National Testing Agency

Question Paper Name :	BTECH E 5th Sep 2020 Shift 1
Subject Name :	BTECH E
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Actual Answer Key :	Yes

BTECH

Group Number :	1
Group Id :	405036130
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 :	405036430
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 :	405036827
Question Shuffling Allowed :	Yes

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Question Number : 1 Question Id : 40503611756 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 physical quantity z depends on four observables a, b, c and d, as $z = \frac{a^2 b^{\frac{2}{3}}}{\sqrt{c}\, d^3}$.

The percentages of error in the measurement of a, b, c and d are 2%, 1.5%, 4% and 2.5% respectively. The percentage of error in z is :

Options :

40503642561. 12.25%

40503642562. 14.5%

40503642563. 13.5%

40503642564. 16.5%

Question Number : 1 Question Id : 40503611756 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 भौतिक राशि z का चार अन्य राशियों a, b, c तथा d से सम्बन्ध $z = \frac{a^2 b^{\frac{2}{3}}}{\sqrt{c}\, d^3}$ है। राशि a, b, c तथा d के मापन में प्रतिशत त्रुटियाँ क्रमशः 2%, 1.5%, 4% तथा 2.5% हैं। z में प्रतिशत त्रुटि का मान होगा :

Options :

40503642561. 12.25%

40503642562. 14.5%

40503642563. 13.5%

40503642564. 16.5%

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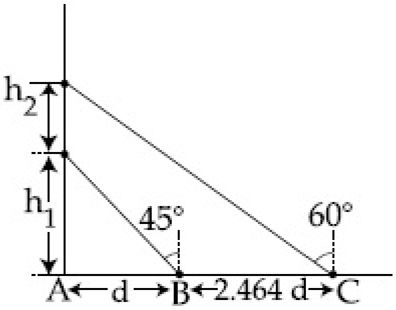
Question Number : 2 Question Id : 40503611757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A balloon is moving up in air vertically above a point A on the ground. When it is at a height h_1, a girl standing at a distance d (point B) from A (see figure) sees it at an angle 45° with respect to the vertical. When the balloon climbs up a further height h_2, it is seen at an angle 60° with respect to the vertical if the girl moves further by a distance 2.464 d (point C). Then the height h_2 is (given $\tan 30° = 0.5774$) :



Options :

40503642565. 1.464 d

40503642566. 0.732 d

40503642567. 0.464 d

40503642568. d

Question Number : 2 Question Id : 40503611757 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

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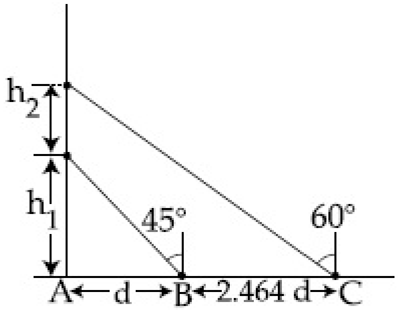
धरती पर बिन्दु A से ऊर्ध्वाधर ऊपर की ओर वायु में एक गुब्बारा गतिशील है। जब गुब्बारा ऊँचाई h_1 पर है तब A से d दूरी (बिन्दु B) पर खड़ी एक लड़की को ऊर्ध्व से 45° के कोण पर वह दिखाई देता है (चित्र देखें)। जब गुब्बारा अतिरिक्त ऊँचाई h_2 तय करता है, तब लड़की को 2.464 d अतिरिक्त दूरी (बिन्दु C) तय करने पर गुब्बारा ऊर्ध्व से 60° पर दिखाई देता है। ऊँचाई h_2 का मान है :
(दिया है : $\tan 30° = 0.5774$)



Options :

40503642565. 1.464 d

40503642566. 0.732 d

40503642567. 0.464 d

40503642568. d

Question Number : 3 Question Id : 40503611758 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 helicopter rises from rest on the ground vertically upwards with a constant acceleration g. A food packet is dropped from the helicopter when it is at a height h. The time taken by the packet to reach the ground is close to [g is the acceleration due to gravity] :

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Options :

40503642569. $t = 1.8\sqrt{\frac{h}{g}}$

40503642570. $t = \sqrt{\frac{2h}{3g}}$

40503642571. $t = 3.4\sqrt{\left(\frac{h}{g}\right)}$

40503642572. $t = \frac{2}{3}\sqrt{\left(\frac{h}{g}\right)}$

Question Number : 3 Question Id : 40503611758 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

विरामावस्था से एक हैलीकॉप्टर धरती से ऊपर की तरफ एक स्थिर त्वरण g से उठता है। जब हैलीकॉप्टर h ऊँचाई पर पहुँचता है तो उससे एक खाने के पैकेट को छोड़ा जाता है। इस पैकेट को धरती पर पहुँचने में लगे समय का मान होगा : (यहाँ g गुरुत्वीय त्वरण है)

Options :

40503642569. $t = 1.8\sqrt{\frac{h}{g}}$

40503642570. $t = \sqrt{\frac{2h}{3g}}$

40503642571. $t = 3.4\sqrt{\left(\frac{h}{g}\right)}$

40503642572. $t = \frac{2}{3}\sqrt{\left(\frac{h}{g}\right)}$

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Question Number : 4 Question Id : 40503611759 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 wheel is rotating freely with an angular speed ω on a shaft. The moment of inertia of the wheel is I and the moment of inertia of the shaft is negligible. Another wheel of moment of inertia 3I initially at rest is suddenly coupled to the same shaft. The resultant fractional loss in the kinetic energy of the system is :

Options :

40503642573. $\frac{1}{4}$

40503642574. $\frac{3}{4}$

40503642575. $\frac{5}{6}$

40503642576. 0

Question Number : 4 Question Id : 40503611759 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 शाफ्ट पर एक पहिया एक कोणीय गति ω से घूर्णित हो रहा है। पहिये का जड़त्व आघूर्ण I है तथा शाफ्ट का जड़त्व आघूर्ण नगण्य है। 3I जड़त्व आघूर्ण के दूसरे पहिये को जो कि प्रारम्भ में स्थिर अवस्था में हैं, अचानक उसी शाफ्ट से जोड़ दिया जाता है। इस निकाय की गतिज ऊर्जा में हुई भिन्नात्मक (fractional) क्षय का मान होगा :

Options :

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40503642573. $\frac{1}{4}$

40503642574. $\frac{3}{4}$

40503642575. $\frac{5}{6}$

40503642576. 0

Question Number : 5 Question Id : 40503611760 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 value of the acceleration due to gravity is g_1 at a height $h = \frac{R}{2}$ (R = radius of the earth) from the surface of the earth. It is again equal to g_1 at a depth d below the surface of the earth. The ratio $\left(\frac{d}{R}\right)$ equals :

Options :

40503642577. $\frac{1}{3}$

40503642578. $\frac{4}{9}$

40503642579. $\frac{5}{9}$

40503642580. $\frac{7}{9}$

Question Number : 5 Question Id : 40503611760 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

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पृथ्वी की सतह से ऊँचाई $h = \frac{R}{2}$ (R= पृथ्वी की त्रिज्या) पर गुरुत्वीय त्वरण का मान g_1 है। यदि पृथ्वी की सतह से गहराई d पर भी इसका मान फिर से g_1 पाया जाता है, तो $\left(\frac{d}{R}\right)$ का मान होगा :

Options :

40503642577. $\frac{1}{3}$

40503642578. $\frac{4}{9}$

40503642579. $\frac{5}{9}$

40503642580. $\frac{7}{9}$

Question Number : 6 Question Id : 40503611761 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 bullet of mass 5 g, travelling with a speed of 210 m/s, strikes a fixed wooden target. One half of its kinetic energy is converted into heat in the bullet while the other half is converted into heat in the wood. The rise of temperature of the bullet if the specific heat of its material is 0.030 cal/(g – °C) (1 cal = 4.2×10^7 ergs) close to :

Options :

40503642581. 119.2°C

40503642582. 38.4°C

40503642583. 87.5°C

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40503642584. 83.3°C

Question Number : 6 Question Id : 40503611761 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

210 m/s की चाल से गतिशील एक 5 g की गोली एक लकड़ी के दृढ़ लक्ष्य से टकराती है। गोली की आधी गतिज ऊर्जा गोली में ऊष्मा के रूप में तथा बाकी आधी, लकड़ी में ऊष्मा के रूप में परिवर्तित हो जाती है। यदि गोली के पदार्थ की विशिष्ट ऊष्मा 0.030 cal/(g−°C) है, तो गोली के तापमान में वृद्धि का मान लगभग होगा : (दिया है : 1 cal $= 4.2 \times 10^7$ अर्ग)

Options :

40503642581. 119.2°C

40503642582. 38.4°C

40503642583. 87.5°C

40503642584. 83.3°C

Question Number : 7 Question Id : 40503611762 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 hollow spherical shell at outer radius R floats just submerged under the water surface. The inner radius of the shell is r. If the specific gravity of the shell material is $\frac{27}{8}$ w.r.t water, the value of r is :

Options :

40503642585. $\frac{2}{3}R$

40503642586. $\frac{4}{9}R$

40503642587. $\frac{1}{3}R$

40503642588. $\frac{8}{9}R$

Question Number : 7 Question Id : 40503611762 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

बाहरी त्रिज्या R का एक खोखला गोलीय कोश पानी की सतह से ठीक नीचे तैरता है। कोश की आंतरिक त्रिज्या r है। यदि कोश के पदार्थ का विशिष्ट घनत्व जल के सापेक्ष $\frac{27}{8}$ हैं, तब r का मान होगा :

Options :

40503642585. $\frac{2}{3}R$

40503642586. $\frac{4}{9}R$

40503642587. $\frac{1}{3}R$

40503642588. $\frac{8}{9}R$

Question Number : 8 Question Id : 40503611763 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

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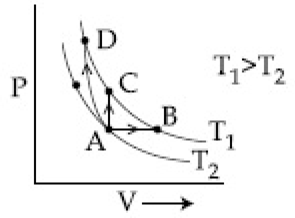
Three different processes that can occur in an ideal monoatomic gas are shown in the P vs V diagram. The paths are labelled as $A \rightarrow B$, $A \rightarrow C$ and $A \rightarrow D$. The change in internal energies during these process are taken as E_{AB}, E_{AC} and E_{AD} and the workdone as W_{AB}, W_{AC} and W_{AD}.

The correct relation between these parameters are :



Options :

40503642589. $E_{AB} = E_{AC} = E_{AD}$, $W_{AB} > 0$, $W_{AC} = 0$, $W_{AD} > 0$

40503642590. $E_{AB} = E_{AC} < E_{AD}$, $W_{AB} > 0$, $W_{AC} = 0$, $W_{AD} < 0$

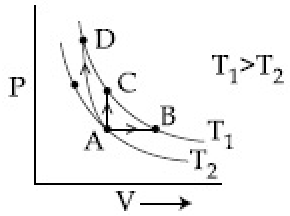
40503642591. $E_{AB} < E_{AC} < E_{AD}$, $W_{AB} > 0$, $W_{AC} > W_{AD}$

40503642592. $E_{AB} > E_{AC} > E_{AD}$, $W_{AB} < W_{AC} < W_{AD}$

Question Number : 8 Question Id : 40503611763 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 विभिन्न प्रक्रियायें, जो कि एक आदर्श एकपरमाणुक गैस में घट सकती हैं, P vs V चित्र में दर्शायी गई हैं। पथों को $A \rightarrow B$, $A \rightarrow C$ एवं $A \rightarrow D$ से चिन्हित किया गया है। इन प्रक्रियाओं में हुआ आन्तरिक ऊर्जा में परिवर्तन E_{AB}, E_{AC} एवं E_{AD} से और किया गया कार्य W_{AB}, W_{AC} एवं W_{AD} से दिया जाता है।
इन प्राचलों के बीच सही सम्बन्ध है :



Options :

40503642589. $E_{AB}=E_{AC}=E_{AD}$, $W_{AB}>0$, $W_{AC}=0$, $W_{AD}>0$

40503642590. $E_{AB}=E_{AC}<E_{AD}$, $W_{AB}>0$, $W_{AC}=0$, $W_{AD}<0$

40503642591. $E_{AB}<E_{AC}<E_{AD}$, $W_{AB}>0$, $W_{AC}>W_{AD}$

40503642592. $E_{AB}>E_{AC}>E_{AD}$, $W_{AB}<W_{AC}<W_{AD}$

Question Number : 9 Question Id : 40503611764 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

Number of molecules in a volume of 4 cm^3 of a perfect monoatomic gas at some temperature T and at a pressure of 2 cm of mercury is close to ? (Given, mean kinetic energy of a molecule (at T) is 4×10^{-14} erg, $g=980$ cm/s^2, density of mercury $=13.6$ g/cm^3)

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Options :

40503642593. 5.8×10^{16}

40503642594. 4.0×10^{16}

40503642595. 5.8×10^{18}

40503642596. 4.0×10^{18}

Question Number : 9 Question Id : 40503611764 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

T तापमान तथा 2 cm पारे की ऊँचाई के दबाव पर, 4 cm^3 आयतन में रखी एक एकपरमाणुक आदर्श गैस में अणुओं की संख्या लगभग क्या होगी?

(दिया है : T तापमान पर एक अणु की औसत गतिज ऊर्जा $= 4 \times 10^{-14}$ erg, $g = 980\ cm/s^2$ और पारे का घनत्व $= 13.6\ g/cm^3$)

Options :

40503642593. 5.8×10^{16}

40503642594. 4.0×10^{16}

40503642595. 5.8×10^{18}

40503642596. 4.0×10^{18}

Question Number : 10 Question Id : 40503611765 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

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Assume that the displacement (s) of air is proportional to the pressure difference (Δp) created by a sound wave. Displacement (s) further depends on the speed of sound (v), density of air (ρ) and the frequency (f). If $\Delta p \sim 10$Pa, $v \sim 300$ m/s, $\rho \sim 1$ kg/m^3 and $f \sim 1000$ Hz, then s will be of the order of (take the multiplicative constant to be 1)

Options :

40503642597. 10 mm

40503642598. 1 mm

40503642599. $\frac{1}{10}$ mm

40503642600. $\frac{3}{100}$ mm

Question Number : 10 Question Id : 40503611765 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

मान लें हवा का विस्थापन (s), एक ध्वनि तरंग द्वारा बनाये गये दाबांतर (Δp) के समानुपाती है। यह विस्थापन (s) ध्वनि तरंग की चाल (v), हवा के घनत्व (ρ) एवं आवृत्ति (f) पर भी निर्भर करता है। यदि $\Delta p \sim 10$Pa, $v \sim 300$ m/s, $\rho \sim 1$ kg/m^3 तथा $f \sim 1000$ Hz तो s का कोटिमान होगा : (गुणक नियतांक का मान 1 लीजिये)

Options :

40503642597. 10 mm

40503642598. 1 mm

40503642599. $\frac{1}{10}$ mm

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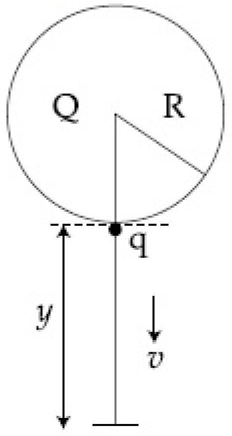
40503642600. $\frac{3}{100}$ mm

Question Number : 11 Question Id : 40503611766 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 solid sphere of radius R carries a charge Q + q distributed uniformly over its volume. A very small point like piece of it of mass m gets detached from the bottom of the sphere and falls down vertically under gravity. This piece carries charge q. If it acquires a speed v when it has fallen through a vertical height y (see figure), then : (assume the remaining portion to be spherical).



Options :

40503642601. $v^2 = y\left[\frac{qQ}{4\pi\epsilon_0 R(R+y)m} + g\right]$

40503642602. $v^2 = 2y\left[\frac{Qq\,R}{4\pi\epsilon_0 (R+y)^3 m} + g\right]$

40503642603. $v^2 = 2y\left[\frac{qQ}{4\pi\epsilon_0 R(R+y)m} + g\right]$

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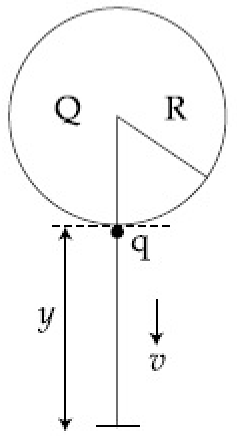
$$v^2 = y\left[\frac{qQ}{4\pi\epsilon_0 R^2 y m} + g\right]$$
40503642604.

Question Number : 11 Question Id : 40503611766 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

त्रिज्या R के एक ठोस गोले पर आवेश $Q+q$ सम्पूर्ण आयतन पर एकसमान रूप से वितरित है। द्रव्यमान m का एक अत्यंत बिन्दु समान छोटा टुकड़ा इस गोले की तली से अलग होकर गुरुत्वीय क्षेत्र के अंतर्गत ऊर्ध्वाधर नीचे गिरता है। इस टुकड़े पर आवेश q है। यदि ऊर्ध्वाधर ऊँचाई y से गिरने पर इस टुकड़े की चाल v हो जाती है (चित्र देखिये) तो : (मान लें शेष भाग गोलीय हैं)



Options :

$$v^2 = y\left[\frac{qQ}{4\pi\epsilon_0 R(R+y)m} + g\right]$$
40503642601.

$$v^2 = 2y\left[\frac{Qq\,R}{4\pi\epsilon_0 (R+y)^3 m} + g\right]$$
40503642602.

$$v^2 = 2y\left[\frac{qQ}{4\pi\epsilon_0 R(R+y)m} + g\right]$$
40503642603.

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40503642604. $v^2 = y\left[\frac{qQ}{4\pi\epsilon_0 R^2 ym} + g\right]$

Question Number : 12 Question Id : 40503611767 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 capacitors of capacitances C and 2C are charged to potential differences V and 2V, respectively. These are then connected in parallel in such a manner that the positive terminal of one is connected to the negative terminal of the other. The final energy of this configuration is :

Options :

40503642605. zero

40503642606. $\frac{3}{2}CV^2$

40503642607. $\frac{25}{6}CV^2$

40503642608. $\frac{9}{2}CV^2$

Question Number : 12 Question Id : 40503611767 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

धारिता C तथा 2C के दो संधारित्रों को क्रमशः V तथा 2V विभवान्तर तक आवेशित किया जाता है। तत्पश्चात इन दोनों को इस तरह समांतर क्रम में जोड़ते हैं कि एक का धनात्मक सिरा दूसरे के ऋणात्मक सिरे से जुड़ जाता है। इस विन्यास की अंतिम ऊर्जा होगी :

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Options :

40503642605. शून्य

40503642606. $\frac{3}{2}$ CV^2

40503642607. $\frac{25}{6}$ CV^2

40503642608. $\frac{9}{2}$ CV^2

Question Number : 13 Question Id : 40503611768 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 electrical power line, having a total resistance of 2 Ω, delivers 1 kW at 220 V. The efficiency of the transmission line is approximately :

Options :

40503642609. 96%

40503642610. 85%

40503642611. 91%

40503642612. 72%

Question Number : 13 Question Id : 40503611768 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 विद्युतशक्ति संचरण लाइन, जिसका कुल प्रतिरोध 2 Ω है, 220 V पर 1 kW शक्ति दे रही है। इस संचरण लाइन की दक्षता लगभग होगी :

Options :

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40503642609. 96%

40503642610. 85%

40503642611. 91%

40503642612. 72%

Question Number : 14 Question Id : 40503611769 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 galvanometer of resistance G is converted into a voltmeter of range $0-1V$ by connecting a resistance R_1 in series with it. The additional resistance that should be connected in series with R_1 to increase the range of the voltmeter to $0-2V$ will be :

Options :

40503642613. G

40503642614. $R_1 - G$

40503642615. R_1

40503642616. $R_1 + G$

Question Number : 14 Question Id : 40503611769 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

G प्रतिरोध के एक गैल्वेनोमीटर को श्रेणीक्रम में प्रतिरोध R_1 लगाकर एक $0-1V$ परास के विभवमापी में बदला जाता है। इस विभवमापी की परास को $0-2V$ बनाने के लिए R_1 के श्रेणीक्रम में लगाने वाले अतिरिक्त प्रतिरोध का मान होगा :

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Options :

40503642613. G

40503642614. $R_1 - G$

40503642615. R_1

40503642616. $R_1 + G$

Question Number : 15 Question Id : 40503611770 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 square loop of side 2a, and carrying current I, is kept in XZ plane with its centre at origin. A long wire carrying the same current I is placed parallel to the z-axis and passing through the point (0, b, 0), (b > > a). The magnitude of the torque on the loop about z-axis is given by :

Options :

40503642617. $\frac{2\mu_o I^2 a^2}{\pi b}$

40503642618. $\frac{2\mu_o I^2 a^3}{\pi b^2}$

40503642619. $\frac{\mu_o I^2 a^3}{2\pi b^2}$

40503642620. $\frac{\mu_o I^2 a^2}{2\pi b}$

Question Number : 15 Question Id : 40503611770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

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Correct Marks : 4 Wrong Marks : 1

भुजाओं 2a वाले एक वर्गीय पाश, जिसमें धारा I बह रही हैं, को XZ समतल में मूल बिंदु पर केन्द्रित करके रखा गया है। एक लंबा तार, जिसमें भी धारा I बह रही है, को z-अक्ष के समांतर रखा गया है जिससे वह तार बिंदु (0, b, 0) से होकर गुजरता है (b > > a)। z-अक्ष के परित: पाश पर लगने वाले बल आघूर्ण का परिमाण इससे दिया जायेगा :

Options :

40503642617. $\dfrac{2\mu_o I^2 a^2}{\pi b}$

40503642618. $\dfrac{2\mu_o I^2 a^3}{\pi b^2}$

40503642619. $\dfrac{\mu_o I^2 a^3}{2\pi b^2}$

40503642620. $\dfrac{\mu_o I^2 a^2}{2\pi b}$

Question Number : 16 Question Id : 40503611771 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 constrained to move along the y-axis with a speed of 0.1 c (c is the speed of light) in the presence of electromagnetic wave, whose electric field is $\vec{E} = 30\ \hat{j}\ \sin(1.5 \times 10^7 t - 5 \times 10^{-2} x)$ V/m. The maximum magnetic force experienced by the electron will be :
(given $c = 3 \times 10^8\ ms^{-1}$ and electron charge $= 1.6 \times 10^{-19}$C)

Options :

40503642621. 2.4×10^{-18} N

40503642622. 4.8×10^{-19} N

40503642623. 3.2×10^{-18} N

40503642624. 1.6×10^{-19} N

Question Number : 16 Question Id : 40503611771 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 विद्युत चुम्बकीय तरंग की उपस्थिति में एक इलेक्ट्रॉन गति 0.1 c से y-अक्ष पर चलने को बाध्य है, (जहाँ c प्रकाश की चाल है।) तरंग का विद्युत क्षेत्र है,

$\vec{E}=30\ \hat{j}\ \sin(1.5\times10^{7}t-5\times10^{-2}x)$ V/m।

इलेक्ट्रॉन द्वारा अनुभव किये गये चुम्बकीय बल का अधिकतम मान होगा :

(दिया है $c=3\times10^{8}$ ms^{-1} और इलेक्ट्रॉन का आवेश $=1.6\times10^{-19}$C)

Options :

40503642621. 2.4×10^{-18} N

40503642622. 4.8×10^{-19} N

40503642623. 3.2×10^{-18} N

40503642624. 1.6×10^{-19} N

Question Number : 17 Question Id : 40503611772 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

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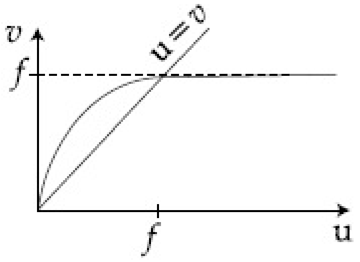
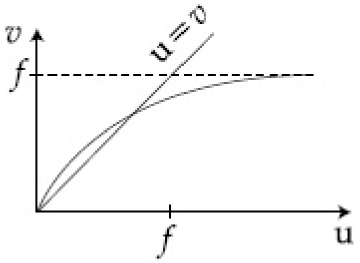
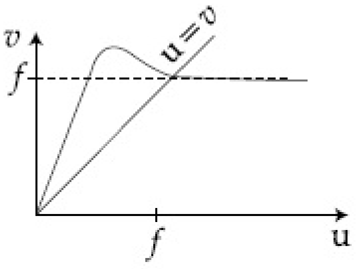
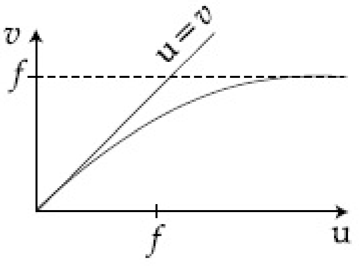
For a concave lens of focal length f, the relation between object and image distances u and v, respectively, from its pole can best be represented by (u $=v$ is the reference line) :

Options :

40503642625. 

40503642626. 

40503642627. 

40503642628. 

Question Number : 17 Question Id : 40503611772 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

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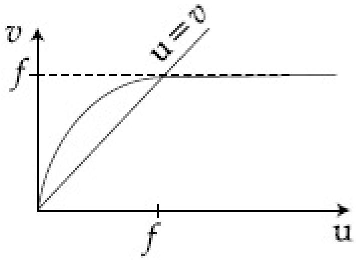
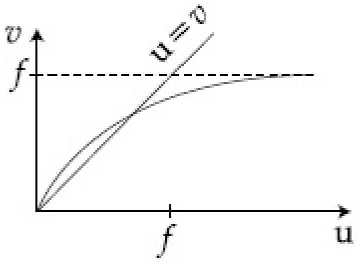
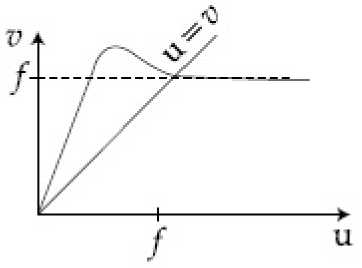
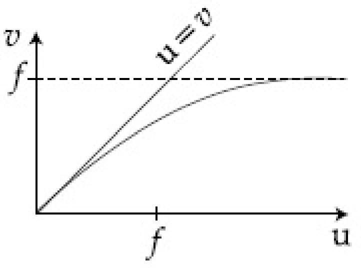
एक अवतल लेंस की फोकस दूरी f है। इस लेंस के ध्रुव से वस्तु एवं उसके प्रतिबिंब की दूरी, क्रमश: u एवं v के संबंध को निम्न में से कौन–सा चित्र सबसे उत्तम दर्शाता है? ($u = v$ एक निर्देश रेखा (Reference line) है) :

Options :

40503642625. 

40503642626. 

40503642627. 

40503642628. 

Question Number : 18 Question Id : 40503611773 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

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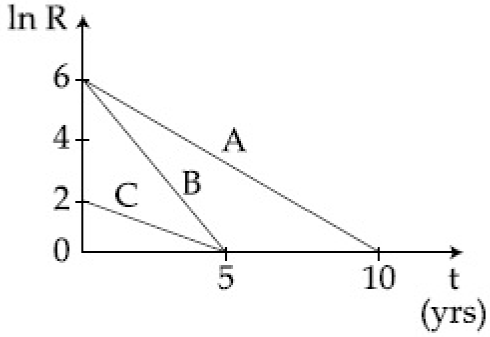
Activities of three radioactive substances A, B and C are represented by the curves A, B and C, in the figure. Then their half-lives $T_{\frac{1}{2}}(A) : T_{\frac{1}{2}}(B) : T_{\frac{1}{2}}(C)$ are in the ratio :



Options :

40503642629. $3:2:1$

40503642630. $4:3:1$

40503642631. $2:1:1$

40503642632. $2:1:3$

Question Number : 18 Question Id : 40503611773 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

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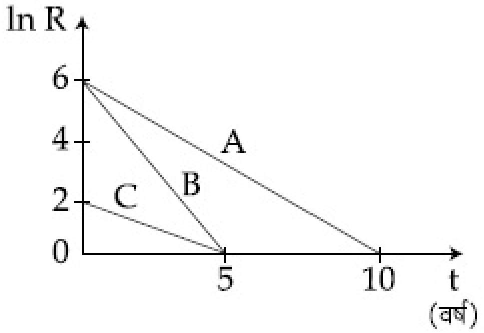
तीन रेडियोधर्मी पदार्थों A, B तथा C, की सक्रियता को दिये गये चित्र में क्रमशः वक्र A, B तथा C से दिखाया गया है। इन पदार्थों की अर्ध आयुओं का अनुपात, $T_{\frac{1}{2}}(A) : T_{\frac{1}{2}}(B) : T_{\frac{1}{2}}(C)$, होगा :



Options :

40503642629. 3 : 2 : 1

40503642630. 4 : 3 : 1

40503642631. 2 : 1 : 1

40503642632. 2 : 1 : 3

Question Number : 19 Question Id : 40503611774 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

With increasing biasing voltage of a photodiode, the photocurrent magnitude :

Options :

40503642633. increases initially and saturates finally

40503642634. remains constant

40503642635. increases linearly

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40503642636. increases initially and after attaining certain value, it decreases

Question Number : 19 Question Id : 40503611774 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 फोटोडायोड की बायसिंग वोल्टता में वृद्धि करने पर, फोटो धारा का परिमाण :

Options :

40503642633. प्रारम्भ में बढ़ता हैं और अन्ततः संतृप्त हो जाता है।

40503642634. स्थिर रहता है।

40503642635. रैखिक वृद्धि करता है।

40503642636. प्रारम्भ में बढ़ता हैं और एक विशेष मान के पश्चात् घटता है।

Question Number : 20 Question Id : 40503611775 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 a resonance tube experiment when the tube is filled with water up to a height of 17.0 cm from bottom, it resonates with a given tuning fork. When the water level is raised the next resonance with the same tuning fork occurs at a height of 24.5 cm. If the velocity of sound in air is 330 m/s, the tuning fork frequency is :

Options :

40503642637. 1100 Hz

40503642638. 550 Hz

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40503642639. 3300 Hz

40503642640. 2200 Hz

Question Number : 20 Question Id : 40503611775 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

अनुनाद नली के एक प्रयोग में जब नली में उसकी तली से 17.0 cm की ऊँचाई तक पानी भरते हैं तो यह दिये गये स्वरित्र द्विभुज के साथ अनुनाद करती है। जब पानी के तल को बढ़ाकर 24.5 cm करते हैं, तो उसी स्वरित्र द्विभुज से अगला अनुनाद होता है। यदि वायु में ध्वनि की चाल 330 m/s है, तो स्वरित्र द्विभुज की आवृत्ति होगी :

Options :

40503642637. 1100 Hz

40503642638. 550 Hz

40503642639. 3300 Hz

40503642640. 2200 Hz

Sub-Section Number :	2
Sub-Section Id :	405036828
Question Shuffling Allowed :	Yes

Question Number : 21 Question Id : 40503611776 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

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A particle of mass 200 MeV/c^2 collides with a hydrogen atom at rest. Soon after the collision the particle comes to rest, and the atom recoils and goes to its first excited state. The initial kinetic energy of the particle (in eV) is $\frac{N}{4}$. The value of N is :

(Given the mass of the hydrogen atom to be 1 GeV/c^2) ________.

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 : 40503611776 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

200 MeV/c^2 द्रव्यमान का एक कण विरामावस्था के एक हाइड्रोजन परमाणु से संघट्ट करता है। संघट्ट के तुरंत पश्चात कण विराम अवस्था में आ जाता है तथा परमाणु प्रतिक्षेपित होकर अपनी प्रथम उत्तेजित अवस्था में चला जाता है। कण की आरम्भिक गतिज ऊर्जा का मान (eV में) $\frac{N}{4}$ हैं। N का मान होगा (दिया है हाइड्रोजन परमाणु का द्रव्यमान = 1 GeV/c^2) ________ ।

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 : 40503611777 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

A force $\vec{F} = (\hat{i} + 2\hat{j} + 3\hat{k})$ N acts at a point $(4\hat{i} + 3\hat{j} - \hat{k})$ m. Then the magnitude of torque about the point $(\hat{i} + 2\hat{j} + \hat{k})$ m will be $\sqrt{x}$ N-m. 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 : 22 Question Id : 40503611777 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

एक बिन्दु $(4\hat{i} + 3\hat{j} - \hat{k})$ m पर एक बल $\vec{F} = (\hat{i} + 2\hat{j} + 3\hat{k})$ N कार्यरत है। तो बिन्दु $(\hat{i} + 2\hat{j} + \hat{k})$ m के प्रति बल आघूर्ण का परिमाण $\sqrt{x}$ N-m होगा। 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 : 23 Question Id : 40503611778 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

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Two concentric circular coils, C_1 and C_2, are placed in the XY plane. C_1 has 500 turns, and a radius of 1 cm. C_2 has 200 turns and radius of 20 cm. C_2 carries a time dependent current $I(t) = (5t^2 - 2t + 3)$ A where t is in s. The emf induced in C_1 (in mV), at the instant $t = 1$ s is $\frac{4}{x}$. 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 : 23 Question Id : 40503611778 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

दो समकेन्द्रीय वृत्ताकार कुण्डलियों C_1 तथा C_2 को XY समतल में रखा गया है। C_1 की त्रिज्या 1 cm तथा इसमें 500 फेरे हैं। C_2 में 200 फेरे हैं तथा इसकी त्रिज्या 20 cm है। C_2 में समय पर निर्भर धारा $I(t) = (5t^2 - 2t + 3)$A जहाँ t सेकण्ड में है, प्रवाहित होती है। क्षण $t = 1$ s पर C_1 में प्रेरित विद्युत वाहक बल (mV में) $\frac{4}{x}$ हैं : 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 : 24 Question Id : 40503611779 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

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A compound microscope consists of an objective lens of focal length 1 cm and an eye piece of focal length 5 cm with a separation of 10 cm.

The distance between an object and the objective lens, at which the strain on the eye is minimum is $\frac{n}{40}$ cm. The value of 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 : 24 Question Id : 40503611779 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

एक संयुक्त सूक्ष्मदर्शी में अभिदृश्यक लेंस की फोकस दूरी 1 cm, नेत्रिका लेंस की फोकस दूरी 5 cm तथा उनके बीच की दूरी 10 cm है।

वस्तु तथा अभिदृश्यक लेंस के बीच की वह दूरी, जिससे कि आँखों में न्यूनतम तनाव हो, $\frac{n}{40}$ cm होगी। n 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 : 25 Question Id : 40503611780 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

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A beam of electrons of energy E scatters from a target having atomic spacing of 1Å. The first maximum intensity occurs at $\theta = 60°$. Then E (in eV) is ________.

(Planck constant $h = 6.64 \times 10^{-34}$ Js,

$1 \text{ eV} = 1.6 \times 10^{-19}$ J,

electron mass $m = 9.1 \times 10^{-31}$ kg)

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 : 40503611780 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

ऊर्जा E का एक इलेक्ट्रॉन किरण पुँज एक लक्ष्य से प्रकीर्णित होता है जिसका परमाणु अन्तराल 1Å है। प्रथम महत्तम तीव्रता $\theta = 60°$ पर प्राप्त होती है। तब E होगा (eV में) ________ ।

(दिया है : प्लांक नियतांक $h = 6.64 \times 10^{-34}$ Js,

$1 \text{ eV} = 1.6 \times 10^{-19}$ J,

इलेक्ट्रॉन का द्रव्यमान $m = 9.1 \times 10^{-31}$ kg)

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 :	405036431
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 : 405036829
Question Shuffling Allowed : Yes

Question Number : 26 Question Id : 40503611781 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 is not an essential amino acid ?

Options :

40503642646. Valine

40503642647. Leucine

40503642648. Lysine

40503642649. Tyrosine

Question Number : 26 Question Id : 40503611781 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 अनिवार्य ऐमीनो अम्ल **नहीं** है?

Options :

40503642646. वैलीन

40503642647. ल्यूसीन

40503642648. लाइसीन

40503642649. टाइरोसीन

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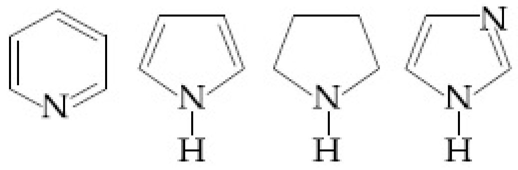
Question Number : 27 Question Id : 40503611782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The increasing order of basicity of the following compounds is :



(A) (B) (C) (D)

Options :

40503642650. (A) < (B) < (C) < (D)

40503642651. (B) < (A) < (D) < (C)

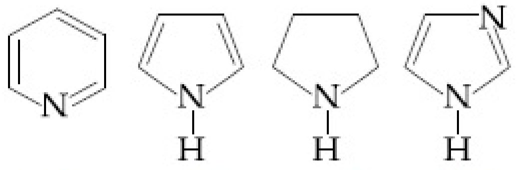
40503642652. (B) < (A) < (C) < (D)

40503642653. (D) < (A) < (B) < (C)

Question Number : 27 Question Id : 40503611782 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 की क्षारीयता का बढ़ता क्रम है :



(A) (B) (C) (D)

Options :

40503642650. (A) < (B) < (C) < (D)

40503642651. (B) < (A) < (D) < (C)

40503642652. (B) < (A) < (C) < (D)

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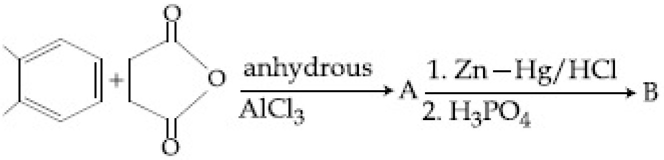
40503642653. (D) < (A) < (B) < (C)

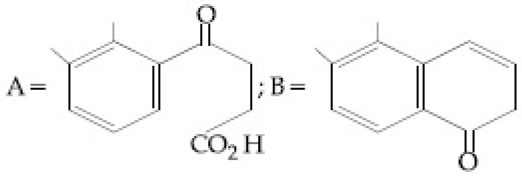
Question Number : 28 Question Id : 40503611783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

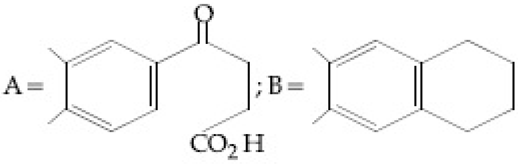
Correct Marks : 4 Wrong Marks : 1

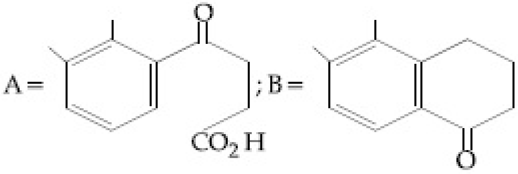
In the following reaction sequence the major products A and B are :

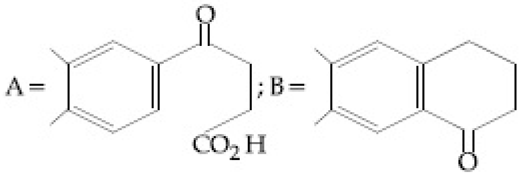


Options :

40503642654. 

40503642655. 

40503642656. 

40503642657. 

Question Number : 28 Question Id : 40503611783 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

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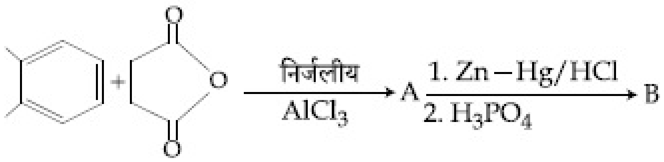
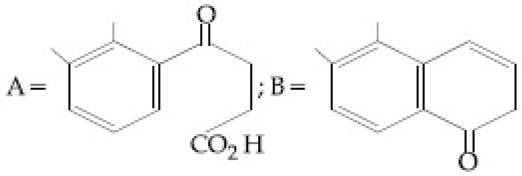
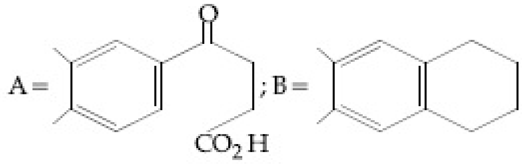
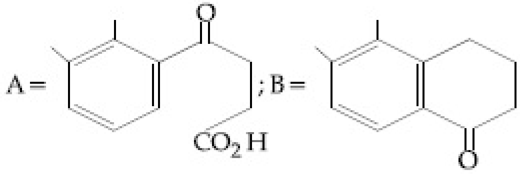
निम्नलिखित अभिक्रिया क्रम में मुख्य उत्पाद A तथा B हैं :

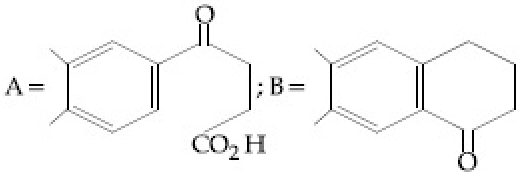


Options :

40503642654. 

40503642655. 

40503642656. 

40503642657. 

Question Number : 29 Question Id : 40503611784 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 most appropriate reagent for conversion of C_2H_5CN into $CH_3CH_2CH_2NH_2$ is :

Options :

40503642658. $LiAlH_4$

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40503642659. $NaBH_4$

40503642660. $Na(CN)BH_3$

40503642661. CaH_2

Question Number : 29 Question Id : 40503611784 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

C_2H_5CN को $CH_3CH_2CH_2NH_2$ में परिवर्तित करने के लिए सबसे ज्यादा उपयुक्त अभिकर्मक है :

Options :

40503642658. $LiAlH_4$

40503642659. $NaBH_4$

40503642660. $Na(CN)BH_3$

40503642661. CaH_2

Question Number : 30 Question Id : 40503611785 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 the acidity of the α-hydrogen of the following compounds is :

(A) (B) (C) (D)

Options :

40503642662. (A) < (C) < (D) < (B)

40503642663. (D) < (C) < (A) < (B)

40503642664. (C) < (A) < (B) < (D)

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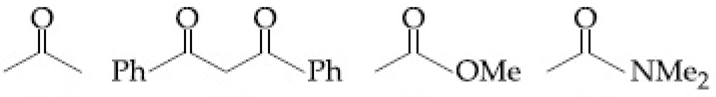
40503642665. (B) < (C) < (A) < (D)

Question Number : 30 Question Id : 40503611785 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 α-हाइड्रोजन के अम्लीयता का बढ़ता क्रम है :



(A) (B) (C) (D)

Options :

40503642662. (A) < (C) < (D) < (B)

40503642663. (D) < (C) < (A) < (B)

40503642664. (C) < (A) < (B) < (D)

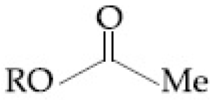
40503642665. (B) < (C) < (A) < (D)

Question Number : 31 Question Id : 40503611786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

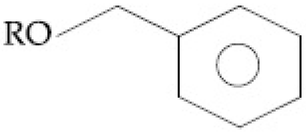
Correct Marks : 4 Wrong Marks : 1

Which of the following derivatives of alcohols is unstable in an aqueous base ?

Options :

40503642666. 

40503642667. $RO-CMe_3$



40503642668.

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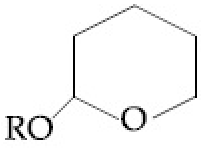
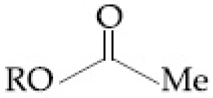
40503642669. 

Question Number : 31 Question Id : 40503611786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

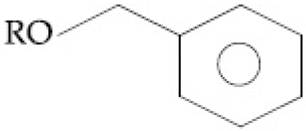
Correct Marks : 4 Wrong Marks : 1

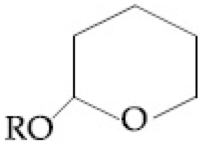
निम्नलिखित में से कौन सा ऐलकोहॉल का व्युत्पन्न
एक जलीय क्षारक में अस्थिर है?

Options :

40503642666. 

40503642667. $RO-CMe_3$

40503642668. 

40503642669. 

Question Number : 32 Question Id : 40503611787 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 a person is suffering from the deficiency of nor-adrenaline, what kind of drug can be suggested ?

Options :

40503642670. Antihistamine

40503642671. Analgesic

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40503642672. Anti-inflammatory

40503642673. Antidepressant

Question Number : 32 Question Id : 40503611787 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 कोई व्यक्ति नॉर-ऐड्रीनेलिन की न्यूनता से पीड़ित है तो किस प्रकार की औषधि का सुझाव दिया जा सकता है?

Options :

40503642670. प्रतिहिस्टामिन

40503642671. पीड़ाहारी

40503642672. प्रतिशोतज (एन्टी-इनफ्लेमेटरी)

40503642673. प्रतिअवसादक

Question Number : 33 Question Id : 40503611788 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 sixth period, the orbitals that are filled are :

Options :

40503642674. 6s, 6p, 6d, 6f

40503642675. 6s, 5f, 6d, 6p

40503642676. 6s, 5d, 5f, 6p

40503642677. 6s, 4f, 5d, 6p

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Question Number : 33 Question Id : 40503611788 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

छठें आवर्तक में, भरे जाने वाले कक्षक हैं :

Options :

40503642674. 6s, 6p, 6d, 6f

40503642675. 6s, 5f, 6d, 6p

40503642676. 6s, 5d, 5f, 6p

40503642677. 6s, 4f, 5d, 6p

Question Number : 34 Question Id : 40503611789 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 Ellingham diagram provides information about :

Options :

40503642678. the kinetics of the reduction process.

40503642679. the conditions of pH and potential under which a species is thermodynamically stable.

40503642680. the temperature dependence of the standard Gibbs energies of formation of some metal oxides.

40503642681. the pressure dependence of the standard electrode potentials of reduction reactions involved in the extraction of metals.

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Question Number : 34 Question Id : 40503611789 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

एलिंगम आरेख जिस सूचना को प्राप्त कराता है वह होती है :

Options :

40503642678. अपचयन प्रक्रम की बलगतिकी।

40503642679. पीएच (pH) तथा विभव की शर्तें जिसमें की स्पीशीज़ ऊष्मागतिकीय रूप से स्थिर होती है।

40503642680. कुछ धातु ऑक्साइड़ों के सम्भवन में मानक गिब्ज़ ऊर्जा की ताप निर्भरता।

40503642681. धातु के निष्कर्षण में निहित अपचयन अभिक्रिया के मानक इलेक्ट्रोड विभव की दाब निर्भरता।

Question Number : 35 Question Id : 40503611790 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 equation that represents the water-gas shift reaction is :

Options :

40503642682. $C(s) + H_2O(g) \xrightarrow{1270\ K} CO(g) + H_2(g)$

40503642683. $CH_4(g) + H_2O(g) \xrightarrow[Ni]{1270\ K} CO(g) + 3\ H_2(g)$

40503642684. $CO(g) + H_2O(g) \xrightarrow[Catalyst]{673\ K} CO_2(g) + H_2(g)$

40503642685. $2\ C(s) + O_2(g) + 4\ N_2(g) \xrightarrow{1273\ K} 2\ CO(g) + 4\ N_2(g)$

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Question Number : 35 Question Id : 40503611790 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 समीकरण जो वाटर-गैस शिफ्ट अभिक्रिया को निरूपित करता है, होगा :

Options :

40503642682. $C(s) + H_2O(g) \xrightarrow{1270\ K} CO(g) + H_2(g)$

40503642683. $CH_4(g) + H_2O(g) \xrightarrow[Ni]{1270\ K} CO(g) + 3\ H_2(g)$

40503642684. $CO(g) + H_2O(g) \xrightarrow[\text{उत्प्रेरक}]{673\ K} CO_2(g) + H_2(g)$

40503642685. $2\,C(s) + O_2(g) + 4\,N_2(g) \xrightarrow{1273\ K} 2\,CO(g) + 4\,N_2(g)$

Question Number : 36 Question Id : 40503611791 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 structure of PCl_5 in the solid state is :

Options :

40503642686. trigonal bipyramidal

40503642687. square pyramidal

40503642688. tetrahedral $[PCl_4]^+$ and octahedral $[PCl_6]^-$

40503642689. square planar $[PCl_4]^+$ and octahedral $[PCl_6]^-$

Question Number : 36 Question Id : 40503611791 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

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ठोस प्रावस्था में PCl_5 की संरचना है :

Options :

40503642686. त्रिसमनताक्ष द्विपिरामिडी

40503642687. वर्ग पिरामिडी

40503642688. चतुष्फलकीय $[PCl_4]^+$ तथा अष्टफलकीय $[PCl_6]^-$

40503642689. वर्ग समतली $[PCl_4]^+$ तथा अष्टफलकीय $[PCl_6]^-$

Question Number : 37 Question Id : 40503611792 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 electronic configuration and spin-only magnetic moment (BM) of Gd^{3+} (Z = 64), respectively, are :

Options :

40503642690. [Xe] $4f^7$ and 7.9

40503642691. [Xe] $4f^7$ and 8.9

40503642692. [Xe] $5f^7$ and 7.9

40503642693. [Xe] $5f^7$ and 8.9

Question Number : 37 Question Id : 40503611792 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

Gd^{3+} (Z = 64) के सही इलेक्ट्रॉनिक विन्यास तथा स्पिन-मात्र चुम्बकीय आघूर्ण (BM में) हैं :

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Options :

40503642690. [Xe] $4f^7$ तथा 7.9

40503642691. [Xe] $4f^7$ तथा 8.9

40503642692. [Xe] $5f^7$ तथा 7.9

40503642693. [Xe] $5f^7$ तथा 8.9

Question Number : 38 Question Id : 40503611793 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 the crystal field stabilization energies for a high spin d^6 metal ion in octahedral and tetrahedral fields, respectively, are :

Options :

40503642694. $-0.4\ \Delta_o$ and $-0.6\ \Delta_t$

40503642695. $-2.4\ \Delta_o$ and $-0.6\ \Delta_t$

40503642696. $-1.6\ \Delta_o$ and $-0.4\ \Delta_t$

40503642697. $-0.4\ \Delta_o$ and $-0.27\ \Delta_t$

Question Number : 38 Question Id : 40503611793 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

अष्टफलकीय तथा चतुष्फलकीय क्षेत्रों में उच्च प्रचक्रण d^6 धातु आयन के लिए क्रिस्टल क्षेत्र स्थिरीकरण ऊर्जाओं का मान क्रमशः होगा :

Options :

40503642694. $-0.4\ \Delta_o$ तथा $-0.6\ \Delta_t$

40503642695. $-2.4\ \Delta_o$ तथा $-0.6\ \Delta_t$

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40503642696. $-1.6\,\Delta_o$ तथा $-0.4\,\Delta_t$

40503642697. $-0.4\,\Delta_o$ तथा $-0.27\,\Delta_t$

Question Number : 39 Question Id : 40503611794 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 condition that indicates a polluted environment is :

Options :

40503642698. pH of rain water to be 5.6

40503642699. 0.03% of CO_2 in the atmosphere

40503642700. BOD value of 5 ppm

40503642701. eutrophication

Question Number : 39 Question Id : 40503611794 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 स्थिति जो दूषित पर्यावरण इंगित करती है, होगी :

Options :

40503642698. वर्षा के जल का pH 5.6 होना

40503642699. वायुमंडल में 0.03% CO_2 का होना

40503642700. BOD का मान 5 ppm होना

40503642701. सुपोषण

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Question Number : 40 Question Id : 40503611795 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 diatomic molecule X_2 has a body-centred cubic (bcc) structure with a cell edge of 300 pm. The density of the molecule is 6.17 g cm^{-3}. The number of molecules present in 200 g of X_2 is :
(Avogadro constant (N_A) $= 6 \times 10^{23}$ mol^{-1})

Options :

40503642702. $2\ N_A$

40503642703. $4\ N_A$

40503642704. $40\ N_A$

40503642705. $8\ N_A$

Question Number : 40 Question Id : 40503611795 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 द्विपरमाणुक अणु X_2 की काय केन्द्रित घन (बीसीसी) संरचना है जिसकी कोष्टिका कोर 300 pm है। अणु का घनत्व 6.17 g cm^{-3} है। X_2 के 200 g में उपस्थित अणुओं की संख्या होगी :
(N_A, एवोगैद्रो स्थिरांक $= 6 \times 10^{23}$ mol^{-1})

Options :

40503642702. $2\ N_A$

40503642703. $4\ N_A$

40503642704. $40\ N_A$

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40503642705. $8\ N_A$

Question Number : 41 Question Id : 40503611796 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 difference between the radii of 3[rd] and 4[th] orbits of Li^{2+} is ΔR_1. The difference between the radii of 3[rd] and 4[th] orbits of He^+ is ΔR_2. Ratio $\Delta R_1 : \Delta R_2$ is :

Options :

40503642706. $3:8$

40503642707. $8:3$

40503642708. $3:2$

40503642709. $2:3$

Question Number : 41 Question Id : 40503611796 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

Li^{2+} के तीसरे तथा चौथे कक्षों की त्रिज्याओं का अंतर ΔR_1 है। He^+ के तीसरे तथा चौथे कक्षों की त्रिज्याओं का अंतर ΔR_2 है। $\Delta R_1 : \Delta R_2$ अनुपात है :

Options :

40503642706. $3:8$

40503642707. $8:3$

40503642708. $3:2$

40503642709. $2:3$

Question Number : 42 Question Id : 40503611797 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

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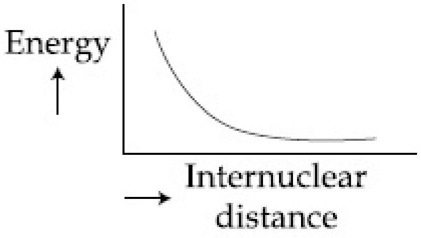
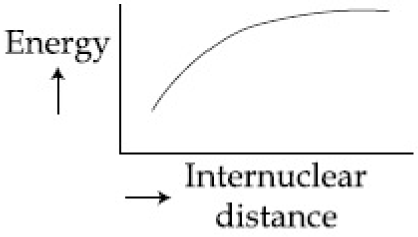
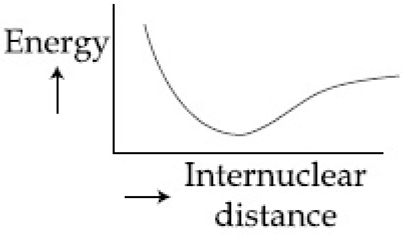
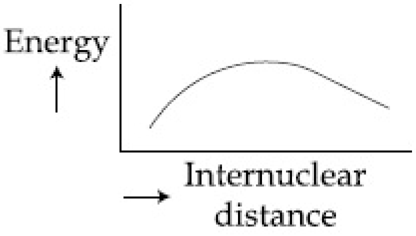
The potential energy curve for the H_2 molecule as a function of internuclear distance is :

Options :

40503642710. 

40503642711. 

40503642712. 

40503642713. 

Question Number : 42 Question Id : 40503611797 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

अंतरान्यूक्लीय दूरी के फलन के रूप में H_2 अणु के लिए स्थितिज ऊर्जा का वक्र है :

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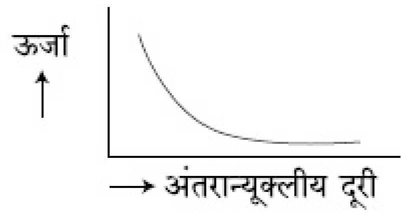
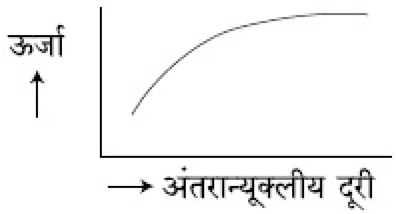
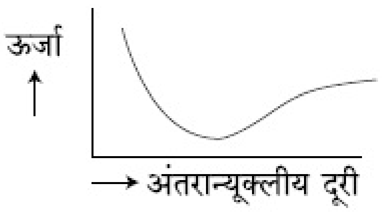
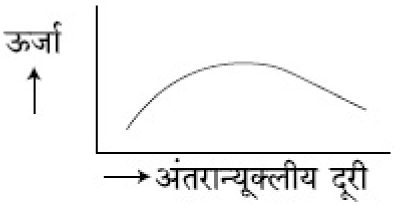
Options :

40503642710. 

40503642711. 

40503642712. 

40503642713. 

Question Number : 43 Question Id : 40503611798 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 reaction :

$N_2O_4(g) \rightleftharpoons 2NO_2(g)$; $\Delta H^0 = +58$ kJ

For each of the following cases (a, b), the direction in which the equilibrium shifts is :

(a) Temperature is decreased.

(b) Pressure is increased by adding N_2 at constant T.

Options :

40503642714. (a) towards product, (b) towards reactant

40503642715. (a) towards reactant, (b) towards product

40503642716. (a) towards reactant, (b) no change

40503642717. (a) towards product, (b) no change

Question Number : 43 Question Id : 40503611798 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

निम्नलिखित अभिक्रिया पर विचार कीजिए

$N_2O_4(g) \rightleftharpoons 2NO_2(g)$; $\Delta H^0 = +58$ kJ

निम्न प्रत्येक प्रकरण (a, b) में, वह दिशा जिसमें साम्य खिसक जायेगा, होगी :

(a) ताप घटाया जाता है।

(b) स्थिर T पर N_2 डालकर दाब बढ़ाया जाता है।

Options :

40503642714. (a) उत्पाद की तरफ (b) अभिकारक की तरफ

40503642715. (a) अभिकारक की तरफ (b) उत्पाद की तरफ

40503642716. (a) अभिकारक की तरफ (b) कोई परिवर्तन नहीं

40503642717. (a) उत्पाद की तरफ (b) कोई परिवर्तन नहीं

Question Number : 44 Question Id : 40503611799 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

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A flask contains a mixture of compounds A and B. Both compounds decompose by first-order kinetics. The half-lives for A and B are 300 s and 180 s, respectively. If the concentrations of A and B are equal initially, the time required for the concentration of A to be four times that of B (in s) is : (Use ln 2 = 0.693)

Options :

40503642718. 300

40503642719. 120

40503642720. 900

40503642721. 180

Question Number : 44 Question Id : 40503611799 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 तथा B यौगिकों का एक मिश्रण एक फ्लास्क में उपस्थित है। दोनों यौगिक प्रथम कोटि बल गतिकी द्वारा विघटित होते हैं । A तथा B की अर्द्ध आयु क्रमश: 300 s तथा 180 s हैं। यदि A तथा B की सान्द्रतायें प्रारम्भ में बराबर रही हों तो A की सान्द्रता को B की सान्द्रता के चार गुना होने में लगने वाला समय (सेकन्ड में) होगा : (ln 2 = 0.693)

Options :

40503642718. 300

40503642719. 120

40503642720. 900

40503642721. 180

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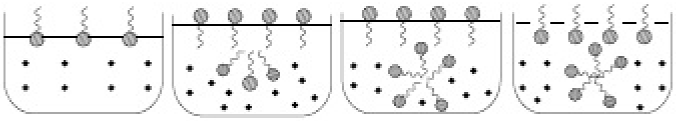
Question Number : 45 Question Id : 40503611800 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Identify the correct molecular picture showing what happens at the critical micellar concentration (CMC) of an aqueous solution of a surfactant (● polar head; ∿ non-polar tail ; . water).



(A) (B) (C) (D)

Options :

40503642722. (A)

40503642723. (B)

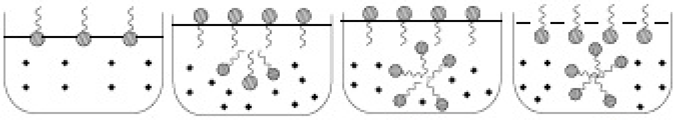
40503642724. (C)

40503642725. (D)

Question Number : 45 Question Id : 40503611800 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 पृष्ठ संक्रियक के एक जलीय विलयन के क्रान्तिक मिसेली सान्द्रता (CMC) पर क्या होता है इसको दर्शाने वाले **सही** आण्विक चित्र को पहचानिये। (● ध्रुवीय सिरा ; ∿ अध्रुवीय पुंछ . जल)



(A) (B) (C) (D)

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Options :

40503642722. (A)

40503642723. (B)

40503642724. (C)

40503642725. (D)

Sub-Section Number : 2
Sub-Section Id : 405036830
Question Shuffling Allowed : Yes

Question Number : 46 Question Id : 40503611801 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

The total number of coordination sites in ethylenediaminetetraacetate ($EDTA^{4-}$) 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 : 46 Question Id : 40503611801 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

एथिलीनडाइऐमीनटेट्राऐसीटेट ($EDTA^{4-}$) में उपसहसंयोजन स्थलों की कुल 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 : 47 Question Id : 40503611802 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

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The minimum number of moles of O_2 required for complete combustion of 1 mole of propane and 2 moles of butane 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 : 40503611802 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

1 मोल प्रोपेन तथा 2 मोल ब्यूटेन के पूर्ण दहन के लिए आवश्यक O_2 की अल्पतम मोलों की संख्या होगी ________ ।

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 : 40503611803 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

A soft drink was bottled with a partial pressure of CO_2 of 3 bar over the liquid at room temperature. The partial pressure of CO_2 over the solution approaches a value of 30 bar when 44 g of CO_2 is dissolved in 1 kg of water at room temperature. The approximate pH of the soft drink is ________ $\times 10^{-1}$.

(First dissociation constant of $H_2CO_3 = 4.0 \times 10^{-7}$; $\log 2 = 0.3$; density of the soft drink $= 1\ g\ mL^{-1}$)

Response Type : Numeric
Evaluation Required For SA : Yes

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Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 48 Question Id : 40503611803 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

कक्ष ताप पर एक सॉफ्ट ड्रिंक को CO_2 के 3 बार आंशिक दाब पर बोतल में द्रव के ऊपर भरा जाता है। कक्ष ताप पर जब 44 g CO_2 1 kg जल में घुलती है तो विलयन के ऊपर CO_2 का आंशिक दाब 30 बार पहुँच जाता है। सॉफ्ट ड्रिंक का pH लगभग होगा __________ $\times 10^{-1}$।

(H_2CO_3 का प्रथम वियोजन स्थिरांक $= 4.0 \times 10^{-7}$; $\log 2 = 0.3$; सॉफ्ट ड्रिंक का घनत्व $= 1\ g\ mL^{-1}$)

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 : 49 Question Id : 40503611804 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

An oxidation-reduction reaction in which 3 electrons are transferred has a ΔG^0 of 17.37 kJ mol^{-1} at 25°C. The value of E^0_{cell} (in V) is __________ $\times 10^{-2}$.

(1 F = 96,500 C 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

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Question Number : 49 Question Id : 40503611804 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

एक अपचयोपचय अभिक्रिया जिसमें 3 इलेक्ट्रॉन स्थानांतरित होते हैं, का 25°C पर ΔG^0 का मान $17.37 \text{ kJ mol}^{-1}$ है। E^0_{cell} का मान (V में) होगा __________ $\times 10^{-2}$ ।

$(1 \text{ F} = 96{,}500 \text{ C mol}^{-1})$

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 : 40503611805 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

The number of chiral carbon(s) present in peptide, Ile-Arg-Pro, 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 : 50 Question Id : 40503611805 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

पेप्टाइड, Ile-Arg-Pro, में उपस्थित काइरल कार्बनों 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

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Mathematics

Section Id :	405036432
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 :	405036831
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 40503611806 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 survey shows that 73% of the persons working in an office like coffee, whereas 65% like tea. If x denotes the percentage of them, who like both coffee and tea, then x cannot be :

Options :

40503642731. 38

40503642732. 54

40503642733. 63

40503642734. 36

Question Number : 51 Question Id : 40503611806 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

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एक सर्वेक्षण यह दिखाता है कि एक कार्यालय में कार्यरत 73% व्यक्ति कॉफी पसन्द करते हैं, जबकि 65% चाय पसन्द करते हैं। यदि x उस प्रतिशत को दर्शाता है, जो कॉफी और चाय दोनों को पसन्द करते हैं, तो x **नहीं** हो सकता :

Options :

40503642731. 38

40503642732. 54

40503642733. 63

40503642734. 36

Question Number : 52 Question Id : 40503611807 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 four complex numbers z, $\bar{z}$, $\bar{z} - 2\text{Re}(\bar{z})$ and $z - 2\text{Re}(z)$ represent the vertices of a square of side 4 units in the Argand plane, then $|z|$ is equal to :

Options :

40503642735. $4\sqrt{2}$

40503642736. 2

40503642737. $2\sqrt{2}$

40503642738. 4

Question Number : 52 Question Id : 40503611807 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

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यदि आर्गंड तल में, चार सम्मिश्र संख्याएँ z, $\bar{z}$, $\bar{z}-2\mathrm{Re}(\bar{z})$ तथा $z-2\mathrm{Re}(z)$, 4 इकाई भुजा के एक वर्ग के शीर्षों को निरूपित करते हैं, तो $|z|$ बराबर है :

Options :

40503642735. $4\sqrt{2}$

40503642736. 2

40503642737. $2\sqrt{2}$

40503642738. 4

Question Number : 53 Question Id : 40503611808 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 product of the roots of the equation $9x^2-18|x|+5=0$, is :

Options :

40503642739. $\frac{25}{9}$

40503642740. $\frac{5}{27}$

40503642741. $\frac{5}{9}$

40503642742. $\frac{25}{81}$

Question Number : 53 Question Id : 40503611808 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

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समीकरण $9x^2-18|x|+5=0$ के मूलों का गुणनफल है :

Options :

40503642739. $\frac{25}{9}$

40503642740. $\frac{5}{27}$

40503642741. $\frac{5}{9}$

40503642742. $\frac{25}{81}$

Question Number : 54 Question Id : 40503611809 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 minimum and the maximum values of the function $f:\left[\frac{\pi}{4},\frac{\pi}{2}\right]\rightarrow \mathbf{R}$, defined by

$$f(\theta)=\begin{vmatrix} -\sin^2\theta & -1-\sin^2\theta & 1 \\ -\cos^2\theta & -1-\cos^2\theta & 1 \\ 12 & 10 & -2 \end{vmatrix}$$

are m and M respectively, then the ordered pair (m, M) is equal to :

Options :

40503642743. $(-4, 4)$

40503642744. $(0, 2\sqrt{2})$

40503642745. $(-4, 0)$

40503642746. $(0, 4)$

Question Number : 54 Question Id : 40503611809 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 $f(\theta) = \begin{vmatrix} -\sin^2\theta & -1-\sin^2\theta & 1 \\ -\cos^2\theta & -1-\cos^2\theta & 1 \\ 12 & 10 & -2 \end{vmatrix}$

द्वारा परिभाषित फलन $f : \left[\frac{\pi}{4}, \frac{\pi}{2}\right] \to \mathbf{R}$ के निम्नतम तथा उच्चतम मान क्रमशः m तथा M हैं, तो क्रमित युग्म (m, M) बराबर है :

Options :

40503642743. $(-4, 4)$

40503642744. $(0, 2\sqrt{2})$

40503642745. $(-4, 0)$

40503642746. $(0, 4)$

Question Number : 55 Question Id : 40503611810 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 $\lambda \in \mathbf{R}$. The system of linear equations

$2x_1 - 4x_2 + \lambda x_3 = 1$

$x_1 - 6x_2 + x_3 = 2$

$\lambda x_1 - 10x_2 + 4x_3 = 3$

is inconsistent for :

Options :

40503642747. every value of λ.

40503642748. exactly one positive value of λ.

40503642749. exactly one negative value of λ.

40503642750. exactly two values of λ.

Question Number : 55 Question Id : 40503611810 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 $\lambda \in \mathbf{R}$. रैखिक समीकरण निकाय

$2x_1 - 4x_2 + \lambda x_3 = 1$

$x_1 - 6x_2 + x_3 = 2$

$\lambda x_1 - 10x_2 + 4x_3 = 3$

असंगत है :

Options :

40503642747. λ के प्रत्येक मान के लिए।

40503642748. λ के मात्र एक धनात्मक मान के लिए।

40503642749. λ के मात्र एक ऋणात्मक मान के लिए।

40503642750. λ के मात्र दो मानों के लिए।

Question Number : 56 Question Id : 40503611811 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 $3^{2\sin 2\alpha - 1}$, 14 and $3^{4 - 2\sin 2\alpha}$ are the first three terms of an A.P. for some α, then the sixth term of this A.P. is :

Options :

40503642751. 81

40503642752. 78

40503642753. 66

40503642754. 65

Question Number : 56 Question Id : 40503611811 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 किसी α के लिए $3^{2\sin 2\alpha - 1}$, 14 तथा $3^{4 - 2\sin 2\alpha}$ एक समान्तर श्रेढ़ी के प्रथम तीन पद हैं, तो इस समान्तर श्रेढ़ी का छठा पद है :

Options :

40503642751. 81

40503642752. 78

40503642753. 66

40503642754. 65

Question Number : 57 Question Id : 40503611812 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

$2^{10} + 2^9 \cdot 3^1 + 2^8 \cdot 3^2 + \dots + 2 \cdot 3^9 + 3^{10} = S - 2^{11}$,

then S is equal to :

Options :

40503642755. 3^{11}

40503642756. $2 \cdot 3^{11}$

40503642757. $3^{11} - 2^{12}$

40503642758. $\frac{3^{11}}{2} + 2^{10}$

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Question Number : 57 Question Id : 40503611812 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

$2^{10}+2^9 \cdot 3^1+2^8 \cdot 3^2+\ldots.+2 \cdot 3^9+3^{10}=S-2^{11}$,

तो S बराबर है :

Options :

40503642755. 3^{11}

40503642756. $2 \cdot 3^{11}$

40503642757. $3^{11}-2^{12}$

40503642758. $\frac{3^{11}}{2}+2^{10}$

Question Number : 58 Question Id : 40503611813 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 is the positive root of the equation, $p(x)=x^2-x-2=0$, then

$\lim_{x \to \alpha^+} \frac{\sqrt{1 - \cos(p(x))}}{x+\alpha-4}$ is equal to :

Options :

40503642759. $\frac{1}{2}$

40503642760. $\frac{1}{\sqrt{2}}$

40503642761. $\frac{3}{\sqrt{2}}$

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40503642762. $\frac{3}{2}$

Question Number : 58 Question Id : 40503611813 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, समीकरण $p(x) = x^2 - x - 2 = 0$ का धनात्मक मूल है, तो $\lim_{x\to\alpha^+} \frac{\sqrt{1 - \cos(p(x))}}{x + \alpha - 4}$ बराबर है :

Options :

40503642759. $\frac{1}{2}$

40503642760. $\frac{1}{\sqrt{2}}$

40503642761. $\frac{3}{\sqrt{2}}$

40503642762. $\frac{3}{2}$

Question Number : 59 Question Id : 40503611814 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 function $f(x) = \begin{cases} k_1(x - \pi)^2 - 1, & x \le \pi \\ k_2 \cos x, & x > \pi \end{cases}$ is twice differentiable, then the ordered pair (k_1, k_2) is equal to :

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Options :

40503642763. $\left(\frac{1}{2}, 1\right)$

40503642764. $(1, 1)$

40503642765. $\left(\frac{1}{2}, -1\right)$

40503642766. $(1, 0)$

Question Number : 59 Question Id : 40503611814 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 फलन

$$f(x) = \begin{cases} k_1(x-\pi)^2 - 1, & x \le \pi \\ k_2 \cos x, & x > \pi \end{cases}$$

दो बार अवकलनीय है, तो क्रमित युग्म (k_1, k_2) बराबर है :

Options :

40503642763. $\left(\frac{1}{2}, 1\right)$

40503642764. $(1, 1)$

40503642765. $\left(\frac{1}{2}, -1\right)$

40503642766. $(1, 0)$

Question Number : 60 Question Id : 40503611815 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

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If the point P on the curve, $4x^2 + 5y^2 = 20$ is farthest from the point Q(0, −4), then PQ^2 is equal to :

Options :

40503642767. 36

40503642768. 29

40503642769. 21

40503642770. 48

Question Number : 60 Question Id : 40503611815 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 वक्र $4x^2+5y^2=20$ पर बिन्दु P, बिन्दु Q$(0, -4)$ से अधिकतम दूरी पर है, तो PQ^2 बराबर है :

Options :

40503642767. 36

40503642768. 29

40503642769. 21

40503642770. 48

Question Number : 61 Question Id : 40503611816 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 $\int\left(e^{2x}+2e^{x}-e^{-x}-1\right)e^{(e^{x}+e^{-x})}\,dx$

$= g(x)\,e^{(e^{x}+e^{-x})}+c$, where c is a constant of integration, then g(0) is equal to :

Options :

40503642771. 1

40503642772. 2

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40503642773. e

40503642774. e^2

Question Number : 61 Question Id : 40503611816 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 $\int\left(e^{2x}+2e^{x}-e^{-x}-1\right)e^{(e^{x}+e^{-x})}\,dx$

$= g(x)\,e^{(e^{x}+e^{-x})}+c$ है, जहाँ c एक समाकलन अचर है, तो g(0) बराबर है :

Options :

40503642771. 1

40503642772. 2

40503642773. e

40503642774. e^2

Question Number : 62 Question Id : 40503611817 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 value of $\int_{-\pi/2}^{\pi/2}\frac{1}{1+e^{\sin x}}\,dx$ is :

Options :

40503642775. $\frac{3\pi}{2}$

40503642776. $\frac{\pi}{2}$

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40503642777. $\frac{\pi}{4}$

40503642778. π

Question Number : 62 Question Id : 40503611817 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

$\int_{-\pi/2}^{\pi/2} \frac{1}{1 + e^{\sin x}} dx$ का मान है :

Options :

40503642775. $\frac{3\pi}{2}$

40503642776. $\frac{\pi}{2}$

40503642777. $\frac{\pi}{4}$

40503642778. π

Question Number : 63 Question Id : 40503611818 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 $y = y(x)$ is the solution of the differential equation $\frac{5 + e^x}{2 + y} \cdot \frac{dy}{dx} + e^x = 0$ satisfying $y(0) = 1$, then a value of $y(\log_e 13)$ is :

Options :

40503642779. 1

40503642780. -1

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40503642781. 0

40503642782. 2

Question Number : 63 Question Id : 40503611818 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 अवकल समीकरण $\frac{5+e^x}{2+y}\cdot\frac{dy}{dx}+e^x=0$,

का हल $y=y(x)$ है, जिसके लिए $y(0)=1$ है, तो $y(\log_e 13)$ का एक मान है :

Options :

40503642779. 1

40503642780. -1

40503642781. 0

40503642782. 2

Question Number : 64 Question Id : 40503611819 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 common tangent to the parabolas, $y^2=4x$ and $x^2=4y$ also touches the circle, $x^2+y^2=c^2$, then c is equal to :

Options :

40503642783. $\frac{1}{\sqrt{2}}$

40503642784. $\frac{1}{2}$

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40503642785. $\frac{1}{4}$

40503642786. $\frac{1}{2\sqrt{2}}$

Question Number : 64 Question Id : 40503611819 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 परवलयों $y^2=4x$ तथा $x^2=4y$ की उभयनिष्ठ स्पर्शरेखा, वृत्त $x^2+y^2=c^2$ को भी स्पर्श करती है, तो c बराबर है :

Options :

40503642783. $\frac{1}{\sqrt{2}}$

40503642784. $\frac{1}{2}$

40503642785. $\frac{1}{4}$

40503642786. $\frac{1}{2\sqrt{2}}$

Question Number : 65 Question Id : 40503611820 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 co-ordinates of two points A and B are $(\sqrt{7}, 0)$ and $(-\sqrt{7}, 0)$ respectively and P is any point on the conic, $9x^2+16y^2=144$, then PA + PB is equal to :

Options :

40503642787. 16

40503642788. 6

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40503642789. 9

40503642790. 8

Question Number : 65 Question Id : 40503611820 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 बिन्दुओं A तथा B के निर्देशांक क्रमशः $(\sqrt{7}, 0)$ तथा $(-\sqrt{7}, 0)$ हैं और शांकव (conic) $9x^2+16y^2=144$ पर कोई बिन्दु P है, तो $PA+PB$ बराबर है :

Options :

40503642787. 16

40503642788. 6

40503642789. 9

40503642790. 8

Question Number : 66 Question Id : 40503611821 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 (a, b, c) is the image of the point $(1, 2, -3)$ in the line,

$\frac{x+1}{2} = \frac{y-3}{-2} = \frac{z}{-1}$, then $a+b+c$ is equal to :

Options :

40503642791. -1

40503642792. 1

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40503642793. 2

40503642794. 3

Question Number : 66 Question Id : 40503611821 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 बिन्दु (1, 2, −3) का रेखा

$\frac{x+1}{2} = \frac{y-3}{-2} = \frac{z}{-1}$ में प्रतिबिंब (a, b, c) है,

तो a + b + c बराबर है :

Options :

40503642791. -1

40503642792. 1

40503642793. 2

40503642794. 3

Question Number : 67 Question Id : 40503611822 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 volume of a parallelopiped, whose coterminus edges are given by the vectors

$\vec{a} = \hat{i} + \hat{j} + n\hat{k}$, $\vec{b} = 2\hat{i} + 4\hat{j} - n\hat{k}$ and

$\vec{c} = \hat{i} + n\hat{j} + 3\hat{k}$ $(n \geq 0)$, is 158 cu.units,

then :

Options :

40503642795. $n=7$

40503642796. $n=9$

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40503642797. $\vec{b} \cdot \vec{c} = 10$

40503642798. $\vec{a} \cdot \vec{c} = 17$

Question Number : 67 Question Id : 40503611822 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 एक समांतर षट्फलक, जिसके एक ही शीर्ष से जाने वाले किनारे (edges) सदिशों $\vec{a} = \hat{i}+\hat{j}+n\hat{k}$, $\vec{b} = 2\hat{i}+4\hat{j}-n\hat{k}$ तथा $\vec{c} = \hat{i}+n\hat{j}+3\hat{k}$ $(n \geqslant 0)$ द्वारा दिए गए हैं, का आयतन 158 घन इकाइयाँ है, तो :

Options :

40503642795. $n=7$

40503642796. $n=9$

40503642797. $\vec{b} \cdot \vec{c} = 10$

40503642798. $\vec{a} \cdot \vec{c} = 17$

Question Number : 68 Question Id : 40503611823 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 mean and variance of 7 observations are 8 and 16, respectively. If five observations are 2, 4, 10, 12, 14, then the absolute difference of the remaining two observations is :

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Options :

40503642799. 1

40503642800. 2

40503642801. 3

40503642802. 4

Question Number : 68 Question Id : 40503611823 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

7 प्रेक्षणों का माध्य तथा प्रसरण क्रमशः 8 तथा 16 हैं। यदि पाँच प्रेक्षण 2, 4, 10, 12, 14 हैं, तो शेष दो प्रेक्षणों का निरपेक्ष अंतर है :

Options :

40503642799. 1

40503642800. 2

40503642801. 3

40503642802. 4

Question Number : 69 Question Id : 40503611824 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 S is the sum of the first 10 terms of the series

$$\tan^{-1}\left(\frac{1}{3}\right)+\tan^{-1}\left(\frac{1}{7}\right)+\tan^{-1}\left(\frac{1}{13}\right)+\tan^{-1}\left(\frac{1}{21}\right)+\dots,$$

then tan(S) is equal to :

Options :

40503642803. $\frac{5}{6}$

40503642804. $\frac{10}{11}$

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40503642805. $-\frac{6}{5}$

40503642806. $\frac{5}{11}$

Question Number : 69 Question Id : 40503611824 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 श्रेणी

$\tan^{-1}\left(\frac{1}{3}\right)+\tan^{-1}\left(\frac{1}{7}\right)+\tan^{-1}\left(\frac{1}{13}\right)+\tan^{-1}\left(\frac{1}{21}\right)+....,$

के प्रथम 10 पदों का योग S है, तो tan(S) बराबर है :

Options :

40503642803. $\frac{5}{6}$

40503642804. $\frac{10}{11}$

40503642805. $-\frac{6}{5}$

40503642806. $\frac{5}{11}$

Question Number : 70 Question Id : 40503611825 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

$x \leftrightarrow \sim y$ is equivalent to :

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Options :

40503642807. $(x \wedge \sim y) \vee (\sim x \wedge y)$

40503642808. $(\sim x \wedge y) \vee (\sim x \wedge \sim y)$

40503642809. $(x \wedge y) \wedge (\sim x \vee \sim y)$

40503642810. $(x \wedge y) \vee (\sim x \wedge \sim y)$

Question Number : 70 Question Id : 40503611825 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 $x \leftrightarrow \sim y$ का निषेधन निम्न में से किस के समतुल्य है?

Options :

40503642807. $(x \wedge \sim y) \vee (\sim x \wedge y)$

40503642808. $(\sim x \wedge y) \vee (\sim x \wedge \sim y)$

40503642809. $(x \wedge y) \wedge (\sim x \vee \sim y)$

40503642810. $(x \wedge y) \vee (\sim x \wedge \sim y)$

Sub-Section Number :	2
Sub-Section Id :	405036832
Question Shuffling Allowed :	Yes

Question Number : 71 Question Id : 40503611826 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

The number of words, with or without meaning, that can be formed by taking 4 letters at a time from the letters of the word 'SYLLABUS' such that two letters are distinct and two letters are alike, is ________.

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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 : 40503611826 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

'SYLLABUS' शब्द के अक्षरों में से एक बार में 4 अक्षर लेकर बनाए जा सकने वाले शब्दों, अर्थपूर्ण या अर्थहीन, इस प्रकार कि दो अक्षर भिन्न हों तथा दो अक्षर एक समान हों, 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 : 72 Question Id : 40503611827 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

The natural number m, for which the coefficient of x in the binomial expansion of $\left(x^m + \frac{1}{x^2}\right)^{22}$ is 1540, 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 : 40503611827 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

प्राकृत संख्या m, जिसके लिए $\left(x^m + \frac{1}{x^2}\right)^{22}$ के द्विपद प्रसार में x का गुणांक 1540 है, है ________ ।

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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 : 40503611828 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

Let $f(x) = x.\left[\frac{x}{2}\right]$, for $-10 < x < 10$, where [t] denotes the greatest integer function. Then the number of points of discontinuity of f is equal to __________.

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

Question Number : 73 Question Id : 40503611828 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

माना $f(x) = x.\left[\frac{x}{2}\right], -10 < x < 10$, है जहाँ [t] महत्तम पूर्णांक फलन है, तो f के असंतत बिन्दुओं 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 : 74 Question Id : 40503611829 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

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If the line, $2x-y+3=0$ is at a distance $\frac{1}{\sqrt{5}}$ and $\frac{2}{\sqrt{5}}$ from the lines $4x-2y+\alpha=0$ and $6x-3y+\beta=0$, respectively, then the sum of all possible values of α and β 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 : 40503611829 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

यदि रेखा $2x-y+3=0$, रेखाओं $4x-2y+\alpha=0$ तथा $6x-3y+\beta=0$ से क्रमशः $\frac{1}{\sqrt{5}}$ तथा $\frac{2}{\sqrt{5}}$ की दूरी पर है, तो α तथा β के सभी संभव मानों का योग 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 : 40503611830 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

Four fair dice are thrown independently 27 times. Then the expected number of times, at least two dice show up a three or a five, is __________.

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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 : 40503611830 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

चार अनभिनत पासों को 27 बार स्वतंत्र रूप से फेंका जाता है। तो कम से कम दो पासों के तीन या पाँच दर्शाने की संभावना कितनी बार 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

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