National Testing Agency

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Paper I

Group Number :	1
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Physics

Section Id :	416529136
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
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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:	416529145
Question Shuffling Allowed :	Yes

Question Number : 1 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 :

1. 40

2. 410

3. 640

4. 16

Question Number : 1 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 $128\ \text{kg m}^{-3}$ 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 :

1. 40

2. 410

3. 640

4. 16

Question Number : 1 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 એકમ પદ્ધતિમાં એક પદાર્થની ઘનતા $128\ \text{kg m}^{-3}$ છે. કોઇ ચોક્કસ એકમ પદ્ધતિ કે જેમાં લંબાઇનો એકમ 25 cm અને દળનો એકમ 50 g હોય, તો પદાર્થની ઘનતાનું મૂલ્ય હશે :

Options :

1. 40

2. 410

3. 640

4. 16

Question Number : 2 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 :

1. 1 : 2

2. 1 : 16

3. 1 : 8

4. 1 : 4

Question Number : 2 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 क्रमश: 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 :

1. 1 : 2

2. 1 : 16

3. 1 : 8

4. 1 : 4

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

Correct Marks : 4 Wrong Marks : 1

બે બંદૂકો A અને B એ ક્રમશઃ 1 km/s અને 2 km/s ની ઝડપ થી ગોળીઓ છોડી શકે છે. સમક્ષિતિજ મેદાનના કોઇ એક બિંદુથી શક્ય બધીજ દિશામાં ગોળીઓ છોડવામાં આવે છે. આ ગોળીઓ વળે આંતરાતા મહત્તમ વિસ્તારનો ગુણોત્તર હશે :

Options :

1. 1 : 2

2. $1:16$

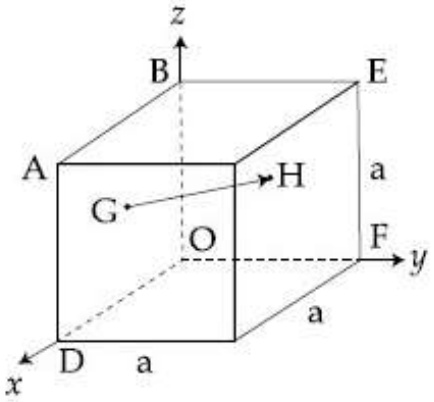
3. $1:8$

4. $1:4$

Question Number : 3 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 :

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

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

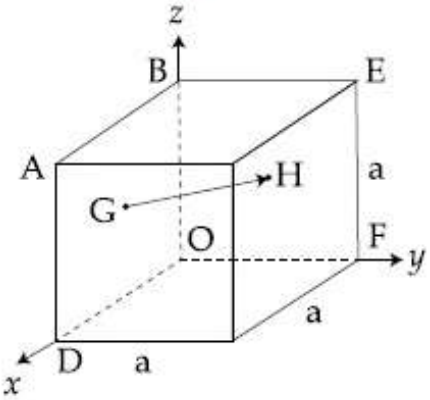
3. $\frac{1}{2}a\left(\hat{j}-\hat{i}\right)$

4. $\frac{1}{2}a\left(\hat{j}-\hat{k}\right)$

Question Number : 3 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 :

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

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

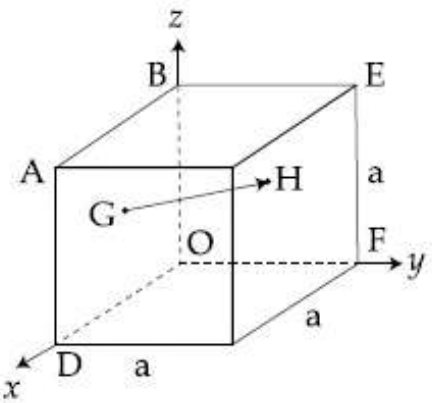
3. $\frac{1}{2}a\left(\hat{j}-\hat{i}\right)$

4. $\frac{1}{2}a\left(\hat{j}-\hat{k}\right)$

Question Number : 3 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 બાજુ ધરાવતા ઘનમાં, ફલક (સપાટી) ABOD નાં કેન્દ્ર આગળથી ફલક BEFO નાં કેન્દ્ર સુધી (આકૃતિમાં દર્શાવ્યા અનુસાર) દોરેલ સદિશ હશે :



Options :

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

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

3. $\frac{1}{2}a\left(\hat{j}-\hat{i}\right)$

4. $\frac{1}{2}a\left(\hat{j}-\hat{k}\right)$

Question Number : 4 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 : ($g = 10ms^{-2}$)

Options :

1. 40 m

2. 30 m

3. 20 m

4. 10 m

Question Number : 4 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 $g = 10\ ms^{-2}$)

Options :

1. 40 m

2. 30 m

3. 20 m

4. 10 m

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

Correct Marks : 4 Wrong Marks : 1

એક 100 m ઊંચા મકાનની ટોચ પર થી 0.03 kg દળ ધરાવતા એક લાકડાના ટુકડાને મુક્ત કરવામાં આવે છે. આ જ સમયે, 0.02 kg દળ ધરાવતી ગોળી (કારતુષ) ને જમીન પરથી ઊર્ધ્વદિશામાં ઉપર તરફ $100\ ms^{-1}$ ના વેગ થી છોડવામાં આવે છે. ગોળી લાકડામાં જોડાઇ જાય છે, તો આ સંયુક્ત તંત્રે પાછું પડવાનું ચાલુ કરે તે પહેલા મકાનની ટોચથી ઉપર પહોંચેલ મહત્તમ ઊંચાઇ થશે: $(g = 10\ ms^{-2})$

Options :

1. 40 m

2. 30 m

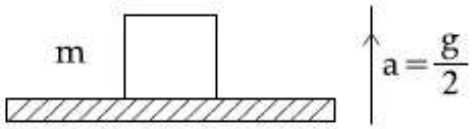
3. 20 m

4. 10 m

Question Number : 5 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 :

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

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

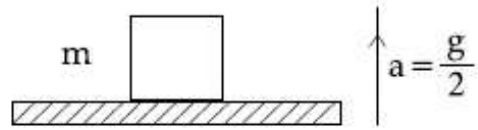
3. $\frac{m g^2t^2}{8}$

4. 0

Question Number : 5 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 :

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

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

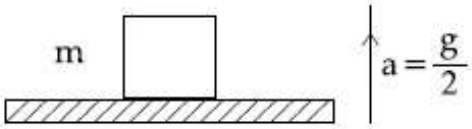
3. $\frac{m g^2 t^2}{8}$

4. 0

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

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા મુજબ, એક m દળ ધરાવતુ ચોસલું કે જે તેની સ્થિર સ્થિતિમાંથી અચળ પ્રવેગ g/2 થી ઊપરની દિશામા ગતિ શરૂ કરે તેમ રાખેલ છે. t સમયમાં લંબ પ્રત્યાઘાત (normal reaction) દ્વારા થતું કાર્ય :



Options :

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

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

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

4. 0

Question Number : 6 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 :

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

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

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

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

Question Number : 6 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 :

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

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

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

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

Question Number : 6 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 જેટલી ત્રિજ્યા અને M દળ ધરાવતા એક સમાંગી ઘન નળાકારીય રોલરને એક ક્રિકેટ પીચ પર સમક્ષિતિજ બળ F ની મદદથી ખેંચવામાં આવે છે. રોલર સરક્યા સિવાય ગબડે છે તેમ ધારતા, નળાકારનો કોણીય પ્રવેગ હશે :

Options :

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

2. $\frac{3F}{2\,m\,R}$

3. $\frac{F}{3\,m\,R}$

4. $\frac{F}{2\,m\,R}$

Question Number : 7 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 :

1. $\mu FR/6$

2. $\mu FR/3$

3. $\mu FR/2$

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

Question Number : 7 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 परित: 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 :

1. $\mu FR/6$

2. $\mu FR/3$

3. $\mu FR/2$

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

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

Correct Marks : 4 Wrong Marks : 1

ભોંયતળિયુ સાફ કરવાનું પોતુનું મશીન એક R ત્રિજ્યાના વર્તુળાકાર પોતાને નીચે તરફ F જેટલુ કુલ બળ લગાડે છે અને તેને તેની અક્ષને ફરતે અચળ કોણીય ઝડપથી ભ્રમણ કરાવે છે. જો બળ F એ પોતા પર સમાન રીતે વહેંચાતો હોય, અને પોતા ભોંયતળિયા વચ્ચેનો ઘર્ષણાંક μ હોય તો પોતા પર મશીન દ્વારા લાગતું ટોર્ક હશે :

Options :

1. $\mu FR/6$

2. $\mu FR/3$

3. $\mu FR/2$

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

Question Number : 8 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 :

1. $\frac{1}{2}\mathrm{m}\,v^2$

2. $\mathrm{m}\,v^2$

3. $\frac{3}{2}\mathrm{m}\,v^2$

4. $2\,\mathrm{m}\,v^2$

Question Number : 8 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 :

1. $\frac{1}{2}\mathrm{m}\,v^2$

2. $\mathrm{m}\,v^2$

3. $\frac{3}{2}\mathrm{m}\,v^2$

4. $2\,\mathrm{m}\,v^2$

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

Correct Marks : 4 Wrong Marks : 1

એક ઉપગ્રહ v જેટલી અચળ ઝડપથી એક વર્તુળાકાર કક્ષામાં પૃથ્વીની ફરતે ભ્રમણ કરે છે. એક m દળ ધરાવતા પદાર્થને ઉપગ્રહ પરથી એવી રીતે ફેંકવામાં આવે છે કે જેથી તે પૃથ્વીના ગુરૂત્વાકર્ષણના ખેંચાણથી મુક્ત થાય. પદાર્થના મુક્ત કરવાના સમયે તેની ગતીઊર્જા હશે :

Options :

1. $\frac{1}{2}\mathrm{m}\,v^2$

2. $\mathrm{m}\,v^2$

3. $\frac{3}{2}\mathrm{m}\,v^2$

4. $2\ m\ v^2$

Question Number : 9 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 $10^{-4}\ m^3/s$ 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 :

1. 5.1 cm

2. 4 cm

3. 2.9 cm

4. 1.7 cm

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

Correct Marks : 4 Wrong Marks : 1

પાણી સપાટ તળીયું ધરાવતી એક મોટી ટાંકીમાં $10^{-4}\ m^3/s$ ના દરથી વહે છે. ઉપરાંત, તળીયામાં $1\ cm^2$ ક્ષેત્રફળ ધરાવતા છિદ્રમાંથી વહી (લિક) જાય છે. જો ટાંકીમાં પાણીની ઊંચાઇ અચળ જળવાતી હોય તો આ ઊંચાઈ હશે :

Options :

1. 5.1 cm

2. 4 cm

3. 2.9 cm

4. 1.7 cm

Question Number : 9 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 $10^{-4}\ m^3s^{-1}$. 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 :

1. 5.1 cm

2. 4 cm

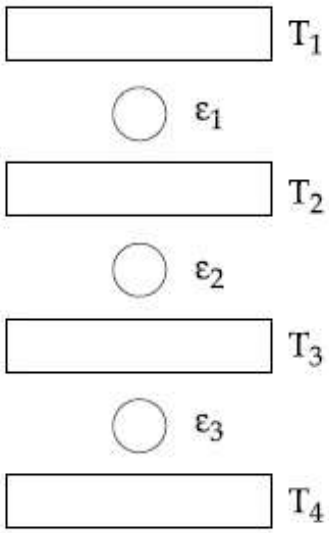
3. 2.9 cm

4. 1.7 cm

Question Number : 10 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 :



Options :

1. $T_2 = \left(T_1T_4^2\right)^{1/3}; T_3 = \left(T_1^2T_4\right)^{1/3}$

2. $T_2 = \left(T_1T_4\right)^{1/2}; T_3 = \left(T_1^2T_4\right)^{1/3}$

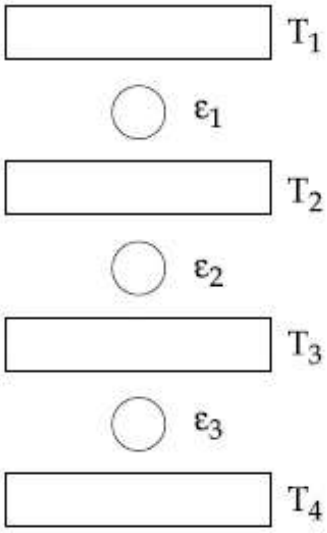
3. $T_2 = \left(T_1^2 T_4\right)^{1/3}; T_3 = \left(T_1 T_4^2\right)^{1/3}$

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

Question Number : 10 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 कार्नो 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 है यहाँ $T_1 > T_2 > T_3 > T_4$ हैं। तीनों इंजन बराबर क्षमता के होंगे, यदि :



Options :

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

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

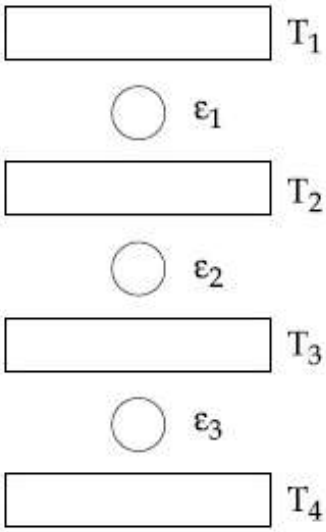
3. $T_2 = \left(T_1^2 T_4\right)^{1/3}; T_3 = \left(T_1 T_4^2\right)^{1/3}$

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

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

Correct Marks : 4 Wrong Marks : 1

ત્રણ કાર્નોટ એન્જિન શ્રેણીમાં T_1 તાપમાને રહેલ ઊષ્મા પ્રાપ્તિ સ્થાન અને T_4 તાપમાને રહેલ ઊષ્મા ઠારણની વચ્ચે કાર્ય કરે છે (આકૃતિ જુઓ). ત્યાં બીજા બે ઊષ્મા સંગ્રાહકો કે જે T_2 અને T_3 તાપમાને આકૃતિમાં દર્શાવ્યા મુજબ રહેલ છે ; અત્રે $T_1 > T_2 > T_3 > T_4$ છે. ત્રણેય એન્જિન એક સમાન રીતે કાર્યક્ષમ થાય જો :



Options :

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

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

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

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

Question Number : 11 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 $WK^{-1}m^{-1}$, the energy flux through it in the steady state is :

Options :

1. $90\ Wm^{-2}$

2. $120\ Wm^{-2}$

3. $65\ Wm^{-2}$

4. $200\ Wm^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $90\ Wm^{-2}$

2. $120\ Wm^{-2}$

3. $65\ Wm^{-2}$

4. $200\ Wm^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

$T = 10^3$ K તાપમાને રહેલ એક ઊષ્મા સ્રોતને બીજા $T = 10^2$ K તાપમાને રહેલા ઊષ્મા સંગ્રાહક સાથે 1 m જાડા કોપરના ચોસલા વડે જોડવામા આવે છે. કોપરની ઊષ્મીય વાહકતા $0.1\ WK^{-1}m^{-1}$ હોય તો સ્થિત સ્થિતિમાં તેમાંથી પસાર થતું ઊર્જા ફ્લક્સ હશે :

Options :

1. $90\ Wm^{-2}$

2. $120\ Wm^{-2}$

3. $65\ Wm^{-2}$

4. $200\ Wm^{-2}$

Question Number : 12 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 :

1. 10.0 cm

2. 16.6 cm

3. 20.0 cm

4. 33.3 cm

Question Number : 12 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 :

1. 10.0 cm

2. 16.6 cm

3. 20.0 cm

4. 33.3 cm

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

Correct Marks : 4 Wrong Marks : 1

એક 1 m લંબાઇની અને 5 g દળ ધરાવતી દોરીને બન્ને છેડે થી જડીત કરેલ છે. દોરીમાં તણાવ 8.0 N છે. દોરીને એક 100 Hz આવૃત્તિ ધરાવતા બાહ્ય કંપન (દોલક)ની મદદથી કંપિત કરાવવામાં આવે છે. દોરી પરના ક્રમિક નિસ્પંદ બિંદુઓ વચ્ચેનું અંતર _____ ની નજીકનું હશે.

Options :

1. 10.0 cm

2. 16.6 cm

3. 20.0 cm

4. 33.3 cm

Question Number : 13 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 :

1. 18/17

2. 21/20

3. 20/19

4. 19/18

Question Number : 13 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 :

1. 18/17

2. 21/20

3. 20/19

4. 19/18

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

Correct Marks : 4 Wrong Marks : 1

એક ટ્રેન એક સ્થિર અવલોકનકાર તરફ 34 m/s ની ઝડપથી ગતિ કરે છે. ટ્રેન સીટી વગાડે છે અને તેની આવૃત્તિ અવલોનકાર દ્વારા f_1 જેટલી નોંધાય છે. હવે જો ટ્રેનની ઝડપ ઘટીને 17 m/s જેટલી થાય ત્યારે નોંધાતી આવૃત્તિ f_2 છે. જો ધ્વનિની ઝડપ 340 m/s હોય તો ગુણોત્તર $\frac{f_1}{f_2}$ હશે :

Options :

1. 18/17

2. 21/20

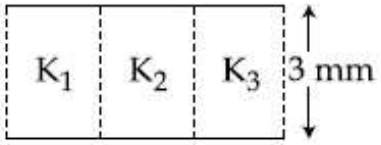
3. 20/19

4. 19/18

Question Number : 14 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 :

1. 36

2. 12

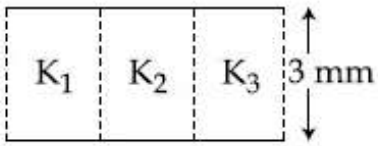
3. 4

4. 14

Question Number : 14 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 :

1. 36

2. 12

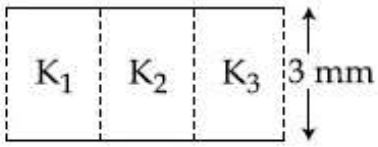
3. 4

4. 14

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

Correct Marks : 4 Wrong Marks : 1

એક સમાંતર પ્લેટ કેપેસિટરનું ક્ષેત્રફળ $6\,cm^2$ અને પ્લેટો વચ્ચેનું અંતર 3 mm છે. $K_1 = 10$, $K_2 = 12$, $K_3 = 14$ જેટલો પરાવૈદ્યુતાંક (ડાયઇલેક્ટ્રિક અચળાંક) ધરાવતા અને સમાન જાડાઇ ધરાવતા અવાહક પદાર્થની મદદથી બે પ્લટો વચ્ચેના ગેપને ભરવામાં આવે છે (આકૃતિ જુઓ). જ્યારે અવાહકને પૂર્ણ તરીકે કેપેસિટરમાં દાખલ કરવામાં આવે અને જો સમાન કેપેસિન્ટસ (સંધારકતા) મળે તો પદાર્થનો ડાયઇલેક્ટ્રિક અચળાંક હશે :



Options :

1. 36

2. 12

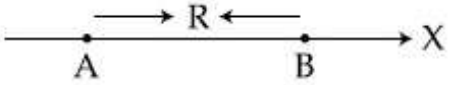
3. 4

4. 14

Question Number : 15 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 $\vec{d}_A = -4\,qa\hat{i}$ and $\vec{d}_B = -2\,qa\hat{i}$ 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 :

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

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

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

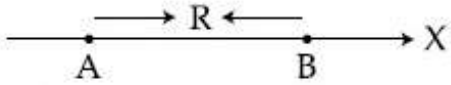
4. $\frac{R}{\sqrt{2}-1}$

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 15 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 :

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

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

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

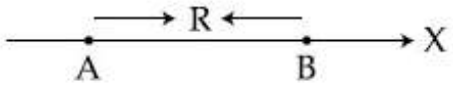
4. $\frac{R}{\sqrt{2}-1}$

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

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

Correct Marks : 4 Wrong Marks : 1

બે વિદ્યુત દ્વિધ્રુવી A અને B ની દ્વિધ્રુવી ચાકમાત્રા અનુક્રમે $\vec{d}_A = -4qa\hat{i}$ અને $\vec{d}_B = -2qa\hat{i}$, અને તેમની વચ્ચેનું અંતર R છે. તેઓ આકૃતિમાં દર્શાવ્યા મુજબ x-અક્ષની દિશામાં મુકેલ છે.



દ્વિધ્રુવી A થી કે જ્યારે બન્ને દ્વારા ઉત્પન્ન સ્થિતિમાન સમાન થાય તે અંતર હશે :

Options :

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

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

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

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

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 16 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 :

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

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

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

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

Question Number : 16 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 :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

વિદ્યુતભાર Q ને a, b, c ($a < b < c$) ત્રિજ્યા ધરાવતા સમકેન્દ્રિય ગોલીય કવચો પર એવી રીતે વહેંચવામાં આવેલ છે કે જેથી તેમની પૃષ્ઠ વિદ્યુતભાર ઘનતા એક બીજા જેટલી સમાન થાય. તેમના સામાન્ય કેન્દ્રથી r અંતરે રહેલા બિંદુ, જ્યાં $r < a$, આગળ કુલ સ્થિતિમાન હશે :

Options :

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

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

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

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

Question Number : 17 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 18 Ω and is bent into an equilateral triangle. Then, the resistance between any two vertices of the triangle is :

Options :

1. 2 Ω

2. 12 Ω

3. 4 Ω

4. 8 Ω

Question Number : 17 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 18 Ω है। इसे मोड़कर एक समबाहु त्रिभुज बनाते हैं। इस त्रिभुज के कोई दो शीर्षों के बीच तुल्य प्रतिरोध का मान होगा :

Options :

1. 2 Ω

2. 12 Ω

3. 4 Ω

4. $8\ \Omega$

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

Correct Marks : 4 Wrong Marks : 1

એક 18 Ω નો અવરોધ ધરાવતા એક સમાન ધાત્વીય તારને વાળીને એક સમબાજુ ત્રિકોણ બનાવવામાં આવે છે. તો ત્રિકોણના કોઇપણ બે શિરોબિંદુઓ વચ્ચેનો સમતુલ્ય અવરોધ હશે :

Options :

1. $2\ \Omega$

2. $12\ \Omega$

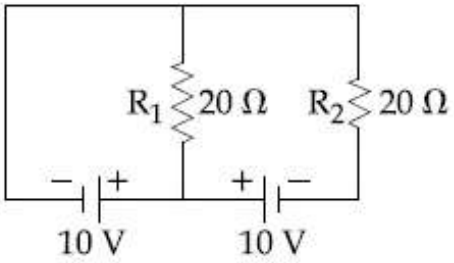
3. $4\ \Omega$

4. $8\ \Omega$

Question Number : 18 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 :

1. 0.5, 0

2. 1, 2

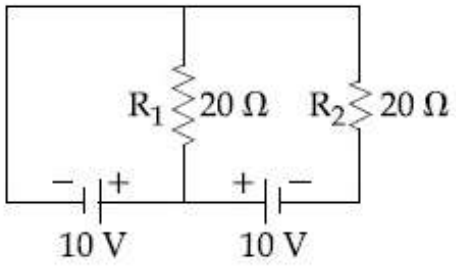
3. 2, 2

4. 0, 1

Question Number : 18 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 :

1. 0.5, 0

2. 1, 2

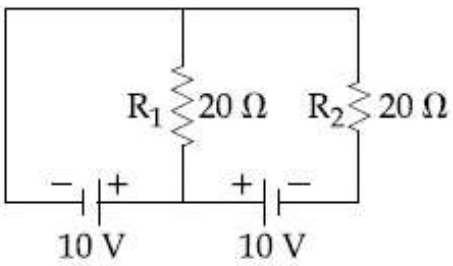
3. 2, 2

4. 0, 1

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

Correct Marks : 4 Wrong Marks : 1

આપેલ પરિપથમાં, વિદ્યુતકોષોને શૂન્ય આંતરિક અવરોધ છે. અવરોધો R_1 અને R_2 માંથી વહેતો પ્રવાહ (એમ્પિઅર માં), અનુક્રમે હશે :



Options :

1. 0.5, 0

2. 1, 2

3. 2, 2

4. 0, 1

Question Number : 19 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 :

1. 1 mV

2. 6 mV

3. 12 mV

4. 2 mV

Question Number : 19 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 :

1. 1 mV

2. 6 mV

3. 12 mV

4. 2 mV

Question Number : 19 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 બાજુની લંબાઈ ધરાવતા એક નક્કર ધાતુનો ઘન, ઘન y- દિશામાં 6 m/s જેટલી અચળ ઝડપથી ગતિ કરે છે. ઘન z- દિશામાં 0.1 T પ્રબળતા ધરાવતું એક સમાંગી ચુંબકીય ક્ષેત્ર પ્રવર્તે છે. x- અક્ષને લંબ તેવી ઘનની બે બાજુઓ વચ્ચે સ્થિતિમાનનો તફાવત હશે :

Options :

1. 1 mV

2. 6 mV

3. 12 mV

4. 2 mV

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

Correct Marks : 4 Wrong Marks : 1

એક અવાહક પાતળા l લંબાઇના સળીયા પર $\rho(x)=\rho_0\frac{x}{l}$ જેટલી રેખીય વિજભાર ઘનતા છે. ઉગમ બિંદુ $(x=0)$ માંથી પસાર થતી અને સળીયાને લંબ અક્ષને અનુલક્ષીને સળિયાને પરિભ્રમણ કરાવવામાં આવે છે. જો સળીયો n પરિભ્રમણ પ્રતિ સેકન્ડ ફરતો હોય તો સળીયા માટે સમય સરેરાશ ચુંબકીય ચાક માત્રા હશે :

Options :

1. $n\rho l^3$

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

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

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

Question Number : 20 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 :

1. $n\rho l^3$

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

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

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

Question Number : 20 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 परित: n चक्कर प्रति सेकंड से घुमाया जाता है। इस छड़ का कालिक माध्य चुम्बकीय आघूर्ण होगा :

Options :

1. $n \rho l^3$

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

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

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

Question Number : 21 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-m^2 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 :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 0.014 J

2. 0.007 J

3. 0.01 J

4. 0.028 J

Question Number : 21 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-m^2 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 :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 0.014 J

2. 0.007 J

3. 0.01 J

4. 0.028 J

Question Number : 21 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-m^2 જેટલી કુલ ચુંબકીય ચાકમાત્રા ધરાવતા એક ચુંબકને સયમ સાથે બદલાતા ચુંબકીય ક્ષેત્ર $B\hat{i}(\cos\omega t)$, જ્યાં B=1 ટેસ્લા અને $\omega = 0.125$ rad/s, માં મૂકવામાં આવે છે. t=1 સેકન્ડે ચુંબકીય ચાકમાત્રાની દિશા ઉલટાવવા માટે કરવું પડતું કાર્ય :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 0.014 J

2. 0.007 J

3. 0.01 J

4. 0.028 J

Question Number : 22 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 $=3\times10^8$ m/s)

$$B=100\times10^{-6}\sin\left[2\pi\times2\times10^{15}\left(t-\frac{x}{c}\right)\right]$$

then the maximum electric field associated with it is :

Options :

1. 4×10^4 N/C

2. 6×10^4 N/C

3. 3×10^4 N/C

4. 4.5×10^4 N/C

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

Correct Marks : 4 Wrong Marks : 1

જો સમતલ વિદ્યુતચુંબકીય તરંગમાં ચુંબકીય ક્ષેત્ર

$$B=100\times10^{-6}\sin\left[2\pi\times2\times10^{15}\left(t-\frac{x}{c}\right)\right]$$

મુજબ આપી શકાય તો તેની સાથે સંકળાયેલ મહત્તમ વિદ્યુતક્ષેત્ર :

(પ્રકાશની ઝડપ $=3\times10^8$ m/s)

Options :

1. 4×10^4 N/C

2. 6×10^4 N/C

3. 3×10^4 N/C

4. 4.5×10^4 N/C

Question Number : 22 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 :

1. 4×10^4 N/C

2. 6×10^4 N/C

3. 3×10^4 N/C

4. 4.5×10^4 N/C

Question Number : 23 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 :

1. $\mu_1 + \mu_2 = 3$

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

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

4. $3\mu_2 - 2\mu_1 = 1$

Question Number : 23 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 :

1. $\mu_1 + \mu_2 = 3$

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

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

4. $3\mu_2 - 2\mu_1 = 1$

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

Correct Marks : 4 Wrong Marks : 1

μ_1 જેટલો વક્રીભવનાંક અને f_1 જેટલી કેન્દ્ર લંબાઈ ધરાવતો એક સમતલ-બહિર્ગોળ (plano convex) લેન્સ, μ_2 જેટલો વક્રીભવનાંક અને f_2 જેટલી કેન્દ્ર લંબાઈ ધરાવતા બીજા સમતલ-અંતર્ગોળ (plano concave) લેન્સનાં સંપર્કમાં મુકવામાં આવે છે. જો તે દરેકની ગોલીય સપાટીઓની વક્રતા ત્રિજ્યા R હોય અને $f_1 = 2f_2$ હોય, તો μ_1 અને μ_2 ———— રીતે એકબીજાસાથે સંકળાયેલા છે.

Options :

1. $\mu_1 + \mu_2 = 3$

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

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

4. $3\mu_2 - 2\mu_1 = 1$

Question Number : 24 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 :

1. 380 nm, 525 nm

2. 625 nm, 500 nm

3. 380 nm, 500 nm

4. 400 nm, 500 nm

Question Number : 24 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, तरंगदैर्ध्य λ_1 के प्रकाश द्वारा $\frac{1}{40}$ rad कोण पर दीप्त फ्रिन्ज देखी जाती है। जब इसी प्रयोग में λ_2 तरंगदैर्ध्य 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 :

1. 380 nm, 525 nm

2. 625 nm, 500 nm

3. 380 nm, 500 nm

4. 400 nm, 500 nm

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

Correct Marks : 4 Wrong Marks : 1

0.1 mm જેટલું સ્લિટો વચ્ચેનું અંતર ધરાવતા યંગ ડબલ સ્લિટનાં પ્રયોગમાં જ્યારે λ_1 તરંગલંબાઈ ધરાવતાં પ્રકાશનો ઉપયોગ કરવામાં આવે છે ત્યારે $\frac{1}{40}$ rad ના કોણે પ્રકાશિત શલાકા જોવા મળે છે. જ્યારે λ_2 તરંગલંબાઈ ધરાવતાં પ્રકાશનો ઉપયોગ કરવામાં આવે છે ત્યારે આ જ ગોઠવણી માટે પ્રકાશિત શલાકા આ જ કોણ આગળ મળે છે. જો તરંગલંબાઇ λ_1 અને λ_2 એ દૃશ્ય પ્રકાશ વિભાગ (380 nm થી 740 nm સુધી) તો તેમના મૂલ્ય હશે :

Options :

1. 380 nm, 525 nm

2. 625 nm, 500 nm

3. 380 nm, 500 nm

4. 400 nm, 500 nm

Question Number : 25 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 :

1. 1 keV

2. 25 keV

3. 500 keV

4. 100 keV

Question Number : 25 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 इलेक्ट्रॉनो की तरंगदैर्ध्य की कोटि की है। 7.5×10^{-12} m की चौड़ाई के विभेदन हेतु इलेक्ट्रॉन की न्यूनतम ऊर्जा का निकटतम मान होगा :

Options :

1. 1 keV

2. 25 keV

3. 500 keV

4. 100 keV

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

Correct Marks : 4 Wrong Marks : 1

ઇલેક્ટ્રૉન માઇક્રોસ્કોપમાં મેળવી શકાતું વિભેદન એ તેમાં વપરાતા ઇલેક્ટ્રૉનની તરંગલંબાઈના ક્રમનું હોય છે. 7.5×10^{-12} m ની પહોળાઇને છૂટી પાડવા (છૂટી જોવા) ઇલેક્ટ્રૉનની જરૂરી લઘુત્તમ ઊર્જા _____ ની નજીકની હશે.

Options :

1. 1 keV

2. 25 keV

3. 500 keV

4. 100 keV

Question Number : 26 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 स्त्रोत 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 :

1. 150

2. 200

3. 360

4. 400

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

Correct Marks : 4 Wrong Marks : 1

ન્યૂક્લિયર કાઉન્ટર (ગણક) ની મદદથી એક રેડિયો એક્ટિવ ઉદ્‌ગમમાંથી ઉત્સર્જાતા કણનો દર માપવામાં આવે છે. t = 0 સમયે તે 1600 કાઉન્ટ પ્રતિ સેકન્ડ અને t = 8 સેકન્ડે તે 100 કાઉન્ટ પ્રતિ સેકન્ડ હતો. t = 6 સેકન્ડે કણનો પ્રતિ સેકન્ડ (ગણવાનો) દર _____ની નજીકનો હોત.

Options :

1. 150

2. 200

3. 360

4. 400

Question Number : 26 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 :

1. 150

2. 200

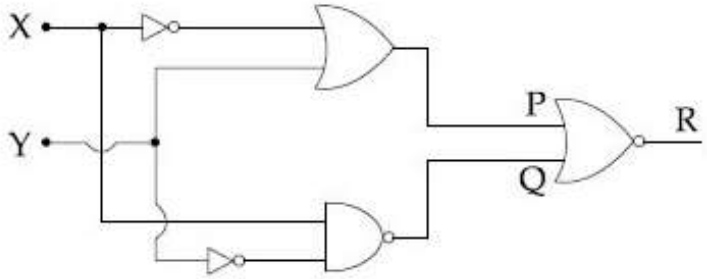
3. 360

4. 400

Question Number : 27 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 :

1. $X=0, Y=0$

2. $X=0, Y=1$

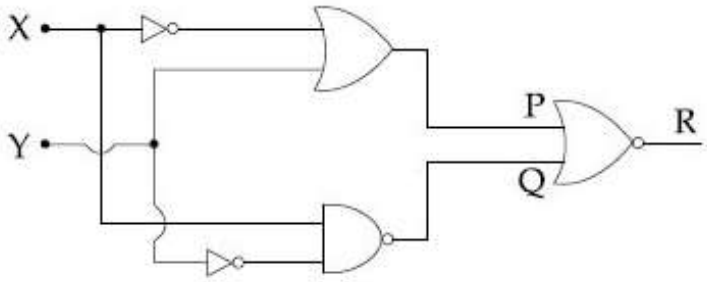
3. $X=1, Y=0$

4. $X=1, Y=1$

Question Number : 27 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 :

1. $X=0, Y=0$

2. $X=0, Y=1$

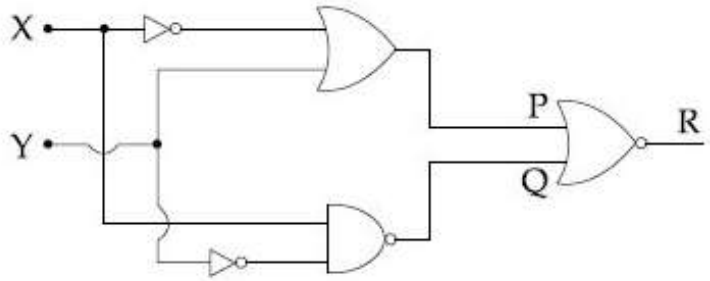
3. $X=1, Y=0$

4. $X=1, Y=1$

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

Correct Marks : 4 Wrong Marks : 1

આપેલ લૉજિક ગેટ પરિપથ માટે, R આગળ '1' મળે તે માટે ઇનપૂટ મૂલ્ય _____ જોઇશે જ.



Options :

1. $X=0, Y=0$

2. $X=0, Y=1$

3. $X=1, Y=0$

4. $X=1, Y=1$

Question Number : 28 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 $=6.4\times10^6$ m).

Options :

1. 40 km

2. 80 km

3. 65 km

4. 48 km

Question Number : 28 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 $=6.4\times10^6$ m)

Options :

1. 40 km

2. 80 km

3. 65 km

4. 48 km

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

Correct Marks : 4 Wrong Marks : 1

એક ટીવી ટ્રાન્સમીશન (પ્રસારણ) ટાવરની ઊંચાઈ 140 m અને રિસિવિંગ (ગ્રહણ) એન્ટિનાની ઊંચાઈ 40 m છે. તો આ ટાવર પર થી દૃષ્ટિ-રેખા (Line of Sight) અવસ્થામાં કેટલા મહત્તમ અંતર સુધી સિગ્નલને પ્રસારિત કરી શકાય? (પૃથ્વીની ત્રિજ્યા $=6.4\times10^6$ m આપેલ છે.)

Options :

1. 40 km

2. 80 km

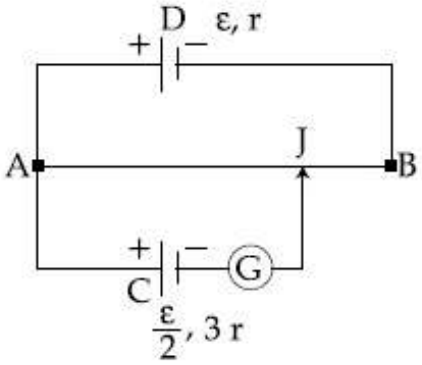
3. 65 km

4. 48 km

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



Options :

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

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

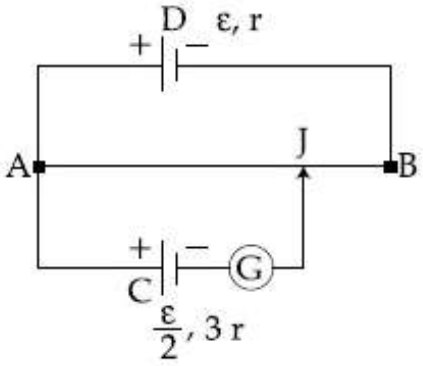
3. $\frac{11}{24}$ L

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

Question Number : 29 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 લંબાઇનો અને 12 r નો અવરોધ ધરાવતા એક પોટેન્શીયોમીટર તાર AB અને ε જેટલું emf અને r જેટલો આંતરિક અવરોધ ધરાવતા કોષ D સાથે જોડવામાં આવે છે. ε/2 જેટલું emf અને 3r જેટલો આતંરિક અવરોધ ધરાવતા કોષ C ને આકૃતિમાં દર્શાવ્યા મુજબ જોડવામાં આવે છે. ગેલ્વેનોમીટરમાં દર્શાવતું શૂન્ય આવર્તન માટેની લંબાઈ AJ _____હશે.



Options :

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

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

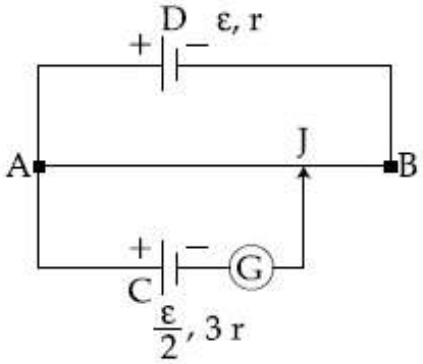
3. $\frac{11}{24}$ L

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

Question Number : 29 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 12 r के एक विभवमापी तार AB को वि.वा.बल ε तथा आन्तरिक प्रतिरोध r की एक सेल D से जोड़ते है। 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 :

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

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

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

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

Question Number : 30 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 :

1. 0.4 mA

2. 20 mA

3. 63 mA

4. 100 mA

Question Number : 30 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 :

1. 0.4 mA

2. 20 mA

3. 63 mA

4. 100 mA

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

Correct Marks : 4 Wrong Marks : 1

એક 2 W ના કાર્બન અવરોધ પર અનુક્રમે લીલા, કાળા, રાતા અને બ્રાઉન (કથ્થાઈ) રંગનો વર્ણ સંકેત છે. આ અવરોધમાંથી પસાર કરી શકાતો મહત્તમ પ્રવાહ :

Options :

1. 0.4 mA

2. 20 mA

3. 63 mA

4. 100 mA

Chemistry

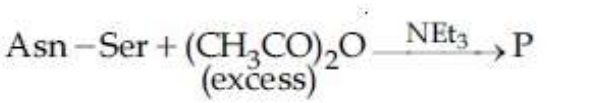
Section Id :	416529137
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529146
Question Shuffling Allowed :	Yes

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

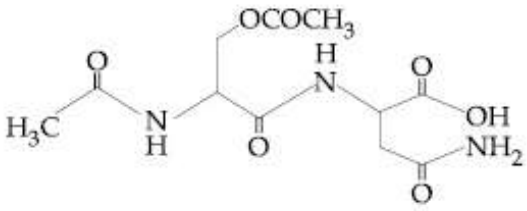
Correct Marks : 4 Wrong Marks : 1

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

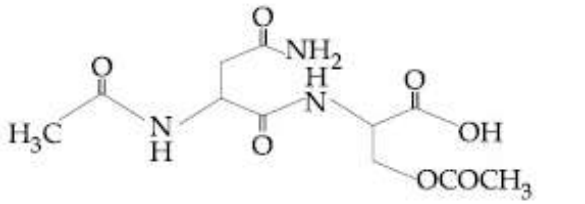


Options :

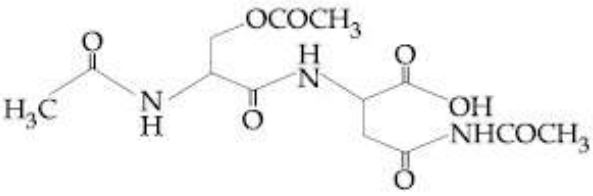
1.



2.



3.

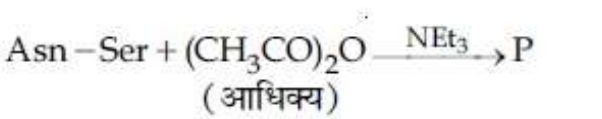


4.

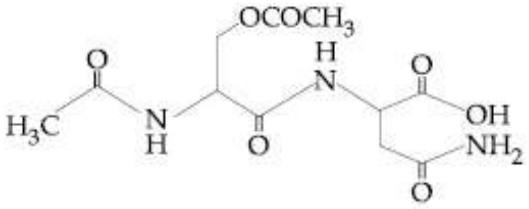
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

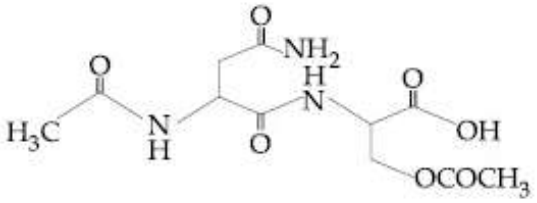
निम्न अभिक्रिया में उत्पाद 'P' की सही संरचना है



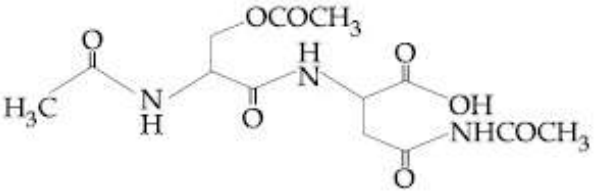
Options :



1.



2.



3.

4.

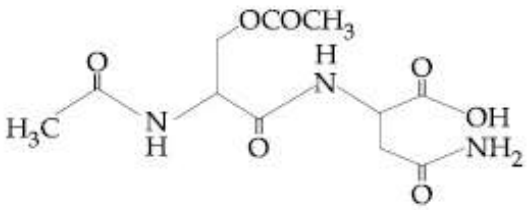
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયામાં મળતી નીપજ 'P' નું સાચું બંધારણ આપો ?

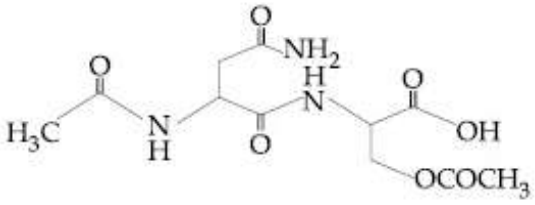
$$\text{Asn} - \text{Ser} + (CH_3CO)_2O \xrightarrow[\text{(વધુપડતો)}]{NEt_3} P$$

Options :

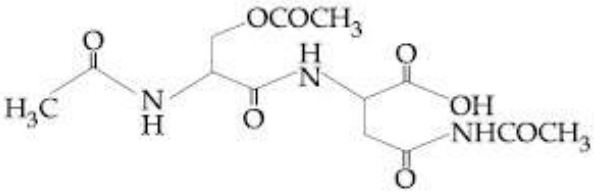


1.

2.



3.

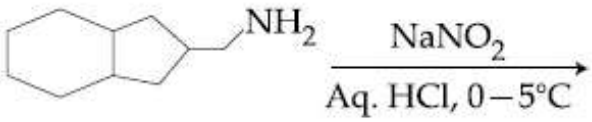


4.

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

Correct Marks : 4 Wrong Marks : 1

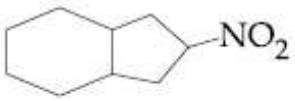
The major product formed in the reaction given below will be :



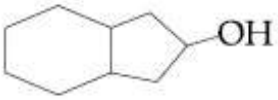
Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

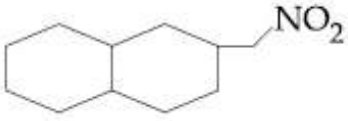
1.

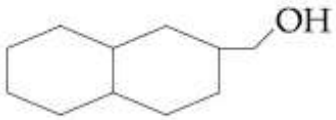


2.



3.

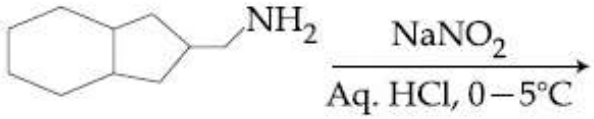


4. 

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

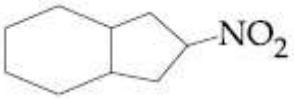
Correct Marks : 4 Wrong Marks : 1

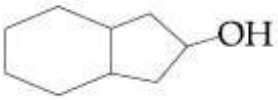
नीचे दी गई अभिक्रिया में बनने वाला मुख्य उत्पाद होगा :

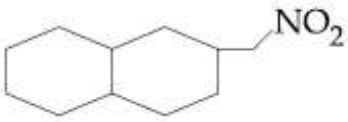


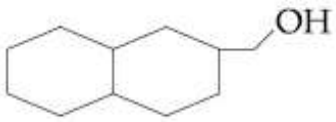
Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 

2. 

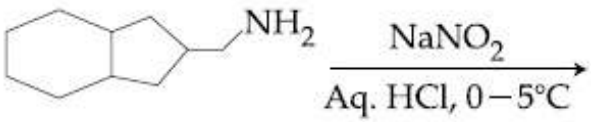
3. 

4. 

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

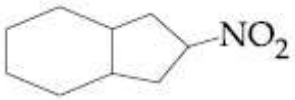
Correct Marks : 4 Wrong Marks : 1

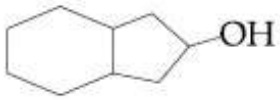
નીચે આપેલી પ્રક્રિયામાં મળતી મુખ્ય નીપજ કઇ હશે?

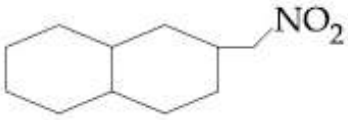


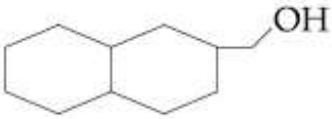
Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 

2. 

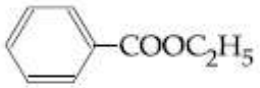
3. 

4. 

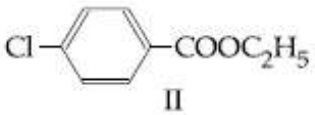
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

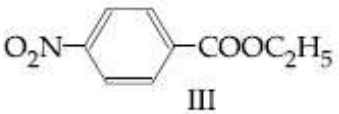
निम्न एस्टरों के लिए क्षारीय जल अपघटन के आसानी से होने का घटता क्रम है,



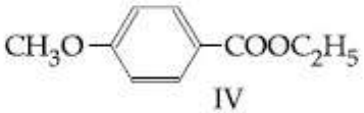
I



II



III



IV

Options :

1. III > II > IV > I

2. II > III > I > IV

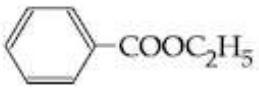
3. III > II > I > IV

4. IV > II > III > I

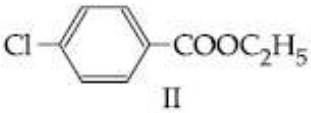
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

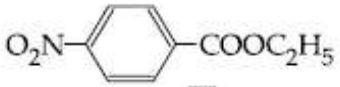
નીચે આપેલા એસ્ટરને બેઝિક જળવિભાજન કરવા માટે પડતી સરળતાનાં ઉતરતાક્રમમાં ગોઠવો.



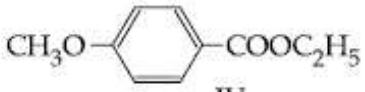
I



II



III



IV

Options :

1. III > II > IV > I

2. II > III > I > IV

3. III > II > I > IV

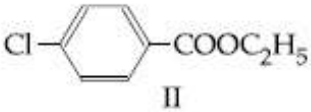
4. IV > II > III > I

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

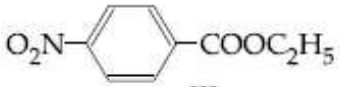
Correct Marks : 4 Wrong Marks : 1

The decreasing order of ease of alkaline hydrolysis for the following esters is

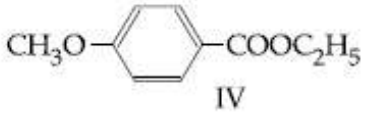
I



II



III



IV

Options :

1. III > II > IV > I

2. II > III > I > IV

3. III > II > I > IV

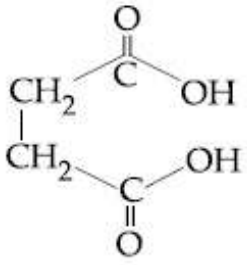
4. IV > II > III > I

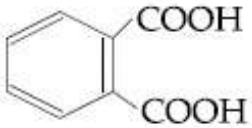
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

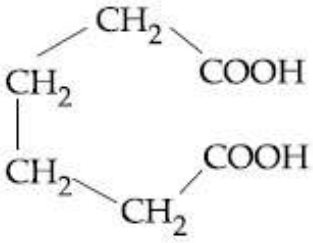
Correct Marks : 4 Wrong Marks : 1

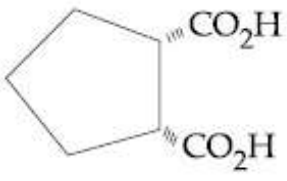
Which dicarboxylic acid in presence of a dehydrating agent is least reactive to give an anhydride ?

Options :

1. 

2. 

3. 

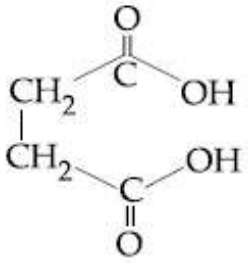
4. 

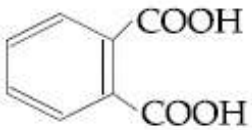
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

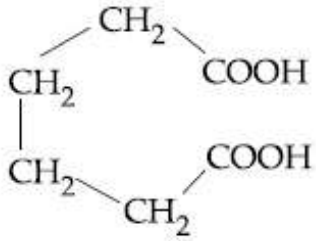
Correct Marks : 4 Wrong Marks : 1

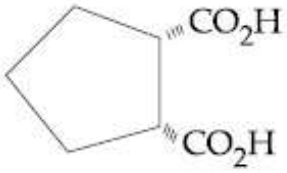
निम्न में से कौन डाइकार्बाक्सिलिक अम्ल निर्जलीकारक की उपस्थिति में एक ऐनहाइड्राइड देने के लिए सबसे कम अभिक्रियाशील है?

Options :

1. 

2. 

3. 

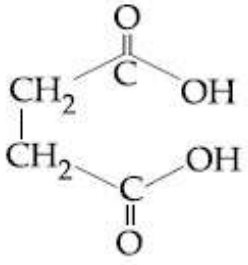
4. 

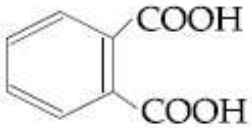
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

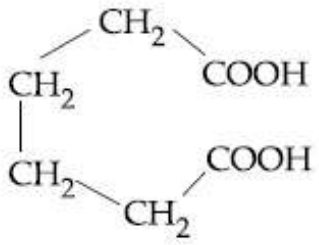
Correct Marks : 4 Wrong Marks : 1

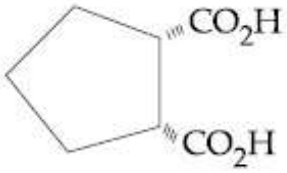
કયો ડાયકાર્બોક્સિલીક એસિડ નિર્જલીકરણ એજન્ટની હાજરીમાં એનહાઇડ્રાઇડ બનાવવા માટે ઓછામા ઓછો સક્રિય હશે?

Options :

1. 

2. 

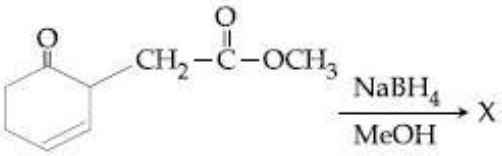
3. 

4. 

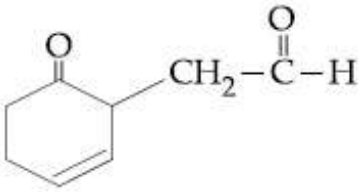
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

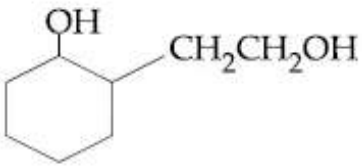
Correct Marks : 4 Wrong Marks : 1

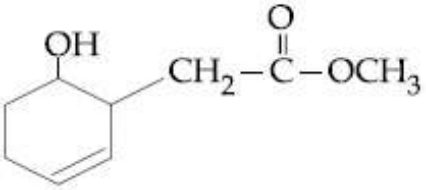
The major product 'X' formed in the following reaction is :

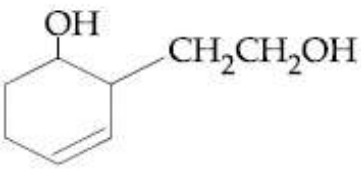


Options :

1. 

2. 

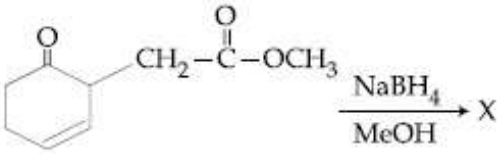
3. 

4. 

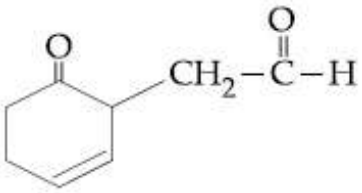
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

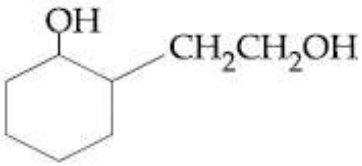
Correct Marks : 4 Wrong Marks : 1

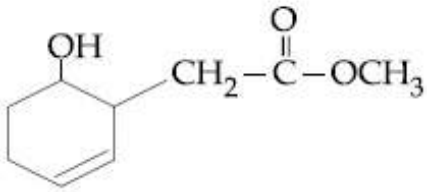
निम्न अभिक्रिया में बननेवाला मुख्य उत्पाद 'X' है

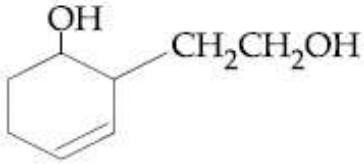


Options :

1.


2.


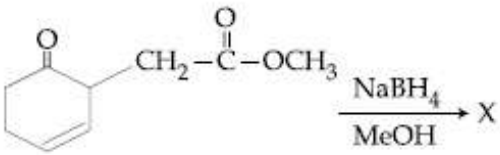
3.


4.


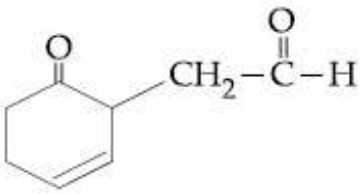
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

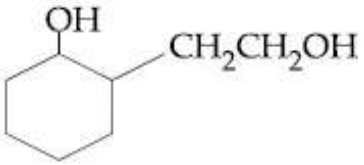
Correct Marks : 4 Wrong Marks : 1

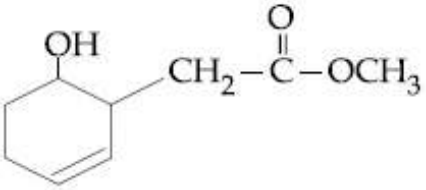
નીચેની પ્રક્રિયામાં બનતી મુખ્ય નીપજ 'X' શોધો.

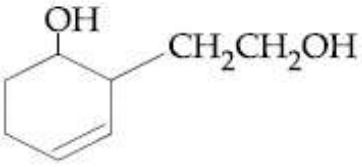


Options :

1. 

2. 

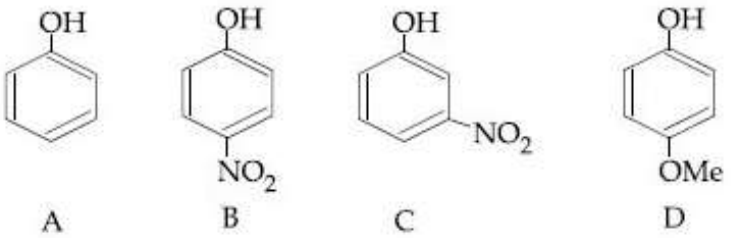
3. 

4. 

Question Number : 36 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 pKa values of the following compounds is :



Options :

1. D < A < C < B

2. B < C < A < D

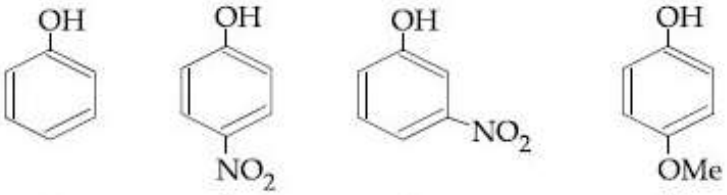
3. C < B < A < D

4. B < C < D < A

Question Number : 36 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 :

1. D < A < C < B

2. B < C < A < D

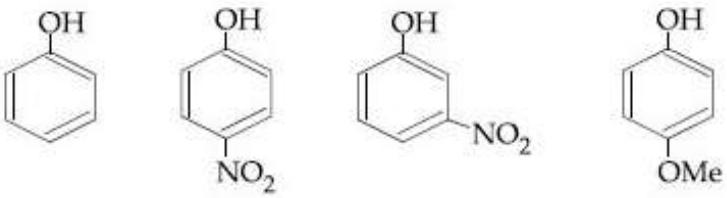
3. C < B < A < D

4. B < C < D < A

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંયોજનની pKa મૂલ્યની ચઢતો ક્રમ શોધો .



A B C D

Options :

1. D < A < C < B

2. B < C < A < D

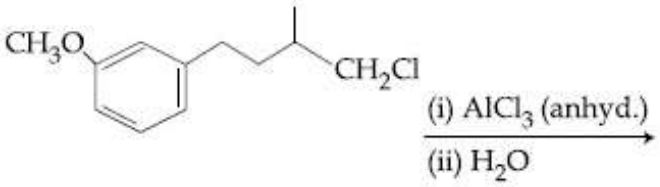
3. C < B < A < D

4. B < C < D < A

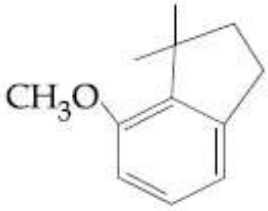
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

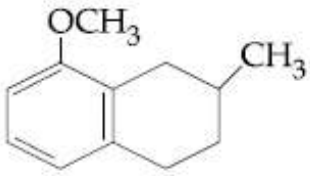
Correct Marks : 4 Wrong Marks : 1

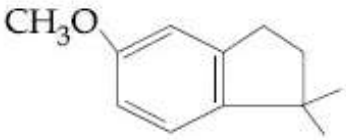
The major product of the following reaction is :

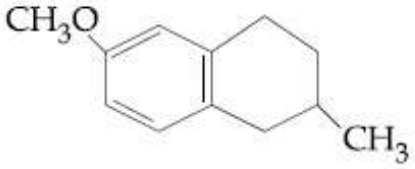


Options :

1.


2.


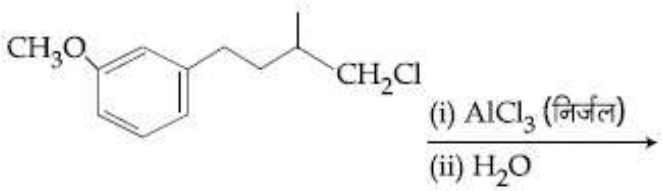
3.


4.


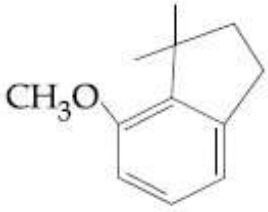
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

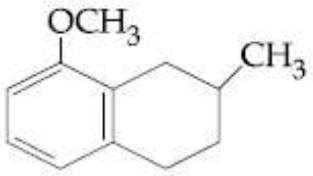
Correct Marks : 4 Wrong Marks : 1

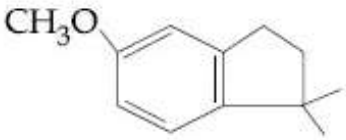
निम्न अभिक्रिया का मुख्य उत्पाद है :

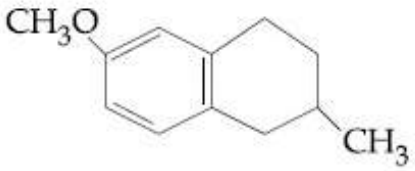


Options :

1.


2. 

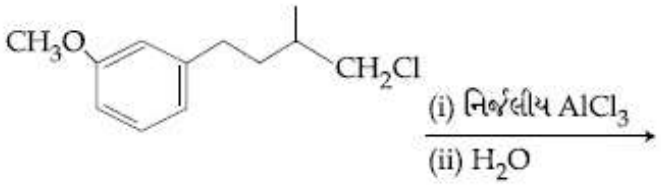
3. 

4. 

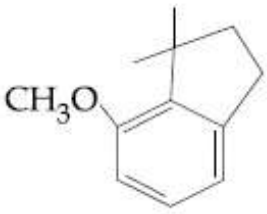
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

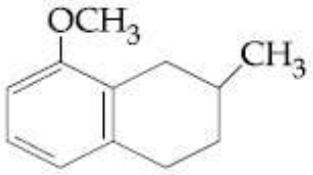
Correct Marks : 4 Wrong Marks : 1

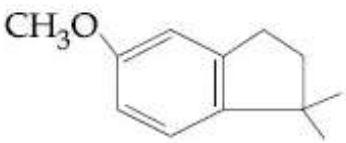
નીચેની પ્રક્રિયા માટેની મુખ્ય નીપજ કઇ ?

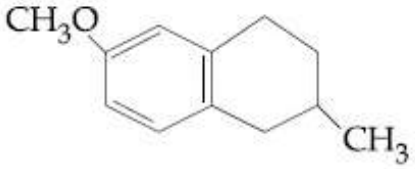


Options :

1. 

2. 

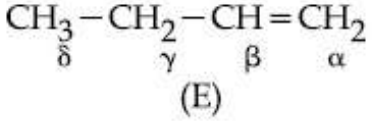
3. 

4. 

Question Number : 38 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 ?



(E)

Options :

1. α - hydrogen

2. β - hydrogen

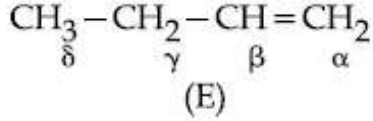
3. γ - hydrogen

4. δ - hydrogen

Question Number : 38 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?



(E)

Options :

1. α - हाइड्रोजन

2. β - हाइड्रोजन

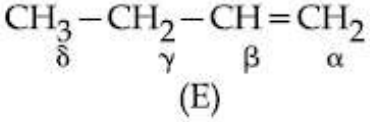
3. γ - हाइड्रोजन

4. δ - हाइड्रोजन

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

Correct Marks : 4 Wrong Marks : 1

પ્રકાશની હાજરીમાં સંયોજન (E) માંથી બ્રોમીનેશન પ્રક્રિયા દરિમ્યાન ક્યો હાઇડ્રોજન સહેલાયથી વિસ્થાપિત થશે?



(E)

Options :

1. α - હાઇડ્રોજન

2. β - હાઇડ્રોજન

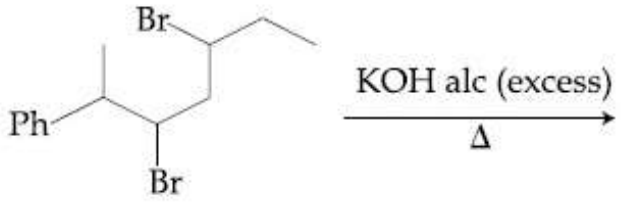
3. γ - હાઇડ્રોજન

4. δ - હાઇડ્રોજન

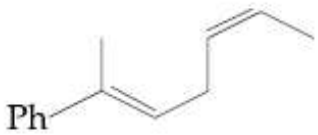
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

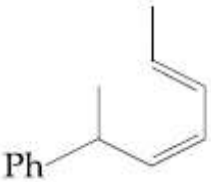
The major product of the following reaction is :



Options :

1. 

2. 

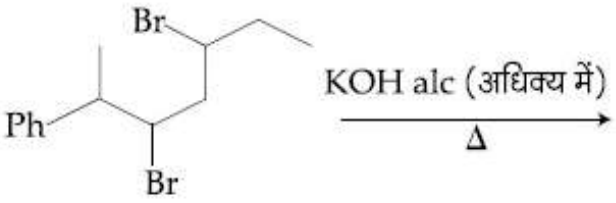
3. 

4. 

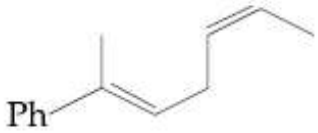
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

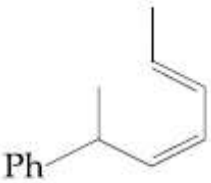
निम्न अभिक्रिया का मुख्य उत्पाद है :



Options :

1. 

2. 

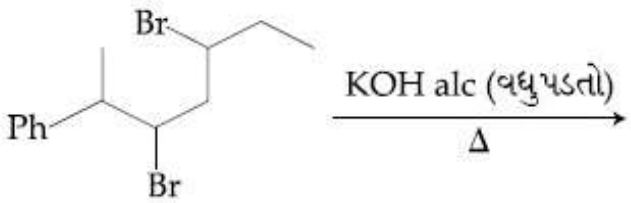
3. 

4. 

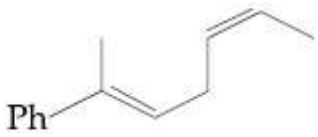
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

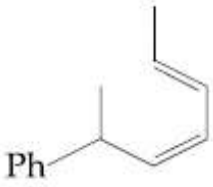
નીચેની પ્રક્રિયાની મુખ્ય નીપજ કઇ?

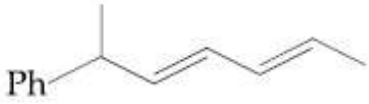


Options :

1. 

2. 

3. 

4. 

Question Number : 40 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 :

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

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

3. DCM and H_2O will make turbid/ colloidal mixture

4. DCM and H_2O will be miscible clearly

Question Number : 40 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 :

1. DCM तथा H_2O पृथक्कारी फनेल में क्रमश: ऊपरी तथा निचले भाग में रुकेंगे

2. DCM तथा H_2O पृथक्कारी फनेल में क्रमश: निम्न तथा उच्च सतहों में रुकेंगे

3. DCM तथा H_2O एक आविल/कोलाइडी विलयन बनायेंगे

4. DCM तथा H_2O स्पष्ट रूप से मिश्रणीय होंगे

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

Correct Marks : 4 Wrong Marks : 1

જો ડાઇક્લોરોમીથેન (DCM) અને પાણી (H_2O)નો ઉપયોગ વિકલ નિષ્કર્ષણ (differential extraction)માં કરવામાં આવે તો, નીચેના પૈકી કયુ એક વિધાન સાચુ ઠરે?

Options :

1. ભિન્નકારી ગળતીમાં DCM અને H_2O નું સ્તર અનુક્રમે ઊપર અને નીચે રહેશે.

2. ભિન્નકારી ગલથીમાં DCM અને H_2O નું સ્તર અનુક્રમે નીચે અને ઊપર રહેશે.

3. DCM અને H_2O નું મિશ્રણ ડહોળુ/કલિલી બનશે.

4. DCM અને H_2O સંપૂર્ણ મિશ્રણીય રહેશે.

Question Number : 41 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 :

1. Lithium

2. Carbon

3. Beryllium

4. Boron

Question Number : 41 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 :

1. लीथियम

2. कार्बन

3. बेरीलियम

4. बोरान

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

Correct Marks : 4 Wrong Marks : 1

એલ્યુમિનિયમની વિદ્યુતઋણતા કોની સમાન છે?

Options :

1. લિથીયમ

2. કાર્બન

3. બેરિલિયમ

4. બોરોન

Question Number : 42 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 :

1. $Cu^{2+}(aq) + H_2(g) \rightarrow Cu(s) + 2H^+(aq)$

2. $2\,Al_2O_3 + 3\,C \rightarrow 4\,Al + 3\,CO_2$

3. $ZnO + C \xrightarrow{\text{Coke, 1673 K}} Zn + CO$

4. $Cr_2O_3 + 2\,Al \rightarrow Al_2O_3 + 2\,Cr$

Question Number : 42 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 :

1. $Cu^{2+}(aq) + H_2(g) \rightarrow Cu(s) + 2H^+(aq)$

2. $2\,Al_2O_3 + 3\,C \rightarrow 4\,Al + 3\,CO_2$

3. $ZnO + C \xrightarrow{\text{कोक, 1673 K}} Zn + CO$

4. $Cr_2O_3 + 2\,Al \rightarrow Al_2O_3 + 2\,Cr$

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

Correct Marks : 4 Wrong Marks : 1

હોલ-હેરોલ્ટ પ્રક્રમ નીચેનામાંથી કયુ છે?

Options :

1. $Cu^{2+}(aq) + H_2(g) \rightarrow Cu(s) + 2H^+(aq)$

2. $2\,Al_2O_3 + 3\,C \rightarrow 4\,Al + 3\,CO_2$

3. $ZnO + C \xrightarrow{\text{Coke, 1673 K}} Zn + CO$

4. $Cr_2O_3 + 2\,Al \rightarrow Al_2O_3 + 2\,Cr$

Question Number : 43 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 :

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

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

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

4. Oxidising and reducing agent in both acidic and basic medium.

Question Number : 43 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 :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

હાઇડ્રોજન પેરોક્સાઇડનો રાસાયણિક સ્વભાવ કેવો છે?

Options :

1. એસિડીક માધ્યમમા ઓક્સીડિશન કર્તા, પરંતુ બેઝિક માધ્યમમા નહીં.

2. બેઝિક માધ્યમમા રીડક્શનકર્તા, પરંતુ એસિડિક માધ્યમમા નહીં.

3. એસિડીક માધ્યમમા ઓક્સિડેશન કર્તા અને રિડક્શનકર્તા પરંતુ બેઝિક માધ્યમમા નહીં.

4. એસિડિક અને બેઝિક બંને માધ્યમમા ઓક્સિડેશનકર્તા અને રિડક્શનકર્તા.

Question Number : 44 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 :

1. 2 and 1

2. 3 and 1

3. 2 and 0

4. 3 and 2

Question Number : 44 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 :

1. 2 तथा 1

2. 3 तथा 1

3. 2 तथा 0

4. 3 तथा 2

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

Correct Marks : 4 Wrong Marks : 1

હાઇડ્રોજનના કુલ સમસ્થાનિકો અને તેમાના કિરણોત્સર્ગી સમસ્થાનિકો અનુક્રમે છે :

Options :

1. 2 અને 1

2. 3 અને 1

3. 2 અને 0

4. 3 અને 2

Question Number : 45 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 :

1. Mg

2. Ca

3. Na

4. Be

Question Number : 45 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 :

1. Mg

2. Ca

3. Na

4. Be

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

Correct Marks : 4 Wrong Marks : 1

ક્ષ-કિરણ નળની બારી બનવવામાં વપરાતી ધાતુ કઈ?

Options :

1. Mg

2. Ca

3. Na

4. Be

Question Number : 46 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 :

1. sp^3d and 1

2. sp^3d and 2

3. sp^3d^2 and 1

4. sp^3d^2 and 2

Question Number : 46 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 क्रमश: हैं :

Options :

1. sp^3d तथा 1

2. sp^3d तथा 2

3. sp^3d^2 तथा 1

4. sp^3d^2 तथा 2

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

Correct Marks : 4 Wrong Marks : 1

$XeOF_4$ માં Xe નું સંકરણ અને એકાકી ઇલેક્ટ્રોન યુગ્મ (યુગ્મો) ની સંખ્યા અનુક્રમે :

Options :

1. sp^3d અને 1

2. sp^3d અને 2

3. sp^3d^2 અને 1

4. sp^3d^2 અને 2

Question Number : 47 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 :

1. decrease in both atomic and ionic radii

2. increase in atomic radii and decrease in ionic radii

3. decrease in atomic radii and increase in ionic radii

4. increase in both atomic and ionic radii

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

Correct Marks : 4 Wrong Marks : 1

तत्वों के लैन्थेनाइड श्रृंखला में लैन्थेनाइड संकुचन सामान्यतया दर्शाता है :

Options :

1. परमाणुक तथा आयनिक त्रिज्याओं दोनों का घटना

2. परमाणुक त्रिज्याओं का बढ़ना तथा आयनिक त्रिज्याओं का घटना

3. परमाणुक त्रिज्याओं का घटना तथा आयनिक त्रिज्याओं का बढ़ना

4. परमाणुक तथा आयनिक त्रिज्याओं दोनों का बढ़ना

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

Correct Marks : 4 Wrong Marks : 1

લેન્થેનાઇડ તત્વોની શ્રેણીમાં લેન્થેનાઇડ સંકોચન અસરનો મોટા ભાગે શો અર્થ થાય છે?

Options :

1. પરમાણ્વિય અને આયનીય ત્રિજ્યા બન્નેમાં ઘટાડો.

2. પરમાણ્વિય ત્રિજ્યામાં વધારો અને આયનિય ત્રિજ્યામાં ઘટાડો.

3. પરમાણ્વિય ત્રિજ્યામાં ઘટાડો અને આયનીય ત્રિજ્યામાં વધારો.

4. પરમાણ્વિય અને આયનીય ત્રિજ્યા બન્નેમાં વધારો.

Question Number : 48 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 :

1. $[(Ph_3P)_3RhCl] \quad (Et = C_2H_5)$

2. $[(Et_3P)_3RhCl]$

3. $[(Ph_3P)_3IrCl]$

4. $[(Et_3P)_3IrCl]$

Question Number : 48 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 :

1. $[(Ph_3P)_3RhCl]$ $(Et = C_2H_5)$

2. $[(Et_3P)_3RhCl]$

3. $[(Ph_3P)_3IrCl]$

4. $[(Et_3P)_3IrCl]$

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

Correct Marks : 4 Wrong Marks : 1

વિલ્કીન્સન ઉદ્દીપક નીચેનામાંથી કયો છે?

Options :

1. $[(Ph_3P)_3RhCl]$ $(Et = C_2H_5)$

2. $[(Et_3P)_3RhCl]$

3. $[(Ph_3P)_3IrCl]$

4. $[(Et_3P)_3IrCl]$

Question Number : 49 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 :

1. 4

2. 8

3. 12

4. 16

Question Number : 49 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 :

1. 4

2. 8

3. 12

4. 16

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

Correct Marks : 4 Wrong Marks : 1

આપેલા $[M(F)(Cl)(SCN)(NO_2)]$ સમતલીય સમચોરસ સંકીર્ણમાં કુલ કેટલા સમઘટકો છે?

Options :

1. 4

2. 8

3. 12

4. 16

Question Number : 50 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 :

1. B is more polluted than A.

2. A is more polluted than B.

3. A is suitable for drinking, whereas B is not.

4. Both A and B are suitable for drinking.

Question Number : 50 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 क्रमश: 10 तथा 20 है। सही कथन को पहचानिये :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

બે પ્યાલાઓ A અને B માં પાણી ભરેલું છે. જેમની જૈવરાસાયણિક ઓક્સિજન જરૂરિયાત (BOD) કિંમત અનુક્રમે 10 અને 20 છે. સાચુ વિધાન શોધો ?

Options :

1. B એ A કરતા વધુ પ્રદૂષિત છે.

2. A એ B કરતા વધુ પ્રદૂષિત છે.

3. A એ પીવા યોગ્ય છે, જ્યારે B નથી.

4. A અને B બન્ને પીવા યોગ્ય છે.

Question Number : 51 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 $Ca(OH)_2$ 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 $Ca(OH)_2$, Na_2SO_4 and $CaSO_4$ are 74, 143 and136 g mol^{-1}, respectively ; K_{sp} of $Ca(OH)_2$ is 5.5×10^{-6})

Options :

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

2. $1.9\ g, 0.14\ mol\ L^{-1}$

3. $13.6\ g, 0.14\ mol\ L^{-1}$

4. $1.9\ g, 0.28\ mol\ L^{-1}$

Question Number : 51 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, ($Ca(OH)_2$, Na_2SO_4 तथा $CaSO_4$ के मोलर द्रव्यमान हैं क्रमशः 74, 143 तथा 136 g mol^{-1}; $Ca(OH)_2$ का $K_{sp} = 5.5 \times 10^{-6}$)

Options :

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

2. $1.9\ g, 0.14\ mol\ L^{-1}$

3. $13.6\ g, 0.14\ mol\ L^{-1}$

4. $1.9\ g, 0.28\ mol\ L^{-1}$

Question Number : 51 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 $Ca(OH)_2$ અને 2 g સોડિયમ સલ્ફેટને મિશ્ર કરી, પાણીમાં ઓગાળી બનતા દ્રાવણનું કદ 100 mL સુધી લઇ જવામાં આવ્યુ. દ્રાવણમાં બનતા કેલ્શિયમ સલ્ફેટનું દળ અને પરિણામી દ્રાવણમાં OH^-ની સાંદ્રતા અનુક્રમે શું હશે?

($Ca(OH)_2$, Na_2SO_4 અને $CaSO_4$ ના આણ્વિય દળો અનુક્રમે 74, 143 અને 136 g mol^{-1} છે, $Ca(OH)_2$ નો દ્રાવ્યતા ગુણાકાર $K_{sp} = 5.5 \times 10^{-6}$).

Options :

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

2. $1.9\ g,\ 0.14\ mol\ L^{-1}$

3. $13.6\ g,\ 0.14\ mol\ L^{-1}$

4. $1.9\ g,\ 0.28\ mol\ L^{-1}$

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

Options :

1. Tetragonal

2. Hexagonal

3. Monoclinic

4. Triclinic

Question Number : 52 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 :

1. द्विसमलम्बाक्ष

2. षटकोणीय

3. एकनताक्ष

4. त्रिनताक्ष

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

Correct Marks : 4 Wrong Marks : 1

કયા આદિમ એકમ કોષમાં અસમાન ધાર લંબાઈ $(a \neq b \neq c)$ અને બધા અક્ષીય ખૂણાઓ 90° થી ભિન્ન હોય છે?

Options :

1. ટેટ્રાગોનલ

2. હેક્ઝાગોનલ

3. મોનોક્લિનિક્

4. ટ્રાઈક્લિનિક્

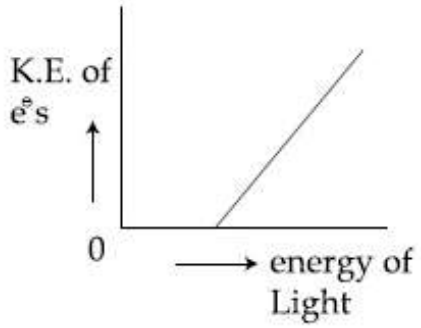
Question Number : 53 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

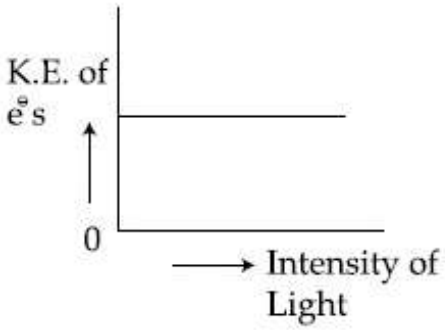
Which of the graphs shown below does not represent the relationship between incident light and the electron ejected from metal surface ?

Options :

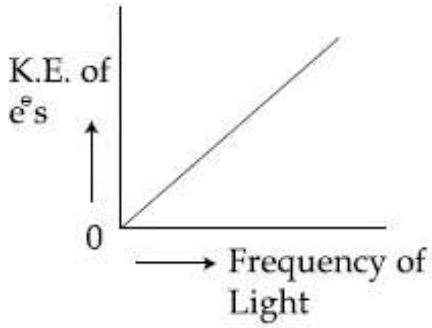
1.



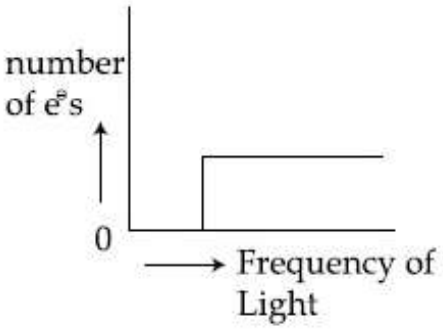
2.



3.



4.



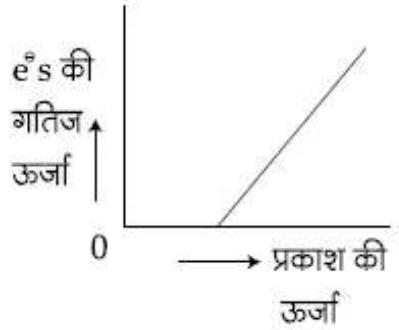
Question Number : 53 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

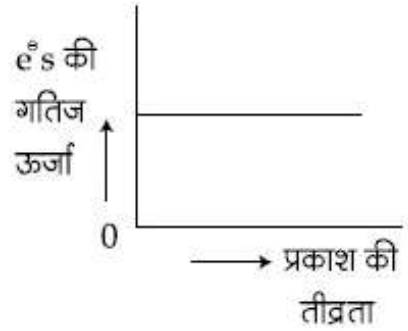
नीचे प्रदर्शित ग्राफ में से कौन-सा आपतित प्रकाश तथा धातु पृष्ठ से निष्कासित इलेक्ट्रॉन के बीच का सम्बन्ध सही ढंग से नहीं अभिव्यक्त करता है?

Options :

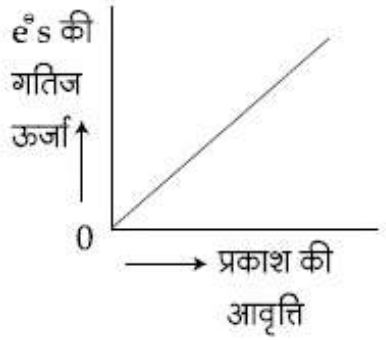
1.



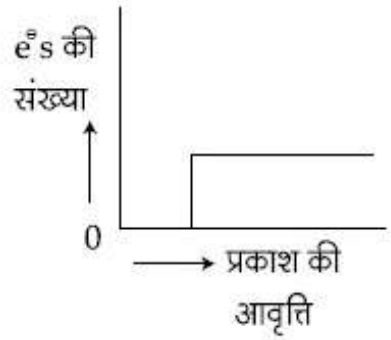
2.



3.



4.



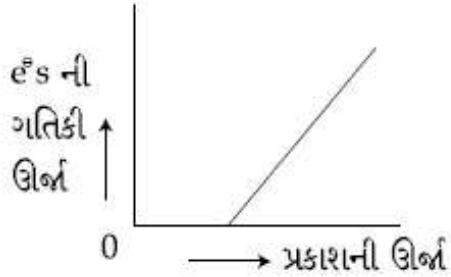
Question Number : 53 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

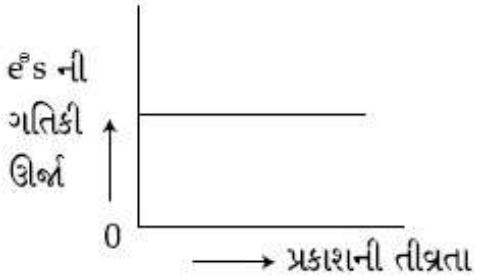
નીચેના આલેખોમાંથી કયો આલેખ આપાતી પ્રકાશ અને ધાતુની સપાટી પરીથી ઉત્સર્જત થતા ઇલેક્ટ્રોન વચ્ચેનો સંબંધ દર્શાવતો નથી?

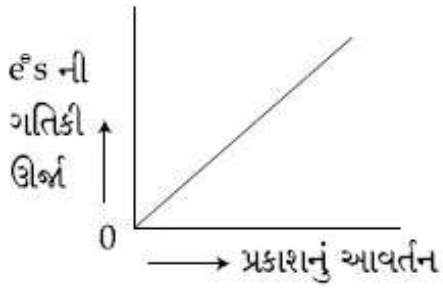
Options :

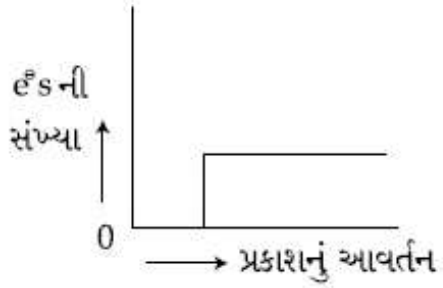
1.



2.



3. 

4. 

Question Number : 54 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 :

1. O_2^+

2. N_2

3. O_2

4. N_2^+

Question Number : 54 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 :

1. O_2^+

2. N_2

3. O_2

4. N_2^+

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

Correct Marks : 4 Wrong Marks : 1

નીચેનામાંથી કયામાં બે પાઈ અને અડધો સીગ્મા બંધો રહેલા છે?

Options :

1. O_2^+

2. N_2

3. O_2

4. N_2^+

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

Options :

1. 12 K

2. 5 K

3. 20 K

4. 4 K

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

Options :

1. 12 K

2. 5 K

3. 20 K

4. 4 K

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

Correct Marks : 4 Wrong Marks : 1

એક પ્રક્રિયામાં $\Delta H = 200\ Jmol^{-1}$ અને $\Delta S = 40\ JK^{-1}mol^{-1}$ છે. નીચે આપેલી કિંમતો પૈકી કોઇ ઓછામા ઓછુ તાપમાન પસંદ કરે કે જેનાથી ઊપર પ્રક્રિયા સ્વયંભૂ થશે?

Options :

1. 12 K

2. 5 K

3. 20 K

4. 4 K

Question Number : 56 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 7×10^3 Pa and 12×10^3 Pa, respectively. The composition of the vapor in equilibrium with a solution containing 40 mole percent of A at this temperature is :

Options :

1. $x_A = 0.76\ ;\ x_B = 0.24$

2. $x_A = 0.4\ ;\ x_B = 0.6$

3. $x_A = 0.37\ ;\ x_B = 0.63$

4. $x_A = 0.28 ; x_B = 0.72$

Question Number : 56 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 क्रमश: 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 :

1. $x_A = 0.76 ; x_B = 0.24$

2. $x_A = 0.4 ; x_B = 0.6$

3. $x_A = 0.37 ; x_B = 0.63$

4. $x_A = 0.28 ; x_B = 0.72$

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

Correct Marks : 4 Wrong Marks : 1

પ્રવાહી A અને B ના વિશાળ શ્રેણીના સંયોજનો આદર્શ દ્રાવણ બનાવે છે. 350 K તાપમાને શુદ્ધ A અને શુદ્ધ B ના બાષ્પદબાણ અનુક્રમે 7×10^3 Pa અને 12×10^3 Pa છે. જો આ તાપમાને પ્રવાહી A ની 40 મોલ ટકાવારી ધરાવતુ દ્રાવણ બાષ્પસાથે સંતુલિત અવસ્થામાં હોય, તો બાષ્પનું બંધારણ શોધો ?

Options :

1. $x_A = 0.76 ; x_B = 0.24$

2. $x_A = 0.4 ; x_B = 0.6$

3. $x_A = 0.37 ; x_B = 0.63$

4. $x_A = 0.28 ; x_B = 0.72$

Question Number : 57 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, $RT = 24.62\ dm^3 atm\ mol^{-1}$)

$N_2(g) + O_2(g) \rightleftharpoons 2\ NO(g)$

$N_2O_4(g) \rightleftharpoons 2\ NO_2(g)$

$N_2(g) + 3\ H_2(g) \rightleftharpoons 2\ NH_3(g)$

Options :

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

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

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

4. $1, 4.1 \times 10^{-2}\ dm^{-3} atm^{-1}\ mol, 606\ dm^6 atm^2\ mol^{-2}$

Question Number : 57 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 क्रमश: होंगे : (300 K पर $RT = 24.62\ dm^3 atm\ mol^{-1}$)

$N_2(g) + O_2(g) \rightleftharpoons 2\ NO(g)$

$N_2O_4(g) \rightleftharpoons 2\ NO_2(g)$

$N_2(g) + 3\ H_2(g) \rightleftharpoons 2\ NH_3(g)$

Options :

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

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

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

4. $1, 4.1 \times 10^{-2}\,dm^{-3}atm^{-1}\,mol,$
$606\,dm^6atm^2\,mol^{-2}$

Question Number : 57 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 એ નીચેની પ્રક્રિયામાટે K_p/K_c ની કિંમતો અનુક્રમે શોધો ?

(300 K એ, $RT = 24.62\,dm^3atm\,mol^{-1}$)

$N_2(g) + O_2(g) \rightleftharpoons 2\,NO(g)$

$N_2O_4(g) \rightleftharpoons 2\,NO_2(g)$

$N_2(g) + 3\,H_2(g) \rightleftharpoons 2\,NH_3(g)$

Options :

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

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

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

4. $1, 4.1 \times 10^{-2}\,dm^{-3}atm^{-1}\,mol,$
$606\,dm^6atm^2\,mol^{-2}$

Question Number : 58 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 :

$Zn^{2+} + 2e^- \rightarrow Zn(s);\ E^o = -0.76\ V$

$Ca^{2+} + 2e^- \rightarrow Ca(s);\ E^o = -2.87\ V$

$Mg^{2+} + 2e^- \rightarrow Mg(s);\ E^o = -2.36\ V$

$Ni^{2+} + 2e^- \rightarrow Ni(s);\ E^o = -0.25\ V$

The reducing power of the metals increases in the order :

Options :

1. $Ca < Zn < Mg < Ni$

2. $Ca < Mg < Zn < Ni$

3. $Ni < Zn < Mg < Ca$

4. $Zn < Mg < Ni < Ca$

Question Number : 58 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

$Zn^{2+} + 2e^- \rightarrow Zn(s); E^o = -0.76\ V$

$Ca^{2+} + 2e^- \rightarrow Ca(s); E^o = -2.87\ V$

$Mg^{2+} + 2e^- \rightarrow Mg(s); E^o = -2.36\ V$

$Ni^{2+} + 2e^- \rightarrow Ni(s); E^o = -0.25\ V$

धातुओं की अपचायक सामर्थ्य इस क्रम में बढ़ेगी :

Options :

1. $Ca < Zn < Mg < Ni$

2. $Ca < Mg < Zn < Ni$

3. $Ni < Zn < Mg < Ca$

4. $Zn < Mg < Ni < Ca$

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

Correct Marks : 4 Wrong Marks : 1

નીચેની રીડક્શન પ્રક્રિયાઓને ધ્યાનમાં લો :

$Zn^{2+} + 2e^- \rightarrow Zn(s); E^o = -0.76\ V$

$Ca^{2+} + 2e^- \rightarrow Ca(s); E^o = -2.87\ V$

$Mg^{2+} + 2e^- \rightarrow Mg(s); E^o = -2.36\ V$

$Ni^{2+} + 2e^- \rightarrow Ni(s); E^o = -0.25\ V$

ધાતુઓની રિડક્શનકર્તા શક્તિનો ચઢતો ક્રમ :

Options :

1. $Ca < Zn < Mg < Ni$

2. $Ca < Mg < Zn < Ni$

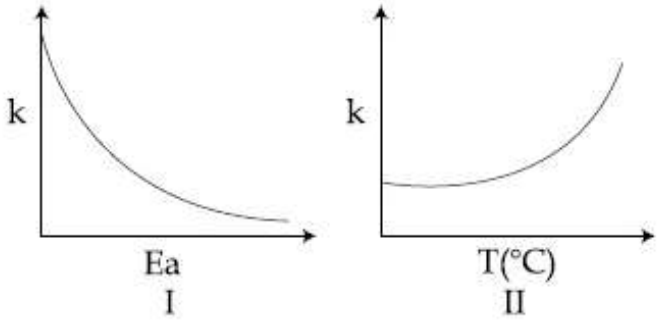
3. $Ni < Zn < Mg < Ca$

4. $Zn < Mg < Ni < Ca$

Question Number : 59 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 ($0°C < T < 300°C$) : (k and E_a are rate constant and activation energy, respectively)



Choose the correct option :

Options :

1. Both I and II are correct

2. Both I and II are wrong

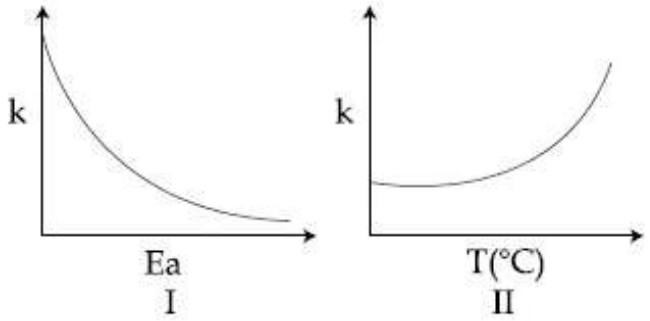
3. I is right but II is wrong

4. I is wrong but II is right

Question Number : 59 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 प्लाटों पर विचार कीजिए ($0°C < T < 300°C$), (k तथा E_a क्रमशः दर नियतांक तथा संक्रमण ऊर्जा हैं)



सही विकल्प चुनिये :

Options :

1. I तथा II दोनों सही हैं

2. I तथा II दोनों गलत हैं

3. I सही है परन्तु II गलत है

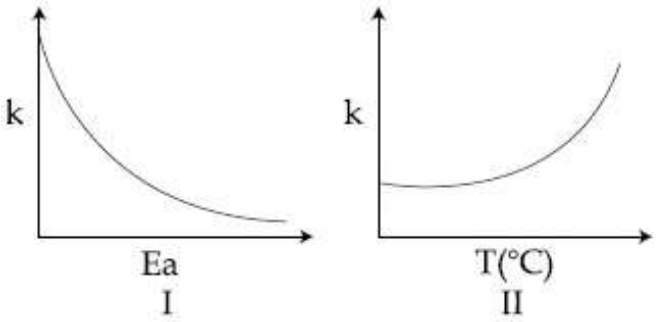
4. I गलत है परन्तु II सही है

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

Correct Marks : 4 Wrong Marks : 1

આર્હેનિયસના સમીકરણને અનુસરતિ કોઈ એક પ્રક્રિયાના આલોખો નીચે આપેલા છે ($0°C < T < 300°C$)

(k અને E_a અનુક્રમે પ્રક્રિયા વેગ અને સક્રીયકરણ શક્તિ છે.)



સાચો વિકલ્પ આપો.

Options :

1. I અને II બન્ને સાચા છે.

2. I અને II બન્ને ખોટા છે.

3. I સાચો છે પણ II ખોટો છે.

4. I ખોટો છે પણ II સાચો છે.

Question Number : 60 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 :

1. Haber's process

2. Combustion of coal

3. Hydrogenatoin of vegetable oils

4. Ostwald's process

Question Number : 60 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 :

1. हैबर प्रक्रम

2. कोयले का दहन

3. वनस्पति तेलों का हाइड्रोजनीकरण

4. ओस्टवाल्ड प्रक्रम

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

Correct Marks : 4 Wrong Marks : 1

નીચેનામાંથી કઈ વિસમાંગી ઉદ્દીપકીય પ્રક્રિયાનું ઉદાહરણ નથી?

Options :

1. હેબર પ્રક્રિયા

2. કોલસાનું દહન

3. વનસ્પતિ તેલનું હાઇડ્રોજનીકરણ

4. ઓસ્વાલ્ડની પ્રક્રિયા

Mathematics

Section Id :	416529138
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:	416529147
Question Shuffling Allowed :	Yes

Question Number : 61 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 :

1. 1

2. 102

3. 38

4. 42

Question Number : 61 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 :

1. 1

2. 102

3. 38

4. 42

Question Number : 61 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 વિદ્યાર્થીઓના એક વર્ગમાં વિદ્યાર્થીઓને 1 થી 140 ક્રમાંક આપેલા છે. બધા જ યુગ્મ ક્રમાંકિત વિદ્યાર્થીઓ ગણિત વિષય પસંદ કરે છે. જેનો ક્રમાંક 3 વડે વિભાજ્ય હોય તેવા વિદ્યાર્થીઓ ભૌતિકશાસ્ત્ર વિષય તથા જેનો ક્રમાંક 5 વડે વિભાજ્ય હોય તેવા વિદ્યાર્થીઓ રસાયણશાસ્ત્ર વિષય પસંદ કરે છે. તો આ ત્રણમાંથી કોઈ પણ વિષય પસંદ ન કર્યો હોય તેવા વિદ્યાર્થીઓની સંખ્યા _____ છે.

Options :

1. 1

2. 102

3. 38

4. 42

Question Number : 62 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 :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

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

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

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

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

Question Number : 62 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 :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે z_1 અને z_2 એ કોઈ એવી બે શૂન્યેતર સંકર સંખ્યાઓ છે કે જેથી $3|z_1|=4|z_2|$ થાય. જો $z=\frac{3z_1}{2z_2}+\frac{2z_2}{3z_1}$ હોય, તો _____.

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. $\mathrm{Im}(z)=0$

2. $\mathrm{Re}(z)=0$

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

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

Question Number : 63 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 :

1. 18

2. 12

3. 11

4. 10

Question Number : 63 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 $(c-5)x^2-2cx+(c-4)=0$, $c\neq5$ 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 :

1. 18

2. 12

3. 11

4. 10

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

Correct Marks : 4 Wrong Marks : 1

દ્વિઘાત સમીકરણ $(c-5)x^2-2cx+(c-4)=0, c\neq5$ નો વિચાર કરો. ધારો કે S એ c ની એવી પૂર્ણાંક કિંમતોનો ગણ છે કે જેથી સમીકરણનું એક બીજ (0, 2) અંતરાલમાં આવે તથા તેનું બીજું બીજ (2, 3) અંતરાલમાં આવે. તો S ના ઘટકોની સંખ્યા _____ છે.

Options :

1. 18

2. 12

3. 11

4. 10

Question Number : 64 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 $d\in\mathbf{R}$, 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 :

1. -5

2. $2\left(\sqrt{2}+2\right)$

3. -7

4. $2\left(\sqrt{2}+1\right)$

Question Number : 64 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 $d \in R$ 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 :

1. -5

2. $2\left(\sqrt{2}+2\right)$

3. -7

4. $2\left(\sqrt{2}+1\right)$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $d \in R$ અને

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

$\theta \in [0, 2\pi]$. જો det(A) ની ન્યૂનતમ કિંમત 8 હોય, તો d ની કોઈ એક કિંમત _____ છે.

Options :

1. -5

2. $2\left(\sqrt{2}+2\right)$

3. -7

4. $2\left(\sqrt{2}+1\right)$

Question Number : 65 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 :

1. 5

2. 18

3. 8

4. 21

Question Number : 65 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 :

1. 5

2. 18

3. 8

4. 21

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

Correct Marks : 4 Wrong Marks : 1

જો સમીકરણ સંહતિ

$$x+y+z=5$$
$$x+2y+3z=9$$
$$x+3y+\alpha z=\beta$$

ને અનંત ઉકેલો હોય, તો $\beta-\alpha$ બરાબર _____.

Options :

1. 5

2. 18

3. 8

4. 21

Question Number : 66 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 :

1. 50

2. 100

3. 200

4. 400

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

Correct Marks : 4 Wrong Marks : 1

જો $\sum_{i=1}^{20}\left(\frac{{}^{20}C_{i-1}}{{}^{20}C_i+{}^{20}C_{i-1}}\right)^3=\frac{k}{21}$, તો k બરાબર

_____ છે.

Options :

1. 50

2. 100

3. 200

4. 400

Question Number : 66 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 :

1. 50

2. 100

3. 200

4. 400

Question Number : 67 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 $\left(1+x^{\log_2 x}\right)^5$ equals 2560, then a possible value of x is :

Options :

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

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

3. $2\sqrt{2}$

4. $4\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

यदि $\left(1+x^{\log_2 x}\right)^5$ के द्विपद प्रसार में तीसरा पद 2560

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

Options :

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

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

3. $2\sqrt{2}$

4. $4\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

$\left(1+x^{\log_2 x}\right)^5$ ના દ્વિપદી વિસ્તરણમાં ત્રીજું પદ બરાબર

2560 હોય, તો x ની કોઈ એક શક્ય કિંમત _____

છે.

Options :

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

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

3. $2\sqrt{2}$

4. $4\sqrt{2}$

Question Number : 68 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, $5r^2$ are the lengths of the sides of a triangle, then r **cannot** be equal to :

Options :

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

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

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

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

Question Number : 68 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, $5r^2$ है,
तो r निम्न में से किसके बराबर **नहीं** हो सकता?

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

જો 5, 5r, $5r^2$ એ કોઈ એક ત્રિકોણની બાજુઓની લંબાઈઓ
હોય, તો r એ _____ ન હોઈ શકે.

Options :

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

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

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

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

Question Number : 69 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 :

1. 1465

2. 1256

3. 1356

4. 1365

Question Number : 69 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 :

1. 1465

2. 1256

3. 1356

4. 1365

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

Correct Marks : 4 Wrong Marks : 1

જ્યારે 7 વડે ભાગવાથી શેષ તરીકે 2 અથવા 5 મળે એવી બે અંકોવાળી તમામ ધન સંખ્યાઓનો સરવાળો _____ થાય.

Options :

1. 1465

2. 1256

3. 1356

4. 1365

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

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

Options :

1. equals 0

2. equals 1

3. equals -1

4. does not exist

Question Number : 70 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 $t \in \mathbf{R}$ के लिए, माना $[t]$, t के समान या उससे कम महत्तम पूर्णांक है, तो

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

Options :

1. 0 के बराबर है।

2. 1 के बराबर है।

3. -1 के बराबर है।

4. का अस्तित्व नहीं है।

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

Correct Marks : 4 Wrong Marks : 1

પ્રત્યેક $t \in \mathbf{R}$ માટે, ધારો કે $[t]$ એ t થી નાના અથવા t ને સમાન તમામ પૂર્ણાંકોમાં સૌથી મોટો પૂર્ણાંક છે. તો

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

Options :

1. બરાબર 0

2. બરાબર 1

3. બરાબર -1

4. નું અસ્તિત્વ નથી

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. is an empty set

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. एक रिक्त समुच्चय है।

2. $\{-2, -1, 1, 2\}$ के बराबर है।

3. $\{-2, -1, 0, 1, 2\}$ के बराबर है।

4. $\{-2, 2\}$ के बराबर है।

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

Correct Marks : 4 Wrong Marks : 1

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

ધારો કે S એ $(-4, 4)$ અંતરાલમાં આવેલા એવાં બિંદુઓનો ગણ છે કે જ્યાં f વિકલનીય નથી. તો S _____.

Options :

1. ખાલી ગણ છે

2. બરાબર $\{-2, -1, 1, 2\}$

3. બરાબર $\{-2, -1, 0, 1, 2\}$

4. બરાબર $\{-2, 2\}$

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

Correct Marks : 4 Wrong Marks : 1

Let $f : \mathbf{R}\to\mathbf{R}$ be a function such that
$f(x) = x^3+x^2f'(1)+xf''(2)+f'''(3), x\epsilon\mathbf{R}$.
Then $f(2)$ equals :

Options :

1. -4

2. 30

3. 8

4. -2

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

Options :

1. -4

2. 30

3. 8

4. -2

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f : \mathbf{R} \to \mathbf{R}$ એક એવું વિધેય છે કે જેથી $f(x) = x^3 + x^2 f'(1) + x f''(2) + f'''(3), x \in \mathbf{R}$ તો $f(2)$ બરાબર _____ .

Options :

1. -4

2. 30

3. 8

4. -2

Question Number : 73 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 :

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

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

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

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

Question Number : 73 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 :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

બિંદુ $\left(\frac{3}{2}, 0\right)$ અને વક્ર $y=\sqrt{x}$, $(x>0)$ વચ્ચેનું ન્યૂનતમ અંતર _____ છે.

Options :

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

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

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

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

Question Number : 74 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 :

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

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

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

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

Question Number : 74 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 :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $n \geq 2$ એક પ્રાકૃતિક સંખ્યા છે અને $0<\theta<\pi/2$

તો $\int \frac{(\sin^n\theta - \sin\theta)^{\frac{1}{n}} \cos\theta}{\sin^{n+1}\theta} d\theta$ બરાબર

_____ થાય.

(જ્યાં C એ સંકલનનો અચળાંક છે.)

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $I=\int_a^b(x^4-2x^2)dx$. જો I ન્યૂનતમ હોય તો

ક્રમયુક્ત જોડ (a, b) એ _____ છે.

Options :

1. $(0, \sqrt{2})$

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

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

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

Question Number : 75 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 :

1. $(0, \sqrt{2})$

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

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

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

Question Number : 75 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 :

1. $(0, \sqrt{2})$

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

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

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

Question Number : 76 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 :

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

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

3. $\sqrt{3}$

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

Question Number : 76 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 :

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

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

3. $\sqrt{3}$

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

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

Correct Marks : 4 Wrong Marks : 1

જો વક્રો $y = kx^2$ અને $x = ky^2$, $(k>0)$ વચ્ચે ઘેરાયેલ પ્રદેશનું ક્ષેત્રફળ 1 ચોરસ એકમ હોય, તો k એ _____ છે.

Options :

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

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

3. $\sqrt{3}$

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

Question Number : 77 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 :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

જો $\frac{dy}{dx}+\frac{3}{\cos^2 x}y=\frac{1}{\cos^2 x}, x\in\left(\frac{-\pi}{3}, \frac{\pi}{3}\right)$ અને

$y\left(\frac{\pi}{4}\right)=\frac{4}{3}$, તો $y\left(-\frac{\pi}{4}\right)$ બરાબર _____.

Options :

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

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

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

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

Question Number : 77 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 :

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

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

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

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

Question Number : 78 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 :

1. $(4, 3)$

2. $(2, 2)$

3. $(3, 4)$

4. $(4, 4)$

Question Number : 78 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 अन्त:केंद्र है :

Options :

1. $(4, 3)$

2. $(2, 2)$

3. $(3, 4)$

4. $(4, 4)$

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

Correct Marks : 4 Wrong Marks : 1

જો રેખા $3x+4y-24=0$ એ x-અક્ષને બિંદુ A આગળ છેદે અને y-અક્ષને બિંદુ B આગળ છેદે, તો ત્રિકોણ OAB નું અંતઃકેન્દ્ર, જ્યાં O એ ઉગમબિંદુ છે, _____ છે.

Options :

1. $(4, 3)$

2. $(2, 2)$

3. $(3, 4)$

4. $(4, 4)$

Question Number : 79 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 :

1. parallel to x-axis

2. parallel to y-axis

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

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

Question Number : 79 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 :

1. जो कि x-अक्ष के समांतर है।

2. जो कि y-अक्ष के समांतर है।

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

4. जिसकी ढाल $\frac{2}{3}$ ।

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

Correct Marks : 4 Wrong Marks : 1

કોઈ એક બિંદુ P એ રેખા $2x-3y+4=0$ પર ગતિ કરે છે. જો Q(1, 4) અને R(3, −2) એ સ્થિર બિંદુઓ હોય, તો ΔPQR ના મધ્યકેન્દ્રનો બિંદુપથ એ _____.

Options :

1. x-અક્ષને સમાંતર રેખા છે

2. y-અક્ષને સમાંતર રેખા છે

3. $\frac{3}{2}$ ઢાળવાળી રેખા છે

4. $\frac{2}{3}$ ઢાળવાળી રેખા છે

Question Number : 80 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 :

1. $\sqrt{57}$

2. 4

3. $2\sqrt{5}$

4. 5

Question Number : 80 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 :

1. $\sqrt{57}$

2. 4

3. $2\sqrt{5}$

4. 5

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

Correct Marks : 4 Wrong Marks : 1

જો બિંદુ (4, 0) માંથી પસાર થતું એક વર્તુળ C એ વર્તુળ $x^2+y^2+4x-6y=12$ ને બિંદુ (1, −1) આગળ બહારથી સ્પર્શે, તો C ની ત્રિજ્યા _____ થાય.

Options :

1. $\sqrt{57}$

2. 4

3. $2\sqrt{5}$

4. 5

Question Number : 81 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) ?

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

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

2. $(1, 1, 3)$

3. $(1, 1, 0)$

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

Question Number : 81 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?

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

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

2. $(1, 1, 3)$

3. $(1, 1, 0)$

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

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

Correct Marks : 4 Wrong Marks : 1

જો પરવલયો $y^2 = 4b(x - c)$ અને $y^2 = 8ax$ ને કોઈ સામાન્ય અભિલંબ હોય, તો નીચેના પૈકી કયું, ક્રમયુક્ત ત્રય (a, b, c) માટેની યોગ્ય પસંદગી છે?

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

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

2. $(1,1,3)$

3. $(1,1,0)$

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

Question Number : 82 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 :

1. $x-y+1=0$

2. $x-y+7=0$

3. $x-y-3=0$

4. $x-y+9=0$

Question Number : 82 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 :

1. $x-y+1=0$

2. $x-y+7=0$

3. $x-y-3=0$

4. $x-y+9=0$

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

Correct Marks : 4 Wrong Marks : 1

અતિવલય $4x^2-5y^2=20$ ના, રેખા $x-y=2$ ને સમાંતર હોય એવા એક સ્પર્શકનું સમીકરણ_____ છે.

Options :

1. $x-y+1=0$

2. $x-y+7=0$

3. $x-y-3=0$

4. $x-y+9=0$

Question Number : 83 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 $\frac{x+2}{3}=\frac{y-2}{-1}=\frac{z+1}{2}$ and $\frac{x-2}{1}=\frac{y-3}{2}=\frac{z-4}{3}$ also passes through the point :

Options :

1. $(1,1,1)$

2. $(1,1,-1)$

3. $(-1,-1,-1)$

4. $(-1,-1,1)$

Question Number : 83 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 $\frac{x+2}{3}=\frac{y-2}{-1}=\frac{z+1}{2}$ 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 :

1. $(1,1,1)$

2. $(1,1,-1)$

3. $(-1, -1, -1)$

4. $(-1, -1, 1)$

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

Correct Marks : 4 Wrong Marks : 1

બિંદુ $(4, -1, 2)$ માંથી પસાર થતું તથા રેખાઓ $\frac{x+2}{3}=\frac{y-2}{-1}=\frac{z+1}{2}$ અને $\frac{x-2}{1}=\frac{y-3}{2}=\frac{z-4}{3}$ ને સમાંતર હોય તેવું સમતલ _____ બિંદુમાંથી પણ પસાર થાય છે.

Options :

1. $(1, 1, 1)$

2. $(1, 1, -1)$

3. $(-1, -1, -1)$

4. $(-1, -1, 1)$

Question Number : 84 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 :

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

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

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

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

Question Number : 84 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 :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે બિંદુ A એ રેખા $\vec{r}=(1-3\mu)\hat{i}+(\mu-1)\hat{j}+(2+5\mu)\hat{k}$ પર આવેલું છે અને B(3, 2, 6) એ અવકાશમાંનું એક બિંદુ છે. તો સદિશ $\vec{AB}$ એ સમતલ $x-4y+3z=1$ ને સમાંતર થાય તે માટેની μ ની કિંમત _____ છે.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

2. $(1, 5, 1)$

3. $(1, 3, 1)$

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

Question Number : 85 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 है 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 :

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

2. $(1, 5, 1)$

3. $(1, 3, 1)$

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $\vec{a}=2\hat{i}+\lambda_1\hat{j}+3\hat{k}$,

$\vec{b}=4\hat{i}+(3-\lambda_2)\hat{j}+6\hat{k}$ અને

$\vec{c}=3\hat{i}+6\hat{j}+(\lambda_3-1)\hat{k}$ એવા ત્રણ સદિશો છે કે જેથી

$\vec{b}=2\vec{a}$ અને $\vec{a}$ એ $\vec{c}$ ને લંબ થાય, તો $(\lambda_1, \lambda_2, \lambda_3)$ ની એક શક્ય કિંમત _____ છે.

Options :

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

2. $(1, 5, 1)$

3. $(1, 3, 1)$

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

Question Number : 86 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 :

1. 10 : 3

2. 4 : 9

3. 5 : 8

4. 6 : 7

Question Number : 86 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 प्रेक्षणों का माध्य 5 है तथा उनका प्रसरण 9.20 है।
यदि इन दिए गए पाँच प्रेक्षणों में से तीन 1, 3 तथा 8 हैं,
तो अन्य दो प्रेक्षणों का एक अनुपात है :

Options :

1. 10 : 3

2. 4 : 9

3. 5 : 8

4. 6 : 7

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

Correct Marks : 4 Wrong Marks : 1

પાંચ અવલોકનોનો મધ્યક 5 છે અને તેઓનું વિચરણ 9.20 છે. જો આપેલ પાંચ અવલોકનોમાંથી ત્રણ અવલોકનો 1, 3 અને 8 હોય, તો બીજાં બે અવલોકનોનો કોઈ એક ગુણોત્તર_____ થાય.

Options :

1. 10 : 3

2. 4 : 9

3. 5 : 8

4. 6 : 7

Question Number : 87 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 probablity that the noted number is either 7 or 8 is :

Options :

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

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

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

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

Question Number : 87 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 पट् 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 :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

એક સમતોલ સિક્કાને ઉછાળવામાં આવે છે. પરિણામ છાપ આવે તો સમતોલ પાસાની એક જોડને ગબડાવવામાં આવે છે અને તેમના પર મળેલ અંકોના સરવાળાને નોંધવામાં આવે છે. જો સિક્કાને ઉછાળતાં કાંટો મળે તો સરખી રીતે ચીપેલાં 1, 2, 3, ..., 9 અંકોથી અંકિત નવ પત્તાંની થોકડીમાંથી એક પત્તું યાદચ્છિક રીતે ખેંચવામાં આવે છે અને તે પત્તા પરનો અંક નોંધવામાં આવે છે. તો નોંધવામાં આવેલ અંક 7 અથવા 8 હોય તેની સંભાવના _____ છે.

Options :

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

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

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

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

Question Number : 88 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

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

Options :

1. π

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. π

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

$\sin^2 2\theta + \cos^4 2\theta = \frac{3}{4}$ ને સંતોષતી $\theta \in \left(0, \frac{\pi}{2}\right)$ ની

તમામ કિંમતોનો સરવાળો _____ થાય.

Options :

1. π

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

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

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

Question Number : 89 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 :

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

2. $7\sqrt{3}$

3. $2\sqrt{21}$

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

Question Number : 89 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 प्लाट 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 :

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

2. $7\sqrt{3}$

3. $2\sqrt{21}$

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

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

Correct Marks : 4 Wrong Marks : 1

$AB = 7\ m, BC = 5\ m$ અને $CA = 6\ m$ બાજુઓવાળું એક ત્રિકોણાકાર મેદાન ABC વિચારો. AC ના મધ્યબિંદુ D આગળનો એક શિરોલંબ લાઈટનો થાંભલો B આગળ $30°$ નો ખૂણો આંતરે છે. આ લાઈટના થાંભલાની ઊંચાઈ (મીટરમાં) _____ છે.

Options :

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

2. $7\sqrt{3}$

3. $2\sqrt{21}$

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

Question Number : 90 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 statement : "$P(n) : n^2 - n + 41$ is prime." Then which one of the following is true ?

Options :

1. Both P(3) and P(5) are false.

2. P(3) is false but P(5) is true.

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

4. Both P(3) and P(5) are true.

Question Number : 90 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 :

1. P(3) तथा P(5) दोनों असत्य हैं।

2. P(3) असत्य है परन्तु P(5) सत्य है।

3. P(5) असत्य है परन्तु P(3) सत्य है।

4. P(3) तथा P(5) दोनों सत्य हैं।

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

Correct Marks : 4 Wrong Marks : 1

વિધાન

"$P(n): n^2-n+41$ અવિભાજ્ય છે." નો વિચાર કરો.

તો નીચેના પૈકી કયું સત્ય છે?

Options :

1. P(3) અને P(5) બંને અસત્ય છે.

2. P(3) અસત્ય છે, પણ P(5) સત્ય છે.

3. P(5) અસત્ય છે પણ P(3) સત્ય છે.

4. P(3) અને P(5) બંને સત્ય છે.