National Testing Agency

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Paper I

Group Number :	1
Group Id :	416529119
Group Maximum Duration :	0
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Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	360

Physics

Section Id :	416529139
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:	416529148
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 4165299506 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 speed (V), acceleration (A) and force (F) are considered as fundamental units, the dimension of Young's modulus will be :

Options :

41652937482. $V^{-4}A^{2}F$

41652937483. $V^{-4}A^{-2}F$

41652937484. $V^{-2}A^{2}F^{2}$

41652937485. $V^{-2}A^{2}F^{-2}$

Question Number : 1 Question Id : 4165299506 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 गति (V), त्वरण (A) तथा बल (F) को मूल भौतिक इकाइयाँ मानें तो, यंग प्रत्यास्थता गुणांक की विमा होगी :

Options :

41652937482. $V^{-4}A^{2}F$

41652937483. $V^{-4}A^{-2}F$

41652937484. $V^{-2}A^{2}F^{2}$

41652937485. $V^{-2}A^{2}F^{-2}$

Question Number : 2 Question Id : 4165299507 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 moves from the point $\left(2.0\hat{i} + 4.0\hat{j}\right)$ m, at t = 0, with an initial velocity $\left(5.0\hat{i} + 4.0\hat{j}\right)$ ms^{-1}. It is acted upon by a constant force which produces a constant acceleration $\left(4.0\hat{i} + 4.0\hat{j}\right)$ ms^{-2}. What is the distance of the particle from the origin at time 2 s ?

Options :

41652937486. $20\sqrt{2}$ m

41652937487. 15 m

41652937488. $10\sqrt{2}$ m

41652937489. 5 m

Question Number : 2 Question Id : 4165299507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समय $t=0$ पर एक कण बिन्दु $\left(2.0\hat{i} + 4.0\hat{j}\right)$ m से, आरम्भिक वेग $\left(5.0\hat{i} + 4.0\hat{j}\right)$ ms^{-1} से, गतिशील है। यह एक स्थिर त्वरण $\left(4.0\hat{i} + 4.0\hat{j}\right)ms^{-2}$ उत्पन्न करने वाले एक स्थिर बल के प्रभाव में चलता है। समय 2 s पर कण की मूल बिन्दु से दूरी क्या होगी?

Options :

41652937486. $20\sqrt{2}$ m

41652937487. 15 m

41652937488. $10\sqrt{2}$ m

41652937489. 5 m

Question Number : 3 Question Id : 4165299508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The magnitude of torque on a particle of mass 1 kg is 2.5 Nm about the origin. If the force acting on it is 1 N, and the distance of the particle from the origin is 5 m, the angle between the force and the position vector is (in radians) :

Options :

41652937490. $\frac{\pi}{3}$

41652937491. $\frac{\pi}{6}$

41652937492. $\frac{\pi}{4}$

41652937493. $\frac{\pi}{8}$

Question Number : 3 Question Id : 4165299508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1 kg द्रव्यमान पर मूल बिन्दु के सापेक्ष बल आघूर्ण का परिमाण 2.5 Nm है। यदि इस पर लगने वाला बल 1 N है, तथा कण की मूल बिन्दु से दूरी 5 m है तो बल तथा स्थिति सदिश के बीच कोण (रेडियन में) है :

Options :

41652937490. $\frac{\pi}{3}$

41652937491. $\frac{\pi}{6}$

41652937492. $\frac{\pi}{4}$

41652937493. $\frac{\pi}{8}$

Question Number : 4 Question Id : 4165299509 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 of mass m is moving in a straight line with momentum p. Starting at time $t = 0$, a force $F = kt$ acts in the same direction on the moving particle during time interval T so that its momentum changes from p to 3p. Here k is a constant. The value of T is :

Options :

41652937494. $\sqrt{\frac{2p}{k}}$

41652937495. $2\sqrt{\frac{p}{k}}$

41652937496. $2\sqrt{\frac{k}{p}}$

41652937497. $\sqrt{\frac{2k}{p}}$

Question Number : 4 Question Id : 4165299509 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 द्रव्यमान का एक कण संवेग p से एक सीधी रेखा में जा रहा है। समय $t=0$ से आरम्भ करके उसी दिशा में एक बल $F=kt$ इस गतिमान कण पर समयान्तराल T तक लगता है तो, इसका संवेग p से बदलकर 3p हो जाता है। यहाँ k एक स्थिरांक है। T का मान है :

Options :

41652937494. $\sqrt{\frac{2p}{k}}$

41652937495. $2\sqrt{\frac{p}{k}}$

41652937496. $2\sqrt{\frac{k}{p}}$

41652937497. $\sqrt{\frac{2k}{p}}$

Question Number : 5 Question Id : 4165299510 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 of mass m and charge q is in an electric and magnetic field given by

$\vec{E}=2\hat{i}+3\hat{j}$; $\vec{B}=4\hat{j}+6\hat{k}$.

The charged particle is shifted from the origin to the point $P(x=1 ; y=1)$ along a straight path. The magnitude of the total work done is :

Options :

41652937498. 5q

41652937499. (2.5)q

41652937500. $(0.15)q$

41652937501. $(0.35)q$

Question Number : 5 Question Id : 4165299510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान m तथा आवेश q का एक कण $\vec{E}=2\hat{i}+3\hat{j}$;

$\vec{B}=4\hat{j}+6\hat{k}$ द्वारा दिये गये विद्युत एवं चुम्बकीय क्षेत्र में है। इस आवेश को मूल बिन्दु से बिन्दु $P(x=1\,;y=1)$ तक एक सीधी रेखा के पथ के अनुगत विस्थापित करते हैं। किये गये कुल कार्य का परिमाण है :

Options :

41652937498. $5q$

41652937499. $(2.5)q$

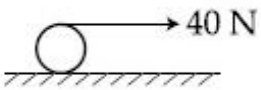
41652937500. $(0.15)q$

41652937501. $(0.35)q$

Question Number : 6 Question Id : 4165299511 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 string is wound around a hollow cylinder of mass 5 kg and radius 0.5 m. If the string is now pulled with a horizontal force of 40 N, and the cylinder is rolling without slipping on a horizontal surface(see figure), then the angular acceleration of the cylinder will be (Neglect the mass and thickness of the string) :



Options :

41652937502. $10\ rad/s^2$

41652937503. $12\ rad/s^2$

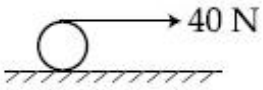
41652937504. $16\ rad/s^2$

41652937505. $20\ rad/s^2$

Question Number : 6 Question Id : 4165299511 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 kg द्रव्यमान तथा 0.5 m त्रिज्या के एक खोखले बेलन पर एक डोरी को लपेटा गया है। यदि डोरी को अब 40 N के क्षैतिज बल से खींचा जाये और, बेलन बिना फिसले क्षैतिज समतल पर लुढ़कता है (चित्र देखिये) तो, बेलन का कोणीय त्वरण होगा (डोरी का द्रव्यमान तथा मोटाई नगण्य है) :



Options :

41652937502. $10\ rad/s^2$

41652937503. $12\ rad/s^2$

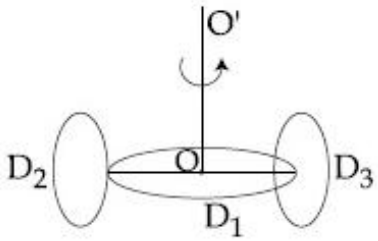
41652937504. $16\ rad/s^2$

41652937505. $20\ rad/s^2$

Question Number : 7 Question Id : 4165299512 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 circular disc D_1 of mass M and radius R has two identical discs D_2 and D_3 of the same mass M and radius R attached rigidly at its opposite ends (see figure). The moment of inertia of the system about the axis OO′, passing through the centre of D_1, as shown in the figure, will be :



Options :

41652937506. MR^2

41652937507. $\frac{2}{3}MR^2$

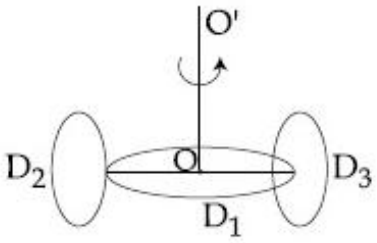
41652937508. $3MR^2$

41652937509. $\frac{4}{5}MR^2$

Question Number : 7 Question Id : 4165299512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M तथा त्रिज्या R की एक डिस्क D_1 से समान द्रव्यमान M तथा त्रिज्या R की दो डिस्क D_2 और D_3 को आमने-सामने दृढ़तापूर्वक जोड़ा गया है (चित्र देखिये)। इस संयोजन का, दिखाये गये चित्रानुसार D_1 के केन्द्र से गुजरने वाली अक्ष OO′ के सापेक्ष, जड़त्व आघूर्ण होगा :



Options :

41652937506. MR^2

41652937507. $\frac{2}{3}MR^2$

41652937508. $3MR^2$

41652937509. $\frac{4}{5}MR^2$

Question Number : 8 Question Id : 4165299513 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 mass and the diameter of a planet are three times the respective values for the Earth. The period of oscillation of a simple pendulum on the Earth is 2 s. The period of oscillation of the same pendulum on the planet would be :

Options :

41652937510. $\frac{3}{2}$ s

41652937511. $\frac{\sqrt{3}}{2}$ s

41652937512. $\frac{2}{\sqrt{3}}$ s

41652937513. $2\sqrt{3}$ s

Question Number : 8 Question Id : 4165299513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक ग्रह का द्रव्यमान तथा व्यास, पृथ्वी की संगत राशियों का तीन गुना है। पृथ्वी पर एक सरल लोलक का आवर्तकाल 2 s है। उसी लोलक का ग्रह पर आवर्तकाल होगा :

Options :

41652937510. $\frac{3}{2}$ s

41652937511. $\frac{\sqrt{3}}{2}$ s

41652937512. $\frac{2}{\sqrt{3}}$ s

41652937513. $2\sqrt{3}$ s

Question Number : 9 Question Id : 4165299514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

When 100 g of a liquid A at 100°C is added to 50 g of a liquid B at temperature 75°C, the temperature of the mixture becomes 90°C. The temperature of the mixture, if 100 g of liquid A at 100°C is added to 50 g of liquid B at 50°C, will be :

Options :

41652937514. 60°C

41652937515. 70°C

41652937516. 80°C

41652937517. 85°C

Question Number : 9 Question Id : 4165299514 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 g द्रव्यमान तथा 100°C तापमान वाले द्रव A को 50 g द्रव्यमान तथा 75°C तापमान वाले दूसरे द्रव B के साथ मिलाते हैं तो मिश्रण का तापमान 90°C हो जाता है। यदि 100 g द्रव्यमान तथा 100°C तापमान वाले द्रव A को 50 g द्रव्यमान तथा 50°C तापमान वाले द्रव B के साथ मिलाये तो मिश्रण का तापमान होगा :

Options :

41652937514. 60°C

41652937515. 70°C

41652937516. 80°C

41652937517. 85°C

Question Number : 10 Question Id : 4165299515 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 process, temperature and volume of one mole of an ideal monoatomic gas are varied according to the relation $VT = K$, where K is a constant. In this process the temperature of the gas is increased by ΔT. The amount of heat absorbed by gas is (R is gas constant) :

Options :

41652937518. $\frac{1}{2}R\Delta T$

41652937519. $\frac{1}{2}KR\Delta T$

41652937520. $\frac{2K}{3}\Delta T$

41652937521. $\frac{3}{2}R\Delta T$

Question Number : 10 Question Id : 4165299515 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 प्रक्रम में, एक आदर्श एकपरमाणुक गैस के एक मोल का आयतन व तापमान, सम्बन्ध $VT = K$ द्वारा बदलता है, जहाँ कि K एक नियतांक है। इस प्रक्रिया में गैस का तापमान ΔT बढ़ जाता है। गैस द्वारा अवशोषित ऊष्मा का मान है (R गैस स्थिरांक हैं) :

Options :

41652937518. $\frac{1}{2}R\Delta T$

41652937519. $\frac{1}{2}KR\Delta T$

41652937520. $\frac{2K}{3}\Delta T$

41652937521. $\frac{3}{2}R\Delta T$

Question Number : 11 Question Id : 4165299516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A metal ball of mass 0.1 kg is heated upto 500°C and dropped into a vessel of heat capacity 800 JK^{-1} and containing 0.5 kg water. The initial temperature of water and vessel is 30°C. What is the approximate percentage increment in the temperature of the water ? [Specific Heat Capacities of water and metal are, respectively, 4200 $Jkg^{-1}K^{-1}$ and 400 $Jkg^{-1}K^{-1}$]

Options :

41652937522. 30 %

41652937523. 25 %

41652937524. 15 %

41652937525. 20 %

Question Number : 11 Question Id : 4165299516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.1 kg द्रव्यमान की धातु की एक गेंद को 500°C तक गर्म करते हैं और 800 JK^{-1} ऊष्माधारिता वाले एक पात्र, जिसमें 0.5 kg पानी है, के अन्दर डाल देते हैं। पानी तथा पात्र का आरम्भिक तापमान 30°C है। पानी के तापमान में हुई प्रतिशत वृद्धि लगभग क्या है? (पानी तथा धातु की विशिष्ट ऊष्माधारितायें क्रमशः 4200 $Jkg^{-1}K^{-1}$ तथा 400 $Jkg^{-1}K^{-1}$ हैं)

Options :

41652937522. 30 %

41652937523. 25 %

41652937524. 15 %

41652937525. 20 %

Question Number : 12 Question Id : 4165299517 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 pendulum is executing simple harmonic motion and its maximum kinetic energy is K_1. If the length of the pendulum is doubled and it performs simple harmonic motion with the same amplitude as in the first case, its maximum kinetic energy is K_2. Then :

Options :

41652937526. $K_2 = K_1$

41652937527. $K_2 = 2K_1$

41652937528. $K_2 = \frac{K_1}{2}$

41652937529. $K_2 = \frac{K_1}{4}$

Question Number : 12 Question Id : 4165299517 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 लोलक सरल आवर्त गति कर रहा है और इसकी अधिकतम गतिज ऊर्जा K_1 है। यदि लोलक की लम्बाई दोगुनी कर दें और यह पहले के समान आयाम से ही सरल आवर्त गति करता है तो इसकी अधिकतम गतिज ऊर्जा K_2 है। तब :

Options :

41652937526. $K_2 = K_1$

41652937527. $K_2 = 2K_1$

41652937528. $K_2 = \frac{K_1}{2}$

41652937529. $K_2 = \frac{K_1}{4}$

Question Number : 13 Question Id : 4165299518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A simple pendulum of length 1 m is oscillating with an angular frequency 10 rad/s. The support of the pendulum starts oscillating up and down with a small angular frequency of 1 rad/s and an amplitude of 10^{-2} m. The relative change in the angular frequency of the pendulum is best given by :

Options :

41652937530. 10^{-1} rad/s

41652937531. 10^{-3} rad/s

41652937532. 10^{-5} rad/s

41652937533. 1 rad/s

Question Number : 13 Question Id : 4165299518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1 m लम्बाई का एक सरल लोलक कोणीय आवृत्ति 10 rad/s से दोलन कर रहा है। लोलक का आधार ऊपर तथा नीचे एक अल्प कोणीय आवृत्ति 1 rad/s से, तथा 10^{-2} m आयाम से, दोलन आरम्भ करता है। लोलक की कोणीय आवृत्ति में आपेक्षिक परिवर्तन सबसे अच्छा दिया जाता है :

Options :

41652937530. 10^{-1} rad/s

41652937531. 10^{-3} rad/s

41652937532. 10^{-5} rad/s

41652937533. 1 rad/s

Question Number : 14 Question Id : 4165299519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

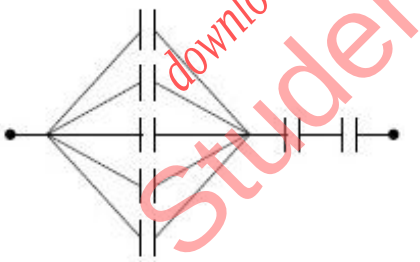
Correct Marks : 4 Wrong Marks : 1

Seven capacitors, each of capacitance 2 μF, are to be connected in a configuration to obtain an effective capacitance of $\left(\frac{6}{13}\right)$ μF.

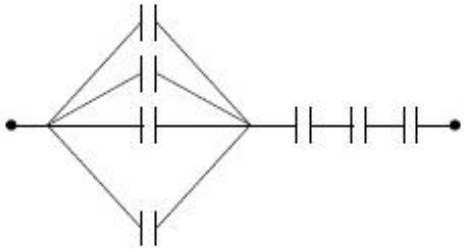
Which of the combinations, shown in figures below, will achieve the desired value ?

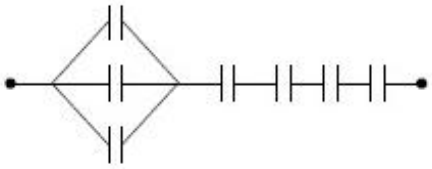
Options :

41652937534.



41652937535.





41652937536.

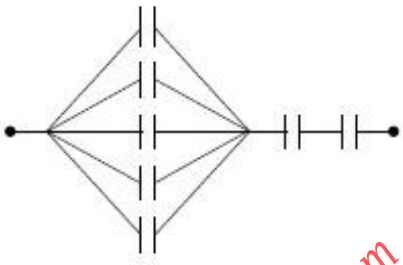
41652937537.

Question Number : 14 Question Id : 4165299519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

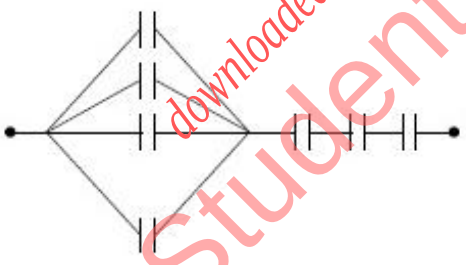
Correct Marks : 4 Wrong Marks : 1

2 μF धारिता के 7 संधारित्रों को एक संयोजन में जोड़ने पर प्रभावी धारिता $\left(\frac{6}{13}\right)$ μF प्राप्त होती है। दिखाये गये चित्रों में से कौन सा संयोजन इच्छित मान देगा?

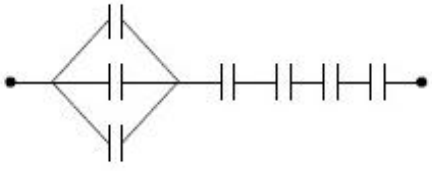
Options :



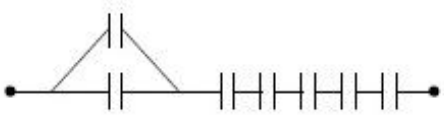
41652937534.



41652937535.



41652937536.



41652937537.

Question Number : 15 Question Id : 4165299520 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 field of 1000 V/m is applied to an electric dipole at angle of 45°. The value of electric dipole moment is 10^{-29} C.m. What is the potential energy of the electric dipole ?

Options :

41652937538. -7×10^{-27} J

41652937539. -10×10^{-29} J

41652937540. -9×10^{-20} J

41652937541. -20×10^{-18} J

Question Number : 15 Question Id : 4165299520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1000 V/m के एक विद्युत क्षेत्र को 45° कोण पर एक विद्युत द्विध्रुव पर लगाते हैं। विद्युत द्विध्रुव आघूर्ण का मान 10^{-29} C.m है। विद्युत द्विध्रुव की स्थितिज ऊर्जा क्या है?

Options :

41652937538. -7×10^{-27} J

41652937539. -10×10^{-29} J

41652937540. -9×10^{-20} J

41652937541. -20×10^{-18} J

Question Number : 16 Question Id : 4165299521 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 rods A and B of identical dimensions are at temperature 30°C. If A is heated upto 180°C and B upto T°C, then the new lengths are the same. If the ratio of the coefficients of linear expansion of A and B is 4 : 3, then the value of T is :

Options :

41652937542. 200°C

41652937543. 230°C

41652937544. 250°C

41652937545. 270°C

Question Number : 16 Question Id : 4165299521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एकसमान आकार की दो छड़ A तथा B, 30°C तापमान पर हैं। यदि A को 180°C तक तथा B को T°C तक गर्म करते हैं तो इनकी नई लम्बाइयाँ समान हैं। यदि A तथा B के रेखीय प्रसार गुणांकों का अनुपात 4 : 3 है तो, T का मान है :

Options :

41652937542. 200°C

41652937543. 230°C

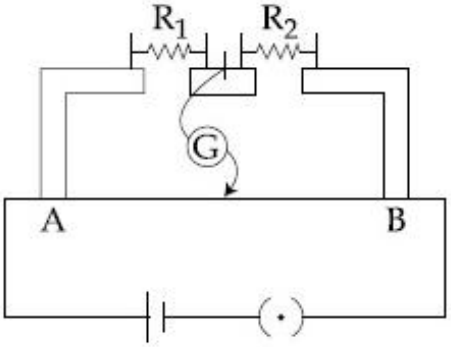
41652937544. 250°C

41652937545. 270°C

Question Number : 17 Question Id : 4165299522 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 experimental set up of metre bridge shown in the figure, the null point is obtained at a distance of 40 cm from A. If a 10 Ω resistor is connected in series with R_1, the null point shifts by 10 cm. The resistance that should be connected in parallel with $(R_1 + 10)$ Ω such that the null point shifts back to its initial position is :



Options :

41652937546. 60 Ω

41652937547. 40 Ω

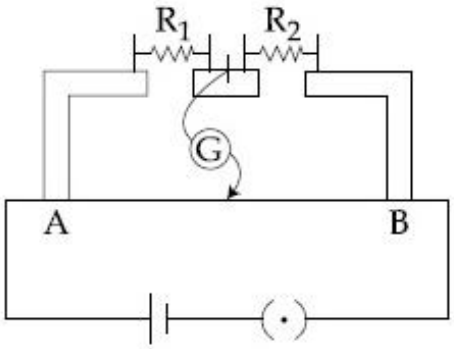
41652937548. 30 Ω

41652937549. 20 Ω

Question Number : 17 Question Id : 4165299522 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 चित्रानुसार मीटर सेतु के एक प्रयोग में A से 40 cm दूरी पर शून्य बिन्दु प्राप्त होता है। यदि 10 Ω के एक प्रतिरोध को R_1 के साथ श्रेणी क्रम में लगाते हैं, तो शून्य बिन्दु 10 cm विस्थापित हो जाता है। वह प्रतिरोध, जिसको $(R_1 + 10)$ Ω के साथ समान्तर क्रम में लगाने से शून्य बिन्दु पुनः अपनी आरम्भिक स्थिति में आ जाता है, होना चाहिये :



Options :

41652937546. 60 Ω

41652937547. 40 Ω

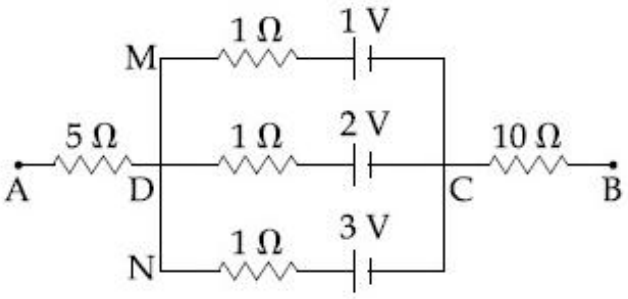
41652937548. 30 Ω

41652937549. 20 Ω

Question Number : 18 Question Id : 4165299523 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, the potential difference between A and B is :



Options :

41652937550. 2 V

41652937551. 3 V

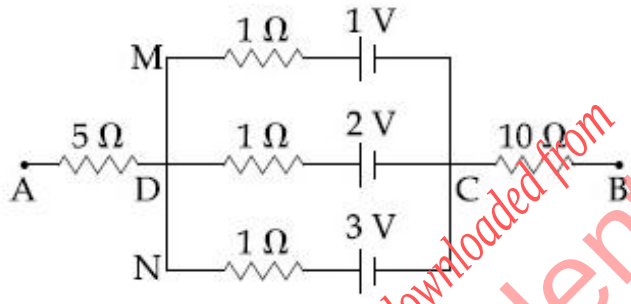
41652937552. 6 V

41652937553. 1 V

Question Number : 18 Question Id : 4165299523 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 परिपथ में A तथा B के बीच विभवान्तर है :



Options :

41652937550. 2 V

41652937551. 3 V

41652937552. 6 V

41652937553. 1 V

Question Number : 19 Question Id : 4165299524 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 paramagnetic substance in the form of a cube with sides 1 cm has a magnetic dipole moment of 20×10^{-6} J/T when a magnetic intensity of 60×10^{3} A/m is applied. Its magnetic susceptibility is :

Options :

41652937554. 3.3×10^{-2}

41652937555. 4.3×10^{-2}

41652937556. 2.3×10^{-2}

41652937557. 3.3×10^{-4}

Question Number : 19 Question Id : 4165299524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1 cm भुजा के घनरूपी अनुचुम्बकीय पदार्थ पर, चुम्बकीय तीव्रता 60×10^{3} A/m लगाने पर उसका चुम्बकीय द्विध्रुव आघूर्ण 20×10^{-6} J/T होता है। इसकी चुम्बकीय प्रवृत्ति है :

Options :

41652937554. 3.3×10^{-2}

41652937555. 4.3×10^{-2}

41652937556. 2.3×10^{-2}

41652937557. 3.3×10^{-4}

Question Number : 20 Question Id : 4165299525 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 region between $y=0$ and $y=d$ contains a magnetic field $\vec{B} = B\hat{z}$. A particle of mass m and charge q enters the region with a velocity $\vec{v}=v\hat{i}$. If $d=\frac{mv}{2qB}$, the acceleration of the charged particle at the point of its emergence at the other side is :

Options :

41652937558. $\frac{qvB}{m}\left(\frac{\sqrt{3}}{2}\hat{i}+\frac{1}{2}\hat{j}\right)$

41652937559. $\frac{qvB}{m}\left(\frac{1}{2}\hat{i}-\frac{\sqrt{3}}{2}\hat{j}\right)$

41652937560. $\frac{qvB}{m}\left(\frac{\hat{i}+\hat{j}}{\sqrt{2}}\right)$

41652937561. $\frac{qvB}{m}\left(\frac{-\hat{j}+\hat{i}}{\sqrt{2}}\right)$

Question Number : 20 Question Id : 4165299525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$y=0$ तथा $y=d$ के बीच के क्षेत्र में एक समान चुम्बकीय क्षेत्र $\vec{B} = B\hat{z}$ विद्यमान है। द्रव्यमान m तथा आवेश q का एक कण, वेग $\vec{v}=v\hat{i}$ से इस क्षेत्र में प्रवेश करता है। यदि $d = \frac{mv}{2qB}$ है, तो दूसरी ओर से बाहर निकलने वाले बिन्दु पर, आवेशित कण का त्वरण होगा :

Options :

41652937558. $\frac{qvB}{m}\left(\frac{\sqrt{3}}{2}\hat{i}+\frac{1}{2}\hat{j}\right)$

41652937559. $\frac{qvB}{m}\left(\frac{1}{2}\hat{i}-\frac{\sqrt{3}}{2}\hat{j}\right)$

41652937560. $\frac{qvB}{m}\left(\frac{\hat{i}+\hat{j}}{\sqrt{2}}\right)$

41652937561. $\frac{qvB}{m}\left(\frac{-\hat{j}+\hat{i}}{\sqrt{2}}\right)$

Question Number : 21 Question Id : 4165299526 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 copper wire is wound on a wooden frame, whose shape is that of an equilateral triangle. If the linear dimension of each side of the frame is increased by a factor of 3, keeping the number of turns of the coil per unit length of the frame the same, then the self inductance of the coil :

Options :

41652937562. increases by a factor of 3

41652937563. decreases by a factor of 9

41652937564. increases by a factor of 27

41652937565. decreases by a factor of $9\sqrt{3}$

Question Number : 21 Question Id : 4165299526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ताँबे के तार को एक लकड़ी के खाँचे, जिसका आकार एक समबाहु त्रिभुज है, पर लपेटा गया है। खाँचे की प्रति लम्बाई के फेरों की संख्या समान रखते हुए, यदि खाँचे की प्रत्येक भुजा की रेखीय विमायें 3 के गुणांक से बढ़ा दी जायें तो कुण्डली में स्वप्रेरण :

Options :

41652937562. 3 के गुणांक से बढ़ेगा

41652937563. 9 के गुणांक से घटेगा

41652937564. 27 के गुणांक से बढ़ेगा

41652937565. $9\sqrt{3}$ के गुणांक से घटेगा

Question Number : 22 Question Id : 4165299527 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 27 mW laser beam has a cross-sectional area of 10 mm^2. The magnitude of the maximum electric field in this electromagnetic wave is given by :
[Given permittivity of space $\epsilon_0 = 9 \times 10^{-12}$ SI units, Speed of light $c = 3 \times 10^8$ m/s]

Options :

41652937566. 1.4 kV/m

41652937567. 1 kV/m

41652937568. 2 kV/m

41652937569. 0.7 kV/m

Question Number : 22 Question Id : 4165299527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

27 mW के एक लेसर किरणपुँज के अनुप्रस्थ काट का क्षेत्रफल 10 mm^2 है। इस विद्युत चुम्बकीय तरंग के महत्तम वैद्युत क्षेत्र का परिमाण होगा (दिया है निर्वात की विद्युतशीलता $\epsilon_0 = 9 \times 10^{-12}$ SI मात्रक में प्रकाश की चाल, $c = 3 \times 10^8$ m/s)

Options :

41652937566. 1.4 kV/m

41652937567. 1 kV/m

41652937568. 2 kV/m

41652937569. 0.7 kV/m

Question Number : 23 Question Id : 4165299528 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 monochromatic light is incident at a certain angle on an equilateral triangular prism and suffers minimum deviation. If the refractive index of the material of the prism is $\sqrt{3}$, then the angle of incidence is :

Options :

41652937570. 45°

41652937571. 30°

41652937572. 60°

41652937573. 90°

Question Number : 23 Question Id : 4165299528 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 एकवर्णीय प्रकाश किसी समबाहु त्रिभुजीय प्रिज़्म पर एक निश्चित कोण पर आपतित होता है और उसका न्यूनतम विचलन होता है। यदि प्रिज़्म के पदार्थ का अपवर्तनांक $\sqrt{3}$ हो, तो आपतन कोण है :

Options :

41652937570. 45°

41652937571. 30°

41652937572. 60°

41652937573. 90°

Question Number : 24 Question Id : 4165299529 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 double-slit experiment, green light (5303Å) falls on a double slit having a separation of 19.44 μm and a width of 4.05 μm. The number of bright fringes between the first and the second diffraction minima is :

Options :

41652937574. 10

41652937575. 09

41652937576. 05

41652937577. 04

Question Number : 24 Question Id : 4165299529 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 द्वि-झिरी प्रयोग में, हरा प्रकाश (5303Å) द्वि-झिरी पर पड़ता है। झिरियों के बीच की दूरी 19.44 μm तथा इनकी चौड़ाई 4.05 μm है। प्रथम तथा द्वितीय विवर्तन निम्निष्ठ के बीच में कितनी दीप्त फ्रिन्जें हैं?

Options :

41652937574. 10

41652937575. 09

41652937576. 05

41652937577. 04

Question Number : 25 Question Id : 4165299530 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 photoelectric experiment, the wavelength of the light incident on a metal is changed from 300 nm to 400 nm. The decrease in the stopping potential is close to : ($\frac{hc}{e} = 1240$ nm-V)

Options :

41652937578. 1.0 V

41652937579. 2.0 V

41652937580. 0.5 V

41652937581. 1.5 V

Question Number : 25 Question Id : 4165299530 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रकाश-विद्युत प्रभाव के एक प्रयोग में धातु पर आपतित प्रकाश की तरंगदैर्ध्य 300 nm से बदलकर 400 nm करते हैं। निरोधी विभव में कमी होगी, लगभग (दिया है : $\frac{hc}{e} = 1240$ nm-V)

Options :

41652937578. 1.0 V

41652937579. 2.0 V

41652937580. 0.5 V

41652937581. 1.5 V

Question Number : 26 Question Id : 4165299531 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 hydrogen like atom, when an electron jumps from the M - shell to the L - shell, the wavelength of emitted radiation is λ. If an electron jumps from N-shell to the L-shell, the wavelength of emitted radiation will be :

Options :

41652937582. $\frac{16}{25}\lambda$

41652937583. $\frac{25}{16}\lambda$

41652937584. $\frac{20}{27}\lambda$

41652937585. $\frac{27}{20}\lambda$

Question Number : 26 Question Id : 4165299531 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 हाइड्रोजन समान परमाणु में, जब इलेक्ट्रॉन M - कक्षा से L - कक्षा में संक्रमण करता है, तो उत्सर्जित विकिरण की तरंगदैर्घ्य λ है। यदि इलेक्ट्रॉन N-कक्षा से L-कक्षा में संक्रमण करे तो उत्सर्जित विकिरण की तरंगदैर्ध्य होगी :

Options :

41652937582. $\frac{16}{25}\lambda$

41652937583. $\frac{25}{16}\lambda$

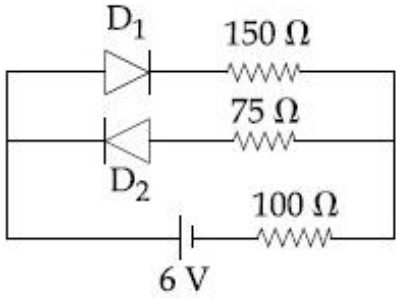
41652937584. $\frac{20}{27}\lambda$

41652937585. $\frac{27}{20}\lambda$

Question Number : 27 Question Id : 4165299532 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 circuit shown below contains two ideal diodes, each with a forward resistance of 50 Ω. If the battery voltage is 6 V, the current through the 100 Ω resistance(in Amperes) is :



Options :

41652937586. 0.020

41652937587. 0.027

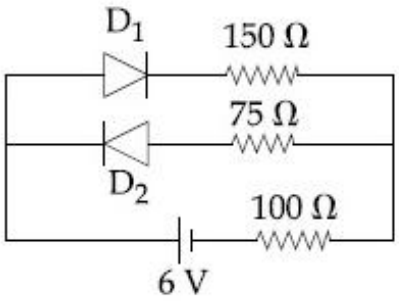
41652937588. 0.030

41652937589. 0.036

Question Number : 27 Question Id : 4165299532 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 दो आदर्श डायोड हैं, जिनमें प्रत्येक का अग्रदिशिक प्रतिरोध 50 Ω है। यदि बैटरी की वोल्टता 6 V है, तो 100 Ω के प्रतिरोध में धारा (एम्पियर में) होगी :



Options :

41652937586. 0.020

41652937587. 0.027

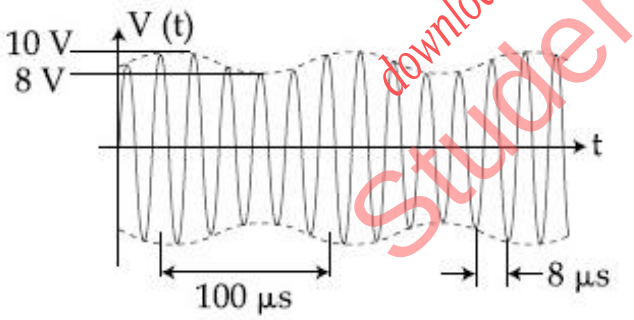
41652937588. 0.030

41652937589. 0.036

Question Number : 28 Question Id : 4165299533 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 amplitude modulated signal is plotted below :



Which one of the following best describes the above signal ?

Options :

41652937590. $(9+\sin(2.5\pi\times10^5\,t))\sin(2\pi\times10^4 t)$ V

41652937591. $(1+9\sin(2\pi\times10^4\,t))\sin(2.5\pi\times10^5 t)$ V

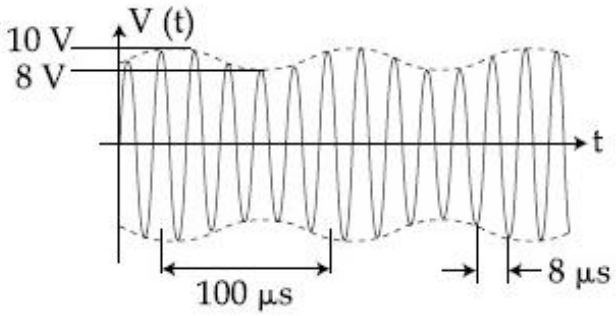
41652937592. $(9+\sin(4\pi\times10^4\,t))\sin(5\pi\times10^5 t)$ V

41652937593. $(9+\sin(2\pi\times10^4\,t))\sin(2.5\pi\times10^5 t)$ V

Question Number : 28 Question Id : 4165299533 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 आयाम-माडुलित सिग्नल को चित्र में दिखाया गया है :



निम्न में से कौन उपरोक्त सिग्नल को सबसे अच्छा दर्शाता है?

Options :

41652937590. $(9+\sin(2.5\pi\times10^5\,t))\sin(2\pi\times10^4 t)$ V

41652937591. $(1+9\sin(2\pi\times10^4\,t))\sin(2.5\pi\times10^5 t)$ V

41652937592. $(9+\sin(4\pi\times10^4\,t))\sin(5\pi\times10^5 t)$ V

41652937593. $(9+\sin(2\pi\times10^4\,t))\sin(2.5\pi\times10^5 t)$ V

Question Number : 29 Question Id : 4165299534 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 galvanometer having a resistance of 20 Ω and 30 divisions on both sides has figure of merit 0.005 ampere/division. The resistance that should be connected in series such that it can be used as a voltmeter upto 15 volt, is :

Options :

41652937594. 80 Ω

41652937595. 100 Ω

41652937596. 120 Ω

41652937597. 125 Ω

Question Number : 29 Question Id : 4165299534 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 धारामापी जिसका प्रतिरोध 20 Ω है तथा दोनों और 30 भाग हैं, की धारा सुग्रागिता 0.005 एम्पियर/भाग है। कितना प्रतिरोध श्रेणीबद्ध क्रम में लगाये कि, इसको 15 V तक के एक वोल्टमीटर के रूप में प्रयोग किया जा सके?

Options :

41652937594. 80 Ω

41652937595. 100 Ω

41652937596. 120 Ω

41652937597. 125 Ω

Question Number : 30 Question Id : 4165299535 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 thermometer graduated according to a linear scale reads a value x_0 when in contact with boiling water, and $x_0/3$ when in contact with ice. What is the temperature of an object in °C, if this thermometer in the contact with the object reads $x_0/2$?

Options :

41652937598. 60

41652937599. 25

41652937600. 35

41652937601. 40

Question Number : 30 Question Id : 4165299535 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

रेखीय स्केल के अनुसार मापांकित एक तापमापी (thermometer) का पाठ्यांक उबलते हुए पानी के सम्पर्क में x_0, तथा बर्फ के सम्पर्क में $x_0/3$ आता है। इस तापमापी को किसी वस्तु के सम्पर्क में रखने पर इसका पाठ्यांक $x_0/2$ आता है तो, वस्तु का तापमान °C में क्या है?

Options :

41652937598. 60

41652937599. 25

41652937600. 35

41652937601. 40

Chemistry

Section Id :	416529140
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

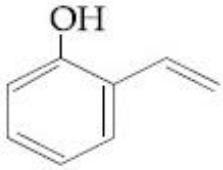
Sub-Section Number:	1
Sub-Section Id:	416529149
Question Shuffling Allowed :	Yes

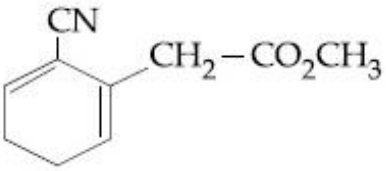
Question Number : 31 Question Id : 4165299536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

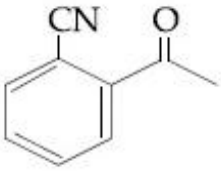
Correct Marks : 4 Wrong Marks : 1

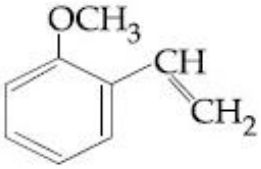
Which of the following compounds reacts with ethylmagnesium bromide and also decolourizes bromine water solution :

Options :

41652937602. 

41652937603. 

41652937604. 

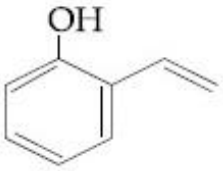
41652937605. 

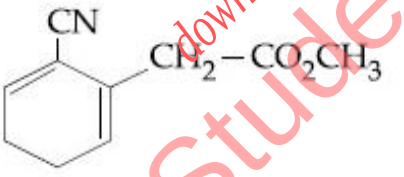
Question Number : 31 Question Id : 4165299536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

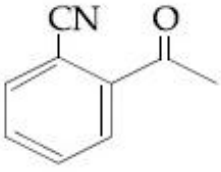
Correct Marks : 4 Wrong Marks : 1

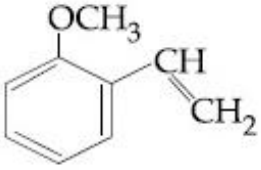
निम्नलिखित में से कौन-सा यौगिक एथिल मैग्नीशियम ब्रोमाइड से अभिक्रिया करता है तथा ब्रोमीन जल को रंगहीन भी करता है?

Options :

41652937602. 

41652937603. 

41652937604. 

41652937605. 

Question Number : 32 Question Id : 4165299537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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

	Item I		Item II
(A)	Ester test	(P)	Tyr
(B)	Carbylamine test	(Q)	Asp
(C)	Phthalein dye test	(R)	Ser
		(S)	Lys

Options :

41652937606. (A)→(Q); (B)→(S); (C)→(R)

41652937607. (A)→(Q); (B)→(S); (C)→(P)

41652937608. (A)→(R); (B)→(Q); (C)→(P)

41652937609. (A)→(R); (B)→(S); (C)→(Q)

Question Number : 32 Question Id : 4165299537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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

	मद I		मद II
(A)	एस्टर परीक्षण	(P)	Tyr
(B)	कार्बीलऐमीन जांच	(Q)	Asp
(C)	थैलीन डाइ टेस्ट	(R)	Ser
		(S)	Lys

Options :

41652937606. (A)→(Q); (B)→(S); (C)→(R)

41652937607. (A)→(Q); (B)→(S); (C)→(P)

41652937608. (A)→(R); (B)→(Q); (C)→(P)

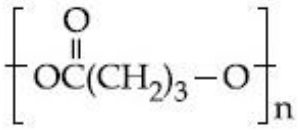
41652937609. (A)→(R); (B)→(S); (C)→(Q)

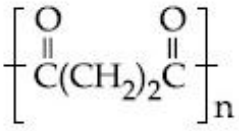
Question Number : 33 Question Id : 4165299538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

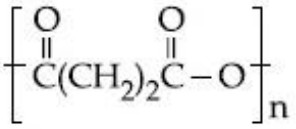
Correct Marks : 4 Wrong Marks : 1

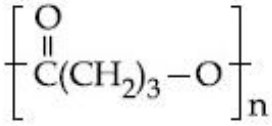
The homopolymer formed from 4-hydroxy-butanoic acid is :

Options :

41652937610. 

41652937611. 

41652937612. 

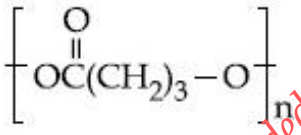
41652937613. 

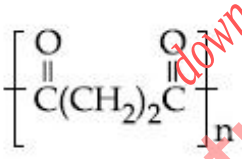
Question Number : 33 Question Id : 4165299538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

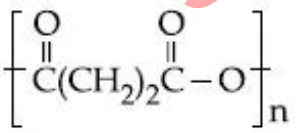
Correct Marks : 4 Wrong Marks : 1

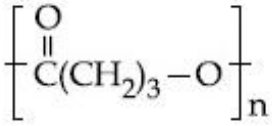
4-हाइड्राक्सी ब्यूटेनोइक अयन से बनने वाला समबहुलक है :

Options :

41652937610. 

41652937611. 

41652937612. 

41652937613. 

Question Number : 34 Question Id : 4165299539 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 following compound,

the favourable site/s for protonation is/are :

Options :

41652937614. (a)

41652937615. (a) and (e)

41652937616. (b), (c) and (d)

41652937617. (a) and (d)

Question Number : 34 Question Id : 4165299539 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 यौगिक में

प्रोटनीकरण के लिए अनुकूल स्थल है/हैं :

Options :

41652937614. (a)

41652937615. (a) तथा (e)

41652937616. (b), (c) तथा (d)

41652937617. (a) तथा (d)

Question Number : 35 Question Id : 4165299540 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 compound 'X' on treatment with $Br_2/NaOH$, provided C_3H_9N, which gives positive carbylamine test. Compound 'X' is :

Options :

41652937618. $CH_3CH_2COCH_2NH_2$

41652937619. $CH_3CH_2CH_2CONH_2$

41652937620. $CH_3CON(CH_3)_2$

41652937621. $CH_3COCH_2NHCH_3$

Question Number : 35 Question Id : 4165299540 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 यौगिक 'X' को $Br_2/NaOH$ के साथ अभिकृत करने पर C_3H_9N दिया जो धनात्मक कार्बिलएमीन जाँच देता है। यौगिक 'X' की संरचना है :

Options :

41652937618. $CH_3CH_2COCH_2NH_2$

41652937619. $CH_3CH_2CH_2CONH_2$

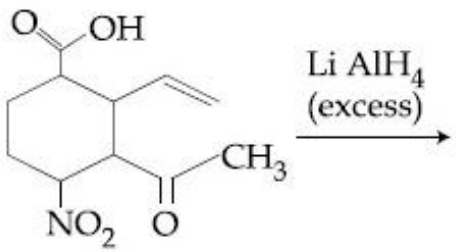
41652937620. $CH_3CON(CH_3)_2$

41652937621. $CH_3COCH_2NHCH_3$

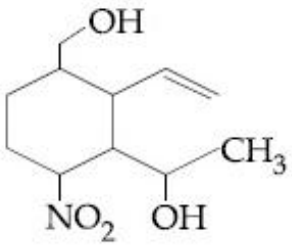
Question Number : 36 Question Id : 4165299541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

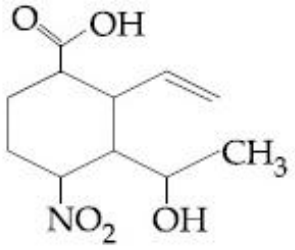
Correct Marks : 4 Wrong Marks : 1

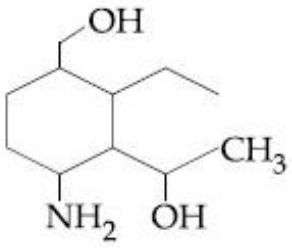
The major product obtained in the following reaction is :

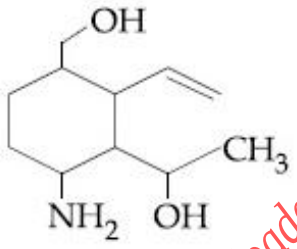


Options :

41652937622. 

41652937623. 

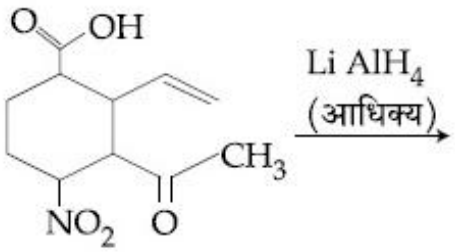
41652937624. 

41652937625. 

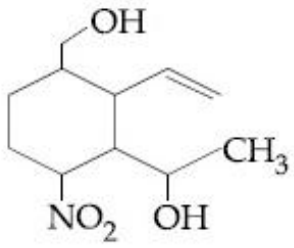
Question Number : 36 Question Id : 4165299541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

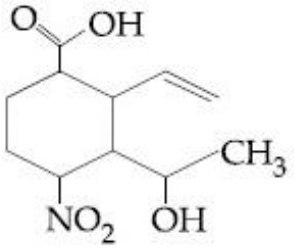
निम्न अभिक्रिया में प्राप्त मुख्य उत्पाद है :



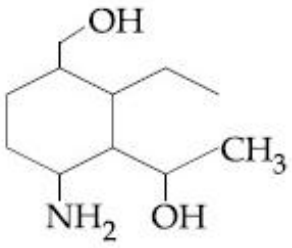
Options :



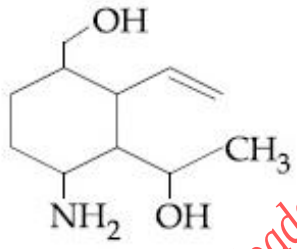
41652937622.



41652937623.



41652937624.

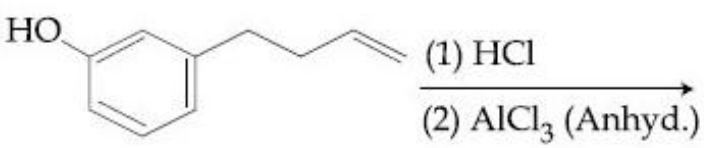


41652937625.

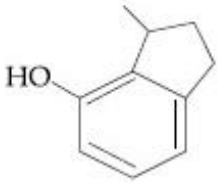
Question Number : 37 Question Id : 4165299542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

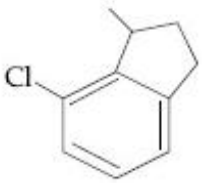
The major product of the following reaction is :

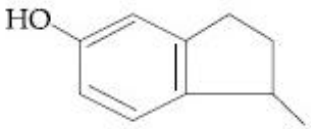


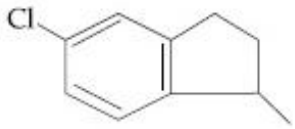
Options :



41652937626.

41652937627. 

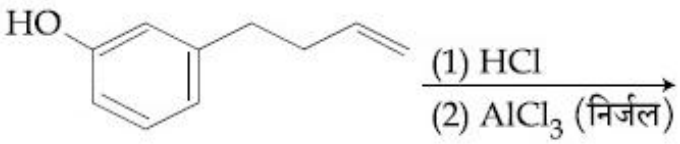
41652937628. 

41652937629. 

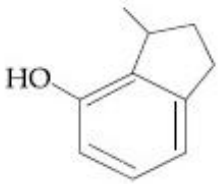
Question Number : 37 Question Id : 4165299542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

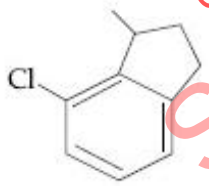
Correct Marks : 4 Wrong Marks : 1

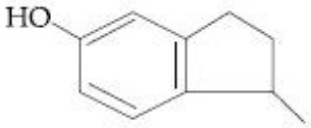
निम्न अभिक्रिया का मुख्य उत्पाद है :

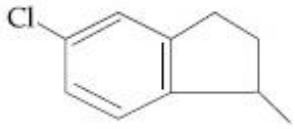


Options :

41652937626. 

41652937627. 

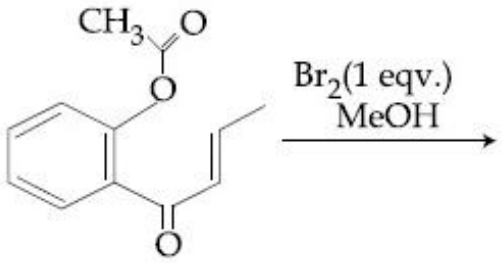
41652937628. 

41652937629. 

Question Number : 38 Question Id : 4165299543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

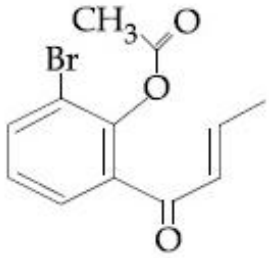
Correct Marks : 4 Wrong Marks : 1

The major product obtained in the following conversion is :

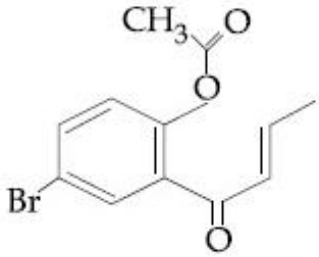


Options :

41652937630.

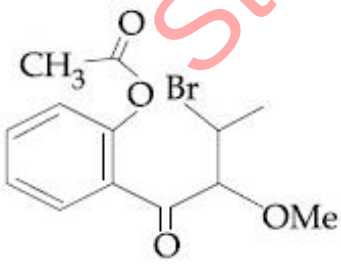


41652937631.



41652937632.

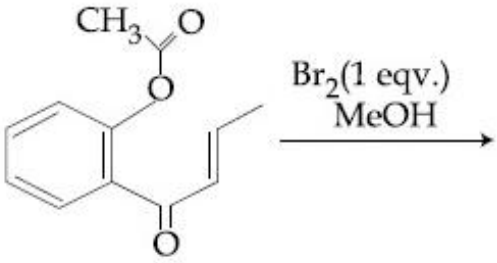
41652937633.



Question Number : 38 Question Id : 4165299543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

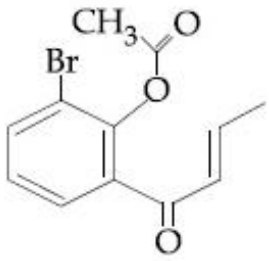
Correct Marks : 4 Wrong Marks : 1

निम्न रूपान्तरण में प्राप्त होने वाला मुख्य उत्पाद है :

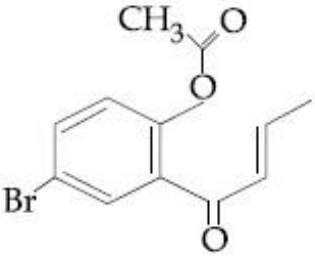


Options :

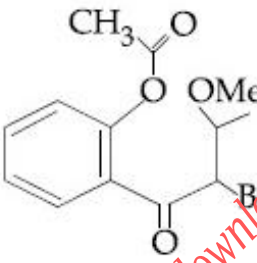
41652937630.



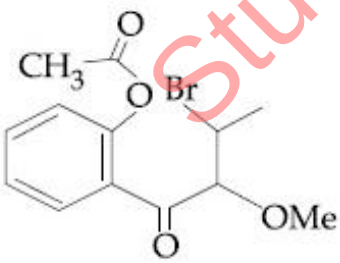
41652937631.



41652937632.



41652937633.

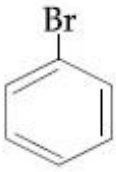


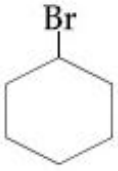
Question Number : 39 Question Id : 4165299544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

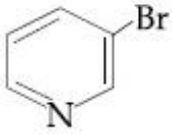
Correct Marks : 4 Wrong Marks : 1

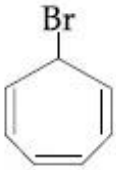
Which of the following compounds will produce a precipitate with $AgNO_3$?

Options :

41652937634. 

41652937635. 

41652937636. 

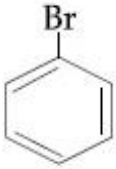
41652937637. 

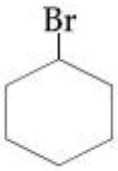
Question Number : 39 Question Id : 4165299544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

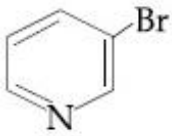
Correct Marks : 4 Wrong Marks : 1

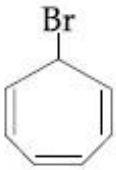
$AgNO_3$ के साथ निम्न यौगिकों में से कौन सा अवक्षेप देगा :

Options :

41652937634. 

41652937635. 

41652937636. 

41652937637. 

Question Number : 40 Question Id : 4165299545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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

	Item I		**Item II**
(A)	Allosteric effect	(P)	Molecule binding to the active site of enzyme
(B)	Competitive inhibitor	(Q)	Molecule crucial for communication in the body
(C)	Receptor	(R)	Molecule binding to a site other than the active site of enzyme
(D)	Poison	(S)	Molecule binding to the enzyme covalently

Options :

41652937638. (A)→(P); (B)→(R); (C)→(Q); (D)→(S)

41652937639. (A)→(P); (B)→(R); (C)→(S); (D)→(Q)

41652937640. (A)→(R); (B)→(P); (C)→(Q); (D)→(S)

41652937641. (A)→(R); (B)→(P); (C)→(S); (D)→(Q)

Question Number : 40 Question Id : 4165299545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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

	मद I		**मद II**
(A)	ऐलोस्टेरिक प्रभार	(P)	एन्जाइम के सक्रिय भाग से अणु का बंधन
(B)	प्रतियोगी निरोधक	(Q)	शरीर में संकटकालीन संसूचक अणु
(C)	ग्राही	(R)	एन्जाइम के सक्रिय भाग के अलावा अणु का बंधन
(D)	विष	(S)	अणु जो एन्जाइम से सहसंयोजक रूप से आबंधित है

Options :

41652937638. (A)→(P); (B)→(R); (C)→(Q); (D)→(S)

41652937639. (A)→(P); (B)→(R); (C)→(S); (D)→(Q)

41652937640. (A)→(R); (B)→(P); (C)→(Q); (D)→(S)

41652937641. (A)→(R); (B)→(P); (C)→(S); (D)→(Q)

Question Number : 41 Question Id : 4165299546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct option with respect to the Pauling electronegativity values of the elements is :

Options :

41652937642. Te > Se

41652937643. P > S

41652937644. Si < Al

41652937645. Ga < Ge

Question Number : 41 Question Id : 4165299546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

तत्वों के पाउलिंग विद्युत ऋणात्मकता मान का सही विकल्प है :

Options :

41652937642. Te > Se

41652937643. P > S

41652937644. Si < Al

41652937645. Ga < Ge

Question Number : 42 Question Id : 4165299547 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 reaction that does NOT define calcination is :

Options :

41652937646. $Fe_2O_3 \cdot XH_2O \xrightarrow{\Delta} Fe_2O_3 + XH_2O$

41652937647. $ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2$

41652937648. $CaCO_3 \cdot MgCO_3 \xrightarrow{\Delta} CaO + MgO + 2CO_2$

41652937649. $2Cu_2S + 3O_2 \xrightarrow{\Delta} 2Cu_2O + 2SO_2$

Question Number : 42 Question Id : 4165299547 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 जो निस्तापन को परिभाषित नहीं करती है, है :

Options :

41652937646. $Fe_2O_3 \cdot XH_2O \xrightarrow{\Delta} Fe_2O_3 + XH_2O$

41652937647. $ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2$

41652937648. $CaCO_3 \cdot MgCO_3 \xrightarrow{\Delta} CaO + MgO + 2CO_2$

41652937649. $2Cu_2S + 3O_2 \xrightarrow{\Delta} 2Cu_2O + 2SO_2$

Question Number : 43 Question Id : 4165299548 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 hydride that is NOT electron deficient is :

Options :

41652937650. SiH_4

41652937651. AlH_3

41652937652. B_2H_6

41652937653. GaH_3

Question Number : 43 Question Id : 4165299548 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हाइड्राइड जो इलेक्ट्रॉन-न्यून **नहीं** है, वह है :

Options :

41652937650. SiH_4

41652937651. AlH_3

41652937652. B_2H_6

41652937653. GaH_3

Question Number : 44 Question Id : 4165299549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Match the following items in column I with the corresponding items in column II.

	Column I		Column II
(i)	$Na_2CO_3 \cdot 10\ H_2O$	(A)	Portland cement ingredient
(ii)	$Mg(HCO_3)_2$	(B)	Castner-Kellner process
(iii)	NaOH	(C)	Solvay process
(iv)	$Ca_3Al_2O_6$	(D)	Temporary hardness

Options :

41652937654. (i)→(B); (ii)→(C); (iii)→(A); (iv)→(D)

41652937655. (i)→(C); (ii)→(B); (iii)→(D); (iv)→(A)

41652937656. (i)→(C); (ii)→(D); (iii)→(B); (iv)→(A)

41652937657. (i)→(D); (ii)→(A); (iii)→(B); (iv)→(C)

Question Number : 44 Question Id : 4165299549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कॉलम I में दिये गये निम्न मदों को उनके संगत कॉलम II में दिये गये मदों से सुमेलित कीजिए।

	कॉलम I		कॉलम II
(i)	$Na_2CO_3 \cdot 10\ H_2O$	(A)	पोर्टलैंड सीमेंट का संघटक
(ii)	$Mg(HCO_3)_2$	(B)	कैस्टनर केलनर प्रक्रम
(iii)	NaOH	(C)	साल्वे प्रक्रम
(iv)	$Ca_3Al_2O_6$	(D)	अस्थायी कठोरता

Options :

41652937654. (i)→(B); (ii)→(C); (iii)→(A); (iv)→(D)

41652937655. (i)→(C); (ii)→(B); (iii)→(D); (iv)→(A)

41652937656. (i)→(C); (ii)→(D); (iii)→(B); (iv)→(A)

41652937657. (i)→(D); (ii)→(A); (iii)→(B); (iv)→(C)

Question Number : 45 Question Id : 4165299550 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 relative stability of +1 oxidation state of group 13 elements follows the order :

Options :

41652937658. Al < Ga < In < Tl

41652937659. Tl < In < Ga < Al

41652937660. Ga < Al < In < Tl

41652937661. Al < Ga < Tl < In

Question Number : 45 Question Id : 4165299550 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ग्रुप 13 तत्वों की +1 ऑक्सीकरण अवस्था का आपेक्षिक स्थायित्व इस क्रम में है :

Options :

41652937658. Al < Ga < In < Tl

41652937659. Tl < In < Ga < Al

41652937660. Ga < Al < In < Tl

41652937661. $Al < Ga < Tl < In$

Question Number : 46 Question Id : 4165299551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\underline{A} \xrightarrow{4\,KOH,\,O_2} 2\underline{B} + 2\,H_2O$

(Green)

$3\,\underline{B} \xrightarrow{4\,HCl} 2\underline{C} + MnO_2 + 2\,H_2O$

(Purple)

$2\,\underline{C} \xrightarrow{H_2O,\,KI} 2\,\underline{A} + 2\,KOH + \underline{D}$

In the above sequence of reactions, $\underline{A}$ and $\underline{D}$, respectively, are :

Options :

41652937662. KI and K_2MnO_4

41652937663. MnO_2 and KIO_3

41652937664. KIO_3 and MnO_2

41652937665. KI and $KMnO_4$

Question Number : 46 Question Id : 4165299551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\underline{A} \xrightarrow{4\,KOH,\,O_2} 2\underline{B} + 2\,H_2O$

(हरा)

$3\,\underline{B} \xrightarrow{4\,HCl} 2\underline{C} + MnO_2 + 2\,H_2O$

(बैंगनी)

$2\,\underline{C} \xrightarrow{H_2O,\,KI} 2\,\underline{A} + 2\,KOH + \underline{D}$

अभिक्रियाओं के उपरोक्त क्रम में, $\underline{A}$ तथा $\underline{D}$ क्रमशः है :

Options :

41652937662. KI तथा K_2MnO_4

41652937663. MnO_2 तथा KIO_3

41652937664. KIO_3 तथा MnO_2

41652937665. KI तथा $KMnO_4$

Question Number : 47 Question Id : 4165299552 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 bridging CO ligand(s) and Co-Co bond(s) in $Co_2(CO)_8$, respectively are :

Options :

41652937666. 0 and 2

41652937667. 2 and 0

41652937668. 2 and 1

41652937669. 4 and 0

Question Number : 47 Question Id : 4165299552 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$Co_2(CO)_8$ में सेतु बंधन CO लिगन्ड तथा Co-Co आबन्ध/आबन्धों की संख्या क्रमशः है :

Options :

41652937666. 0 तथा 2

41652937667. 2 तथा 0

41652937668. 2 तथा 1

41652937669. 4 तथा 0

Question Number : 48 Question Id : 4165299553 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 coordination number of Th in $K_4[Th(C_2O_4)_4(OH_2)_2]$ is :

$\left(C_2O_4^{2-} = \text{Oxalato}\right)$

Options :

41652937670. 6

41652937671. 8

41652937672. 10

41652937673. 14

Question Number : 48 Question Id : 4165299553 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$K_4[Th(C_2O_4)_4(OH_2)_2]$ में Th की समन्वय संख्या है :

$\left(C_2O_4^{2-} = \text{Oxalato}\right)$

Options :

41652937670. 6

41652937671. 8

41652937672. 10

41652937673. 14

Question Number : 49 Question Id : 4165299554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Taj Mahal is being slowly disfigured and discoloured. This is primarily due to :

Options :

41652937674. soil pollution

41652937675. global warming

41652937676. acid rain

41652937677. water pollution

Question Number : 49 Question Id : 4165299554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ताजमहल धीरे-धीरे विरूप तथा बेरंग होता जा रहा है।
यह मुख्य रूप से इस कारण से है :

Options :

41652937674. मृदा प्रदूषण

41652937675. ग्लोबल वार्मिंग

41652937676. अम्ल वृष्टि

41652937677. जल प्रदूषण

Question Number : 50 Question Id : 4165299555 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 higher concentration of which gas in air can cause stiffness of flower buds ?

Options :

41652937678. SO_2

41652937679. CO_2

41652937680. NO_2

41652937681. CO

Question Number : 50 Question Id : 4165299555 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हवा में किसकी उच्च सान्द्रता फूल की कलियों में सख्तीपन ला सकती है?

Options :

41652937678. SO_2

41652937679. CO_2

41652937680. NO_2

41652937681. CO

Question Number : 51 Question Id : 4165299556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

25 ml of the given HCl solution requires 30 mL of 0.1 M sodium carbonate solution. What is the volume of this HCl solution required to titrate 30 mL of 0.2 M aqueous NaOH solution ?

Options :

41652937682. 25 mL

41652937683. 50 mL

41652937684. 75 mL

41652937685. 12.5 mL

Question Number : 51 Question Id : 4165299556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

25 mL HCl विलयन के लिये 0.1 M सोडियम कार्बोनेट विलयन का 30 mL आवश्यक होता है, 0.2 M जलीय NaOH के विलयन को अनुमापित करने के लिये इस HCl विलयन के कितने आयतन की आवश्यकता होगी?

Options :

41652937682. 25 mL

41652937683. 50 mL

41652937684. 75 mL

41652937685. 12.5 mL

Question Number : 52 Question Id : 4165299557 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 radius of the largest sphere which fits properly at the centre of the edge of a body centred cubic unit cell is : (Edge length is represented by 'a')

Options :

41652937686. 0.134 a

41652937687. 0.067 a

41652937688. 0.027 a

41652937689. 0.047 a

Question Number : 52 Question Id : 4165299557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

काय केन्द्रित घन एकल सेल के कोर के केन्द्र में बैठने वाले (फिट होने वाले) सबसे बड़े गोले की त्रिज्या होगी (कोर लम्बाई को 'a' द्वारा व्यक्त किया गया है) :

Options :

41652937686. 0.134 a

41652937687. 0.067 a

41652937688. 0.027 a

41652937689. 0.047 a

Question Number : 53 Question Id : 4165299558 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 de Broglie wavelength (λ) associated with a photoelectron varies with the frequency (ν) of the incident radiation as, [ν_0 is threshold frequency] :

Options :

41652937690. $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{2}}}$

41652937691. $\lambda \propto \frac{1}{(\nu - \nu_0)}$

41652937692. $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{4}}}$

41652937693. $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{3}{2}}}$

Question Number : 53 Question Id : 4165299558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रकाशिक इलेक्ट्रॉन से सम्बन्धित डि-ब्रॉग्ली तरंगदैर्घ्य (λ), आपतित विकिरण की आवृत्ति (ν) के साथ इस प्रकार परिवर्तित होती है, (ν_0 = देहली आवृत्ति)

Options :

41652937690. $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{2}}}$

41652937691. $\lambda \propto \frac{1}{(\nu - \nu_0)}$

41652937692. $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{4}}}$

41652937693. $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{3}{2}}}$

Question Number : 54 Question Id : 4165299559 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 standard reaction Gibbs energy for a chemical reaction at an absolute temperature T is given by

$$\Delta_r G^\circ = A - BT$$

Where A and B are non-zero constants. Which of the following is **TRUE** about this reaction ?

Options :

41652937694. Endothermic if $A > 0$

41652937695. Exothermic if $B < 0$

41652937696. Endothermic if $A < 0$ and $B > 0$

41652937697. Exothermic if $A > 0$ and $B < 0$

Question Number : 54 Question Id : 4165299559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परम ताप T पर एक रासायनिक अभिक्रिया के लिए मानक अभिक्रिया गिब्ज ऊर्जा निम्न के द्वारा अभिव्यक्त की जाती है :

$$\Delta_r G^\circ = A - BT$$

जहाँ A तथा B शून्य न होने वाले स्थिरांक हैं। इस अभिक्रिया के लिए निम्न में से कौन-सा **सत्य** है?

Options :

41652937694. ऊष्माशोषी यदि $A > 0$

41652937695. ऊष्माक्षेपी यदि $B < 0$

41652937696. ऊष्माशोषी यदि $A < 0$ तथा $B > 0$

41652937697. ऊष्माक्षेपी यदि $A > 0$ तथा $B < 0$

Question Number : 55 Question Id : 4165299560 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 reaction, $MgO(s) + C(s) \rightarrow Mg(s) + CO(g)$, for which $\Delta_r H^\circ = +491.1 \text{ kJ mol}^{-1}$ and $\Delta_r S^\circ = 198.0 \text{ JK}^{-1} \text{ mol}^{-1}$, is not feasible at 298 K. Temperature above which reaction will be feasible is :

Options :

41652937698. 2040.5 K

41652937699. 2480.3 K

41652937700. 2380.5 K

41652937701. 1890.0 K

Question Number : 55 Question Id : 4165299560 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 $MgO(s) + C(s) \rightarrow Mg(s) + CO(g)$ जिसका $\Delta_r H^\circ = +491.1 \text{ kJ mol}^{-1}$ तथा $\Delta_r S^\circ = 198.0 \text{ JK}^{-1} \text{ mol}^{-1}$ है, 298 K पर सम्भव नहीं है। वह ताप जिसके ऊपर अभिक्रिया सम्भव होगी, है :

Options :

41652937698. 2040.5 K

41652937699. 2480.3 K

41652937700. 2380.5 K

41652937701. 1890.0 K

Question Number : 56 Question Id : 4165299561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

K_2HgI_4 is 40% ionised in aqueous solution.
The value of its van't Hoff factor (i) is :

Options :

41652937702. 1.6

41652937703. 1.8

41652937704. 2.0

41652937705. 2.2

Question Number : 56 Question Id : 4165299561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

K_2HgI_4 जलीय विलयन में 40% आयनित है। इसके वान्टहॉफ गुणांक (i) का मान होगा :

Options :

41652937702. 1.6

41652937703. 1.8

41652937704. 2.0

41652937705. 2.2

Question Number : 57 Question Id : 4165299562 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 equilibrium,
$2\ H_2O \rightleftharpoons H_3O^+ + OH^-$, the value of ΔG° at 298 K is approximately :

Options :

41652937706. $-100\ kJ\ mol^{-1}$

41652937707. $-80\ kJ\ mol^{-1}$

41652937708. $80\ kJ\ mol^{-1}$

41652937709. $100\ kJ\ mol^{-1}$

Question Number : 57 Question Id : 4165299562 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$2H_2O \rightleftharpoons H_3O^+ + OH^-$ साम्य के लिए, 298 K पर ΔG° का मान लगभग है :

Options :

41652937706. $-100\ kJ\ mol^{-1}$

41652937707. $-80\ kJ\ mol^{-1}$

41652937708. $80\ kJ\ mol^{-1}$

41652937709. $100\ kJ\ mol^{-1}$

Question Number : 58 Question Id : 4165299563 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 the equilibrium constant :

K_C of the reaction :

$Cu(s) + 2Ag^+(aq) \rightarrow Cu^{2+}(aq) + 2Ag(s)$ is

10×10^{15}, calculate the E^θ_{cell} of this reaction at 298 K

$\left[2.303\ \frac{RT}{F} \text{ at } 298\ K = 0.059\ V\right]$

Options :

41652937710. 0.04736 V

41652937711. 0.4736 V

41652937712. 0.04736 mV

41652937713. 0.4736 mV

Question Number : 58 Question Id : 4165299563 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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

अभिक्रिया का दिया गया साम्य स्थिरांक, K_C, 10×10^{15} है। 298 K पर इस अभिक्रिया के E^θ_{cell} की गणना कीजिए।

$\left[2.303\ \frac{RT}{F} \text{ at } 298\ K = 0.059\ V\right]$

Options :

41652937710. 0.04736 V

41652937711. 0.4736 V

41652937712. 0.04736 mV

41652937713. 0.4736 mV

Question Number : 59 Question Id : 4165299564 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 reaction $2X \rightarrow B$ is a zeroth order reaction. If the initial concentration of X is 0.2 M, the half-life is 6 h. When the initial concentration of X is 0.5 M, the time required to reach its final concentration of 0.2 M will be :

Options :

41652937714. 7.2 h

41652937715. 18.0 h

41652937716. 9.0 h

41652937717. 12.0 h

Question Number : 59 Question Id : 4165299564 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, $2X \rightarrow B$ एक शून्य कोटि की अभिक्रिया है। 0.2 M की प्रारम्भिक सान्द्रता के लिए, अर्द्धआयु 6 h है। यदि X की प्रारम्भिक सान्द्रता 0.5 M हो, तो 0.2 M की अंतिम सान्द्रता पहुचने में लगने वाला समय होगा :

Options :

41652937714. 7.2 h

41652937715. 18.0 h

41652937716. 9.0 h

41652937717. 12.0 h

Question Number : 60 Question Id : 4165299565 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 colloids cheese (C), milk (M) and smoke (S), the correct combination of the dispersed phase and dispersion medium, respectively is :

Options :

41652937718. C : solid in liquid; M : liquid in liquid ; S : gas in solid

41652937719. C : solid in liquid; M : solid in liquid ; S : solid in gas

41652937720. C : liquid in solid; M : liquid in solid ; S : solid in gas

41652937721. C : liquid in solid; M : liquid in liquid ; S : solid in gas

Question Number : 60 Question Id : 4165299565 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कोलाइडों, जैसे पनीर (C), दूध (M) तथा धूआं (S) के विषय में परिक्षिप्त प्रावस्था तथा परिक्षेपण माध्यम का सही मेल क्रमशः होगा :

Options :

41652937718. C : द्रव में ठोस; M : द्रव में द्रव; S : द्रव में गैस

41652937719. C : द्रव में ठोस; M : द्रव में ठोस; S : गैस में ठोस

41652937720. C : ठोस में द्रव; M : ठोस में द्रव; S : गैस में ठोस

41652937721. C : ठोस में द्रव; M : द्रव में द्रव; S : गैस में ठोस

Mathematics

Section Id :	416529141
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: 416529150
Question Shuffling Allowed : Yes

Question Number : 61 Question Id : 4165299566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Let a function $f:(0,\infty)\to(0,\infty)$ be defined by $f(x)=\left|1-\frac{1}{x}\right|$. Then f is :

Options :

41652937722. injective only

41652937723. not injective but it is surjective

41652937724. neither injective nor surjective

41652937725. both injective as well as surjective

Question Number : 61 Question Id : 4165299566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

माना एक फलन $f:(0,\infty)\to(0,\infty)$

$f(x)=\left|1-\frac{1}{x}\right|$ द्वारा परिभाषित है, तो f :

Options :

41652937722. केवल एकैकी है।

41652937723. आच्छादी है पर एकैकी नहीं है।

41652937724. न एकैकी है न आच्छादी है।

41652937725. एकैकी और आच्छादी दोनों हैं।

Question Number : 62 Question Id : 4165299567 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 z be a complex number such that $|z|+z=3+i$ (where $i=\sqrt{-1}$).

Then $|z|$ is equal to :

Options :

41652937726. $\frac{5}{3}$

41652937727. $\frac{5}{4}$

41652937728. $\frac{\sqrt{34}}{3}$

41652937729. $\frac{\sqrt{41}}{4}$

Question Number : 62 Question Id : 4165299567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना एक सम्मिश्र संख्या z इस प्रकार है कि $|z|+z=3+i$ (जहाँ $i=\sqrt{-1}$), तो $|z|$ बराबर है :

Options :

41652937726. $\frac{5}{3}$

41652937727. $\frac{5}{4}$

41652937728. $\frac{\sqrt{34}}{3}$

41652937729. $\frac{\sqrt{41}}{4}$

Question Number : 63 Question Id : 4165299568 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 α and β be the roots of the quadratic equation
$x^2 \sin\theta - x(\sin\theta \cos\theta + 1) + \cos\theta = 0$
$(0 < \theta < 45^\circ)$, and $\alpha < \beta$. Then

$\sum_{n=0}^{\infty}\left(\alpha^n + \frac{(-1)^n}{\beta^n}\right)$ is equal to :

Options :

41652937730. $\frac{1}{1+\cos\theta} - \frac{1}{1-\sin\theta}$

41652937731. $\frac{1}{1-\cos\theta} - \frac{1}{1+\sin\theta}$

41652937732. $\frac{1}{1+\cos\theta} + \frac{1}{1-\sin\theta}$

41652937733. $\frac{1}{1-\cos\theta} + \frac{1}{1+\sin\theta}$

Question Number : 63 Question Id : 4165299568 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 द्विघात समीकरण
$x^2 \sin\theta - x(\sin\theta \cos\theta + 1) + \cos\theta = 0$
$(0 < \theta < 45^\circ)$, के मूल α तथा β $(\alpha < \beta)$ हैं, तो

$\sum_{n=0}^{\infty}\left(\alpha^n + \frac{(-1)^n}{\beta^n}\right)$ बराबर है :

Options :

41652937730. $\frac{1}{1+\cos\theta} - \frac{1}{1-\sin\theta}$

41652937731. $\frac{1}{1-\cos\theta} - \frac{1}{1+\sin\theta}$

41652937732. $\frac{1}{1+\cos\theta} + \frac{1}{1-\sin\theta}$

$\frac{1}{1-\cos\theta}+\frac{1}{1+\sin\theta}$

41652937733.

Question Number : 64 Question Id : 4165299569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let A and B be two invertible matrices of order 3×3. If $\det(ABA^T)=8$ and $\det(AB^{-1})=8$, then $\det(BA^{-1}B^T)$ is equal to :

Options :

41652937734. 1

41652937735. $\frac{1}{4}$

41652937736. 16

41652937737. $\frac{1}{16}$

Question Number : 64 Question Id : 4165299569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना A तथा B, 3×3 कोटि के दो व्युत्क्रमणीय आव्यूह हैं। यदि $\det(ABA^T)=8$ तथा $\det(AB^{-1})=8$, तो $\det(BA^{-1}B^T)$ बराबर है :

Options :

41652937734. 1

41652937735. $\frac{1}{4}$

41652937736. 16

41652937737. $\frac{1}{16}$

Question Number : 65 Question Id : 4165299570 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 $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix}$

$= (a+b+c)\ (x+a+b+c)^2$, $x \neq 0$ and $a+b+c \neq 0$, then x is equal to :

Options :

41652937738. abc

41652937739. $2(a+b+c)$

41652937740. $-(a+b+c)$

41652937741. $-2(a+b+c)$

Question Number : 65 Question Id : 4165299570 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 $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix}$

$= (a+b+c)\ (x+a+b+c)^2$, $x \neq 0$ तथा $a+b+c \neq 0$, तो x बराबर है :

Options :

41652937738. abc

41652937739. $2(a+b+c)$

41652937740. $-(a+b+c)$

41652937741. $-2(a+b+c)$

Question Number : 66 Question Id : 4165299571 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 functions f from $\{1, 2, 3, ..., 20\}$ onto $\{1, 2, 3, ..., 20\}$ such that $f(k)$ is a multiple of 3, whenever k is a multiple of 4, is :

Options :

41652937742. $5! \times 6!$

41652937743. $5^6 \times 15$

41652937744. $6^5 \times (15)!$

41652937745. $(15)! \times 6!$

Question Number : 66 Question Id : 4165299571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\{1, 2, 3, ..., 20\}$ से $\{1, 2, 3, ..., 20\}$ पर ऐसे आच्छादक फलनों, जिनके लिए $f(k)$ तीन का गुणज है जब k चार का गुणज है, की संख्या है :

Options :

41652937742. $5! \times 6!$

41652937743. $5^6 \times 15$

41652937744. $6^5 \times (15)!$

41652937745. $(15)! \times 6!$

Question Number : 67 Question Id : 4165299572 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 $(x+10)^{50} + (x-10)^{50} = a_0 + a_1 x + a_2 x^2 + ... + a_{50} x^{50}$, for all $x \in \mathbf{R}$; then $\frac{a_2}{a_0}$ is equal to :

Options :

41652937746. 12.75

41652937747. 12.50

41652937748. 12.25

41652937749. 12.00

Question Number : 67 Question Id : 4165299572 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 सभी $x \epsilon R$ के लिए
$(x+10)^{50} + (x-10)^{50}$

$= a_0 + a_1 x + a_2 x^2 + ... + a_{50} x^{50}$, तो $\frac{a_2}{a_0}$

बराबर है :

Options :

41652937746. 12.75

41652937747. 12.50

41652937748. 12.25

41652937749. 12.00

Question Number : 68 Question Id : 4165299573 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 19th term of a non-zero A.P. is zero, then its (49th term) : (29th term) is :

Options :

41652937750. 4 : 1

41652937751. 1 : 3

41652937752. 2 : 1

41652937753. 3 : 1

Question Number : 68 Question Id : 4165299573 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 शून्येतर समान्तर श्रेढ़ी का 19वां पद शून्य है,
तो इसका (49वां पद) : (29वां पद) है :

Options :

41652937750. 4 : 1

41652937751. 1 : 3

41652937752. 2 : 1

41652937753. 3 : 1

Question Number : 69 Question Id : 4165299574 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 $S_n = 1 + q + q^2 + \ldots + q^n$ and

$T_n = 1 + \left(\frac{q+1}{2}\right) + \left(\frac{q+1}{2}\right)^2 + \ldots + \left(\frac{q+1}{2}\right)^n$

where q is a real number and $q \neq 1$. If

$^{101}C_1 + {}^{101}C_2 \cdot S_1 + \ldots + {}^{101}C_{101} \cdot S_{100} = \alpha T_{100}$,

then α is equal to :

Options :

41652937754. 202

41652937755. 200

41652937756. 2^{100}

41652937757. 2^{99}

Question Number : 69 Question Id : 4165299574 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 $S_n = 1 + q + q^2 + \ldots + q^n$ तथा

$T_n = 1 + \left(\frac{q+1}{2}\right) + \left(\frac{q+1}{2}\right)^2 + \ldots + \left(\frac{q+1}{2}\right)^n$, जहाँ

q एक वास्तविक संख्या है तथा $q \neq 1$। यदि

$^{101}C_1 + {}^{101}C_2 \cdot S_1 + \ldots + {}^{101}C_{101} \cdot S_{100} = \alpha T_{100}$,

तो α बराबर है :

Options :

41652937754. 202

41652937755. 200

41652937756. 2^{100}

41652937757. 2^{99}

Question Number : 70 Question Id : 4165299575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\lim\limits_{x \to 0} \dfrac{x \cot(4x)}{\sin^2 x \cot^2(2x)}$ is equal to :

Options :

41652937758. 2

41652937759. 0

41652937760. 1

41652937761. 4

Question Number : 70 Question Id : 4165299575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\lim\limits_{x\to 0} \dfrac{x\cot(4x)}{\sin^2 x\cot^2(2x)}$ बराबर है :

Options :

41652937758. 2

41652937759. 0

41652937760. 1

41652937761. 4

Question Number : 71 Question Id : 4165299576 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 K be the set of all real values of α where the function $f(x) = \sin|x| - |x| + 2(x-\pi)\cos|x|$ is not differentiable. Then the set K is equal to :

Options :

41652937762. $\{0\}$

41652937763. $\{\pi\}$

41652937764. $\{0, \pi\}$

41652937765. ϕ (an empty set)

Question Number : 71 Question Id : 4165299576 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 K (x के) उन सभी वास्तविक मानों का समुच्चय है जहाँ फलन

$f(x) = \sin|x| - |x| + 2\ (x-\pi)\ \cos|x|$

अवकलनीय नहीं है, तो समुच्चय K बराबर है :

Options :

41652937762. $\{0\}$

41652937763. $\{\pi\}$

41652937764. $\{0, \pi\}$

41652937765. ϕ (एक रिक्त समुच्चय)

Question Number : 72 Question Id : 4165299577 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 $f(x)=\frac{x}{\sqrt{a^2+x^2}}-\frac{d-x}{\sqrt{b^2+(d-x)^2}},\ x\epsilon\mathbf{R},$

where a, b and d are non-zero real constants. Then :

Options :

41652937766. f is an increasing function of x

41652937767. f is neither increasing nor decreasing function of x

41652937768. f is a decreasing function of x

41652937769. f' is not a continuous function of x

Question Number : 72 Question Id : 4165299577 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 $f(x)=\frac{x}{\sqrt{a^2+x^2}}-\frac{d-x}{\sqrt{b^2+(d-x)^2}},\ x\epsilon\mathbf{R},$

जहाँ a, b तथा d शून्येतर वास्तविक अचर हैं, तो :

Options :

41652937766. f, x का एक वर्धमान फलन है।

41652937767. f, x का न तो वर्धमान न ही ह्रासमान फलन है।

41652937768. f, x का ह्रासमान फलन है।

41652937769. f', x का संतत फलन नहीं है।

Question Number : 73 Question Id : 4165299578 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 x, y be positive real numbers and m, n positive integers. The maximum value of the expression $\frac{x^m y^n}{(1+x^{2m})(1+y^{2n})}$ is :

Options :

41652937770. $\frac{1}{4}$

41652937771. 1

41652937772. $\frac{m+n}{6mn}$

41652937773. $\frac{1}{2}$

Question Number : 73 Question Id : 4165299578 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 x, y धनात्मक वास्तविक संख्याएँ हैं तथा m, n धनपूर्णांक हैं।

व्यंजक $\frac{x^m y^n}{(1+x^{2m})(1+y^{2n})}$ का अधिकतम मान है :

Options :

41652937770. $\frac{1}{4}$

41652937771. 1

41652937772. $\frac{m+n}{6mn}$

41652937773. $\frac{1}{2}$

Question Number : 74 Question Id : 4165299579 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 $\int\frac{x+1}{\sqrt{2x-1}}dx=f(x)\sqrt{2x-1}+C$, where C is a constant of integration, then $f(x)$ is equal to :

Options :

41652937774. $\frac{1}{3}(x+1)$

41652937775. $\frac{2}{3}(x+2)$

41652937776. $\frac{2}{3}(x-4)$

41652937777. $\frac{1}{3}(x+4)$

Question Number : 74 Question Id : 4165299579 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 $\int\frac{x+1}{\sqrt{2x-1}}dx=f(x)\sqrt{2x-1}+C$ है, जहाँ C एक समाकलन अचर है, तो $f(x)$ बराबर है :

Options :

41652937774. $\frac{1}{3}(x+1)$

41652937775. $\frac{2}{3}(x+2)$

41652937776. $\frac{2}{3}(x-4)$

41652937777. $\frac{1}{3}(x+4)$

Question Number : 75 Question Id : 4165299580 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The integral $\int_{\pi/6}^{\pi/4} \frac{dx}{\sin 2x\,(\tan^5 x+\cot^5 x)}$

equals :

Options :

41652937778. $\frac{1}{10}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{9\sqrt{3}}\right)\right)$

41652937779. $\frac{1}{5}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{3\sqrt{3}}\right)\right)$

41652937780. $\frac{\pi}{40}$

41652937781. $\frac{1}{20}\tan^{-1}\left(\frac{1}{9\sqrt{3}}\right)$

Question Number : 75 Question Id : 4165299580 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समाकल $\int_{\pi/6}^{\pi/4} \frac{dx}{\sin 2x\,(\tan^5 x+\cot^5 x)}$ बराबर

है :

Options :

41652937778. $\frac{1}{10}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{9\sqrt{3}}\right)\right)$

41652937779. $\frac{1}{5}\left(\frac{\pi}{4}-\tan^{-1}\left(\frac{1}{3\sqrt{3}}\right)\right)$

41652937780. $\frac{\pi}{40}$

41652937781. $\frac{1}{20}\tan^{-1}\left(\frac{1}{9\sqrt{3}}\right)$

Question Number : 76 Question Id : 4165299581 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The area(in sq. units) in the first quadrant bounded by the parabola, $y = x^2 + 1$, the tangent to it at the point (2, 5) and the coordinate axes is :

Options :

41652937782. $\frac{37}{24}$

41652937783. $\frac{8}{3}$

41652937784. $\frac{187}{24}$

41652937785. $\frac{14}{3}$

Question Number : 76 Question Id : 4165299581 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 $y = x^2 + 1$, इस के एक बिंदु (2, 5) पर खींची गई स्पर्श रेखा तथा निर्देशांक अक्षों द्वारा प्रथम चतुर्थांश में घिरे क्षेत्र का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

41652937782. $\frac{37}{24}$

41652937783. $\frac{8}{3}$

41652937784. $\frac{187}{24}$

41652937785. $\frac{14}{3}$

Question Number : 77 Question Id : 4165299582 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 solution of the differential equation,

$\frac{dy}{dx}=(x-y)^2$, when $y(1)=1$, is :

Options :

41652937786. $-\log_e\left|\frac{1-x+y}{1+x-y}\right|=2(x-1)$

41652937787. $\log_e\left|\frac{2-y}{2-x}\right|=2(y-1)$

41652937788. $\log_e\left|\frac{2-x}{2-y}\right|=x-y$

41652937789. $-\log_e\left|\frac{1+x-y}{1-x+y}\right|=x+y-2$

Question Number : 77 Question Id : 4165299582 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अवकल समीकरण $\frac{dy}{dx}=(x-y)^2$, जबकि $y(1)=1$

है, का हल है :

Options :

41652937786. $-\log_e\left|\frac{1-x+y}{1+x-y}\right|=2(x-1)$

41652937787. $\log_e\left|\frac{2-y}{2-x}\right|=2(y-1)$

41652937788. $\log_e\left|\frac{2-x}{2-y}\right|=x-y$

41652937789. $-\log_e\left|\frac{1+x-y}{1-x+y}\right|=x+y-2$

Question Number : 78 Question Id : 4165299583 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 in a parallelogram ABDC, the coordinates of A, B and C are respectively $(1, 2)$, $(3, 4)$ and $(2, 5)$, then the equation of the diagonal AD is :

Options :

41652937790. $5x+3y-11=0$

41652937791. $5x-3y+1=0$

41652937792. $3x-5y+7=0$

41652937793. $3x+5y-13=0$

Question Number : 78 Question Id : 4165299583 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 समांतर चतुर्भुज ABDC के बिंदुओं A, B तथा C के निर्देशांक क्रमश: $(1, 2)$, $(3, 4)$ तथा $(2, 5)$ हैं, तो विकर्ण AD का समीकरण है :

Options :

41652937790. $5x+3y-11=0$

41652937791. $5x-3y+1=0$

41652937792. $3x-5y+7=0$

41652937793. $3x+5y-13=0$

Question Number : 79 Question Id : 4165299584 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 length of the latus rectum of an ellipse with its major axis along x-axis and centre at the origin, be 8. If the distance between the foci of this ellipse is equal to the length of its minor axis, then which one of the following points lies on it ?

Options :

41652937794. $(4\sqrt{2}, 2\sqrt{2})$

41652937795. $(4\sqrt{2}, 2\sqrt{3})$

41652937796. $(4\sqrt{3}, 2\sqrt{3})$

41652937797. $(4\sqrt{3}, 2\sqrt{2})$

Question Number : 79 Question Id : 4165299584 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना एक दीर्घवृत्त, जिसका दीर्घ-अक्ष x-अक्ष के अनुदिश है तथा केंद्र मूलबिंदु पर है, के नाभिलंब की लंबाई 8 है। यदि दीर्घवृत्त की नाभियों के बीच की दूरी, इसके लघु-अक्ष की लंबाई के समान हो, तो निम्न में से कौन-सा बिंदु इस पर स्थित है?

Options :

41652937794. $(4\sqrt{2}, 2\sqrt{2})$

41652937795. $(4\sqrt{2}, 2\sqrt{3})$

41652937796. $(4\sqrt{3}, 2\sqrt{3})$

41652937797. $(4\sqrt{3}, 2\sqrt{2})$

Question Number : 80 Question Id : 4165299585 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 circle cuts a chord of length 4a on the x-axis and passes through a point on the y-axis, distant 2b from the origin. Then the locus of the centre of this circle, is :

Options :

41652937798. a straight line

41652937799. an ellipse

41652937800. a parabola

41652937801. a hyperbola

Question Number : 80 Question Id : 4165299585 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 वृत्त x-अक्ष पर एक जीवा काटता है जिसकी लंबाई 4a है तथा यह वृत्त y-अक्ष के एक बिन्दु से हो कर जाता है जिसकी मूलबिंदु से दूरी 2b है। तो वृत्त के केंद्र का बिंदुपथ (locus) है :

Options :

41652937798. एक सरल रेखा

41652937799. एक दीर्घवृत्त

41652937800. एक परवलय

41652937801. एक अतिपरवलय

Question Number : 81 Question Id : 4165299586 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 area of the triangle whose one vertex is at the vertex of the parabola, $y^2+4(x-a^2)=0$ and the other two vertices are the points of intersection of the parabola and y-axis, is 250 sq. units, then a value of 'a' is :

Options :

41652937802. $5(2^{1/3})$

41652937803. $(10)^{2/3}$

41652937804. 5

41652937805. $5\sqrt{5}$

Question Number : 81 Question Id : 4165299586 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, जिसका एक शीर्ष परवलय $y^2+4(x-a^2)=0$ के शीर्ष पर है तथा अन्य दो शीर्ष परवलय तथा y-अक्ष के प्रतिच्छेदन बिंदुओं पर हैं, का क्षेत्रफल 250 वर्ग इकाई है, तो 'a' का एक मान है :

Options :

41652937802. $5(2^{1/3})$

41652937803. $(10)^{2/3}$

41652937804. 5

41652937805. $5\sqrt{5}$

Question Number : 82 Question Id : 4165299587 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 hyperbola has length of its conjugate axis equal to 5 and the distance between its foci is 13, then the eccentricity of the hyperbola is :

Options :

41652937806. $\frac{13}{6}$

41652937807. 2

41652937808. $\frac{13}{8}$

41652937809. $\frac{13}{12}$

Question Number : 82 Question Id : 4165299587 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 अतिपरवलय के संयुग्मी अक्ष (conjugate axis) की लंबाई 5 है तथा इसकी नाभियों के बीच की दूरी 13 है, तो इस अतिपरवलय की उत्केंद्रता है :

Options :

41652937806. $\frac{13}{6}$

41652937807. 2

41652937808. $\frac{13}{8}$

41652937809. $\frac{13}{12}$

Question Number : 83 Question Id : 4165299588 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 lines $\frac{x-3}{1}=\frac{y+1}{3}=\frac{z-6}{-1}$ and $\frac{x+5}{7}=\frac{y-2}{-6}=\frac{z-3}{4}$ intersect at the point R.

The reflection of R in the xy-plane has coordinates :

Options :

41652937810. $(2, -4, -7)$

41652937811. $(2, 4, 7)$

41652937812. $(2, -4, 7)$

41652937813. $(-2, 4, 7)$

Question Number : 83 Question Id : 4165299588 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 रेखाएँ $\frac{x-3}{1}=\frac{y+1}{3}=\frac{z-6}{-1}$ तथा $\frac{x+5}{7}=\frac{y-2}{-6}=\frac{z-3}{4}$ बिंदु R पर काटती हैं। बिंदु R के xy - तल में प्रतिबिंब के निर्देशांक हैं :

Options :

41652937810. $(2, -4, -7)$

41652937811. $(2, 4, 7)$

41652937812. $(2, -4, 7)$

41652937813. $(-2, 4, 7)$

Question Number : 84 Question Id : 4165299589 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 point $(2, \alpha, \beta)$ lies on the plane which passes through the points $(3, 4, 2)$ and $(7, 0, 6)$ and is perpendicular to the plane $2x - 5y = 15$, then $2\alpha - 3\beta$ is equal to :

Options :

41652937814. 17

41652937815. 12

41652937816. 5

41652937817. 7

Question Number : 84 Question Id : 4165299589 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 $(2, \alpha, \beta)$ उस समतल पर स्थित है जो बिंदुओं $(3, 4, 2)$ तथा $(7, 0, 6)$ से हो कर जाता है तथा समतल $2x - 5y = 15$ के लंबवत है, तो $2\alpha - 3\beta$ बराबर है :

Options :

41652937814. 17

41652937815. 12

41652937816. 5

41652937817. 7

Question Number : 85 Question Id : 4165299590 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 $\sqrt{3}\hat{i}+\hat{j}$, $\hat{i}+\sqrt{3}\hat{j}$ and $\beta\hat{i}+(1-\beta)\hat{j}$ respectively be the position vectors of the points A, B and C with respect to the origin O. If the distance of C from the bisector of the acute angle between OA and OB is $\frac{3}{\sqrt{2}}$, then the sum of all possible values of β is :

Options :

41652937818. 1

41652937819. 2

41652937820. 3

41652937821. 4

Question Number : 85 Question Id : 4165299590 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 $\sqrt{3}\hat{i}+\hat{j}$, $\hat{i}+\sqrt{3}\hat{j}$ तथा $\beta\hat{i}+(1-\beta)\hat{j}$ क्रमशः तीन बिंदुओं A, B तथा C के मूलबिंदु O के सापेक्ष, स्थिति सदिश हैं। यदि C की, OA तथा OB के बीच बने न्यूनकोण के समद्विभाजक से दूरी $\frac{3}{\sqrt{2}}$ है, तो β के सभी संभावित मानों का योग है :

Options :

41652937818. 1

41652937819. 2

41652937820. 3

41652937821. 4

Question Number : 86 Question Id : 4165299591 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 bag contains 30 white balls and 10 red balls. 16 balls are drawn one by one randomly from the bag with replacement. If X be the number of white balls drawn, then $\left(\frac{\text{mean of X}}{\text{standard deviation of X}}\right)$ is equal to :

Options :

41652937822. $3\sqrt{2}$

41652937823. $\frac{4\sqrt{3}}{3}$

41652937824. $4\sqrt{3}$

41652937825. 4

Question Number : 86 Question Id : 4165299591 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 थैले में 30 सफेद गेंदें तथा 10 लाल गेंदें हैं। थैले में से यादृच्छया, एक एक करके (प्रतिस्थापना सहित) 16 गेंदें निकाली गई। यदि निकाली गई सफेद गेंदों की संख्या X है, तो $\left(\frac{\text{X का माध्य}}{\text{X का मानक विचलन}}\right)$ बराबर है :

Options :

41652937822. $3\sqrt{2}$

41652937823. $\frac{4\sqrt{3}}{3}$

41652937824. $4\sqrt{3}$

41652937825. 4

Question Number : 87 Question Id : 4165299592 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 = {1, 2, ..., 20}. A subset B of S is said to be "nice", if the sum of the elements of B is 203. Then the probability that a randomly chosen subset of S is "nice" is :

Options :

41652937826. $\frac{5}{2^{20}}$

41652937827. $\frac{6}{2^{20}}$

41652937828. $\frac{4}{2^{20}}$

41652937829. $\frac{7}{2^{20}}$

Question Number : 87 Question Id : 4165299592 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 = {1, 2, ..., 20} है। S के एक उपसमुच्चय B को "nice" कहा जाता है यदि इसके अवयवों का योग 203 है। तो, S के एक यादृच्छया चुने गए उपसमुच्चय के "nice" होने की प्रायिकता है :

Options :

41652937826. $\frac{5}{2^{20}}$

41652937827. $\frac{6}{2^{20}}$

41652937828. $\frac{4}{2^{20}}$

41652937829. $\frac{7}{2^{20}}$

Question Number : 88 Question Id : 4165299593 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 $\frac{b+c}{11}=\frac{c+a}{12}=\frac{a+b}{13}$ for a ΔABC with usual notation. If $\frac{\cos A}{\alpha}=\frac{\cos B}{\beta}=\frac{\cos C}{\gamma}$, then the ordered triad (α, β, γ) has a value :

Options :

41652937830. $(3, 4, 5)$

41652937831. $(19, 7, 25)$

41652937832. $(7, 19, 25)$

41652937833. $(5, 12, 13)$

Question Number : 88 Question Id : 4165299593 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 ΔABC में सामान्य संकेतों के आधार पर दिया है कि $\frac{b+c}{11}=\frac{c+a}{12}=\frac{a+b}{13}$ है। यदि $\frac{\cos A}{\alpha}=\frac{\cos B}{\beta}=\frac{\cos C}{\gamma}$ है, तो क्रमित त्रिक (α, β, γ) का एक मान है :

Options :

41652937830. $(3, 4, 5)$

41652937831. $(19, 7, 25)$

41652937832. $(7, 19, 25)$

41652937833. $(5, 12, 13)$

Question Number : 89 Question Id : 4165299594 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

All x satisfying the inequality $(\cot^{-1}x)^2-7(\cot^{-1}x)+10>0$, lie in the interval :

Options :

41652937834. $(\cot 5, \cot 4)$

41652937835. $(\cot 2, \infty)$

41652937836. $(-\infty, \cot 5) \cup (\cot 4, \cot 2)$

41652937837. $(-\infty, \cot 5) \cup (\cot 2, \infty)$

Question Number : 89 Question Id : 4165299594 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वे सभी x, जो असमीकरण $(\cot^{-1}x)^2 - 7(\cot^{-1}x) + 10 > 0$ को संतुष्ट करते हैं, निम्न में से किस अंतराल में है?

Options :

41652937834. $(\cot 5, \cot 4)$

41652937835. $(\cot 2, \infty)$

41652937836. $(-\infty, \cot 5) \cup (\cot 4, \cot 2)$

41652937837. $(-\infty, \cot 5) \cup (\cot 2, \infty)$

Question Number : 90 Question Id : 4165299595 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Contrapositive of the statement "If two numbers are not equal, then their squares are not equal." is :

Options :

41652937838. If the squares of two numbers are equal, then the numbers are not equal.

41652937839. If the squares of two numbers are not equal, then the numbers are not equal.

41652937840. If the squares of two numbers are not equal, then the numbers are equal.

41652937841. If the squares of two numbers are equal, then the numbers are equal.

Question Number : 90 Question Id : 4165299595 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कथन

''यदि दो संख्याएँ बराबर नहीं हैं, तो उनके वर्ग भी बराबर नहीं हैं''

का प्रतिधनात्मक (contrapositive) कथन है :

Options :

41652937838. यदि दो संख्याओं के वर्ग बराबर हैं, तो संख्याएँ बराबर नहीं हैं।

41652937839. यदि दो संख्याओं के वर्ग बराबर नहीं हैं, तो संख्याएँ बराबर नहीं हैं।

41652937840. यदि दो संख्याओं के वर्ग बराबर नहीं हैं, तो संख्याएँ बराबर हैं।

41652937841. यदि दो संख्याओं के वर्ग बराबर हैं, तो संख्याएँ बराबर हैं।