times 10^{-10}$]

Options :

70819159079. 0.625×10^{-6}

70819159080. 1.6×10^{-6}

70819159081. 2.2×10^{-16}

70819159082. 1.9×10^{-5}

Question Number : 34 Question Id : 70819117977 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In Freundlich adsorption isotherm at moderate pressure, the extent of adsorption $\left(\frac{x}{m}\right)$ is directly proportional to P^x . The value of x is :

Options :

70819159083. 1

70819159084. zero

70819159085. ∞

70819159086. $\frac{1}{n}$

Question Number : 34 Question Id : 70819117977 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

કુન્ડલીય અધિશોષણ સમતાપીમાં મર્યાદીત (moderate) દબાણ પર, અધિશોષણ $\left(\frac{x}{m}\right)$ ની માત્રા એ P^x ના સમપ્રમાણમાં

હોય છે તો x નું મૂલ્ય શોધો :

Options :

70819159083. 1

70819159084. शून्य

70819159085. ∞

70819159086. $\frac{1}{n}$

Question Number : 35 Question Id : 70819117978 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Ellingham diagram is a graphical representation of :

Options :

70819159087. ΔG vs T

70819159088. ΔH vs T

70819159089. ΔG vs P

70819159090. $(\Delta G - T\Delta S)$ vs T

Question Number : 35 Question Id : 70819117978 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એલિંગહામ આકૃતિ આલેખનીય પ્રદર્શન કરે છે તે _____ છે.

Options :

70819159087. ΔG વિરુદ્ધ T

70819159088. ΔH વિરુદ્ધ T

70819159089. ΔG વિરુદ્ધ P

70819159090. $(\Delta G - T\Delta S)$ વિરુદ્ધ T

Question Number : 36 Question Id : 70819117979 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following equation depicts the oxidizing nature of H_2O_2 ?

Options :

70819159091. $KIO_4 + H_2O_2 \rightarrow KIO_3 + H_2O + O_2$

70819159092. $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$

70819159093. $2I^- + H_2O_2 + 2H^+ \rightarrow I_2 + 2H_2O$

70819159094. $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$

Question Number : 36 Question Id : 70819117979 Question Type : MCQ Option Shuffling : Yes

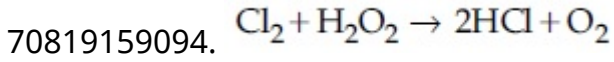
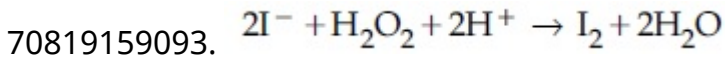
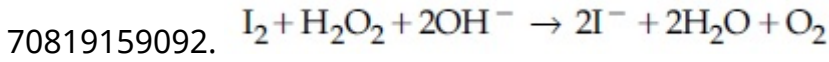
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સમીકરણો પૈકી કયું એક H_2O_2 નો ઓક્સીડેશન કરતાં સ્વભાવ દર્શાવે છે ?

Options :

70819159091. $KIO_4 + H_2O_2 \rightarrow KIO_3 + H_2O + O_2$



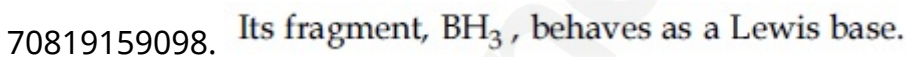
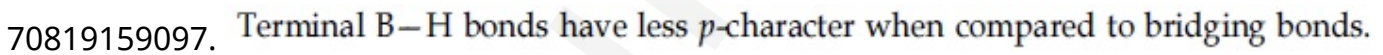
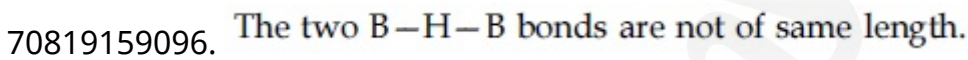
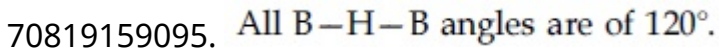
Question Number : 37 Question Id : 70819117980 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct statement about B_2H_6 is :

Options :



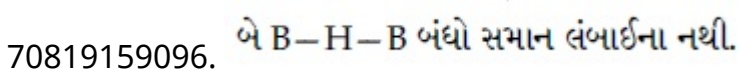
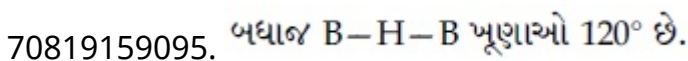
Question Number : 37 Question Id : 70819117980 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

B_2H_6 માટે સાચુ વિધાન શોધો.

Options :



70819159097. સેતુ બંધોની સરખામણીમાં છેડાના B—H બંધોમાં p -લક્ષણ (પ્રકૃતિ) ઓછું છે.

70819159098. તેનો, ઘટક BH_3 , લુઈસ બેઈઝની જેમ વર્તણૂક કરે છે.

Question Number : 38 Question Id : 70819117981 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : CeO_2 can be used for oxidation of aldehydes and ketones.

Statement II : Aqueous solution of $EuSO_4$ is a strong reducing agent.

In the light of the above statements, choose the correct answer from the options given below :

Options :

70819159099. Both Statement I and Statement II are true

70819159100. Both Statement I and Statement II are false

70819159101. Statement I is true but Statement II is false

70819159102. Statement I is false but Statement II is true

Question Number : 38 Question Id : 70819117981 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : CeO_2 નો ઉપયોગ આલ્ડીહાઈડ અને કિટોનનાં ઓક્સિડેશન માટે કરવામાં આવે છે.

વિધાન II : $EuSO_4$ નું જલીય દ્રાવણ એ પ્રબળ રીડક્શન કર્તા છે.

ઉપરોક્ત વિધાનોને ધ્યાનમાં લઈ, નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819159099. બન્ને, વિધાનો I અને વિધાન II સાચાં છે.

70819159100. બન્ને, વિધાનો I અને વિધાન II ખોટાં છે.

70819159101. વિધાન I સાચું છે પરંતુ વિધાન II ખોટું છે.

70819159102. વિધાન I ખોટું છે પરંતુ વિધાન II સાચું છે.

Question Number : 39 Question Id : 70819117982 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In which of the following pairs, the outer most electronic configuration will be the same ?

Options :

70819159103. V^{2+} and Cr^{+}

70819159104. Cr^{+} and Mn^{2+}

70819159105. Ni^{2+} and Cu^{+}

70819159106. Fe^{2+} and Co^{+}

Question Number : 39 Question Id : 70819117982 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા યુગ્મો પૈકી કયામાં સૌથી બહારની ઈલેક્ટ્રોન સંરચના સમાન થશે ?

Options :

70819159103. V^{2+} અને Cr^{+}

70819159104. Cr^+ અને Mn^{2+}

70819159105. Ni^{2+} અને Cu^+

70819159106. Fe^{2+} અને Co^+

Question Number : 40 Question Id : 70819117983 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The hybridization and magnetic nature of $[\text{Mn}(\text{CN})_6]^{4-}$ and $[\text{Fe}(\text{CN})_6]^{3-}$, respectively are :

Options :

70819159107. d^2sp^3 and paramagnetic

70819159108. sp^3d^2 and diamagnetic

70819159109. d^2sp^3 and diamagnetic

70819159110. sp^3d^2 and paramagnetic

Question Number : 40 Question Id : 70819117983 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$[\text{Mn}(\text{CN})_6]^{4-}$ અને $[\text{Fe}(\text{CN})_6]^{3-}$ નું સંકરણ અને ચુંબકીય સ્વભાવ અનુક્રમે શોધો.

Options :

70819159107. d^2sp^3 અને અનુચુંબકીય

70819159108. sp^3d^2 અને પ્રતિચુંબકીય

70819159109. d^2sp^3 અને પ્રતિચુંબકીય

70819159110. sp^3d^2 અને અનુચુંબકીય

Question Number : 41 Question Id : 70819117984 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : An allotrope of oxygen is an important intermediate in the formation of reducing smog.

Statement II : Gases such as oxides of nitrogen and sulphur present in troposphere contribute to the formation of photochemical smog.

In the light of the above statements, choose the correct answer from the options given below :

Options :

70819159111. Both Statement I and Statement II are true

70819159112. Both Statement I and Statement II are false

70819159113. Statement I is true but Statement II is false

70819159114. Statement I is false but Statement II is true

Question Number : 41 Question Id : 70819117984 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : રીડ્યુસીંગ ધૂમ્ર ધુમ્મસના સર્જનમાં ઓક્સિજનના અપરરૂપો અગત્યના મધ્યવર્તી છે.

વિધાન II : ટ્રોપોસ્ફીયરમાં હાજર વાયુઓ જેવા કે નાઈટ્રોજન અને સલ્ફરના ઓક્સાઈડો પ્રકાશ રાસાયણિક ધૂમ્ર ધુમ્મસની બનાવટમાં યોગદાન આપે છે.

ઉપરના વિધાનોની સંદર્ભમાં નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819159111. બન્ને વિધાન I અને વિધાન II સાચાં છે.

70819159112. બન્ને વિધાન I અને વિધાન II ખોટાં છે.

70819159113. વિધાન I સાચું છે પણ વિધાન II ખોટું છે.

70819159114. વિધાન I ખોટું છે પણ વિધાન II સાચું છે.

Question Number : 42 Question Id : 70819117985 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Complete combustion of 1.80 g of an oxygen containing compound ($C_xH_yO_z$) gave 2.64 g of CO_2 and 1.08 g of H_2O . The percentage of oxygen in the organic compound is :

Options :

70819159115. 50.33

70819159116. 53.33

70819159117. 63.53

70819159118. 51.63

Question Number : 42 Question Id : 70819117985 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

1.80 g ઓક્સીજન ધરાવતું એક સંયોજન ($C_xH_yO_z$) નું સંપૂર્ણ દહન કરતા 2.64 g CO_2 અને 1.08 g H_2O આપે છે.
તો કાર્બનિક સંયોજનમાં ઓક્સીજનની ટકાવારી _____ છે.

Options :

70819159115. 50.33

70819159116. 53.33

70819159117. 63.53

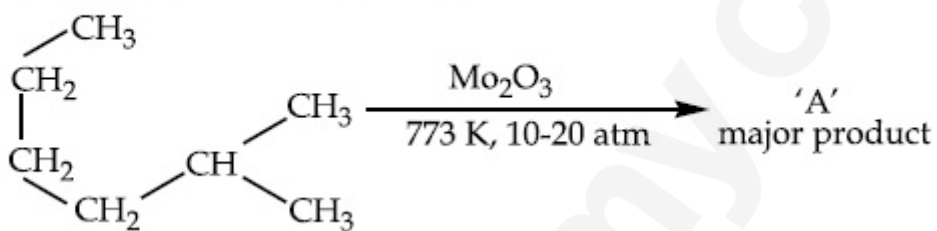
70819159118. 51.63

Question Number : 43 Question Id : 70819117986 Question Type : MCQ Option Shuffling : Yes

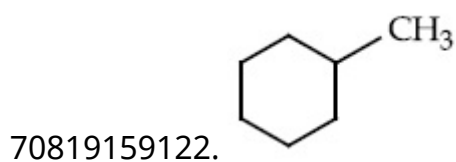
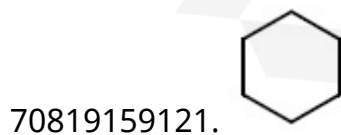
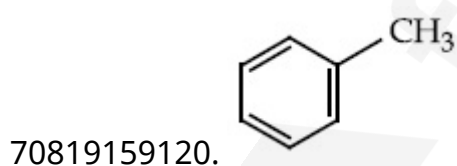
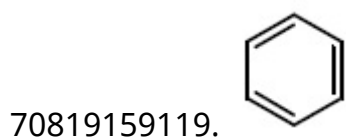
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify A in the given chemical reaction.



Options :

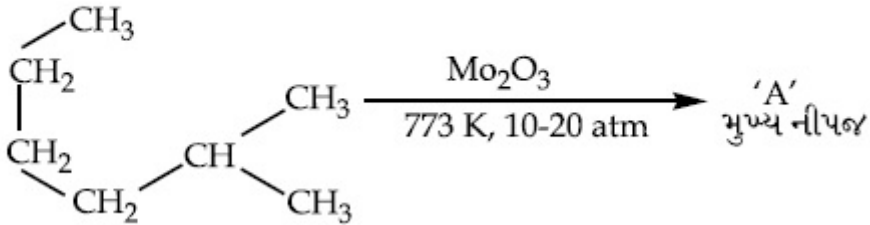


Question Number : 43 Question Id : 70819117986 Question Type : MCQ Option Shuffling : Yes

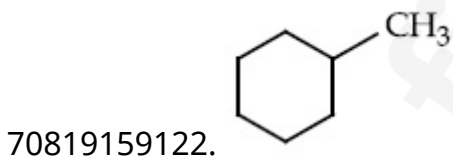
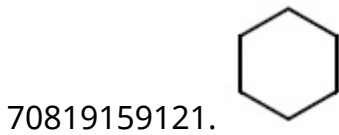
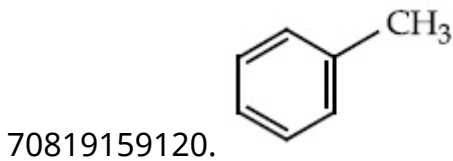
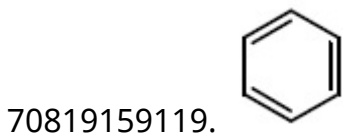
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી રાસાયણિક પ્રક્રિયામાં 'A' શોધો :



Options :

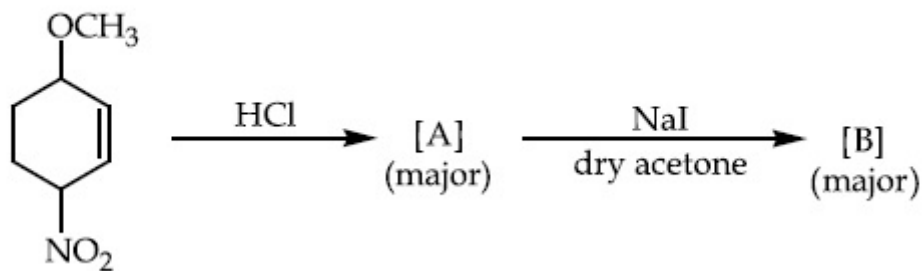


Question Number : 44 Question Id : 70819117987 Question Type : MCQ Option Shuffling : Yes

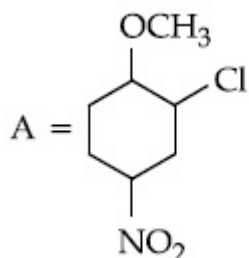
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

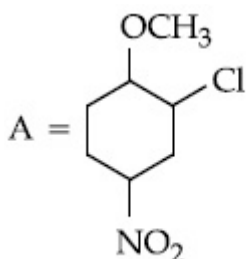
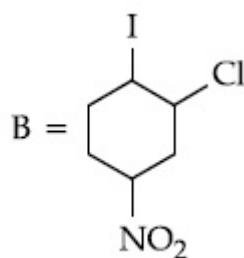
Identify A and B in the chemical reaction.



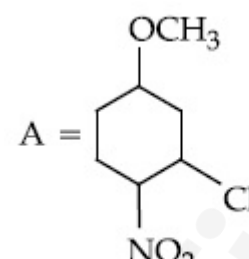
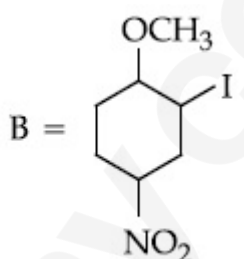
Options :



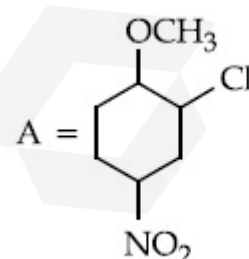
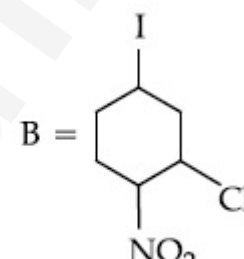
70819159123.



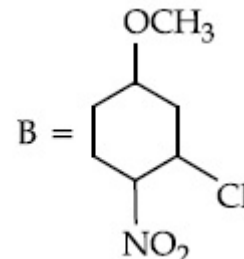
70819159124.



70819159125.

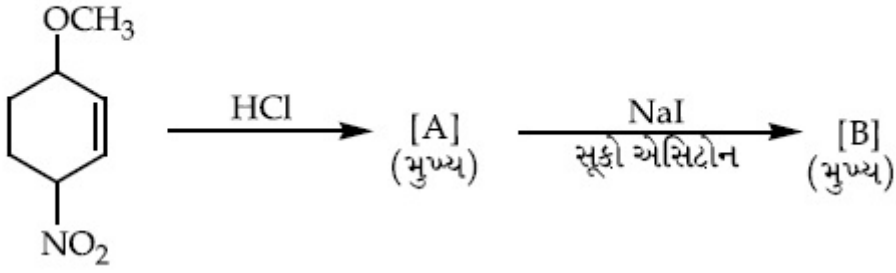


70819159126.

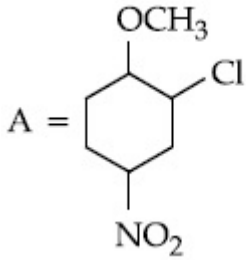


Correct Marks : 4 Wrong Marks : 1

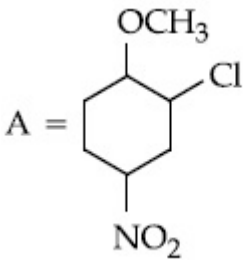
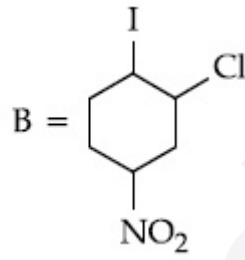
નીચે આપેલી રાસાયણિક પ્રક્રિયામાં A અને B શોધો :



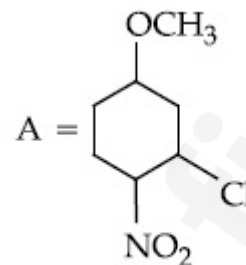
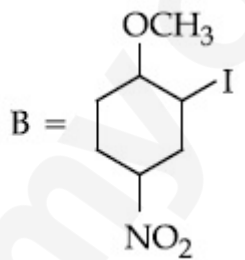
Options :



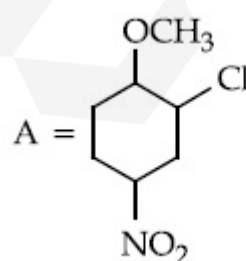
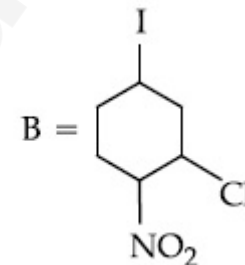
70819159123.



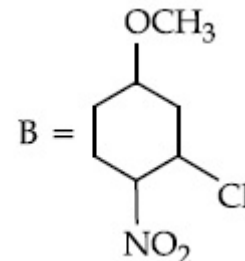
70819159124.



70819159125.



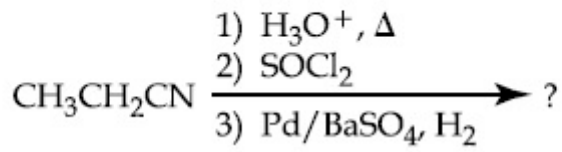
70819159126.



Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The major product of the following chemical reaction is :



Options :

70819159127. $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

70819159128. $(\text{CH}_3\text{CH}_2\text{CO})_2\text{O}$

70819159129. $\text{CH}_3\text{CH}_2\text{CH}_3$

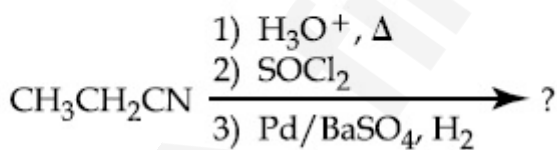
70819159130. $\text{CH}_3\text{CH}_2\text{CHO}$

Question Number : 45 Question Id : 70819117988 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

नीचे आपेली रासायनिक प्रक्रिया मुख्य नीपल शोधो :



Options :

70819159127. $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

70819159128. $(\text{CH}_3\text{CH}_2\text{CO})_2\text{O}$

70819159129. $\text{CH}_3\text{CH}_2\text{CH}_3$

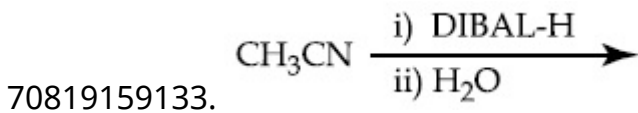
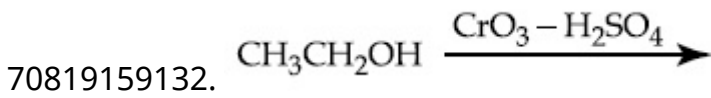
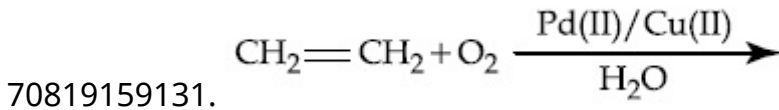
70819159130. $\text{CH}_3\text{CH}_2\text{CHO}$

Question Number : 46 Question Id : 70819117989 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following reactions will not form acetaldehyde ?

Options :

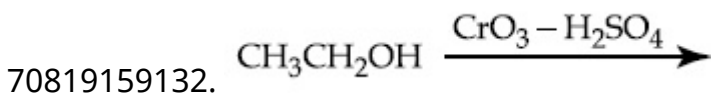
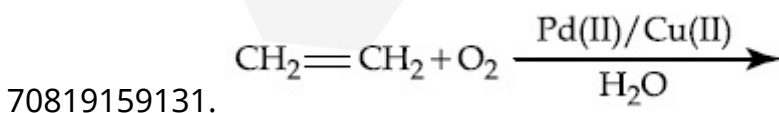


Question Number : 46 Question Id : 70819117989 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

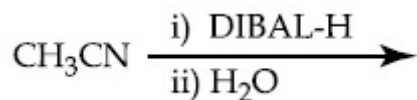
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા પૈકી કઈ એક વડે એસીટાલ્ડીહાઈડ બનશે નહીં ?

Options :



70819159133.

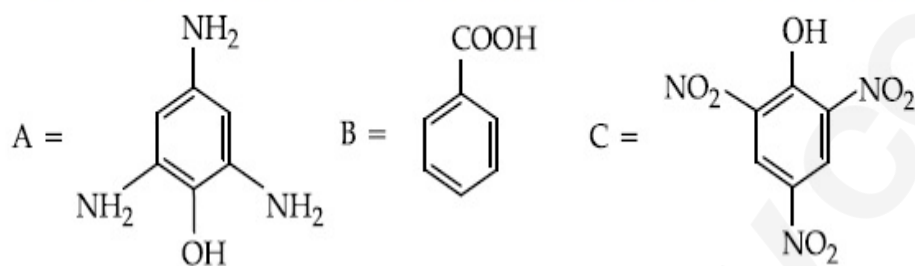


Question Number : 47 Question Id : 70819117990 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Compound(s) which will liberate carbon dioxide with sodium bicarbonate solution is/are :



Options :

70819159135. A and B only

70819159136. C only

70819159137. B and C only

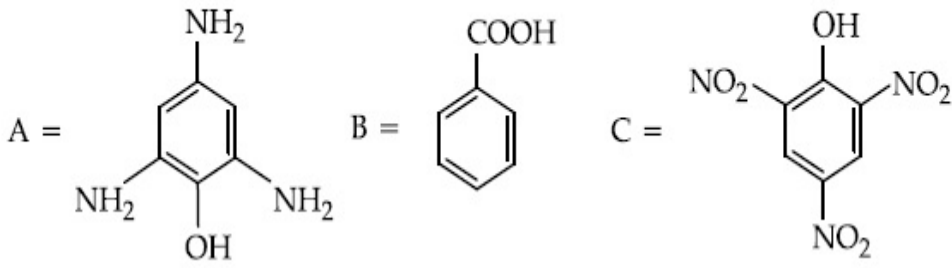
70819159138. B only

Question Number : 47 Question Id : 70819117990 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંયોજન(નો) પૈકી કયો(યા) સોડીયમ બાયકાર્બોનેટના દ્રાવણ સાથે કાર્બન ડાયોક્સાઇડ મુક્ત કરે છે ?



Options :

70819159135. ફક્ત A અને B

70819159136. ફક્ત C

70819159137. ફક્ત B અને C

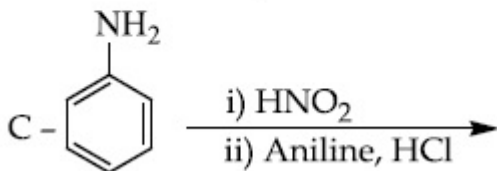
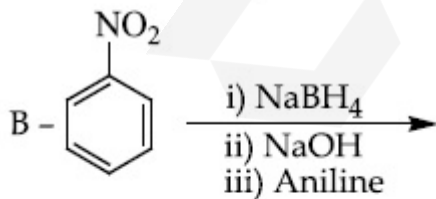
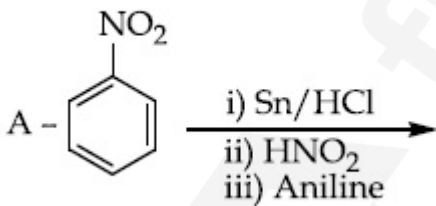
70819159138. ફક્ત B

Question Number : 48 Question Id : 70819117991 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following reaction/s will not give *p*-aminoazobenzene ?



Options :

70819159139. A only

70819159140. C only

70819159141. B only

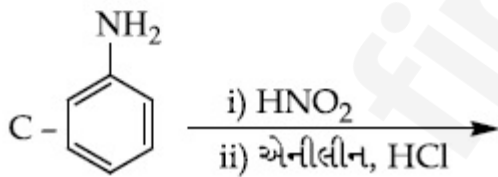
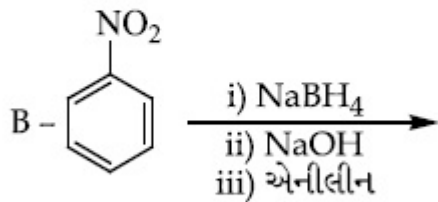
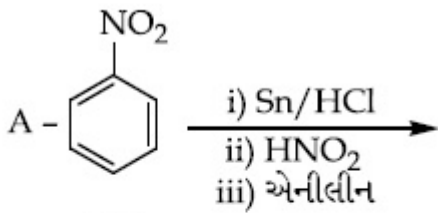
70819159142. A and B

Question Number : 48 Question Id : 70819117991 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચેના આપેલમાંથી કઈ પ્રક્રિયા/પ્રક્રિયાઓ *p*-એમિનોએઝોબેન્ઝીન આપશે નહીં ?



Options :

70819159139. ફક્ત A

70819159140. ફક્ત C

70819159141. ફક્ત B

70819159142. A અને B

Question Number : 49 Question Id : 70819117992 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which statement is correct ?

Options :

70819159143. Buna-N is a natural polymer.

70819159144. Buna-S is a synthetic and linear thermosetting polymer.

70819159145. Neoprene is an addition copolymer used in plastic bucket manufacturing.

70819159146. Synthesis of Buna-S needs nascent oxygen.

Question Number : 49 Question Id : 70819117992 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

કયું વિધાન સાચું છે ?

Options :

70819159143. બ્યુના-N એ કુદરતી બહુલક છે.

70819159144. બ્યુના-S એ કૃત્રિમ અને રેખીય થર્મોસેટિંગ બહુલક છે.

70819159145. નીયોપ્રીન એક યોગશીલ કો-પોલીમર છે જે પ્લાસ્ટીકની ડોલ બનાવવામાં ઉપયોગી છે.

70819159146. બ્યુના-S ના સંશ્લેષણમાં નવજાત ઓક્સીજનની જરૂર હોય છે.

Question Number : 50 Question Id : 70819117993 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the glycosidic linkage between galactose and glucose is present in lactose ?

Options :

70819159147. C-1 of galactose and C-4 of glucose

70819159148. C-1 of galactose and C-6 of glucose

70819159149. C-1 of glucose and C-4 of galactose

70819159150. C-1 of glucose and C-6 of galactose

Question Number : 50 Question Id : 70819117993 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

લેક્ટોઝમાં ગેલેક્ટોઝ અને ગ્લુકોઝની વચ્ચે નીચેનામાંથી કયો ગ્લાયકોસાઈડીક બંધ હાજર છે ?

Options :

70819159147. ગેલેક્ટોઝનો C-1 અને ગ્લુકોઝનો C-4

70819159148. ગેલેક્ટોઝનો C-1 અને ગ્લુકોઝનો C-6

70819159149. ગ્લુકોઝનો C-1 અને ગેલેક્ટોઝનો C-4

70819159150. ગ્લુકોઝનો C-1 અને ગેલેક્ટોઝનો C-6

Chemistry Section B

Section Id :	708191739
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911019
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 70819117994 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

0.4 g mixture of NaOH, Na₂CO₃ and some inert impurities was first titrated with $\frac{N}{10}$ HCl using phenolphthalein as an indicator, 17.5 mL of HCl was required at the end point. After this methyl orange was added and titrated. 1.5 mL of same HCl was required for the next end point. The weight percentage of Na₂CO₃ in the mixture is _____. (Rounded-off to the nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 51 Question Id : 70819117994 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

NaOH, Na₂CO₃ અને કેટલીક નિષ્ક્રિય અશુદ્ધિઓ ધરાવતા 0.4 g મિશ્રણને ફિનોલ્ફથેલીન સૂચકનો ઉપયોગ કરીને $\frac{N}{10}$ HCl સાથે અનુમાપન કરતાં, અંતિમ બિંદુ એ 17.5 mL HCl જરૂરી બને છે. ત્યારબાદ મિથાઈલ ઓરેન્જ ઉમેરીને અનુમાપન કરવામાં આવે છે. પછીના અંતિમ બિંદુ માટે તે જ HCl ના 1.5 mL ની જરૂર પડે છે. તો મિશ્રણમાં Na₂CO₃ ની વજન ટકાવારી _____ છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819117995 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A car tyre is filled with nitrogen gas at 35 psi at 27°C. It will burst if pressure exceeds 40 psi. The temperature in °C at which the car tyre will burst is _____. (Rounded-off to the nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819117995 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

35 psi અને 27°C પર, એક કાર ના ટાયરમાં નાઈટ્રોજન વાયુ ને ભરવામાં આવ્યો. જો દબાણ 40 psi થી વધુ થશે તો તે ફાટી જશે. તો કયા તાપમાને °C માં કાર ટાયર ફાટશે? (નજીકનાં પૂર્ણાંકમાં રાઉન્ડ ઓફ)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

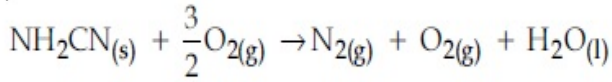
Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819117996 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The reaction of cyanamide, $\text{NH}_2\text{CN}_{(s)}$ with oxygen was run in a bomb calorimeter and ΔU was found to be $-742.24 \text{ kJ mol}^{-1}$. The magnitude of ΔH_{298} for the reaction



is _____ kJ. (Rounded off to the nearest integer)

[Assume ideal gases and $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

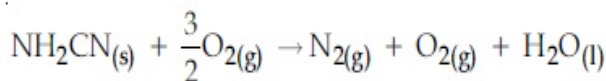
Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819117996 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક બોમ્બ કેલોરીમીટરમાં, સાયનામાઇડ $\text{NH}_2\text{CN}_{(s)}$ અને ઓક્સિજનની પ્રક્રિયા કરવામાં આવે છે અને તેનો $\Delta U -742.24 \text{ kJ mol}^{-1}$ માલૂમ પડ્યો. તો આપેલી પ્રક્રિયા માટે,



ΔH_{298} ની માત્રા, _____ kJ છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

[ધારી લો આદર્શ વાયુઓ અને $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 **Question Id :** 70819117997 **Question Type :** SA

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

1 molal aqueous solution of an electrolyte A_2B_3 is 60% ionised. The boiling point of the solution at 1 atm is _____ K. (Rounded-off to the nearest integer)

[Given K_b for $(H_2O) = 0.52 \text{ K kg mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 **Question Id :** 70819117997 **Question Type :** SA

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

એક મોલલ વિદ્યુત વિભાજ્ય A_2B_3 નું જલીય દ્રાવણ 60% આયનીકરણ પામેલ છે. તો 1 atm પર, આ દ્રાવણનું ઉત્કલન બિંદુ _____ K છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

[આપેલ $K_b (H_2O) = 0.52 \text{ K kg mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 Question Id : 70819117998 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In basic medium CrO_4^{2-} oxidises $\text{S}_2\text{O}_3^{2-}$ to form SO_4^{2-} and itself changes into $\text{Cr}(\text{OH})_4^-$.

The volume of 0.154 M CrO_4^{2-} required to react with 40 mL of 0.25 M $\text{S}_2\text{O}_3^{2-}$ is _____ mL. (Rounded-off to the nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 Question Id : 70819117998 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

બેઝિક માધ્યમમાં CrO_4^{2-} , $\text{S}_2\text{O}_3^{2-}$ નું ઓક્સિડેશન કરી SO_4^{2-} બનાવે છે અને તે પોતે $\text{Cr}(\text{OH})_4^-$ માં પરિવર્તન પામે છે. તો 40 mL 0.25 M $\text{S}_2\text{O}_3^{2-}$ ની સાથે પ્રક્રિયા કરવા માટે 0.154 M CrO_4^{2-} ના _____ mL કદની જરૂર પડશે ? (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

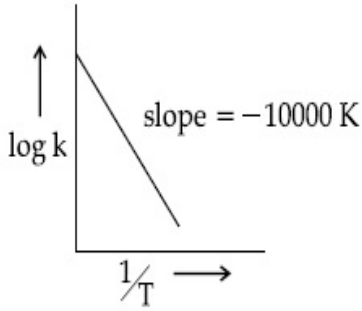
Possible Answers :

5 to 5.001

Question Number : 56 Question Id : 70819117999 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

For the reaction, $aA + bB \rightarrow cC + dD$, the plot of $\log k$ vs $\frac{1}{T}$ is given below :



The temperature at which the rate constant of the reaction is 10^{-4} s^{-1} is _____ K.
(Rounded-off to the nearest integer)

[Given : The rate constant of the reaction is 10^{-5} s^{-1} at 500 K.]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

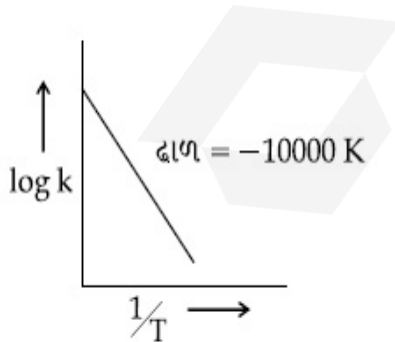
Possible Answers :

5 to 5.001

Question Number : 56 Question Id : 70819117999 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

પ્રક્રિયા, $aA + bB \rightarrow cC + dD$ માટે, આલેખ $\log k$ વિરૂદ્ધ $\frac{1}{T}$ નીચે આપેલ છે :



કયા તાપમાને (K માં) પ્રક્રિયાનો વેગ અચળાંક 10^{-4} s^{-1} થશે તે શોધો ? (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

[આપેલ : 500 K પર, પ્રક્રિયાનો વેગ અચળાંક 10^{-5} s^{-1} છે]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 **Question Id :** 70819118000 **Question Type :** SA

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

The ionization enthalpy of Na^+ formation from $\text{Na}_{(g)}$ is $495.8 \text{ kJ mol}^{-1}$, while the electron gain enthalpy of Br is $-325.0 \text{ kJ mol}^{-1}$. Given the lattice enthalpy of NaBr is $-728.4 \text{ kJ mol}^{-1}$. The energy for the formation of NaBr ionic solid is $(-)______ \times 10^{-1} \text{ kJ mol}^{-1}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 **Question Id :** 70819118000 **Question Type :** SA

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

$\text{Na}_{(g)}$ માંથી Na^+ ઉત્પન્ન થવાની આયનીકરણ એન્થાલ્પી $495.8 \text{ kJ mol}^{-1}$ છે, જ્યારે Br ની ઈલેક્ટ્રોન પ્રાપ્તિ એન્થાલ્પી $-325.0 \text{ kJ mol}^{-1}$ છે. NaBr ની લેટાઈસ એન્થાલ્પી $-728.4 \text{ kJ mol}^{-1}$ આપેલ છે. તો આયોનીક ઘન NaBr ની સર્જનમોટેની ઊર્જા $(-)______ \times 10^{-1} \text{ kJ mol}^{-1}$ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819118001 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following, the number of halide(s) which is/are inert to hydrolysis is _____.

(A) BF_3 (B) SiCl_4 (C) PCl_5 (D) SF_6

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819118001 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

નીચે આપેલા પૈકી, હાલોઈડ(ડો) ની સંખ્યા કે જેઓ જળવિભાજન થી નિષ્ક્રિય છે તે/તેઓ _____ છે.

(A) BF_3 (B) SiCl_4 (C) PCl_5 (D) SF_6

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

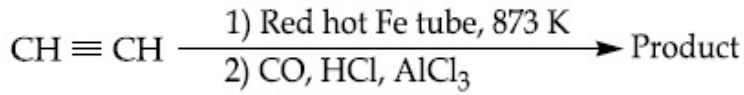
Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819118002 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Consider the following chemical reaction.



The number of sp^2 hybridized carbon atom(s) present in the product is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

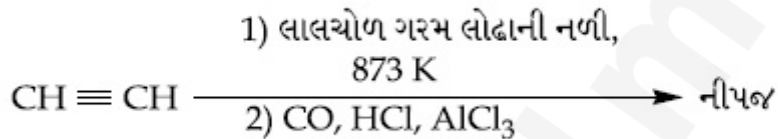
Possible Answers :

5 to 5.001

Question Number : 59 **Question Id :** 70819118002 **Question Type :** SA

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

નીચે આપેલી રાસાયણિક પ્રક્રિયા ને ધ્યાનમાં લો,



નીપજમાં sp^2 સંકરણ પામેલા કાર્બન પરમાણુઓની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 60 **Question Id :** 70819118003 **Question Type :** SA

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

Using the provided information in the following paper chromatogram:

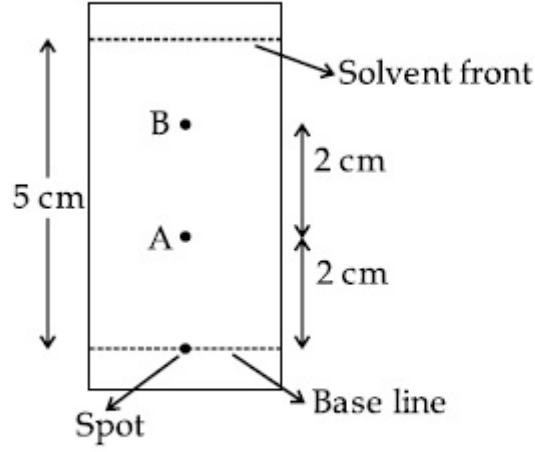


Fig : Paper chromatography for compounds A and B.
the calculated R_f value of A _____ $\times 10^{-1}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

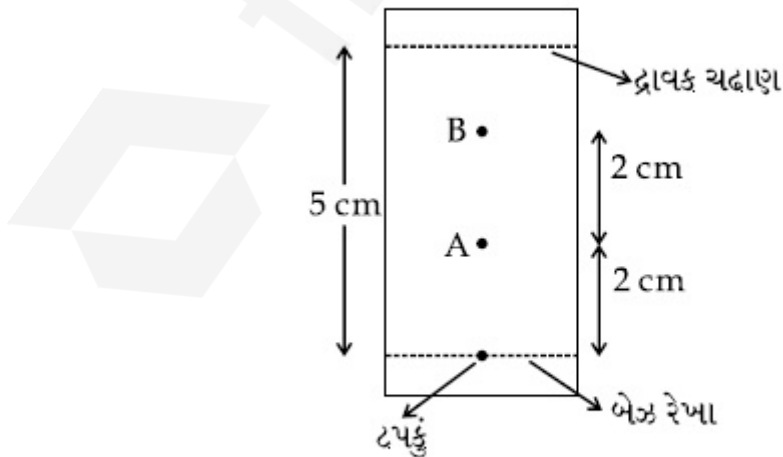
Possible Answers :

5 to 5.001

Question Number : 60 Question Id : 70819118003 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

નીચે આપેલ પેપર ક્રોમેટોગ્રાફીની માહિતીનો ઉપયોગ કરતાં :



આકૃતિ : સંયોજનો A અને B માટે પેપર ક્રોમેટોગ્રાફી

A નુ ગણતરી કરેલ R_f મૂલ્ય _____ $\times 10^{-1}$ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Mathematics Section A

Section Id :	708191740
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911020
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 70819118004 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f, g : \mathbb{N} \rightarrow \mathbb{N}$ such that $f(n+1) = f(n) + f(1) \forall n \in \mathbb{N}$ and g be any arbitrary function. Which of the following statements is NOT true ?

Options :

70819159161. If f is onto, then $f(n) = n \forall n \in \mathbb{N}$

70819159162. f is one-one

70819159163. If g is onto, then $f \circ g$ is one-one

70819159164. If $f \circ g$ is one-one, then g is one-one

Question Number : 61 Question Id : 70819118004 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે $f, g : \mathbb{N} \rightarrow \mathbb{N}$ એવાં છે કે જેથી $f(n+1) = f(n) + f(1), \forall n \in \mathbb{N}$ અને g કોઈ સ્વૈર વિધેય છે. નીચેનામાંથી કયું વિધાન સત્ય નથી ?

Options :

70819159161. જો f વ્યાપ્ત હોય, તો $f(n) = n \forall n \in \mathbb{N}$

70819159162. f એક-એક છે.

70819159163. જો g વ્યાપ્ત હોય, તો $f \circ g$ એક-એક છે.

70819159164. જો $f \circ g$ એક-એક હોય, તો g એક-એક છે.

Question Number : 62 Question Id : 70819118005 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let the lines $(2 - i)z = (2 + i)\bar{z}$ and $(2 + i)z + (i - 2)\bar{z} - 4i = 0$, (here $i^2 = -1$) be normal to a circle C . If the line $iz + \bar{z} + 1 + i = 0$ is tangent to this circle C , then its radius is :

Options :

70819159165. $3\sqrt{2}$

70819159166. $\frac{1}{2\sqrt{2}}$

70819159167. $\frac{3}{2\sqrt{2}}$

70819159168. $\frac{3}{\sqrt{2}}$

Question Number : 62 Question Id : 70819118005 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે રેખાઓ $(2 - i)z = (2 + i)\bar{z}$ અને $(2 + i)z + (i - 2)\bar{z} - 4i = 0$, (અહીં $i^2 = -1$) એ વર્તુળ C નાં અભિલંબ છે. જો રેખા $iz + \bar{z} + 1 + i = 0$ એ આ વર્તુળ C નો સ્પર્શક હોય, તો તેની ત્રિજ્યા _____ છે.

Options :

70819159165. $3\sqrt{2}$

70819159166. $\frac{1}{2\sqrt{2}}$

70819159167. $\frac{3}{2\sqrt{2}}$

70819159168. $\frac{3}{\sqrt{2}}$

Question Number : 63 Question Id : 70819118006 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The integer 'K', for which the inequality $x^2 - 2(3k - 1)x + 8k^2 - 7 > 0$ is valid for every x in \mathbb{R} , is :

Options :

70819159169. 2

70819159170. 3

70819159171. 4

70819159172. 0

**Question Number : 63 Question Id : 70819118006 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

અસમતા $x^2 - 2(3k-1)x + 8k^2 - 7 > 0$, R માંના પ્રત્યેક x માટે માન્ય હોય તેવું પૂર્ણાંક 'k' નું મૂલ્ય _____ છે.

Options :

70819159169. 2

70819159170. 3

70819159171. 4

70819159172. 0

**Question Number : 64 Question Id : 70819118007 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

If $0 < \theta, \phi < \frac{\pi}{2}$, $x = \sum_{n=0}^{\infty} \cos^{2n} \theta$, $y = \sum_{n=0}^{\infty} \sin^{2n} \phi$ and $z = \sum_{n=0}^{\infty} \cos^{2n} \theta \cdot \sin^{2n} \phi$ then :

Options :

70819159173. $xy - z = (x + y)z$

70819159174. $xy + z = (x + y)z$

70819159175. $xy + yz + zx = z$

70819159176. $xyz = 4$

Question Number : 64 Question Id : 70819118007 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $0 < \theta, \phi < \frac{\pi}{2}$, $x = \sum_{n=0}^{\infty} \cos^{2n} \theta$, $y = \sum_{n=0}^{\infty} \sin^{2n} \phi$ and $z = \sum_{n=0}^{\infty} \cos^{2n} \theta \cdot \sin^{2n} \phi$

Options :

70819159173. $xy - z = (x + y)z$

70819159174. $xy + z = (x + y)z$

70819159175. $xy + yz + zx = z$

70819159176. $xyz = 4$

Question Number : 65 Question Id : 70819118008 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If Rolle's theorem holds for the function $f(x) = x^3 - ax^2 + bx - 4$, $x \in [1, 2]$ with $f' \left(\frac{4}{3} \right) = 0$,

then ordered pair (a, b) is equal to :

Options :

70819159177. (5, 8)

70819159178. (5, -8)

70819159179. (-5, 8)

70819159180. (-5, -8)

Question Number : 65 Question Id : 70819118008 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો વિધેય $f(x) = x^3 - ax^2 + bx - 4$, $x \in [1, 2]$ માટે $f' \left(\frac{4}{3} \right) = 0$ સાથે રોલનું પ્રમેટ પળાતું હોય, તો ક્રમયુક્ત બેડ

(a, b) = _____.

Options :

70819159177. (5, 8)

70819159178. (5, -8)

70819159179. (-5, 8)

70819159180. (-5, -8)

Question Number : 66 Question Id : 70819118009 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\lim_{n \rightarrow \infty} \left(1 + \frac{1 + \frac{1}{2} + \dots + \frac{1}{n}}{n^2} \right)^n$ is equal to :

Options :

70819159181. 0

70819159182. $\frac{1}{2}$

70819159183. $\frac{1}{e}$

70819159184. 1

Question Number : 66 Question Id : 70819118009 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1 + \frac{1}{2} + \dots + \frac{1}{n}}{n^2} \right)^n = \underline{\hspace{2cm}}$$

Options :

70819159181. 0

70819159182. $\frac{1}{2}$

70819159183. $\frac{1}{e}$

70819159184. 1

Question Number : 67 Question Id : 70819118010 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of the integral

$$\int \frac{\sin\theta \cdot \sin 2\theta (\sin^6\theta + \sin^4\theta + \sin^2\theta) \sqrt{2\sin^4\theta + 3\sin^2\theta + 6}}{1 - \cos 2\theta} d\theta \text{ is :}$$

(where c is a constant of integration)

Options :

70819159185. $\frac{1}{18} [9 - 2\sin^6\theta - 3\sin^4\theta - 6\sin^2\theta]^{\frac{3}{2}} + c$

70819159186. $\frac{1}{18} [9 - 2\cos^6\theta - 3\cos^4\theta - 6\cos^2\theta]^{\frac{3}{2}} + c$

70819159187. $\frac{1}{18} [11 - 18\sin^2\theta + 9\sin^4\theta - 2\sin^6\theta]^{\frac{3}{2}} + c$

70819159188. $\frac{1}{18} [11 - 18\cos^2\theta + 9\cos^4\theta - 2\cos^6\theta]^{\frac{3}{2}} + c$

Question Number : 67 Question Id : 70819118010 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\int \frac{\sin\theta \cdot \sin 2\theta (\sin^6\theta + \sin^4\theta + \sin^2\theta) \sqrt{2\sin^4\theta + 3\sin^2\theta + 6}}{1 - \cos 2\theta} d\theta \text{ નું મૂલ્ય } \underline{\hspace{2cm}} \text{ છે.}$$

(જ્યાં c એ સંકલનનો અચળાંક છે)

Options :

70819159185. $\frac{1}{18} [9 - 2\sin^6\theta - 3\sin^4\theta - 6\sin^2\theta]^{\frac{3}{2}} + c$

70819159186. $\frac{1}{18} [9 - 2\cos^6\theta - 3\cos^4\theta - 6\cos^2\theta]^{\frac{3}{2}} + c$

70819159187.

$$\frac{1}{18} [11 - 18\sin^2\theta + 9\sin^4\theta - 2\sin^6\theta]^{\frac{3}{2}} + c$$

70819159188. $\frac{1}{18} [11 - 18\cos^2\theta + 9\cos^4\theta - 2\cos^6\theta]^{\frac{3}{2}} + c$

Question Number : 68 Question Id : 70819118011 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\int_{-1}^1 x^2 e^{[x^3]} dx$, where $[t]$ denotes the greatest integer $\leq t$, is :

Options :

70819159189. $\frac{e+1}{3}$

70819159190. $\frac{1}{3e}$

70819159191. $\frac{e-1}{3e}$

70819159192. $\frac{e+1}{3e}$

Question Number : 68 Question Id : 70819118011 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\int_{-1}^1 x^2 e^{[x^3]} dx$ નું મૂલ્ય _____ છે, જ્યાં $[t]$ અધિકતમ પૂર્ણાંક $\leq t$ દર્શાવે છે.

Options :

70819159189. $\frac{e + 1}{3}$

70819159190. $\frac{1}{3e}$

70819159191. $\frac{e - 1}{3e}$

70819159192. $\frac{e + 1}{3e}$

**Question Number : 69 Question Id : 70819118012 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

If a curve passes through the origin and the slope of the tangent to it at any point (x, y) is

$\frac{x^2 - 4x + y + 8}{x - 2}$, then this curve also passes through the point :

Options :

70819159193. $(4, 5)$

70819159194. $(5, 5)$

70819159195. $(5, 4)$

70819159196. $(4, 4)$

**Question Number : 69 Question Id : 70819118012 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

જો વક્ર ઊગમબિંદુમાંથી પસાર થતો હોય અને તેના કોઈપણ બિંદુ (x, y) આગળનાં સ્પર્શકનો ઢાળ

$$\frac{x^2}{x-2}$$

હોય, તો આ વક્ર _____ બિંદુમાંથી પણ પસાર થાય.

Options :

70819159193. (4, 5)

70819159194. (5, 5)

70819159195. (5, 4)

70819159196. (4, 4)

Question Number : 70 Question Id : 70819118013 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The image of the point (3, 5) in the line $x - y + 1 = 0$, lies on :

Options :

70819159197. $(x - 4)^2 + (y + 2)^2 = 16$

70819159198. $(x - 2)^2 + (y - 4)^2 = 4$

70819159199. $(x - 4)^2 + (y - 4)^2 = 8$

70819159200. $(x - 2)^2 + (y - 2)^2 = 12$

Question Number : 70 Question Id : 70819118013 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બિંદુ (3, 5) નું રેખા $x - y + 1 = 0$ માં પ્રતિબિંબ એ _____ પર આવેલું છે.

Options :

70819159197. $(x-4)^2 + (y+2)^2 = 16$

70819159198. $(x-2)^2 + (y-4)^2 = 4$

70819159199. $(x-4)^2 + (y-4)^2 = 8$

70819159200. $(x-2)^2 + (y-2)^2 = 12$

Question Number : 71 Question Id : 70819118014 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A tangent is drawn to the parabola $y^2 = 6x$ which is perpendicular to the line $2x + y = 1$. Which of the following points does NOT lie on it ?

Options :

70819159201. $(0, 3)$

70819159202. $(-6, 0)$

70819159203. $(5, 4)$

70819159204. $(4, 5)$

Question Number : 71 Question Id : 70819118014 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

પરવલય $y^2 = 6x$ ને એક સ્પર્શક દોરેલ છે, જે રેખા $2x + y = 1$ ને લંબ છે. નીચેનાં માંથી કયું બિંદુ તેની પર આવેલું નથી ?

Options :

70819159201. (0, 3)

70819159202. (-6, 0)

70819159203. (5, 4)

70819159204. (4, 5)

Question Number : 72 Question Id : 70819118015 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the curves, $\frac{x^2}{a} + \frac{y^2}{b} = 1$ and $\frac{x^2}{c} + \frac{y^2}{d} = 1$ intersect each other at an angle of 90° , then which of the following relations is TRUE ?

Options :

70819159205. $a + b = c + d$

70819159206. $a - b = c - d$

70819159207. $ab = \frac{c + d}{a + b}$

70819159208. $a - c = b + d$

Question Number : 72 Question Id : 70819118015 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જે વક્રો $\frac{x^2}{a} + \frac{y^2}{b} = 1$ અને $\frac{x^2}{c} + \frac{y^2}{d} = 1$ એકબીજાને 90° નાં ખૂણે છેદતા હોય, તો નીચેનામાંથી કયો સંબંધ સત્ય છે ?

Options :

70819159205. $a + b = c + d$

70819159206. $a - b = c - d$

70819159207. $ab = \frac{c + d}{a + b}$

70819159208. $a - c = b + d$

Question Number : 73 Question Id : 70819118016 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let α be the angle between the lines whose direction cosines satisfy the equations $l + m - n = 0$ and $l^2 + m^2 - n^2 = 0$. Then the value of $\sin^4 \alpha + \cos^4 \alpha$ is :

Options :

70819159209. $\frac{5}{8}$

70819159210. $\frac{3}{8}$

70819159211. $\frac{1}{2}$

70819159212. $\frac{3}{4}$

Question Number : 73 Question Id : 70819118016 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જેમના દ્વિઙ્ કોસાઈન, સમીકરણો $l + m - n = 0$ અને $l^2 + m^2 - n^2 = 0$ નું સમાધાન કરતા હોય તેવો કોણ α હોય, તો $\sin^4 \alpha + \cos^4 \alpha$ નું મૂલ્ય _____ છે.

Options :

70819159209. $\frac{5}{8}$

70819159210. $\frac{3}{8}$

70819159211. $\frac{1}{2}$

70819159212. $\frac{3}{4}$

Question Number : 74 Question Id : 70819118017 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The equation of the line through the point $(0, 1, 2)$ and perpendicular to the line

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

Options :

70819159213. $\frac{x}{3} = \frac{y-1}{4} = \frac{z-2}{-3}$

70819159214. $\frac{x}{-3} = \frac{y-1}{4} = \frac{z-2}{3}$

70819159215. $\frac{x}{3} = \frac{y-1}{-4} = \frac{z-2}{3}$

70819159216. $\frac{x}{3} = \frac{y-1}{4} = \frac{z-2}{3}$

Question Number : 74 Question Id : 70819118017 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બિંદુ $(0, 1, 2)$ માંથી પસાર થતી અને રેખા $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-1}{-2}$ ને લંબ રેખાનું સમીકરણ _____ છે.

Options :

70819159213. $\frac{x}{3} = \frac{y-1}{4} = \frac{z-2}{-3}$

70819159214. $\frac{x}{-3} = \frac{y-1}{4} = \frac{z-2}{3}$

70819159215. $\frac{x}{3} = \frac{y-1}{-4} = \frac{z-2}{3}$

70819159216. $\frac{x}{3} = \frac{y-1}{4} = \frac{z-2}{3}$

Question Number : 75 Question Id : 70819118018 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

When a missile is fired from a ship, the probability that it is intercepted is $\frac{1}{3}$ and the probability that the missile hits the target, given that it is not intercepted, is $\frac{3}{4}$. If three missiles are fired independently from the ship, then the probability that all three hit the target, is :

Options :

70819159217. $\frac{1}{27}$

70819159218. $\frac{1}{8}$

70819159219. $\frac{3}{8}$

70819159220. $\frac{3}{4}$

Question Number : 75 Question Id : 70819118018 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

વહાણમાંથી મિસાઈલ છોડવામાં આવે છે, તેને અટકાવવામાં આવે તેની સંભાવના $\frac{1}{3}$ છે અને તેને અટકાવવામાં આવતી

નથી તેમ આપેલ હોય ત્યારે તે લક્ષ્ય સાથે તેની સંભાવના $\frac{3}{4}$ છે. જો વહાણમાંથી નિરપેક્ષ રીતે ત્રણ મિસાઈલ છોડવામાં આવે, તો આ ત્રણેય લક્ષ્ય સાથે તેની સંભાવના _____ છે.

Options :

70819159217. $\frac{1}{27}$

70819159218. $\frac{1}{8}$

70819159219. $\frac{3}{8}$

70819159220. $\frac{3}{4}$

Question Number : 76 Question Id : 70819118019 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The coefficients a , b and c of the quadratic equation, $ax^2 + bx + c = 0$ are obtained by throwing a dice three times. The probability that this equation has equal roots is :

Options :

70819159221. $\frac{1}{36}$

70819159222. $\frac{1}{54}$

70819159223. $\frac{1}{72}$

70819159224. $\frac{5}{216}$

Question Number : 76 Question Id : 70819118019 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

દ્વિઘાત સમીકરણ $ax^2 + bx + c = 0$ નાં સહગુણકો a , b અને c એ એક પાસાને ત્રણ વખત ઉછાળીને મેળવવામાં આવે છે. તો આ સમીકરણને સમાન બીજા હોવાની સંભાવના _____ છે.

Options :

70819159221. $\frac{1}{36}$

70819159222. $\frac{1}{54}$

70819159223. $\frac{1}{72}$

70819159224. $\frac{5}{216}$

Question Number : 77 Question Id : 70819118020 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

All possible values of $\theta \in [0, 2\pi]$ for which $\sin 2\theta + \tan 2\theta > 0$ lie in :

Options :

70819159225. $\left(0, \frac{\pi}{2}\right) \cup \left(\pi, \frac{3\pi}{2}\right)$

70819159226. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{11\pi}{6}\right)$

70819159227. $\left(0, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{7\pi}{6}\right)$

70819159228. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{5\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{7\pi}{4}\right)$

Question Number : 77 Question Id : 70819118020 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\sin 2\theta + \tan 2\theta > 0$ થાય તેવી $\theta \in [0, 2\pi]$ ની શક્ય તમામ કિંમતો _____ માં આપેલ છે.

Options :

70819159225. $\left(0, \frac{\pi}{2}\right) \cup \left(\pi, \frac{3\pi}{2}\right)$

70819159226. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{11\pi}{6}\right)$

70819159227. $\left(0, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{7\pi}{6}\right)$

70819159228. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{5\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{7\pi}{4}\right)$

Question Number : 78 Question Id : 70819118021 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The total number of positive integral solutions (x, y, z) such that $xyz = 24$ is :

Options :

70819159229. 24

70819159230. 30

70819159231. 36

70819159232. 45

Question Number : 78 Question Id : 70819118021 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$xyz = 24$ થાય તેવા તમામ ધન પૂર્ણાંક ઉકેલો (x, y, z) ની સંખ્યા _____ છે.

Options :

70819159229. 24

70819159230. 30

70819159231. 36

70819159232. 45

Question Number : 79 Question Id : 70819118022 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A man is observing, from the top of a tower, a boat speeding towards the tower from a certain point A, with uniform speed. At that point, angle of depression of the boat with the man's eye is 30° (Ignore man's height). After sailing for 20 seconds, towards the base of the tower (which is at the level of water), the boat has reached a point B, where the angle of depression is 45° . Then the time taken (in seconds) by the boat from B to reach the base of the tower is :

Options :

70819159233. 10

70819159234. $10(\sqrt{3} + 1)$

70819159235. $10\sqrt{3}$

70819159236. $10(\sqrt{3} - 1)$

Question Number : 79 Question Id : 70819118022 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક વ્યક્તિ ટૉવરની ટોચ પરથી, એક હોડીને નિશ્ચિત બિંદુ A આગળથી ટૉવર તરફ એક સરખી ઝડપે ગતિ કરતી જુએ છે. તે બિંદુએ હોડીનો વ્યક્તિની આંખ સાથેનો અવસેધ કોણ 30° છે, (વ્યક્તિની ઊંચાઈ અવગણવી). ટૉવરનાં તળીયા (જે પાણીના સ્તરે છે) તરફ 20 સેકન્ડ હોડીની મુસાફરી બાદ, હોડી બિંદુ B આગળ પહોંચે છે, જ્યાં અવસેધ કોણ 45° છે. તો હોડીએ બિંદુ B થી ટૉવરનાં તળીયા સુધી પહોંચવા માટે લીધેલ સમય (સેકન્ડ માં) _____ છે.

Options :

70819159233. 10

70819159234. $10(\sqrt{3} + 1)$

70819159235. $10\sqrt{3}$

70819159236. $10(\sqrt{3} - 1)$

Question Number : 80 Question Id : 70819118023 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The statement $A \rightarrow (B \rightarrow A)$ is equivalent to :

Options :

70819159237. $A \rightarrow (A \rightarrow B)$

70819159238. $A \rightarrow (A \vee B)$

70819159239. $A \rightarrow (A \wedge B)$

70819159240. $A \rightarrow (A \leftrightarrow B)$

Question Number : 80 Question Id : 70819118023 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

વિધાન $A \rightarrow (B \rightarrow A)$ એ _____ ને સમાનાર્થી છે.

Options :

70819159237. $A \rightarrow (A \rightarrow B)$

70819159238. $A \rightarrow (A \vee B)$

70819159239. $A \rightarrow (A \wedge B)$

70819159240. $A \rightarrow (A \leftrightarrow B)$

Mathematics Section B

Section Id :	708191741
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911021
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 70819118024 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $A = \begin{bmatrix} 0 & -\tan\left(\frac{\theta}{2}\right) \\ \tan\left(\frac{\theta}{2}\right) & 0 \end{bmatrix}$ and $(I_2 + A)(I_2 - A)^{-1} = \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$, then $13(a^2 + b^2)$ is equal to

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 81 Question Id : 70819118024 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો $A = \begin{bmatrix} 0 & -\tan\left(\frac{\theta}{2}\right) \\ \tan\left(\frac{\theta}{2}\right) & 0 \end{bmatrix}$ અને $(I_2 + A)(I_2 - A)^{-1} = \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ હોય, તો $13(a^2 + b^2)$
 = _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819118025 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $A = \begin{bmatrix} x & y & z \\ y & z & x \\ z & x & y \end{bmatrix}$, where x, y and z are real numbers such that $x + y + z > 0$ and $xyz = 2$.

If $A^2 = I_3$, then the value of $x^3 + y^3 + z^3$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819118025 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે $A = \begin{bmatrix} x & y & z \\ y & z & x \\ z & x & y \end{bmatrix}$, જ્યાં x, y અને z એ એવી વાસ્તવિક સંખ્યાઓ છે, કે જેથી $x+y+z > 0$ અને $xyz=2$.

જો $A^2=I_3$ હોય, તો $x^3+y^3+z^3$ નું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 83 **Question Id :** 70819118026 **Question Type :** SA

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

If the system of equations

$$kx + y + 2z = 1$$

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

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

has infinitely many solutions, then k is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 83 **Question Id :** 70819118026 **Question Type :** SA

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

ને સમીકરણ સંહતિ

$$kx + y + 2z = 1$$

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

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

ને અસંખ્ય ઉકેલો હોય, તો $k =$ _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 84 **Question Id :** 70819118027 **Question Type :** SA

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

The total number of numbers, lying between 100 and 1000 that can be formed with the digits 1, 2, 3, 4, 5, if the repetition of digits is not allowed and numbers are divisible by either 3 or 5, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 84 **Question Id :** 70819118027 **Question Type :** SA

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

ને અંકોનું પુનરાવર્તન કરવાની છૂટ ન હોય, તો 100 અને 1000 વચ્ચે આપેલી, અંકો 1, 2, 3, 4, 5 થી બનતી અને 3 અથવા 5 વડે વિભાજ્ય હોય તેવી સંખ્યાઓની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 Question Id : 70819118028 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let A_1, A_2, A_3, \dots be squares such that for each $n \geq 1$, the length of the side of A_n equals the length of diagonal of A_{n+1} . If the length of A_1 is 12 cm, then the smallest value of n for which area of A_n is less than one, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 Question Id : 70819118028 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે A_1, A_2, A_3, \dots એ એવા ચોરસો છે કે જેથી પ્રત્યેક $n \geq 1$ માટે A_n ની બાજુની લંબાઈ બરાબર A_{n+1} નાં વિકર્ણની લંબાઈ થાય. જો A_1 ની લંબાઈ 12 સેમી. હોય, તો A_n નું ક્ષેત્રફળ એક કરતાં ઓછું થાય તેવું n નું નાનામાં નાનું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 Question Id : 70819118029 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of points, at which the function $f(x) = |2x+1| - 3|x+2| + |x^2+x-2|$, $x \in \mathbb{R}$ is not differentiable, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 Question Id : 70819118029 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

વિધેય $f(x) = |2x+1| - 3|x+2| + |x^2+x-2|$, $x \in \mathbb{R}$ જ્યાં વિકલનીય ન હોય તેવા બિંદુઓની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819118030 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $f(x)$ be a polynomial of degree 6 in x , in which the coefficient of x^6 is unity and it has extrema at $x = -1$ and $x = 1$. If $\lim_{x \rightarrow 0} \frac{f(x)}{x^3} = 1$, then $5 \cdot f(2)$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819118030 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે $f(x)$ એ 6 ઘાતવાળી x ની બહુપદી છે, કે જેમાં x^6 નો સહગુણક એકમ ઘટક છે, અને તેનાં આત્યાંતિક મૂલ્યો $x = -1$ અને $x = 1$ આગળ છે. જો $\lim_{x \rightarrow 0} \frac{f(x)}{x^3} = 1$ હોય, તો $5 \cdot f(2) =$ _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819118031 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The graphs of sine and cosine functions, intersect each other at a number of points and between two consecutive points of intersection, the two graphs enclose the same area A. Then A^4 is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

Question Number : 88 Question Id : 70819118031 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

sine અને cosine વિધેયોનાં આલેખો એક બીજાને સંખ્યાબંધ બિંદુઓએ છેદે છે, અને બે ક્રમિક છેદબિંદુઓ વચ્ચે બે આલેખો સમાન ક્ષેત્રફળ A આંતરે છે, તો $A^4 =$ _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819118032 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The locus of the point of intersection of the lines $(\sqrt{3})kx + ky - 4\sqrt{3} = 0$ and $\sqrt{3}x - y - 4(\sqrt{3})k = 0$ is a conic, whose eccentricity is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819118032 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

રેખાઓ $(\sqrt{3})kx + ky - 4\sqrt{3} = 0$ અને $\sqrt{3}x - y - 4(\sqrt{3})k = 0$ નાં છેદબિંદુનાં બિંદુપથનું સમીકરણ શક્ય છે, જેની ઉત્કેન્દ્રતા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 90 **Question Id :** 70819118033 **Question Type :** SA

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

Let $\vec{a} = \hat{i} + 2\hat{j} - \hat{k}$, $\vec{b} = \hat{i} - \hat{j}$ and $\vec{c} = \hat{i} - \hat{j} - \hat{k}$ be three given vectors. If \vec{r} is a vector such that $\vec{r} \times \vec{a} = \vec{c} \times \vec{a}$ and $\vec{r} \cdot \vec{b} = 0$, then $\vec{r} \cdot \vec{a}$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 90 **Question Id :** 70819118033 **Question Type :** SA

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

ધારોકે $\vec{a} = \hat{i} + 2\hat{j} - \hat{k}$, $\vec{b} = \hat{i} - \hat{j}$ અને $\vec{c} = \hat{i} - \hat{j} - \hat{k}$ આપેલ ત્રણ સદિશો છે. જો \vec{r} એ એક એવો સદિશ હોય કે જેથી $\vec{r} \times \vec{a} = \vec{c} \times \vec{a}$ અને $\vec{r} \cdot \vec{b} = 0$ થાય, તો $\vec{r} \cdot \vec{a} =$ _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

