National Testing Agency

Question Paper Name :	BTECH E 6th Sep 2020 Shift 1
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BTECH

Group Number :	1
Group Id :	405036126
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 Id :	405036418
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036803
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 40503611456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A clock has a continuously moving second's hand of 0.1 m length. The average acceleration of the tip of the hand (in units of ms^{-2}) is of the order of :

Options :

40503641541. 10^{-1}

40503641542. 10^{-3}

40503641543. 10^{-4}

40503641544. 10^{-2}

Question Number : 1 Question Id : 40503611456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक घड़ी की लगातार घूमने वाली सेकेण्ड की सुई की लम्बाई 0.1 m है। सुई की नोक के औसत त्वरण के परिमाण की (ms^{-2} की इकाई में) कोटि का मान है :

Options :

40503641541. 10^{-1}

40503641542. 10^{-3}

40503641543. 10^{-4}

40503641544. 10^{-2}

Question Number : 2 Question Id : 40503611457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An insect is at the bottom of a hemispherical ditch of radius 1 m. It crawls up the ditch but starts slipping after it is at height h from the bottom. If the coefficient of friction between the ground and the insect is 0.75, then h is : ($g = 10\ ms^{-2}$)

Options :

40503641545. 0.45 m

40503641546. 0.20 m

40503641547. 0.60 m

40503641548. 0.80 m

Question Number : 2 Question Id : 40503611457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1 m त्रिज्या की किसी अर्द्ध गोलाकार गड्ढे की तली पर एक कीड़ा बैठा है और वह वहाँ से ऊपर की ओर रेंगना प्रारम्भ करता है। किन्तु, तली से h ऊँचाई तक पहुँचने पर फिसलने लगता है। यदि गड्ढे तथा कीट के बीच घर्षण गुणाँक 0.75 है, तो h का मान होगा : ($g = 10\ ms^{-2}$)

Options :

40503641545. 0.45 m

40503641546. 0.20 m

40503641547. 0.60 m

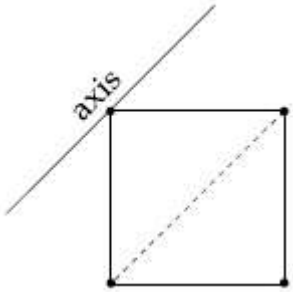
40503641548. 0.80 m

Question Number : 3 Question Id : 40503611458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Four point masses, each of mass m, are fixed at the corners of a square of side l. The square is rotating with angular frequency ω, about an axis passing through one of the corners of the square and parallel to its diagonal, as shown in the figure. The angular momentum of the square about this axis is :



Options :

40503641549. $ml^2\omega$

40503641550. $3\,ml^2\omega$

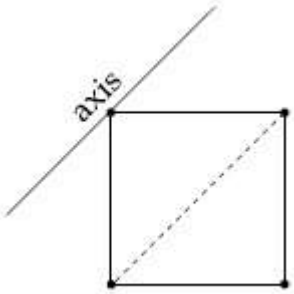
40503641551. $2\,ml^2\omega$

40503641552. $4\,ml^2\omega$

Question Number : 3 Question Id : 40503611458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चार बिन्दु द्रव्यमान, जिनमें प्रत्येक का द्रव्यमान m है, को l भुजा वाले एक वर्ग के कोनों पर रखते हैं। दिखाये गये चित्रानुसार, वर्ग के कोई एक कोने से जाने वाली तथा विकर्ण के समान्तर अक्ष के परित: वर्ग कोणीय आवृत्ति ω से घूर्णन कर रहा हैं। इस अक्ष के सापेक्ष वर्ग का कोणीय संवेग है :



Options :

40503641549. $ml^2\omega$

40503641550. $3\,ml^2\omega$

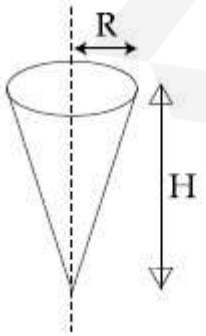
40503641551. $2\,ml^2\omega$

40503641552. $4\,ml^2\omega$

Question Number : 4 Question Id : 40503611459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Shown in the figure is a hollow icecream cone(it is open at the top). If its mass is M, radius of its top, R and height, H, then its moment of inertia about its axis is :



Options :

40503641553. $\frac{MR^2}{2}$

40503641554. $\frac{MH^2}{3}$

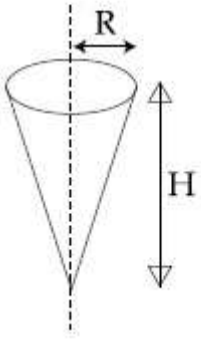
40503641555. $\frac{MR^2}{3}$

40503641556. $\frac{M(R^2+H^2)}{4}$

Question Number : 4 Question Id : 40503611459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक खोखला आईसक्रीम शंकु को चित्र में दिखाया गया है (इसका ऊपरी भाग खुला है।)। यदि इसका द्रव्यमान M, ऊपरी भाग की त्रिज्या R, तथा ऊँचाई, H हो, तो इसकी अक्ष के सापेक्ष जड़त्व आघूर्ण है :



Options :

40503641553. $\frac{MR^2}{2}$

40503641554. $\frac{MH^2}{3}$

40503641555. $\frac{MR^2}{3}$

40503641556. $\frac{M(R^2+H^2)}{4}$

Question Number : 5 Question Id : 40503611460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A satellite is in an elliptical orbit around a planet P. It is observed that the velocity of the satellite when it is farthest from the planet is 6 times less than that when it is closest to the planet. The ratio of distances between the satellite and the planet at closest and farthest points is :

Options :

40503641557. $1:6$

40503641558. $1:3$

40503641559. $1:2$

40503641560. $3:4$

Question Number : 5 Question Id : 40503611460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक उपग्रह किसी ग्रह P के चारों ओर एक दीर्घवृत्तीय कक्ष में है। देखा जाता है कि जब उपग्रह, ग्रह से अधिकतम दूरी पर है तो उसकी चाल उस चाल से 6 गुना कम है जबकि वह ग्रह से निकटतम दूरी पर है। उपग्रह और ग्रह के बीच की निकटतम तथा अधिकतम दूरियों का अनुपात होगा :

Options :

40503641557. $1:6$

40503641558. $1:3$

40503641559. $1:2$

40503641560. $3:4$

Question Number : 6 Question Id : 40503611461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An object of mass m is suspended at the end of a massless wire of length L and area of cross-section, A. Young modulus of the material of the wire is Y. If the mass is pulled down slightly its frequency of oscillation along the vertical direction is :

Options :

40503641561. $f=\frac{1}{2\pi}\sqrt{\frac{mA}{YL}}$

40503641562. $f=\frac{1}{2\pi}\sqrt{\frac{mL}{YA}}$

40503641563. $f=\frac{1}{2\pi}\sqrt{\frac{YA}{mL}}$

40503641564. $f=\frac{1}{2\pi}\sqrt{\frac{YL}{mA}}$

Question Number : 6 Question Id : 40503611461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

m द्रव्यमान के एक पिण्ड को, लम्बाई L तथा अनुप्रस्थ काट क्षेत्रफल A द्रव्यमानरहित के तार के एक सिरे से लटकाते हैं। तार के पदार्थ का यंग प्रत्यास्थता गुणांक Y है। यदि द्रव्यमान को थोड़ा सा नीचे खींचकर छोड़ देते हैं तो ऊर्ध्व दिशा में इसके दोलन की आवृत्ति होगी :

Options :

40503641561. $f=\frac{1}{2\pi}\sqrt{\frac{mA}{YL}}$

40503641562. $f=\frac{1}{2\pi}\sqrt{\frac{mL}{YA}}$

40503641563. $f=\frac{1}{2\pi}\sqrt{\frac{YA}{mL}}$

40503641564. $f=\frac{1}{2\pi}\sqrt{\frac{YL}{mA}}$

Question Number : 7 Question Id : 40503611462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Molecules of an ideal gas are known to have three translational degrees of freedom and two rotational degrees of freedom. The gas is maintained at a temperature of T.

The total internal energy, U of a mole of this gas, and the value of $\gamma\left(=\frac{C_p}{C_v}\right)$ are given, respectively, by :

Options :

40503641565. $U=5RT$ and $\gamma=\frac{6}{5}$

40503641566. $U=\frac{5}{2}RT$ and $\gamma=\frac{6}{5}$

40503641567. $U=\frac{5}{2}RT$ and $\gamma=\frac{7}{5}$

40503641568. $U=5RT$ and $\gamma=\frac{7}{5}$

Question Number : 7 Question Id : 40503611462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किसी आदर्श गैस के अणुओं की तीन स्थानांतरीय एवं दो घूर्णी स्वातंत्र्य कोटि हैं। गैस को तापमान T पर रखा गया है। इस गैस के एक मोल अणुओं की कुल आन्तरिक ऊर्जा U तथा $\gamma\left(=\frac{C_p}{C_v}\right)$ का मान क्रमशः होगा :

Options :

40503641565. $U=5RT$ तथा $\gamma=\frac{6}{5}$

40503641566. $U=\frac{5}{2}RT$ तथा $\gamma=\frac{6}{5}$

40503641567. $U=\frac{5}{2}RT$ तथा $\gamma=\frac{7}{5}$

40503641568. $U=5RT$ तथा $\gamma=\frac{7}{5}$

Question Number : 8 Question Id : 40503611463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the potential energy between two molecules is given by $U=-\frac{A}{r^6}+\frac{B}{r^{12}}$, then at equilibrium, separation between molecules, and the potential energy are :

Options :

40503641569. $\left(\frac{2B}{A}\right)^{1/6}, -\frac{A^2}{4B}$

40503641570. $\left(\frac{2B}{A}\right)^{1/6}, -\frac{A^2}{2B}$

40503641571. $\left(\frac{B}{A}\right)^{1/6}, 0$

40503641572. $\left(\frac{B}{2A}\right)^{1/6}, -\frac{A^2}{2B}$

Question Number : 8 Question Id : 40503611463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि दो अणुओं के बीच स्थितिज ऊर्जा का संबंध उनकी बीच की दूरी से $U = -\frac{A}{r^6} + \frac{B}{r^{12}}$ से दी जाती है, तब साम्यावस्था पर अणुओं के बीच दूरी और स्थितिज ऊर्जा होगी :

Options :

40503641569. $\left(\frac{2B}{A}\right)^{1/6}, -\frac{A^2}{4B}$

40503641570. $\left(\frac{2B}{A}\right)^{1/6}, -\frac{A^2}{2B}$

40503641571. $\left(\frac{B}{A}\right)^{1/6}, 0$

40503641572. $\left(\frac{B}{2A}\right)^{1/6}, -\frac{A^2}{2B}$

Question Number : 9 Question Id : 40503611464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

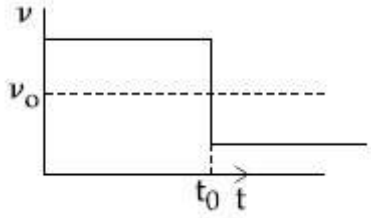
Correct Marks : 4 Wrong Marks : 1

A sound source S is moving along a straight track with speed v, and is emitting sound of frequency ν_o (see figure). An observer is standing at a finite distance, at the point O, from the track. The time variation of frequency heard by the observer is best represented by :

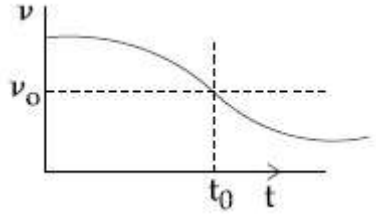
(t_0 represents the instant when the distance between the source and observer is minimum)

Options :

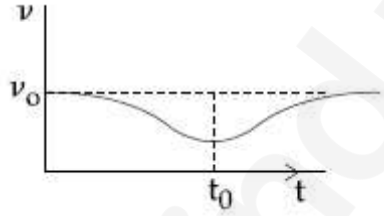
40503641573.



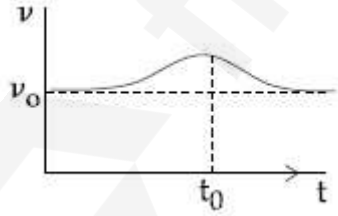
40503641574.



40503641575.



40503641576.



Question Number : 9 Question Id : 40503611464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

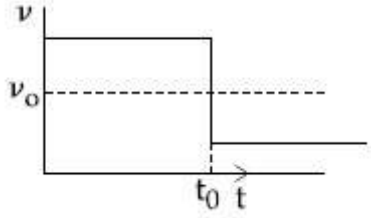
Correct Marks : 4 Wrong Marks : 1

एक ध्वनि स्रोत S, v गति से किसी सीधे पथ पर जा रहा है और ν_0 आवृत्ति की ध्वनि उत्सर्जित कर रहा है (चित्र देखिये)। एक प्रेक्षक बिन्दु O पर पथ से एक सीमित दूरी पर खड़ा है। प्रेक्षक द्वारा सुनी गयी आवृत्ति का समय के अनुसार परिवर्तन को सबसे अच्छा इससे दर्शाया गया है :

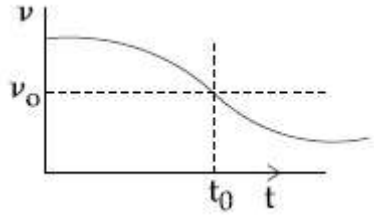
(t_0 उस क्षण को दर्शाता है जब प्रेक्षक और स्रोत के बीच की दूरी न्यूनतम है)

Options :

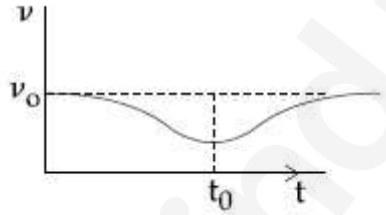
40503641573.



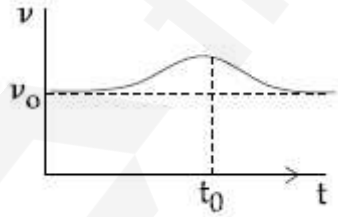
40503641574.



40503641575.



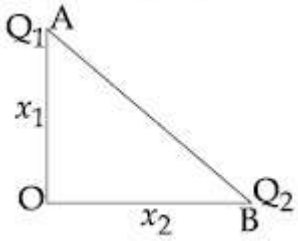
40503641576.



Question Number : 10 Question Id : 40503611465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Charges Q_1 and Q_2 are at points A and B of a right angle triangle OAB(see figure). The resultant electric field at point O is perpendicular to the hypotenuse , then Q_1/Q_2 is proportional to :



Options :

40503641577. $\frac{x_1}{x_2}$

40503641578. $\frac{x_2}{x_1}$

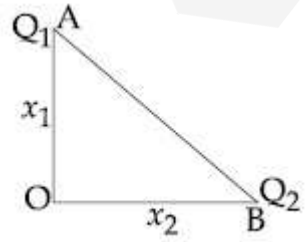
40503641579. $\frac{{x_1}^3}{{x_2}^3}$

40503641580. $\frac{{x_2}^2}{{x_1}^2}$

Question Number : 10 Question Id : 40503611465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समकोण त्रिभुज OAB के बिन्दु A तथा B पर आवेश Q_1 तथा Q_2 रखे हैं (चित्र देखिये)। यदि बिन्दु O पर वैद्युत क्षेत्र कर्ण के लम्बवत् है तो आवेशों का अनुपात Q_1/Q_2 किसके समानुपाती होगा?



Options :

40503641577. $\frac{x_1}{x_2}$

40503641578. $\frac{x_2}{x_1}$

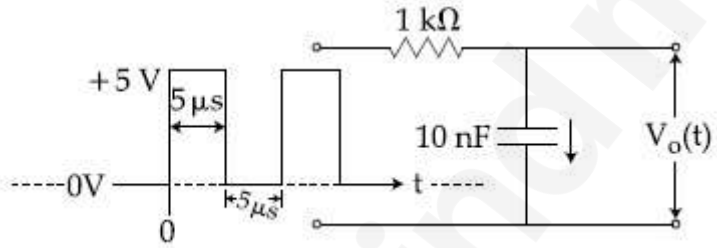
40503641579. $\frac{x_1^3}{x_2^3}$

40503641580. $\frac{x_2^2}{x_1^2}$

Question Number : 11 Question Id : 40503611466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

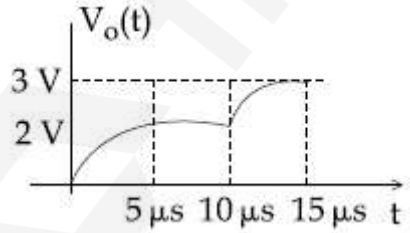
Correct Marks : 4 Wrong Marks : 1

For the given input voltage waveform $V_{in}(t)$, the output voltage waveform $V_o(t)$, across the capacitor is correctly depicted by :

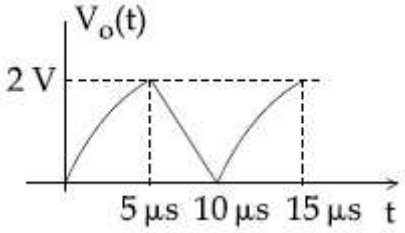


Options :

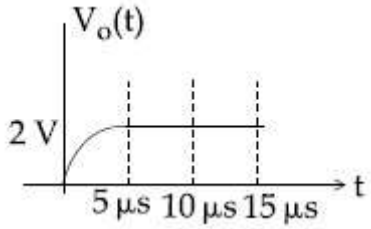
40503641581.



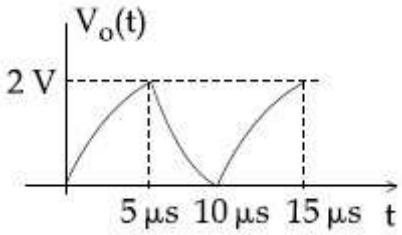
40503641582.



40503641583.



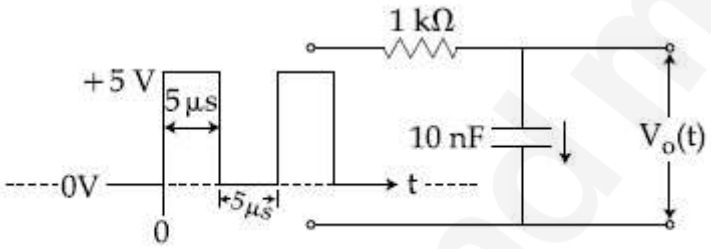
40503641584.



Question Number : 11 Question Id : 40503611466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

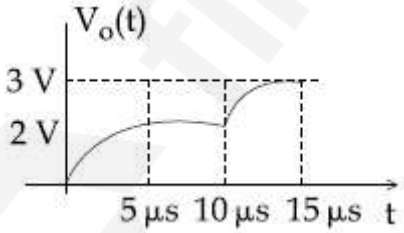
Correct Marks : 4 Wrong Marks : 1

दिये गये निवेशित वोल्टेज $V_{in}(t)$ के तरंग रूप के लिये संधारित्र पर निर्गत वोल्टेज $V_o(t)$ के तरंगरूप का सही वर्णन होगा :

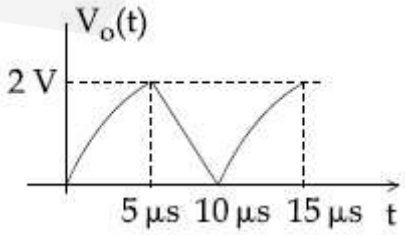


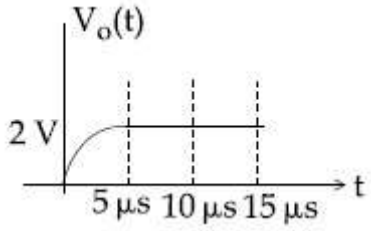
Options :

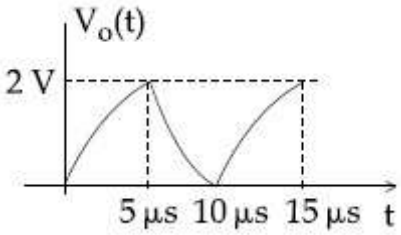
40503641581.



40503641582.



40503641583. 

40503641584. 

Question Number : 12 Question Id : 40503611467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A particle of charge q and mass m is moving with a velocity $-v\hat{i}\,(v \neq 0)$ towards a large screen placed in the Y-Z plane at a distance d. If there is a magnetic field $\vec{B} = B_0\hat{k}$, the minimum value of v for which the particle will not hit the screen is :

Options :

40503641585. $\frac{qdB_0}{m}$

40503641586. $\frac{qdB_0}{2m}$

40503641587. $\frac{2qdB_0}{m}$

40503641588. $\frac{qdB_0}{3m}$

Question Number : 12 Question Id : 40503611467 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आवेश q तथा द्रव्यमान m का एक कण Y-Z समतल में d दूरी पर रखे पर्दे की ओर $-v\hat{i}(v\neq 0)$ वेग से चल रहा है। यदि एक चुम्बकीय क्षेत्र $\vec{B} = B_0\hat{k}$ उपस्थित हो तो, v के किस न्यूनतम मान के लिए कण पर्दे से नहीं टकरायेगा?

Options :

40503641585. $\frac{qdB_0}{m}$

40503641586. $\frac{qdB_0}{2m}$

40503641587. $\frac{2qdB_0}{m}$

40503641588. $\frac{qdB_0}{3m}$

Question Number : 13 Question Id : 40503611468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An electron is moving along $+x$ direction with a velocity of 6×10^6 ms^{-1}. It enters a region of uniform electric field of 300 V/cm pointing along $+y$ direction. The magnitude and direction of the magnetic field set up in this region such that the electron keeps moving along the x direction will be :

Options :

40503641589. 5×10^{-3} T, along $+z$ direction

40503641590. 5×10^{-3} T, along $-z$ direction

40503641591. 3×10^{-4} T, along $-z$ direction

40503641592. 3×10^{-4} T, along $+z$ direction

Question Number : 13 Question Id : 40503611468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक इलेक्ट्रॉन $+x$ दिशा में $6\times10^{6}\,ms^{-1}$ की चाल से चल रहा है। यह $+y$ दिशा में लगने वाले $300\,V/cm$ के एक समान वैद्युत क्षेत्र में प्रवेश करता है। यदि इलेक्ट्रॉन x दिशा में ही चलता रहता है तो इस स्थान पर उपस्थित चुम्बकीय क्षेत्र का परिमाण और दिशा होंगे :

Options :

40503641589. 5×10^{-3} T, $+z$ दिशा में

40503641590. 5×10^{-3} T, $-z$ दिशा में

40503641591. 3×10^{-4} T, $-z$ दिशा में

40503641592. 3×10^{-4} T, $+z$ दिशा में

Question Number : 14 Question Id : 40503611469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An AC circuit has $R=100\,\Omega$, $C=2\,\mu F$ and $L=80$ mH, connected in series. The quality factor of the circuit is :

Options :

40503641593. 400

40503641594. 20

40503641595. 2

40503641596. 0.5

Question Number : 14 Question Id : 40503611469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक AC परिपथ में $R=100\ \Omega$, $C=2\ \mu F$ तथा $L=80\ mH$ श्रेणीक्रम में लगाया जाता है। परिपथ का गुणता कारक हैं :

Options :

40503641593. 400

40503641594. 20

40503641595. 2

40503641596. 0.5

Question Number : 15 Question Id : 40503611470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A point like object is placed at a distance of 1 m in front of a convex lens of focal length 0.5 m. A plane mirror is placed at a distance of 2 m behind the lens. The position and nature of the final image formed by the system is :

Options :

40503641597. 2.6 m from the mirror, real

40503641598. 2.6 m from the mirror, virtual

40503641599. 1 m from the mirror, virtual

40503641600. 1 m from the mirror, real

Question Number : 15 Question Id : 40503611470 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक बिन्दु के समान वस्तु 0.5 m फोकस दूरी वाले किसी उत्तल लेंस से 1 m की दूरी पर है। लेंस के 2 m पीछे एक समतल दर्पण को रखते है। इस विन्यास से बने अन्तिम प्रतिबिम्ब की स्थिति और प्रकृति होगी :

Options :

40503641597. दर्पण से 2.6 m, वास्तविक

40503641598. दर्पण से 2.6 m, आभासी

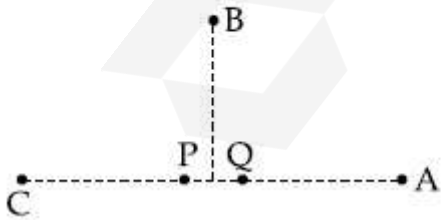
40503641599. दर्पण से 1 m, आभासी

40503641600. दर्पण से 1 m, वास्तविक

Question Number : 16 Question Id : 40503611471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In the figure below, P and Q are two equally intense coherent sources emitting radiation of wavelength 20 m. The separation between P and Q is 5 m and the phase of P is ahead of that of Q by 90°. A, B and C are three distinct points of observation, each equidistant from the midpoint of PQ. The intensities of radiation at A, B, C will be in the ratio :



Options :

40503641601. 2 : 1 : 0

40503641602. 0 : 1 : 4

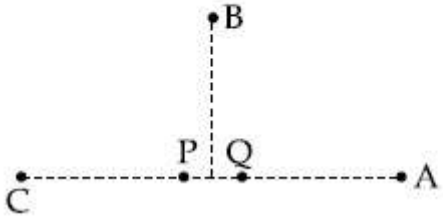
40503641603. $4:1:0$

40503641604. $0:1:2$

Question Number : 16 Question Id : 40503611471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाये अनुसार एक समान तीव्रता वाले कलासम्बद्ध स्रोत P तथा Q, 20 m तरंगदैर्घ्य का विकिरण उत्सर्जित करते हैं। P तथा Q के बीच की दूरी 5 m, है तथा P की कला Q की कला से 90° आगे है। PQ के मध्य बिन्दु से तीन बिन्दु A, B और C समान दूरी पर स्थित हैं। A, B तथा C पर विकिरण की तीव्रताओं का अनुपात होगा :



Options :

40503641601. $2:1:0$

40503641602. $0:1:4$

40503641603. $4:1:0$

40503641604. $0:1:2$

Question Number : 17 Question Id : 40503611472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An electron, a doubly ionized helium ion (He^{++}) and a proton are having the same kinetic energy. The relation between their respective de-Broglie wavelengths λ_e, $\lambda_{He^{++}}$ and λ_p is :

Options :

40503641605. $\lambda_e < \lambda_p < \lambda_{He^{++}}$

40503641606. $\lambda_e > \lambda_{He^{++}} > \lambda_p$

40503641607. $\lambda_e > \lambda_p > \lambda_{He^{++}}$

40503641608. $\lambda_e < \lambda_{He^{++}} = \lambda_p$

Question Number : 17 Question Id : 40503611472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक इलेक्ट्रॉन, एक द्वि आयनित हीलियम आयन (He^{++}) तथा एक प्रोटॉन की गतिज ऊर्जा समान हैं। उनकी दे-ब्रोग्ली तरंगदैर्घ्यों, λ_e, $\lambda_{He^{++}}$ तथा λ_p, के बीच सम्बन्ध है :

Options :

40503641605. $\lambda_e < \lambda_p < \lambda_{He^{++}}$

40503641606. $\lambda_e > \lambda_{He^{++}} > \lambda_p$

40503641607. $\lambda_e > \lambda_p > \lambda_{He^{++}}$

40503641608. $\lambda_e < \lambda_{He^{++}} = \lambda_p$

Question Number : 18 Question Id : 40503611473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

You are given that Mass of $^{7}_{3}\mathrm{Li} = 7.0160$ u,

Mass of $^{4}_{2}\mathrm{He} = 4.0026$ u

and Mass of $^{1}_{1}\mathrm{H} = 1.0079$ u.

When 20 g of $^{7}_{3}\mathrm{Li}$ is converted into $^{4}_{2}\mathrm{He}$ by proton capture, the energy liberated, (in kWh), is :

[Mass of nucleon $= 1$ GeV/c^2]

Options :

40503641609. 6.82×10^5

40503641610. 4.5×10^5

40503641611. 1.33×10^6

40503641612. 8×10^6

Question Number : 18 Question Id : 40503611473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिया है $^{7}_{3}\mathrm{Li}$ का द्रव्यमान $= 7.0160$ u,

$^{4}_{2}\mathrm{He}$ का द्रव्यमान $= 4.0026$ u

तथा $^{1}_{1}\mathrm{H}$ का द्रव्यमान $= 1.0079$ u.

जब 20 g $^{7}_{3}\mathrm{Li}$ को प्रोटॉन अभिग्रहण द्वारा $^{4}_{2}\mathrm{He}$ में बदला जाता है तो, kWh, में मुक्त ऊर्जा है :

[Mass of nucleon $= 1$ GeV/c^2]

Options :

40503641609. 6.82×10^5

40503641610. 4.5×10^5

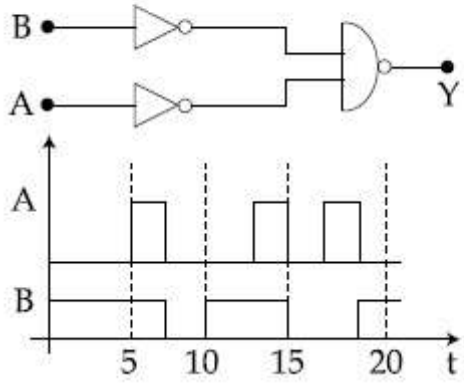
40503641611. 1.33×10^6

40503641612. 8×10^6

Question Number : 19 Question Id : 40503611474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

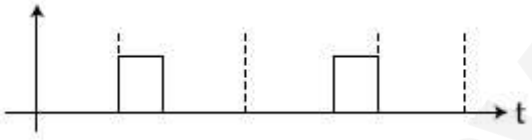
Correct Marks : 4 Wrong Marks : 1

Identify the correct output signal Y in the given combination of gates (as shown) for the given inputs A and B.



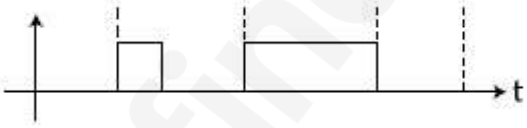
Options :

40503641613.

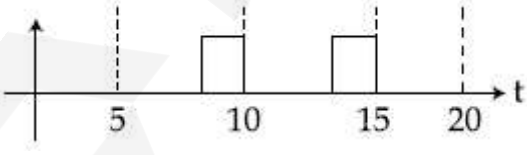


40503641614.

40503641615.



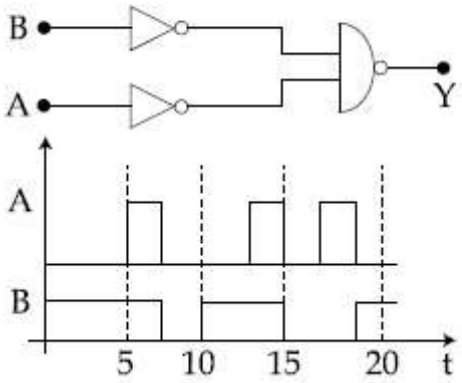
40503641616.



Question Number : 19 Question Id : 40503611474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

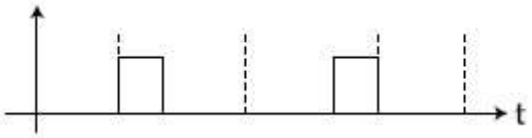
Correct Marks : 4 Wrong Marks : 1

(दिखाये अनुसार) दिये गये A और B निवेशों के लिए, दिये हुए गेट संयोजन में, निर्गत सिग्नल Y का सही मान ज्ञात कीजिए :

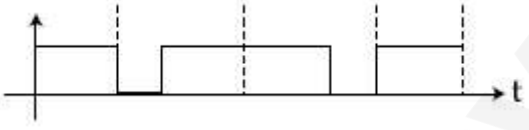


Options :

40503641613.



40503641614.



40503641615.

40503641616.

Question Number : 20 Question Id : 40503611475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A screw gauge has 50 divisions on its circular scale. The circular scale is 4 units ahead of the pitch scale marking, prior to use. Upon one complete rotation of the circular scale, a displacement of 0.5 mm is noticed on the pitch scale. The nature of zero error involved, and the least count of the screw gauge, are respectively :

Options :

40503641617. Positive, 10 μm

40503641618. Positive, 0.1 μm

40503641619. Negative, 2 μm

40503641620. Positive, 0.1 mm

Question Number : 20 Question Id : 40503611475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक स्क्रूगेज़ (पेंचमापी) के वृत्तीय पैमाने पर 50 भाग हैं। प्रयोग से पहले, वृत्तीय पैमाना पिच पैमाने के चिह्न से 4 इकाई आगे है। वृत्तीय पैमाने के एक पूरे चक्कर के बाद पिच पैमाने में 0.5 mm का विस्थापन देखा जाता है। संगत शून्य त्रुटि की प्रकृति तथा स्क्रूगेज़ का अल्पतमांक है :

Options :

40503641617. धनात्मक, 10 μm

40503641618. धनात्मक, 0.1 μm

40503641619. ऋणात्मक, 2 μm

40503641620. धनात्मक, 0.1 mm

Sub-Section Number : 2

Sub-Section Id : 405036804

Question Shuffling Allowed : Yes

Question Number : 21 Question Id : 40503611476 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

The density of a solid metal sphere is determined by measuring its mass and its diameter. The maximum error in the density of the sphere is $\left(\frac{x}{100}\right)$%. If the relative errors in measuring the mass and the diameter are 6.0% and 1.5% respectively, the 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 5.002

Question Number : 21 Question Id : 40503611476 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

ठोस धातु के एक गोले के घनत्व को उसके द्रव्यमान तथा व्यास के द्वारा ज्ञात करते हैं। यदि द्रव्यमान तथा व्यास के मापन में सापेक्ष त्रुटियाँ क्रमशः 6.0% और 1.5% हो तो गोले के व्यास में अधिकतम त्रुटि $\left(\frac{x}{100}\right)$% हैं, और x का मान हैं _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 22 Question Id : 40503611477 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Two bodies of the same mass are moving with the same speed, but in different directions in a plane. They have a completely inelastic collision and move together thereafter with a final speed which is half of their initial speed. The angle between the initial velocities of the two bodies (in degree) is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 22 Question Id : 40503611477 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

एक समान द्रव्यमान के दो पिण्ड किसी समतल में समान चाल से, किन्तु विभिन्न दिशाओं में, गतिमान हैं। उनका पूर्णतया अप्रत्यास्थ संघट्ट होता है और उसके पश्चात् वह दोनों एक साथ अपनी आरम्भिक चाल की आधी चाल से गतिमान होते हैं। दोनों पिण्डों के आरम्भिक वेगों के बीच कोण (डिग्री में) है _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 23 Question Id : 40503611478 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Initially a gas of diatomic molecules is contained in a cylinder of volume V_1 at a pressure P_1 and temperature 250 K. Assuming that 25% of the molecules get dissociated causing a change in number of moles. The pressure of the resulting gas at temperature 2000 K, when contained in a volume $2V_1$ is given by P_2. The ratio P_2/P_1 is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

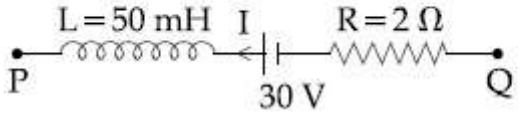
Question Number : 23 Question Id : 40503611478 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

दाब P_1 तथा तापमान 250 K पर आयतन V_1 के एक बेलन में द्विपरमाणुक अणु की एक गैस रखी गई है। यह मानते हुये कि अणुओं का वियोजन 25% है जिससे कि मोल की संख्या में परिवर्तन होता है, तब तापमान 2000 K पर $2V_1$ आयतन के एक पात्र में दाब P_2 है। अनुपात P_2/P_1 का मान है _____।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 24 Question Id : 40503611479 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

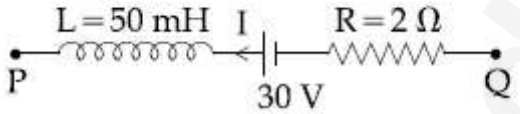
A part of a complete circuit is shown in the figure. At some instant, the value of current I is 1 A and it is decreasing at a rate of 10^2A s^{-1}. The value of the potential difference $V_P - V_Q$, (in volts) at that instant, is _____ .



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 24 Question Id : 40503611479 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

चित्र में किसी सम्पूर्ण परिपथ के एक भाग को दिखाया गया है। किसी क्षण, धारा I का मान 1 A है तथा यह 10^2A s^{-1} की दर से घट रही है। उसी क्षण, विभवान्तर $V_P - V_Q$ का मान (वोल्ट में) होगा_____.



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 25 Question Id : 40503611480 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Suppose that intensity of a laser is $\left(\frac{315}{\pi}\right)$ W/m^2. The rms electric field, in units of V/m associated with this source is close to the nearest integer is _____.
($\epsilon_0 = 8.86 \times 10^{-12}$ C^{2}Nm^{-2}; c = 3×10^8 ms^{-1})

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 25 Question Id : 40503611480 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

माना कि लेज़र प्रकाश की तीव्रता $\left(\frac{315}{\pi}\right)$ W/m^2 है। इस स्रोत के संगत rms विद्युत क्षेत्र का निकटतम मान V/m की इकाई में निकटतम पूर्णांक में हैं _____।
($\epsilon_0 = 8.86 \times 10^{-12}$ C^{2}Nm^{-2}; c = 3×10^8 ms^{-1})

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Chemistry

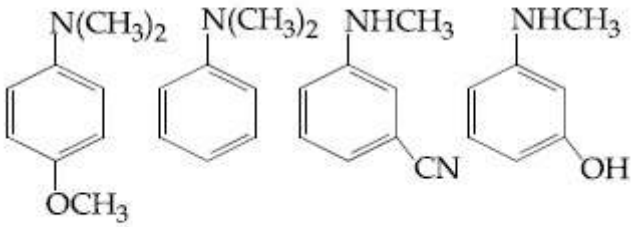
Section Id :	405036419
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25

Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036805
Question Shuffling Allowed :	Yes

Question Number : 26 Question Id : 40503611481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The increasing order of pK_b values of the following compounds is :



I II III IV

Options :

40503641626. $I < II < IV < III$

40503641627. $II < I < III < IV$

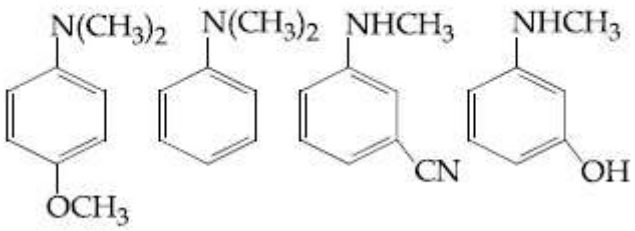
40503641628. $I < II < III < IV$

40503641629. $II < IV < III < I$

Question Number : 26 Question Id : 40503611481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न यौगिकों के pK_b के मान का बढ़ता क्रम है :



I II III IV

Options :

40503641626. $I < II < IV < III$

40503641627. $II < I < III < IV$

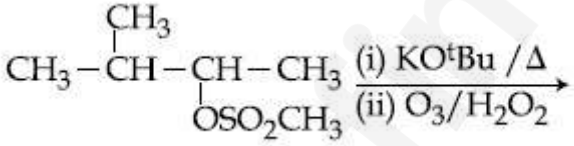
40503641628. $I < II < III < IV$

40503641629. $II < IV < III < I$

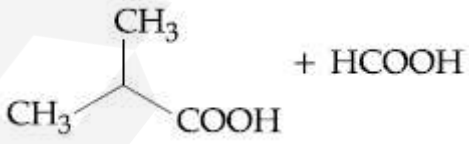
Question Number : 27 Question Id : 40503611482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

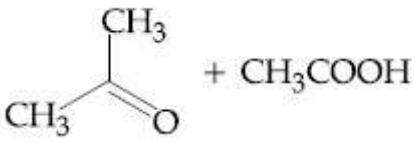
Correct Marks : 4 Wrong Marks : 1

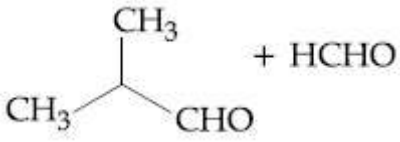
The major products of the following reaction are :

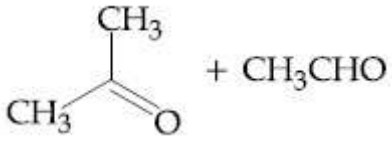


Options :

40503641630. 

40503641631. 

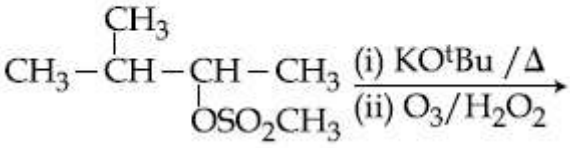
40503641632. 

40503641633. 

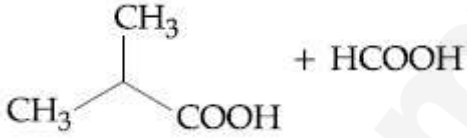
Question Number : 27 Question Id : 40503611482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

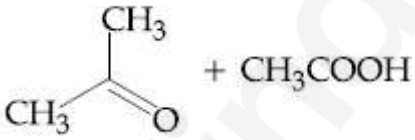
Correct Marks : 4 Wrong Marks : 1

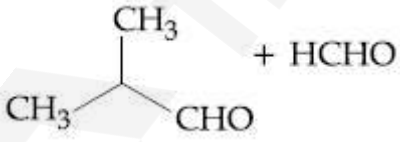
निम्न अभिक्रिया के मुख्य उत्पाद हैं :

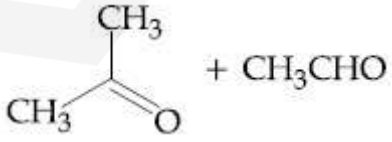


Options :

40503641630. 

40503641631. 

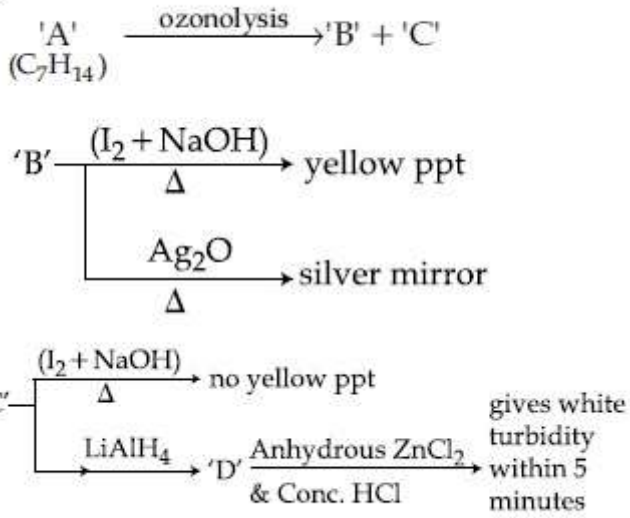
40503641632. 

40503641633. 

Question Number : 28 Question Id : 40503611483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

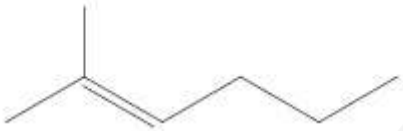
Consider the following reactions :

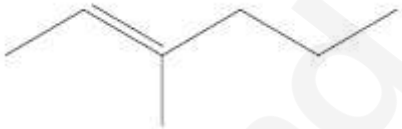


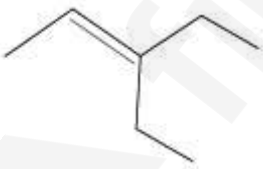
'A' is :

Options :

40503641634. 

40503641635. 

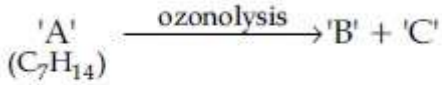
40503641636. 

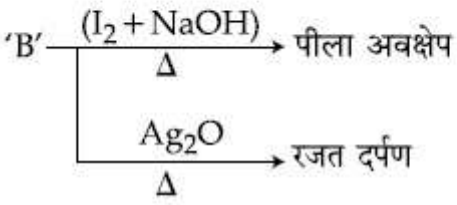
40503641637. 

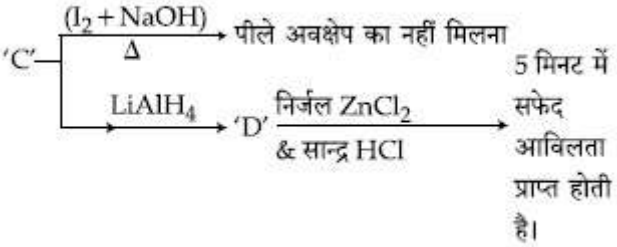
Question Number : 28 Question Id : 40503611483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रियाओं पर विचार कीजिए :



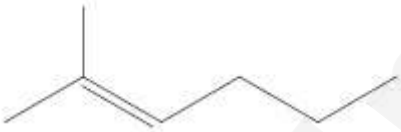




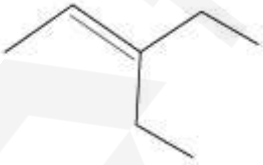
'A' है :

Options :

40503641634. 

40503641635. 

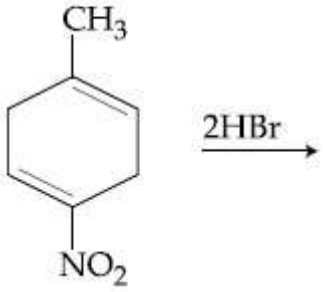
40503641636. 

40503641637. 

Question Number : 29 Question Id : 40503611484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

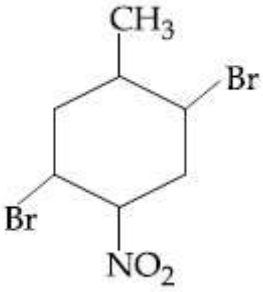
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

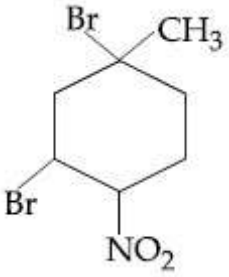


Options :

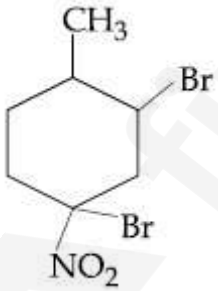
40503641638.



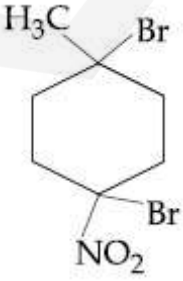
40503641639.



40503641640.



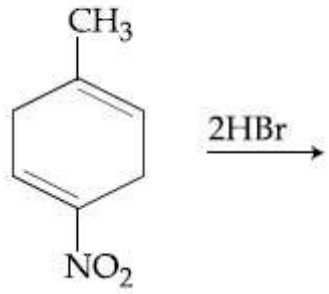
40503641641.



Question Number : 29 Question Id : 40503611484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

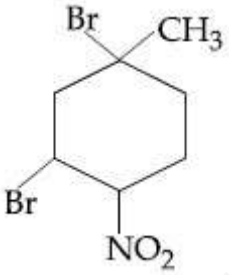
निम्न अभिक्रिया का मुख्य उत्पाद है :



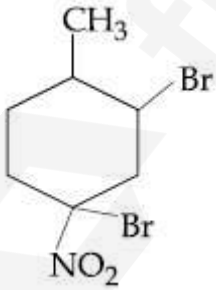
Options :

40503641638.

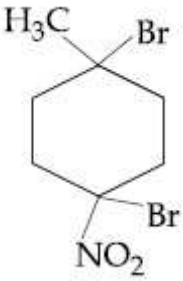
40503641639.



40503641640.



40503641641.



Question Number : 30 Question Id : 40503611485 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the Assertion and Reason given below.

Assertion (A) : Ethene polymerized in the presence of Ziegler Natta Catalyst at high temperature and pressure is used to make buckets and dustbins.

Reason (R) : High density polymers are closely packed and are chemically inert.

Choose the correct answer from the following :

Options :

40503641642. Both (A) and (R) are correct and (R) is the correct explanation of (A).

40503641643. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

40503641644. (A) is correct but (R) is wrong.

40503641645. (A) and (R) both are wrong.

Question Number : 30 Question Id : 40503611485 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे दिये गये **कथन** तथा **कारण** पर विचार कीजिए।

कथन (A) : उच्च ताप तथा दाब पर जिगलर-नाटा उत्प्रेरक की उपस्थिति में एथीन के बहुलकीकृत होने में प्राप्त पालीमर का उपयोग बकेट (बॉल्टी) तथा डस्टबिन के बनाने में होता है।

कारण (R) : उच्च घनत्व वाले पालीमर (बहुलक) संवृतता से संकुलित होते हैं तथा रासायनिक दृष्टि से उदासीन होते हैं।

निम्न में से सही उत्तर चुनिये :

Options :

40503641642. (A) तथा (R) दोनों सही हैं तथा (R), (A) की सही व्याख्या है।

40503641643. (A) तथा (R) दोनों ही सही हैं परन्तु (R), (A) की सही व्याख्या नहीं है।

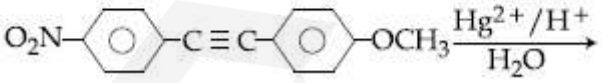
40503641644. (A) सही है परन्तु (R) गलत है।

40503641645. (A) तथा (R) दोनों ही गलत हैं।

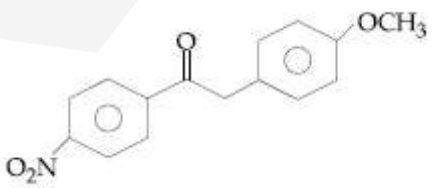
Question Number : 31 Question Id : 40503611486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

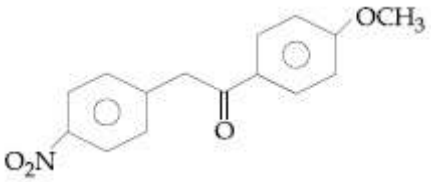
Correct Marks : 4 Wrong Marks : 1

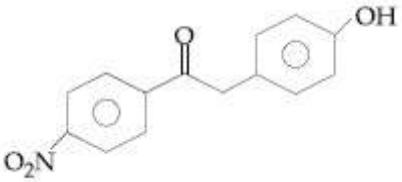
The major product obtained from the following reaction is :

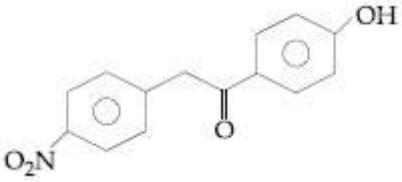


Options :

40503641646. 

40503641647. 

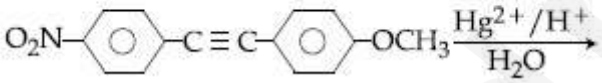
40503641648. 

40503641649. 

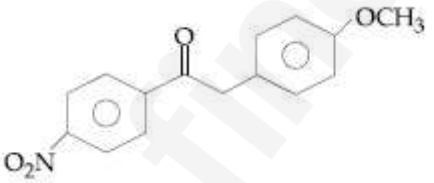
Question Number : 31 Question Id : 40503611486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

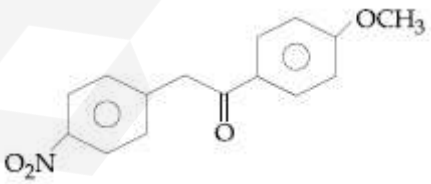
Correct Marks : 4 Wrong Marks : 1

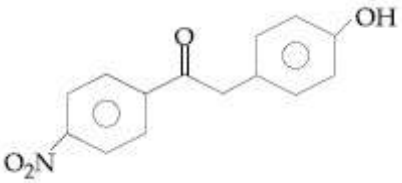
निम्न अभिक्रिया से प्राप्त होने वाला मुख्य उत्पाद है :

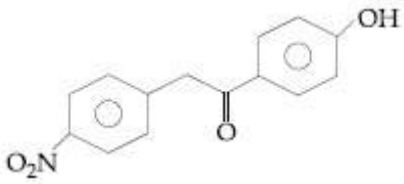


Options :

40503641646. 

40503641647. 

40503641648. 

40503641649. 

Question Number : 32 Question Id : 40503611487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following compounds shows geometrical isomerism ?

Options :

40503641650. 2-methylpent-1-ene

40503641651. 2-methylpent-2-ene

40503641652. 4-methylpent-1-ene

40503641653. 4-methylpent-2-ene

Question Number : 32 Question Id : 40503611487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सा यौगिक ज्यामितीय समावयवता प्रदर्शित करता है ?

Options :

40503641650. 2-मेथिलपेन्ट-1-ईन

40503641651. 2-मेथिलपेन्ट-2-ईन

40503641652. 4-मेथिलपेन्ट-1-ईन

40503641653. 4-मेथिलपेन्ट-2-ईन

Question Number : 33 Question Id : 40503611488 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The set that contains atomic numbers of only transition elements, is :

Options :

40503641654. 21, 25, 42, 72

40503641655. 9, 17, 34, 38

40503641656. 37, 42, 50, 64

40503641657. 21, 32, 53, 64

Question Number : 33 Question Id : 40503611488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह सेट जिसमें मात्र संक्रमण तत्वों की परमाणु संख्याओं का समावेश है, होगा :

Options :

40503641654. 21, 25, 42, 72

40503641655. 9, 17, 34, 38

40503641656. 37, 42, 50, 64

40503641657. 21, 32, 53, 64

Question Number : 34 Question Id : 40503611489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The INCORRECT statement is :

Options :

40503641658. bronze is an alloy of copper and tin.

40503641659. german silver is an alloy of zinc, copper and nickel.

40503641660. cast iron is used to manufacture wrought iron.

40503641661. brass is an alloy of copper and nickel.

Question Number : 34 Question Id : 40503611489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

गलत कथन है :

Options :

40503641658. ब्रांज, कॉपर तथा टिन की एक मिश्रातु है।

40503641659. जर्मन सिल्वर, जिंक, कॉपर तथा निकल का एक मिश्रातु है।

40503641660. राट आयरन (पिटवाँ लोहा) के निर्माण में कास्ट आयरन (ढलवाँ लोहा) प्रयुक्त होता है।

40503641661. ब्रास, कॉपर तथा निकल का एक मिश्रातु है।

Question Number : 35 Question Id : 40503611490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Among the sulphates of alkaline earth metals, the solubilities of $BeSO_4$ and $MgSO_4$ in water, respectively, are :

Options :

40503641662. high and high

40503641663. poor and high

40503641664. high and poor

40503641665. poor and poor

Question Number : 35 Question Id : 40503611490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्षारीय मृदा धातुओं के सल्फेट के बीच, जल में $BeSO_4$ तथा $MgSO_4$ की घुलनशीलता क्रमशः हैं :

Options :

40503641662. उच्च तथा उच्च

40503641663. अल्प तथा उच्च

40503641664. उच्च तथा अल्प

40503641665. अल्प तथा अल्प

Question Number : 36 Question Id : 40503611491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct statement with respect to dinitrogen is :

Options :

40503641666. liquid dinitrogen is not used in cryosurgery.

40503641667. it can be used as an inert diluent for reactive chemicals.

40503641668. it can combine with dioxygen at 25 °C.

40503641669. N_2 is paramagnetic in nature.

Question Number : 36 Question Id : 40503611491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

डाइनाइट्रोजन के संदर्भ में सही कथन होगा :

Options :

40503641666. द्रव डाइनाइट्रोजन का प्रयोग क्रायोसर्जरी (निम्नताप सर्जरी) में नहीं होता है।

40503641667. यह सक्रिय रसायनों के लिए एक निष्क्रिय तनुकारी के रूप में प्रयुक्त किया जा सकता है।

40503641668. यह 25 °C पर डाइऑक्सीजन के साथ संयोग कर सकता है।

40503641669. N_2 की प्रकृति अनुचुम्बकीय है।

Question Number : 37 Question Id : 40503611492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The lanthanoid that does NOT show +4 oxidation state is :

Options :

40503641670. Dy

40503641671. Eu

40503641672. Tb

40503641673. Ce

Question Number : 37 Question Id : 40503611492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह लैन्थन्वायड जो +4 आक्सीकरण अवस्था नहीं प्रदर्शित करता है, होगा :

Options :

40503641670. Dy

40503641671. Eu

40503641672. Tb

40503641673. Ce

Question Number : 38 Question Id : 40503611493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The species that has a spin-only magnetic moment of 5.9 BM, is :

(T_d = tetrahedral)

Options :

40503641674. $Ni(CO)_4$ (T_d)

40503641675. $[MnBr_4]^{2-}$ (T_d)

40503641676. $[NiCl_4]^{2-}$ (T_d)

40503641677. $[Ni(CN)_4]^{2-}$ (square planar)

Question Number : 38 Question Id : 40503611493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह स्पीशीज़ जिसमें 5.9 BM का स्पिन मात्र चुम्बकीय आघूर्ण है, होगी :

[T_d = (टेट्राहेड्रल) चतुष्फलकीय]

Options :

40503641674. $Ni(CO)_4$ (T_d)

40503641675. $[MnBr_4]^{2-}$ (T_d)

40503641676. $[NiCl_4]^{2-}$ (T_d)

40503641677. $[Ni(CN)_4]^{2-}$ (वर्ग समतली)

Question Number : 39 Question Id : 40503611494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The presence of soluble fluoride ion upto 1 ppm concentration in drinking water, is :

Options :

40503641678. safe for teeth

40503641679. harmful for teeth

40503641680. harmful to bones

40503641681. harmful to skin

Question Number : 39 Question Id : 40503611494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पेय जल में 1 ppm सान्द्रता के घुलनशील फ्लोराइड आयन की उपस्थिति होगी :

Options :

40503641678. दाँतों के लिए सुरक्षित

40503641679. दाँतों के लिए हानिकारक

40503641680. हड्डियों के लिए हानिकारक

40503641681. त्वचा के लिए हानिकारक

Question Number : 40 Question Id : 40503611495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A solution of two components containing n_1 moles of the 1st component and n_2 moles of the 2nd component is prepared. M_1 and M_2 are the molecular weights of component 1 and 2 respectively. If d is the density of the solution in g mL^{-1}, C_2 is the molarity and x_2 is the mole fraction of the 2nd component, then C_2 can be expressed as :

Options :

40503641682. $$C_2 = \frac{1000\, d\, x_2}{M_1 + x_2 (M_2 - M_1)}$$

40503641683. $$C_2 = \frac{d\, x_2}{M_2 + x_2 (M_2 - M_1)}$$

40503641684. $$C_2 = \frac{d\, x_1}{M_2 + x_2 (M_2 - M_1)}$$

40503641685. $$C_2 = \frac{1000\, x_2}{M_1 + x_2 (M_2 - M_1)}$$

Question Number : 40 Question Id : 40503611495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो अवयवों का एक विलयन है जो n_1 मोल प्रथम अवयव तथा n_2 मोल द्वितीय अवयव को मिलाकर तैयार किया गया है। अवयव 1 तथा अवयव 2 के अणुभार क्रमशः M_1 तथा M_2 है। यदि विलयन का घनत्व (g mL^{-1} में) d है तथा द्वितीय अवयव की मोलरता C_2 एवं मोल प्रभांश x_2 हो तो C_2 को इस प्रकार अभिव्यक्त कर सकते हैं :

Options :

40503641682. $$C_2 = \frac{1000\, d\, x_2}{M_1 + x_2 (M_2 - M_1)}$$

40503641683. $$C_2 = \frac{d\, x_2}{M_2 + x_2 (M_2 - M_1)}$$

40503641684. $$C_2 = \frac{d\, x_1}{M_2 + x_2 (M_2 - M_1)}$$

40503641685. $$C_2 = \frac{1000\, x_2}{M_1 + x_2 (M_2 - M_1)}$$

Question Number : 41 Question Id : 40503611496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The variation of equilibrium constant with temperature is given below :

Temperature	Equilibrium Constant
$T_1 = 25\ ^\circ C$	$K_1 = 10$
$T_2 = 100\ ^\circ C$	$K_2 = 100$

The values of ΔH°, ΔG° at T_1 and ΔG° at T_2 (in kJ mol^{-1}) respectively, are close to

[use $R = 8.314\ J\ K^{-1}\ mol^{-1}$]

Options :

40503641686. 0.64, −7.14 and −5.71

40503641687. 28.4, −5.71 and −14.29

40503641688. 28.4, −7.14 and −5.71

40503641689. 0.64, −5.71 and −14.29

Question Number : 41 Question Id : 40503611496 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ताप के साथ साम्य स्थिरांक का परिवर्तन नीचे दिया गया है :

ताप	साम्य स्थिरांक
$T_1 = 25\ ^\circ C$	$K_1 = 10$
$T_2 = 100\ ^\circ C$	$K_2 = 100$

ΔH°, T_1 पर ΔG° तथा T_2 पर ΔG° के मान ($kJ\ mol^{-1}$ में) क्रमश: निम्न के सन्निकट होंगे :

$[R = 8.314\ J\ K^{-1}\ mol^{-1}]$

Options :

40503641686. $0.64, -7.14$ तथा -5.71

40503641687. $28.4, -5.71$ तथा -14.29

40503641688. $28.4, -7.14$ तथा -5.71

40503641689. $0.64, -5.71$ तथा -14.29

Question Number : 42 Question Id : 40503611497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the reaction

$$Fe_2N(s) + \frac{3}{2}H_2(g) \rightleftharpoons 2\,Fe(s) + NH_3(g)$$

Options :

40503641690. $K_c = K_p(RT)^{-1/2}$

40503641691. $K_c = K_p(RT)^{1/2}$

40503641692. $K_c = K_p(RT)$

40503641693. $K_c = K_p(RT)^{3/2}$

Question Number : 42 Question Id : 40503611497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिक्रिया,

$Fe_2N(s) + \frac{3}{2}H_2(g) \rightleftharpoons 2\,Fe(s) + NH_3(g)$ के

लिए :

Options :

40503641690. $K_c = K_p(RT)^{-1/2}$

40503641691. $K_c = K_p(RT)^{1/2}$

40503641692. $K_c = K_p(RT)$

40503641693. $K_c = K_p(RT)^{3/2}$

Question Number : 43 Question Id : 40503611498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Arrange the following solutions in the decreasing order of pOH :

(A) 0.01 M HCl

(B) 0.01 M NaOH

(C) 0.01 M CH_3COONa

(D) 0.01 M NaCl

Options :

40503641694. (B) > (D) > (C) > (A)

40503641695. (B) > (C) > (D) > (A)

40503641696. (A) > (C) > (D) > (B)

40503641697. (A) > (D) > (C) > (B)

Question Number : 43 Question Id : 40503611498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न विलयनों को pOH के घटते क्रम में व्यवस्थित कीजिए।

(A) 0.01 M HCl

(B) 0.01 M NaOH

(C) 0.01 M CH_3COONa

(D) 0.01 M NaCl

Options :

40503641694. (B) > (D) > (C) > (A)

40503641695. (B) > (C) > (D) > (A)

40503641696. (A) > (C) > (D) > (B)

40503641697. (A) > (D) > (C) > (B)

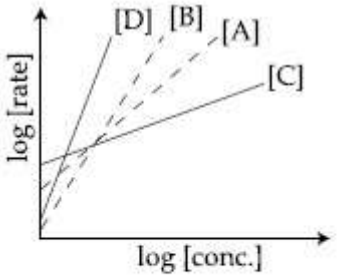
Question Number : 44 Question Id : 40503611499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the following reactions

$A \rightarrow P1\ ;\ B \rightarrow P2\ ;\ C \rightarrow P3\ ;\ D \rightarrow P4,$

The order of the above reactions are a, b, c, and d, respectively. The following graph is obtained when log[rate] vs. log[conc.] are plotted :



Among the following, the correct sequence for the order of the reactions is :

Options :

40503641698. $c > a > b > d$

40503641699. $d > a > b > c$

40503641700. $d > b > a > c$

40503641701. $a > b > c > d$

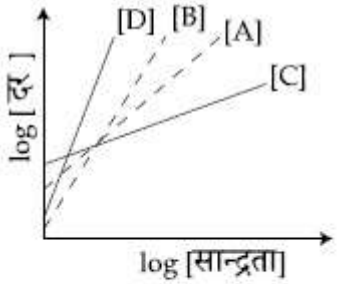
Question Number : 44 Question Id : 40503611499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया पर विचार कीजिए :

$A \rightarrow P1 ; B \rightarrow P2 ; C \rightarrow P3 ; D \rightarrow P4,$

उपरोक्त अभिक्रियाओं की कोटि क्रमश: a, b, c तथा d हैं। log[दर] विरुद्ध log[सान्द्रता] के प्लाट से निम्न ग्राफ प्राप्त होता है :



निम्न में से अभिक्रियाओं की कोटि के लिए सही क्रम होगा :

Options :

40503641698. $c > a > b > d$

40503641699. $d > a > b > c$

40503641700. $d > b > a > c$

40503641701. $a > b > c > d$

Question Number : 45 Question Id : 40503611500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Kraft temperature is the temperature :

Options :

40503641702. below which the formation of micelles takes place.

40503641703. above which the formation of micelles takes place.

40503641704. below which the aqueous solution of detergents starts freezing.

40503641705. above which the aqueous solution of detergents starts boiling.

Question Number : 45 Question Id : 40503611500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

क्राफ्ट ताप वह ताप है :

Options :

40503641702. जिसके नीचे मिसेल का निर्माण होता है।

40503641703. जिसके ऊपर मिसेल का निर्माण होता है।

40503641704. जिसके नीचे डिटरजेंट के जलीय विलयन का हिमन (जमना) प्रारंभ हो जाता है।

40503641705. जिसके ऊपर डिटरजेंट के जलीय विलयन का उबलना प्रारंभ हो जाता है।

Sub-Section Number : 2
Sub-Section Id : 405036806
Question Shuffling Allowed : Yes

Question Number : 46 Question Id : 40503611501 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

In an estimation of bromine by Carius method, 1.6 g of an organic compound gave 1.88 g of AgBr. The mass percentage of bromine in the compound is _____.

(Atomic mass, Ag = 108, Br = 80 g mol^{-1})

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

Question Number : 46 Question Id : 40503611501 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

कैरियस विधि द्वारा ब्रोमीन के एक आकलन में एक कार्बनिक यौगिक का 1.6 g, AgBr का 1.88 g देता है। यौगिक में ब्रोमीन की संहति प्रतिशतता है _____.

(Atomic mass, Ag = 108, Br = 80 g mol^{-1})

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 47 Question Id : 40503611502 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

The number of Cl = O bonds in perchloric acid is, "_____."

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 47 Question Id : 40503611502 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

परक्लोरिक ऐसिड में Cl = O आबन्धों की संख्या है _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

Question Number : 48 Question Id : 40503611503 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

A spherical balloon of radius 3 cm containing helium gas has a pressure of 48×10^{-3} bar. At the same temperature, the pressure, of a spherical balloon of radius 12 cm containing the same amount of gas will be _____ $\times 10^{-6}$ bar.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 48 Question Id : 40503611503 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

3 cm त्रिज्या के एक गोलीय गुब्बारे में 48×10^{-3} bar दाब पर हीलियम गैस भरी है। उसी ताप पर, 12 cm त्रिज्या के गोलीय गुब्बारे में उसी मात्रा की भरी हुई गैस का दाब (millibar में) होगा _____ $\times 10^{-6}$ bar.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 49 Question Id : 40503611504 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

The elevation of boiling point of 0.10 m aqueous $CrCl_3.xNH_3$ solution is two times that of 0.05 m aqueous $CaCl_2$ solution. The value of x is _____.

[Assume 100% ionisation of the complex and $CaCl_2$, coordination number of Cr as 6, and that all NH_3 molecules are present inside the coordination sphere]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 49 Question Id : 40503611504 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

0.10 m के जलीय $CrCl_3.xNH_3$ का क्वथनांक उन्नयन, 0.05 m के जलीय $CaCl_2$ विलयन के क्वथनांक उन्नयन का दोगुना है। x का मान है _____.

(संकर तथा $CaCl_2$ के आयनन को 100%, Cr की समन्वय संख्या 6 तथा NH_3 के सभी अणु समन्वय गोले के अंदर उपस्थित होनें को मानें)

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 50 Question Id : 40503611505 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Potassium chlorate is prepared by the electrolysis of KCl in basic solution

$6\,OH^- + Cl^- \rightarrow ClO_3^- + 3\,H_2O + 6\,e^-$

If only 60% of the current is utilized in the reaction, the time (rounded to the nearest hour) required to produce 10 g of $KClO_3$ using a current of 2 A is _____.

(Given : F = 96,500 C mol^{-1}; molar mass of $KClO_3$ = 122 g mol^{-1})

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 50 Question Id : 40503611505 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

क्षारीय विलयन में KCl के विद्युत अपघटन द्वारा पोटेशियम क्लोरेट को तैयार किया जाता है।

$6\,OH^- + Cl^- \rightarrow ClO_3^- + 3\,H_2O + 6\,e^-$

अभिक्रिया में मात्र 60% विद्युत धारा प्रयुक्त होती है। 2 A के विद्युत धारा का उपयोग करके 10 g $KClO_3$ को बनाने के लिए कितना समय (घंटों में) आवश्यक होगा _____.

(दिया गया है : F = 96,500 C mol^{-1}; $KClO_3$ का मोलर द्रव्यमान = 122 g mol^{-1})

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Mathematics

Section Id :	405036420
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036807
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 40503611506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The region represented by $\{z = x + iy \in C : |z| - \mathrm{Re}(z) \leq 1\}$ is also given by the inequality :

Options :

40503641711. $y^2 \leq x + \frac{1}{2}$

40503641712. $y^2 \leq 2\left(x + \frac{1}{2}\right)$

40503641713. $y^2 \geq x + 1$

40503641714. $y^2 \geq 2(x + 1)$

Question Number : 51 Question Id : 40503611506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\{z = x + iy \in C : |z| - \mathrm{Re}(z) \leq 1\}$ द्वारा निरूपित क्षेत्र निम्न में से किस असमता द्वारा भी दिया जाता है?

Options :

40503641711. $y^2 \leq x+\frac{1}{2}$

40503641712. $y^2 \leq 2\left(x+\frac{1}{2}\right)$

40503641713. $y^2 \geq x+1$

40503641714. $y^2 \geq 2(x+1)$

Question Number : 52 Question Id : 40503611507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If α and β be two roots of the equation $x^2-64x+256=0$. Then the value of $\left(\frac{\alpha^3}{\beta^5}\right)^{1/8}+\left(\frac{\beta^3}{\alpha^5}\right)^{1/8}$ is :

Options :

40503641715. 1

40503641716. 4

40503641717. 2

40503641718. 3

Question Number : 52 Question Id : 40503611507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि α तथा β, समीकरण $x^2-64x+256=0$ के दो मूल हैं, तो $\left(\frac{\alpha^3}{\beta^5}\right)^{1/8}+\left(\frac{\beta^3}{\alpha^5}\right)^{1/8}$ का मान है :

Options :

40503641715. 1

40503641716. 4

40503641717. 2

40503641718. 3

Question Number : 53 Question Id : 40503611508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The values of λ and μ for which the system of linear equations

$x+y+z=2$

$x+2y+3z=5$

$x+3y+\lambda z=\mu$

has infinitely many solutions are, respectively :

Options :

40503641719. 5 and 8

40503641720. 4 and 9

40503641721. 6 and 8

40503641722. 5 and 7

Question Number : 53 Question Id : 40503611508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

λ तथा μ के क्रमशः मान, जिनके लिए समीकरण निकाय

$x+y+z=2$

$x+2y+3z=5$

$x+3y+\lambda z=\mu$

के असंख्य हल हैं, हैं :

Options :

40503641719. 5 तथा 8

40503641720. 4 तथा 9

40503641721. 6 तथा 8

40503641722. 5 तथा 7

Question Number : 54 Question Id : 40503611509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let m and M be respectively the minimum and maximum values of

$$\begin{vmatrix} \cos^2 x & 1+\sin^2 x & \sin 2x \\ 1+\cos^2 x & \sin^2 x & \sin 2x \\ \cos^2 x & \sin^2 x & 1+\sin 2x \end{vmatrix}.$$

Then the ordered pair (m, M) is equal to :

Options :

40503641723. $(-3, -1)$

40503641724. $(-3, 3)$

40503641725. $(-4, -1)$

40503641726. $(1, 3)$

Question Number : 54 Question Id : 40503611509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना m तथा M

$$\begin{vmatrix} \cos^2 x & 1+\sin^2 x & \sin 2x \\ 1+\cos^2 x & \sin^2 x & \sin 2x \\ \cos^2 x & \sin^2 x & 1+\sin 2x \end{vmatrix}$$ के, क्रमश:

न्यूनतम तथा अधिकतम मान हैं, तो क्रमित युग्म (m, M) बराबर है :

Options :

40503641723. $(-3, -1)$

40503641724. $(-3, 3)$

40503641725. $(-4, -1)$

40503641726. $(1, 3)$

Question Number : 55 Question Id : 40503611510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two families with three members each and one family with four members are to be seated in a row. In how many ways can they be seated so that the same family members are not separated ?

Options :

40503641727. $(3!)^3 \cdot (4!)$

40503641728. $(3!)^2 \cdot (4!)$

40503641729. $3!\,(4!)^3$

40503641730. $2!\,3!\,4!$

Question Number : 55 Question Id : 40503611510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

तीन तीन सदस्यों वाले दो परिवारों तथा चार सदस्यों वाले एक परिवार के सदस्यों को एक पंक्ति में बिठाना है। उन्हें कितने तरीकों से बिठाया जा सकता है जबकि एक ही परिवार के सदस्य अलग न हों?

Options :

40503641727. $(3!)^3 \cdot (4!)$

40503641728. $(3!)^2 \cdot (4!)$

40503641729. $3!\,(4!)^3$

40503641730. $2!\,3!\,4!$

Question Number : 56 Question Id : 40503611511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If {p} denotes the fractional part of the number p, then $\left\{\frac{3^{200}}{8}\right\}$, is equal to :

Options :

40503641731. $\frac{3}{8}$

40503641732. $\frac{1}{8}$

40503641733. $\frac{5}{8}$

40503641734. $\frac{7}{8}$

Question Number : 56 Question Id : 40503611511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि {p}, संख्या p के भिन्नात्मक भाग (fractional part) को दर्शाता है, तो $\left\{\frac{3^{200}}{8}\right\}$, बराबर है :

Options :

40503641731. $\frac{3}{8}$

40503641732. $\frac{1}{8}$

40503641733. $\frac{5}{8}$

40503641734. $\frac{7}{8}$

Question Number : 57 Question Id : 40503611512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let a, b, c, d and p be any non zero distinct real numbers such that $(a^2+b^2+c^2)p^2 - 2(ab+bc+cd)p+(b^2+c^2+d^2)=0$. Then :

Options :

40503641735. a, b, c, d are in A.P.

40503641736. a, c, p are in G.P.

40503641737. a, b, c, d are in G.P.

40503641738. a, c, p are in A.P.

Question Number : 57 Question Id : 40503611512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि a, b, c, d तथा p कोई भी भिन्न अशून्य वास्तविक संख्याएँ हैं, कि
$(a^2+b^2+c^2)p^2-2(ab+bc+cd)p+(b^2+c^2+d^2)=0$, है, तो :

Options :

40503641735. a, b, c, d समांतर श्रेढ़ी में हैं।

40503641736. a, c, p गुणोत्तर श्रेढ़ी में हैं।

40503641737. a, b, c, d गुणोत्तर श्रेढ़ी में हैं।

40503641738. a, c, p समांतर श्रेढ़ी में हैं।

Question Number : 58 Question Id : 40503611513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $f(x+y)=f(x)\ f(y)$ and $\sum_{x=1}^{\infty} f(x)=2$, $x, y \in N$, where N is the set of all natural numbers, then the value of $\frac{f(4)}{f(2)}$ is :

Options :

40503641739. $\frac{2}{3}$

40503641740. $\frac{1}{3}$

40503641741. $\frac{1}{9}$

40503641742. $\frac{4}{9}$

Question Number : 58 Question Id : 40503611513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $f(x+y)=f(x)\,f(y)$ तथा $\sum_{x=1}^{\infty} f(x)=2$, x, $y\in N$ हैं, जहाँ N, सभी प्राकृत संख्याओं का समुच्चय है, तो $\frac{f(4)}{f(2)}$ का मान है :

Options :

40503641739. $\frac{2}{3}$

40503641740. $\frac{1}{3}$

40503641741. $\frac{1}{9}$

40503641742. $\frac{4}{9}$

Question Number : 59 Question Id : 40503611514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\lim_{x\to 1}\left(\frac{\int_0^{(x-1)^2} t\cos(t^2)\,dt}{(x-1)\sin(x-1)}\right)$$

Options :

40503641743. does not exist

40503641744. is equal to 1

40503641745. is equal to $\frac{1}{2}$

40503641746. is equal to $-\frac{1}{2}$

Question Number : 59 Question Id : 40503611514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\lim_{x\to 1}\left(\frac{\int_0^{(x-1)^2} t\cos(t^2)dt}{(x-1)\sin(x-1)}\right)$$

Options :

40503641743. का अस्तित्व नहीं है।

40503641744. 1 के बराबर है।

40503641745. $\frac{1}{2}$ के बराबर है।

40503641746. $-\frac{1}{2}$ के बराबर है।

Question Number : 60 Question Id : 40503611515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The position of a moving car at time t is given by $f(t)=at^2+bt+c$, $t>0$, where a, b and c are real numbers greater than 1. Then the average speed of the car over the time interval $[t_1,t_2]$ is attained at the point :

Options :

40503641747. $2a(t_1+t_2)+b$

40503641748. $(t_1+t_2)/2$

40503641749. $(t_2-t_1)/2$

40503641750. $a(t_2-t_1)+b$

Question Number : 60 Question Id : 40503611515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक गतिशील कार की t समय पर स्थिति (position) $f(t)=at^2+bt+c,\ t>0$ द्वारा दी गई है, जहाँ $a>1$, $b>1$ तथा $c>1$ वास्तविक संख्याएँ हैं, तो समय अंतराल $[t_1,t_2]$ में कार की औसत गति निम्न में से किस बिन्दु पर प्राप्त होती है?

Options :

40503641747. $2a(t_1+t_2)+b$

40503641748. $(t_1+t_2)/2$

40503641749. $(t_2-t_1)/2$

40503641750. $a(t_2-t_1)+b$

Question Number : 61 Question Id : 40503611516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $I_1=\int_0^1\left(1-x^{50}\right)^{100}dx$ and

$I_2=\int_0^1\left(1-x^{50}\right)^{101}dx$ such that $I_2=\alpha I_1$ then α equals to :

Options :

40503641751. $\frac{5050}{5051}$

40503641752. $\frac{5051}{5050}$

40503641753. $\frac{5049}{5050}$

40503641754. $\frac{5050}{5049}$

Question Number : 61 Question Id : 40503611516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $I_1=\int_0^1\left(1-x^{50}\right)^{100}dx$ तथा

$I_2=\int_0^1\left(1-x^{50}\right)^{101}dx$ हैं जिन के लिए $I_2=\alpha I_1$

है, तो α बराबर है :

Options :

40503641751. $\frac{5050}{5051}$

40503641752. $\frac{5051}{5050}$

40503641753. $\frac{5049}{5050}$

40503641754. $\frac{5050}{5049}$

Question Number : 62 Question Id : 40503611517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The area (in sq. units) of the region $A=\{(x, y):|x|+|y|\leq 1,\ 2y^2\geq|x|\}$ is :

Options :

40503641755. $\frac{5}{6}$

40503641756. $\frac{1}{6}$

40503641757. $\frac{1}{3}$

40503641758. $\frac{7}{6}$

Question Number : 62 Question Id : 40503611517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्षेत्र $A=\{(x, y):|x|+|y|\leq 1,\ 2y^2 \geq |x|\}$ का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

40503641755. $\frac{5}{6}$

40503641756. $\frac{1}{6}$

40503641757. $\frac{1}{3}$

40503641758. $\frac{7}{6}$

Question Number : 63 Question Id : 40503611518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The general solution of the differential equation $\sqrt{1+x^2+y^2+x^2y^2}+xy\frac{dy}{dx}=0$ is :

(where C is a constant of integration)

Options :

40503641759. $\sqrt{1+y^2}+\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1}\right)+C$

40503641760. $\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$

40503641761. $\sqrt{1+y^2}+\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$

40503641762. $\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1}\right)+C$

Question Number : 63 Question Id : 40503611518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अवकल समीकरण

$\sqrt{1+x^2+y^2+x^2y^2}+xy\frac{dy}{dx}=0$ का व्यापक

हल है :

(जहाँ C एक समाकलन अचर है)

Options :

40503641759. $\sqrt{1+y^2}+\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1}\right)+C$

40503641760. $\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$

40503641761. $\sqrt{1+y^2}+\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$

40503641762. $\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1}\right)+C$

Question Number : 64 Question Id : 40503611519 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A ray of light coming from the point $(2, 2\sqrt{3})$ is incident at an angle $30°$ on the line $x=1$ at the point A. The ray gets reflected on the line $x=1$ and meets x-axis at the point B. Then, the line AB passes through the point :

Options :

40503641763. $(4, -\sqrt{3})$

40503641764. $\left(4, -\frac{\sqrt{3}}{2}\right)$

40503641765. $\left(3, -\frac{1}{\sqrt{3}}\right)$

40503641766. $(3, -\sqrt{3})$

Question Number : 64 Question Id : 40503611519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$(2, 2\sqrt{3})$ से होकर आती हुई प्रकाश की एक किरण रेखा $x=1$ पर $30°$ के कोण पर बिन्दु A पर आपतित (incident) होती है तथा रेखा $x=1$ से प्रावर्तित हो कर x-अक्ष को बिंदु B पर मिलती है, तो रेखा AB निम्न में से किस बिन्दु से होकर जाती है :

Options :

40503641763. $(4, -\sqrt{3})$

40503641764. $\left(4, -\frac{\sqrt{3}}{2}\right)$

40503641765. $\left(3, -\frac{1}{\sqrt{3}}\right)$

40503641766. $(3, -\sqrt{3})$

Question Number : 65 Question Id : 40503611520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following points lies on the locus of the foot of perpendicular drawn upon any tangent to the ellipse, $\frac{x^2}{4}+\frac{y^2}{2}=1$ from any of its foci ?

Options :

40503641767. $(-1, \sqrt{3})$

40503641768. $(1, 2)$

40503641769. $(-1, \sqrt{2})$

40503641770. $(-2, \sqrt{3})$

Question Number : 65 Question Id : 40503611520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सा बिंदु, दीर्घवृत्त $\frac{x^2}{4}+\frac{y^2}{2}=1$ की किसी भी स्पर्श रेखा पर इसकी किसी एक नाभि से खींचे गए लंब के पाद के बिंदु पथ पर स्थित है?

Options :

40503641767. $(-1, \sqrt{3})$

40503641768. $(1, 2)$

40503641769. $(-1, \sqrt{2})$

40503641770. $(-2, \sqrt{3})$

Question Number : 66 Question Id : 40503611521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let L_1 be a tangent to the parabola $y^2=4(x+1)$ and L_2 be a tangent to the parabola $y^2=8(x+2)$ such that L_1 and L_2 intersect at right angles. Then L_1 and L_2 meet on the straight line :

Options :

40503641771. $x+2=0$

40503641772. $2x+1=0$

40503641773. $x+2y=0$

40503641774. $x+3=0$

Question Number : 66 Question Id : 40503611521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना L_1, परवलय $y^2=4(x+1)$ की एक स्पर्श रेखा है, तथा L_2, परवलय $y^2=8(x+2)$ की एक स्पर्श रेखा है। यदि L_1 तथा L_2 परस्पर लंबवत प्रतिच्छेदन करती हैं, तो वे निम्न में से जिस रेखा पर मिलती हैं, वह है :

Options :

40503641771. $x+2=0$

40503641772. $2x+1=0$

40503641773. $x+2y=0$

40503641774. $x+3=0$

Question Number : 67 Question Id : 40503611522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The shortest distance between the lines

$\frac{x-1}{0}=\frac{y+1}{-1}=\frac{z}{1}$ and $x+y+z+1=0$,

$2x-y+z+3=0$ is :

Options :

40503641775. 1

40503641776. $\frac{1}{\sqrt{2}}$

40503641777. $\frac{1}{\sqrt{3}}$

40503641778. $\frac{1}{2}$

Question Number : 67 Question Id : 40503611522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

रेखाओं $\frac{x-1}{0}=\frac{y+1}{-1}=\frac{z}{1}$ तथा $x+y+z+1=0$,

$2x-y+z+3=0$ के बीच की न्यूनतम दूरी है :

Options :

40503641775. 1

40503641776. $\frac{1}{\sqrt{2}}$

40503641777. $\frac{1}{\sqrt{3}}$

40503641778. $\frac{1}{2}$

Question Number : 68 Question Id : 40503611523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $\sum_{i=1}^{n}(x_i-a)=n$ and $\sum_{i=1}^{n}(x_i-a)^2=na$, $(n, a > 1)$ then the standard deviation of n observations $x_1, x_2, ..., x_n$ is :

Options :

40503641779. $\sqrt{n(a-1)}$

40503641780. $a-1$

40503641781. $\sqrt{a-1}$

40503641782. $n\sqrt{a-1}$

Question Number : 68 Question Id : 40503611523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\sum_{i=1}^{n}(x_i-a)=n$ तथा $\sum_{i=1}^{n}(x_i-a)^2=na$, $(n, a > 1)$ हैं, तो n प्रेक्षणों $x_1, x_2, ..., x_n$ का मानक विचलन है :

Options :

40503641779. $\sqrt{n(a-1)}$

40503641780. $a-1$

40503641781. $\sqrt{a-1}$

40503641782. $\sqrt[n]{a-1}$

Question Number : 69 Question Id : 40503611524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Out of 11 consecutive natural numbers if three numbers are selected at random (without repetition), then the probability that they are in A.P. with positive common difference, is :

Options :

40503641783. $\frac{15}{101}$

40503641784. $\frac{5}{33}$

40503641785. $\frac{5}{101}$

40503641786. $\frac{10}{99}$

Question Number : 69 Question Id : 40503611524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

11 क्रमागत प्राकृत संख्याओं में से यदि तीन संख्याएँ यादृच्छया बिना प्रतिस्थापना के निकाली जाती हैं तो इन तीन संख्याओं के समांतर श्रेढ़ी, जिनका सार्वअन्तर धनात्मक है, में होने की प्रायिकता है :

Options :

40503641783. $\frac{15}{101}$

40503641784. $\frac{5}{33}$

40503641785. $\frac{5}{101}$

40503641786. $\frac{10}{99}$

Question Number : 70 Question Id : 40503611525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The negation of the Boolean expression

$p \vee (\sim p \wedge q)$ is equivalent to :

Options :

40503641787. $\sim p \wedge \sim q$

40503641788. $\sim p \vee \sim q$

40503641789. $p \wedge \sim q$

40503641790. $\sim p \vee q$

Question Number : 70 Question Id : 40503611525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बूले के व्यंजक (Boolean expression)

$p \vee (\sim p \wedge q)$ का निषेधन (Negation) निम्न में से किसके तुल्य है?

Options :

40503641787. $\sim p \wedge \sim q$

40503641788. $\sim p \vee \sim q$

40503641789. $p \wedge \sim q$

40503641790. $\sim p \vee q$

Sub-Section Number : 2
Sub-Section Id : 405036808
Question Shuffling Allowed : Yes

Question Number : 71 Question Id : 40503611526 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Set A has m elements and Set B has n elements. If the total number of subsets of A is 112 more than the total number of subsets of B, then the value of m·n is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 71 Question Id : 40503611526 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

समुच्चय A में m अवयव हैं तथा समुच्चय B में n अवयव हैं। यदि A के सभी उपसमुच्चयों की संख्या, B के सभी उपसमुच्चयों की संख्या से 112 अधिक है, तो m·n का मान है _____।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 72 Question Id : 40503611527 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Let $f: \mathbf{R} \to \mathbf{R}$ be defined as

$$f(x)=\begin{cases} x^5 \sin\left(\frac{1}{x}\right)+5x^2, & x<0 \\ 0, & x=0 \\ x^5 \cos\left(\frac{1}{x}\right)+\lambda x^2, & x>0 \end{cases}$$

The value of λ for which $f''(0)$ exists, is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 72 Question Id : 40503611527 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

माना $f: \mathbf{R} \to \mathbf{R}$,

$$f(x)=\begin{cases} x^5 \sin\left(\frac{1}{x}\right)+5x^2, & x<0 \\ 0, & x=0 \\ x^5 \cos\left(\frac{1}{x}\right)+\lambda x^2, & x>0 \end{cases}$$

द्वारा परिभाषित है। λ का मान जिसके लिए $f''(0)$ का अस्तित्व है, है _____।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 73 Question Id : 40503611528 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Let AD and BC be two vertical poles at A and B respectively on a horizontal ground. If AD = 8 m, BC = 11 m and AB = 10 m; then the distance (in meters) of a point M on AB from the point A such that $MD^2 + MC^2$ is minimum is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 73 Question Id : 40503611528 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

माना AD तथा BC, क्षैतिज समतल भूमि पर क्रमशः A तथा B पर सीधे खड़े दो खम्भे हैं। यदि AD = 8 मी., BC = 11 मी. तथा AB = 10 मी. है, तो AB पर स्थित एक बिंदु M की, बिंदु A से वह दूरी (मीटरों में) जिसके लिए $MD^2 + MC^2$ का मान न्यूनतम है, है _____।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 74 Question Id : 40503611529 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

If $\vec{a}$ and $\vec{b}$ are unit vectors, then the greatest value of $\sqrt{3}\left|\vec{a}+\vec{b}\right|+\left|\vec{a}-\vec{b}\right|$ is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes

Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 74 Question Id : 40503611529 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

यदि $\vec{a}$ तथा $\vec{b}$ एकक सदिश हैं, तो $\sqrt{3}\left|\vec{a}+\vec{b}\right|+\left|\vec{a}-\vec{b}\right|$ का अधिकतम मान है _____ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 75 Question Id : 40503611530 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

The angle of elevation of the top of a hill from a point on the horizontal plane passing through the foot of the hill is found to be 45°. After walking a distance of 80 meters towards the top, up a slope inclined at an angle of 30° to the horizontal plane, the angle of elevation of the top of the hill becomes 75°. Then the height of the hill (in meters) is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 75 Question Id : 40503611530 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

एक पहाड़ की चोटी का इसके पाद से हो कर जाने वाले क्षैतिज समतल पर स्थित एक बिंदु पर उन्नयन कोण 45° पाया गया। इस बिंदु से क्षैतिज तल से 30° का कोण बनाते हुए तल पर पहाड़ की चोटी की ओर 80 मीटर चलने के बाद चोटी का उन्नयन कोण 75° हो जाता है, तो पहाड़ की ऊँचाई (मीटरों में) है _____।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002