National Testing Agency

Question Paper Name:	Paper I EH 8th April 2019 Shift 2 S2
Subject Name:	Paper I EH
Creation Date:	2019-04-08 19:13:01
Duration:	180
Total Marks:	360
Display Marks:	Yes
Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

Paper I

Group Number :	1
Group Id :	416529174
Group Maximum Duration :	0
Group Minimum Duration :	180
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	360

Physics

Section Id :	416529316
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529456
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 41652914676 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If Surface tension (S), Moment of Inertia (I) and Planck's constant (h), were to be taken as the fundamental units, the dimensional formula for linear momentum would be :

Options :

41652957482. $S^{1/2}I^{1/2}h^{0}$

41652957483. $S^{3/2}I^{1/2}h^{0}$

41652957484. $S^{1/2}I^{3/2}h^{-1}$

41652957485. $S^{1/2}I^{1/2}h^{-1}$

Question Number : 1 Question Id : 41652914676 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि पृष्ठ तनाव (S), जड़त्व आघूर्ण (I) तथा प्लांक नियतांक (h) को मूलभूत इकाई मानें तो रेखीय संवेग का विमा सूत्र होगा :

Options :

41652957482. $S^{1/2}I^{1/2}h^{0}$

41652957483. $S^{3/2}I^{1/2}h^{0}$

41652957484. $S^{1/2}I^{3/2}h^{-1}$

41652957485. $S^{1/2}I^{1/2}h^{-1}$

Question Number : 2 Question Id : 41652914677 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $\left|\overrightarrow{A_1}\right| = 3$, $\left|\overrightarrow{A_2}\right| = 5$ and $\left|\overrightarrow{A_1} + \overrightarrow{A_2}\right| = 5$. The value of $\left(2\overrightarrow{A_1} + 3\overrightarrow{A_2}\right) \bullet \left(3\overrightarrow{A_1} - 2\overrightarrow{A_2}\right)$ is :

Options :

41652957486. -99.5

41652957487. -106.5

41652957488. -112.5

41652957489. -118.5

Question Number : 2 Question Id : 41652914677 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिया है $\left|\overrightarrow{A_1}\right|=3$, $\left|\overrightarrow{A_2}\right|=5$ तथा $\left|\overrightarrow{A_1}+\overrightarrow{A_2}\right|=5$ तो

$\left(2\overrightarrow{A_1}+3\overrightarrow{A_2}\right)\bullet\left(3\overrightarrow{A_1}-2\overrightarrow{A_2}\right)$ का मान होगा :

Options :

41652957486. -99.5

41652957487. -106.5

41652957488. -112.5

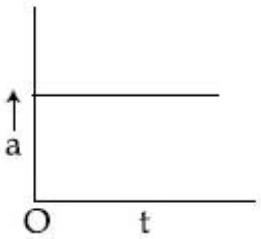
41652957489. -118.5

Question Number : 3 Question Id : 41652914678 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

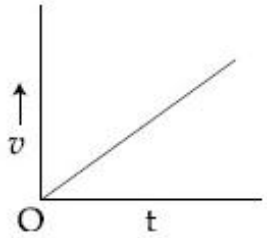
Correct Marks : 4 Wrong Marks : 1

A particle starts from origin O from rest and moves with a uniform acceleration along the positive x- axis. Identify all figures that correctly represent the motion qualitatively.
(a = acceleration, v = velocity,
x = displacement, t = time)

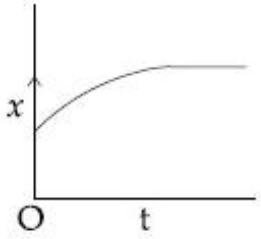
(A)



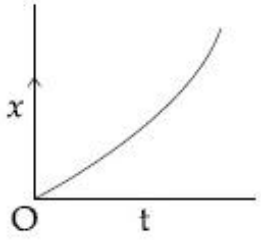
(B)



(C)



(D)



Options :

41652957490. (A)

41652957491. (A), (B), (D)

41652957492. (A), (B), (C)

41652957493. (B), (C)

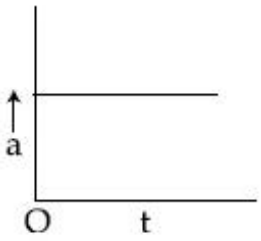
Question Number : 3 Question Id : 41652914678 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

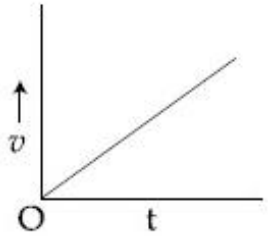
एक कण स्थिरावस्था से एक धनात्मक x-अक्ष की दिशा में मूलबिंदु O से नियत त्वरण से चलता है। वह सभी चित्र ज्ञात कीजिये जो इस कण की गति को गुणात्मक रूप में सही दर्शाते हैं।

(a = त्वरण, v = वेग, x = विस्थापन, t = समय)

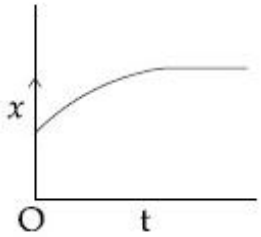
(A)



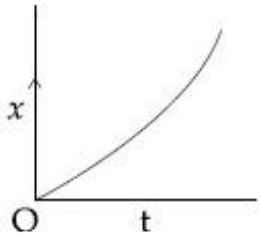
(B)



(C)



(D)



Options :

41652957490. (A)

41652957491. (A), (B), (D)

41652957492. (A), (B), (C)

41652957493. (B), (C)

Question Number : 4 Question Id : 41652914679 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A body of mass m_1 moving with an unknown velocity of $v_1 \hat{i}$, undergoes a collinear collision with a body of mass m_2 moving with a velocity $v_2 \hat{i}$. After collision, m_1 and m_2 move with velocities of $v_3 \hat{i}$ and $v_4 \hat{i}$, respectively.
If $m_2 = 0.5\ m_1$ and $v_3 = 0.5\ v_1$, then v_1 is :

Options :

41652957494. $v_4 - v_2$

41652957495. $v_4 - \frac{v_2}{2}$

41652957496. $v_4 + v_2$

41652957497. $v_4 - \frac{v_2}{4}$

Question Number : 4 Question Id : 41652914679 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान m_1 का एक पिण्ड अज्ञात वेग $v_1 \hat{i}$ से चलते हुए एक दूसरे द्रव्यमान m_2 तथा वेग $v_2 \hat{i}$ से जाते हुये एक पिण्ड से समरेखीय संघट्ट करता है। संघट्ट के बाद m_1 तथा m_2 क्रमश: वेग $v_3 \hat{i}$ तथा $v_4 \hat{i}$ से चलते हैं।
यदि $m_2 = 0.5\ m_1$ तथा $v_3 = 0.5\ v_1$ हो, तो v_1 होगा :

Options :

41652957494. $v_4 - v_2$

41652957495. $v_4 - \frac{v_2}{2}$

41652957496. $v_4 + v_2$

41652957497. $v_4 - \frac{v_2}{4}$

Question Number : 5 Question Id : 41652914680 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A solid sphere and solid cylinder of identical radii approach an incline with the same linear velocity (see figure). Both roll without slipping all throughout. The two climb maximum heights h_{sph} and h_{cyl} on the incline. The ratio $\frac{h_{sph}}{h_{cyl}}$ is given by :

Options :

41652957498. 1

41652957499. $\frac{2}{\sqrt{5}}$

41652957500. $\frac{14}{15}$

41652957501. $\frac{4}{5}$

Question Number : 5 Question Id : 41652914680 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक ठोस गोला तथा एक ठोस बेलन जिनकी त्रिज्यायें समान है, एक आनत तल की तरफ समान रेखीय वेग से जा रहे हैं (चित्र देखें)। शुरू से अंत तक दोनों बिना फिसले लुढ़कते हुये चलते हैं। ये आनत तल पर अधिकतम ऊँचाई h_{sph} तथा h_{cyl} तक चढ़ पाते हैं तो अनुपात $\frac{h_{sph}}{h_{cyl}}$ होगा :

Options :

41652957498. 1

41652957499. $\frac{2}{\sqrt{5}}$

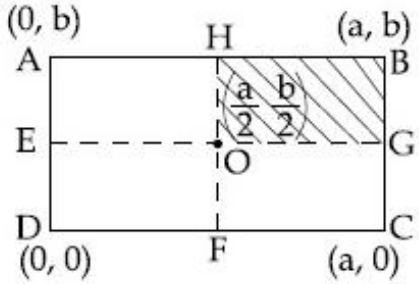
41652957500. $\frac{14}{15}$

41652957501. $\frac{4}{5}$

Question Number : 6 Question Id : 41652914681 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A uniform rectangular thin sheet ABCD of mass M has length a and breadth b, as shown in the figure. If the shaded portion HBGO is cut-off, the coordinates of the centre of mass of the remaining portion will be :



Options :

41652957502. $\left(\frac{5a}{12}, \frac{5b}{12}\right)$

41652957503. $\left(\frac{5a}{3}, \frac{5b}{3}\right)$

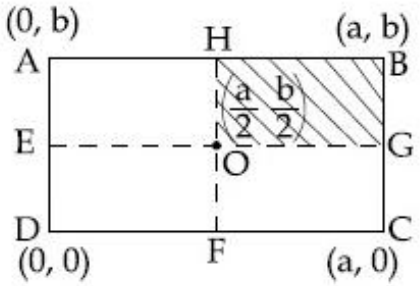
41652957504. $\left(\frac{3a}{4}, \frac{3b}{4}\right)$

41652957505. $\left(\frac{2a}{3}, \frac{2b}{3}\right)$

Question Number : 6 Question Id : 41652914681 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M की एकसमान आयताकार पतली चद्दर ABCD, जिसकी लम्बाई a तथा चौड़ाई b है, को चित्र में दिखाया गया है। यदि इसके आच्छादित भाग HBGO को काटकर हटा देते हैं तो बाकी चद्दर के द्रव्यमान केन्द्र का निर्देशांक होगा :



Options :

41652957502. $\left(\frac{5a}{12}, \frac{5b}{12}\right)$

41652957503. $\left(\frac{5a}{3}, \frac{5b}{3}\right)$

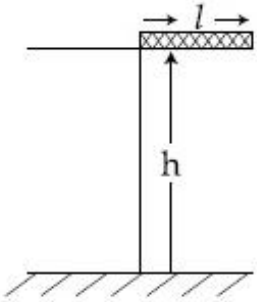
41652957504. $\left(\frac{3a}{4}, \frac{3b}{4}\right)$

41652957505. $\left(\frac{2a}{3}, \frac{2b}{3}\right)$

Question Number : 7 Question Id : 41652914682 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A rectangular solid box of length 0.3 m is held horizontally, with one of its sides on the edge of a platform of height 5 m. When released, it slips off the table in a very short time $\tau = 0.01$ s, remaining essentially horizontal. The angle by which it would rotate when it hits the ground will be (in radians) close to :



Options :

41652957506. 0.3

41652957507. 0.02

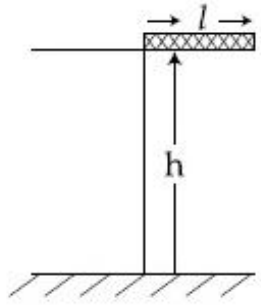
41652957508. 0.5

41652957509. 0.28

Question Number : 7 Question Id : 41652914682 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.3 m लम्बाई के एक ठोस आयताकार डिब्बे के एक सिरे को 5 m ऊँचे प्लेटफॉर्म के किनारे पर क्षैतिज पकड़ा हुआ है। जब उसे छोड़ते हैं तो लगभग क्षैतिज रहते हुए बहुत कम समय $\tau = 0.01$ s में मेज पर से फिसल जाता है। जब यह जमीन पर गिरता है तो यह लगभग किस कोण (रेडियन में) घूम जायेगा?



Options :

41652957506. 0.3

41652957507. 0.02

41652957508. 0.5

41652957509. 0.28

Question Number : 8 Question Id : 41652914683 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A rocket has to be launched from earth in such a way that it never returns. If E is the minimum energy delivered by the rocket launcher, what should be the minimum energy that the launcher should have if the same rocket is to be launched from the surface of the moon ? Assume that the density of the earth and the moon are equal and that the earth's volume is 64 times the volume of the moon.

Options :

41652957510. $\frac{E}{64}$

41652957511. $\frac{E}{32}$

41652957512. $\frac{E}{16}$

41652957513. $\frac{E}{4}$

Question Number : 8 Question Id : 41652914683 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक रॉकेट को पृथ्वी से इस तरह प्रक्षेपित करते हैं कि वह वापस नहीं आता है। यदि इसके लिये राकेट प्रक्षेपक (launcher) द्वारा दी गयी न्यूनतम ऊर्जा E है तो उसी राकेट को चन्द्रमा की सतह से प्रक्षेपित करने के लिए प्रक्षेपक द्वारा दी गयी न्यूनतम ऊर्जा क्या होगी ? मानिये कि पृथ्वी तथा चन्द्रमा का घनत्व समान है तथा पृथ्वी का आयतन चन्द्रमा से 64 गुना ज्यादा है :

Options :

41652957510. $\frac{E}{64}$

41652957511. $\frac{E}{32}$

41652957512. $\frac{E}{16}$

41652957513. $\frac{E}{4}$

Question Number : 9 Question Id : 41652914684 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Young's moduli of two wires A and B are in the ratio 7 : 4. Wire A is 2 m long and has radius R. Wire B is 1.5 m long and has radius 2 mm. If the two wires stretch by the same length for a given load, then the value of R is close to :

Options :

41652957514. 1.3 mm

41652957515. 1.5 mm

41652957516. 1.7 mm

41652957517. 1.9 mm

Question Number : 9 Question Id : 41652914684 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो तारों A तथा B के यंग प्रत्यास्थता गुणांकों का अनुपात 7 : 4 है। तार A की लम्बाई 2 m तथा त्रिज्या R है। तार B की लम्बाई 1.5 m तथा त्रिज्या 2 mm है। यदि इन दोनों तारों की लम्बाई में वृद्धि, एक दिये गये भार के कारण, बराबर है तो R का सन्निकट मान होगा :

Options :

41652957514. 1.3 mm

41652957515. 1.5 mm

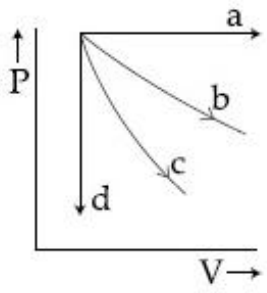
41652957516. 1.7 mm

41652957517. 1.9 mm

Question Number : 10 Question Id : 41652914685 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The given diagram shows four processes i.e., isochoric, isobaric, isothermal and adiabatic. The correct assignment of the processes, in the same order is given by :



Options :

41652957518. d a c b

41652957519. a d b c

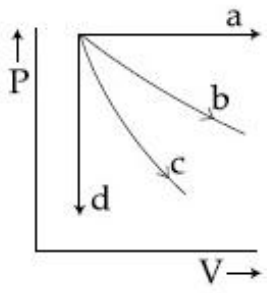
41652957520. a d c b

41652957521. d a b c

Question Number : 10 Question Id : 41652914685 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिये गये चित्र में चार प्रक्रम, समआयतनिक, समदाबीय, समतापीय तथा रुद्धोष्म, दिखाये गये हैं। इन ग्राफों का इसी क्रम में सही निर्दिष्टीकरण होगा :



Options :

41652957518. d a c b

41652957519. a d b c

41652957520. a d c b

41652957521. d a b c

Question Number : 11 Question Id : 41652914686 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The temperature, at which the root mean square velocity of hydrogen molecules equals their escape velocity from the earth, is closest to :

[Boltzmann Constant $k_B = 1.38 \times 10^{-23}$ J/K

Avogadro Number $N_A = 6.02 \times 10^{26}$ /kg

Radius of Earth : 6.4×10^6 m

Gravitational acceleration on Earth = $10\ ms^{-2}$]

Options :

41652957522. 800 K

41652957523. 650 K

41652957524. 10^4 K

41652957525. 3×10^5 K

Question Number : 11 Question Id : 41652914686 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह तापमान, जिस पर हाइड्रोजन अणु का वर्ग माध्य मूल वेग, पृथ्वी से उसके पलायन वेग के बराबर होगा, का सन्निकट मान है :

[दिया है : बोल्टजमॉन नियतांक $= 1.38 \times 10^{-23}$ J/K

आवोगाद्रो संख्या $= 6.02 \times 10^{26}$ /kg

पृथ्वी की त्रिज्या $= 6.4 \times 10^6$ m

पृथ्वी पर गुरुत्वीय त्वरण $= 10\ ms^{-2}$]

Options :

41652957522. 800 K

41652957523. 650 K

41652957524. 10^4 K

41652957525. 3×10^5 K

Question Number : 12 Question Id : 41652914687 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A damped harmonic oscillator has a frequency of 5 oscillations per second. The amplitude drops to half its value for every 10 oscillations. The time it will take to drop to $\frac{1}{1000}$ of the original amplitude is close to :

Options :

41652957526. 100 s

41652957527. 50 s

41652957528. 20 s

41652957529. 10 s

Question Number : 12 Question Id : 41652914687 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक अवमन्दित आवर्ती दोलक की आवृत्ति प्रति सेकण्ड 5 दोलन है। इसका आयाम प्रत्येक 10 दोलन के बाद आधा हो जाता है। इसके मूल आयाम को $\frac{1}{1000}$ गुना घटाने में लगे समय का सन्निकट मान होगा :

Options :

41652957526. 100 s

41652957527. 50 s

41652957528. 20 s

41652957529. 10 s

Question Number : 13 Question Id : 41652914688 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An electric dipole is formed by two equal and opposite charges q with separation d. The charges have same mass m. It is kept in a uniform electric field E. If it is slightly rotated from its equilibrium orientation, then its angular frequency ω is :

Options :

41652957530. $\sqrt{\frac{qE}{2md}}$

41652957531. $\sqrt{\frac{2qE}{md}}$

41652957532. $\sqrt{\frac{qE}{md}}$

41652957533. $2\sqrt{\frac{qE}{md}}$

Question Number : 13 Question Id : 41652914688 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक विद्युत द्विध्रुव d दूरी पर रखे दो बराबर एवं विपरीत आवेश q से बना है। आवेशों का एकसमान द्रव्यमान m है। इसको एकसमान विद्युत क्षेत्र E में रखते हैं। इसे इसकी साम्यावस्था के अभिविन्यास से थोड़ा सा घुमाते हैं तो, कोणीय आवृत्ति ω होगी :

Options :

41652957530. $\sqrt{\frac{qE}{2md}}$

41652957531. $\sqrt{\frac{2qE}{md}}$

41652957532. $\sqrt{\frac{qE}{md}}$

41652957533. $2\sqrt{\frac{qE}{md}}$

Question Number : 14 Question Id : 41652914689 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A parallel plate capacitor has 1μF capacitance. One of its two plates is given +2 μC charge and the other plate, +4 μC charge. The potential difference developed across the capacitor is :

Options :

41652957534. 1 V

41652957535. 5 V

41652957536. 2 V

41652957537. 3 V

Question Number : 14 Question Id : 41652914689 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समान्तर प्लेट संधारित्र की धारिता 1 μF है। इसकी एक प्लेट को +2 μC तथा दूसरी प्लेट को +4 μC आवेश देते हैं। संधारित्र पर उत्पन्न विभवान्तर है :

Options :

41652957534. 1 V

41652957535. 5 V

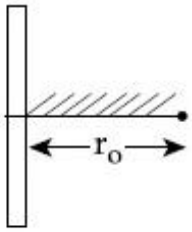
41652957536. 2 V

41652957537. 3 V

Question Number : 15 Question Id : 41652914690 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A positive point charge is released from rest at a distance r_o from a positive line charge with uniform density. The speed (v) of the point charge, as a function of instantaneous distance r from line charge, is proportional to :



Options :

41652957538. $v \propto ln\left(\frac{r}{r_o}\right)$

41652957539. $v \propto \left(\frac{r}{r_o}\right)$

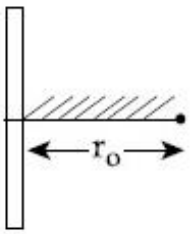
41652957540. $v \propto \sqrt{ln\left(\frac{r}{r_o}\right)}$

41652957541. $v \propto e^{+r/r_o}$

Question Number : 15 Question Id : 41652914690 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

विरामावस्था से एक बिन्दु धन आवेश को एक एकसमान घनत्व के धनात्मक रेखीय आवेश से r_o दूरी पर छोड़ते हैं। बिन्दु आवेश की चाल (v) रेखीय आवेश से तात्क्षणिक दूरी r के फलन के रूप में समानुपाती होगी :



Options :

41652957538. $v \propto ln\left(\frac{r}{r_o}\right)$

41652957539. $v \propto \left(\frac{r}{r_o}\right)$

41652957540. $v \propto \sqrt{ln\left(\frac{r}{r_o}\right)}$

41652957541. $v \propto e^{+r/r_o}$

Question Number : 16 Question Id : 41652914691 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The electric field in a region is given by $\vec{E}=(Ax+B)\hat{i}$, where E is in NC^{-1} and x is in metres. The values of constants are $A=20$ SI unit and $B=10$ SI unit. If the potential at $x=1$ is V_1 and that at $x=-5$ is V_2, then V_1-V_2 is :

Options :

41652957542. -520 V

41652957543. 320 V

41652957544. 180 V

41652957545. -48 V

Question Number : 16 Question Id : 41652914691 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक स्थान पर विद्युत क्षेत्र $\vec{E}=(Ax+B)\hat{i}$ है, जहाँ E NC^{-1} में तथा x मीटर में है। नियतांकों के मान, $A=20$ SI unit तथा $B=10$ SI unit हैं। यदि $x=1$ पर विभव V_1 तथा $x=-5$ पर विभव V_2 है तो V_1-V_2 होगा :

Options :

41652957542. -520 V

41652957543. 320 V

41652957544. 180 V

41652957545. -48 V

Question Number : 17 Question Id : 41652914692 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A cell of internal resistance r drives current through an external resistance R. The power delivered by the cell to the external resistance will be maximum when :

Options :

41652957546. $R = 1000\ r$

41652957547. $R = 0.001\ r$

41652957548. $R = r$

41652957549. $R = 2r$

Question Number : 17 Question Id : 41652914692 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आंतरिक प्रतिरोध r की एक सेल एक बाह्य प्रतिरोध R में धारा प्रवाहित करती है। सेल द्वारा प्रतिरोध को प्रदान की गयी शक्ति का मान अधिकतम होगा, जब :

Options :

41652957546. $R = 1000\ r$

41652957547. $R = 0.001\ r$

41652957548. $R = r$

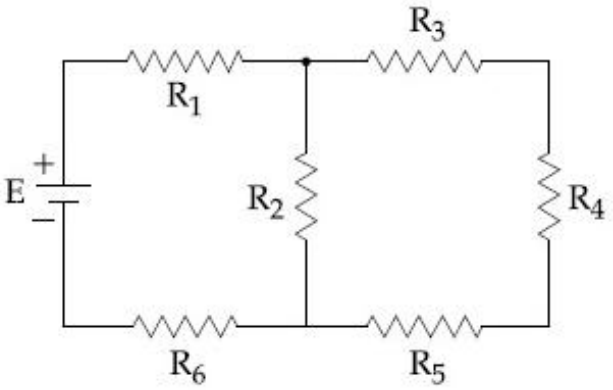
41652957549. $R = 2r$

Question Number : 18 Question Id : 41652914693 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In the figure shown, what is the current (in Ampere) drawn from the battery ? You are given :

$R_1 = 15\ \Omega$, $R_2 = 10\ \Omega$, $R_3 = 20\ \Omega$, $R_4 = 5\ \Omega$, $R_5 = 25\ \Omega$, $R_6 = 30\ \Omega$, $E = 15$ V



Options :

41652957550. 9/32

41652957551. 13/24

41652957552. 20/3

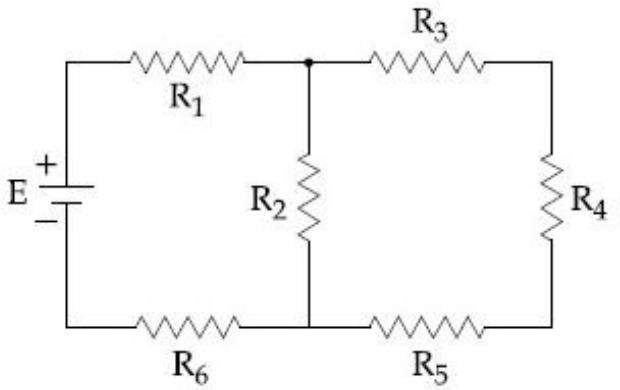
41652957553. 7/18

Question Number : 18 Question Id : 41652914693 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाई गयी बैटरी से निकली धारा का मान (एम्पियर में) क्या होगा? दिया गया है :

$R_1 = 15\ \Omega$, $R_2 = 10\ \Omega$, $R_3 = 20\ \Omega$, $R_4 = 5\ \Omega$, $R_5 = 25\ \Omega$, $R_6 = 30\ \Omega$, $E = 15$ V



Options :

41652957550. 9/32

41652957551. 13/24

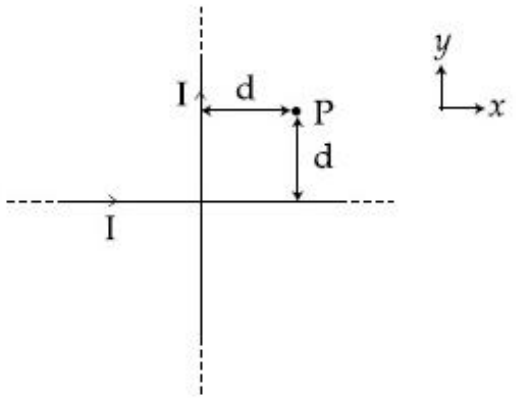
41652957552. 20/3

41652957553. 7/18

Question Number : 19 Question Id : 41652914694 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two very long, straight, and insulated wires are kept at 90° angle from each other in xy-plane as shown in the figure.



These wires carry currents of equal magnitude I, whose directions are shown in the figure. The net magnetic field at point P will be :

Options :

41652957554. $\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

41652957555. $-\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

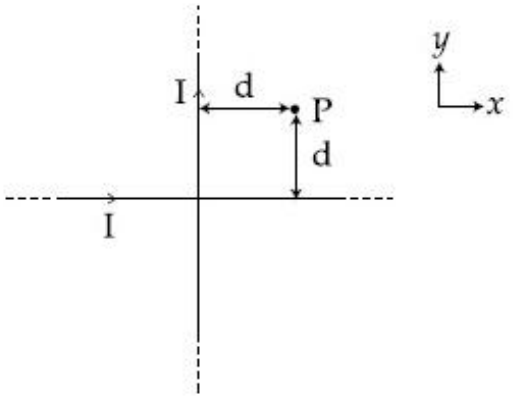
41652957556. $\frac{+\mu_0 I}{\pi d}(\hat{z})$

41652957557. Zero

Question Number : 19 Question Id : 41652914694 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो बहुत लम्बे, सीधे तथा विद्युत रोधी तारों को एक दूसरे से 90° कोण पर चित्रानुसार xy-समतल में रखा है।



तारों में एकसमान धारा I, चित्र में दिखायी दिशा में, बह रही है। बिन्दु P पर परिणामी चुम्बकीय क्षेत्र होगा :

Options :

41652957554. $\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

41652957555. $-\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

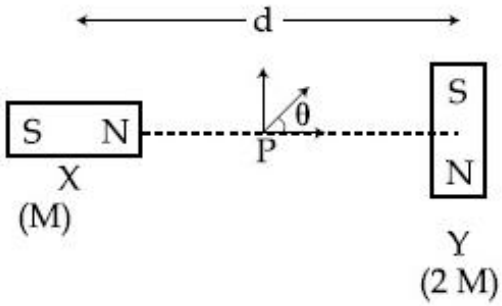
41652957556. $\frac{+\mu_0 I}{\pi d}(\hat{z})$

41652957557. शून्य

Question Number : 20 Question Id : 41652914695 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two magnetic dipoles X and Y are placed at a separation d, with their axes perpendicular to each other. The dipole moment of Y is twice that of X. A particle of charge q is passing through their mid-point P, at angle $\theta = 45°$ with the horizontal line, as shown in figure. What would be the magnitude of force on the particle at that instant ? (d is much larger than the dimensions of the dipole)



Options :

41652957558. $\left(\frac{\mu_0}{4\pi}\right)\frac{2M}{\left(d/2\right)^3}\times qv$

41652957559. $\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

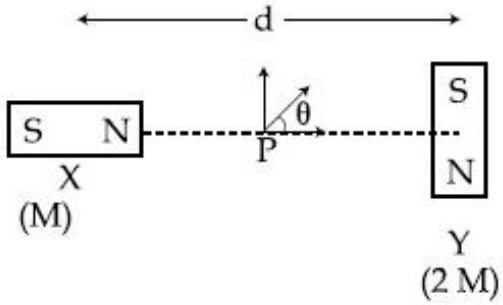
41652957560. 0

41652957561. $\sqrt{2}\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

Question Number : 20 Question Id : 41652914695 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो चुम्बकीय द्विध्रुवों X तथा Y को चित्रानुसार d दूरी पर, उनके अक्षों को परस्पर लम्बवत् करके, रखा है। Y का द्विध्रुव आघूर्ण X का दो गुना है। q आवेश का एक कण इन दोनों के ठीक मध्य बिंदु P से क्षैतिज रेखा से $\theta = 45°$ के कोण पर, चित्रानुसार, गुजरता है। इस क्षण पर कण पर एक लगे बल का परिमाण क्या होगा? (दिया है : d द्विध्रुव के आकार (dimensions) से अत्यधिक बड़ा है)



Options :

41652957558. $\left(\frac{\mu_0}{4\pi}\right)\frac{2M}{\left(d/2\right)^3}\times qv$

41652957559. $\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

41652957560. 0

41652957561. $\sqrt{2}\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

Question Number : 21 Question Id : 41652914696 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A circuit connected to an ac source of emf $e = e_0 \sin(100t)$ with t in seconds, gives a phase difference of $\frac{\pi}{4}$ between the emf e and current i. Which of the following circuits will exhibit this ?

Options :

41652957562. RC circuit with $R = 1\,k\Omega$ and $C = 1\,\mu F$

41652957563. RC circuit with $R = 1\ k\Omega$ and $C = 10\ \mu F$

41652957564. RL circuit with $R = 1\ k\Omega$ and $L = 10\ mH$

41652957565. RL circuit with $R = 1\ k\Omega$ and $L = 1\ mH$

Question Number : 21 Question Id : 41652914696 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

जब एक विद्युत वाहक बल $e = e_0 \sin(100t)$, जहाँ t सेकण्ड में है, के प्रत्यावर्ती स्रोत को एक परिपथ से जोड़ते हैं तो विद्युत वाहक बल e तथा धारा i में $\frac{\pi}{4}$ का कलान्तर पाया जाता है। निम्न में से किस परिपथ में ऐसा होगा?

Options :

41652957562. RC - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $C = 1\ \mu F$

41652957563. RC - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $C = 10\ \mu F$

41652957564. RL - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $L = 10\ mH$

41652957565. RL - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $L = 1\ mH$

Question Number : 22 Question Id : 41652914697 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The magnetic field of an electromagnetic wave is given by :

$$\vec{B} = 1.6\times10^{-6}\cos\left(2\times10^{7}z + 6\times10^{15}t\right)(2\hat{i}+\hat{j})\frac{Wb}{m^2}$$

The associated electric field will be :

Options :

41652957566. $\vec{E} = 4.8\times10^{2}\cos\left(2\times10^{7}z + 6\times10^{15}t\right)(-\hat{i}+2\hat{j})\frac{V}{m}$

41652957567. $\vec{E} = 4.8\times10^{2}\cos\left(2\times10^{7}z - 6\times10^{15}t\right)(-2\hat{j}+\hat{i})\frac{V}{m}$

41652957568. $\vec{E}=4.8\times10^{2}\cos\left(2\times10^{7}z+6\times10^{15}t\right)(\hat{i}-2\hat{j})\frac{V}{m}$

41652957569. $\vec{E}=4.8\times10^{2}\cos\left(2\times10^{7}z-6\times10^{15}t\right)(2\hat{i}+\hat{j})\frac{V}{m}$

Question Number : 22 Question Id : 41652914697 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक विद्युत चुम्बकीय तरंग का चुम्बकीय क्षेत्र निम्न है :

$$\vec{B}=1.6\times10^{-6}\cos(2\times10^{7}z+6\times10^{15}t)(2\hat{i}+\hat{j})\frac{Wb}{m^{2}}$$

इसके संगत विद्युत क्षेत्र होगा :

Options :

41652957566. $\vec{E}=4.8\times10^{2}\cos\left(2\times10^{7}z+6\times10^{15}t\right)(-\hat{i}+2\hat{j})\frac{V}{m}$

41652957567. $\vec{E}=4.8\times10^{2}\cos\left(2\times10^{7}z-6\times10^{15}t\right)(-2\hat{j}+\hat{i})\frac{V}{m}$

41652957568. $\vec{E}=4.8\times10^{2}\cos\left(2\times10^{7}z+6\times10^{15}t\right)(\hat{i}-2\hat{j})\frac{V}{m}$

41652957569. $\vec{E}=4.8\times10^{2}\cos\left(2\times10^{7}z-6\times10^{15}t\right)(2\hat{i}+\hat{j})\frac{V}{m}$

Question Number : 23 Question Id : 41652914698 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A convex lens (of focal length 20 cm) and a concave mirror, having their principal axes along the same lines, are kept 80 cm apart from each other. The concave mirror is to the right of the convex lens. When an object is kept at a distance of 30 cm to the left of the convex lens, its image remains at the same position even if the concave mirror is removed. The maximum distance of the object for which this concave mirror, by itself would produce a virtual image would be :

Options :

41652957570. 30 cm

41652957571. 25 cm

41652957572. 20 cm

41652957573. 10 cm

Question Number : 23 Question Id : 41652914698 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक उत्तल लेंस (फोकस दूरी 20 cm) तथा एक अवतल दर्पण, जिनके मुख्य अक्ष एक ही रेखा में हैं, को एक दूसरे से 80 cm की दूरी पर रखा गया है; अवतल दर्पण उत्तल लेंस के दाहिनी तरफ रखा है। जब एक वस्तु उत्तल लेंस के बाँयी तरफ 30 cm की दूरी पर रखी जाती है, तो उसका प्रतिबिंब उसी स्थान पर ही रहता है, भले ही अवतल दर्पण को उसकी स्थिति से हटा दिया जाये। वस्तु की अधिकतम दूरी, जिसके लिए वह अवतल दर्पण खुद से ही आभासी प्रतिबिंब बनाये, होगी :

Options :

41652957570. 30 cm

41652957571. 25 cm

41652957572. 20 cm

41652957573. 10 cm

Question Number : 24 Question Id : 41652914699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Calculate the limit of resolution of a telescope objective having a diameter of 200 cm, if it has to detect light of wavelength 500 nm coming from a star.

Options :

41652957574. 152.5×10^{-9} radian

41652957575. 457.5×10^{-9} radian

41652957576. 610×10^{-9} radian

41652957577. 305×10^{-9} radian

Question Number : 24 Question Id : 41652914699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक तारे से आ रहे 500 nm तरंगदैर्ध्य के प्रकाश को संसूचित (detect) करने के लिये 200 cm व्यास के अभिदृश्यक लेंस वाले दूरदर्शी की विभेदन सीमा ज्ञात कीजिये :

Options :

41652957574. 152.5×10^{-9} radian

41652957575. 457.5×10^{-9} radian

41652957576. 610×10^{-9} radian

41652957577. 305×10^{-9} radian

Question Number : 25 Question Id : 41652914700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A nucleus A, with a finite de-broglie wavelength λ_A, undergoes spontaneous fission into two nuclei B and C of equal mass. B flies in the same direction as that of A, while C flies in the opposite direction with a velocity equal to half of that of B. The de-Broglie wavelengths λ_B and λ_C of B and C are respectively :

Options :

41652957578. $2\lambda_A, \lambda_A$

41652957579. $\lambda_A, 2\lambda_A$

41652957580. $\frac{\lambda_A}{2}, \lambda_A$

41652957581. $\lambda_A, \frac{\lambda_A}{2}$

Question Number : 25 Question Id : 41652914700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परिमित दे-ब्रॉग्ली तरंगदैर्घ्य λ_A के एक नाभिक A का स्वत: विखण्डन बराबर द्रव्यमान के दो नाभिकों B तथा C में होता है। B नाभिक A की दिशा में तथा C नाभिक उसके विपरीत दिशा में B के आधे वेग से जाता है। तो B व C की दे-ब्रॉग्ली तरंगदैर्घ्य, λ_B तथा λ_C क्रमश: होंगी :

Options :

41652957578. $2\lambda_A, \lambda_A$

41652957579. $\lambda_A, 2\lambda_A$

41652957580. $\frac{\lambda_A}{2}, \lambda_A$

41652957581. $\lambda_A, \frac{\lambda_A}{2}$

Question Number : 26 Question Id : 41652914701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The ratio of mass densities of nuclei of ^{40}Ca and ^{16}O is close to :

Options :

41652957582. 0.1

41652957583. 5

41652957584. 2

41652957585. 1

Question Number : 26 Question Id : 41652914701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

^{40}Ca तथा ^{16}O के नाभिकों के द्रव्यमान घनत्व के अनुपात का सन्निकट मान होगा :

Options :

41652957582. 0.1

41652957583. 5

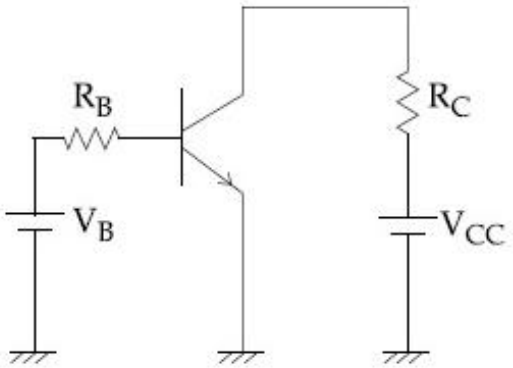
41652957584. 2

41652957585. 1

Question Number : 27 Question Id : 41652914702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A common emitter amplifier circuit, built using an npn transistor, is shown in the figure. Its dc current gain is 250, $R_C = 1\,k\Omega$ and $V_{CC} = 10\,V$. What is the minimum base current for V_{CE} to reach saturation ?



Options :

41652957586. $10\ \mu A$

41652957587. $40\ \mu A$

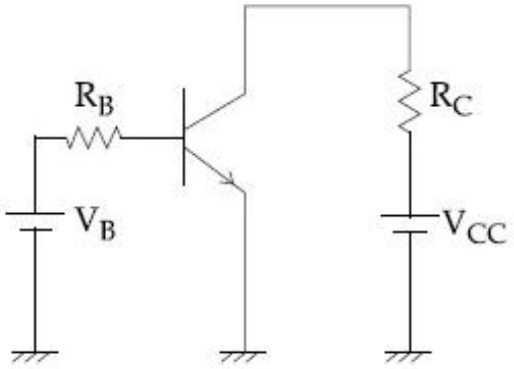
41652957588. $7\ \mu A$

41652957589. $100\ \mu A$

Question Number : 27 Question Id : 41652914702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में एक npn ट्रांसिस्टर द्वारा बनाये गये उभयनिष्ठ उत्सर्जक प्रवर्धक को दिखाया गया है। इसका dc धारा प्रवर्धन 250 है तथा इसमें $R_C = 1\ k\Omega$ तथा $V_{CC} = 10\ V$ है। V_{CE} की संतृप्ति (saturation) के लिये आधार धारा का न्यूनतम मान होगा :



Options :

41652957586. $10\ \mu A$

41652957587. $40\ \mu A$

41652957588. $7\ \mu A$

41652957589. $100\ \mu A$

Question Number : 28 Question Id : 41652914703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In a line of sight radio communication, a distance of about 50 km is kept between the transmitting and receiving antennas. If the height of the receiving antenna is 70 m, then the minimum height of the transmitting antenna should be :
(Radius of the Earth $= 6.4 \times 10^6$ m).

Options :

41652957590. 40 m

41652957591. 32 m

41652957592. 51 m

41652957593. 20 m

Question Number : 28 Question Id : 41652914703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक दृष्टिरेखीय रेडियो संचरण में प्रेषक तथा अभिग्राही एन्टीना के बीच 50 km की दूरी है। यदि अभिग्राही एन्टीना की ऊँचाई 70 m है तो प्रेषक एन्टीना की न्यूनतम ऊँचाई होनी चाहिये :

(दिया है : पृथ्वी की त्रिज्या= 6.4×10^6 m)

Options :

41652957590. 40 m

41652957591. 32 m

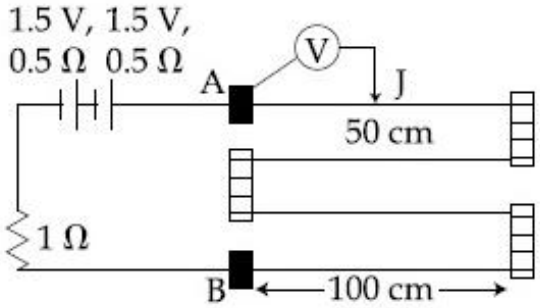
41652957592. 51 m

41652957593. 20 m

Question Number : 29 Question Id : 41652914704 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In the circuit shown, a four-wire potentiometer is made of a 400 cm long wire, which extends between A and B. The resistance per unit length of the potentiometer wire is r = 0.01 Ω/cm. If an ideal voltmeter is connected as shown with jockey J at 50 cm from end A, the expected reading of the voltmeter will be :



Options :

41652957594. 0.25 V

41652957595. 0.20 V

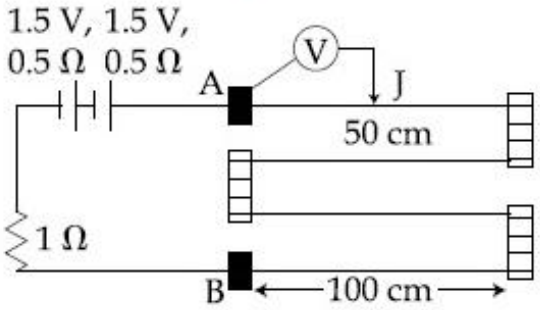
41652957596. 0.50 V

41652957597. 0.75 V

Question Number : 29 Question Id : 41652914704 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिखाये गये परिपथ में एक चार तार वाले विभवमापी के 400 cm लम्बे तार को A तथा B के बीच में लगाया गया है (चित्र देखिये)। इस विभवमापी तार का एकाकी लम्बाई प्रतिरोध $r = 0.01\ \Omega/cm$ है। यदि एक आदर्श वोल्टमीटर को चित्रानुसार जॉकी J के साथ सिरे A से 50 cm दूरी पर लगाते हैं, तो वोल्टमीटर के पाठ्यांक का अपेक्षित मान होगा :



Options :

41652957594. 0.25 V

41652957595. 0.20 V

41652957596. 0.50 V

41652957597. 0.75 V

Question Number : 30 Question Id : 41652914705 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In a simple pendulum experiment for determination of acceleration due to gravity (g), time taken for 20 oscillations is measured by using a watch of 1 second least count. The mean value of time taken comes out to be 30 s. The length of pendulum is measured by using a meter scale of least count 1 mm and the value obtained is 55.0 cm. The percentage error in the determination of g is close to :

Options :

41652957598. 0.2 %

41652957599. 0.7 %

41652957600. 3.5 %

41652957601. 6.8 %

Question Number : 30 Question Id : 41652914705 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक सरल दोलक के प्रयोग, जिसमें गुरुत्वीय त्वरण (g) मापना है, में 20 दोलनों का समय एक 1 sec अल्पतमांक वाली एक विराम घड़ी से मापते हैं। इस समय का माध्य मान 30 s आता है। दोलक की लम्बाई को 1 mm अल्पतमांक के पैमाने से मापने पर 55.0 cm आती है। g के मापन में प्रतिशत त्रुटि का सन्निकट मान होगा :

Options :

41652957598. 0.2 %

41652957599. 0.7 %

41652957600. 3.5 %

41652957601. 6.8 %

Chemistry

Section Id :	416529317
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

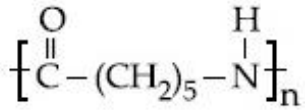
Sub-Section Number:	1
Sub-Section Id:	416529457
Question Shuffling Allowed :	Yes

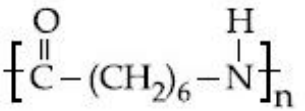
Question Number : 31 Question Id : 41652914706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

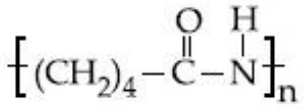
Correct Marks : 4 Wrong Marks : 1

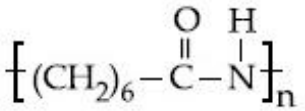
The structure of Nylon-6 is :

Options :

41652957602. 

41652957603. 

41652957604. 

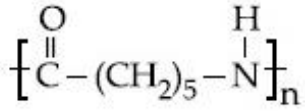
41652957605. 

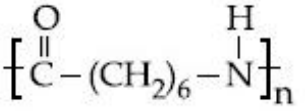
Question Number : 31 Question Id : 41652914706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

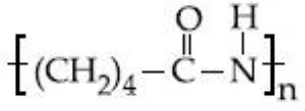
Correct Marks : 4 Wrong Marks : 1

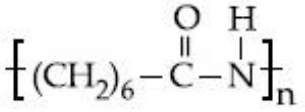
नाइलॉन-6 की संरचना है :

Options :

41652957602. 

41652957603. 

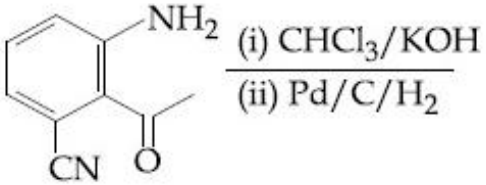
41652957604. 

41652957605. 

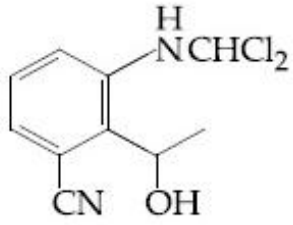
Question Number : 32 Question Id : 41652914707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

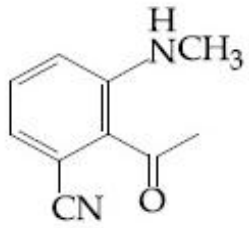
Correct Marks : 4 Wrong Marks : 1

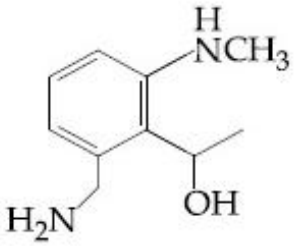
The major product obtained in the following reaction is :

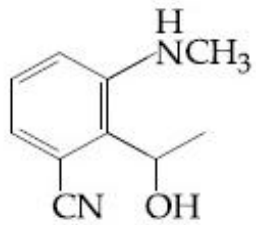


Options :

41652957606. 

41652957607. 

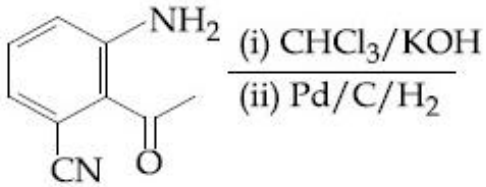
41652957608. 

41652957609. 

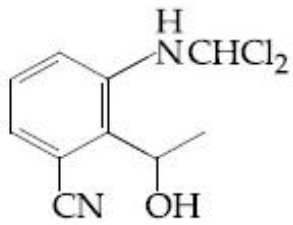
Question Number : 32 Question Id : 41652914707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

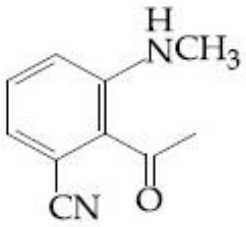
Correct Marks : 4 Wrong Marks : 1

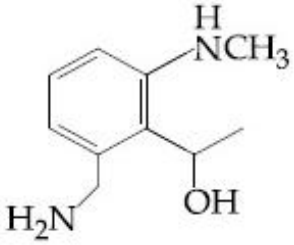
निम्न अभिक्रिया में प्राप्त होने वाला मुख्य उत्पाद है :

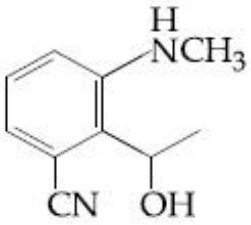


Options :

41652957606. 

41652957607. 

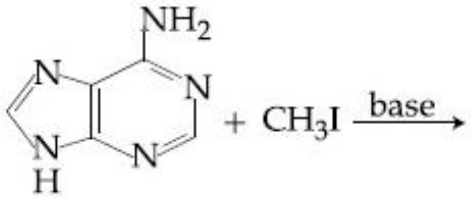
41652957608. 

41652957609. 

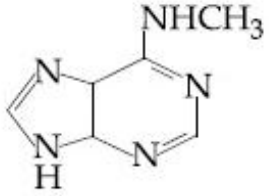
Question Number : 33 Question Id : 41652914708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

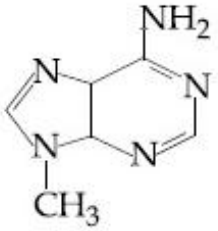
Correct Marks : 4 Wrong Marks : 1

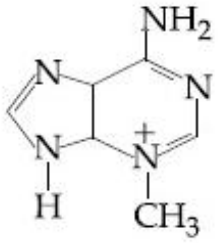
The major product in the following reaction is :

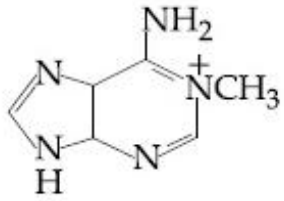


Options :

41652957610. 

41652957611. 

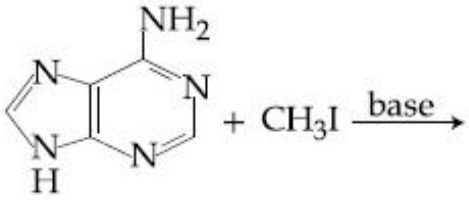
41652957612. 

41652957613. 

Question Number : 33 Question Id : 41652914708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

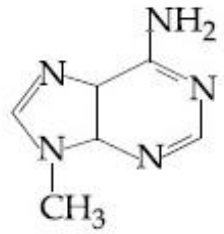
Correct Marks : 4 Wrong Marks : 1

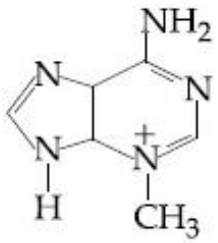
निम्न अभिक्रिया में मुख्य उत्पाद है :

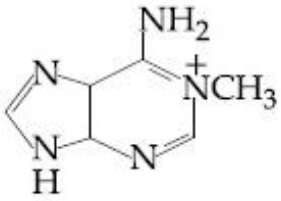


Options :

41652957610. 

41652957611. 

41652957612. 

41652957613. 

Question Number : 34 Question Id : 41652914709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Polysubstitution is a major drawback in :

Options :

41652957614. Friedel Craft's alkylation

41652957615. Friedel Craft's acylation

41652957616. Acetylation of aniline

41652957617. Reimer Tiemann reaction

Question Number : 34 Question Id : 41652914709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से किसमें बहुप्रतिस्थापन एक मुख्य कमी है?

Options :

41652957614. फ्रीडल-क्राफ्ट ऐल्किलेशन

41652957615. फ्रीडल-क्राफ्ट ऐसाइलेशन (एसिलीकरण)

41652957616. ऐनिलीन का ऐसिटिलेशन

41652957617. राइमर टीमन अभिक्रिया

Question Number : 35 Question Id : 41652914710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Fructose and glucose can be distinguished by :

Options :

41652957618. Fehling's test

41652957619. Benedict's test

41652957620. Barfoed's test

41652957621. Seliwanoff's test

Question Number : 35 Question Id : 41652914710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

फ्रक्टोज़ तथा ग्लुकोज़ निम्न किसके द्वारा पहचाने जा सकते हैं?

Options :

41652957618. फेहलिंग परीक्षण

41652957619. बेनिडिक्ट परीक्षण

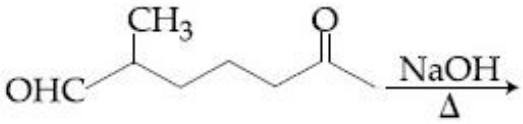
41652957620. बार्फोड परीक्षण

41652957621. सेलिवानॉफ परीक्षण

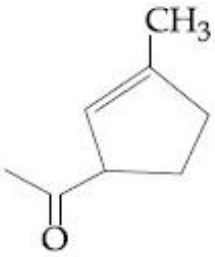
Question Number : 36 Question Id : 41652914711 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

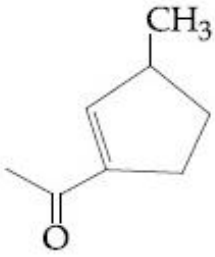
Correct Marks : 4 Wrong Marks : 1

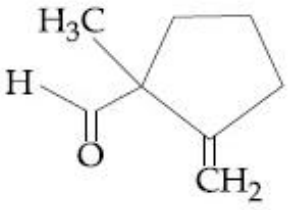
The major product obtained in the following reaction is :

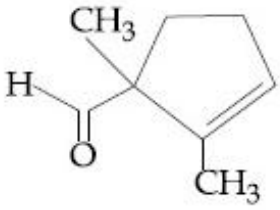


Options :

41652957622. 

41652957623. 

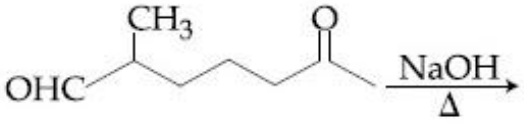
41652957624. 

41652957625. 

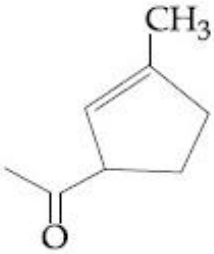
Question Number : 36 Question Id : 41652914711 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

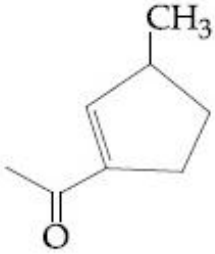
Correct Marks : 4 Wrong Marks : 1

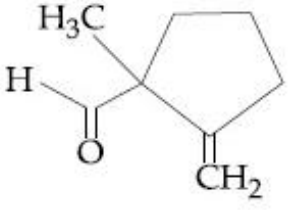
निम्न अभिक्रिया में प्राप्त होने वाला मुख्य उत्पाद है :

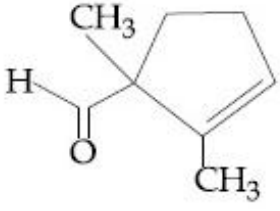


Options :

41652957622. 

41652957623. 

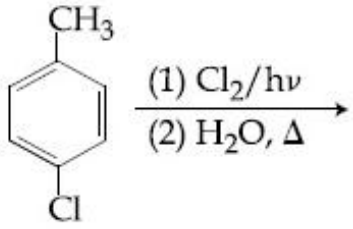
41652957624. 

41652957625. 

Question Number : 37 Question Id : 41652914712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

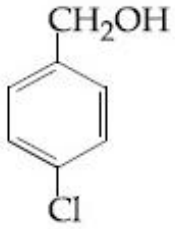
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

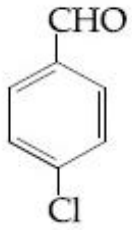


Options :

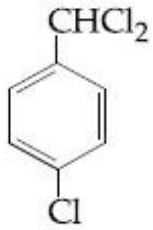
41652957626.



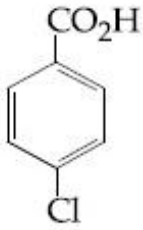
41652957627.



41652957628.



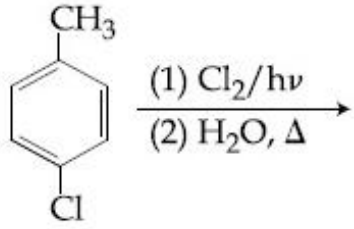
41652957629.



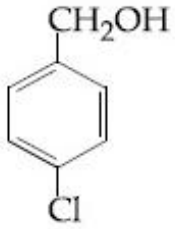
Question Number : 37 Question Id : 41652914712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

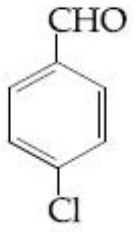
Correct Marks : 4 Wrong Marks : 1

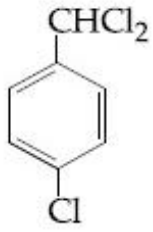
निम्न अभिक्रिया का मुख्य उत्पाद है :

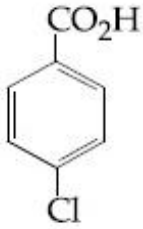


Options :

41652957626. 

41652957627. 

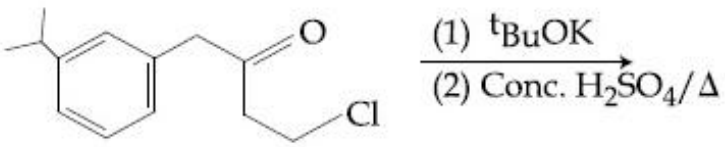
41652957628. 

41652957629. 

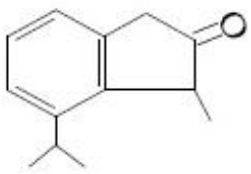
Question Number : 38 Question Id : 41652914713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

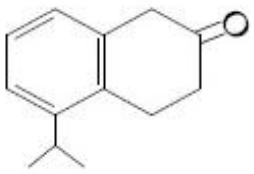
Correct Marks : 4 Wrong Marks : 1

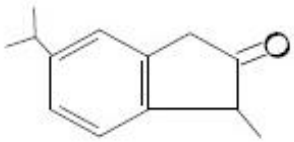
The major product of the following reaction is :

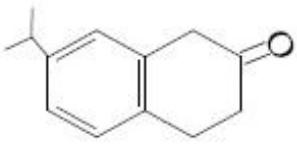


Options :

41652957630. 

41652957631. 

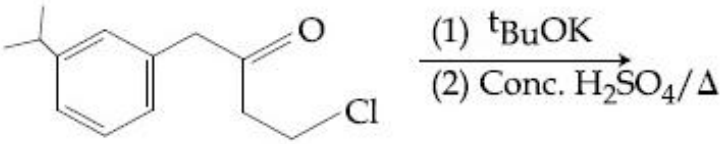
41652957632. 

41652957633. 

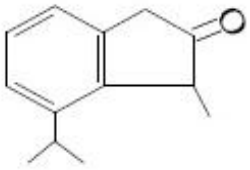
Question Number : 38 Question Id : 41652914713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

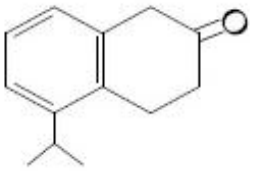
Correct Marks : 4 Wrong Marks : 1

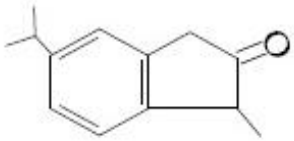
निम्न अभिक्रिया का मुख्य उत्पाद है :

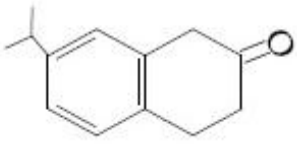


Options :

41652957630. 

41652957631. 

41652957632. 

41652957633. 

Question Number : 39 Question Id : 41652914714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following compounds will show the maximum 'enol' content ?

Options :

41652957634. $CH_3COCH_2COCH_3$

41652957635. $CH_3COCH_2COOC_2H_5$

41652957636. CH_3COCH_3

41652957637. $CH_3COCH_2CONH_2$

Question Number : 39 Question Id : 41652914714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न यौगिकों में से कौन-सा 'ईनॉल' की अधिकतम मात्रा प्रदर्शित करेगा?

Options :

41652957634. $CH_3COCH_2COCH_3$

41652957635. $CH_3COCH_2COOC_2H_5$

41652957636. CH_3COCH_3

41652957637. $CH_3COCH_2CONH_2$

Question Number : 40 Question Id : 41652914715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which one of the following alkenes when treated with HCl yields majorly an anti Markovnikov product ?

Options :

41652957638. $CH_3O-CH=CH_2$

41652957639. $F_3C-CH=CH_2$

41652957640. $Cl-CH=CH_2$

41652957641. $H_2N-CH=CH_2$

Question Number : 40 Question Id : 41652914715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित ऐल्कीनों में से कौन-सा एक HCl के साथ अभिक्रिया करके मुख्यत: एक प्रति मार्कोनीकॉफ उत्पाद देता है?

Options :

41652957638. $CH_3O-CH=CH_2$

41652957639. $F_3C-CH=CH_2$

41652957640. $Cl-CH=CH_2$

41652957641. $H_2N-CH=CH_2$

Question Number : 41 Question Id : 41652914716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The IUPAC symbol for the element with atomic number 119 would be :

Options :

41652957642. une

41652957643. uun

41652957644. unh

41652957645. uue

Question Number : 41 Question Id : 41652914716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

119 परमाणु क्रमांक वाले तत्व के लिए आई.यू.पी.ए.सी. प्रतीक होगा :

Options :

41652957642. une

41652957643. uun

41652957644. unh

41652957645. uue

Question Number : 42 Question Id : 41652914717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The Mond process is used for the :

Options :

41652957646. extraction of Zn

41652957647. extraction of Mo

41652957648. purification of Ni

41652957649. purification of Zr and Ti

Question Number : 42 Question Id : 41652914717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

मॉन्ड प्रक्रम प्रयुक्त होता है :

Options :

41652957646. Zn के निष्कर्षण के लिए

41652957647. Mo के निष्कर्षण के लिए

41652957648. Ni के शोधन के लिए

41652957649. Zr तथा Ti के शोधन के लिए

Question Number : 43 Question Id : 41652914718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The strength of 11.2 volume solution of H_2O_2 is : [Given that molar mass of $H = 1\ g\ mol^{-1}$ and $O = 16\ g\ mol^{-1}$]

Options :

41652957650. 13.6%

41652957651. 3.4%

41652957652. 1.7%

41652957653. 34%

Question Number : 43 Question Id : 41652914718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

H_2O_2 के 11.2 आयतन विलयन की सामर्थ्य है,
(दिया गया है : मोलर द्रव्यमान $H = 1\ g\ mol^{-1}$ तथा $O = 16\ g\ mol^{-1}$)

Options :

41652957650. 13.6%

41652957651. 3.4%

41652957652. 1.7%

41652957653. 34%

Question Number : 44 Question Id : 41652914719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The covalent alkaline earth metal halide (X = Cl, Br, I) is :

Options :

41652957654. BeX_2

41652957655. MgX_2

41652957656. CaX_2

41652957657. SrX_2

Question Number : 44 Question Id : 41652914719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सहसंयोजी क्षारीय मृदा धातु हैलाइड (X = Cl, Br, I) है :

Options :

41652957654. BeX_2

41652957655. MgX_2

41652957656. CaX_2

41652957657. SrX_2

Question Number : 45 Question Id : 41652914720 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct statement about ICl_5 and ICl_4^- is :

Options :

41652957658. both are isostructural.

41652957659. ICl_5 is trigonal bipyramidal and ICl_4^- is tetrahedral.

41652957660. ICl_5 is square pyramidal and ICl_4^- is square planar.

41652957661. ICl_5 is square pyramidal and ICl_4^- is tetrahedral.

Question Number : 45 Question Id : 41652914720 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ICl_5 तथा ICl_4^- के लिए सत्य कथन है :

Options :

41652957658. दोनों ही समसंरचनात्मक हैं।

41652957659. ICl_5 त्रिसमनताक्ष द्विपिरामिडी तथा ICl_4^- चतुष्फलकीय है।

41652957660. ICl_5 वर्ग पिरामिडी तथा ICl_4^- वर्ग समतलीय है।

41652957661. ICl_5 वर्ग पिरामिडी तथा ICl_4^- चतुष्फलकीय है।

Question Number : 46 Question Id : 41652914721 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The ion that has sp^3d^2 hybridization for the central atom, is :

Options :

41652957662. $[BrF_2]^-$

41652957663. $[ICl_4]^-$

41652957664. $[IF_6]^-$

41652957665. $[ICl_2]^-$

Question Number : 46 Question Id : 41652914721 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से किस आयन में केन्द्रीय परमाणु का संकरण sp^3d^2 है?

Options :

41652957662. $[BrF_2]^-$

41652957663. $[ICl_4]^-$

41652957664. $[IF_6]^-$

41652957665. $[ICl_2]^-$

Question Number : 47 Question Id : 41652914722 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The statement that is INCORRECT about the interstitial compounds is :

Options :

41652957666. they have high melting points.

41652957667. they are very hard.

41652957668. they have metallic conductivity.

41652957669. they are chemically reactive.

Question Number : 47 Question Id : 41652914722 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अंतराली यौगिकों के बारे में जो कथन असत्य होगा, वह है :

Options :

41652957666. उनके गलनांक उच्च होते हैं

41652957667. वे बहुत कठोर होते हैं

41652957668. उनमें धात्विक चालकता होती है

41652957669. वे रासायनिक रूप से अभिक्रियाशील होते हैं

Question Number : 48 Question Id : 41652914723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The compound that inhibits the growth of tumors is :

Options :

41652957670. *cis*-$[Pt(Cl)_2(NH_3)_2]$

41652957671. *trans*-$[Pt(Cl)_2(NH_3)_2]$

41652957672. *cis*-$[Pd(Cl)_2(NH_3)_2]$

41652957673. *trans*-$[Pd(Cl)_2(NH_3)_2]$

Question Number : 48 Question Id : 41652914723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह यौगिक जो ट्यूमर की वृद्धि को रोकता है, है :

Options :

41652957670. *सिस*-$[Pt(Cl)_2(NH_3)_2]$

41652957671. *ट्रांस*-$[Pt(Cl)_2(NH_3)_2]$

41652957672. *सिस*-$[Pd(Cl)_2(NH_3)_2]$

41652957673. *ट्रांस*-$[Pd(Cl)_2(NH_3)_2]$

Question Number : 49 Question Id : 41652914724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The calculated spin-only magnetic moments (BM) of the anionic and cationic species of $[Fe(H_2O)_6]_2$ and $[Fe(CN)_6]$, respectively, are :

Options :

41652957674. 4.9 and 0

41652957675. 0 and 5.92

41652957676. 0 and 4.9

41652957677. 2.84 and 5.92

Question Number : 49 Question Id : 41652914724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$[Fe(H_2O)_6]_2$ तथा $[Fe(CN)_6]$ के ऋणायनिक तथा धनायनिक स्पीशीज के परिकलित प्रचक्रण – मात्र चुम्बकीय आघूर्ण (B.M. में) क्रमश: हैं :

Options :

41652957674. 4.9 तथा 0

41652957675. 0 तथा 5.92

41652957676. 0 तथा 4.9

41652957677. 2.84 तथा 5.92

Question Number : 50 Question Id : 41652914725 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The maximum prescribed concentration of copper in drinking water is :

Options :

41652957678. 0.5 ppm

41652957679. 0.05 ppm

41652957680. 3 ppm

41652957681. 5 ppm

Question Number : 50 Question Id : 41652914725 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पीने के जल में कॉपर (तांबें) की निर्धारित अधिकतम सान्द्रता है :

Options :

41652957678. 0.5 ppm

41652957679. 0.05 ppm

41652957680. 3 ppm

41652957681. 5 ppm

Question Number : 51 Question Id : 41652914726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The percentage composition of carbon by mole in methane is :

Options :

41652957682. 25%

41652957683. 75%

41652957684. 20%

41652957685. 80%

Question Number : 51 Question Id : 41652914726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

मोल के आधार पर मिथेन में कार्बन की प्रतिशतता संघटन है :

Options :

41652957682. 25%

41652957683. 75%

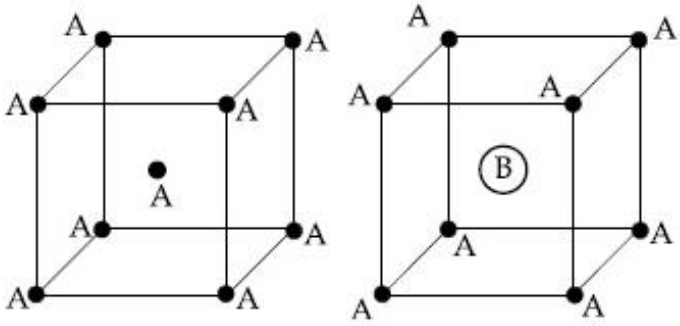
41652957684. 20%

41652957685. 80%

Question Number : 52 Question Id : 41652914727 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the bcc unit cells of the solids 1 and 2 with the position of atoms as shown below. The radius of atom B is twice that of atom A. The unit cell edge length is 50% more in solid 2 than in 1. What is the approximate packing efficiency in solid 2 ?



Solid 1 Solid 2

Options :

41652957686. 90%

41652957687. 75%

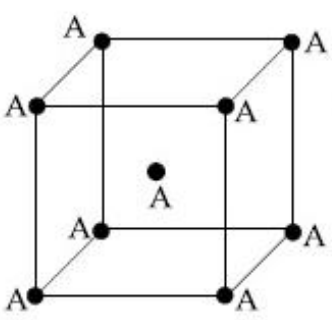
41652957688. 65%

41652957689. 45%

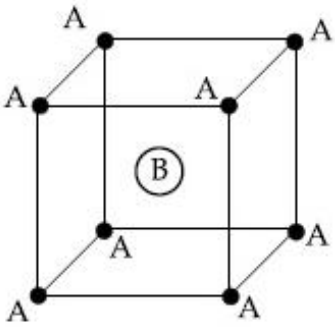
Question Number : 52 Question Id : 41652914727 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ठोस 1 तथा 2 परमाणुओं की स्थिति के साथ, जैसा कि नीचे दर्शाया गया है, की बी.सी.सी. (का.कं.घ.) एकक कोष्ठिका पर विचार कीजिए। परमाणु B की त्रिज्या परमाणु A की त्रिज्या की दूनी है। ठोस 1 की एकक कोष्ठिका की कोर लम्बाई से ठोस 2 की एकक कोष्ठिका की कोर लम्बाई 50% ज्यादा है। ठोस 2 में लगभग सुसंकुलन दक्षता क्या है?



Solid 1



Solid 2

Options :

41652957686. 90%

41652957687. 75%

41652957688. 65%

41652957689. 45%

Question Number : 53 Question Id : 41652914728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If p is the momentum of the fastest electron ejected from a metal surface after the irradiation of light having wavelength λ, then for 1.5 p momentum of the photoelectron, the wavelength of the light should be :

(Assume kinetic energy of ejected photoelectron to be very high in comparison to work function) :

Options :

41652957690. $\frac{1}{2}\lambda$

41652957691. $\frac{2}{3}\lambda$

41652957692. $\frac{3}{4}\lambda$

41652957693. $\frac{4}{9}\lambda$

Question Number : 53 Question Id : 41652914728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि λ तरंगदैर्घ्य के प्रकाश से किरणित होने पर एक धातु की सतह से निकले हुए तीव्रतम इलेक्ट्रॉन का संवेग p है तो प्रकाशिक इलेक्ट्रॉन के 1.5 p संवेग के लिए प्रकाश का तरंगदैर्घ्य होगा :

(मान लीजिये कि निष्कासित प्रकाशिक इलेक्ट्रॉन की K.E. (गतिज ऊर्जा) उसके कार्यफलन की तुलना में बहुत उच्च है)

Options :

41652957690. $\frac{1}{2}\lambda$

41652957691. $\frac{2}{3}\lambda$

41652957692. $\frac{3}{4}\lambda$

41652957693. $\frac{4}{9}\lambda$

Question Number : 54 Question Id : 41652914729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Among the following molecules/ions,

$C_2^{2-}, N_2^{2-}, O_2^{2-}, O_2$

which one is diamagnetic and has the shortest bond length ?

Options :

41652957694. O_2^{2-}

41652957695. C_2^{2-}

41652957696. N_2^{2-}

41652957697. O_2

Question Number : 54 Question Id : 41652914729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अणुओं/आयनों में

$C_2^{2-}, N_2^{2-}, O_2^{2-}, O_2$

कौन प्रतिचुम्बकीय है और उसकी आबन्ध लम्बाई सबसे कम है?

Options :

41652957694. O_2^{2-}

41652957695. C_2^{2-}

41652957696. N_2^{2-}

41652957697. O_2

Question Number : 55 Question Id : 41652914730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

5 moles of an ideal gas at 100 K are allowed to undergo reversible compression till its temperature becomes 200 K. If $C_V = 28\ J\ K^{-1}\ mol^{-1}$, calculate ΔU and ΔpV for this process. $(R = 8.0\ J\ K^{-1}\ mol^{-1})$

Options :

41652957698. $\Delta U = 14\ kJ;\ \Delta(pV) = 18\ kJ$

41652957699. $\Delta U = 14\ J;\ \Delta(pV) = 0.8\ J$

41652957700. $\Delta U = 14\ kJ;\ \Delta(pV) = 4\ kJ$

41652957701. $\Delta U = 2.8\ kJ;\ \Delta(pV) = 0.8\ kJ$

Question Number : 55 Question Id : 41652914730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

100 K पर, एक आदर्श गैस के 5 मोल का उत्क्रमणीय संपीडन तब तक किया जाता है जब तक की उसका ताप 200 K नहीं हो जाता। यदि $C_V = 28\ J\ K^{-1} mol^{-1}$, तो इस प्रक्रम के लिए ΔU तथा ΔpV की गणना कीजिए ($R = 8.0\ J\ K^{-1}\ mol^{-1}$)

Options :

41652957698. $\Delta U = 14\ kJ; \Delta(pV) = 18\ kJ$

41652957699. $\Delta U = 14\ J; \Delta(pV) = 0.8\ J$

41652957700. $\Delta U = 14\ kJ; \Delta(pV) = 4\ kJ$

41652957701. $\Delta U = 2.8\ kJ; \Delta(pV) = 0.8\ kJ$

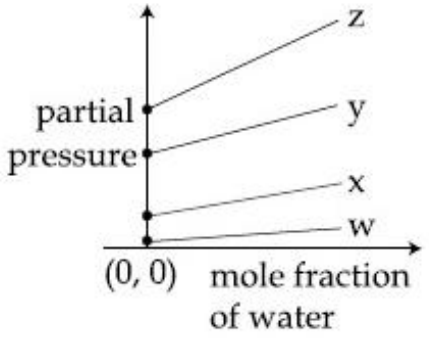
Question Number : 56 Question Id : 41652914731 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

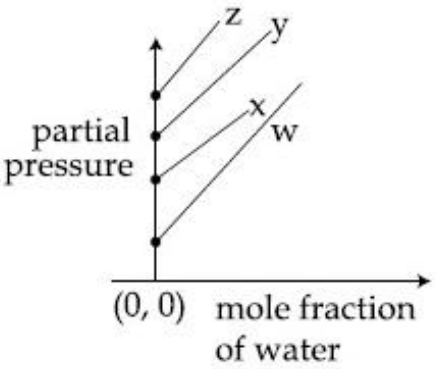
For the solution of the gases w, x, y and z in water at 298 K, the Henrys law constants (K_H) are 0.5, 2, 35 and 40 kbar, respectively. The correct plot for the given data is :

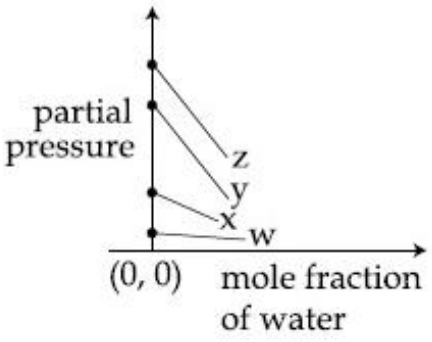
Options :

41652957702.

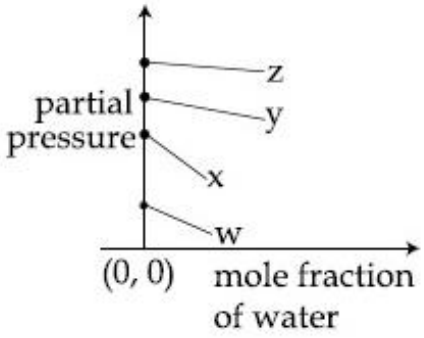


41652957703.





41652957704.



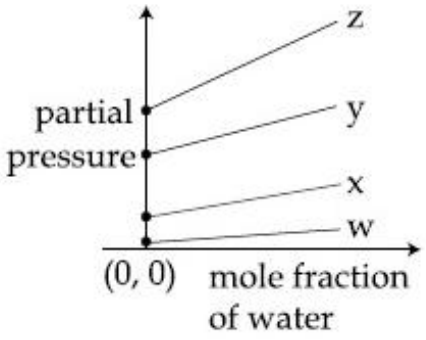
41652957705.

Question Number : 56 Question Id : 41652914731 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

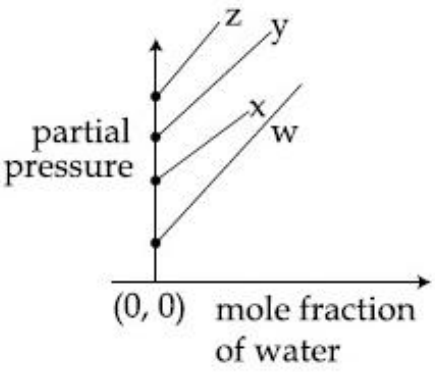
Correct Marks : 4 Wrong Marks : 1

298 K पर जल में गैस w, x, y तथा z के विलयन के लिए हेनरी नियम स्थिरांक (K_H) क्रमश: 0.5, 2, 35 तथा 40 kbar हैं। दिये आँकड़ों के लिये सही प्लाट है :

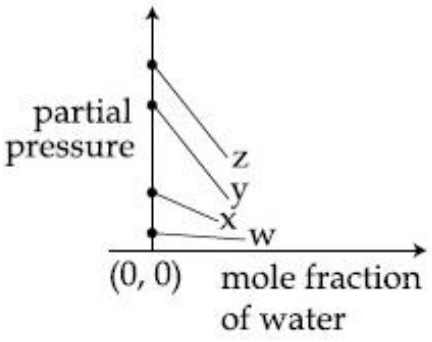
Options :



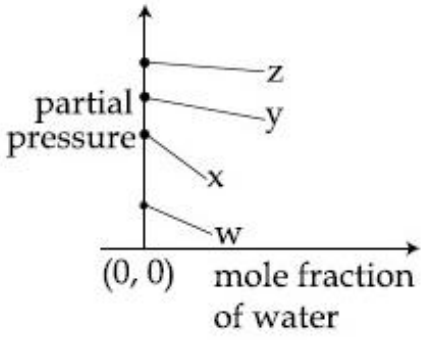
41652957702.



41652957703.



41652957704.



41652957705.

Question Number : 57 Question Id : 41652914732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the following reactions, equilibrium constants are given :

$S(s) + O_2(g) \rightleftharpoons SO_2(g);\ K_1 = 10^{52}$

$2S(s) + 3O_2(g) \rightleftharpoons 2SO_3(g);\ K_2 = 10^{129}$

The equilibrium constant for the reaction,

$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ is :

Options :

41652957706. 10^{77}

41652957707. 10^{181}

41652957708. 10^{154}

41652957709. 10^{25}

Question Number : 57 Question Id : 41652914732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे दी गई अभिक्रियाओं के लिये साम्य स्थिरांक दिये गये हैं :

$S(s)+O_2(g) \rightleftharpoons SO_2(g);\ K_1 = 10^{52}$

$2S(s)+3O_2(g) \rightleftharpoons 2SO_3(g);\ K_2 = 10^{129}$

अभिक्रिया

$2SO_2(g)+O_2(g) \rightleftharpoons 2SO_3(g)$ का साम्य स्थिरांक होगा :

Options :

41652957706. 10^{77}

41652957707. 10^{181}

41652957708. 10^{154}

41652957709. 10^{25}

Question Number : 58 Question Id : 41652914733 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Calculate the standard cell potential (in V) of the cell in which following reaction takes place :

$Fe^{2+}(aq)+Ag^{+}(aq) \rightarrow Fe^{3+}(aq)+Ag(s)$

Given that

$E^{o}_{Ag^{+}/Ag} = x\ V$

$E^{o}_{Fe^{2+}/Fe} = y\ V$

$E^{o}_{Fe^{3+}/Fe} = z\ V$

Options :

41652957710. $x-y$

41652957711. $x-z$

41652957712. $x+y-z$

41652957713. $x+2y-3z$

Question Number : 58 Question Id : 41652914733 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

उस सेल के मानक सेल विभव (V में) की गणना कीजिए जिसमें निम्न अभिक्रिया होती है :

$Fe^{2+}(aq) + Ag^{+}(aq) \rightarrow Fe^{3+}(aq) + Ag(s)$

दिया गया है :

$E^{o}_{Ag^{+}/Ag} = x\,V$

$E^{o}_{Fe^{2+}/Fe} = y\,V$

$E^{o}_{Fe^{3+}/Fe} = z\,V$

Options :

41652957710. $x - y$

41652957711. $x - z$

41652957712. $x + y - z$

41652957713. $x + 2y - 3z$

Question Number : 59 Question Id : 41652914734 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For a reaction scheme $A \xrightarrow{k_1} B \xrightarrow{k_2} C$, if the rate of formation of B is set to be zero then the concentration of B is given by :

Options :

41652957714. $\left(\frac{k_1}{k_2}\right)[A]$

41652957715. $(k_1 + k_2)\,[A]$

41652957716. $(k_1 - k_2)\,[A]$

41652957717. $k_1 k_2\,[A]$

Question Number : 59 Question Id : 41652914734 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिक्रिया योजना $A \xrightarrow{k_1} B \xrightarrow{k_2} C$ के लिए, यदि B के बनने की दर शून्य कर दी जाय तो B की सान्द्रता निम्न के द्वारा दी जायेगी :

Options :

41652957714. $\left(\frac{k_1}{k_2}\right)[A]$

41652957715. $(k_1 + k_2)\,[A]$

41652957716. $(k_1 - k_2)\,[A]$

41652957717. $k_1 k_2\,[A]$

Question Number : 60 Question Id : 41652914735 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.27 g of a long chain fatty acid was dissolved in 100 cm^3 of hexane. 10 mL of this solution was added dropwise to the surface of water in a round watch glass. Hexane evaporates and a monolayer is formed. The distance from edge to centre of the watch glass is 10 cm. What is the height of the monolayer ?

[Density of fatty acid $= 0.9\ g\ cm^{-3}$; $\pi = 3$]

Options :

41652957718. $10^{-4}\ m$

41652957719. $10^{-6}\ m$

41652957720. $10^{-2}\ m$

41652957721. $10^{-8}\ m$

Question Number : 60 Question Id : 41652914735 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दीर्घ शृंखला वाले फैटी एसिड के 0.27 g को $100\ cm^3$ हेक्सेन में घोला गया। इस विलयन के 10 mL को एक गोलाकार वाच ग्लास में रखे जल की सतह पर बूँद बूँद करके गिराया गया। हेक्सेन वाष्पीकृत हो गई और एक एकल पर्त बन गई। वाच ग्लास के किनारे से उसके केन्द्र तक की दूरी 10 cm है। उस एकल परत की ऊँचाई क्या होगी?

(फैटी एसिड का घनत्व $=0.9\ g\ cm^{-3}, \pi=3$)

Options :

41652957718. 10^{-4} m

41652957719. 10^{-6} m

41652957720. 10^{-2} m

41652957721. 10^{-8} m

Mathematics

Section Id :	416529318
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529458
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 41652914736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f(x)=a^x\ (a>0)$ be written as $f(x)=f_1(x)+f_2(x)$, where $f_1(x)$ is an even function and $f_2(x)$ is an odd function. Then $f_1(x+y)+f_1(x-y)$ equals :

Options :

41652957722. $2f_1(x)f_1(y)$

41652957723. $2f_1(x+y)f_1(x-y)$

41652957724. $2f_1(x)f_2(y)$

41652957725. $2f_1(x+y)f_2(x-y)$

Question Number : 61 Question Id : 41652914736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f(x)=a^x\,(a>0)$ को $f(x)=f_1(x)+f_2(x)$ के रूप में लिखा गया है जबकि $f_1(x)$ एक सम फलन है और $f_2(x)$ एक विषम फलन है, तो $f_1(x+y)+f_1(x-y)$ बराबर है :

Options :

41652957722. $2f_1(x)f_1(y)$

41652957723. $2f_1(x+y)f_1(x-y)$

41652957724. $2f_1(x)f_2(y)$

41652957725. $2f_1(x+y)f_2(x-y)$

Question Number : 62 Question Id : 41652914737 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $z=\frac{\sqrt{3}}{2}+\frac{i}{2}\ (i=\sqrt{-1})$, then $(1+iz+z^5+iz^8)^9$ is equal to :

Options :

41652957726. 1

41652957727. -1

41652957728. $(-1+2i)^9$

41652957729. 0

Question Number : 62 Question Id : 41652914737 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $z=\frac{\sqrt{3}}{2}+\frac{i}{2}$ $(i=\sqrt{-1})$, तो

$(1+iz+z^5+iz^8)^9$ बराबर है :

Options :

41652957726. 1

41652957727. -1

41652957728. $(-1+2i)^9$

41652957729. 0

Question Number : 63 Question Id : 41652914738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The number of integral values of m for which the equation $(1+m^2)x^2-2(1+3m)x+(1+8m)=0$ has no real root is :

Options :

41652957730. 2

41652957731. 3

41652957732. infinitely many

41652957733. 1

Question Number : 63 Question Id : 41652914738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

m के उन पूर्णांक मानों की संख्या, जिनके लिए समीकरण, $(1+m^2)x^2-2(1+3m)x+(1+8m)=0$ के कोई भी वास्तविक मूल नहीं हैं, है :

Options :

41652957730. 2

41652957731. 3

41652957732. अनन्त

41652957733. 1

Question Number : 64 Question Id : 41652914739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let the numbers 2, b, c be in an A.P. and

$A=\begin{bmatrix}1 & 1 & 1\\ 2 & b & c\\ 4 & b^2 & c^2\end{bmatrix}$. If $\det(A) \in [2, 16]$, then c

lies in the interval :

Options :

41652957734. $[3, 2+2^{3/4}]$

41652957735. $[4, 6]$

41652957736. $[2, 3)$

41652957737. $(2+2^{3/4}, 4)$

Question Number : 64 Question Id : 41652914739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना संख्याएं 2, b, c एक समान्तर श्रेढ़ी में हैं तथा

$A=\begin{bmatrix}1 & 1 & 1\\ 2 & b & c\\ 4 & b^2 & c^2\end{bmatrix}$. यदि $\det(A) \in [2, 16]$, तो c

निम्न में से किस अन्तराल में है :

Options :

41652957734. $[3, 2+2^{3/4}]$

41652957735. $[4, 6]$

41652957736. $[2, 3)$

41652957737. $(2+2^{3/4}, 4)$

Question Number : 65 Question Id : 41652914740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the system of linear equations

$x-2y+kz=1$

$2x+y+z=2$

$3x-y-kz=3$

has a solution (x, y, z), $z\neq 0$, then (x, y) lies on the straight line whose equation is :

Options :

41652957738. $4x-3y-1=0$

41652957739. $3x-4y-1=0$

41652957740. $3x-4y-4=0$

41652957741. $4x-3y-4=0$

Question Number : 65 Question Id : 41652914740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि रैखिक समीकरण निकाय

$x-2y+kz=1$

$2x+y+z=2$

$3x-y-kz=3$

का एक हल (x, y, z), $z\neq 0$ है, तो (x, y) जिस रेखा पर स्थित है, उसका समीकरण है :

Options :

41652957738. $4x-3y-1=0$

41652957739. $3x-4y-1=0$

41652957740. $3x-4y-4=0$

41652957741. $4x-3y-4=0$

Question Number : 66 Question Id : 41652914741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The number of four-digit numbers strictly greater than 4321 that can be formed using the digits 0, 1, 2, 3, 4, 5 (repetition of digits is allowed) is :

Options :

41652957742. 310

41652957743. 360

41652957744. 288

41652957745. 306

Question Number : 66 Question Id : 41652914741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अंकों 0, 1, 2, 3, 4, 5 को प्रयोग करके (जहाँ अंकों को दोहराया जा सकता है) बनाई जा सकने वाली चार अंकों की संख्याओं, जो 4321 से अधिक (strictly greater) हों, की संख्या है :

Options :

41652957742. 310

41652957743. 360

41652957744. 288

41652957745. 306

Question Number : 67 Question Id : 41652914742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the fourth term in the binomial expansion

of $\left(\sqrt{\frac{1}{x^{1+\log_{10}x}}}+x^{\frac{1}{12}}\right)^6$ is equal to 200, and

$x > 1$, then the value of x is :

Options :

41652957746. 100

41652957747. 10

41652957748. 10^4

41652957749. 10^3

Question Number : 67 Question Id : 41652914742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\left(\sqrt{\frac{1}{x^{1+\log_{10}x}}}+x^{\frac{1}{12}}\right)^6$ के द्विपद प्रसार का चौथा पद 200 है तथा $x > 1$ है, तो x का मान है :

Options :

41652957746. 100

41652957747. 10

41652957748. 10^4

41652957749. 10^3

Question Number : 68 Question Id : 41652914743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If three distinct numbers a, b, c are in G.P. and the equations $ax^2+2bx+c=0$ and $dx^2+2ex+f=0$ have a common root, then which one of the following statements is correct ?

Options :

41652957750. d, e, f are in G.P.

41652957751. d, e, f are in A.P.

41652957752. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ are in G.P.

41652957753. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ are in A.P.

Question Number : 68 Question Id : 41652914743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि तीन भिन्न संख्याएं a, b, c गुणोत्तर श्रेढ़ी में हैं तथा समीकरण $ax^2+2bx+c=0$ और $dx^2+2ex+f=0$ का एक उभयनिष्ठ मूल है, तो निम्न में से कौन-सा एक कथन सत्य है?

Options :

41652957750. d, e, f गुणोत्तर श्रेढ़ी में हैं।

41652957751. d, e, f समांतर श्रेढ़ी में हैं।

41652957752. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ गुणोत्तर श्रेढ़ी में हैं।

41652957753. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ समांतर श्रेढ़ी में हैं।

Question Number : 69 Question Id : 41652914744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum $\sum_{k=1}^{20} k\frac{1}{2^k}$ is equal to :

Options :

41652957754. $2-\frac{11}{2^{19}}$

41652957755. $2-\frac{21}{2^{20}}$

41652957756. $1-\frac{11}{2^{20}}$

41652957757. $2-\frac{3}{2^{17}}$

Question Number : 69 Question Id : 41652914744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

योग $\sum_{k=1}^{20} k\frac{1}{2^k}$ बराबर है :

Options :

41652957754. $2-\frac{11}{2^{19}}$

41652957755. $2-\frac{21}{2^{20}}$

41652957756. $1-\frac{11}{2^{20}}$

41652957757. $2-\frac{3}{2^{17}}$

Question Number : 70 Question Id : 41652914745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f:\mathbf{R}\to\mathbf{R}$ be a differentiable function satisfying $f'(3)+f'(2)=0$. Then

$\lim\limits_{x\to 0}\left(\frac{1+f(3+x)-f(3)}{1+f(2-x)-f(2)}\right)^{\frac{1}{x}}$ is equal to :

Options :

41652957758. e

41652957759. 1

41652957760. e^{-1}

41652957761. e^{2}

Question Number : 70 Question Id : 41652914745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f:\mathbf{R}\to\mathbf{R}$ एक अवकलनीय फलन है जो कि $f'(3)+f'(2)=0$ को संतुष्ट करता है, तो

$\lim\limits_{x\to 0}\left(\frac{1+f(3+x)-f(3)}{1+f(2-x)-f(2)}\right)^{\frac{1}{x}}$ बराबर है :

Options :

41652957758. e

41652957759. 1

41652957760. e^{-1}

41652957761. e^{2}

Question Number : 71 Question Id : 41652914746 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $f(1)=1, f'(1)=3$, then the derivative of $f(f(f(x)))+(f(x))^2$ at $x=1$ is :

Options :

41652957762. 9

41652957763. 12

41652957764. 15

41652957765. 33

Question Number : 71 Question Id : 41652914746 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $f(1)=1, f'(1)=3$ है, तो $f(f(f(x)))+(f(x))^2$ का $x=1$ पर अवकलज है :

Options :

41652957762. 9

41652957763. 12

41652957764. 15

41652957765. 33

Question Number : 72 Question Id : 41652914747 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f:[-1,3]\to$ R be defined as

$$f(x)=\begin{cases}|x|+[x], & -1\le x<1\\ x+|x|, & 1\le x<2\\ x+[x], & 2\le x\le 3,\end{cases}$$

where [t] denotes the greatest integer less than or equal to t. Then, f is discontinuous at :

Options :

41652957766. only one point

41652957767. only two points

41652957768. only three points

41652957769. four or more points

Question Number : 72 Question Id : 41652914747 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f:[-1,3]\to \mathbf{R}$ इस प्रकार परिभाषित है कि

$$f(x)=\begin{cases}|x|+[x], & -1\le x<1\\ x+|x|, & 1\le x<2\\ x+[x], & 2\le x\le 3,\end{cases}$$

जहाँ [t], t या उससे कम अधिकतम पूर्णांक को दर्शाता है। तो, f असंतत है :

Options :

41652957766. केवल एक बिंदु पर

41652957767. केवल दो बिंदुओं पर

41652957768. केवल तीन बिंदुओं पर

41652957769. चार अथवा उससे अधिक बिंदुओं पर

Question Number : 73 Question Id : 41652914748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The height of a right circular cylinder of maximum volume inscribed in a sphere of radius 3 is :

Options :

41652957770. $\frac{2}{3}\sqrt{3}$

41652957771. $2\sqrt{3}$

41652957772. $\sqrt{6}$

41652957773. $\sqrt{3}$

Question Number : 73 Question Id : 41652914748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक गोले जिसकी त्रिज्या 3 है, के अन्तर्गत बने अधिकतम आयतन के लंबवृत्तीय बेलन की ऊँचाई है :

Options :

41652957770. $\frac{2}{3}\sqrt{3}$

41652957771. $2\sqrt{3}$

41652957772. $\sqrt{6}$

41652957773. $\sqrt{3}$

Question Number : 74 Question Id : 41652914749 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If

$$\int \frac{dx}{x^3(1+x^6)^{2/3}} = xf(x)(1+x^6)^{\frac{1}{3}} + C$$

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

Options :

41652957774. $-\frac{1}{6x^3}$

41652957775. $-\frac{1}{2x^2}$

41652957776. $-\frac{1}{2x^3}$

41652957777. $\frac{3}{x^2}$

Question Number : 74 Question Id : 41652914749 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि

$$\int \frac{dx}{x^3(1+x^6)^{2/3}} = xf(x)(1+x^6)^{\frac{1}{3}} + C$$

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

Options :

41652957774. $-\frac{1}{6x^3}$

41652957775. $-\frac{1}{2x^2}$

41652957776. $-\frac{1}{2x^3}$

41652957777. $\frac{3}{x^2}$

Question Number : 75 Question Id : 41652914750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f(x) = \int_0^x g(t)dt$, where g is a non-zero even function. If $f(x+5) = g(x)$, then $\int_0^x f(t)dt$ equals :

Options :

41652957778. $\int_{x+5}^{5} g(t)dt$

41652957779. $\int_{5}^{x+5} g(t)dt$

41652957780. $2\int_{5}^{x+5} g(t)dt$

41652957781. $5\int_{x+5}^{5} g(t)dt$

Question Number : 75 Question Id : 41652914750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f(x)=\int_0^x g(t)dt$ है, जहाँ g एक शून्येत्तर सम फलन

है। यदि $f(x+5)=g(x)$ है, तो $\int_0^x f(t)dt$ बराबर है :

Options :

41652957778. $\int_{x+5}^{5} g(t)dt$

41652957779. $\int_{5}^{x+5} g(t)dt$

41652957780. $2\int_{5}^{x+5} g(t)dt$

41652957781. $5\int_{x+5}^{5} g(t)dt$

Question Number : 76 Question Id : 41652914751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $S(\alpha)=\{(x,y): y^2\le x,\ 0\le x\le\alpha\}$ and $A(\alpha)$ is area of the region $S(\alpha)$. If for a $\lambda, 0<\lambda<4$, $A(\lambda) : A(4) = 2 : 5$, then λ equals :

Options :

41652957782. $4\left(\frac{4}{25}\right)^{\frac{1}{3}}$

41652957783. $4\left(\frac{2}{5}\right)^{\frac{1}{3}}$

41652957784. $2\left(\frac{2}{5}\right)^{\frac{1}{3}}$

41652957785. $2\left(\frac{4}{25}\right)^{\frac{1}{3}}$

Question Number : 76 Question Id : 41652914751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $S(\alpha)=\{(x,y): y^2 \le x,\ 0 \le x \le \alpha\}$ तथा $A(\alpha)$, क्षेत्र $S(\alpha)$ का क्षेत्रफल है। यदि किसी $\lambda,\ 0<\lambda<4$ के लिए $A(\lambda) : A(4) = 2 : 5$ है, तो λ बराबर है :

Options :

41652957782. $4\left(\frac{4}{25}\right)^{\frac{1}{3}}$

41652957783. $4\left(\frac{2}{5}\right)^{\frac{1}{3}}$

41652957784. $2\left(\frac{2}{5}\right)^{\frac{1}{3}}$

41652957785. $2\left(\frac{4}{25}\right)^{\frac{1}{3}}$

Question Number : 77 Question Id : 41652914752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Given that the slope of the tangent to a curve $y=y(x)$ at any point (x,y) is $\frac{2y}{x^2}$. If the curve passes through the centre of the circle $x^2+y^2-2x-2y=0$, then its equation is :

Options :

41652957786. $x \log_e |y| = 2(x-1)$

41652957787. $x \log_e |y| = x-1$

41652957788. $x \log_e |y| = -2(x-1)$

41652957789. $x^2 \log_e |y| = -2(x-1)$

Question Number : 77 Question Id : 41652914752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिया है कि वक्र $y = y(x)$ के किसी बिंदु (x,y) पर खींची गई स्पर्श रेखा की ढाल (slope) $\frac{2y}{x^2}$ है। यदि यह वक्र, वृत्त $x^2+y^2-2x-2y=0$ के केंद्र से होकर जाता है, तो इसका समीकरण है :

Options :

41652957786. $x \log_e |y| = 2(x-1)$

41652957787. $x \log_e |y| = x-1$

41652957788. $x \log_e |y| = -2(x-1)$

41652957789. $x^2 \log_e |y| = -2(x-1)$

Question Number : 78 Question Id : 41652914753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The tangent and the normal lines at the point $(\sqrt{3}, 1)$ to the circle $x^2+y^2=4$ and the x-axis form a triangle. The area of this triangle (in square units) is :

Options :

41652957790. $\frac{4}{\sqrt{3}}$

41652957791. $\frac{1}{3}$

41652957792. $\frac{1}{\sqrt{3}}$

41652957793. $\frac{2}{\sqrt{3}}$

Question Number : 78 Question Id : 41652914753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वृत्त $x^2+y^2=4$ के बिंदु $(\sqrt{3}, 1)$ पर खींची गई स्पर्श रेखा और अभिलंब तथा x-अक्ष एक त्रिभुज बनाते हैं। इस त्रिभुज का (वर्ग इकाइयों में) क्षेत्रफल है :

Options :

41652957790. $\frac{4}{\sqrt{3}}$

41652957791. $\frac{1}{3}$

41652957792. $\frac{1}{\sqrt{3}}$

41652957793. $\frac{2}{\sqrt{3}}$

Question Number : 79 Question Id : 41652914754 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Suppose that the points (h, k), (1, 2) and $(-3, 4)$ lie on the line L_1. If a line L_2 passing through the points (h, k) and (4, 3) is perpendicular to L_1, then $\frac{k}{h}$ equals :

Options :

41652957794. $\frac{1}{3}$

41652957795. 3

41652957796. 0

41652957797. $-\frac{1}{7}$

Question Number : 79 Question Id : 41652914754 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना बिंदु (h, k), (1, 2) तथा (−3, 4) एक रेखा L_1 पर स्थित हैं। यदि बिंदुओं (h, k) तथा (4, 3) से होकर जाने वाली रेखा L_2, रेखा L_1 के लंबवत है, तो $\frac{k}{h}$ बराबर है :

Options :

41652957794. $\frac{1}{3}$

41652957795. 3

41652957796. 0

41652957797. $-\frac{1}{7}$

Question Number : 80 Question Id : 41652914755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The tangent to the parabola $y^2=4x$ at the point where it intersects the circle $x^2+y^2=5$ in the first quadrant, passes through the point :

Options :

41652957798. $\left(-\frac{1}{3}, \frac{4}{3}\right)$

41652957799. $\left(-\frac{1}{4}, \frac{1}{2}\right)$

41652957800. $\left(\frac{3}{4}, \frac{7}{4}\right)$

41652957801. $\left(\frac{1}{4}, \frac{3}{4}\right)$

Question Number : 80 Question Id : 41652914755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परवलय $y^2=4x$ के उस बिंदु, जहाँ यह वृत्त $x^2+y^2=5$ को प्रथम चतुर्थांश में काटता है, पर खींची गई स्पर्श रेखा जिस बिंदु से होकर जाती है, वह है :

Options :

41652957798. $\left(-\frac{1}{3}, \frac{4}{3}\right)$

41652957799. $\left(-\frac{1}{4}, \frac{1}{2}\right)$

41652957800. $\left(\frac{3}{4}, \frac{7}{4}\right)$

41652957801. $\left(\frac{1}{4}, \frac{3}{4}\right)$

Question Number : 81 Question Id : 41652914756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In an ellipse, with centre at the origin, if the difference of the lengths of major axis and minor axis is 10 and one of the foci is at $(0, 5\sqrt{3})$, then the length of its latus rectum is :

Options :

41652957802. 8

41652957803. 10

41652957804. 5

41652957805. 6

Question Number : 81 Question Id : 41652914756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि एक दीर्घवृत्त जिसका केंद्र मूलबिंदु पर है, के दीर्घ अक्ष तथा लघु अक्ष की लंबाइयों का अंतर 10 है तथा एक नाभिकेंद्र $(0, 5\sqrt{3})$ पर है, तो इसके नाभिलंब की लंबाई है :

Options :

41652957802. 8

41652957803. 10

41652957804. 5

41652957805. 6

Question Number : 82 Question Id : 41652914757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the eccentricity of the standard hyperbola passing through the point (4, 6) is 2, then the equation of the tangent to the hyperbola at (4, 6) is :

Options :

41652957806. $3x-2y=0$

41652957807. $2x-y-2=0$

41652957808. $2x-3y+10=0$

41652957809. $x-2y+8=0$

Question Number : 82 Question Id : 41652914757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि बिंदु (4, 6) से होकर जाने वाले मानक अतिपरवलय की उत्केंद्रता 2 है, तो (4, 6) पर अतिपरवलय पर खींची गई स्पर्श रेखा का समीकरण है :

Options :

41652957806. $3x-2y=0$

41652957807. $2x-y-2=0$

41652957808. $2x-3y+10=0$

41652957809. $x-2y+8=0$

Question Number : 83 Question Id : 41652914758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The vector equation of the plane through the line of intersection of the planes $x+y+z=1$ and $2x+3y+4z=5$ which is perpendicular to the plane $x-y+z=0$ is :

Options :

41652957810. $\vec{r}\times(\hat{i}+\hat{k})+2=0$

41652957811. $\vec{r}\times(\hat{i}-\hat{k})+2=0$

41652957812. $\vec{r}\cdot(\hat{i}-\hat{k})-2=0$

41652957813. $\vec{r}\cdot(\hat{i}-\hat{k})+2=0$

Question Number : 83 Question Id : 41652914758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समतलों $x+y+z=1$ तथा $2x+3y+4z=5$ की प्रतिच्छेदन रेखा से हो कर जाने वाले तथा समतल $x-y+z=0$ के लंबवत समतल का सदिश समीकरण है :

Options :

41652957810. $\vec{r}\times(\hat{i}+\hat{k})+2=0$

41652957811. $\vec{r}\times(\hat{i}-\hat{k})+2=0$

41652957812. $\vec{r}\cdot(\hat{i}-\hat{k})-2=0$

41652957813. $\vec{r}\cdot(\hat{i}-\hat{k})+2=0$

Question Number : 84 Question Id : 41652914759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a point R(4, y, z) lies on the line segment joining the points P(2, -3, 4) and Q(8, 0, 10), then the distance of R from the origin is :

Options :

41652957814. $\sqrt{53}$

41652957815. $2\sqrt{14}$

41652957816. $2\sqrt{21}$

41652957817. 6

Question Number : 84 Question Id : 41652914759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि एक बिंदु $R(4, y, z)$, बिंदुओं $P(2, -3, 4)$ तथा $Q(8, 0, 10)$ को मिलाने वाले रेखाखण्ड पर स्थित है, तो R की मूलबिंदु से दूरी है :

Options :

41652957814. $\sqrt{53}$

41652957815. $2\sqrt{14}$

41652957816. $2\sqrt{21}$

41652957817. 6

Question Number : 85 Question Id : 41652914760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $\vec{a} = 3\hat{i} + 2\hat{j} + x\hat{k}$ and $\vec{b} = \hat{i} - \hat{j} + \hat{k}$, for some real x. Then $|\vec{a} \times \vec{b}| = r$ is possible if :

Options :

41652957818. $0 < r \leq \sqrt{\frac{3}{2}}$

41652957819. $\sqrt{\frac{3}{2}} < r \leq 3\sqrt{\frac{3}{2}}$

41652957820. $3\sqrt{\frac{3}{2}} < r < 5\sqrt{\frac{3}{2}}$

41652957821. $r \geqslant 5\sqrt{\frac{3}{2}}$

Question Number : 85 Question Id : 41652914760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना किसी वास्तविक संख्या x के लिए $\vec{a}=3\hat{i}+2\hat{j}+x\hat{k}$ तथा $\vec{b}=\hat{i}-\hat{j}+\hat{k}$ है। तो $\left|\vec{a}\times\vec{b}\right|=r$ तभी सम्भव है, जब :

Options :

41652957818. $0 < r \leq \sqrt{\frac{3}{2}}$

41652957819. $\sqrt{\frac{3}{2}} < r \leq 3\sqrt{\frac{3}{2}}$

41652957820. $3\sqrt{\frac{3}{2}} < r < 5\sqrt{\frac{3}{2}}$

41652957821. $r \geqslant 5\sqrt{\frac{3}{2}}$

Question Number : 86 Question Id : 41652914761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A student scores the following marks in five tests : 45, 54, 41, 57, 43. His score is not known for the sixth test. If the mean score is 48 in the six tests, then the standard deviation of the marks in six tests is :

Options :

41652957822. $\frac{100}{3}$

41652957823. $\frac{10}{3}$

41652957824. $\frac{10}{\sqrt{3}}$

41652957825. $\frac{100}{\sqrt{3}}$

Question Number : 86 Question Id : 41652914761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक विद्यार्थी पाँच परीक्षाओं में निम्न अंक प्राप्त करता है : 45, 54, 41, 57, 43. उसके द्वारा छटी परीक्षा में प्राप्त अंक ज्ञात नहीं हैं। यदि छः परीक्षाओं में प्राप्त अंकों का माध्य 48 है तो छः परीक्षाओं में प्राप्त अंकों का मानक विचलन है :

Options :

41652957822. $\frac{100}{3}$

41652957823. $\frac{10}{3}$

41652957824. $\frac{10}{\sqrt{3}}$

41652957825. $\frac{100}{\sqrt{3}}$

Question Number : 87 Question Id : 41652914762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The minimum number of times one has to toss a fair coin so that the probability of observing at least one head is at least 90% is :

Options :

41652957826. 2

41652957827. 3

41652957828. 4

41652957829. 5

Question Number : 87 Question Id : 41652914762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक अनभिनत सिक्के को कम से कम कितनी बार उछाला जाए ताकि कम से कम एक चित्त आने की प्रायिकता, कम से कम 90% हो ?

Options :

41652957826. 2

41652957827. 3

41652957828. 4

41652957829. 5

Question Number : 88 Question Id : 41652914763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the lengths of the sides of a triangle are in A.P. and the greatest angle is double the smallest, then a ratio of lengths of the sides of this triangle is :

Options :

41652957830. 5 : 6 : 7

41652957831. 5 : 9 : 13

41652957832. 4 : 5 : 6

41652957833. 3 : 4 : 5

Question Number : 88 Question Id : 41652914763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि एक त्रिभुज की भुजाओं की लंबाइयाँ समांतर श्रेढ़ी में हैं तथा इसका सबसे बड़ा कोण सबसे छोटे कोण का दुगुना है, तो त्रिभुज की भुजाओं की लंबाइयों का एक अनुपात है :

Options :

41652957830. 5 : 6 : 7

41652957831. 5 : 9 : 13

41652957832. 4 : 5 : 6

41652957833. 3 : 4 : 5

Question Number : 89 Question Id : 41652914764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two vertical poles of heights, 20 m and 80 m stand apart on a horizontal plane. The height (in meters) of the point of intersection of the lines joining the top of each pole to the foot of the other, from this horizontal plane is :

Options :

41652957834. 12

41652957835. 15

41652957836. 16

41652957837. 18

Question Number : 89 Question Id : 41652914764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

20 मी. तथा 80 मी. ऊँचाई वाले दो खंभे, एक क्षैतिज समतल पर सीधे खड़े हैं। प्रत्येक खंभे के शिखर को दूसरे खंभे के पाद से मिलाने वाली रेखाओं के प्रतिच्छेदन बिंदु की इस समतल से ऊँचाई (मीटरों में) है :

Options :

41652957834. 12

41652957835. 15

41652957836. 16

41652957837. 18

Question Number : 90 Question Id : 41652914765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which one of the following statements is not a tautology ?

Options :

41652957838. $(p \wedge q) \rightarrow p$

41652957839. $p \rightarrow (p \vee q)$

41652957840. $(p \vee q) \rightarrow (p \vee (\sim q))$

41652957841. $(p \wedge q) \rightarrow (\sim p) \vee q$

Question Number : 90 Question Id : 41652914765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न कथनों में से कौन-सा एक, एक पुनरुक्ति (tautology) **नहीं** है?

Options :

41652957838. $(p \wedge q) \rightarrow p$

41652957839. $p \rightarrow (p \vee q)$

41652957840. $(p \vee q) \rightarrow (p \vee (\sim q))$

41652957841. $(p \wedge q) \rightarrow (\sim p) \vee q$