

Question Paper Name: Paper I EH 10th Jan 2019 Shift 1
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Share Answer Key With Delivery Engine: Yes
Actual Answer Key: Yes

Paper I

Group Number : 1
Group Id : 416529117
Group Maximum Duration : 0
Group Minimum Duration : 180
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Revisit allowed for edit? : No
Break time: 0
Group Marks: 360

Physics

Section Id : 416529133
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: 416529142
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 4165299326 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 density of a material in SI units is 128 kg m^{-3} . In certain units in which the unit of length is 25 cm and the unit of mass is 50 g, the numerical value of density of the material is :

Options :

41652936762. 40
41652936763. 410
41652936764. 640
41652936765. 16

Question Number : 1 Question Id : 4165299326 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

SI मात्रकों में एक पदार्थ का घनत्व 128 kg m^{-3} है।
एक ऐसे मात्रकों में, जिसमें लम्बाई की इकाई 25 cm
तथा द्रव्यमान की इकाई 50 g है, इस पदार्थ के घनत्व
का आंकिक मान होगा :

Options :

41652936762. 40
41652936763. 410
41652936764. 640
41652936765. 16

Question Number : 2 Question Id : 4165299327 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 guns A and B can fire bullets at speeds
1 km/s and 2 km/s respectively. From a
point on a horizontal ground, they are fired
in all possible directions. The ratio of
maximum areas covered by the bullets
fired by the two guns, on the ground is :

Options :

41652936766. 1 : 2
41652936767. 1 : 16
41652936768. 1 : 8
41652936769. 1 : 4

Question Number : 2 Question Id : 4165299327 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 बन्दूकों A तथा B द्वारा आरम्भिक चालों क्रमशः
1 km/s तथा 2 km/s से गोली चलायी जा सकती
है। क्षैतिज भूमि के किसी बिन्दु से सभी सम्भव
दिशाओं में इनको चलाया जाता है। दोनों बन्दूकों द्वारा
दागी गई गोलियों से भूमि पर छादित अधिकतम क्षेत्रफलों
का अनुपात है :

Options :

41652936766. 1 : 2

41652936767. 1 : 16

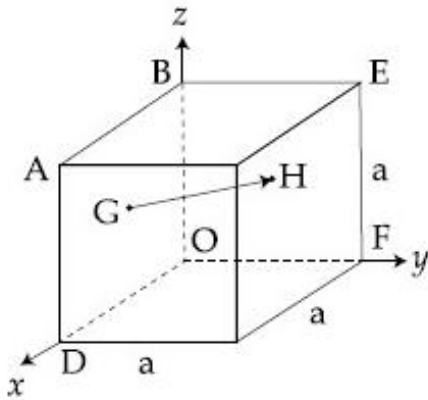
41652936768. 1 : 8

41652936769. 1 : 4

Question Number : 3 Question Id : 4165299328 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 cube of side 'a' shown in the figure,
the vector from the central point of the face
ABOD to the central point of the face
BEFO will be :



Options :

41652936770. $\frac{1}{2}a(\hat{k} - \hat{i})$

41652936771. $\frac{1}{2}a(\hat{i} - \hat{k})$

41652936772. $\frac{1}{2}a(\hat{j} - \hat{i})$

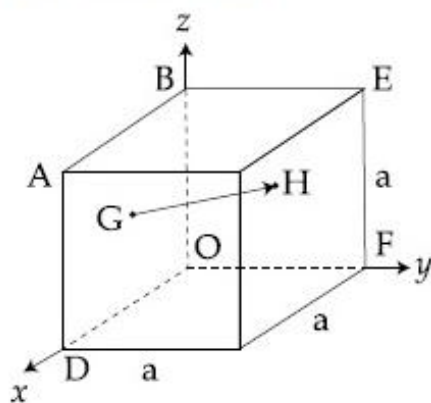
$$\frac{1}{2}a(\hat{j} - \hat{k})$$

41652936773.

Question Number : 3 Question Id : 4165299328 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाये गये घन की भुजा 'a' के फलक
ABOD के केन्द्र से फलक BEFO के केन्द्र तक
जाने वाला सदिश होगा :



Options :

$$\frac{1}{2}a(\hat{k} - \hat{i})$$

41652936770.

$$\frac{1}{2}a(\hat{i} - \hat{k})$$

41652936771.

$$\frac{1}{2}a(\hat{j} - \hat{i})$$

41652936772.

$$\frac{1}{2}a(\hat{j} - \hat{k})$$

41652936773.

Question Number : 4 Question Id : 4165299329 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 piece of wood of mass 0.03 kg is dropped from the top of a 100 m height building. At the same time, a bullet of mass 0.02 kg is fired vertically upward, with a velocity 100 ms^{-1} , from the ground. The bullet gets embedded in the wood. Then the maximum height to which the combined system reaches above the top of the building before falling below is :
($g = 10 \text{ ms}^{-2}$)

Options :

41652936774. 40 m

41652936775. 30 m

41652936776. 20 m

41652936777. 10 m

Question Number : 4 Question Id : 4165299329 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.03 kg द्रव्यमान के लकड़ी के एक टुकड़े को एक 100 m ऊँचाई की इमारत की छत से छोड़ा जाता है। उसी समय 0.02 kg द्रव्यमान की एक गोली को धरातल से 100 ms^{-1} की गति से ऊर्ध्वाधर दिशा में ऊपर की तरफ दागा जाता है। गोली लकड़ी में गड़ जाती है, तो इस संयुक्त निकाय द्वारा नीचे आने से पहले इमारत की शीर्ष से ऊपर तय की गयी अधिकतम ऊँचाई का मान होगा : (दिया है $g = 10 \text{ ms}^{-2}$)

Options :

41652936774. 40 m

41652936775. 30 m

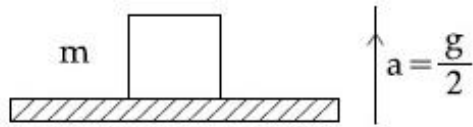
41652936776. 20 m

41652936777. 10 m

Question Number : 5 Question Id : 4165299330 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 block of mass m is kept on a platform which starts from rest with constant acceleration $g/2$ upward, as shown in fig. Work done by normal reaction on block in time t is :



Options :

41652936778. $\frac{3m g^2 t^2}{8}$

41652936779. $-\frac{m g^2 t^2}{8}$

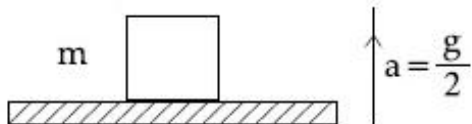
41652936780. $\frac{m g^2 t^2}{8}$

41652936781. 0

Question Number : 5 Question Id : 4165299330 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 m द्रव्यमान का एक गुटका एक प्लेटफॉर्म पर रखा है जो विराम से नियत त्वरण $g/2$ से ऊपर की ओर चलना आरम्भ करता है। गुटके पर लगने वाले अभिलम्ब प्रतिक्रिया (normal reaction) बल द्वारा समय t में किया गया कार्य है :



Options :

41652936778. $\frac{3m g^2 t^2}{8}$

41652936779. $-\frac{m g^2 t^2}{8}$

$$\frac{m g^2 t^2}{8}$$

41652936780.

0

41652936781.

Question Number : 6 Question Id : 4165299331 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 homogeneous solid cylindrical roller of radius R and mass M is pulled on a cricket pitch by a horizontal force. Assuming rolling without slipping, angular acceleration of the cylinder is :

Options :

$$\frac{2F}{3mR}$$

41652936782.

$$\frac{3F}{2mR}$$

41652936783.

$$\frac{F}{3mR}$$

41652936784.

$$\frac{F}{2mR}$$

41652936785.

Question Number : 6 Question Id : 4165299331 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 के एक ठोस समांग बेलनाकार रोलर को एक क्रिकेट पिच पर क्षैतिज बल F, से खींचा जा रहा है। यह मानते हुये कि बेलन बिना फिसले लुढ़कता है, इसके कोणीय त्वरण का मान होगा :

Options :

$$\frac{2F}{3mR}$$

41652936782.

$$\frac{3F}{2mR}$$

41652936783.

41652936784. $\frac{F}{3mR}$

41652936785. $\frac{F}{2mR}$

Question Number : 7 Question Id : 4165299332 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

To mop-clean a floor, a cleaning machine presses a circular mop of radius R vertically down with a total force F and rotates it with a constant angular speed about its axis. If the force F is distributed uniformly over the mop and if coefficient of friction between the mop and the floor is μ , the torque, applied by the machine on the mop is :

Options :

41652936786. $\mu FR/6$

41652936787. $\mu FR/3$

41652936788. $\mu FR/2$

41652936789. $\frac{2}{3}\mu FR$

Question Number : 7 Question Id : 4165299332 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 समतल को पोंछे से साफ करने की एक मशीन द्वारा R त्रिज्या के पोंछे को कुल ऊर्ध्वाधर बल F से दबाकर उसे उसकी अक्ष के परितः एक नियत कोणीय गति से घुमाया जाता है। यदि बल F पोंछे पर एकसमान वितरित है तथा पोंछे और समतल के बीच घर्षणांक μ है तो मशीन द्वारा पोंछे पर लगाया बल आघूर्ण होगा :

Options :

41652936786. $\mu FR/6$

41652936787. $\mu FR/3$

41652936788. $\mu FR/2$

Question Number : 8 Question Id : 4165299333 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 satellite is moving with a constant speed v in circular orbit around the earth. An object of mass ' m ' is ejected from the satellite such that it just escapes from the gravitational pull of the earth. At the time of ejection, the kinetic energy of the object is :

Options :

41652936790. $\frac{1}{2} m v^2$

41652936791. $m v^2$

41652936792. $\frac{3}{2} m v^2$

41652936793. $2 m v^2$

Question Number : 8 Question Id : 4165299333 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 उपग्रह पृथ्वी के परितः वृत्ताकार कक्षा में एक नियत गति v से घूम रहा है। उपग्रह से द्रव्यमान ' m ' का एक पिण्ड इस तरह उत्क्षेपित होता है कि वह पृथ्वी के गुरुत्वाकर्षण से ठीक पलायन कर जाता है। उत्क्षेपण के समय पिण्ड की गतिज ऊर्जा का मान होगा :

Options :

41652936790. $\frac{1}{2} m v^2$

41652936791. $m v^2$

41652936792. $\frac{3}{2} m v^2$

41652936793. $2 m v^2$

Question Number : 9 Question Id : 4165299334 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Water flows into a large tank with flat bottom at the rate of $10^{-4} \text{ m}^3 \text{ s}^{-1}$. Water is also leaking out of a hole of area 1 cm^2 at its bottom. If the height of the water in the tank remains steady, then this height is :

Options :

41652936794. 5.1 cm

41652936795. 4 cm

41652936796. 2.9 cm

41652936797. 1.7 cm

Question Number : 9 Question Id : 4165299334 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 समतल तली के बड़े टैंक में पानी $10^{-4} \text{ m}^3/\text{s}$ से भर रहा है और इसकी तली में बने 1 cm^2 क्षेत्रफल के एक छेद से पानी बाहर भी बह रहा है। यदि पानी की टैंक में ऊँचाई स्थिर है तो इस ऊँचाई का मान होगा :

Options :

41652936794. 5.1 cm

41652936795. 4 cm

41652936796. 2.9 cm

41652936797. 1.7 cm

Question Number : 10 Question Id : 4165299335 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Three Carnot engines operate in series between a heat source at a temperature T_1 and a heat sink at temperature T_4 (see figure). There are two other reservoirs at temperature T_2 and T_3 , as shown, with $T_1 > T_2 > T_3 > T_4$. The three engines are equally efficient if :

T_1

☐ ϵ_1

T_2

☐ ϵ_2

T_3

☐ ϵ_3

T_4

Options :

41652936798. $T_2 = (T_1 T_4^2)^{1/3}; T_3 = (T_1^2 T_4)^{1/3}$

41652936799. $T_2 = (T_1 T_4)^{1/2}; T_3 = (T_1^2 T_4)^{1/3}$

41652936800. $T_2 = (T_1^2 T_4)^{1/3}; T_3 = (T_1 T_4^2)^{1/3}$

41652936801. $T_2 = (T_1^3 T_4)^{1/4}; T_3 = (T_1 T_4^3)^{1/4}$

Question Number : 10 Question Id : 4165299335 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

तीन कार्नों इंजन श्रेणीक्रम में T_1 तापमान के एक गर्म ऊष्मा भण्डार तथा T_4 तापमान के एक ठण्डे ऊष्मा भण्डार के बीच लगे हैं (चित्र देखिये)। दिखाये अनुसार T_2 तथा T_3 तापमान के दो और ऊष्मा भण्डार हैं यहाँ $T_1 > T_2 > T_3 > T_4$ हैं। तीनों इंजन बराबर क्षमता के होंगे, यदि :

T_1

☐ ϵ_1

T_2

☐ ϵ_2

T_3

☐ ϵ_3

T_4

Options :

41652936798.

$$T_2 = (T_1 T_4)^{1/3}; T_3 = (T_1^2 T_4)^{1/3}$$

41652936799.

$$T_2 = (T_1 T_4)^{1/2}; T_3 = (T_1^2 T_4)^{1/3}$$

41652936800.

$$T_2 = (T_1^2 T_4)^{1/3}; T_3 = (T_1 T_4^2)^{1/3}$$

41652936801.

$$T_2 = (T_1^3 T_4)^{1/4}; T_3 = (T_1 T_4^3)^{1/4}$$

Question Number : 11 Question Id : 4165299336 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 heat source at $T = 10^3$ K is connected to another heat reservoir at $T = 10^2$ K by a copper slab which is 1 m thick. Given that the thermal conductivity of copper is $0.1 \text{ WK}^{-1}\text{m}^{-1}$, the energy flux through it in the steady state is :

Options :

41652936802. 90 Wm^{-2}

41652936803. 120 Wm^{-2}

41652936804. 65 Wm^{-2}

41652936805. 200 Wm^{-2}

Question Number : 11 Question Id : 4165299336 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$T = 10^3 \text{ K}$ तापमान के गर्म ऊष्मा भण्डार को
 $T = 10^2 \text{ K}$ तापमान के ऊष्मा भण्डार से, 1 मी. मोटाई
के ताँबे के पटल द्वारा जोड़ते हैं। दिया है, ताँबे की
ऊष्मा चालकता $0.1 \text{ WK}^{-1}\text{m}^{-1}$ है। साम्यावस्था
में इससे गुजरने वाला ऊर्जा फ्लक्स होगा :

Options :

41652936802. 90 Wm^{-2}

41652936803. 120 Wm^{-2}

41652936804. 65 Wm^{-2}

41652936805. 200 Wm^{-2}

Question Number : 12 Question Id : 4165299337 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 of length 1 m and mass 5 g is fixed
at both ends. The tension in the string is
8.0 N. The string is set into vibration using
an external vibrator of frequency 100 Hz.
The separation between successive nodes
on the string is close to :

Options :

41652936806. 10.0 cm

41652936807. 16.6 cm

41652936808. 20.0 cm

41652936809. 33.3 cm

Question Number : 12 Question Id : 4165299337 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 तथा 5 g द्रव्यमान की एक डोरी के दोनों सिरों को दृढ़ रखा है। डोरी में 8.0 N का तनाव है। 100 Hz आवृत्ति के एक बाहरी कम्पित्र से डोरी में कम्पन उत्पन्न करते हैं। डोरी में बने निकटतम निस्पंदों के बीच की दूरी का सन्निकट मान होगा :

Options :

41652936806. 10.0 cm

41652936807. 16.6 cm

41652936808. 20.0 cm

41652936809. 33.3 cm

Question Number : 13 Question Id : 4165299338 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 train moves towards a stationary observer with speed 34 m/s. The train sounds a whistle and its frequency registered by the observer is f_1 . If the speed of the train is reduced to 17 m/s, the frequency registered is f_2 . If speed of sound is 340 m/s, then the ratio f_1/f_2 is :

Options :

41652936810. 18/17

41652936811. 21/20

41652936812. 20/19

41652936813. 19/18

Question Number : 13 Question Id : 4165299338 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 रेलगाड़ी गति 34 m/s से एक स्थिर प्रेक्षक की ओर जा रही है। रेलगाड़ी की सीटी की आवाज प्रेक्षक को f_1 आवृत्ति की सुनाई देती है। यदि रेलगाड़ी की गति 17 m/s तक घटा दी जाती है तो सीटी की आवृत्ति f_2 सुनाई देती है। यदि ध्वनि की गति

340 m/s है तो अनुपात $\frac{f_1}{f_2}$ होगा :

Options :

41652936810. $18/17$

41652936811. $21/20$

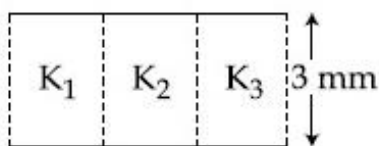
41652936812. $20/19$

41652936813. $19/18$

Question Number : 14 Question Id : 4165299339 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A parallel plate capacitor is of area 6 cm^2 and a separation 3 mm . The gap is filled with three dielectric materials of equal thickness (see figure) with dielectric constants $K_1 = 10$, $K_2 = 12$ and $K_3 = 14$. The dielectric constant of a material which when fully inserted in above capacitor, gives same capacitance would be :



Options :

41652936814. 36

41652936815. 12

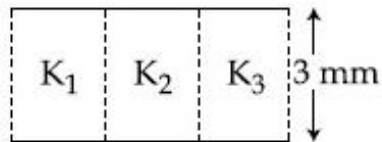
41652936816. 4

41652936817. 14

Question Number : 14 Question Id : 4165299339 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 समांतर पट्ट संधारित्र की प्लेटों का क्षेत्रफल 6 cm^2 तथा उनके बीच दूरी 3 mm है। प्लेटों के बीच तीन उसी मोटाई तथा एकसमान क्षेत्रफल के परावैद्युतों जिनके परावैद्युतांक, $K_1 = 10$, $K_2 = 12$, $K_3 = 14$ हैं, से चित्रानुसार भर दिया जाता है। इसी संधारित्र में ऐसे परावैद्युत का परावैद्युतांक क्या होगा जिसे डालने पर वही धारिता प्राप्त हो :



Options :

41652936814. 36

41652936815. 12

41652936816. 4

41652936817. 14

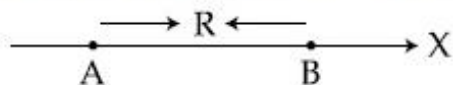
Question Number : 15 Question Id : 4165299340 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two electric dipoles, A, B with respective

dipole moments $\vec{d}_A = -4qa\hat{i}$ and

$\vec{d}_B = -2qa\hat{i}$ are placed on the x -axis with a separation R , as shown in the figure



The distance from A at which both of them produce the same potential is :

Options :

41652936818. $\frac{\sqrt{2} R}{\sqrt{2} - 1}$

41652936819. $\frac{\sqrt{2} R}{\sqrt{2} + 1}$

41652936820. $\frac{R}{\sqrt{2} + 1}$

$$\frac{R}{\sqrt{2} - 1}$$

41652936821.

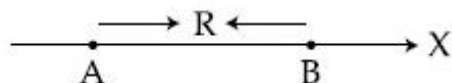
Question Number : 15 Question Id : 4165299340 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो विद्युत द्विध्रुव, A तथा B जिनके द्विध्रुव आघूर्ण

क्रमशः $\vec{d}_A = -4qa\hat{i}$ तथा $\vec{d}_B = -2qa\hat{i}$ हैं,

को x-अक्ष पर R दूरी पर चित्रानुसार रखा गया है।



A से उस बिन्दु की दूरी, जिस पर दोनों का विभव बराबर होगा, है :

Options :

$$\frac{\sqrt{2} R}{\sqrt{2} - 1}$$

41652936818.

$$\frac{\sqrt{2} R}{\sqrt{2} + 1}$$

41652936819.

$$\frac{R}{\sqrt{2} + 1}$$

41652936820.

$$\frac{R}{\sqrt{2} - 1}$$

41652936821.

Question Number : 16 Question Id : 4165299341 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 charge Q is distributed over three concentric spherical shells of radii a, b, c ($a < b < c$) such that their surface charge densities are equal to one another.

The total potential at a point at distance r from their common centre, where $r < a$, would be :

Options :

$$\frac{Q}{12\pi\epsilon_0} \frac{ab + bc + ca}{abc}$$

41652936822.

41652936823.

$$\frac{Q(a + b + c)}{4\pi\epsilon_0(a^2 + b^2 + c^2)}$$

41652936824.

$$\frac{Q}{4\pi\epsilon_0(a + b + c)}$$

41652936825.

$$\frac{Q(a^2 + b^2 + c^2)}{4\pi\epsilon_0(a^3 + b^3 + c^3)}$$

Question Number : 16 Question Id : 4165299341 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आवेश Q को तीन समकेन्द्रीय तथा त्रिज्या a, b, c ($a < b < c$) के गोलाकार कोशों पर इस तरह वितरित किया है कि तीनों पर क्षेत्रीय आवेश घनत्व बराबर है। कोशों के केन्द्र से दूरी r ($r < a$) पर स्थित एक बिन्दु पर कुल विभव का मान होगा :

Options :

41652936822.

$$\frac{Q}{12\pi\epsilon_0} \frac{ab + bc + ca}{abc}$$

41652936823.

$$\frac{Q(a + b + c)}{4\pi\epsilon_0(a^2 + b^2 + c^2)}$$

41652936824.

$$\frac{Q}{4\pi\epsilon_0(a + b + c)}$$

41652936825.

$$\frac{Q(a^2 + b^2 + c^2)}{4\pi\epsilon_0(a^3 + b^3 + c^3)}$$

Question Number : 17 Question Id : 4165299342 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A uniform metallic wire has a resistance of 18Ω and is bent into an equilateral triangle. Then, the resistance between any two vertices of the triangle is :

Options :

41652936826.

$$2 \Omega$$

41652936827. 12Ω

41652936828. 4Ω

41652936829. 8Ω

Question Number : 17 Question Id : 4165299342 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

धातु के एक एकसमान तार का प्रतिरोध 18Ω है। इसे मोड़कर एक समबाहु त्रिभुज बनाते हैं। इस त्रिभुज के कोई दो शीर्षों के बीच तुल्य प्रतिरोध का मान होगा :

Options :

41652936826. 2Ω

41652936827. 12Ω

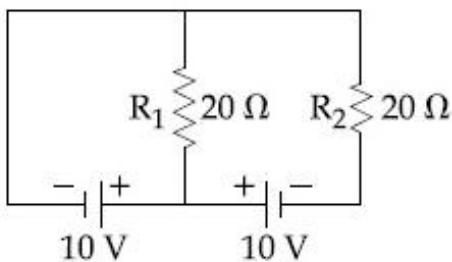
41652936828. 4Ω

41652936829. 8Ω

Question Number : 18 Question Id : 4165299343 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 given circuit the cells have zero internal resistance. The currents (in Amperes) passing through resistance R_1 and R_2 respectively, are :



Options :

41652936830. 0.5, 0

41652936831. 1, 2

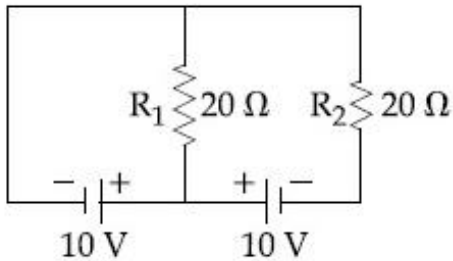
41652936832. 2, 2

41652936833. 0, 1

Question Number : 18 Question Id : 4165299343 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 सेलों का आंतरिक प्रतिरोध शून्य है। प्रतिरोधों R_1 तथा R_2 में, क्रमशः धारा (Ampere में) के मान होंगे :



Options :

41652936830. 0.5, 0

41652936831. 1, 2

41652936832. 2, 2

41652936833. 0, 1

Question Number : 19 Question Id : 4165299344 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A solid metal cube of edge length 2 cm is moving in a positive y -direction at a constant speed of 6 m/s. There is a uniform magnetic field of 0.1 T in the positive z -direction. The potential difference between the two faces of the cube perpendicular to the x -axis, is :

Options :

41652936834. 1 mV

41652936835. 6 mV

41652936836. 12 mV

41652936837. 2 mV

Question Number : 19 Question Id : 4165299344 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 cm कोर का एक ठोस धातु का घन, धनात्मक y -अक्ष की दिशा में 6 m/s की गति से जा रहा है। यहाँ 0.1 T का चुम्बकीय क्षेत्र धनात्मक z -अक्ष की दिशा में उपस्थित है। x -अक्ष के लम्बवत् घन के दो फलकों के बीच विभवान्तर का मान होगा :

Options :

41652936834. 1 mV

41652936835. 6 mV

41652936836. 12 mV

41652936837. 2 mV

Question Number : 20 Question Id : 4165299345 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 insulating thin rod of length l has a

linear charge density $\rho(x) = \rho_0 \frac{x}{l}$ on it. The

rod is rotated about an axis passing through the origin ($x=0$) and perpendicular to the rod. If the rod makes n rotations per second, then the time averaged magnetic moment of the rod is :

Options :

41652936838. $n \rho l^3$

41652936839. $\frac{\pi}{3} n \rho l^3$

41652936840. $\pi n \rho l^3$

41652936841. $\frac{\pi}{4} n \rho l^3$

Question Number : 20 Question Id : 4165299345 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

लम्बाई l की एक पतली रोधी छड़ पर रेखीय आवेश

घनत्व $\rho(x) = \rho_0 \frac{x}{l}$ है। इस छड़ को मूलबिन्दु

($x=0$) से जाने वाली तथा छड़ के लम्बवत एक अक्ष के परितः n चक्कर प्रति सेकंड से घुमाया जाता है।

इस छड़ का कालिक माध्य चुम्बकीय आघूर्ण होगा :

Options :

41652936838. $n \rho l^3$

41652936839. $\frac{\pi}{3} n \rho l^3$

41652936840. $\pi n \rho l^3$

41652936841. $\frac{\pi}{4} n \rho l^3$

Question Number : 21 Question Id : 4165299346 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 magnet of total magnetic moment

$10^{-2} \hat{i}$ A-m² is placed in a time varying

magnetic field, $B \hat{i}(\cos \omega t)$ where $B=1$ Tesla and $\omega=0.125$ rad/s. The work done for reversing the direction of the magnetic moment at $t=1$ second, is :

Options :

41652936842. 0.014 J

41652936843. 0.007 J

41652936844. 0.01 J

41652936845. 0.028 J

Question Number : 21 Question Id : 4165299346 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$10^{-2} \hat{i}$ A-m² चुम्बकीय आघूर्ण वाले एक चुम्बक

को समय के साथ $B \hat{i}(\cos \omega t)$ के अनुसार बदलते हुये एक चुम्बकीय क्षेत्र में रखते हैं। यहाँ $B=1$ Tesla तथा $\omega=0.125$ rad/s हैं। $t=1$ s पर चुम्बकीय आघूर्ण की दिशा को विपरीत करने में किया गया कार्य होगा :

Options :

41652936842. 0.014 J

41652936843. 0.007 J

41652936844. 0.01 J

41652936845. 0.028 J

Question Number : 22 Question Id : 4165299347 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 magnetic field of a plane electromagnetic wave is given by (The speed of light $=3 \times 10^8$ m/s)

$$B=100 \times 10^{-6} \sin \left[2\pi \times 2 \times 10^{15} \left(t - \frac{x}{c} \right) \right]$$

then the maximum electric field associated with it is :

Options :

41652936846. 4×10^4 N/C

41652936847. 6×10^4 N/C

41652936848. 3×10^4 N/C

41652936849. 4.5×10^4 N/C

Question Number : 22 Question Id : 4165299347 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 समतल विद्युत चुम्बकीय तरंग का चुम्बकीय क्षेत्र निम्न है :

$$B = 100 \times 10^{-6} \sin \left[2\pi \times 2 \times 10^{15} \left(t - \frac{x}{c} \right) \right]$$

तो इसके संगत विद्युत क्षेत्र का अधिकतम मान होगा :

[प्रकाश की चाल $= 3 \times 10^8$ m/s]

Options :

41652936846. 4×10^4 N/C

41652936847. 6×10^4 N/C

41652936848. 3×10^4 N/C

41652936849. 4.5×10^4 N/C

Question Number : 23 Question Id : 4165299348 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 plano convex lens of refractive index μ_1 and focal length f_1 is kept in contact with another plano concave lens of refractive index μ_2 and focal length f_2 . If the radius of curvature of their spherical faces is R each and $f_1 = 2f_2$, then μ_1 and μ_2 are related as :

Options :

41652936850. $\mu_1 + \mu_2 = 3$

41652936851. $2\mu_2 - \mu_1 = 1$

41652936852. $2\mu_1 - \mu_2 = 1$

41652936853. $3\mu_2 - 2\mu_1 = 1$

Question Number : 23 Question Id : 4165299348 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अपवर्तनांक μ_1 तथा फोकस f_1 दूरी के एक समतलोत्तल लेन्स को अपवर्तनांक μ_2 तथा फोकस दूरी f_2 के दूसरे समतल-अवतल लेन्स के सम्पर्क में रखा गया है। यदि उनके प्रत्येक गोलीय फलक की वक्रता त्रिज्या R है तथा $f_1 = 2f_2$ है, तो μ_1 तथा μ_2 में सम्बन्ध होगा :

Options :

41652936850. $\mu_1 + \mu_2 = 3$

41652936851. $2\mu_2 - \mu_1 = 1$

41652936852. $2\mu_1 - \mu_2 = 1$

41652936853. $3\mu_2 - 2\mu_1 = 1$

Question Number : 24 Question Id : 4165299349 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 Young's double slit experiment with slit separation 0.1 mm, one observes a

bright fringe at angle $\frac{1}{40}$ rad by using light of wavelength λ_1 . When the light of wavelength λ_2 is used a bright fringe is seen at the same angle in the same set up. Given that λ_1 and λ_2 are in visible range (380 nm to 740 nm), their values are :

Options :

41652936854. 380 nm, 525 nm

41652936855. 625 nm, 500 nm

41652936856. 380 nm, 500 nm

41652936857. 400 nm, 500 nm

Question Number : 24 Question Id : 4165299349 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 यंग द्वि-झिरी प्रयोग जिसमें झिर्रियों के बीच की

दूरी 0.1 mm है, तरंगदैर्घ्य λ_1 के प्रकाश द्वारा $\frac{1}{40}$ rad

कोण पर दीप्त फ्रिन्ज देखी जाती है। जब इसी प्रयोग में λ_2 तरंगदैर्घ्य के प्रकाश का उपयोग करते हैं तो उसी कोण पर दीप्त फ्रिन्ज देखी जाती है। दिया है कि λ_1 तथा λ_2 दृश्य प्रकाश के परास (380 nm से 740 nm तक) में हैं। तो उनके मान होंगे :

Options :

41652936854. 380 nm, 525 nm

41652936855. 625 nm, 500 nm

41652936856. 380 nm, 500 nm

41652936857. 400 nm, 500 nm

Question Number : 25 Question Id : 4165299350 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In an electron microscope, the resolution that can be achieved is of the order of the wavelength of electrons used. To resolve a width of 7.5×10^{-12} m, the minimum electron energy required is close to :

Options :

41652936858. 1 keV

41652936859. 25 keV

41652936860. 500 keV

41652936861. 100 keV

Question Number : 25 Question Id : 4165299350 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 इलेक्ट्रॉन सूक्ष्मदर्शी की विभेदन क्षमता उसमें प्रयोग किये गये इलेक्ट्रॉनों की तरंगदैर्घ्य की कोटि की है। 7.5×10^{-12} m की चौड़ाई के विभेदन हेतु इलेक्ट्रॉन की न्यूनतम ऊर्जा का निकटतम मान होगा :

Options :

41652936858. 1 keV

41652936859. 25 keV

41652936860. 500 keV

41652936861. 100 keV

Question Number : 26 Question Id : 4165299351 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Using a nuclear counter the count rate of emitted particles from a radioactive source is measured. At $t=0$ it was 1600 counts per second and $t=8$ seconds it was 100 counts per second. The count rate observed, as counts per second, at $t=6$ seconds is close to :

Options :

41652936862. 150
41652936863. 200
41652936864. 360
41652936865. 400

Question Number : 26 Question Id : 4165299351 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 नाभिकीय गणित्र (counter) के द्वारा रेडियोधर्मी स्रोत से उत्सर्जित कणों की गणना दर को मापते हैं।
 $t=0$ s समय पर गणना 1600 प्रति सेकण्ड तथा
 $t=8$ s पर गणना 100 प्रति सेकण्ड है। प्रति सेकण्ड गणना के रूप में $t=6$ s पर प्रेक्षित लगभग गणना दर होगी :

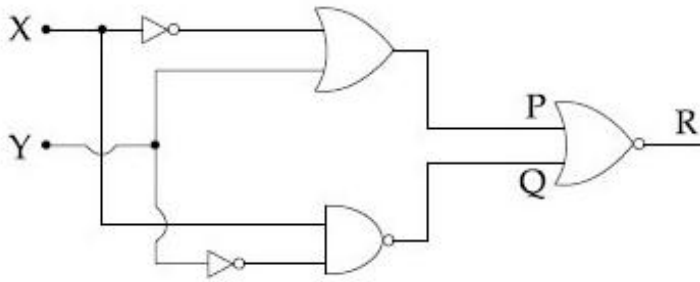
Options :

41652936862. 150
41652936863. 200
41652936864. 360
41652936865. 400

Question Number : 27 Question Id : 4165299352 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

To get output '1' at R, for the given logic gate circuit the input values must be :



Options :

41652936866. $X=0, Y=0$

41652936867. $X=0, Y=1$

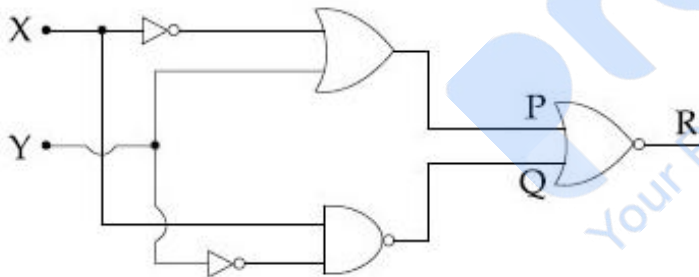
41652936868. $X=1, Y=0$

41652936869. $X=1, Y=1$

Question Number : 27 Question Id : 4165299352 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

R पर निर्गत मान '1' के लिये दिये गये लॉजिक गेट
परिपथ में, निवेशों का मान होना चाहिए :



Options :

41652936866. $X=0, Y=0$

41652936867. $X=0, Y=1$

41652936868. $X=1, Y=0$

41652936869. $X=1, Y=1$

Question Number : 28 Question Id : 4165299353 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 TV transmission tower has a height of 140 m and the height of the receiving antenna is 40 m. What is the maximum distance upto which signals can be broadcasted from this tower in LOS(Line of Sight) mode ? (Given : radius of earth $= 6.4 \times 10^6$ m).

Options :

41652936870. 40 km

41652936871. 80 km

41652936872. 65 km

41652936873. 48 km

Question Number : 28 Question Id : 4165299353 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 TV संचरण मीनार की ऊँचाई 140 m तथा अभिग्राही ऐन्टिना की ऊँचाई 40 m है। इस मीनार से दृष्टि रेखा विधा (LOS) में कितनी अधिकतम दूरी तक सिग्नल प्रसारित कर सकते हैं? (दिया है, पृथ्वी की त्रिज्या $= 6.4 \times 10^6$ m)

Options :

41652936870. 40 km

41652936871. 80 km

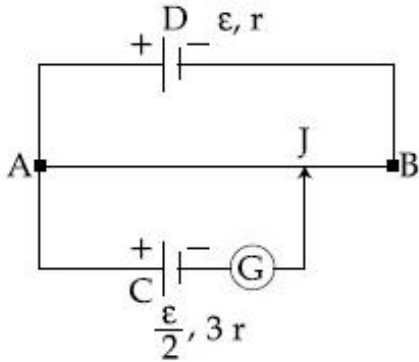
41652936872. 65 km

41652936873. 48 km

Question Number : 29 Question Id : 4165299354 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 potentiometer wire AB having length L and resistance $12r$ is joined to a cell D of emf ε and internal resistance r . A cell C having emf $\varepsilon/2$ and internal resistance $3r$ is connected. The length AJ at which the galvanometer as shown in fig. shows no deflection is :



Options :

41652936874. $\frac{13}{24} L$

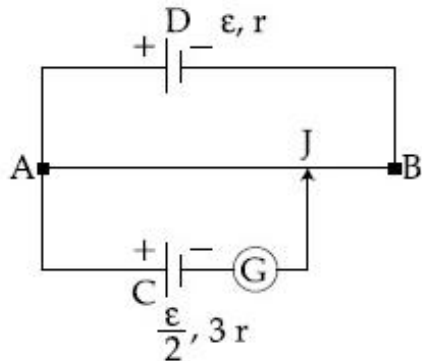
41652936875. $\frac{5}{12} L$

41652936876. $\frac{11}{24} L$

41652936877. $\frac{11}{12} L$

Question Number : 29 Question Id : 4165299354 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

L लम्बाई तथा प्रतिरोध $12r$ के एक विभवमापी तार AB को वि.वा.बल ε तथा आन्तरिक प्रतिरोध r की एक सेल D से जोड़ते हैं। वि.वा.बल $\varepsilon/2$ तथा आन्तरिक प्रतिरोध $3r$ वाली एक सेल C को दिखाये गये चित्रानुसार जोड़ते हैं। वह लम्बाई AJ, जिसके लिये गैल्वेनोमापी में कोई विक्षेप नहीं होता है, होगी :



Options :

41652936874. $\frac{13}{24} L$

41652936875. $\frac{5}{12} L$

41652936876. $\frac{11}{24} L$

41652936877. $\frac{11}{12} L$

Question Number : 30 Question Id : 4165299355 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 2 W carbon resistor is color coded with green, black, red and brown respectively. The maximum current which can be passed through this resistor is :

Options :

41652936878. 0.4 mA

41652936879. 20 mA

41652936880. 63 mA

41652936881. 100 mA

Question Number : 30 Question Id : 4165299355 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

2W के एक कार्बन प्रतिरोध को क्रमशः हरे, काले, लाल तथा भूरे रंग में कलर कोड किया गया है। अधिकतम धारा जो इस प्रतिरोध से बह सकती है, होगी :

Options :

41652936878. 0.4 mA

41652936879. 20 mA

41652936880. 63 mA

41652936881. 100 mA

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

Chemistry

416529134

2

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

416529143

Question Shuffling Allowed :

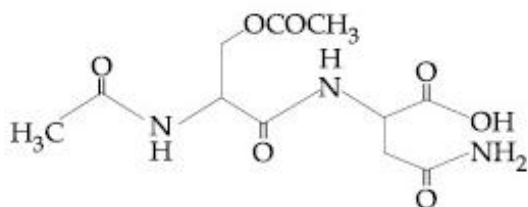
Yes

Question Number : 31 Question Id : 4165299356 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

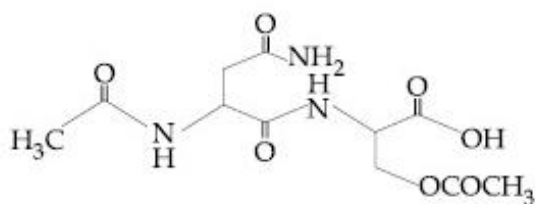
The correct structure of product 'P' in the following reaction is :



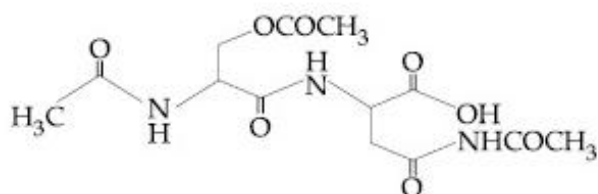
Options :



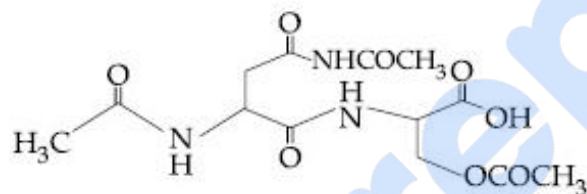
41652936882.



41652936883.



41652936884.



41652936885.

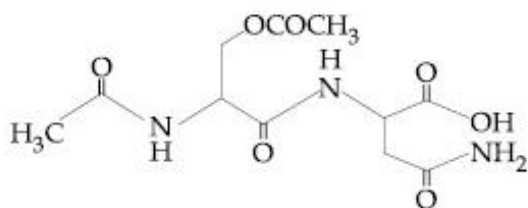
Question Number : 31 Question Id : 4165299356 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

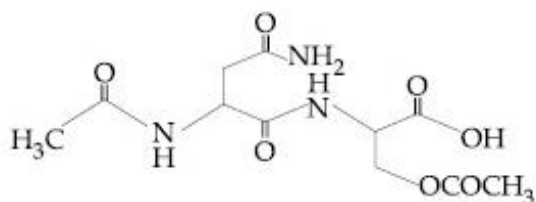
निम्न अभिक्रिया में उत्पाद 'P' की सही संरचना है



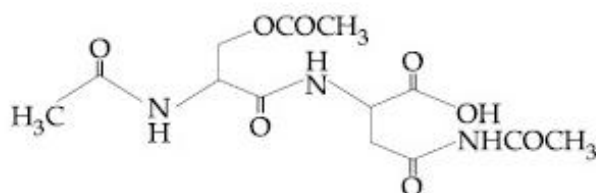
Options :



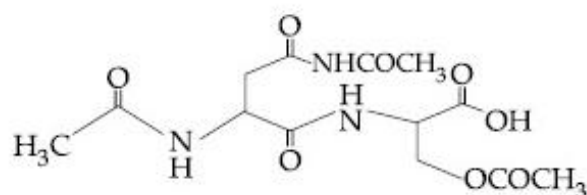
41652936882.



41652936883.



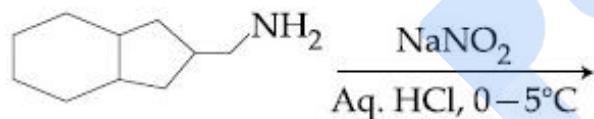
41652936884.



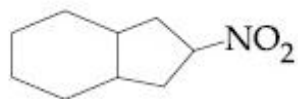
41652936885.

Question Number : 32 Question Id : 4165299357 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

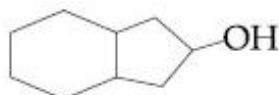
The major product formed in the reaction given below will be :



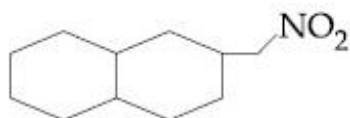
Options :



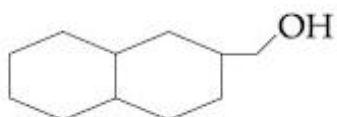
41652936886.



41652936887.



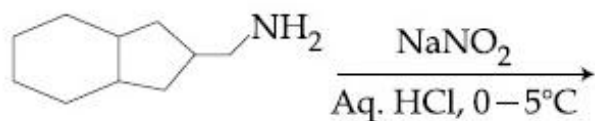
41652936888.



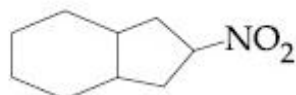
41652936889.

Question Number : 32 Question Id : 4165299357 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

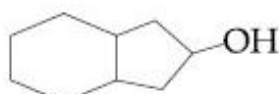
नीचे दी गई अभिक्रिया में बनने वाला मुख्य उत्पाद होगा :



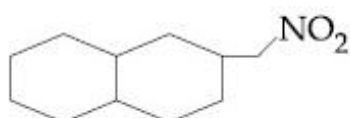
Options :



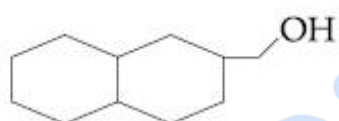
41652936886.



41652936887.



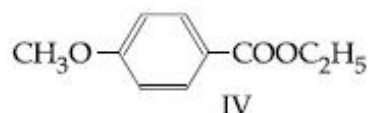
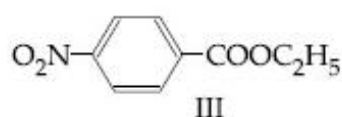
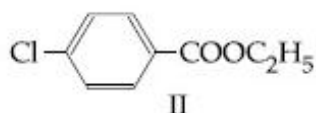
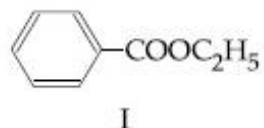
41652936888.



41652936889.

Question Number : 33 Question Id : 4165299358 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 decreasing order of ease of alkaline hydrolysis for the following esters is



Options :

41652936890. III > II > IV > I

41652936891. II > III > I > IV

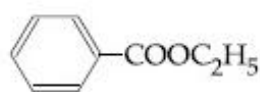
41652936892. III > II > I > IV

41652936893. IV > II > III > I

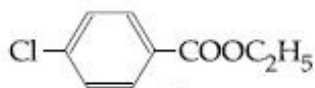
Question Number : 33 Question Id : 4165299358 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

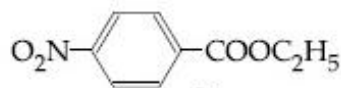
निम्न एस्टर्स के लिए क्षारीय जल अपघटन के आसानी से होने का घटता क्रम है,



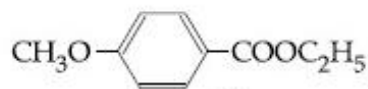
I



II



III



IV

Options :

41652936890. III > II > IV > I

41652936891. II > III > I > IV

41652936892. III > II > I > IV

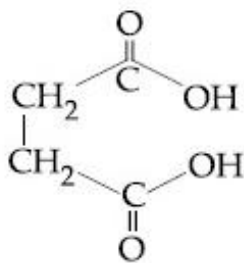
41652936893. IV > II > III > I

Question Number : 34 Question Id : 4165299359 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

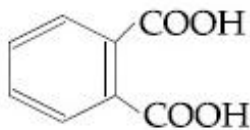
Correct Marks : 4 Wrong Marks : 1

Which dicarboxylic acid in presence of a dehydrating agent is least reactive to give an anhydride ?

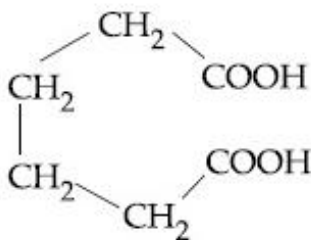
Options :



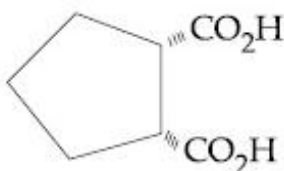
41652936894.



41652936895.



41652936896.

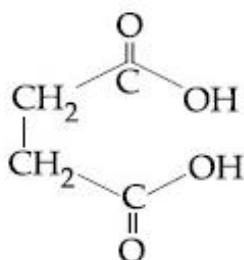


41652936897.

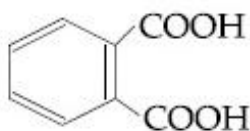
Question Number : 34 Question Id : 4165299359 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन डाइकार्बाक्सिलिक अम्ल निर्जलीकारक की उपस्थिति में एक ऐनहाइड्राइड देने के लिए सबसे कम अभिक्रियाशील है?

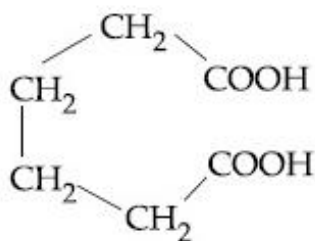
Options :



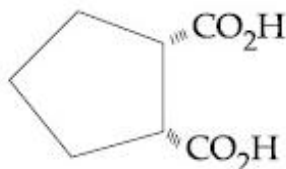
41652936894.



41652936895.



41652936896.

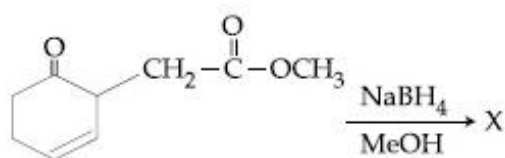


41652936897.

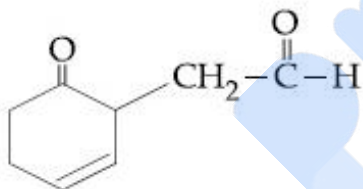
Question Number : 35 Question Id : 4165299360 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

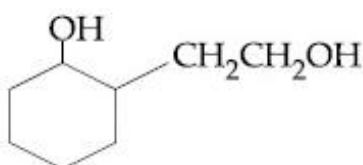
The major product 'X' formed in the following reaction is :



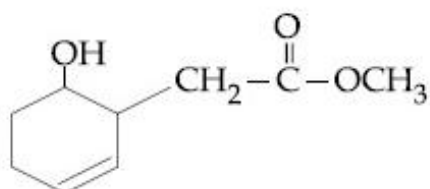
Options :



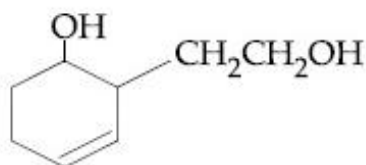
41652936898.



41652936899.

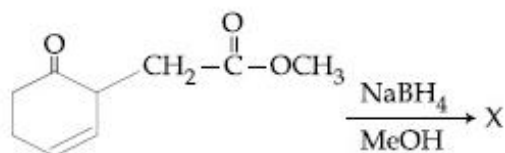


41652936900.

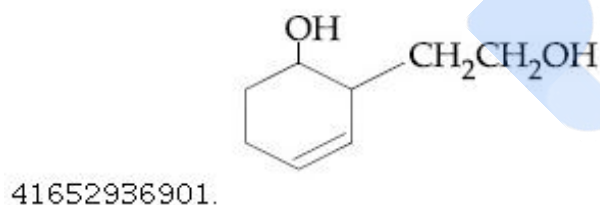
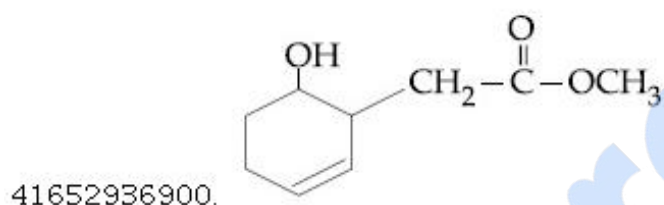
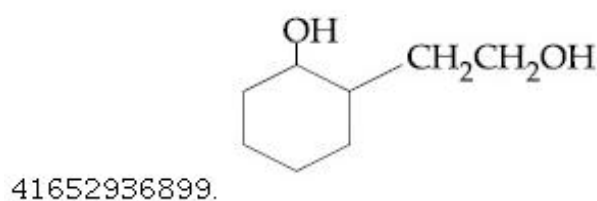
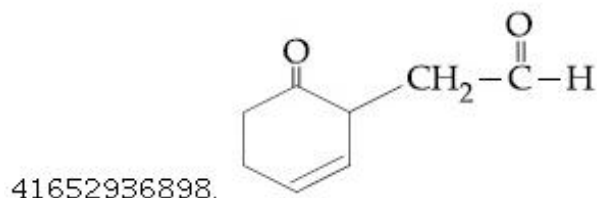


41652936901.

निम्न अभिक्रिया में बननेवाला मुख्य उत्पाद 'X' है



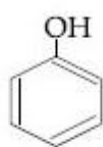
Options :



Question Number : 36 Question Id : 4165299361 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

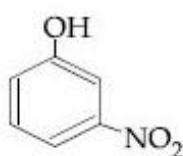
The increasing order of the pK_a values of the following compounds is :



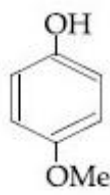
A



B

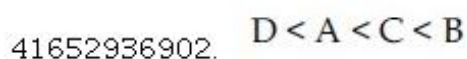


C



D

Options :



41652936903. $B < C < A < D$

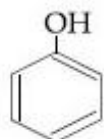
41652936904. $C < B < A < D$

41652936905. $B < C < D < A$

Question Number : 36 Question Id : 4165299361 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

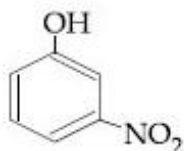
निम्न यौगिकों के pKa का बढ़ता हुआ क्रम है,



A



B



C



D

Options :

41652936902. $D < A < C < B$

41652936903. $B < C < A < D$

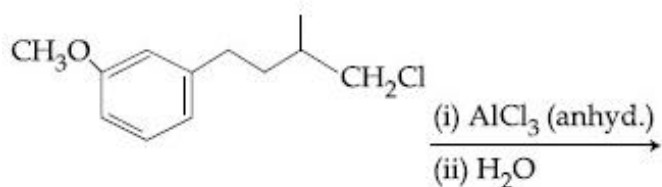
41652936904. $C < B < A < D$

41652936905. $B < C < D < A$

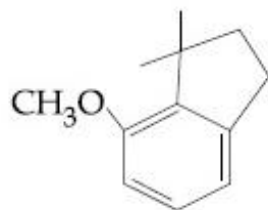
Question Number : 37 Question Id : 4165299362 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

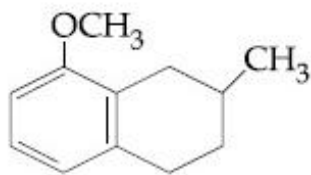
The major product of the following reaction is :



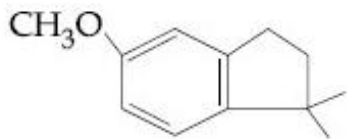
Options :



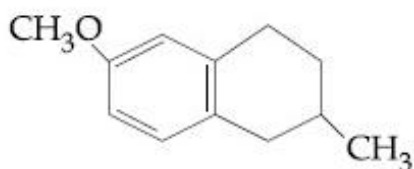
41652936906.



41652936907.



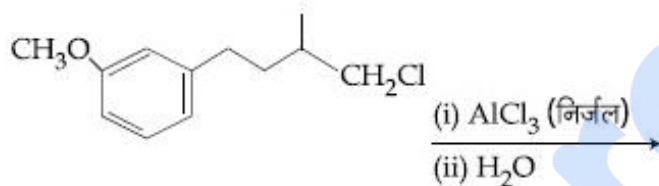
41652936908.



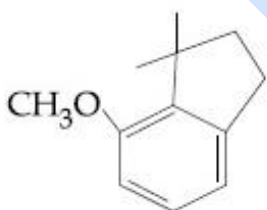
41652936909.

Question Number : 37 Question Id : 4165299362 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

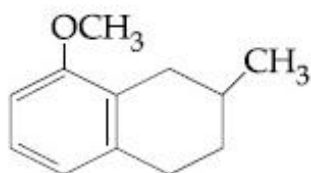
निम्न अभिक्रिया का मुख्य उत्पाद है :



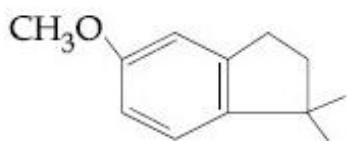
Options :



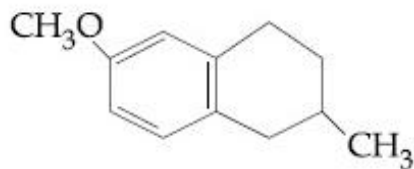
41652936906.



41652936907.



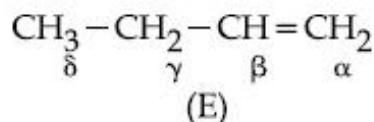
41652936908.



41652936909.

Question Number : 38 Question Id : 4165299363 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 hydrogen in compound (E) is easily replaceable during bromination reaction in presence of light ?



Options :

41652936910. α - hydrogen

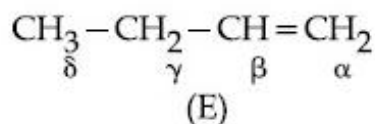
41652936911. β - hydrogen

41652936912. γ - hydrogen

41652936913. δ - hydrogen

Question Number : 38 Question Id : 4165299363 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

यौगिक (E) में प्रकाश की उपस्थिति में ब्रोमीनेशन अभिक्रिया के बीच कौन हाइड्रोजन आसानी से विस्थापित किया जा सकता है ?



Options :

41652936910. α - हाइड्रोजन

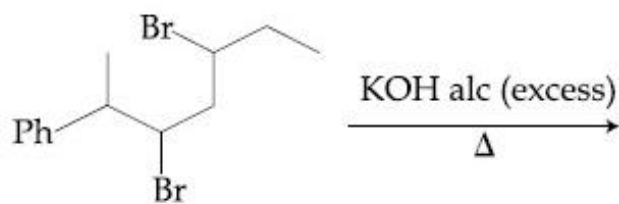
41652936911. β - हाइड्रोजन

41652936912. γ - हाइड्रोजन

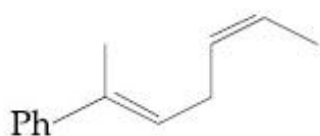
41652936913. δ - हाइड्रोजन

Correct Marks : 4 Wrong Marks : 1

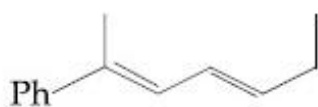
The major product of the following reaction is :



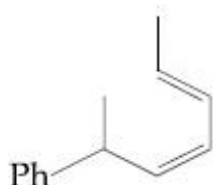
Options :



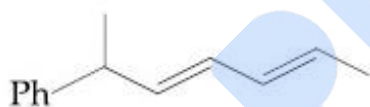
41652936914.



41652936915.



41652936916.

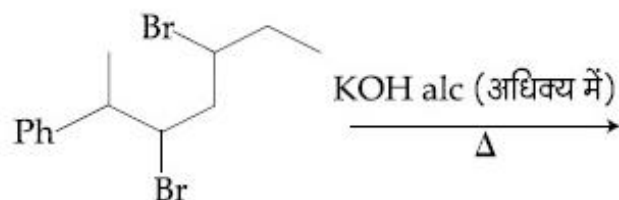


41652936917.

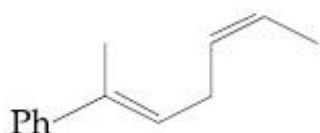
Question Number : 39 Question Id : 4165299364 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :



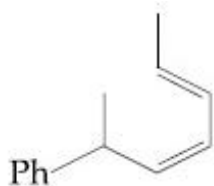
Options :



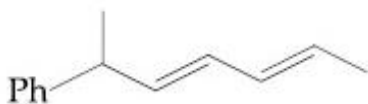
41652936914.



41652936915.



41652936916.



41652936917.

Question Number : 40 Question Id : 4165299365 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 dichloromethane (DCM) and water (H_2O) are used for differential extraction, which one of the following statements is correct ?

Options :

41652936918. DCM and H_2O would stay as upper and lower layer respectively in the separating funnel (S.F.)

41652936919. DCM and H_2O would stay as lower and upper layer respectively in the S.F.

41652936920. DCM and H_2O will make turbid/colloidal mixture

41652936921. DCM and H_2O will be miscible clearly

Question Number : 40 Question Id : 4165299365 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 डाइक्लोरोमेथेन (DCM) तथा जल (H_2O) को अवकल निष्कर्षण में प्रयोग किया जाता है तो निम्न में से कौन सा कथन सही है ?

Options :

DCM तथा H_2O पृथक्कारी फनेल में क्रमशः
ऊपरी तथा निचले भाग में रुकेंगे

41652936918.

DCM तथा H_2O पृथक्कारी फनेल में क्रमशः
निम्न तथा उच्च सतहों में रुकेंगे

41652936919.

DCM तथा H_2O एक आविल/कोलाइडी
विलयन बनायेंगे

41652936920.

DCM तथा H_2O स्पष्ट रूप से मिश्रणीय होंगे

41652936921.

Question Number : 41 Question Id : 4165299366 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 electronegativity of aluminium is
similar to :

Options :

41652936922. Lithium

41652936923. Carbon

41652936924. Beryllium

41652936925. Boron

Question Number : 41 Question Id : 4165299366 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एल्यूमिनियम की विद्युत ऋणात्मकता निम्न में से जिसके
समान है वह है :

Options :

41652936922. लीथियम

41652936923. कार्बन

41652936924. बेरीलियम

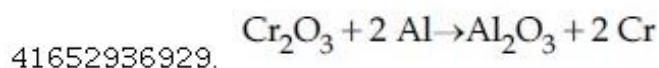
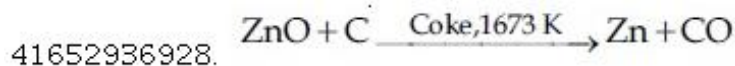
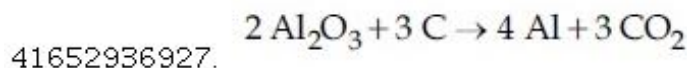
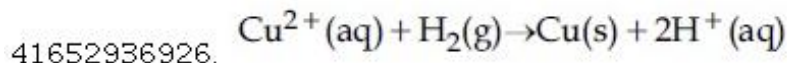
41652936925. बोरान

Question Number : 42 Question Id : 4165299367 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Hall-Heroult's process is given by :

Options :

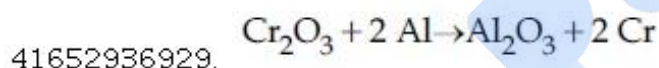
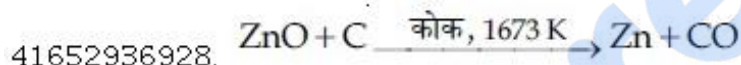
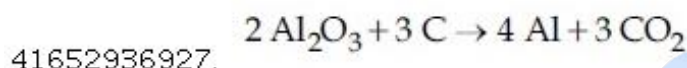
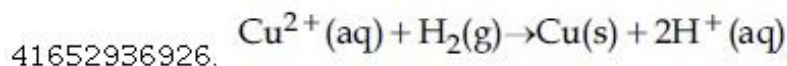


Question Number : 42 Question Id : 4165299367 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हाल-हेरॉल्ट प्रक्रम निम्न किसके द्वारा दिया जायेगा ?

Options :



Question Number : 43 Question Id : 4165299368 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 chemical nature of hydrogen peroxide
is :

Options :

41652936930. Oxidising agent in acidic medium,
but not in basic medium.

41652936931. Reducing agent in basic medium, but
not in acidic medium.

41652936932. Oxidising and reducing agent in
acidic medium, but not in basic
medium.

Oxidising and reducing agent in both acidic and basic medium.

41652936933.

Question Number : 43 Question Id : 4165299368 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन पराक्साइड की रासायनिक प्रकृति है :

Options :

41652936930. अम्लीय माध्यम में उपचायक के रूप में, लेकिन क्षारीय माध्यम में नहीं

41652936931. क्षारीय माध्यम में अपचायक के रूप में, लेकिन अम्लीय माध्यम में नहीं

41652936932. अम्लीय माध्यम में उपचायक तथा अपचायक के रूप में, परन्तु क्षारीय माध्यम में नहीं

41652936933. अम्लीय तथा क्षारीय दोनों माध्यमों में उपचायक तथा अपचायक के रूप में

Question Number : 44 Question Id : 4165299369 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 total number of isotopes of hydrogen and number of radioactive isotopes among them, respectively, are :

Options :

41652936934. 2 and 1

41652936935. 3 and 1

41652936936. 2 and 0

41652936937. 3 and 2

Question Number : 44 Question Id : 4165299369 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन के समस्थानिकों की कुल संख्या तथा उनमें रेडियोधर्मी समस्थानिकों की संख्या, क्रमशः हैं :

Options :

41652936934. 2 तथा 1

41652936935. 3 तथा 1

41652936936. 2 तथा 0

41652936937. 3 तथा 2

Question Number : 45 Question Id : 4165299370 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 metal used for making X-ray tube window is :

Options :

41652936938. Mg

41652936939. Ca

41652936940. Na

41652936941. Be

Question Number : 45 Question Id : 4165299370 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

X-किरण नली के वातायन को बनाने के लिए प्रयुक्त धातु है :

Options :

41652936938. Mg

41652936939. Ca

41652936940. Na

41652936941. Be

Question Number : 46 Question Id : 4165299371 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 type of hybridisation and number of lone pair(s) of electrons of Xe in XeOF_4 , respectively, are :

Options :

41652936942. sp^3d and 1

41652936943. sp^3d and 2

41652936944. sp^3d^2 and 1

41652936945. sp^3d^2 and 2

Question Number : 46 Question Id : 4165299371 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$XeOF_4$ में Xe के संकरण तथा एकाकी इलेक्ट्रॉन युग्मों की संख्या क्रमशः हैं :

Options :

41652936942. sp^3d तथा 1

41652936943. sp^3d तथा 2

41652936944. sp^3d^2 तथा 1

41652936945. sp^3d^2 तथा 2

Question Number : 47 Question Id : 4165299372 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 effect of lanthanoid contraction in the lanthanoid series of elements by and large means :

Options :

41652936946. decrease in both atomic and ionic radii

41652936947. increase in atomic radii and decrease in ionic radii

41652936948. decrease in atomic radii and increase in ionic radii

41652936949. increase in both atomic and ionic radii

Correct Marks : 4 Wrong Marks : 1

तत्वों के लैन्थेनाइड श्रृंखला में लैन्थेनाइड संकुचन सामान्यतया दर्शाता है :

Options :

41652936946. परमाणुक तथा आयनिक त्रिज्याओं दोनों का घटना

41652936947. परमाणुक त्रिज्याओं का बढ़ना तथा आयनिक त्रिज्याओं का घटना

41652936948. परमाणुक त्रिज्याओं का घटना तथा आयनिक त्रिज्याओं का बढ़ना

41652936949. परमाणुक तथा आयनिक त्रिज्याओं दोनों का बढ़ना

Question Number : 48 Question Id : 4165299373 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Wilkinson catalyst is :

Options :

41652936950. $[(\text{Ph}_3\text{P})_3\text{RhCl}]$ (Et = C_2H_5)

41652936951. $[(\text{Et}_3\text{P})_3\text{RhCl}]$

41652936952. $[(\text{Ph}_3\text{P})_3\text{IrCl}]$

41652936953. $[(\text{Et}_3\text{P})_3\text{IrCl}]$

Question Number : 48 Question Id : 4165299373 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

विलकिन्सन उत्प्रेरक है :

Options :

41652936950. $[(\text{Ph}_3\text{P})_3\text{RhCl}]$ (Et = C_2H_5)

41652936951. $[(\text{Et}_3\text{P})_3\text{RhCl}]$

41652936952. $[(\text{Ph}_3\text{P})_3\text{IrCl}]$

41652936953. $[(Et_3P)_3IrCl]$

Question Number : 49 Question Id : 4165299374 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 total number of isomers for a square planar complex $[M(F)(Cl)(SCN)(NO_2)]$ is :

Options :

41652936954. 4

41652936955. 8

41652936956. 12

41652936957. 16

Question Number : 49 Question Id : 4165299374 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वर्ग समतली संकर $[M(F)(Cl)(SCN)(NO_2)]$ के लिये समावयवियों (आइसोमरों) की कुल संख्या होगी :

Options :

41652936954. 4

41652936955. 8

41652936956. 12

41652936957. 16

Question Number : 50 Question Id : 4165299375 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Water filled in two glasses A and B have BOD values of 10 and 20, respectively. The correct statement regarding them, is :

Options :

41652936958. B is more polluted than A.

41652936959. A is more polluted than B.

A is suitable for drinking, whereas B is not.

41652936960.

Both A and B are suitable for drinking.

41652936961.

Question Number : 50 Question Id : 4165299375 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 गिलासों A तथा B, में भरे हुए पानी के BOD का मान क्रमशः 10 तथा 20 है। सही कथन को पहचानिये :

Options :

41652936958. B, A की तुलना में ज्यादा प्रदूषित है।

41652936959. A, B की तुलना में ज्यादा प्रदूषित है।

41652936960. A पीने के लिए उपयुक्त है जबकि B नहीं है।

41652936961. A तथा B, दोनों ही पीने के लिए उपयुक्त हैं।

Question Number : 51 Question Id : 4165299376 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 mixture of 100 m mol of $\text{Ca}(\text{OH})_2$ and 2 g of sodium sulphate was dissolved in water and the volume was made up to 100 mL. The mass of calcium sulphate formed and the concentration of OH^- in resulting solution, respectively, are : (Molar mass of $\text{Ca}(\text{OH})_2$, Na_2SO_4 and CaSO_4 are 74, 143 and 136 g mol⁻¹, respectively ; K_{sp} of $\text{Ca}(\text{OH})_2$ is 5.5×10^{-6})

Options :

41652936962. 13.6 g, 0.28 mol L⁻¹

41652936963. 1.9 g, 0.14 mol L⁻¹

41652936964. 13.6 g, 0.14 mol L⁻¹

41652936965. 1.9 g, 0.28 mol L⁻¹

Question Number : 51 Question Id : 4165299376 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 m mol Ca(OH)_2 तथा 2 g सोडियम सल्फेट के एक मिश्रण को जल में घोलकर उसका आयतन 100 mL तक किया गया। बने हुए विलयन में कैल्शियम सल्फेट का द्रव्यमान तथा OH^- की सान्द्रता क्रमशः हैं, $(\text{Ca(OH)}_2, \text{Na}_2\text{SO}_4$ तथा CaSO_4 के मोलर द्रव्यमान हैं क्रमशः 74, 143 तथा 136 g mol^{-1} ; Ca(OH)_2 का $K_{\text{sp}} = 5.5 \times 10^{-6}$)

Options :

41652936962. 13.6 g, 0.28 mol L^{-1}

41652936963. 1.9 g, 0.14 mol L^{-1}

41652936964. 13.6 g, 0.14 mol L^{-1}

41652936965. 1.9 g, 0.28 mol L^{-1}

Question Number : 52 Question Id : 4165299377 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 primitive unit cell has unequal edge lengths ($a \neq b \neq c$) and all axial angles different from 90° ?

Options :

41652936966. Tetragonal

41652936967. Hexagonal

41652936968. Monoclinic

41652936969. Triclinic

Question Number : 52 Question Id : 4165299377 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किस अभाज्य एकक कोष्ठिका में असमान कोर लम्बाई ($a \neq b \neq c$) होती है तथा सभी अक्षीय कोण 90° से भिन्न होते हैं ?

Options :

41652936966. द्विसमलम्बाक्ष

41652936967. षटकोणीय

41652936968. एकनताक्ष

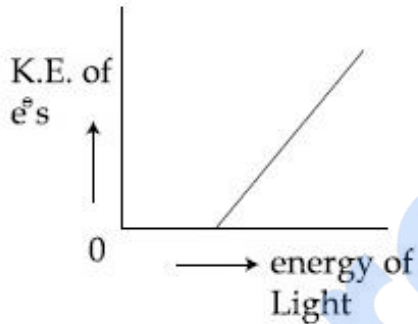
41652936969. त्रिनताक्ष

Question Number : 53 Question Id : 4165299378 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

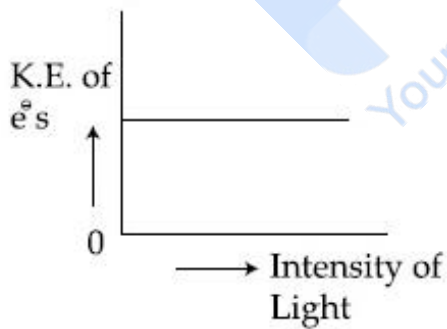
Correct Marks : 4 Wrong Marks : 1

Which of the graphs shown below does not represent the relationship between incident light and the electron ejected from metal surface ?

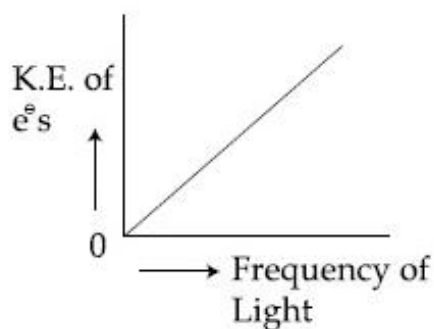
Options :



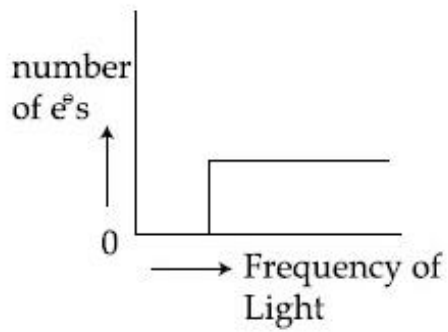
41652936970.



41652936971.



41652936972.



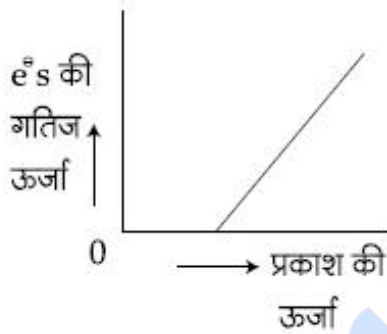
41652936973.

Question Number : 53 Question Id : 4165299378 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

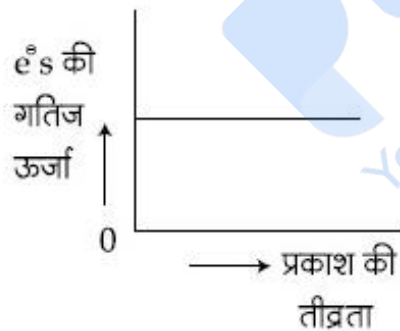
Correct Marks : 4 Wrong Marks : 1

नीचे प्रदर्शित ग्राफ में से कौन-सा आपतित प्रकाश तथा धातु पृष्ठ से निष्कासित इलेक्ट्रॉन के बीच का सम्बन्ध सही ढंग से नहीं अभिव्यक्त करता है?

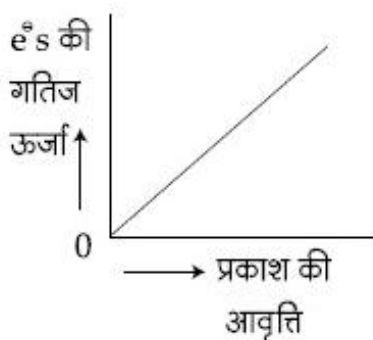
Options :



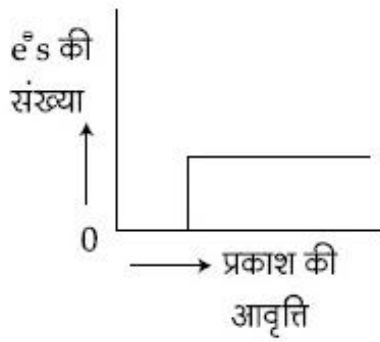
41652936970.



41652936971.



41652936972.



41652936973.

Question Number : 54 Question Id : 4165299379 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 pi and half sigma bonds are present in :

Options :

41652936974. O_2^+

41652936975. N_2

41652936976. O_2

41652936977. N_2^+

Question Number : 54 Question Id : 4165299379 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 पाई तथा आधा सिग्मा आबन्ध निम्न में से किसमें उपस्थित हैं?

Options :

41652936974. O_2^+

41652936975. N_2

41652936976. O_2

41652936977. N_2^+

Question Number : 55 Question Id : 4165299380 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 process has $\Delta H = 200 \text{ Jmol}^{-1}$ and $\Delta S = 40 \text{ JK}^{-1}\text{mol}^{-1}$. Out of the values given below, choose the minimum temperature above which the process will be spontaneous :

Options :

41652936978. 12 K

41652936979. 5 K

41652936980. 20 K

41652936981. 4 K

Question Number : 55 Question Id : 4165299380 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 $\Delta H = 200 \text{ Jmol}^{-1}$ तथा $\Delta S = 40 \text{ JK}^{-1}\text{mol}^{-1}$ है। नीचे दिये गये आँकड़ों में से उस निम्नतम ताप का चुनाव करिये जिसके ऊपर प्रक्रम स्वतः होगा :

Options :

41652936978. 12 K

41652936979. 5 K

41652936980. 20 K

41652936981. 4 K

Question Number : 56 Question Id : 4165299381 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Liquids A and B form an ideal solution in the entire composition range. At 350 K, the vapor pressures of pure A and pure B are $7 \times 10^3 \text{ Pa}$ and $12 \times 10^3 \text{ Pa}$, respectively. The composition of the vapor in equilibrium with a solution containing 40 mole percent of A at this temperature is :

Options :

41652936982. $x_A = 0.76 ; x_B = 0.24$

41652936983. $x_A = 0.4 ; x_B = 0.6$

41652936984. $x_A = 0.37 ; x_B = 0.63$

41652936985. $x_A = 0.28 ; x_B = 0.72$

Question Number : 56 Question Id : 4165299381 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

द्रव A तथा B पूरे संघटन के परास में एक आदर्श विलयन बनाते हैं। 350 K पर शुद्ध A का वाष्प दाब तथा शुद्ध B का वाष्प दाब क्रमशः 7×10^3 Pa तथा 12×10^3 Pa हैं। इस ताप पर, उस वाष्प का संघटन क्या होगा जो A के 40 मोल प्रतिशत विलयन के साम्य में है :

Options :

41652936982. $x_A = 0.76 ; x_B = 0.24$

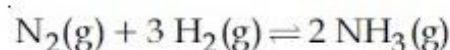
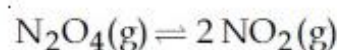
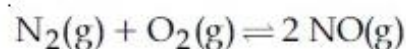
41652936983. $x_A = 0.4 ; x_B = 0.6$

41652936984. $x_A = 0.37 ; x_B = 0.63$

41652936985. $x_A = 0.28 ; x_B = 0.72$

Question Number : 57 Question Id : 4165299382 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 values of K_p/K_c for the following reactions at 300 K are, respectively :
(At 300 K, $RT = 24.62 \text{ dm}^3 \text{ atm mol}^{-1}$)



Options :

41652936986. $1, 24.62 \text{ dm}^3 \text{ atm mol}^{-1},$
 $606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

41652936987. $24.62 \text{ dm}^3 \text{ atm mol}^{-1},$
 $606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2},$
 $1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$

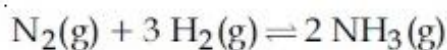
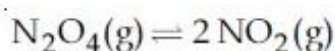
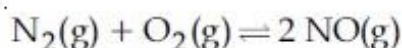
41652936988. 1, $24.62 \text{ dm}^3 \text{ atm mol}^{-1}$,
 $1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$

41652936989. $1, 4.1 \times 10^{-2} \text{ dm}^{-3} \text{ atm}^{-1} \text{ mol}$,
 $606 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

Question Number : 57 Question Id : 4165299382 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

300 K पर, निम्न अभिक्रियाओं के लिए K_p/K_c के मान क्रमशः होंगे : (300 K पर $RT = 24.62 \text{ dm}^3 \text{ atm mol}^{-1}$)



Options :

41652936986. 1, $24.62 \text{ dm}^3 \text{ atm mol}^{-1}$,
 $606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

41652936987. $24.62 \text{ dm}^3 \text{ atm mol}^{-1}$,
 $606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$,
 $1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$

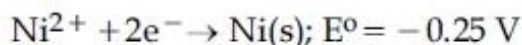
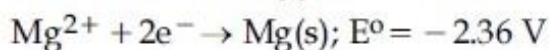
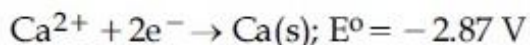
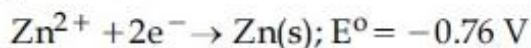
41652936988. 1, $24.62 \text{ dm}^3 \text{ atm mol}^{-1}$,
 $1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$

41652936989. $1, 4.1 \times 10^{-2} \text{ dm}^{-3} \text{ atm}^{-1} \text{ mol}$,
 $606 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

Question Number : 58 Question Id : 4165299383 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the following reduction processes :



The reducing power of the metals increases in the order :

Options :

41652936990. Ca < Zn < Mg < Ni

41652936991. Ca < Mg < Zn < Ni

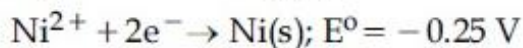
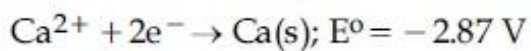
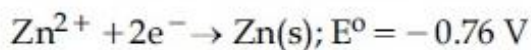
41652936992. Ni < Zn < Mg < Ca

41652936993. Zn < Mg < Ni < Ca

Question Number : 58 Question Id : 4165299383 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 अपचयन प्रक्रमों पर विचार कीजिए



धातुओं की अपचायक सामर्थ्य इस क्रम में बढ़ेगी :

Options :

41652936990. Ca < Zn < Mg < Ni

41652936991. Ca < Mg < Zn < Ni

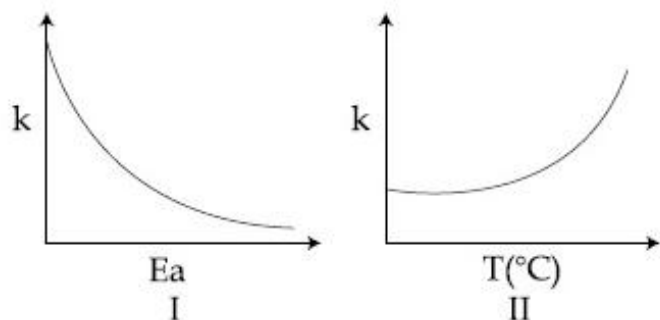
41652936992. Ni < Zn < Mg < Ca

41652936993. Zn < Mg < Ni < Ca

Question Number : 59 Question Id : 4165299384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the given plots for a reaction obeying Arrhenius equation ($0^{\circ}\text{C} < T < 300^{\circ}\text{C}$) : (k and E_a are rate constant and activation energy, respectively)



Choose the correct option :

Options :

41652936994. Both I and II are correct

41652936995. Both I and II are wrong

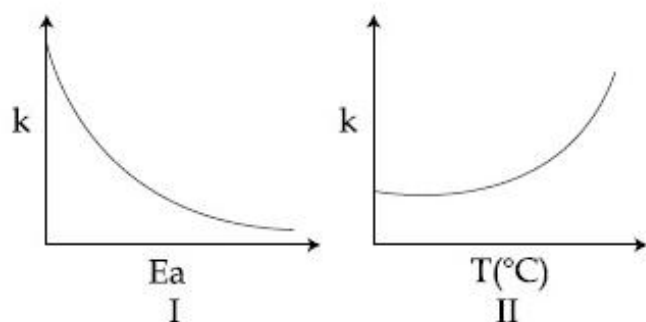
41652936996. I is right but II is wrong

41652936997. I is wrong but II is right

Question Number : 59 Question Id : 4165299384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आर्हेनियस समीकरण को मानने वाली एक अभिक्रिया के लिए प्लॉटों पर विचार कीजिए ($0^{\circ}\text{C} < T < 300^{\circ}\text{C}$), (k तथा E_a क्रमशः दर नियतांक तथा संक्रमण ऊर्जा हैं)



सही विकल्प चुनिये :

Options :

41652936994. I तथा II दोनों सही हैं

41652936995. I तथा II दोनों गलत हैं

41652936996. I सही है परन्तु II गलत है

41652936997. I गलत है परन्तु II सही है

Question Number : 60 Question Id : 4165299385 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 is not an example of heterogeneous catalytic reaction ?

Options :

41652936998. Haber's process

41652936999. Combustion of coal

41652937000. Hydrogenation of vegetable oils

41652937001. Ostwald's process

Question Number : 60 Question Id : 4165299385 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन विषमांगी उत्प्रेरकीय अभिक्रिया का उदाहरण नहीं है ?

Options :

41652936998. हैबर प्रक्रम

41652936999. कोयले का दहन

41652937000. वनस्पति तेलों का हाइड्रोजनीकरण

41652937001. ओस्टवाल्ड प्रक्रम

Mathematics

Section Id :

416529135

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: 416529144
Question Shuffling Allowed : Yes

Question Number : 61 Question Id : 4165299386 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 class of 140 students numbered 1 to 140, all even numbered students opted Mathematics course, those whose number is divisible by 3 opted Physics course and those whose number is divisible by 5 opted Chemistry course. Then the number of students who did not opt for any of the three courses is :

Options :

41652937002. 1

41652937003. 102

41652937004. 38

41652937005. 42

Question Number : 61 Question Id : 4165299386 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

140 विद्यार्थियों, जिनके क्रमांक 1 से 140 हैं, की एक कक्षा में सभी सम क्रमांक के विद्यार्थियों ने गणित विषय चुना है, उन्होंने जिनके क्रमांक 3 से विभाजित होते हैं भौतिक शास्त्र विषय चुना है तथा उन्होंने जिनके क्रमांक 5 से विभाजित होते हैं, रसायन शास्त्र विषय चुना है। तो उन विद्यार्थियों की संख्या, जिन्होंने इन तीन में से कोई भी विषय नहीं चुना है, हैं :

Options :

41652937002. 1

41652937003. 102

41652937004. 38

Question Number : 62 Question Id : 4165299387 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_1 and z_2 be any two non-zero complex numbers such that $3|z_1| = 4|z_2|$.

If $z = \frac{3z_1}{2z_2} + \frac{2z_2}{3z_1}$ then :

Options :

41652937006. $\text{Im}(z) = 0$

41652937007. $\text{Re}(z) = 0$

41652937008. $|z| = \frac{1}{2}\sqrt{\frac{17}{2}}$

41652937009. $|z| = \sqrt{\frac{5}{2}}$

Question Number : 62 Question Id : 4165299387 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 z_1 तथा z_2 कोई दो शून्येतर सम्मिश्र संख्याएँ इस प्रकार हैं कि $3|z_1| = 4|z_2|$. यदि

$z = \frac{3z_1}{2z_2} + \frac{2z_2}{3z_1}$ तो :

Options :

41652937006. $\text{Im}(z) = 0$

41652937007. $\text{Re}(z) = 0$

41652937008. $|z| = \frac{1}{2}\sqrt{\frac{17}{2}}$

41652937009. $|z| = \sqrt{\frac{5}{2}}$

Question Number : 63 Question Id : 4165299388 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the quadratic equation $(c-5)x^2 - 2cx + (c-4) = 0, c \neq 5$. Let S be the set of all integral values of c for which one root of the equation lies in the interval $(0, 2)$ and its other root lies in the interval $(2, 3)$. Then the number of elements in S is :

Options :

41652937010. 18

41652937011. 12

41652937012. 11

41652937013. 10

Question Number : 63 Question Id : 4165299388 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्विघातीय समीकरण $(c-5)x^2 - 2cx + (c-4) = 0, c \neq 5$ पर विचार कीजिए। माना S, c के उन सभी पूर्णांकीय मानों, जिनके लिए समीकरण का एक मूल अंतराल $(0, 2)$ में है तथा इसका दूसरा मूल अंतराल $(2, 3)$ में है, का समुच्चय है, तो S के अवयवों की संख्या है :

Options :

41652937010. 18

41652937011. 12

41652937012. 11

41652937013. 10

Question Number : 64 Question Id : 4165299389 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 $d \in \mathbb{R}$, and

$$A = \begin{bmatrix} -2 & 4+d & (\sin \theta) - 2 \\ 1 & (\sin \theta) + 2 & d \\ 5 & (2 \sin \theta) - d & (-\sin \theta) + 2 + 2d \end{bmatrix},$$

$\theta \in [0, 2\pi]$. If the minimum value of $\det(A)$ is 8, then a value of d is :

Options :

41652937014. -5

41652937015. $2(\sqrt{2} + 2)$

41652937016. -7

41652937017. $2(\sqrt{2} + 1)$

Question Number : 64 Question Id : 4165299389 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 $d \in \mathbb{R}$ तथा

$$A = \begin{bmatrix} -2 & 4+d & (\sin \theta) - 2 \\ 1 & (\sin \theta) + 2 & d \\ 5 & (2 \sin \theta) - d & (-\sin \theta) + 2 + 2d \end{bmatrix},$$

$\theta \in [0, 2\pi]$ । यदि $\det(A)$ का न्यूनतम मान 8 है, तो d का एक मान है :

Options :

41652937014. -5

41652937015. $2(\sqrt{2} + 2)$

41652937016. -7

41652937017. $2(\sqrt{2} + 1)$

Question Number : 65 Question Id : 4165299390 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the system of equations

$$x + y + z = 5$$

$$x + 2y + 3z = 9$$

$$x + 3y + \alpha z = \beta$$

has infinitely many solutions, then $\beta - \alpha$ equals :

Options :

41652937018. 5

41652937019. 18

41652937020. 8

41652937021. 21

Question Number : 65 Question Id : 4165299390 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 समीकरण निकाय

$$x + y + z = 5$$

$$x + 2y + 3z = 9$$

$$x + 3y + \alpha z = \beta$$

के असंख्य हल हैं, तो $\beta - \alpha$ बराबर है :

Options :

41652937018. 5

41652937019. 18

41652937020. 8

41652937021. 21

Question Number : 66 Question Id : 4165299391 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 $\sum_{i=1}^{20} \left(\frac{{}^{20}C_{i-1}}{{}^{20}C_i + {}^{20}C_{i-1}} \right)^3 = \frac{k}{21}$, then k

equals :

Options :

41652937022. 50

41652937023. 100

41652937024. 200

41652937025. 400

Question Number : 66 Question Id : 4165299391 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 $\sum_{i=1}^{20} \left(\frac{{}^{20}C_{i-1}}{{}^{20}C_i + {}^{20}C_{i-1}} \right)^3 = \frac{k}{21}$, तो k बराबर

है :

Options :

41652937022. 50

41652937023. 100

41652937024. 200

41652937025. 400

Question Number : 67 Question Id : 4165299392 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 third term in the binomial expansion

of $(1+x^{\log_2 x})^5$ equals 2560, then a possible

value of x is :

Options :

41652937026. $\frac{1}{8}$

41652937027. $\frac{1}{4}$

41652937028. $2\sqrt{2}$

41652937029. $4\sqrt{2}$

Question Number : 67 Question Id : 4165299392 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 $(1+x^{\log_2 x})^5$ के द्विपद प्रसार में तीसरा पद 2560

के बराबर है, तो x का एक सम्भव मान है :

Options :

41652937026. $\frac{1}{8}$

41652937027. $\frac{1}{4}$

41652937028. $2\sqrt{2}$

41652937029. $4\sqrt{2}$

Question Number : 68 Question Id : 4165299393 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 5, 5r, 5r² are the lengths of the sides of a triangle, then r cannot be equal to :

Options :

41652937030. $\frac{3}{2}$

41652937031. $\frac{3}{4}$

41652937032. $\frac{5}{4}$

41652937033. $\frac{7}{4}$

Question Number : 68 Question Id : 4165299393 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि एक त्रिभुज की भुजाओं की लम्बाई 5, 5r, 5r² है,
तो r निम्न में से किसके बराबर नहीं हो सकता ?

Options :

41652937030. $\frac{3}{2}$

41652937031. $\frac{3}{4}$

41652937032. $\frac{5}{4}$

41652937033. $\frac{7}{4}$

Question Number : 69 Question Id : 4165299394 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The sum of all two digit positive numbers
which when divided by 7 yield 2 or 5 as
remainder is :

Options :

41652937034. 1465

41652937035. 1256

41652937036. 1356

41652937037. 1365

Question Number : 69 Question Id : 4165299394 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

ऐसी सभी दो अंकों की धन संख्याओं, जिन्हें 7 से
विभाजित करने पर 2 या 5 शेषफल प्राप्त होता है, का
योग है :

Options :

41652937034. 1465

41652937035. 1256

41652937036. 1356

41652937037. 1365

Question Number : 70 Question Id : 4165299395 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 each $t \in \mathbb{R}$, let $[t]$ be the greatest integer less than or equal to t . Then,

$$\lim_{x \rightarrow 1+} \frac{(1 - |x| + \sin |1 - x|) \sin \left(\frac{\pi}{2} [1 - x] \right)}{|1 - x| [1 - x]}$$

Options :

41652937038. equals 0

41652937039. equals 1

41652937040. equals -1

41652937041. does not exist

Question Number : 70 Question Id : 4165299395 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रत्येक $t \in \mathbb{R}$ के लिए, माना $[t]$, t के समान या उससे कम महत्तम पूर्णांक है, तो

$$\lim_{x \rightarrow 1+} \frac{(1 - |x| + \sin |1 - x|) \sin \left(\frac{\pi}{2} [1 - x] \right)}{|1 - x| [1 - x]}$$

Options :

41652937038. 0 के बराबर है।

41652937039. 1 के बराबर है।

41652937040. -1 के बराबर है।

41652937041. का अस्तित्व नहीं है।

Question Number : 71 Question Id : 4165299396 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\text{Let } f(x) = \begin{cases} \max\{|x|, x^2\}, & |x| \leq 2 \\ 8 - 2|x|, & 2 < |x| \leq 4 \end{cases}$$

Let S be the set of points in the interval $(-4, 4)$ at which f is not differentiable.

Then S :

Options :

41652937042. is an empty set

41652937043. equals $\{-2, -1, 1, 2\}$

41652937044. equals $\{-2, -1, 0, 1, 2\}$

41652937045. equals $\{-2, 2\}$

Question Number : 71 Question Id : 4165299396 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\text{माना } f(x) = \begin{cases} \max\{|x|, x^2\}, & |x| \leq 2 \\ 8 - 2|x|, & 2 < |x| \leq 4 \end{cases}$$

माना S , अन्तराल $(-4, 4)$ के उन बिन्दुओं, जिन पर f अवकलनीय नहीं है, का समुच्चय है, तो S :

Options :

41652937042. एक रिक्त समुच्चय है।

41652937043. $\{-2, -1, 1, 2\}$ के बराबर है।

41652937044. $\{-2, -1, 0, 1, 2\}$ के बराबर है।

41652937045. $\{-2, 2\}$ के बराबर है।

Question Number : 72 Question Id : 4165299397 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 $f : \mathbb{R} \rightarrow \mathbb{R}$ be a function such that

$$f(x) = x^3 + x^2 f'(1) + x f''(2) + f'''(3), x \in \mathbb{R}.$$

Then $f(2)$ equals :

Options :

41652937046. -4

41652937047. 30

41652937048. 8

41652937049. -2

Question Number : 72 Question Id : 4165299397 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 फलन $f : \mathbb{R} \rightarrow \mathbb{R}$ इस प्रकार है कि $f(x) = x^3 + x^2 f'(1) + x f''(2) + f'''(3)$, $x \in \mathbb{R}$ तो $f(2)$ बराबर है :

Options :

41652937046. -4

41652937047. 30

41652937048. 8

41652937049. -2

Question Number : 73 Question Id : 4165299398 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 shortest distance between the point

$\left(\frac{3}{2}, 0\right)$ and the curve $y = \sqrt{x}$, $(x > 0)$, is :

Options :

41652937050. $\frac{\sqrt{5}}{2}$

41652937051. $\frac{\sqrt{3}}{2}$

41652937052. $\frac{3}{2}$

41652937053. $\frac{5}{4}$

Question Number : 73 Question Id : 4165299398 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बिन्दु $\left(\frac{3}{2}, 0\right)$ तथा वक्र $y = \sqrt{x}$, $(x > 0)$ के बीच की

न्यूनतम दूरी है :

Options :

41652937050. $\frac{\sqrt{5}}{2}$

41652937051. $\frac{\sqrt{3}}{2}$

41652937052. $\frac{3}{2}$

41652937053. $\frac{5}{4}$

Question Number : 74 Question Id : 4165299399 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 $n \geq 2$ be a natural number and
 $0 < \theta < \pi/2$.

Then $\int \frac{(\sin^n \theta - \sin \theta)^{\frac{1}{n}} \cos \theta}{\sin^{n+1} \theta} d\theta$ is equal to :

(where C is a constant of integration)

Options :

41652937054. $\frac{n}{n^2-1} \left(1 - \frac{1}{\sin^{n-1} \theta} \right)^{\frac{n+1}{n}} + C$

41652937055. $\frac{n}{n^2+1} \left(1 - \frac{1}{\sin^{n-1} \theta} \right)^{\frac{n+1}{n}} + C$

41652937056. $\frac{n}{n^2-1} \left(1 - \frac{1}{\sin^{n+1} \theta} \right)^{\frac{n+1}{n}} + C$

41652937057. $\frac{n}{n^2-1} \left(1 + \frac{1}{\sin^{n-1} \theta} \right)^{\frac{n+1}{n}} + C$

Question Number : 74 Question Id : 4165299399 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 $n \geq 2$ एक प्राकृत संख्या है तथा $0 < \theta < \pi/2$ है,

तो $\int \frac{(\sin^n \theta - \sin \theta)^{\frac{1}{n}} \cos \theta}{\sin^{n+1} \theta} d\theta$ बराबर है :

(जहाँ C एक समाकलन अचर है)

Options :

41652937054. $\frac{n}{n^2-1} \left(1 - \frac{1}{\sin^{n-1} \theta} \right)^{\frac{n+1}{n}} + C$

41652937055. $\frac{n}{n^2+1} \left(1 - \frac{1}{\sin^{n-1} \theta} \right)^{\frac{n+1}{n}} + C$

41652937056. $\frac{n}{n^2-1} \left(1 - \frac{1}{\sin^{n+1} \theta} \right)^{\frac{n+1}{n}} + C$

41652937057. $\frac{n}{n^2-1} \left(1 + \frac{1}{\sin^{n-1} \theta} \right)^{\frac{n+1}{n}} + C$

Question Number : 75 Question Id : 4165299400 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 $I = \int_a^b (x^4 - 2x^2) dx$. If I is minimum

then the ordered pair (a, b) is :

Options :

41652937058. $(0, \sqrt{2})$

41652937059. $(-\sqrt{2}, 0)$

41652937060. $(-\sqrt{2}, \sqrt{2})$

41652937061. $(\sqrt{2}, -\sqrt{2})$

Question Number : 75 Question Id : 4165299400 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 $I = \int_a^b (x^4 - 2x^2) dx$ है। यदि I न्यूनतम है, तो क्रमित युग्म (a, b) है :

Options :

41652937058. $(0, \sqrt{2})$

41652937059. $(-\sqrt{2}, 0)$

41652937060. $(-\sqrt{2}, \sqrt{2})$

41652937061. $(\sqrt{2}, -\sqrt{2})$

Question Number : 76 Question Id : 4165299401 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 enclosed between the curves $y = kx^2$ and $x = ky^2$, ($k > 0$), is 1 square unit. Then k is :

Options :

41652937062. $\frac{\sqrt{3}}{2}$

41652937063. $\frac{1}{\sqrt{3}}$

41652937064. $\sqrt{3}$

41652937065. $\frac{2}{\sqrt{3}}$

Question Number : 76 Question Id : 4165299401 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 वक्रों $y = kx^2$ तथा $x = ky^2$, ($k > 0$) के बीच घिरे क्षेत्र का क्षेत्रफल 1 वर्ग इकाई है, तो k बराबर है :

Options :

41652937062. $\frac{\sqrt{3}}{2}$

41652937063. $\frac{1}{\sqrt{3}}$

41652937064. $\sqrt{3}$

41652937065. $\frac{2}{\sqrt{3}}$

Question Number : 77 Question Id : 4165299402 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 $\frac{dy}{dx} + \frac{3}{\cos^2 x} y = \frac{1}{\cos^2 x}$, $x \in \left(-\frac{\pi}{3}, \frac{\pi}{3}\right)$,

and $y\left(\frac{\pi}{4}\right) = \frac{4}{3}$, then $y\left(-\frac{\pi}{4}\right)$ equals :

Options :

41652937066. $-\frac{4}{3}$

41652937067. $\frac{1}{3} + e^6$

41652937068. $\frac{1}{3} + e^3$

41652937069. $\frac{1}{3}$

Question Number : 77 Question Id : 4165299402 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 $\frac{dy}{dx} + \frac{3}{\cos^2 x} y = \frac{1}{\cos^2 x}$, $x \in \left(-\frac{\pi}{3}, \frac{\pi}{3}\right)$

तथा $y\left(\frac{\pi}{4}\right) = \frac{4}{3}$ है, तो $y\left(-\frac{\pi}{4}\right)$ बराबर है :

Options :

41652937066. $-\frac{4}{3}$

41652937067. $\frac{1}{3} + e^6$

41652937068. $\frac{1}{3} + e^3$

41652937069. $\frac{1}{3}$

Question Number : 78 Question Id : 4165299403 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 line $3x + 4y - 24 = 0$ intersects the x -axis at the point A and the y -axis at the point B, then the incentre of the triangle OAB, where O is the origin, is :

Options :

41652937070. (4, 3)

41652937071. (2, 2)

41652937072. (3, 4)

41652937073. (4, 4)

Question Number : 78 Question Id : 4165299403 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 रेखा $3x + 4y - 24 = 0$ x -अक्ष को बिंदु A तथा y -अक्ष को बिंदु B पर काटती है, तो त्रिभुज OAB, जहाँ O मूलबिंदु है, का अन्तःकेंद्र है :

Options :

41652937070. (4, 3)

41652937071. (2, 2)

41652937072. (3, 4)

41652937073. (4, 4)

Question Number : 79 Question Id : 4165299404 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 point P moves on the line $2x - 3y + 4 = 0$.
If Q(1, 4) and R(3, -2) are fixed points, then
the locus of the centroid of ΔPQR is a line :

Options :

41652937074. parallel to x -axis

41652937075. parallel to y -axis

41652937076. with slope $\frac{3}{2}$

41652937077. with slope $\frac{2}{3}$

Question Number : 79 Question Id : 4165299404 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 बिंदु P, रेखा $2x - 3y + 4 = 0$ पर गति करता है।
यदि Q(1, 4) तथा R(3, -2) निश्चित बिंदु हैं, तो
 ΔPQR के केंद्रक का बिंदुपथ (locus) एक रेखा है :

Options :

41652937074. जो कि x -अक्ष के समांतर है।

41652937075. जो कि y -अक्ष के समांतर है।

41652937076. जिसकी ढाल (slope) $\frac{3}{2}$ है।

41652937077. जिसकी ढाल $\frac{2}{3}$ है।

Question Number : 80 Question Id : 4165299405 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 circle C passing through the point (4, 0)
touches the circle $x^2 + y^2 + 4x - 6y = 12$
externally at the point (1, -1), then the
radius of C is :

Options :

41652937078. $\sqrt{57}$

41652937079. 4

41652937080. $2\sqrt{5}$

41652937081. 5

Question Number : 80 Question Id : 4165299405 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 C, बिंदु (4, 0) से होकर जाता है तथा वृत्त $x^2 + y^2 + 4x - 6y = 12$ को बिंदु (1, -1) पर बाह्य स्पर्श करता है, तो C की त्रिज्या है :

Options :

41652937078. $\sqrt{57}$

41652937079. 4

41652937080. $2\sqrt{5}$

41652937081. 5

Question Number : 81 Question Id : 4165299406 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 parabolas $y^2 = 4b(x - c)$ and $y^2 = 8ax$ have a common normal, then which one of the following is a valid choice for the ordered triad (a, b, c) ?

Options :

41652937082. $\left(\frac{1}{2}, 2, 0\right)$

41652937083. (1, 1, 3)

41652937084. (1, 1, 0)

41652937085. $\left(\frac{1}{2}, 2, 3\right)$

Question Number : 81 Question Id : 4165299406 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 परवलयों $y^2 = 4b(x - c)$ तथा $y^2 = 8ax$ का एक उभयनिष्ठ अभिलंब है, तो क्रमित त्रिक (a, b, c) के लिए निम्न में से कौन सा एक सही विकल्प है?

Options :

41652937082. $\left(\frac{1}{2}, 2, 0\right)$

41652937083. $(1, 1, 3)$

41652937084. $(1, 1, 0)$

41652937085. $\left(\frac{1}{2}, 2, 3\right)$

Question Number : 82 Question Id : 4165299407 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 equation of a tangent to the hyperbola $4x^2 - 5y^2 = 20$ parallel to the line $x - y = 2$ is :

Options :

41652937086. $x - y + 1 = 0$

41652937087. $x - y + 7 = 0$

41652937088. $x - y - 3 = 0$

41652937089. $x - y + 9 = 0$

Question Number : 82 Question Id : 4165299407 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अतिपरवलय $4x^2 - 5y^2 = 20$ की एक स्पर्शरेखा जो रेखा $x - y = 2$ के समांतर है, का समीकरण है :

Options :

41652937086. $x - y + 1 = 0$

41652937087. $x - y + 7 = 0$

41652937088. $x - y - 3 = 0$

41652937089. $x - y + 9 = 0$

Question Number : 83 Question Id : 4165299408 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 plane passing through the point $(4, -1, 2)$ and parallel to the lines

$$\frac{x+2}{3} = \frac{y-2}{-1} = \frac{z+1}{2} \text{ and } \frac{x-2}{1} = \frac{y-3}{2} = \frac{z-4}{3}$$

also passes through the point :

Options :

41652937090. $(1, 1, 1)$

41652937091. $(1, 1, -1)$

41652937092. $(-1, -1, -1)$

41652937093. $(-1, -1, 1)$

Question Number : 83 Question Id : 4165299408 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बिंदु $(4, -1, 2)$ से होकर जाने वाला समतल जो रेखाओं

$$\frac{x+2}{3} = \frac{y-2}{-1} = \frac{z+1}{2} \text{ तथा } \frac{x-2}{1} = \frac{y-3}{2} = \frac{z-4}{3}$$

के समांतर है, निम्न में से जिस बिंदु से भी होकर जाता है, वह है :

Options :

41652937090. $(1, 1, 1)$

41652937091. $(1, 1, -1)$

41652937092. $(-1, -1, -1)$

41652937093. $(-1, -1, 1)$

Question Number : 84 Question Id : 4165299409 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 be a point on the line $\vec{r} = (1-3\mu)\hat{i} + (\mu-1)\hat{j} + (2+5\mu)\hat{k}$ and B(3, 2, 6) be a point in the space. Then the value of μ for which the vector $\vec{AB}$ is parallel to the plane $x - 4y + 3z = 1$ is :

Options :

$$\frac{1}{2}$$

41652937094.

$$\frac{1}{4}$$

41652937095.

$$\frac{1}{8}$$

41652937096.

$$-\frac{1}{4}$$

41652937097.

Question Number : 84 Question Id : 4165299409 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 रेखा $\vec{r} = (1-3\mu)\hat{i} + (\mu-1)\hat{j} + (2+5\mu)\hat{k}$ पर स्थित एक बिंदु है तथा B(3, 2, 6) एक अन्य बिंदु है, तो μ का वह मान जिसके लिए सदिश $\vec{AB}$ समतल $x - 4y + 3z = 1$ के समांतर है, है :

Options :

$$\frac{1}{2}$$

41652937094.

$$\frac{1}{4}$$

41652937095.

$$\frac{1}{8}$$

41652937096.

$$-\frac{1}{4}$$

41652937097.

Correct Marks : 4 Wrong Marks : 1

Let $\vec{a} = 2\hat{i} + \lambda_1\hat{j} + 3\hat{k}$, $\vec{b} = 4\hat{i} + (3 - \lambda_2)\hat{j} + 6\hat{k}$

and $\vec{c} = 3\hat{i} + 6\hat{j} + (\lambda_3 - 1)\hat{k}$ be three vectors

such that $\vec{b} = 2\vec{a}$ and $\vec{a}$ is perpendicular

to $\vec{c}$. Then a possible value of $(\lambda_1, \lambda_2, \lambda_3)$ is :

Options :

$\left(-\frac{1}{2}, 4, 0\right)$

41652937098.

$(1, 5, 1)$

41652937099.

$(1, 3, 1)$

41652937100.

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

41652937101.

Question Number : 85 Question Id : 4165299410 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 $\vec{a} = 2\hat{i} + \lambda_1\hat{j} + 3\hat{k}$, $\vec{b} = 4\hat{i} + (3 - \lambda_2)\hat{j} + 6\hat{k}$

तथा $\vec{c} = 3\hat{i} + 6\hat{j} + (\lambda_3 - 1)\hat{k}$ तीन ऐसे सदिश हैं कि

$\vec{b} = 2\vec{a}$ है तथा सदिश $\vec{a}$, सदिश $\vec{c}$ के लंबवत हैं,

तो $(\lambda_1, \lambda_2, \lambda_3)$ का एक संभावित मान है :

Options :

$\left(-\frac{1}{2}, 4, 0\right)$

41652937098.

$(1, 5, 1)$

41652937099.

$(1, 3, 1)$

41652937100.

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

41652937101.

Question Number : 86 Question Id : 4165299411 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 mean of five observations is 5 and their variance is 9.20. If three of the given five observations are 1, 3 and 8, then a ratio of other two observations is :

Options :

41652937102. 10 : 3

41652937103. 4 : 9

41652937104. 5 : 8

41652937105. 6 : 7

Question Number : 86 Question Id : 4165299411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पाँच प्रेक्षकों का माध्य 5 है तथा उनका प्रसरण 9.20 है।
यदि इन दिए गए पाँच प्रेक्षकों में से तीन 1, 3 तथा 8 हैं,
तो अन्य दो प्रेक्षकों का एक अनुपात है :

Options :

41652937102. 10 : 3

41652937103. 4 : 9

41652937104. 5 : 8

41652937105. 6 : 7

Question Number : 87 Question Id : 4165299412 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 unbiased coin is tossed. If the outcome is a head then a pair of unbiased dice is rolled and the sum of the numbers obtained on them is noted. If the toss of the coin results in tail then a card from a well-shuffled pack of nine cards numbered 1, 2, 3, ..., 9 is randomly picked and the number on the card is noted. The probability that the noted number is either 7 or 8 is :

Options :

41652937106. $\frac{19}{36}$

41652937107. $\frac{19}{72}$

41652937108. $\frac{15}{72}$

41652937109. $\frac{13}{36}$

Question Number : 87 Question Id : 4165299412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

एक अनभिनत (unbiased) सिक्के को उछाला जाता है। चित्त आने पर अनभिनत पासों के एक युग्म को उछाला जाता है तथा उन पर आई संख्याओं का योग नोट किया जाता है। यदि सिक्के पर पट आता है, तो 9 कार्डों जिन पर संख्याएं 1, 2, 3, ..., 9 अंकित हैं, की एक अच्छी प्रकार से फेंटी गई गड्डी में से एक कार्ड निकाल कर उस पर आई संख्या नोट की जाती है। इस प्रकार नोट की गई संख्या के 7 अथवा 8 होने की प्रायिकता है :

Options :

41652937106. $\frac{19}{36}$

41652937107. $\frac{19}{72}$

$$\frac{15}{72}$$

41652937108.

$$\frac{13}{36}$$

41652937109.

Question Number : 88 Question Id : 4165299413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The sum of all values of $\theta \in \left(0, \frac{\pi}{2}\right)$ satisfying

$$\sin^2 2\theta + \cos^4 2\theta = \frac{3}{4} \text{ is :}$$

Options :

41652937110. π

41652937111. $\frac{\pi}{2}$

41652937112. $\frac{5\pi}{4}$

41652937113. $\frac{3\pi}{8}$

Question Number : 88 Question Id : 4165299413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

$$\sin^2 2\theta + \cos^4 2\theta = \frac{3}{4} \text{ को संतुष्ट करने वाले}$$

$\theta \in \left(0, \frac{\pi}{2}\right)$ के सभी मानों का योग है :

Options :

41652937110. π

41652937111. $\frac{\pi}{2}$

41652937112. $\frac{5\pi}{4}$

41652937113. $\frac{3\pi}{8}$

Question Number : 89 Question Id : 4165299414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider a triangular plot ABC with sides AB = 7 m, BC = 5 m and CA = 6 m. A vertical lamp-post at the mid point D of AC subtends an angle 30° at B. The height (in m) of the lamp-post is :

Options :

41652937114. $\frac{3}{2}\sqrt{21}$

41652937115. $7\sqrt{3}$

41652937116. $2\sqrt{21}$

41652937117. $\frac{2}{3}\sqrt{21}$

Question Number : 89 Question Id : 4165299414 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 त्रिभुजाकार प्लॉट ABC पर विचार कीजिए, जिसकी भुजाएँ AB = 7 m, BC = 5 m तथा CA = 6 m हैं। AC के मध्य बिंदु D पर स्थित एक सीधा लैम्प-पोस्ट, B पर 30° का कोण अंतरित करता है। लैम्प-पोस्ट की (मीटरों में) ऊँचाई है :

Options :

41652937114. $\frac{3}{2}\sqrt{21}$

41652937115. $7\sqrt{3}$

41652937116. $2\sqrt{21}$

41652937117. $\frac{2}{3}\sqrt{21}$

Correct Marks : 4 Wrong Marks : 1

Consider the statement : " $P(n) : n^2 - n + 41$ is prime." Then which one of the following is true ?

Options :

41652937118. Both $P(3)$ and $P(5)$ are false.

41652937119. $P(3)$ is false but $P(5)$ is true.

41652937120. $P(5)$ is false but $P(3)$ is true.

41652937121. Both $P(3)$ and $P(5)$ are true.

Question Number : 90 Question Id : 4165299415 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 कथन पर विचार कीजिए

" $P(n) : n^2 - n + 41$ एक अभाज्य संख्या है," तो इनमें से कौन-सा एक सत्य है?

Options :

41652937118. $P(3)$ तथा $P(5)$ दोनों असत्य हैं।

41652937119. $P(3)$ असत्य है परन्तु $P(5)$ सत्य है।

41652937120. $P(5)$ असत्य है परन्तु $P(3)$ सत्य है।

41652937121. $P(3)$ तथा $P(5)$ दोनों सत्य हैं।