

Question Paper Name: Paper I EHG 9th April 2019 Shift 2
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Paper I

Group Number : 1
Group Id : 416529155
Group Maximum Duration : 0
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Group Marks: 360

Physics

Section Id : 416529259
Section Number : 1
Section type : Online
Mandatory or Optional: Mandatory
Number of Questions: 30
Number of Questions to be attempted: 30
Section Marks: 120
Display Number Panel: Yes
Group All Questions: No

Sub-Section Number: 1
Sub-Section Id: 416529399
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 area of a square is 5.29 cm^2 . The area of 7 such squares taking into account the significant figures is :

Options :

1. 37.03 cm^2

2. 37.0 cm^2

4. 37.030 cm^2

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

एक वर्ग का क्षेत्रफल 5.29 cm^2 है। ऐसे सात वर्गों का क्षेत्रफल उचित सार्थक अंकों में होगा :

Options :

1. 37.03 cm^2 2. 37.0 cm^2 3. 37 cm^2 4. 37.030 cm^2

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

કોઈ ચોરસનું ક્ષેત્રફળ 5.29 cm^2 છે. સાર્થક અંકો ને ધ્યાનમાં રાખી આવા 7 ચોરસોનું ક્ષેત્રફળ છે :

Options :

1. 37.03 cm^2 2. 37.0 cm^2 3. 37 cm^2 4. 37.030 cm^2

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

The position of a particle as a function of time t , is given by

$$x(t) = at + bt^2 - ct^3$$

where a , b and c are constants. When the particle attains zero acceleration, then its velocity will be : _____

Options :

1. $a + \frac{b^2}{4c}$ 2. $a + \frac{b^2}{3c}$ 3. $a + \frac{b^2}{2c}$ 4. $a + \frac{b^2}{c}$

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

एक कण की स्थिति समय 't' के फलन में निम्न है :

$$x(t) = at + bt^2 - ct^3$$

जहाँ a, b तथा c नियतांक हैं। जब कण का त्वरण शून्य है, तब उसका वेग होगा :

Options :

1. $a + \frac{b^2}{4c}$ 2. $a + \frac{b^2}{3c}$ 3. $a + \frac{b^2}{2c}$ 4. $a + \frac{b^2}{c}$

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

એક કણ દ્વારા કપાતું રેખીય અંતર t સમયના વિધેયના સ્વરૂપમાં $x(t) = at + bt^2 - ct^3$ થી અપાય છે; જ્યાં a, b અને c અચળાંકો છે. જ્યારે કણ શૂન્ય પ્રવેગ પ્રાપ્ત કરે ત્યારે તેનો વેગ _____ હશે.

Options :

1. $a + \frac{b^2}{4c}$

2. $a + \frac{b^2}{3c}$

3. $a + \frac{b^2}{2c}$

4. $a + \frac{b^2}{c}$

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

The position vector of a particle changes with time according to the relation

$\vec{r}(t) = 15t^2\hat{i} + (4-20t^2)\hat{j}$. What is the magnitude of the acceleration at $t=1$?

Options :

1. 25

2. 40

3. 50

4. 100

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

एक कण का स्थिति-सदिश समय के साथ निम्न सूत्र से बदलता है,

$$\vec{r}(t) = 15t^2\hat{i} + (4-20t^2)\hat{j}$$

$t=1$ पर कण के त्वरण का परिमाण होगा :

Options :

1. 25

2. 40

4. 100

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

એક કણના સ્થાન સદિશનો સમય સાથેનો ફેરફાર

 $\vec{r}(t) = 15t^2\hat{i} + (4-20t^2)\hat{j}$ સંબંધ મુજબઆપવામાં આવે છે. $t=1$ એ પ્રવેગનું મૂલ્ય છે :

Options :

1. 25

2. 40

3. 50

4. 100

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 particle of mass 'm' is moving with speed '2v' and collides with a mass '2m' moving with speed 'v' in the same direction. After collision, the first mass is stopped completely while the second one splits into two particles each of mass 'm', which move at angle 45° with respect to the original direction.

The speed of each of the moving particle will be :

Options :

1. $2\sqrt{2} v$ 2. $v/\sqrt{2}$ 3. $\sqrt{2} v$ 4. $v/(2\sqrt{2})$

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान 'm' का एक कण चाल '2v' से जाते हुये एक द्रव्यमान '2m' के कण जो इसी दिशा में चाल 'v' से जा रहा है, से संघट्ट करता है। संघट्ट के बाद पहला कण स्थिर अवस्था में आ जाता है तथा दूसरा कण एक ही द्रव्यमान 'm' के दो कणों में विभाजित हो जाता है। ये दोनों कण आरम्भिक दिशा से 45° के कोण पर जाते हैं :

प्रत्येक चलायमान कण की गति का मान होगा :

Options :

1. $2\sqrt{2} v$
2. $v/\sqrt{2}$
3. $\sqrt{2} v$
4. $v / (2\sqrt{2})$

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

કોઈ 'm' દળ ધરાવતો અને '2v' જેટલા વેગ સાથે ગતિ કરતો કણ એક જ રેખા પર ગતિ કરતા બીજા '2m' દળ ધરાવતા અને 'v' જેટલા વેગ થી સાથે અથડાય છે. અથડામણ બાદ પ્રથમ દળ સંપૂર્ણ પણે સ્થિર થઈ જાય છે જ્યારે બીજો દરેક 'm' એવા દળમાં વિભાજિત થઈ મૂળ દિશાથી 45° ના કોણે ગતિ કરે છે :

આ દરેક ટુકડાઓની ઝડપ _____ હશે.

Options :

1. $2\sqrt{2} v$
2. $v/\sqrt{2}$
3. $\sqrt{2} v$
4. $v / (2\sqrt{2})$

Correct Marks : 4 Wrong Marks : 1

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A wedge of mass $M=4m$ lies on a frictionless plane. A particle of mass m approaches the wedge with speed v . There is no friction between the particle and the plane or between the particle and the wedge. The maximum height climbed by the particle on the wedge is given by :

Options :

1. $\frac{v^2}{2g}$
2. $\frac{2 v^2}{5g}$
3. $\frac{2 v^2}{7g}$
4. $\frac{v^2}{g}$

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

$M=4m$ द्रव्यमान का एक वेज (wedge) आकार का गुटका एक घर्षणहीन सतह पर रखा है। m द्रव्यमान का एक कण गुटके की ओर, v चाल से आता है। कण और सतह या कण और गुटके के बीच कोई घर्षण नहीं है। कण के द्वारा गुटके के ऊपर चढ़ी गयी अधिकतम ऊँचाई होगी :

Options :

1. $\frac{v^2}{2g}$
2. $\frac{2 v^2}{5g}$
3. $\frac{2 v^2}{7g}$

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4. 8

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

કોઈ ઘર્ષણરહિત સમતલ પર $M=4m$ દળ ધરાવતી એક ફાયર પેડેલી છે. કોઈ m દળ ધરાવતો કણ v જેટલી ઝડપથી ફાયર તરફ ગતિ કરે છે. કણ અને સમતલ કે કણ અને ફાયર વચ્ચે કોઈપણ ઘર્ષણ લાગતું નથી. કણ દ્વારા ફાયર ઉપર થતાતી મહત્તમ ઊંચાઈ _____ વડે આપી શકાય.

Options :

1. $\frac{v^2}{2g}$

2. $\frac{2v^2}{5g}$

3. $\frac{2v^2}{7g}$

4. $\frac{v^2}{g}$

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

Moment of inertia of a body about a given axis is 1.5 kg m^2 . Initially the body is at rest. In order to produce a rotational kinetic energy of 1200 J , the angular acceleration of 20 rad/s^2 must be applied about the axis for a duration of :

Options :

1. 5 s

2. 3 s

3. 2 s

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

एक पिण्ड का दिये गये अक्ष के परितः जड़त्व आघूर्ण 1.5 kg m^2 है। आरम्भ में पिण्ड विरामावस्था में है। 1200 J की घूर्णन गतिज ऊर्जा उत्पन्न करने के लिये, उसी अक्ष के परितः 20 rad/s^2 का कोणीय त्वरण कितने समयान्तराल तक लगाना होगा ?

Options :

1. 5 s
2. 3 s
3. 2 s
4. 2.5 s

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

આપેલ અક્ષને સાપેક્ષે દ્રવ્યની જડત્વની ચક્રમાત્રા 1.5 kg m^2 છે. શરૂઆતમાં દ્રવ્ય સ્થિર છે. 1200 J જેટલી કોણીય ગતિ ઊર્જા ઉત્પન્ન કરવા માટે આપેલ અક્ષને સાપેક્ષે કેટલા સમયગાળા માટે 20 rad/s^2 કોણીય પ્રવેગ આપવો પડે?

Options :

1. 5 s
2. 3 s
3. 2 s
4. 2.5 s

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

is rotating freely with angular speed ω_0 about an axis perpendicular to the rod and passing through its center. Two beads of mass m and negligible size are at the center of the rod initially. The beads are free to slide along the rod. The angular speed of the system, when the beads reach the opposite ends of the rod, will be :

Options :

1. $\frac{M \omega_0}{M + 6m}$

2. $\frac{M \omega_0}{M + 2m}$

3. $\frac{M \omega_0}{M + 3m}$

4. $\frac{M \omega_0}{M + m}$

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

द्रव्यमान M तथा लम्बाई L की एक पतली छड़ कोणीय चाल ω_0 से छड़ के लम्बवत् तथा उसके केन्द्र से जाने वाली अक्ष के परितः स्वतंत्र रूप से घूम रही है। द्रव्यमान m तथा नगण्य आकार की दो मणिकायें आरम्भ में छड़ के केन्द्र पर हैं। यह मणिकायें छड़ पर चलने को स्वतंत्र हैं। मणिकायें जब छड़ के विपरीत सिरों पर पहुँचती हैं, तो इस विन्यास की कोणीय चाल होगी :

Options :

1. $\frac{M \omega_0}{M + 6m}$

2. $\frac{M \omega_0}{M + 2m}$

3. $\frac{M \omega_0}{M + 3m}$

4. $M + m$

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

કોઈ L લંબાઈના અને M દળ ધરાવતો એક પાતળો લીસો સળિયો ω_0 જેટલી કોણીય ઝડપથી તેના કેન્દ્રમાંથી પસાર થતી અને સળિયાને લંબ એવી અક્ષને અનુલક્ષીને પરિભ્રમણ કરે છે. m દળ ધરાવતા અને અવગણ્ય કદ ધરાવતા બે મણકાઓ પ્રારંભમાં સળિયાના કેન્દ્ર આગળ રહેલા છે. મણકાઓ સળિયા પર મુક્ત રીતે સરકી શકે છે. મણકાઓ સળિયાના બીજા છેડે પહોંચે ત્યારે તંત્રની કોણીય ઝડપ થશે :

Options :

1. $\frac{M \omega_0}{M + 6m}$

2. $\frac{M \omega_0}{M + 2m}$

3. $\frac{M \omega_0}{M + 3m}$

4. $\frac{M \omega_0}{M + m}$

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 test particle is moving in a circular orbit in the gravitational field produced by a

mass density $\rho(r) = \frac{K}{r^2}$. Identify the

correct relation between the radius R of the particle's orbit and its period T :

Options :

1. T^2/R^3 is a constant

2. T/R^2 is a constant

4. T/R is a constant

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 परीक्षण कण द्रव्यमान घनत्व $\rho(r) = \frac{K}{r^2}$ से उत्पन्न गुरुत्वीय क्षेत्र में एक वृत्ताकार कक्षा में घूम रहा है। कण के कक्ष की त्रिज्या R तथा इसके आवर्तकाल T के बीच सही सम्बन्ध होगा :

Options :

1. T^2/R^3 नियत है।
2. T/R^2 नियत है।
3. TR नियत है।
4. T/R नियत है।

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

સમાન દળ ધરાવતા પરીક્ષણ કણો, $\rho(r) = \frac{K}{r^2}$ જેટલી દળ ધનતા ને કારણે ઉત્પન્ન ગુરુત્વાકર્ષી ક્ષેત્રમાં વર્તુળાકાર કક્ષામાં ગતિ કરે છે. ત્રિજ્યા R અને આવર્તકાળ T વચ્ચે સાચો સંબંધ શોધો.

Options :

1. T^2/R^3 એ અચળ છે.
2. T/R^2 એ અચળ છે.
3. TR એ અચળ છે.
4. T/R એ અચળ છે.

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 has $\frac{4}{5}$ of its volume submerged.

When certain amount of an oil is poured into the bucket, it is found that the block is just under the oil surface with half of its volume under water and half in oil. The density of oil relative to that of water is :

Options :

1. 0.6
2. 0.5
3. 0.7
4. 0.8

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

बाल्टी में तैरते हुए, एक लकड़ी के गुटके के आयतन

का $\frac{4}{5}$ भाग पानी में डूबा हुआ है। जब बाल्टी में कुछ

तेल डालते हैं तो पाया जाता है कि गुटका तेल की सतह से ठीक नीचे तथा इसका आधा हिस्सा तेल के अन्दर तथा आधा पानी के अन्दर है। पानी के सापेक्ष तेल का घनत्व होगा :

Options :

1. 0.6
2. 0.5
3. 0.7
4. 0.8

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

5. પાણીની સપાટી પરથી હેલિયમ ગેસની ડોલમાં એક લાકડાનો ચોસલો તરે છે. જ્યારે કોઈ ચોક્કસ જથ્થાના તેલને ડોલમાં રેડવામાં આવે છે ત્યારે એવું જોવા મળે છે કે ચોસલો તેલની નીચે છે અને તેનું અડધુ કદ પાણીમાં જ્યારે અડધુ તેલમાં છે. પાણીને અનુલક્ષીને તેલની ઘનતા છે :

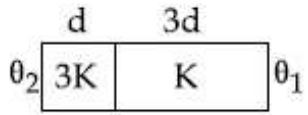
Options :

1. 0.6
2. 0.5
3. 0.7
4. 0.8

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

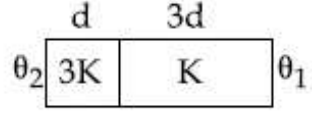
Two materials having coefficients of thermal conductivity ' $3K$ ' and ' K ' and thickness ' d ' and ' $3d$ ', respectively, are joined to form a slab as shown in the figure. The temperatures of the outer surfaces are ' θ_2 ' and ' θ_1 ' respectively, ($\theta_2 > \theta_1$). The temperature at the interface is :



Options :

1. $\frac{\theta_1}{6} + \frac{5\theta_2}{6}$
2. $\frac{\theta_2 + \theta_1}{2}$
3. $\frac{\theta_1}{3} + \frac{2\theta_2}{3}$
4. $\frac{\theta_1}{10} + \frac{9\theta_2}{10}$

दिखाये गये चित्रानुसार, '3K' तथा 'K' ऊष्मा चालकता गुणांक एवं, क्रमशः 'd' तथा '3d' मोटाई वाले दो पदार्थों को जोड़कर एक पट्टिका बनायी गयी है। उनके बाहरी सतहों के तापमान क्रमशः ' θ_2 ' और ' θ_1 ' हैं ($\theta_2 > \theta_1$)। अंतरपृष्ठ का तापमान है :



Options :

1. $\frac{\theta_1}{6} + \frac{5\theta_2}{6}$

2. $\frac{\theta_2 + \theta_1}{2}$

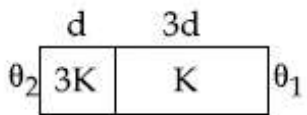
3. $\frac{\theta_1}{3} + \frac{2\theta_2}{3}$

4. $\frac{\theta_1}{10} + \frac{9\theta_2}{10}$

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

'K' અને '3K' જેટલી ઊષ્મા વાહકતા અંક અને અનુક્રમે 'd' અને '3d' જેટલી જાડાઈ ધરાવતા બે પદાર્થોને આકૃતિમાં દર્શાવ્યા અનુસાર જોડી એક ચોસલું બનાવવાનામાં આવે છે. તેમની બહારની સપાટીના તાપમાનો અનુક્રમે ' θ_2 ' અને ' θ_1 ' છે, ($\theta_2 > \theta_1$). આંતરપૃષ્ઠ આગળનું તાપમાન _____ છે.



Options :

1. $\frac{\theta_1}{6} + \frac{5\theta_2}{6}$

2. $\frac{\theta_2 + \theta_1}{2}$

4. $\frac{\theta_1}{10} + \frac{9\theta_2}{10}$

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 massless spring ($k = 800 \text{ N/m}$), attached with a mass (500 g) is completely immersed in 1 kg of water. The spring is stretched by 2 cm and released so that it starts vibrating. What would be the order of magnitude of the change in the temperature of water when the vibrations stop completely ? (Assume that the water container and spring receive negligible heat and specific heat of mass = 400 J/kg K , specific heat of water = 4184 J/kg K)

Options :

1. 10^{-5} K
2. 10^{-1} K
3. 10^{-3} K
4. 10^{-4} K

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

500 g द्रव्यमान से जुड़ी एक द्रव्यमान रहित स्प्रिंग ($k = 800 \text{ N/m}$) को 1 kg पानी में पूर्णतया डुबाया गया है। स्प्रिंग को 2 cm लम्बाई से खींचकर छोड़ने पर दोलन आरम्भ हो जाते हैं। जब दोलन पूर्णतया रुक जाते हैं तब पानी के तापमान में बदलाव की कोटि होगी : (माना कि पानी के पात्र और स्प्रिंग को मिली ऊष्मा नगण्य है तथा द्रव्यमान की विशिष्ट ऊष्मा = 400 J/kg K , पानी की विशिष्ट ऊष्मा = 4184 J/kg K)

Options :

2. 10^{-1} K
3. 10^{-3} K
4. 10^{-4} K

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

કોઈ દળરહિત સ્પ્રિંગ ($k = 800 \text{ N/m}$) એક 500 g દળ સાથે જોડી 1 kg ના પાણીનાં ડૂબાડવામાં આવે છે. સ્પ્રિંગને તેની મૂળ લંબાઈની સ્થિતિમાંથી તેની લંબાઈની દિશામાં 2 cm જેટલી ખેંચવામાં આવી મુક્ત કરવામાં આવે છે કે જેથી તે દોલન શરુ કરે છે. જ્યારે દોલનો સંપૂર્ણ અટકી જાય ત્યારે પાણીના તાપમાનમાં શો ફેરફાર થશે? (એવું ધારોકે પાણી ભરવાનું પાત્ર અને સ્પ્રિંગ અવગણીય ઊષ્મા મેળવે છે.)

દળ ની વિશિષ્ટ ઊષ્મા $= 400 \text{ J/kg K}$,

પાણીની વિશિષ્ટ ઊષ્મા $= 4184 \text{ J/kg K}$:

Options :

1. 10^{-5} K
2. 10^{-1} K
3. 10^{-3} K
4. 10^{-4} K

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

The specific heats, C_p and C_v of a gas of diatomic molecules, A, are given (in units of $\text{J mol}^{-1}\text{K}^{-1}$) by 29 and 22, respectively. Another gas of diatomic molecules, B, has the corresponding values 30 and 21. If they are treated as ideal gases, then :

Options :

1. none.

Both A and B have a vibrational mode

2. each.

A has one vibrational mode and B has

3. two.

A is rigid but B has a vibrational

4. mode.

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

एक द्विपरमाणुक गैस A के अणुओं की विशिष्ट ऊष्मायें ($\text{J mol}^{-1}\text{K}^{-1}$ की इकाई में) C_p तथा C_v , क्रमशः, 29 और 22 हैं। दूसरी द्विपरमाणुक गैस B के अणुओं के लिए संगत मान 30 और 21 हैं। यदि इन्हें आदर्श गैस माना जाये तो :

Options :

A में एक कम्पन विधा है किन्तु B में कोई

1. कम्पन विधा नहीं है।

2. A और B दोनों में एक-एक कम्पन विधायें हैं।

A में एक कम्पन विधा तथा B में दो कम्पन

3. विधायें हैं।

4. A दृढ़ है किन्तु B में एक कम्पन विधा है।

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

કોઈ દ્વિપરમાણ્વીય વાયુ અણુઓ A ની વિશિષ્ટ ઊષ્માઓ C_p અને C_v ($\text{J mol}^{-1}\text{K}^{-1}$ ના એકમ માં) અનુક્રમે 29 અને 22 છે. બીજા દ્વિ-પરમાણ્વિક વાયુ અણુઓ B માટે આનુષંગિક મૂલ્યો 30 અને 21 છે. જો તેઓને આદર્શ વાયુ તરીકે ગણવામાં આવે તો _____.

Options :

1. A ને કંપન-મોડ (અવસ્થા) છે પણ B ને નથી.

3. A ને એક કંપન-અવસ્થા છે અને B ને બે.
4. A એક દૃઢ છે પણ B ને કંપન-મોડ છે.

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 string 2.0 m long and fixed at its ends is driven by a 240 Hz vibrator. The string vibrates in its third harmonic mode. The speed of the wave and its fundamental frequency is :

Options :

1. 180 m/s, 80 Hz
2. 320 m/s, 80 Hz
3. 320 m/s, 120 Hz
4. 180 m/s, 120 Hz

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

दोनों सिरों से बँधी हुई 2.0 m लम्बी एक डोरी 240 Hz के एक कम्पित्र से चालित है। डोरी अपने तीसरे गुणावृत्ती (harmonic) में कंपन करती है। तरंग की चाल और इसकी मूल आवृत्ति हैं :

Options :

1. 180 m/s, 80 Hz
2. 320 m/s, 80 Hz
3. 320 m/s, 120 Hz
4. 180 m/s, 120 Hz

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

દોરી તેના મધ્યમાં બે-મોડ્સ સાથે કંપન કરે છે. તરંગની ઝડપ અને તેની મૂળભૂત આવૃત્તિ છે :

Options :

1. 180 m/s, 80 Hz
2. 320 m/s, 80 Hz
3. 320 m/s, 120 Hz
4. 180 m/s, 120 Hz

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

Two cars A and B are moving away from each other in opposite directions. Both the cars are moving with a speed of 20 ms^{-1} with respect to the ground. If an observer in car A detects a frequency 2000 Hz of the sound coming from car B, what is the natural frequency of the sound source in car B ?

(speed of sound in air = 340 ms^{-1})

Options :

1. 2300 Hz
2. 2060 Hz
3. 2250 Hz
4. 2150 Hz

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

1. જો કાર A અને B એક-દુસરાં સે દુર વિપરીત દિશા માં જા રહી હૈં. ઢોનોં કાર પૃથ્વી કે સાપેક્ષ 20 ms^{-1} કી ચાલ સે ચલ રહી હૈં. યદિ કાર A માં બૈઠા પ્રેક્ષક, કાર B સે આને વાલી ધ્વનિ કી આવૃત્તિ 2000 Hz પાતા હૈ તો કાર B માં ધ્વનિ સ્ત્રોત કી વાસ્તવિક આવૃત્તિ હૈ :
(ધ્વનિ કી વાયુ માં ચાલ $= 340 \text{ ms}^{-1}$)

Options :

1. 2300 Hz
2. 2060 Hz
3. 2250 Hz
4. 2150 Hz

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

બે મોટરકાર A અને B વિરુદ્ધ દિશામાં એક બીજાથી દૂરની દિશામાં ગતિ કરે છે. બંને ગાડીઓ જમીનની સાપેક્ષે 20 ms^{-1} ની ઝડપથી ગતિ કરે છે. A મોટરકારમાં બેઠેલો અવલોકનકાર B કારમાંથી આવતા ધ્વનિની આવૃત્તિ 2000 Hz જોઈતી નોંધે તો કાર B માં ધ્વનિ ઉદ્ગમની મૂળ આવૃત્તિ કેટલી હશે?
(હવામાં ધ્વનિ ની ઝડપ $= 340 \text{ ms}^{-1}$)

Options :

1. 2300 Hz
2. 2060 Hz
3. 2250 Hz
4. 2150 Hz

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

parallel combination of two air filled parallel plate capacitors of capacitance C and nC is connected to a battery of voltage, V . When the capacitors are fully charged, the battery is removed and after that a dielectric material of dielectric constant K is placed between the two plates of the first capacitor. The new potential difference of the combined system is :

Options :

1. V
2. $\frac{nV}{K + n}$
3. $\frac{(n + 1)V}{(K + n)}$
4. $\frac{V}{K + n}$

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

वायु से भरे दो समान्तर प्लेट संधारित्रों, जिनकी धारिताएँ C तथा nC हैं, के समान्तर संयोजन को V वोल्टता की बैटरी से जोड़ा गया है। जब संधारित्र पूर्णतया आवेशित हो जाते हैं तो बैटरी को हटा दिया जाता है और तत्पश्चात पहले संधारित्र की दोनों प्लेटों के बीच परावैद्युतांक K का परावैद्युत पदार्थ रख देते हैं। संयुक्त संयोजन के लिये नया विभवान्तर है :

Options :

1. V
2. $\frac{nV}{K + n}$
3. $\frac{(n + 1)V}{(K + n)}$

4. $K + n$

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

C અને nC જેટલું કેપેસિટન્સ (સંધારકતા), ધરાવતા અને હવાથી ભરેલા બે સમાંતર પ્લેટ કેપેસિટરોના સમાંતર જોડાણને V વોલ્ટની બેટરી સાથે જોડવામાં આવેલ છે. જ્યારે કેપેસિટરો પૂર્ણરીતે વિદ્યુતભારીત થાય ત્યારે બેટરીને દૂર કરવામાં આવે છે, ત્યારપછી K જેટલો ડાઈઇલેક્ટ્રીક અચળાંક ધરાવતો ડાઈઇલેક્ટ્રીક પદાર્થ પ્રથમ કેપેસિટરની બે પ્લેટો વચ્ચે મૂકવામાં આવે છે. આ સંયુક્ત તંત્ર માટે નવો સ્થિતિમાનનો તફાવત _____ થશે.

Options :

1. V
2. $\frac{nV}{K + n}$
3. $\frac{(n + 1)V}{(K + n)}$
4. $\frac{V}{K + n}$

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

Four point charges $-q$, $+q$, $+q$ and $-q$ are placed on y -axis at $y = -2d$, $y = -d$, $y = +d$ and $y = +2d$, respectively. The magnitude of the electric field E at a point on the x -axis at $x = D$, with $D \gg d$, will behave as :

Options :

1. $E \propto \frac{1}{D^2}$
2. $E \propto \frac{1}{D^3}$

3.

 D^4

4.

$$E \propto \frac{1}{D}$$

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

ચાર બિન્દુ આવેશો $-q, +q, +q$ ઓર $-q$ કો y -અક્ષ પર, ક્રમશઃ, $y = -2d, y = -d, y = +d$ તથા $y = +2d$ પર રચ્વા ગયો છે. x -અક્ષ પર ઉપસ્થિત ઁક બિન્દુ $x = D$, જહો $D \gg d$ છે, પર વિદ્યુત ક્ષેત્ર કો પરિમાણ E કો વ્યવહાર હોગો :

Options :

1.

$$E \propto \frac{1}{D^2}$$

2.

$$E \propto \frac{1}{D^3}$$

3.

$$E \propto \frac{1}{D^4}$$

4.

$$E \propto \frac{1}{D}$$

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

ચાર બિંદુવત વિદ્યુતભારો $-q, +q, +q$ ઁને $-q$ ને y -અક્ષ પર અનુક્રમે $y = -2d, y = -d, y = +d$ ઁને $y = +2d$ મૂકેલો છે. x -અક્ષ ઉપર $x = D$ જ્યાં $D \gg d$ ઁગળ વિદ્યુતક્ષેત્ર E _____ મુજબ વર્તે છે.

Options :

1.

$$E \propto \frac{1}{D^2}$$

2.

$$E \propto \frac{1}{D^3}$$

3.

 D^4

4.

$$E \propto \frac{1}{D}$$

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

In a conductor, if the number of conduction electrons per unit volume is $8.5 \times 10^{28} \text{ m}^{-3}$ and mean free time is 25 fs (femto second), it's approximate resistivity is :

$$(m_e = 9.1 \times 10^{-31} \text{ kg})$$

Options :

1.

$$10^{-5} \Omega\text{m}$$

2.

$$10^{-6} \Omega\text{m}$$

3.

$$10^{-7} \Omega\text{m}$$

4.

$$10^{-8} \Omega\text{m}$$

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

किसी चालक में यदि चालक इलेक्ट्रॉनों की संख्या प्रति एकांकी आयतन $8.5 \times 10^{28} \text{ m}^{-3}$ है और माध्य मुक्त समय 25 fs (फेम्टो-सेकेण्ड) है तो उसकी करीबी प्रतिरोधकता है :

$$(m_e = 9.1 \times 10^{-31} \text{ kg})$$

Options :

1.

$$10^{-5} \Omega\text{m}$$

2.

$$10^{-6} \Omega\text{m}$$

3.

$$10^{-7} \Omega\text{m}$$

4.

$$10^{-8} \Omega\text{m}$$

Correct Marks : 4 Wrong Marks : 1

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વાહકમાં જો એકમ કદ દીઠ વાહક ઇલેક્ટ્રોનની સંખ્યા $8.5 \times 10^{28} \text{ m}^{-3}$ અને સરેરાશ મુક્ત સમય 25 fs (ફેમ્ટો સેકન્ડ) હોય તો અવરોધકતા (ρ) છે :
($m_e = 9.1 \times 10^{-31} \text{ kg}$)

Options :

1. $10^{-5} \Omega \text{m}$
2. $10^{-6} \Omega \text{m}$
3. $10^{-7} \Omega \text{m}$
4. $10^{-8} \Omega \text{m}$

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

A metal wire of resistance 3Ω is elongated to make a uniform wire of double its previous length. This new wire is now bent and the ends joined to make a circle. If two points on this circle make an angle 60° at the centre, the equivalent resistance between these two points will be :

Options :

1. $\frac{12}{5} \Omega$
2. $\frac{7}{2} \Omega$
3. $\frac{5}{3} \Omega$
4. $\frac{5}{2} \Omega$

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

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ધ્રુવે એક ધાતુ કે તાર કાઢીંવકર ઉસકી પુરાનો લમ્બાઈ કા દોગુના એક સમાન તાર બનાયા છે। ઇસ નયે તાર કો મોડકર તથા દોનોં સિરેં જોડકર એક વૃત્ત બનાતે હેં। યદિ ઇસ વૃત્ત કે દો બિન્દુ કેન્દ્ર સે 60° કા કોણ બનાતે હેં તો ઇન દોનોં બિન્દુઓં કે બીચ તુલ્ય પ્રતિરોધ હોગા :

Options :

1. $\frac{12}{5} \Omega$

2. $\frac{7}{2} \Omega$

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

4. $\frac{5}{2} \Omega$

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

કોઈ 3 Ω અવરોધ ધરાવતા ધાતુના તારને ખેંચીને એક સમાન પણ મૂળ લંબાઈ કરતા બમણી લંબાઈનો તાર બનાવવામાં આવે છે. હવે આ તારને વાળી તેના છેડાઓ જોડીને એક વર્તુળ બનાવવામાં આવે છે. જો આ વર્તુળ પરના કોઈ બે બિંદુઓ કેન્દ્રઆગળ 60° નો કોણ બનાવે તો આ બે બિંદુઓ વચ્ચેનો સમતુલ્ય અવરોધ _____ થશે.

Options :

1. $\frac{12}{5} \Omega$

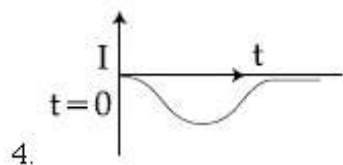
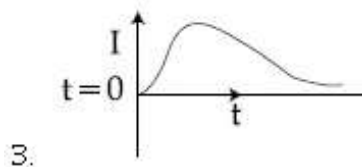
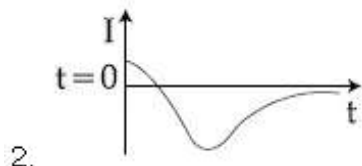
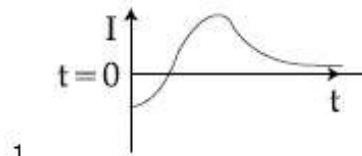
2. $\frac{7}{2} \Omega$

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

4. $\frac{5}{2} \Omega$

A very long solenoid of radius R is carrying current $I(t) = kte^{-\alpha t}$ ($k > 0$), as a function of time ($t \geq 0$). Counter clockwise current is taken to be positive. A circular conducting coil of radius $2R$ is placed in the equatorial plane of the solenoid and concentric with the solenoid. The current induced in the outer coil is correctly depicted, as a function of time, by :

Options :

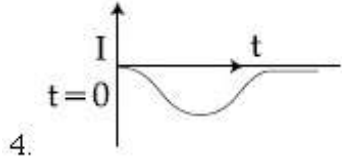
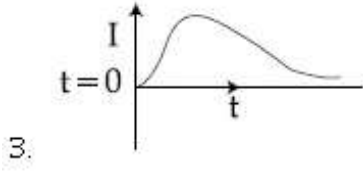
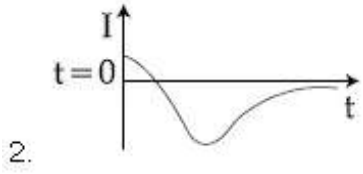
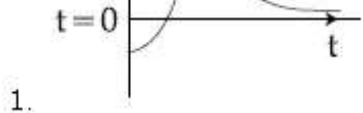


Question Number : 19 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

R त्रिज्या की अत्याधिक लम्बी परिनालिका में प्रवाहित धारा $I(t) = kte^{-\alpha t}$ ($k > 0$) समय के फलन ($t \geq 0$) के रूप में है। वामावर्त दिशा में धारा को धनात्मक लिया गया है। $2R$ त्रिज्या वाली एक वृत्ताकार कुण्डली को परिनालिका के समकेन्द्रीय तथा इसके मध्यवर्ती समतल में रखते हैं। बाह्य कुण्डली में प्रेरित धारा को समय के फलन में सही रूप से दर्शाने वाला ग्राफ है :

Options :

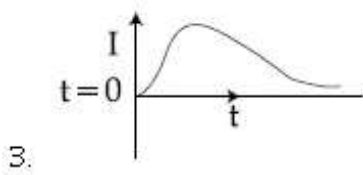
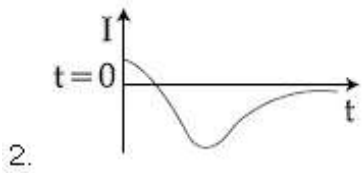
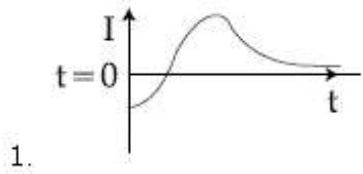


Question Number : 19 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક લાંબા R ત્રિજ્યાનાં સોલેનોઇડમાંથી સમય ($t \geq 0$) ના વિધેય તરીકે $I(t) = kte^{-\alpha t}$ ($k > 0$) જેટલો પ્રવાહ વહે છે. એક $2R$ ત્રિજ્યાનાં વર્તુળાકાર ગુંચળાને વિષ્વૃત્તીય તલમાં સોલેનોઇડને સમકેન્દ્રિય રહે તેમ મૂકવામાં આવે છે. આ બાહ્ય ગુંચળા માં ઉત્પન્ન પ્રવાહને વડે સાચી રીતે દર્શાવી શકાય છે. (બાહ્ય ત્રિજ્યાવર્તી બળ ધન છે.)

Options :



4. 

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

A moving coil galvanometer has a coil with 175 turns and area 1 cm^2 . It uses a torsion band of torsion constant 10^{-6} N-m/rad . The coil is placed in a magnetic field B parallel to its plane. The coil deflects by 1° for a current of 1 mA . The value of B (in Tesla) is approximately :

Options :

1. 10^{-2}

2. 10^{-3}

3. 10^{-4}

4. 10^{-1}

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

एक चल कुण्डली धारामापी में 175 फेरों वाली तथा 1 cm^2 क्षेत्रफल की एक कुण्डली लगी है। इसमें मरोड़ांक 10^{-6} N-m/rad वाले एक मरोड़ बैण्ड का प्रयोग होता है। इस कुण्डली को एक चुम्बकीय क्षेत्र B में रखते हैं जो कि इसके समतल के समान्तर है। 1 mA धारा के लिये कुण्डली में विक्षेप 1° है। B का मान (टेस्ला में) लगभग है :

Options :

1. 10^{-2}

2. 10^{-3}

3. 10^{-4}

4. 10^{-1}

Correct Marks : 4 Wrong Marks : 1

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કોઈ ચલિત ગૂંચળા ધરાવતા ગેલ્વેનોમીટરમાં ગૂંચળામાં 175 આંટા છે અને ક્ષેત્રફળ 1 cm^2 છે. તે 10^{-6} N-m/rad જેટલો વિમોટન (ટોરસન) અચળાંક ધરાવતા વિમોટન બેન્ડ (પટ્ટા) નો ઉપયોગ કરે છે. આ ગૂંચળું તેના સમતલને લંબ એવા ચુંબકીય ક્ષેત્ર B માં મૂકવામાં આવેલ છે. ગૂંચળું 1 mA પ્રવાહ માટે 1° નું આવર્તન અનુભવે છે. B નું ટેસ્લામાં મૂલ્ય છે :

Options :

1. 10^{-2}
2. 10^{-3}
3. 10^{-4}
4. 10^{-1}

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

Two coils 'P' and 'Q' are separated by some distance. When a current of 3 A flows through coil 'P', a magnetic flux of 10^{-3} Wb passes through 'Q'. No current is passed through 'Q'. When no current passes through 'P' and a current of 2 A passes through 'Q', the flux through 'P' is :

Options :

1. $6.67 \times 10^{-4} \text{ Wb}$
2. $6.67 \times 10^{-3} \text{ Wb}$
3. $3.67 \times 10^{-4} \text{ Wb}$
4. $3.67 \times 10^{-3} \text{ Wb}$

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

જો 'P' તથા 'Q' કોઈ દરી પર રાખી છે। જ્યારે
કુણ્ડલી 'P' માં 3 A નો ધારા પ્રવાહિત હોતો છે તો
કુણ્ડલી 'Q' સે 10^{-3} Wb ના ચુમ્બકીય ફલક્સ
ગુજરતા છે। 'Q' માં કોઈ ધારા નહીં છે। જ્યારે 'P' માં કોઈ
ધારા નહીં છે તથા 'Q' સે 2 A ધારા પ્રવાહિત હોતો છે, તો
'P' સે ગુજરને વાલા ફલક્સ હોગા :

Options :

1. 6.67×10^{-4} Wb
2. 6.67×10^{-3} Wb
3. 3.67×10^{-4} Wb
4. 3.67×10^{-3} Wb

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

બે ગૂંચળાઓ 'P' અને 'Q' અમુક અંતરે ઘૂટા મૂકેલા છે.
જ્યારે ગૂંચળા 'P' માં 3 A નો પ્રવાહ પસાર કરવામાં
આવે છે ત્યારે ગૂંચળા 'Q' માંથી 10^{-3} Wb જેટલું
ચુંબકીય ફલક્સ પસાર થાય છે. 'Q' માંથી પ્રવાહ પસાર
થતો નથી. જ્યારે 'P' માંથી કોઈ પ્રવાહ પસાર કરવામાં
આવતો નથી અને 'Q' માંથી 2 A નો પ્રવાહ પસાર
કરવામાં આવે છે. ત્યારે 'P' માંથી પસાર થતું ફલક્સ
_____ છે.

Options :

1. 6.67×10^{-4} Wb
2. 6.67×10^{-3} Wb
3. 3.67×10^{-4} Wb
4. 3.67×10^{-3} Wb

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

normally incident on the surface of a solar panel. Some part of incident energy (25%) is reflected from the surface and the rest is absorbed. The force exerted on 1 m^2 surface area will be close to ($c = 3 \times 10^8 \text{ m/s}$) :

Options :

1. $20 \times 10^{-8} \text{ N}$
2. $35 \times 10^{-8} \text{ N}$
3. $15 \times 10^{-8} \text{ N}$
4. $10 \times 10^{-8} \text{ N}$

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

एक सोलर पैनल की सतह पर 50 W/m^2 ऊर्जा घनत्व का सूर्य का प्रकाश अभिलम्बवत् आपतित होता है। आपतित ऊर्जा का कुछ भाग (25%) सतह से परावर्तित हो जाता है तथा बचा हुआ भाग अवशोषित हो जाता है। सतह के 1 m^2 क्षेत्रफल पर लगने वाला बल होगा : ($c = 3 \times 10^8 \text{ m/s}$)

Options :

1. $20 \times 10^{-8} \text{ N}$
2. $35 \times 10^{-8} \text{ N}$
3. $15 \times 10^{-8} \text{ N}$
4. $10 \times 10^{-8} \text{ N}$

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

પેનલની સપાટી ઉપર લબ્ધપે આપાત થાય છે. સપાટી પરથી કેટલીક (25%) ઊર્જા પરાવર્તન પામે છે. અને બાકીનાનું શોષણ થાય છે. 1 m^2 સપાટી ક્ષેત્રફળ પર પ્રવર્તતું બળ _____ ની નજીકનું હશે.
($c = 3 \times 10^8 \text{ m/s}$)

Options :

1. $20 \times 10^{-8} \text{ N}$
2. $35 \times 10^{-8} \text{ N}$
3. $15 \times 10^{-8} \text{ N}$
4. $10 \times 10^{-8} \text{ N}$

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 convex lens of focal length 20 cm produces images of the same magnification 2 when an object is kept at two distances x_1 and x_2 ($x_1 > x_2$) from the lens. The ratio of x_1 and x_2 is :

Options :

1. 4:3
2. 5:3
3. 3:1
4. 2:1

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

20 cm ફોકસ દૂરી કે એક ઉત્તલ લેન્સ સે કિસી વસ્તુ કે પ્રતિબિમ્બ કા આવર્ધન 2 હી હોતા જબ વસ્તુ કો લેન્સ સે દો દૂરિયોં x_1 તથા x_2 ($x_1 > x_2$) પર રખતે હૈં। x_1 ઓર x_2 કા અનુપાત હૈ :

Options :

1. 4:3

3. 3 : 1

4. 2 : 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

કોઈ 20 cm કેન્દ્રલંબાઈ ધરાવતા બહિર્ગોળ લેન્સ આગળ જ્યારે વસ્તુને x_1 અને x_2 ($x_1 > x_2$) એમ બે અંતરે રાખવામાં આવે છે ત્યારે તે 2 જેટલી સરખી મોટવણી ધરાવતું પ્રતિબિંબ રચે છે. x_1 અને x_2 નો ગુણોત્તર _____ છે.

Options :

1. 4 : 3

2. 5 : 3

3. 3 : 1

4. 2 : 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

Diameter of the objective lens of a telescope is 250 cm. For light of wavelength 600 nm. coming from a distant object, the limit of resolution of the telescope is close to :

Options :

1. 3.0×10^{-7} rad2. 4.5×10^{-7} rad3. 2.0×10^{-7} rad4. 1.5×10^{-7} rad

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

एक दूरदर्शी के अभिदृश्यक लेंस का व्यास 250 cm है। एक दूर स्थित वस्तु से आने वाले तरंगदैर्घ्य 600 nm के प्रकाश के लिये दूरदर्शी की विभेदन सीमा होगी, लगभग :

Options :

1. 3.0×10^{-7} rad
2. 4.5×10^{-7} rad
3. 2.0×10^{-7} rad
4. 1.5×10^{-7} rad

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

એક ટેલીસ્કોપના વસ્તુલેન્સનો વ્યાસ 250 cm છે. દૂર મૂકેલી વસ્તુમાંથી આવતા પ્રકાશની તરંગલંબાઈ 600 nm હોય તો ટેલીસ્કોપની વિભેદન સીમા _____ ની નજીકની છે.

Options :

1. 3.0×10^{-7} rad
2. 4.5×10^{-7} rad
3. 2.0×10^{-7} rad
4. 1.5×10^{-7} rad

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

A particle 'P' is formed due to a completely inelastic collision of particles 'x' and 'y' having de-Broglie wavelengths ' λ_x ' and ' λ_y ' respectively. If x and y were moving in opposite directions, then the de-Broglie wavelength of 'P' is :

Options :

2. $\lambda_x - \lambda_y$

3. $\frac{\lambda_x \lambda_y}{|\lambda_x - \lambda_y|}$

4. $\frac{\lambda_x \lambda_y}{\lambda_x + \lambda_y}$

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

દો કણ 'x' તથા 'y', જિનકી ડી-બ્રાગ્લિ તરંગદૈર્ઘ્ય ક્રમશઃ, ' λ_x ' તથા ' λ_y ' હૈં, કે સમ્પૂર્ણ અપ્રત્યાસ્થ સંઘટ્ટ સે એક કણ 'P' બના હૈ। યદિ કણ 'x' તથા 'y' વિપરીત દિશાઓ મેં ગતિશીલ થે, તો 'P' કી ડી-બ્રાગ્લિ તરંગદૈર્ઘ્ય હૈ :

Options :

1. $\lambda_x + \lambda_y$

2. $\lambda_x - \lambda_y$

3. $\frac{\lambda_x \lambda_y}{|\lambda_x - \lambda_y|}$

4. $\frac{\lambda_x \lambda_y}{\lambda_x + \lambda_y}$

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

કોઈ કણ P એ ' λ_x ' અને ' λ_y ' ડી-બ્રોગ્લી તરંગલંબાઈ ધરાવતા બે કણો 'x' અને 'y' વચ્ચેની સંપૂર્ણ અસ્થિતિસ્થાપક અથડામણને કારણે બને છે. જો 'x' અને 'y' એકબીજાની વિરુદ્ધ દિશામાં ગતિ કરતા હોય તો કણ 'P' ની ડી-બ્રોગ્લી તરંગલંબાઈ થશે :

Options :

1. $\lambda_x + \lambda_y$

3. $\frac{\lambda_x \lambda_y}{|\lambda_x - \lambda_y|}$

4. $\frac{\lambda_x \lambda_y}{\lambda_x + \lambda_y}$

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

A He^+ ion is in its first excited state. Its ionization energy is :

Options :

1. 13.60 eV
2. 48.36 eV
3. 54.40 eV
4. 6.04 eV

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 He^+ आयन अपनी प्रथम उत्तेजित अवस्था में है।

इसकी आयनन ऊर्जा होगी :

Options :

1. 13.60 eV
2. 48.36 eV
3. 54.40 eV
4. 6.04 eV

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

કોઈ He^+ આયન તેની પ્રથમ ઉત્તેજિત અવસ્થામાં છે.

તેની આયનીકરણ ઊર્જા _____ છે.

1. 13.60 eV

2. 48.36 eV

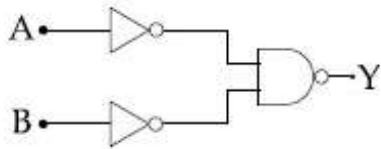
3. 54.40 eV

4. 6.04 eV

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

The logic gate equivalent to the given logic circuit is :



Options :

1. AND

2. NAND

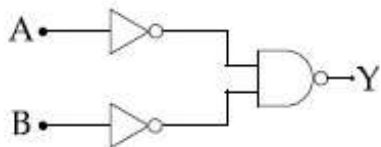
3. NOR

4. OR

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

दिये गये लॉजिक परिपथ का तुल्य लॉजिक गेट है :



Options :

1. AND

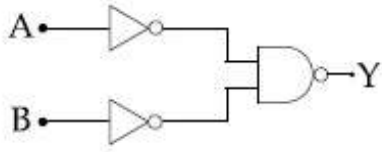
2. NAND

3. NOR

4. OR

Correct Marks : 4 Wrong Marks : 1

આપેલ લોજિક પરિપથને સમતુલ્ય લોજિક ગેટ
_____ છે.



Options :

1. AND
2. NAND
3. NOR
4. OR

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

The physical sizes of the transmitter and receiver antenna in a communication system are :

Options :

1. proportional to carrier frequency
2. inversely proportional to modulation frequency
3. inversely proportional to carrier frequency
4. independent of both carrier and modulation frequency

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 संचार व्यवस्था के लिये प्रेषक तथा अभिग्राही
ऐंटीना के भौतिक आकार होंगे :

Options :

2. माडुलन आवृत्ति के व्युत्क्रमानुपाती
3. वाहक आवृत्ति के व्युत्क्रमानुपाती
- वाहक तथा माडुलन आवृत्ति दोनों पर निर्भर
4. नहीं करता

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

સંચાર વ્યવસ્થામાં વપરાતા ટ્રાન્સિમીટર (પ્રસરણ) અને રીસીવર (ગ્રહણ) એન્ટીનાઓનું ભૌમિતીક કદ

Options :

1. કેરીયર આવૃત્તિના સમપ્રમાણમાં
2. મોડ્યુલેશન આવૃત્તિના વ્યસ્ત પ્રમાણમાં
3. કેરીયર આવૃત્તિના વ્યસ્ત પ્રમાણમાં
4. કેરીયર અને મોડ્યુલેશન આવૃત્તિ એ બંનેથી સ્વતંત્ર

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

The resistance of a galvanometer is 50 ohm and the maximum current which can be passed through it is 0.002 A. What resistance must be connected to it in order to convert it into an ammeter of range 0–0.5 A ?

Options :

1. 0.002 ohm
2. 0.02 ohm
3. 0.2 ohm
4. 0.5 ohm

Correct Marks : 4 Wrong Marks : 1

एक धारामापी का प्रतिरोध 50Ω है तथा इससे अधिकतम 0.002 A धारा प्रवाहित हो सकती है। इसको $0 - 0.5 \text{ A}$ परास के अमीटर में परिवर्तित करने के लिये इसमें कितना प्रतिरोध जोड़ना चाहिये?

Options :

1. 0.002 ohm
2. 0.02 ohm
3. 0.2 ohm
4. 0.5 ohm

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

કોઈ ગેલ્વેનોમીટરનો અવરોધ 50 ઓહ્મ અને તેમાંથી પસાર કરી શકાતો મહત્તમ પ્રવાહ 0.002 A છે. તેને $0 - 0.5 \text{ A}$ જેટલો મહત્તમ પ્રવાહવાળા એમીટરમાં રૂપાંતર કરવા કેટલો અવરોધ જોડવો પડશે?

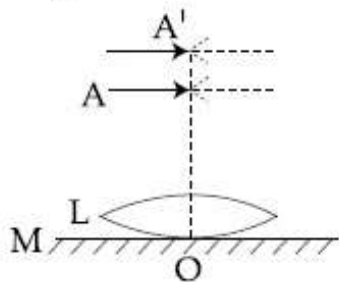
Options :

1. 0.002 ઓહ્મ
2. 0.02 ઓહ્મ
3. 0.2 ઓહ્મ
4. 0.5 ઓહ્મ

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

is placed on a plane mirror M . When a pin is placed at A , such that $OA = 18$ cm, its real inverted image is formed at A itself, as shown in figure. When a liquid of refractive index μ_l is put between the lens and the mirror, the pin has to be moved to A' , such that $OA' = 27$ cm, to get its inverted real image at A' itself. The value of μ_l will be :



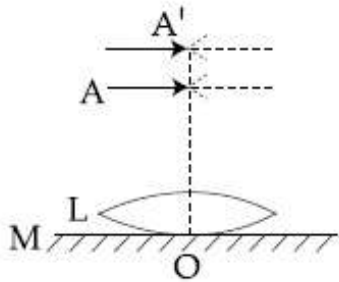
Options :

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

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

एक पिन को A पर रखते हैं, तब इसका वास्तविक किन्तु उल्टा प्रतिबिम्ब, दिखाये चित्रानुसार A पर ही बनता है। दिया है $OA = 18 \text{ cm}$ । अपवर्तनांक μ_l के एक द्रव को लेन्स तथा दर्पण के बीच डालने पर, पिन के वास्तविक एवं उल्टे प्रतिबिम्ब को A' पर ही पाने के लिए पिन को A' तक इस प्रकार उठाते हैं कि $OA' = 27 \text{ cm}$ । μ_l का मान होगा :



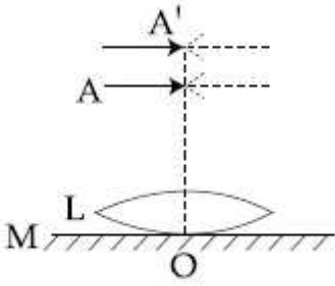
Options :

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

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

લેન્સ L ને એક સમતલ અરીસા M ની સપાટી ઉપર મૂકવામાં આવેલ છે. જ્યારે એક ટાંકણીને તેની આણી A આગળ રહે તેમ મૂકવામાં આવે છે ત્યારે તેનું વાસ્તવિક ઉલટું પ્રતિબિંબ A આગળ જ રચાય છે, જે આકૃતિમાં દર્શાવેલ છે. $OA = 18 \text{ cm}$ આપેલ છે. હવે μ_1 વક્રીભવનાંક ધરાવતા પ્રવાહીને લેન્સ અને અરીસાની વચ્ચે મૂકવામાં આવે છે. હવે ટાંકણીને A' સુધી ઉંચકવામાં આવે છે કે જેથી વાસ્તવિક અને ઉલટું પ્રતિબિંબ મળે. (આકૃતિ જુઓ). $OA' = 27 \text{ cm}$ છે. μ_1 નું મૂલ્ય _____ છે.



Options :

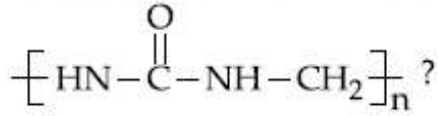
1. $\frac{3}{2}$
2. $\sqrt{3}$
3. $\frac{4}{3}$
4. $\sqrt{2}$

www.

Section Id :	416529260
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

Correct Marks : 4 Wrong Marks : 1

Which of the following compounds is a constituent of the polymer



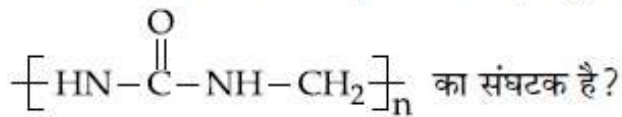
Options :

1. Methylamine
2. N-Methyl urea
3. Ammonia
4. Formaldehyde

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 में से कौन सा एक यौगिक, बहुलक



Options :

1. मेथिल ऐमीन
2. N-मेथिल यूरिया
3. अमोनिया
4. फार्मेलडीहाइड

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

નીચે આપેલામાંથી કયો એક સંયોજન બહુલક



Options :

1. મિથાઈલ એમાઈન

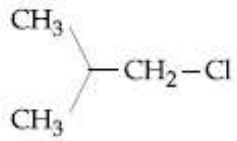
3. એમોનિયા

4. ફોર્માલ્ડીહાઇડ

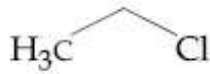
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

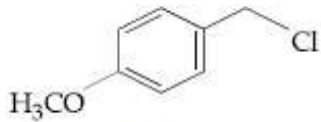
Increasing order of reactivity of the following compounds for S_N1 substitution is :



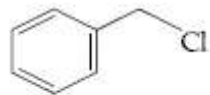
(A)



(B)



(C)



(D)

Options :

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

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

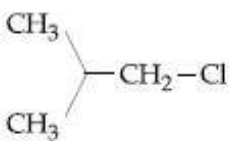
3. (B) < (A) < (D) < (C)

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

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

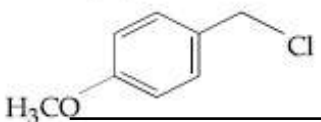
S_N1 પ્રતિસ્થાપન કે લિંઈ નિમ્ન યૌગિકોં કી અભિક્રિયાશીલતા કા બઢતા ક્રમ હૈ :



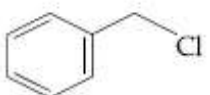
(A)



(B)



(C)



(D)

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

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

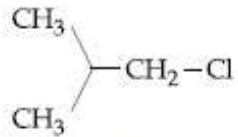
3. (B) < (A) < (D) < (C)

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

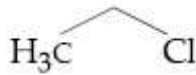
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

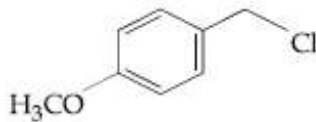
નીચે આપેલા સંયોજનો નો S_N1 વિસ્થાપન માટેની સક્રિયતાનો સાચો ક્રમ શોધો?



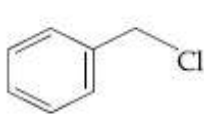
(A)



(B)



(C)



(D)

Options :

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

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

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

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

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

Noradrenaline is a /an :

Options :

1. Antacid

2. Antihistamine

3. Neurotransmitter

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

નારેડ્રીનેલિન હૈ એક :

Options :

1. પ્રતિઅમ્લ
2. પ્રતિહિસ્ટામિન
3. તંત્રકીય સંચારક
4. પ્રતિ-અવસાદક

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

નોરએડ્રીનલીન એ :

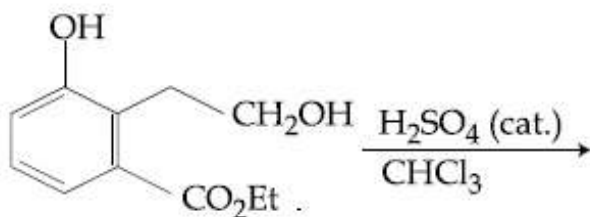
Options :

1. પ્રતિએસિડો
2. પ્રતિહિસ્ટામાઈન્સ
3. એતાવાહકી
4. ઉદાસીનતા રોધીઓ

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

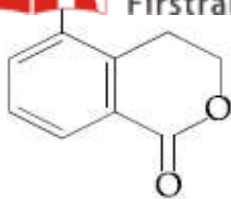
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

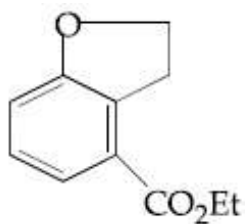


Options :

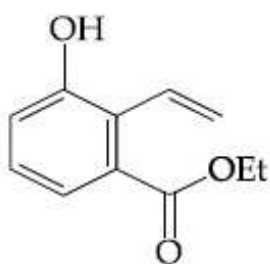
1.



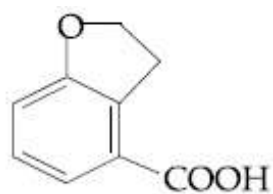
2.



3.



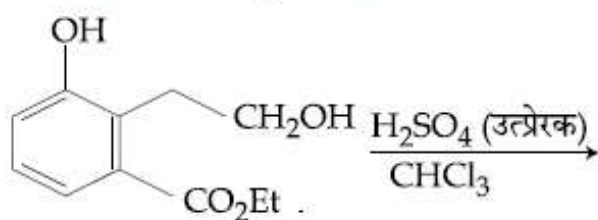
4.



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

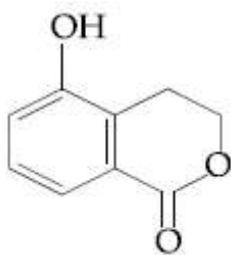
Correct Marks : 4 Wrong Marks : 1

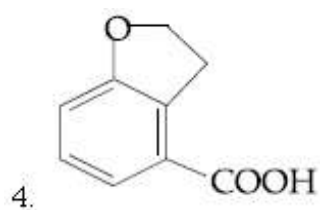
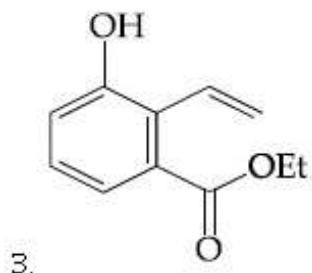
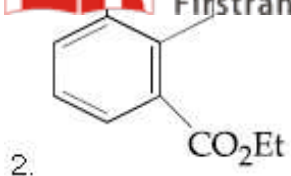
निम्न अभिक्रिया का मुख्य उत्पाद है :



Options :

1.

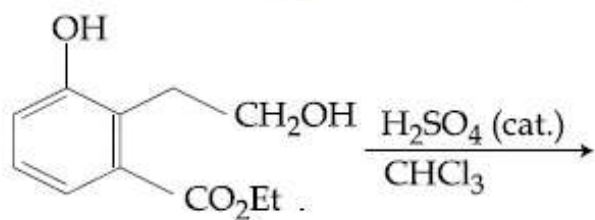




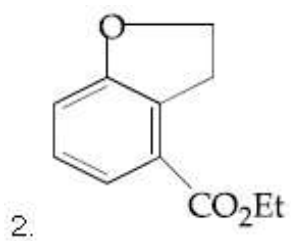
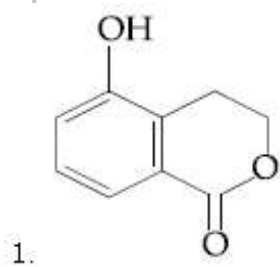
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

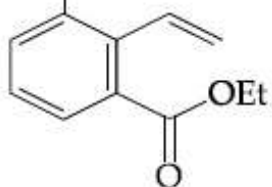
નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?



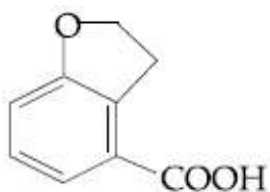
Options :



3.



4.



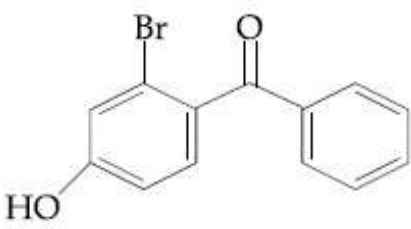
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

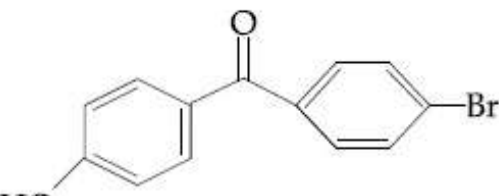
p-Hydroxybenzophenone upon reaction with bromine in carbon tetrachloride gives :

Options :

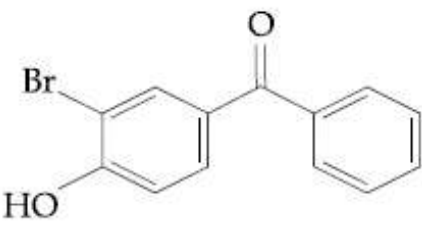
1.



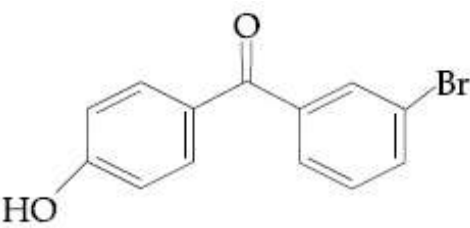
2.



3.



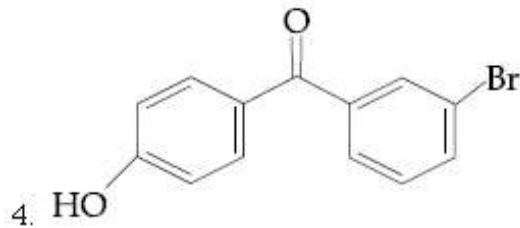
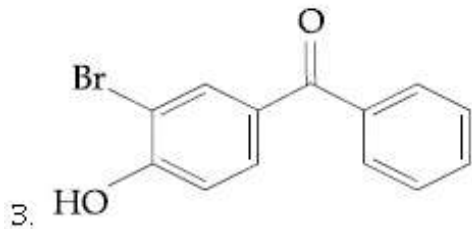
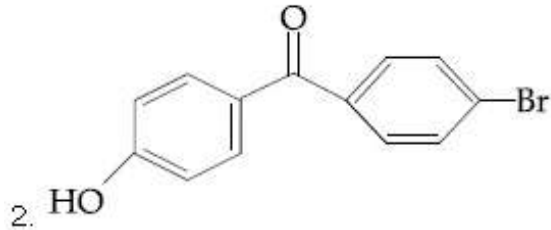
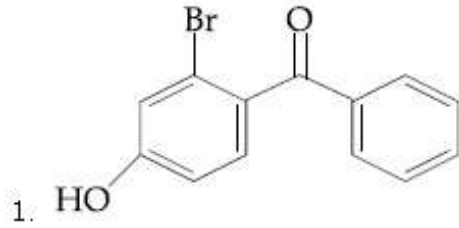
4.



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

Options :

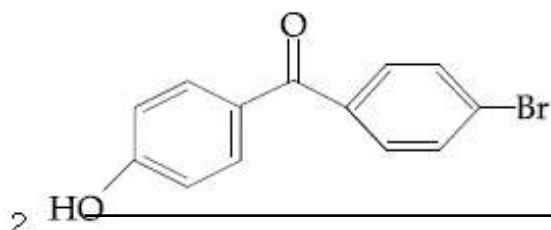
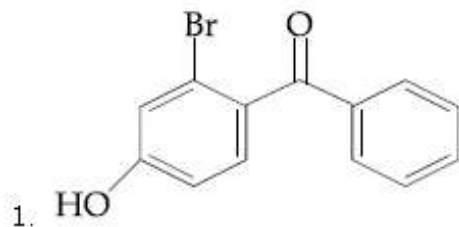


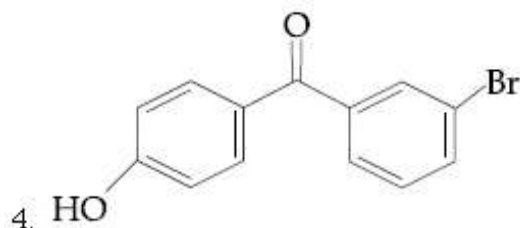
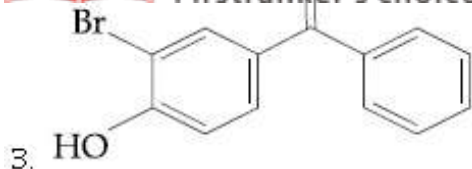
Question Number : 35 Question Type : MCQ Option Showing : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

p-હાઈડ્રોક્સીબેન્ઝોફીનોન સાથે બ્રોમિન ની કાર્બન
 ટ્રેટ્રાક્લોરાઈડમાં પ્રક્રિયા કરતા શું મળશે?

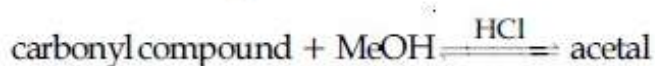
Options :





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

In the following reaction



Rate of the reaction is the highest for :

Options :

1. Acetone as substrate and methanol in excess
2. Propanal as substrate and methanol in excess
3. Acetone as substrate and methanol in stoichiometric amount
4. Propanal as substrate and methanol in stoichiometric amount

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 अभिक्रिया में



अभिक्रिया की दर निम्न में से किसके लिए उच्चतम है?

Options :

1. एसीटोन अवस्तर के रूप में तथा मेथेनॉल आधिक्य में

2. आधिक्य में

3. एसीटोन अवस्तर के रूप में तथा मेथेनॉल
 स्टॉइकियोमीट्री मात्रा में

4. प्रोपेनल अवस्तर के रूप में तथा मेथेनॉल
 स्टॉइकियोमीट्री मात्रा में

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

आपेली प्रक्रिया,

कार्बोनील संयोजन + MeOH $\xrightarrow{\text{HCl}}$ एसिटाल
 मोटे प्रक्रिया दर नीचेना मांथी कोनो सोथी वधु लशे?

Options :

1. एसिटोन सबस्ट्रेट तरीके अने वधु पडतो मिथेनोल

2. प्रोपेनाल सबस्ट्रेट तरीके अने वधु पडतो मिथेनोल

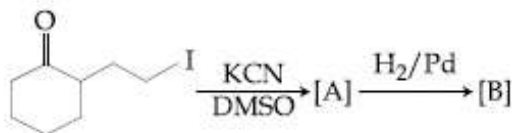
3. एसिटोन सबस्ट्रेट तरीके अने मिथेनोल
 तत्वयोगभीतीय प्रमाणमां

4. प्रोपेनोल सबस्ट्रेट तरीके अने मिथेनोल
 तत्वयोगभीतीय प्रमाणमां

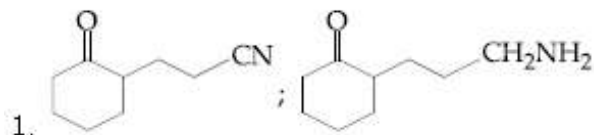
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

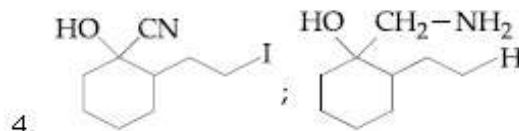
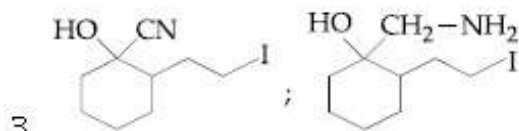
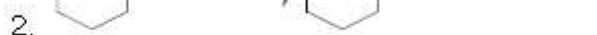
Correct Marks : 4 Wrong Marks : 1

The major products A and B for the following reactions are, respectively :



Options :

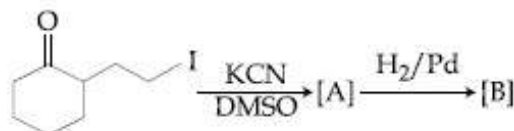




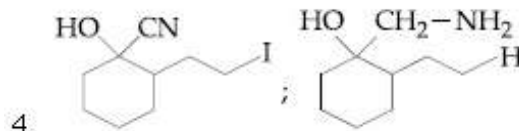
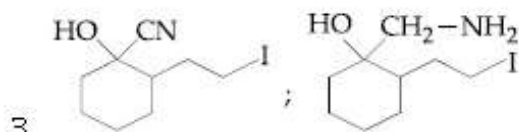
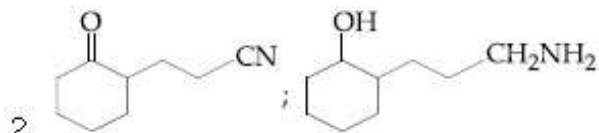
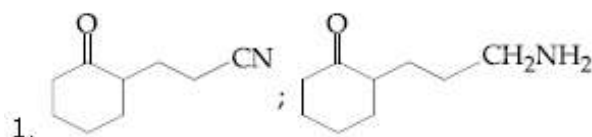
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं के मुख्य उत्पाद A तथा B क्रमशः हैं :



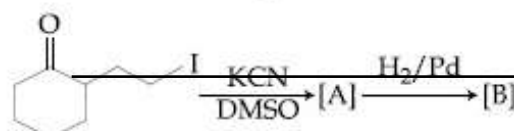
Options :

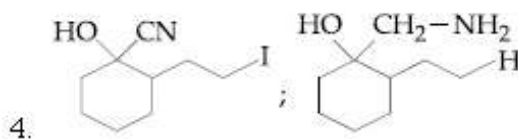
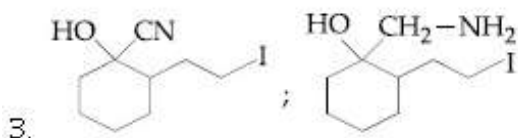
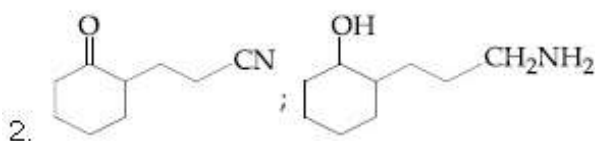
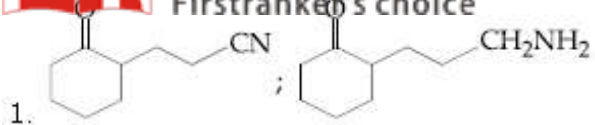


Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આપેલ પ્રક્રિયાઓની મુખ્ય નીપજો A અને B શોધો :



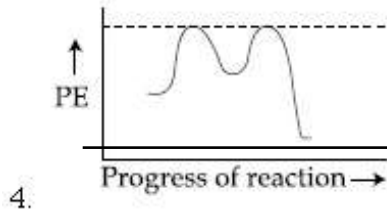
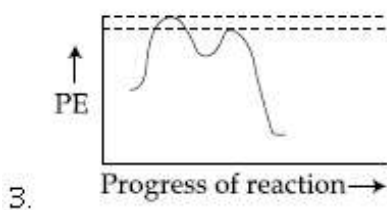
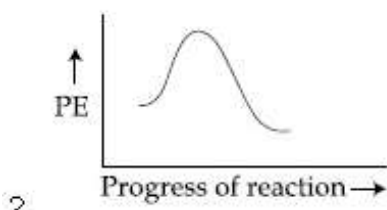
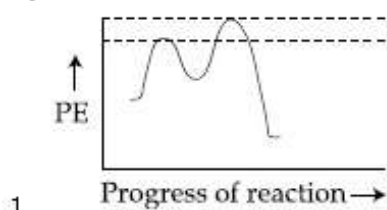


Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following potential energy (PE) diagrams represents the S_N1 reaction?

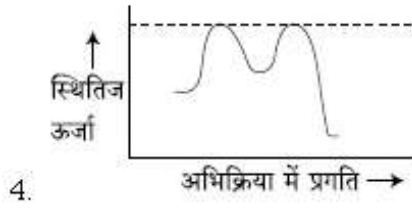
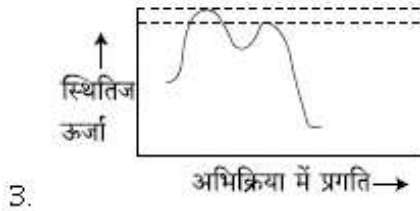
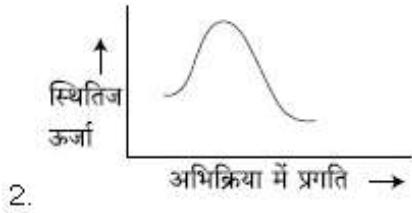
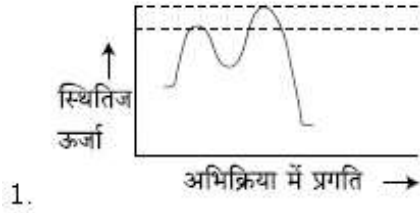
Options :



Correct Marks : 4 Wrong Marks : 1

स्थितिज ऊर्जा (PE) का निम्न में से कौन सा आरेख S_N1 अभिक्रिया को अभिव्यक्त करता है :

Options :

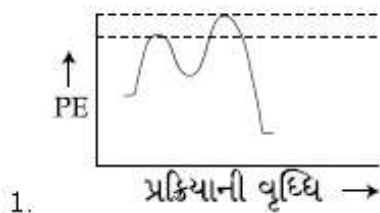


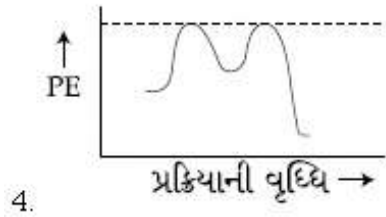
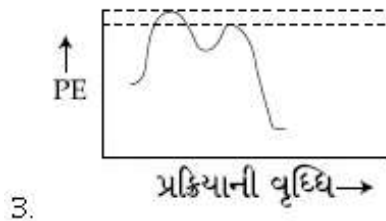
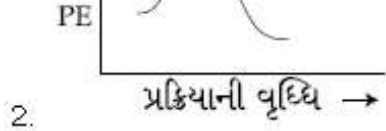
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे आपेला सक्रियकरण शक्तिमां (PE) आलेखोमांथी
क्यो आलेख S_N1 प्रक्रिया दशावे छे ते शोधो?

Options :





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 peptide that gives positive ceric ammonium nitrate and carbylamine tests is :

Options :

1. Ser - Lys
2. Lys - Asp
3. Gln - Asp
4. Asp - Gln

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

वह पेप्टाइड जो सकारात्मक सेरिक अमोनियम नाइट्रेट तथा कार्बिलऐमीन परीक्षण देता है, वह है :

Options :

1. Ser - Lys
2. Lys - Asp
3. Gln - Asp

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

પેપ્ટાઈડ કે જે હકારાત્મક સીરીક અમોનિયમ નાઈટ્રેટ અને કાર્બાયલ એમાઈન કસોટી આપે છે તે શોધો?

Options :

1. Ser - Lys
2. Lys - Asp
3. Gln - Asp
4. Asp - Gln

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

Hinsberg's reagent is :

Options :

1. C_6H_5COCl
2. $SOCl_2$
3. $(COCl)_2$
4. $C_6H_5SO_2Cl$

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

हिंसबर्ग अभिकर्मक है :

Options :

1. C_6H_5COCl
2. $SOCl_2$
3. $(COCl)_2$
4. $C_6H_5SO_2Cl$

Correct Marks : 4 Wrong Marks : 1

હી-સબર્ગ પ્રક્રિયક શોધો ?

Options :

1. C_6H_5COCl
2. $SOCl_2$
3. $(COCl)_2$
4. $C_6H_5SO_2Cl$

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

Assertion :

For the extraction of iron, haematite ore is used.

Reason :

Haematite is a carbonate ore of iron.

Options :

1. Only the assertion is correct.
2. Only the reason is correct.

Both the assertion and reason are correct and the reason is the correct explanation for the assertion.

- 3.
- Both the assertion and reason are correct, but the reason is not the correct explanation for the assertion.
- 4.

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

આયરન કે નિષ્કર્ષણ કે લિફ હેમાટાઈટ અયસ્ક પ્રયુક્ત હોતા હૈ।

કારણ :

હેમાટાઈટ આયરન કા કાર્બોનેટ અયસ્ક હૈ।

Options :

1. માત્ર કથન સત્ય હૈ।

2. માત્ર કારણ સત્ય હૈ।

કથન તથા કારણ દોનોં સત્ય હૈં ઓર કારણ,
3. કથન કી સહી વ્યાખ્યા કરતા હૈ।

કથન તથા કારણ દોનોં સત્ય હૈં પરંતુ કારણ,
4. કથન કી સહી વ્યાખ્યા નહીં કરતા હૈ।

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

અભિધારણ :

આર્યનના નિષ્કર્ષણ માટે હેમેટાઈટ અયસ્ક નો ઉપયોગ કરવામાં આવે છે.

કારણ :

હેમેટાઈટ આર્યનનો કાર્બોનેટ અયસ્ક છે.

Options :

1. ફક્ત અભિધારણ સાચી છે.

2. ફક્ત કારણ સાચું છે.

અભિધારણ અને કારણ બન્ને સાચા છે. અને
3. કારણ એ અભિધારણની સાચી સમજૂતી છે.

અભિધારણ અને કારણ બન્ને સાચા છે પણ
4. કારણ એ અભિધારણની સાચી સમજૂતી નથી.

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

The one that is not a carbonate ore is :

Options :

2. calamine
3. malachite
4. siderite

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

वह एक जो कार्बोनेट अयस्क नहीं है, वह है :

Options :

1. बॉक्साइट
2. केलामाइन
3. मेलकाइट
4. सिडेराइट

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

नीचेના માંથી કઈ કાર્બોનેટ અયસ્ક નથી તે શોધો?

Options :

1. બોક્સાઈટ
2. કેલેમાઈન
3. મેલેચાઈટ
4. સિડેરાઈટ

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

HF has highest boiling point among hydrogen halides, because it has :

Options :

1. lowest ionic character

3. strongest hydrogen bonding
4. strongest van der Waals' interactions

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

HF का क्वथनांक हाइड्रोजन हैलाइडों में उच्चतम होता है, इसका कारण है :

Options :

1. निम्नतम आयनिक स्वभाव
2. निम्नतम वियोजन एन्थैल्पी
3. प्रबलतम हाइड्रोजन आबन्धन
4. प्रबलतम वन डर वाल्स अन्योन्यक्रिया

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

HF નું ઉત્કલનબિંદુ બીજા હાઈડ્રોજન હેલાઈડ્સ કરતા વધુ છે, કારણ તેની પાસે છે :

Options :

1. ઓછામાઓછો આયોનિક ગુણધર્મ
2. નીચી વિયોજન એન્થાલ્પી
3. પ્રબળ હાઈડ્રોજન બંધન
4. પ્રબળ વાન્ડરવાલ ક્રિયા-પ્રતિક્રિયા

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 structures of beryllium chloride in the solid state and vapour phase, respectively, are :

Options :

2. chain and dimeric
3. dimeric and dimeric
4. chain and chain

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

बेरीलियम क्लोराइड की संरचनाएं ठोस अवस्था तथा वाष्प प्रावस्था में क्रमशः हैं :

Options :

1. द्वितीय तथा शृंखला
2. शृंखला तथा द्वितीय
3. द्वितीय तथा द्वितीय
4. शृंखला तथा शृंखला

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

બેરેલિયમ ક્લોરાઈડ નાં બંધારણો અનુક્રમે ધન અવસ્થામાં અને વાયુ અવસ્થામાં કયા હોય છે તે શોધો ?

Options :

1. દ્વિલક અને શ્રંખલા
2. શ્રંખલા અને દ્વિલક
3. દ્વિલક અને દ્વિલક
4. શ્રંખલા અને શ્રંખલા

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 amorphous form of silica is :

Options :

2. cristobalite
3. tridymite
4. kieselguhr

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

सिलिका का अक्रिस्टलीय रूप है :

Options :

1. क्वार्ट्स
2. क्रिस्टोबेलाइट
3. ट्राइडाइमाइट
4. किजेलगूर

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

सिलिका नुं अक्रिस्टकमय स्वरूप नीचेनामांथी शोधो ?

Options :

1. क्वार्ट्स
2. क्रिस्टोबेलाइट
3. ट्राइडाइमाइट
4. किशेल्वर (kieselguhr)

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

- (I) Boron trioxide is acidic.
(II) Oxides of aluminium and gallium are amphoteric.
(III) Oxides of indium and thallium are basic.

Options :

1. (I) and (III) only
2. (II) and (III) only
3. (I) and (II) only
4. (I), (II) and (III)

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

ग्रुप-13 तत्वों के ऑक्साइडों से सम्बन्धित I से III में से सही कथन हैं :

- (I) बोरॉन ट्राइऑक्साइड अम्लीय है।
(II) एल्यूमीनियम तथा गैलियम के ऑक्साइड उभयधर्मी हैं।
(III) इन्डियम तथा थैलियम के ऑक्साइड क्षारीय हैं।

Options :

1. (I) तथा (III) मात्र
2. (II) तथा (III) मात्र
3. (I) तथा (II) मात्र
4. (I), (II) तथा (III)

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

- (I) બોરોન ટ્રાઈઓક્સાઈડ એસેડિક છે.
(II) એલ્યુમિનીયમ અને ગેલિયમના ઓક્સાઈડો ઉભયગુણી છે.
(III) ઇન્ડીયમ અને થેલિયમ ના ઓક્સાઈડ બેઝિક છે.

Options :

- ફક્ત (I) અને (III)
- ફક્ત (II) અને (III)
- ફક્ત (I) અને (II)
- (I), (II) અને (III)

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 maximum number of possible oxidation states of actinoides are shown by :

Options :

- actinium (Ac) and thorium (Th)
- neptunium (Np) and plutonium (Pu)
- berkelium (Bk) and californium (Cf)
- nobelium (No) and lawrencium (Lr)

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

एकटीन्वायडों की सम्भव ऑक्सीकरण अवस्थाओं की उच्चतम संख्या निम्न में से किसके द्वारा प्रदर्शित होती है?

Options :

- एकटीनियम (Ac) तथा थोरियम (Th)
- नेप्ट्यूनियम (Np) तथा प्लुटोनियम (Pu)

4. નોબેલિયમ (No) તથા લારેન્સિયમ (Lr)

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

એક્ટિનાઈડોની મહત્તમ નંબરની શક્ય ઓક્સિડેશન
અવસ્થાઓ કોણ બતાવે છે તે શોધો?

Options :

1. એક્ટિનીયમ (Ac) અને થોરિયમ (Th)
2. નેપ્ચુનિયમ (Np) અને પ્લુટોનિયમ (Pu)
3. બર્કેલિયમ (Bk) અને કેલીફોર્નિયમ (Cf)
4. નોબેલીયમ (No) અને લોરેન્સિયમ (Lr)

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

The correct statements among I to III are :

- (I) Valence bond theory cannot explain the color exhibited by transition metal complexes.
- (II) Valence bond theory can predict quantitatively the magnetic properties of transition metal complexes.
- (III) Valence bond theory cannot distinguish ligands as weak and strong field ones.

Options :

1. (I) and (II) only
2. (I) and (III) only
3. (II) and (III) only

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

I से III में से सही कथन हैं :

- (I) संक्रमण धातु संकरों द्वारा प्रदर्शित रंग को संयोजकता आबन्ध सिद्धान्त समझा नहीं सकता।
- (II) संक्रमण धातु संकरों के चुम्बकीय गुणों की मात्रात्मक प्रागुक्ति संयोजकता आबन्ध सिद्धान्त कर सकता है।
- (III) संयोजकता आबन्ध सिद्धान्त दुर्बल तथा प्रबल क्षेत्र के लिगण्डों के बीच अन्तर नहीं बता सकता।

Options :

1. (I) तथा (II) मात्र
2. (I) तथा (III) मात्र
3. (II) तथा (III) मात्र
4. (I), (II) तथा (III)

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

I થી III માના સાચા વિધાનો શોધો?

- (I) સંક્રાંતિ તત્વો દ્વારા દર્શાવતો રંગ સંયોજકતા બંધન વાદ દ્વારા સમજાવી શકાતો નથી.
- (II) સંક્રાંતિ તત્વોની ચુંબકીય ગુણધર્મો નું જથ્થાત્મક સંયોજકતા બંધન વાદ દ્વારા થઈ શકે છે.
- (III) સંયોજકતા બંધન વાદ દ્વારા, લીગાન્ડોનું નિર્જળ અને પ્રબળ ક્ષેત્ર પ્રતિબેદીત કરી શકાતું નથી.

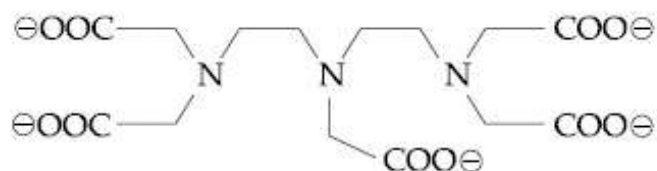
Options :

1. ફક્ત (I) અને (II)
2. ફક્ત (I) અને (III)
3. ફક્ત (II) અને (III)

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 maximum possible denticities of a ligand given below towards a common transition and inner-transition metal ion, respectively, are :



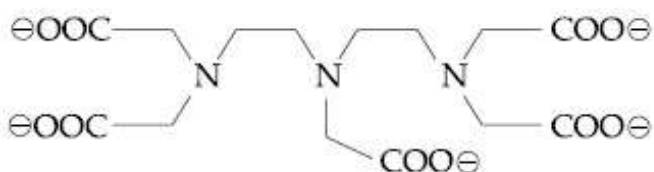
Options :

1. 6 and 6
2. 6 and 8
3. 8 and 8
4. 8 and 6

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

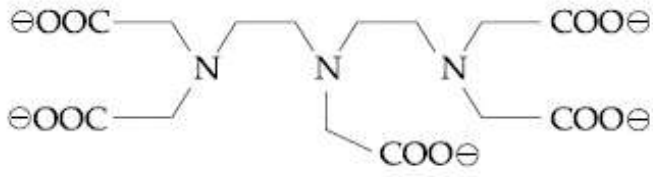
उभयनिष्ठ ट्रान्जिशन तथा इनर-ट्रान्जिशन धातु के प्रति नीचे दिये गये लिगेण्ड की अधिकतम सम्भव दन्तिकतायें क्रमशः हैं :



Options :

1. 6 तथा 6
2. 6 तथा 8
3. 8 तथा 8
4. 8 तथा 6

અનુક્રમે, સામાન્ય સંક્રાંતિ અને આંતરિક સંક્રાંતિ તત્વો તરફ નીચે આપેલ લીગાન્ડની મહત્તમ દંતીયતા ની શક્યતા શોધો ?



Options :

1. 6 અને 6
2. 6 અને 8
3. 8 અને 8
4. 8 અને 6

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

The layer of atmosphere between 10 km to 50 km above the sea level is called as :

Options :

1. stratosphere
2. troposphere
3. mesosphere
4. thermosphere

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

સમુદ્ર તલ સે ઊપર 10 km સે 50 km કે બીચ કી વાયુમંડલ પર્ત કો કહા જાતા હૈ :

Options :

1. સ્ટ્રેટોસ્ફીયર
2. ટ્રોપોસ્ફીયર

4. થર્મોસ્ફીયર

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

સમુદ્રના સ્તરથી ઉપર 10 km થી 50 km વચ્ચે
વાતાવરણનું કયું સ્તર ઓવેલું છે તે શોધો ?

Options :

1. સમતાપ આવરણ
2. ક્ષોભ આવરણ
3. મેસો આવરણ
4. થર્મો આવરણ

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

What would be the molality of 20% (mass/
mass) aqueous solution of KI ?
(molar mass of KI = 166 g mol^{-1})

Options :

1. 1.51
2. 1.35
3. 1.08
4. 1.48

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

KI કે 20% (દ્રવ્યમાન/દ્રવ્યમાન) જલીય વિલયન કી
મોલલતા કયા હોગી ?
(KI કા મોલર દ્રવ્યમાન = 166 g mol^{-1})

Options :

1. 1.51

3. 1.08

4. 1.48

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

KI ના 20 % (દળ/દળ)ના જલીય દ્રાવણની મોલાલિટી કેટલી હશે?

(KI નું મોલર દળ = 166 g mol^{-1})

Options :

1. 1.51

2. 1.35

3. 1.08

4. 1.48

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

At a given temperature T, gases Ne, Ar, Xe and Kr are found to deviate from ideal gas behaviour. Their equation of state is given

$$\text{as } p = \frac{RT}{V-b} \text{ at } T.$$

Here, b is the van der Waals constant.

Which gas will exhibit steepest increase in the plot of Z (compression factor) vs p ?

Options :

1. Ne

2. Ar

3. Xe

4. Kr

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

તેમની અવસ્થા સમીકરણ ઇસ પ્રકાર દિયા છે

$$p = \frac{RT}{V-b}; \text{ દિયે ગયે } T \text{ પર}$$

યહાં b વાન્ડરવાલ્સ સ્થિરાંક છે. કૌન સી ગૈસ Z (સંપીડનકારક) તથા p કે પ્લાટ મેં સર્વાધિક ખડી વૃદ્ધિ પ્રદર્શિત કરેગી?

Options :

1. Ne
2. Ar
3. Xe
4. Kr

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

એક આપેલા તાપમાન T એ, Ne, Ar, Xe અને Kr નું આદર્શ વાયુ વર્તુણકથી વિચલન માત્રા પડેલ છે. આપેલ તાપમાન T એ, તેમની અવસ્થાનું સમીકરણ નીચે મુજબ છે,

$$p = \frac{RT}{V-b}$$

અહીં, b વાન્ડર વાલ્સનો અચળાંક છે. કયો વાયુ દબનીય અવયવ Z વિરુદ્ધ p ના આલેખમાં સૌથી વધુ વધારો દર્શાવશે?

Options :

1. Ne
2. Ar
3. Xe
4. Kr

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

hydrogen atom is incorrect ? (The Bohr radius is represented by a_0).

Options :

1. The electron can be found at a distance $2a_0$ from the nucleus.
2. The total energy of the electron is maximum when it is at a distance a_0 from the nucleus.
3. The probability density of finding the electron is maximum at the nucleus.
4. The magnitude of the potential energy is double that of its kinetic energy on an average.

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

हाइड्रोजन परमाणु के 1s कक्षक में उपस्थित इलेक्ट्रॉन के बारे में निम्न में से कौन सा सही नहीं है ? (बोर त्रिज्या को a_0 द्वारा प्रदर्शित किया गया है।)

Options :

1. इलेक्ट्रॉन, नाभिक से $2a_0$ की दूरी पर पाया जा सकता है।
2. इलेक्ट्रॉन की कुल ऊर्जा उच्चतम तब होगी जब वह नाभिक से a_0 दूरी पर है।
3. इलेक्ट्रॉन के पाये जाने का प्रायिकता घनत्व नाभिक पर सर्वाधिक है।
4. औसतन, स्थितिज ऊर्जा का मान इसके गतिज ऊर्जा के मान का दुगुना है।

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

(બોહ્રની ત્રિજ્યાને a_0 વડે દર્શાવેલ છે)

Options :

1. ઇલેક્ટ્રોન, કેન્દ્ર (ન્યુક્લિઅસ)થી $2a_0$ નાં અંતરે મળે શકે.
2. જ્યારે ઇલેક્ટ્રોન, કેન્દ્ર (ન્યુક્લિઅસ)થી a_0 ના અંતરે હોય છે ત્યારે તેની કુલ ઊર્જા (શક્તિ) મહત્તમ હોય છે.
3. કેન્દ્રમાં ઇલેક્ટ્રોન મળવાની સંભાવના ઘનતા મહત્તમ છે.
4. મોટા ભાગે, તેની ગતિકી ઊર્જા કરતા પોટેન્શિયલ ઊર્જાની તીવ્રતા બમણી હોય છે.

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

Among the following species, the diamagnetic molecule is :

Options :

1. NO
2. CO
3. O_2
4. B_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

निम्न स्पीशीज़ में, प्रतिचुम्बकीय अणु है :

Options :

1. NO
2. CO
3. O_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

નીચે આપેલી સ્પીશીઝમાં, કયો આણુ પ્રતિચુંબકીય છે?

Options :

1. NO
2. CO
3. O₂
4. B₂

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

During compression of a spring the work done is 10 kJ and 2 kJ escaped to the surroundings as heat. The change in internal energy, ΔU (in kJ) is :

Options :

1. 8
2. -12
3. -8
4. 12

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 स्प्रिंग को संपीडित करने में किया गया कार्य 10 kJ है तथा 2 kJ ऊष्मा के रूप में वातावरण को चला जाता है। आंतरिक ऊर्जा में परिवर्तन ΔU (kJ में) होगा :

Options :

1. 8
2. -12
3. -8

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 સ્પ્રિંગને (spring) દબાવવા માટે થતું કાર્ય 10 kJ છે અને 2 kJ ગરમી રૂપે પર્યાવરણમાં મુક્ત થાય છે. તો આંતરિક ઊર્જા ΔU માં થતો ફેરફાર kJ માં શોધો?

Options :

1. 8
2. -12
3. -8
4. 12

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

Molal depression constant for a solvent is $4.0 \text{ K kg mol}^{-1}$. The depression in the freezing point of the solvent for 0.03 mol kg^{-1} solution of K_2SO_4 is :
(Assume complete dissociation of the electrolyte)

Options :

1. 0.24 K
2. 0.36 K
3. 0.12 K
4. 0.18 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

एक विलायक के लिए मोलल अवनमन स्थिरांक $4.0 \text{ K kg mol}^{-1}$ है। K_2SO_4 के 0.03 mol kg^{-1} विलयन के लिए विलायक के हिमांक में गिरावट होगी, (मान लीजिए विद्युत अपघट्य का वियोजन पूर्ण रूपेण है)

1. 0.24 K
2. 0.36 K
3. 0.12 K
4. 0.18 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

એક દ્રાવક માટે મોલલ અવનયન અચળાંક $4.0 \text{ K kg mol}^{-1}$ છે. તો K_2SO_4 ની 0.03 mol kg^{-1} દ્રાવણ માટે, દ્રાવકના ઠારબિંદુમાં થતું અવનયન કેટલું?

(વિદ્યુતવિભાજનનું સંપૂર્ણ વિયોજન થાય છે એવું ધારો)

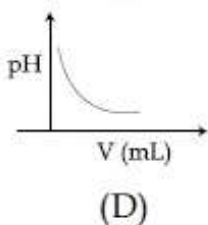
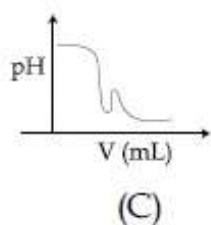
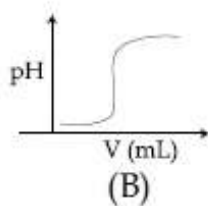
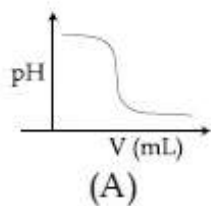
Options :

1. 0.24 K
2. 0.36 K
3. 0.12 K
4. 0.18 K

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

was added to the NaOH solution of unknown strength. Which of the following correctly shows the change of pH of the titration mixture in this experiment?



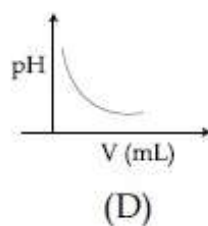
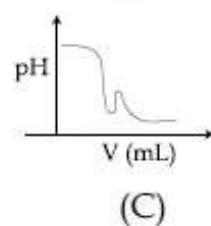
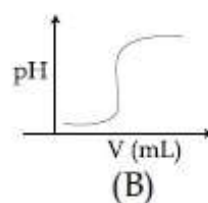
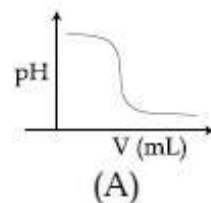
Options :

1. (A)
2. (B)
3. (C)
4. (D)

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

एक अम्ल क्षारक अनुमापन में, 0.1 M HCl विलयन को एक अज्ञात सामर्थ्य वाले NaOH के विलयन में मिलाया गया। इस प्रयोग में, निम्न में से कौन अनुमापन मिश्रण के pH-परिवर्तन को सही-सही प्रदर्शित करता है?



Options :

1. (A)

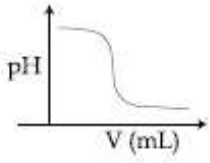
3. (C)

4. (D)

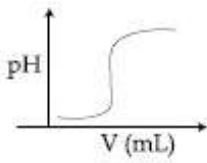
Question Number : 57 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

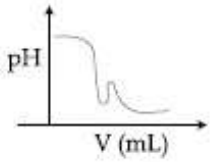
એક એસિડ બેઈક અનુમાપનમાં, અજ્ઞાત પ્રબળતા ધરાવતા NaOH ના દ્રાવણમાં 0.1 M HCl નું દ્રાવણ ઉમેર્યું. આ પ્રયોગમાં, નીચેનામાંથી કયો અનુમાપનમાં થતા pH ના ફેરફારનું સાચું નિરૂપણ કરે છે?



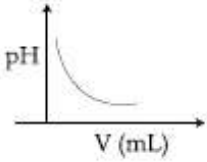
(A)



(B)



(C)



(D)

Options :

1. (A)

2. (B)

3. (C)

4. (D)

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

A solution of $\text{Ni}(\text{NO}_3)_2$ is electrolysed between platinum electrodes using 0.1 Faraday electricity. How many mole of Ni will be deposited at the cathode ?

Options :

1. 0.10

2. 0.05

4. 0.15

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

0.1 फैराडे विद्युत का प्रयोग करते हुए, प्लेटिनम इलेक्ट्रोडों के बीच, $\text{Ni}(\text{NO}_3)_2$ के विलयन को विद्युत अपघटित किया गया। कैथोड पर Ni का कितना मोल निक्षेपित होगा?

Options :

1. 0.10

2. 0.05

3. 0.20

4. 0.15

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

0.1 ફેરાડે વિદ્યુત થી, પ્લેટીનમ ઇલેક્ટ્રોડ ની વચ્ચે $\text{Ni}(\text{NO}_3)_2$ નું દ્રાવણ વિદ્યુત વિભાજિત થાય છે. તો કેથોડ પર Ni ના કેટલા મોલ જમા થશે?

Options :

1. 0.10

2. 0.05

3. 0.20

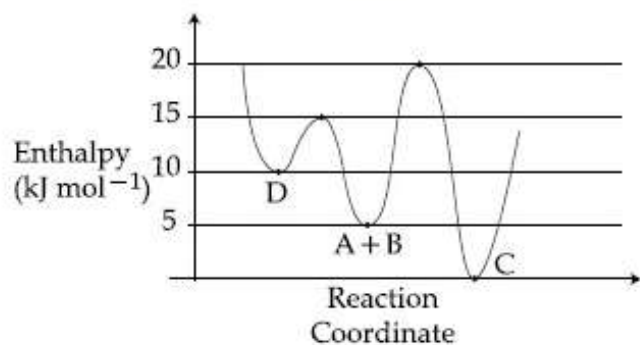
4. 0.15

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



Identify the incorrect statement.



Options :

1. C is the thermodynamically stable product.

2. D is kinetically stable product.

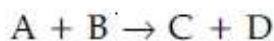
3. Activation enthalpy to form C is 5 kJ mol^{-1} less than that to form D.

4. Formation of A and B from C has highest enthalpy of activation.

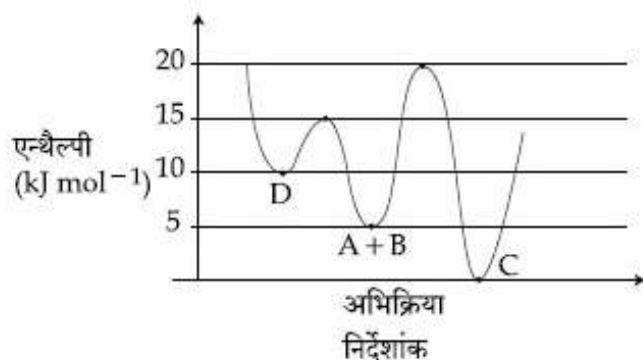
Question Number : 59 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित A एवं B के बीच अभिक्रिया की एन्थैल्पी के दिये गये प्लॉट पर विचार कीजिए।



तथा गलत कथन को बताइये।



Options :

1. C ऊष्मागतिकीय रूप से स्थिर उत्पाद है।

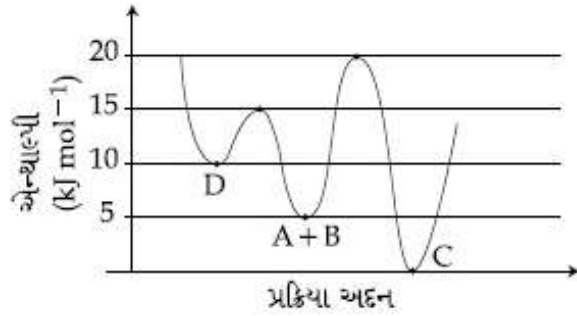
- C को बनाने में संक्रियण एन्थैल्पी, D को बनाने में लगने वाली संक्रियण एन्थैल्पी से
3. 5 kJ mol^{-1} कम है।

- C से A तथा B के बनने में संक्रियण एन्थैल्पी
4. उच्चतम 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

એક પ્રક્રિયા, $A + B \rightarrow C + D$ માટેનો એન્થાલ્પીનો આલેખ ધ્યાનમાં લો અને કયું વિધાન સાચું નથી તે ઓળખો.



Options :

1. C એ ઉષ્મા ગતિકીય (thermodynamically) સ્થાયી નીપજ છે.
2. D એ ગતિકીય સ્થાયી નીપજ છે.
3. C બનાવવાની સક્રિયન એન્થાલ્પી, D બનાવવા કરતા 5 kJ mol^{-1} ઓછી છે.
4. C માંથી A અને B બનાવવા માટેની સક્રિયન એન્થાલ્પી સૌથી વધુ 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

10 mL of 1 mM surfactant solution forms a monolayer covering 0.24 cm^2 on a polar substrate. If the polar head is approximated as a cube, what is its edge length ?

1. 0.1 nm
2. 2.0 pm
3. 1.0 pm
4. 2.0 nm

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

1 mM પૃષ્ઠ સંક્રિયક વિલયન કા 10 mL એક પોલર અવસ્તર પર એક મોનોલેયર બનાકર 0.24 cm^2 ઘેરતા છે. યદિ પોલર હેડ કો એક ઘનક રૂપ મેં માના જાય તો ઇસકે કોર કી લમ્બાઈ ક્યા હોગી ?

Options :

1. 0.1 nm
2. 2.0 pm
3. 1.0 pm
4. 2.0 nm

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

1 mM પૃષ્ઠસક્રિયનું 10 mL દ્રાવણ એક પોલર સબસ્ટ્રેટ પર 0.24 cm^2 ને આવરી લેતું એક સ્તર બનાવે છે. જો પોલાર માથું એક ઘન તરીકે અંદાજીત કરીએ તો, તેની ધાર લંબાઈ કેટલી ?

Options :

1. 0.1 nm
2. 2.0 pm
3. 1.0 pm
4. 2.0 nm

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

416529261

3

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

416529401

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

The domain of the definition of the function

$$f(x) = \frac{1}{4-x^2} + \log_{10}(x^3 - x) \text{ is :}$$

Options :

1. $(-1, 0) \cup (1, 2) \cup (3, \infty)$
2. $(1, 2) \cup (2, \infty)$
3. $(-1, 0) \cup (1, 2) \cup (2, \infty)$
4. $(-2, -1) \cup (-1, 0) \cup (2, \infty)$

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

$$f(x) = \frac{1}{4-x^2} + \log_{10}(x^3 - x) \text{ द्वारा परिभाषित}$$

फलन का प्रांत है :

Options :

1. $(-1, 0) \cup (1, 2) \cup (3, \infty)$
2. $(1, 2) \cup (2, \infty)$
3. $(-1, 0) \cup (1, 2) \cup (2, \infty)$
4. $(-2, -1) \cup (-1, 0) \cup (2, \infty)$

Correct Marks : 4 Wrong Marks : 1

વિધેય $f(x) = \frac{1}{4-x^2} + \log_{10}(x^3-x)$ નો પ્રદેશ _____ છે.

Options :

1. $(-1, 0) \cup (1, 2) \cup (3, \infty)$
2. $(1, 2) \cup (2, \infty)$
3. $(-1, 0) \cup (1, 2) \cup (2, \infty)$
4. $(-2, -1) \cup (-1, 0) \cup (2, \infty)$

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 $z \in \mathbb{C}$ be such that $|z| < 1$. If $\omega = \frac{5+3z}{5(1-z)}$,

then :

Options :

1. $5 \operatorname{Re}(\omega) > 4$
2. $5 \operatorname{Re}(\omega) > 1$
3. $4 \operatorname{Im}(\omega) > 5$
4. $5 \operatorname{Im}(\omega) < 1$

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

માના $z \in \mathbb{C}$ इस प्रकार है कि $|z| < 1$. यदि

$\omega = \frac{5+3z}{5(1-z)}$, तो :

Options :

1. $5 \operatorname{Re}(\omega) > 4$
2. $5 \operatorname{Re}(\omega) > 1$

4. $5 \operatorname{Im}(\omega) < 1$

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 $z \in \mathbb{C}$ કે જેથી $|z| < 1$. $\omega = \frac{5+3z}{5(1-z)}$, તો

_____ .

Options :

1. $5 \operatorname{Re}(\omega) > 4$

2. $5 \operatorname{Re}(\omega) > 1$

3. $4 \operatorname{Im}(\omega) > 5$

4. $5 \operatorname{Im}(\omega) < 1$

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

If m is chosen in the quadratic equation $(m^2 + 1)x^2 - 3x + (m^2 + 1)^2 = 0$ such that the sum of its roots is greatest, then the absolute difference of the cubes of its roots is :

Options :

1. $8\sqrt{5}$

2. $4\sqrt{3}$

3. $10\sqrt{5}$

4. $8\sqrt{3}$

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

यदि द्विघातीय समीकरण

$(m^2 + 1)x^2 - 3x + (m^2 + 1)^2 = 0$ में m इस प्रकार

लिया गया है, कि इसके मूलों का योगफल अधिकतम

है, तो इसके मूलों के घन का निरपेक्ष अन्तर है :

1. $8\sqrt{5}$
2. $4\sqrt{3}$
3. $10\sqrt{5}$
4. $8\sqrt{3}$

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 $(m^2 + 1)x^2 - 3x + (m^2 + 1)^2 = 0$
માં જો m એવો પસંદ કરવામાં આવે કે જેથી તેનાં બીજોનો
સરવાળો મહત્તમ થાય, તો તેનાં બીજોનાં ઘનોનો નિરપેક્ષ
તફાવત _____ છે.

Options :

1. $8\sqrt{5}$
2. $4\sqrt{3}$
3. $10\sqrt{5}$
4. $8\sqrt{3}$

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

The total number of matrices

$$A = \begin{pmatrix} 0 & 2y & 1 \\ 2x & y & -1 \\ 2x & -y & 1 \end{pmatrix}, (x, y \in \mathbb{R}, x \neq y) \text{ for}$$

which $A^T A = 3I_3$ is :

Options :

1. 2
2. 4
3. 6
4. 3

Correct Marks : 4 Wrong Marks : 1

આવ્યૂં A = $\begin{pmatrix} 0 & 2y & 1 \\ 2x & y & -1 \\ 2x & -y & 1 \end{pmatrix}$, $(x, y \in \mathbb{R}, x \neq y)$

જિનકે લિઅ $A^T A = 3I_3$ હૈ, કી કુલ સંખ્યા હૈ :

Options :

1. 2
2. 4
3. 6
4. 3

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

જેનિ માટે $A^T A = 3I_3$ થાય તેવા શ્રેણિકો

A = $\begin{pmatrix} 0 & 2y & 1 \\ 2x & y & -1 \\ 2x & -y & 1 \end{pmatrix}$, $(x, y \in \mathbb{R}, x \neq y)$ ની કુલ

સંખ્યા _____ છે.

Options :

1. 2
2. 4
3. 6
4. 3

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 $2x + 3y - z = 0$,
 $x + ky - 2z = 0$ and $2x - y + z = 0$ has a
non-trivial solution (x, y, z) , then

$\frac{x}{y} + \frac{y}{z} + \frac{z}{x} + k$ is equal to :

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

2. -4

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

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

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 $2x + 3y - z = 0$,
 $x + ky - 2z = 0$ तथा $2x - y + z = 0$ का एक
अतुच्छ (non-trivial) हल (x, y, z) है, तो

$\frac{x}{y} + \frac{y}{z} + \frac{z}{x} + k$ बराबर है :

Options :

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

2. -4

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

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

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 સંહિતિ $2x + 3y - z = 0$, $x + ky - 2z = 0$
અને $2x - y + z = 0$ નો એક યોગ્ય ઉકેલ (non-trivial

solution), (x, y, z) હોય તો $\frac{x}{y} + \frac{y}{z} + \frac{z}{x} + k$

બરાબર _____ થાય.

Options :

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

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

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

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

Some identical balls are arranged in rows to form an equilateral triangle. The first row consists of one ball, the second row consists of two balls and so on. If 99 more identical balls are added to the total number of balls used in forming the equilateral triangle, then all these balls can be arranged in a square whose each side contains exactly 2 balls less than the number of balls each side of the triangle contains. Then the number of balls used to form the equilateral triangle is :

Options :

1. 157

2. 262

3. 190

4. 225

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

કિ વહ એક સમબાહુ ત્રિભુજ બનાતો હૈ। પહલી પંક્તિ
એક ગેંદ હૈ, દૂસરી પંક્તિ મેં દો ગેંદે હૈ તથા ઇસી પ્રકાર
અન્ય પંક્તિઓ મેં ગેંદે હૈ। સમબાહુ ત્રિભુજ બનાને મેં લગી
કુલ ગેંદો મેં યદિ એક જૈસી 99 ગેંદે ઓર જોડ દી જાયે
તો ઇન સારી ગેંદો કો એક એસે વર્ગ કે આકાર મેં રખા
જા સકતા હૈ જિસકી પ્રત્યેક ભુજા મેં ત્રિભુજ કી પ્રત્યેક
ભુજા સે ઠીક દો ગેંદે કમ હૈ। તો સમબાહુ ત્રિભુજ બનાને
મેં લગી ગેંદો કી સંખ્યા હૈ :

Options :

1. 157
2. 262
3. 190
4. 225

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

સમબાજુ ત્રિકોણ બનાવવા કેટલાક સમાન દડાઓને હારોમાં
ગોઠવેલા છે. પ્રથમ હાર એક દડો ધરાવે છે, બીજી હાર બે
દડા ધરાવે છે અને એ રીતે આગળ, સમબાજુ
ત્રિકોણ બનાવવામાં વપરાયેલ કુલ દડાની સંખ્યામાં જો
બીજા 99 સમાન દડાઓ ઉમેરવામાં આવે, તો આ બધા
દડાઓને એક ચોરસમાં ગોઠવી શકાય કે જેની દરેક બાજુ,
ત્રિકોણની દરેક બાજુ જેટલા દડાઓ ધરાવે છે તેના કરતાં
બરાબર બે જ દડાઓ ઓછા ધરાવે છે. તો સમબાજુ
ત્રિકોણ બનાવવા વપરાયેલ દડાઓની સંખ્યા
_____ છે.

Options :

1. 157
2. 262
3. 190
4. 225

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

Three consecutive coefficients in the binomial expansion of $(x+1)^n$ in powers of x are in the ratio 2 : 15 : 70, then the average of these three coefficients is :

Options :

1. 227
2. 232
3. 625
4. 964

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 $(x+1)^n$ के x की घातों में द्विपद प्रसार में कोई तीन क्रमागत गुणांक 2 : 15 : 70 के अनुपात में हैं, तो इन तीन गुणांकों का औसत है :

Options :

1. 227
2. 232
3. 625
4. 964

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

x ની ઘાતોમાં, $(x+1)^n$ દ્વિપદી વિસ્તરણમાં જો કોઈક ત્રણ ક્રમિક સહગુણકો 2 : 15 : 70 ગુણોત્તરમાં હોય, તો આ ત્રણ સહગુણકોની સરેરાશ _____ થાય.

Options :

1. 227
2. 232
3. 625
4. 964

Correct Marks : 4 Wrong Marks : 1

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If the sum and product of the first three terms in an A.P. are 33 and 1155, respectively, then a value of its 11th term is :

Options :

1. -36
2. -25
3. 25
4. -35

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 समान्तर श्रेढी के प्रथम तीन पदों का योगफल तथा गुणनफल क्रमशः 33 तथा 1155 है, तो इसके 11वें पद का एक मान है :

Options :

1. -36
2. -25
3. 25
4. -35

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 એક સમાંતર શ્રેણી (A.P.) માં પ્રથમ ત્રણ પદોનો સરવાળો અને ગુણાકાર અનુક્રમે 33 અને 1155 હોય તો તેના 11 મા પદની કિંમત _____ થાય.

Options :

1. -36
2. -25
3. 25

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 the series
 $1+2\times 3+3\times 5+4\times 7+\dots$ upto 11^{th} term
is :

Options :

1. 916
2. 945
3. 946
4. 915

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

શ્રેણી $1+2\times 3+3\times 5+4\times 7+\dots$ કે 11વે પદ
તક યોગફલ છે :

Options :

1. 916
2. 945
3. 946
4. 915

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

શ્રેણી $1+2\times 3+3\times 5+4\times 7+\dots$ નો 11 મા પદ
સુધીનો સરવાળો _____ છે.

Options :

1. 916
2. 945
3. 946
4. 915

If $f: \mathbb{R} \rightarrow \mathbb{R}$ is a differentiable function and

$$f(2) = 6, \text{ then } \lim_{x \rightarrow 2} \int_6^{f(x)} \frac{2t \, dt}{(x-2)} \text{ is :}$$

Options :

1. 0
2. $2f'(2)$
3. $12f'(2)$
4. $24f'(2)$

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

यदि $f: \mathbb{R} \rightarrow \mathbb{R}$ एक अवकलनीय फलन है तथा $f(2) = 6$

$$\text{है, तो } \lim_{x \rightarrow 2} \int_6^{f(x)} \frac{2t \, dt}{(x-2)} \text{ है :}$$

Options :

1. 0
2. $2f'(2)$
3. $12f'(2)$
4. $24f'(2)$

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

જો $f: \mathbb{R} \rightarrow \mathbb{R}$ એ વિકલનીય વિધેય હોય અને $f(2) = 6$,

$$\text{તો } \lim_{x \rightarrow 2} \int_6^{f(x)} \frac{2t \, dt}{(x-2)} \text{ એ } \underline{\hspace{2cm}} \text{ છે.}$$

Options :

1. 0
2. $2f'(2)$

4. $24f'(2)$

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

If the function $f(x) = \begin{cases} a|\pi - x| + 1, & x \leq 5 \\ b|x - \pi| + 3, & x > 5 \end{cases}$

is continuous at $x = 5$, then the value of $a - b$ is :

Options :

1. $\frac{2}{\pi - 5}$

2. $\frac{2}{\pi + 5}$

3. $\frac{2}{5 - \pi}$

4. $\frac{-2}{\pi + 5}$

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

यदि फलन $f(x) = \begin{cases} a|\pi - x| + 1, & x \leq 5 \\ b|x - \pi| + 3, & x > 5 \end{cases}$

$x = 5$ पर संतत है, तो $a - b$ का मान है :

Options :

1. $\frac{2}{\pi - 5}$

2. $\frac{2}{\pi + 5}$

3. $\frac{2}{5 - \pi}$

4. $\pi+5$

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

જો વિધેય $f(x) = \begin{cases} a|\pi - x| + 1, & x \leq 5 \\ b|x - \pi| + 3, & x > 5 \end{cases}$ એ $x = 5$

આગળ સતત હોય, તો $a - b$ ની કિંમત _____ થાય.

Options :

1. $\frac{2}{\pi-5}$

2. $\frac{2}{\pi+5}$

3. $\frac{2}{5-\pi}$

4. $\frac{-2}{\pi+5}$

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

If $f(x) = [x] - \left\lfloor \frac{x}{4} \right\rfloor$, $x \in \mathbb{R}$, where $[x]$ denotes the greatest integer function, then :

Options :

1. $\lim_{x \rightarrow 4+} f(x)$ exists but $\lim_{x \rightarrow 4-} f(x)$ does not exist.

2. $\lim_{x \rightarrow 4-} f(x)$ exists but $\lim_{x \rightarrow 4+} f(x)$ does not exist.

3. Both $\lim_{x \rightarrow 4-} f(x)$ and $\lim_{x \rightarrow 4+} f(x)$ exist but are not equal.

4. f is continuous at $x = 4$.

Correct Marks : 4 Wrong Marks : 1

यदि $f(x) = [x] - \left\lfloor \frac{x}{4} \right\rfloor$, $x \in \mathbb{R}$ है, जहाँ $[x]$ महत्तम

पूर्णांक फलन है, तो :

Options :

1. $\lim_{x \rightarrow 4+} f(x)$ का अस्तित्व है परन्तु

$\lim_{x \rightarrow 4-} f(x)$ का अस्तित्व नहीं है।

2. $\lim_{x \rightarrow 4-} f(x)$ का अस्तित्व है परन्तु

$\lim_{x \rightarrow 4+} f(x)$ का अस्तित्व नहीं है।

3. $\lim_{x \rightarrow 4-} f(x)$ तथा $\lim_{x \rightarrow 4+} f(x)$ दोनों का

अस्तित्व है परन्तु वह बराबर नहीं हैं।

4. $x=4$ पर f संतत है।

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

જો $f(x) = [x] - \left\lfloor \frac{x}{4} \right\rfloor$, $x \in \mathbb{R}$, જ્યાં $[x]$ એ મહત્તમ

પૂર્ણાંક વિધેય દર્શાવે છે, તો :

Options :

1. $\lim_{x \rightarrow 4+} f(x)$ નું અસ્તિત્વ છે પરંતુ $\lim_{x \rightarrow 4-} f(x)$

નું અસ્તિત્વ નથી.

2. $\lim_{x \rightarrow 4-} f(x)$ નું અસ્તિત્વ છે પરંતુ $\lim_{x \rightarrow 4+} f(x)$

નું અસ્તિત્વ નથી.

3. $\lim_{x \rightarrow 4-} f(x)$ અને $\lim_{x \rightarrow 4+} f(x)$ બન્ને

અસ્તિત્વ ધરાવે છે પરંતુ સરખા નથી.

4. f એ $x=4$ આગળ સતત છે.

Correct Marks : 4 Wrong Marks : 1

A water tank has the shape of an inverted right circular cone, whose semi-vertical angle is $\tan^{-1}\left(\frac{1}{2}\right)$. Water is poured into it at a constant rate of 5 cubic meter per minute. Then the rate (in m/min.), at which the level of water is rising at the instant when the depth of water in the tank is 10 m; is :

Options :

1. $1/15\pi$
2. $2/\pi$
3. $1/5\pi$
4. $1/10\pi$

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

एक पानी की टंकी उल्टे लंब वृत्तीय शंकु के आकार की है, जिसका अर्ध-शीर्ष कोण $\tan^{-1}\left(\frac{1}{2}\right)$ है। इसमें पानी 5 घन मीटर प्रति मिनट की समान दर से डाला जाता है। तो टंकी में पानी की गहराई 10 मी. होने पर वह दर (मी./मि. में), जिस पर पानी की सतह बढ़ रही है, है :

Options :

1. $1/15\pi$
2. $2/\pi$
3. $1/5\pi$
4. $1/10\pi$

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

છે જેનો અર્ધશિરઃકોણ $\tan^{-1}\left(\frac{1}{2}\right)$ છે. 5 ઘન મીટર પ્રતિ મીનિટ ના અચળ દરે પાણી ભરવામાં આવે છે. તો ટાંકીમાં પાણીની ઊંચાઈ જે ઘડીએ 10 મી હોય ત્યારે પાણીના સ્તરનો વધવાનો દર (મી/મિનિટ માં) _____ છે.

Options :

1. $1/15\pi$
2. $2/\pi$
3. $1/5\pi$
4. $1/10\pi$

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

If

$$\int e^{\sec x} (\sec x \tan x f(x) + (\sec x \tan x + \sec^2 x)) dx$$

$= e^{\sec x} f(x) + C$, then a possible choice of

$f(x)$ is :

Options :

1. $\sec x - \tan x - \frac{1}{2}$
2. $\sec x + \tan x + \frac{1}{2}$
3. $x \sec x + \tan x + \frac{1}{2}$
4. $\sec x + x \tan x - \frac{1}{2}$

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

$$\int e^{\sec x} (\sec x \tan x f(x) + (\sec x \tan x + \sec^2 x)) dx$$

$= e^{\sec x} f(x) + C$, तो $f(x)$ का एक संभव विकल्प
(choice) है :

Options :

1. $\sec x - \tan x - \frac{1}{2}$
2. $\sec x + \tan x + \frac{1}{2}$
3. $x \sec x + \tan x + \frac{1}{2}$
4. $\sec x + x \tan x - \frac{1}{2}$

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

જો

$$\int e^{\sec x} (\sec x \tan x f(x) + (\sec x \tan x + \sec^2 x)) dx$$

$= e^{\sec x} f(x) + C$, તો $f(x)$ ની એક શક્ય પસંદગી
_____ છે.

Options :

1. $\sec x - \tan x - \frac{1}{2}$
2. $\sec x + \tan x + \frac{1}{2}$
3. $x \sec x + \tan x + \frac{1}{2}$
4. $\sec x + x \tan x - \frac{1}{2}$

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

$$\int_0^1 x \cot^{-1}(1-x^2+x^4) dx \text{ is :}$$

Options :

1. $\frac{\pi}{4} - \frac{1}{2} \log_e 2$
2. $\frac{\pi}{2} - \log_e 2$
3. $\frac{\pi}{4} - \log_e 2$
4. $\frac{\pi}{2} - \frac{1}{2} \log_e 2$

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

$$\text{समाकल } \int_0^1 x \cot^{-1}(1-x^2+x^4) dx \text{ का मान है :}$$

Options :

1. $\frac{\pi}{4} - \frac{1}{2} \log_e 2$
2. $\frac{\pi}{2} - \log_e 2$
3. $\frac{\pi}{4} - \log_e 2$
4. $\frac{\pi}{2} - \frac{1}{2} \log_e 2$

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

$$\int_0^1 x \cot^{-1}(1-x^2+x^4) dx = \underline{\hspace{2cm}}.$$

Options :

1. $\frac{\pi}{4} - \log_e 2$
2. $\frac{\pi}{2} - \log_e 2$
3. $\frac{\pi}{4} - \log_e 2$
4. $\frac{\pi}{2} - \frac{1}{2} \log_e 2$

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

The area (in sq. units) of the region

$$A = \{(x, y) : \frac{y^2}{2} \leq x \leq y + 4\} \text{ is :}$$

Options :

1. 18
2. 30
3. 16
4. $\frac{53}{3}$

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

क्षेत्र $A = \{(x, y) : \frac{y^2}{2} \leq x \leq y + 4\}$ का क्षेत्रफल
(वर्ग इकाइयों में) है :

Options :

1. 18
2. 30
3. 16
4. $\frac{53}{3}$

પ્રદેશ $A = \{(x, y) : \frac{y^2}{2} \leq x \leq y+4\}$ નું ક્ષેત્રફળ
(ચો એકમમાં) _____ છે.

Options :

1. 18
2. 30
3. 16
4. $\frac{53}{3}$

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 $\cos x \frac{dy}{dx} - y \sin x = 6x$, $(0 < x < \frac{\pi}{2})$ and

$y\left(\frac{\pi}{3}\right) = 0$, then $y\left(\frac{\pi}{6}\right)$ is equal to :

Options :

1. $-\frac{\pi^2}{2}$
2. $-\frac{\pi^2}{2\sqrt{3}}$
3. $-\frac{\pi^2}{4\sqrt{3}}$
4. $\frac{\pi^2}{2\sqrt{3}}$

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 $\cos x \frac{dy}{dx} - y \sin x = 6x$ ($0 < x < \frac{\pi}{2}$) तथा

$y\left(\frac{\pi}{3}\right) = 0$ है, तो $y\left(\frac{\pi}{6}\right)$ बराबर है :

1. $-\frac{\pi^2}{2}$

2. $-\frac{\pi^2}{2\sqrt{3}}$

3. $-\frac{\pi^2}{4\sqrt{3}}$

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

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

જો $\cos x \frac{dy}{dx} - y \sin x = 6x$, $(0 < x < \frac{\pi}{2})$ માટે

$y\left(\frac{\pi}{3}\right) = 0$, તો $y\left(\frac{\pi}{6}\right)$ બરાબર _____ છે.

Options :

1. $-\frac{\pi^2}{2}$

2. $-\frac{\pi^2}{2\sqrt{3}}$

3. $-\frac{\pi^2}{4\sqrt{3}}$

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

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 two lines $x + (a - 1)y = 1$ and $2x + a^2y = 1$ ($a \in \mathbb{R} - \{0, 1\}$) are perpendicular, then the distance of their point of intersection from the origin is :

Options :

1. $\frac{2}{5}$ 2. $\frac{2}{\sqrt{5}}$ 3. $\sqrt{\frac{2}{5}}$ 4. $\frac{2}{5}$

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 दो रेखायें $x + (a - 1)y = 1$ तथा $2x + a^2y = 1$
($a \in \mathbb{R} - \{0, 1\}$) लंबवत हैं, तो उनके प्रतिच्छेदन बिन्दु
की मूल बिन्दु से दूरी है :

Options :

1. $\frac{\sqrt{2}}{5}$ 2. $\frac{2}{\sqrt{5}}$ 3. $\sqrt{\frac{2}{5}}$ 4. $\frac{2}{5}$

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 બે રેખાઓ $x + (a - 1)y = 1$ અને $2x + a^2y = 1$
($a \in \mathbb{R} - \{0, 1\}$) લંબ હોય તો, તેમના છેદબિંદુનું
ઊગમબિંદુથી અંતર _____ છે.

Options :

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

2. $\sqrt{5}$

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

4. $\frac{2}{5}$

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 rectangle is inscribed in a circle with a diameter lying along the line $3y = x + 7$. If the two adjacent vertices of the rectangle are $(-8, 5)$ and $(6, 5)$, then the area of the rectangle (in sq. units) is :

Options :

1. 56

2. 72

3. 84

4. 98

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 वृत्त, जिसका एक व्यास रेखा $3y = x + 7$ के अनुदिश है, के अंतर्गत एक आयत बनाया गया है। यदि आयत के दो संलग्न शीर्ष $(-8, 5)$ तथा $(6, 5)$ हैं, तो आयत का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1. 56

2. 72

3. 84

4. 98

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

જો આપણે $3y = x + 7$ પર હોય તેવા એક વર્તુળમાં
એક લંબચોરસ અંતર્ગત છે. જો આ લંબચોરસના
પાસપાસેનાં શિરોબિંદુઓ $(-8, 5)$ અને $(6, 5)$ હોય, તો
આ લંબચોરસનું ક્ષેત્રફળ (ચો. એકમમાં) _____
છે.

Options :

1. 56
2. 72
3. 84
4. 98

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

The common tangent to the circles
 $x^2 + y^2 = 4$ and $x^2 + y^2 + 6x + 8y - 24 = 0$ also
passes through the point :

Options :

1. $(-6, 4)$
2. $(6, -2)$
3. $(4, -2)$
4. $(-4, 6)$

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

વર્તુળો $x^2 + y^2 = 4$ તથા $x^2 + y^2 + 6x + 8y - 24 = 0$
કી ઝખચનિષ્ઠ સ્પર્શ રેખા નિમ્ન મેં સે કિસ બિન્દુ સે
હોકર જાતી હૈ?

Options :

1. $(-6, 4)$
2. $(6, -2)$
3. $(4, -2)$

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

વર્તુળો $x^2 + y^2 = 4$ અને $x^2 + y^2 + 6x + 8y - 24 = 0$
ના સામાન્ય સ્પર્શકો _____ બિંદુમાંથી પસાર થાય છે.

Options :

1. $(-6, 4)$
2. $(6, -2)$
3. $(4, -2)$
4. $(-4, 6)$

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

The area (in sq. units) of the smaller of the two circles that touch the parabola, $y^2 = 4x$ at the point $(1, 2)$ and the x -axis is :

Options :

1. $4\pi (3 + \sqrt{2})$
2. $8\pi (2 - \sqrt{2})$
3. $8\pi (3 - 2\sqrt{2})$
4. $4\pi (2 - \sqrt{2})$

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

પરવલય $y^2 = 4x$ કો બિન્દુ $(1, 2)$ પર સ્પર્શ કરને વાલે તથા x -અક્ષ કો સ્પર્શ કરને વાલે દો વૃત્તોં મેં સે છોટે વૃત્ત કા ક્ષેત્રફલ (વર્ગ ઇકાઈયોં મેં) હૈ :

Options :

1. $4\pi (3 + \sqrt{2})$

3. $8\pi (3 - 2\sqrt{2})$
4. $4\pi (2 - \sqrt{2})$

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

x - અક્ષ તથા પરવલય $y^2 = 4x$ ને બિંદુ $(1, 2)$ આગળ સ્પર્શતાં બે વર્તુળોમાંના નાના વર્તુળનું ક્ષેત્રફળ (ચો. એકમમાં) _____ છે.

Options :

1. $4\pi (3 + \sqrt{2})$
2. $8\pi (2 - \sqrt{2})$
3. $8\pi (3 - 2\sqrt{2})$
4. $4\pi (2 - \sqrt{2})$

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

If the tangent to the parabola $y^2 = x$ at a point (α, β) , $(\beta > 0)$ is also a tangent to the ellipse, $x^2 + 2y^2 = 1$, then α is equal to :

Options :

1. $\sqrt{2} + 1$
2. $\sqrt{2} - 1$
3. $2\sqrt{2} - 1$
4. $2\sqrt{2} + 1$

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

પર, સ્પર્શ રેખા, દોઢવૃત્ત $x^2 + 2y^2 = 1$ નો સ્પર્શ રેખા છે, તો α બરાબર છે :

Options :

1. $\sqrt{2} + 1$
2. $\sqrt{2} - 1$
3. $2\sqrt{2} - 1$
4. $2\sqrt{2} + 1$

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

જો પરવલય $y^2 = x$ ના એક બિંદુ (α, β) , $(\beta > 0)$ આગળનો સ્પર્શક એ ઉપવલય $x^2 + 2y^2 = 1$ નો પણ સ્પર્શક હોય તો α બરાબર _____ છે.

Options :

1. $\sqrt{2} + 1$
2. $\sqrt{2} - 1$
3. $2\sqrt{2} - 1$
4. $2\sqrt{2} + 1$

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

Let P be the plane, which contains the line of intersection of the planes, $x + y + z - 6 = 0$ and $2x + 3y + z + 5 = 0$ and it is perpendicular to the xy -plane. Then the distance of the point $(0, 0, 256)$ from P is equal to :

Options :

1. $63\sqrt{5}$
2. $11/\sqrt{5}$

4. $17/\sqrt{5}$

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

माना P एक समतल है जिसमें समतलों

$$x + y + z - 6 = 0 \text{ तथा } 2x + 3y + z + 5 = 0 \text{ की}$$

प्रतिच्छेदन रेखा अंतर्विष्ट है तथा यह xy -तल के लंबवत

है। तो बिन्दु $(0, 0, 256)$ की P से दूरी बराबर है :

Options :

1. $63\sqrt{5}$

2. $11/\sqrt{5}$

3. $205\sqrt{5}$

4. $17/\sqrt{5}$

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

ધારો કે P એવું સમતલ છે કે જે સમતલો

$$x + y + z - 6 = 0 \text{ અને } 2x + 3y + z + 5 = 0 \text{ ની}$$

છેદરેખાને સમાવે છે તથા તે xy - સમતલને લંબ છે. તો

બિંદુ $(0, 0, 256)$ નું P થી અંતર _____ છે.

Options :

1. $63\sqrt{5}$

2. $11/\sqrt{5}$

3. $205\sqrt{5}$

4. $17/\sqrt{5}$

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

line, $\frac{x+2}{3} = \frac{y-1}{0} = \frac{z}{4}$ such that $BC=5$

units. Then the area (in sq. units) of this triangle, given that the point $A(1, -1, 2)$, is :

Options :

1. $5\sqrt{17}$
2. $\sqrt{34}$
3. 6
4. $2\sqrt{34}$

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

ΔABC के शीर्ष B तथा C रेखा

$\frac{x+2}{3} = \frac{y-1}{0} = \frac{z}{4}$ पर स्थित हैं तथा $BC=5$

इकाई है। यदि दिया है कि बिन्दु $A(1, -1, 2)$ है, तो इस त्रिभुज का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1. $5\sqrt{17}$
2. $\sqrt{34}$
3. 6
4. $2\sqrt{34}$

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

ΔABC ની રેખા $\frac{x+2}{3} = \frac{y-1}{0} = \frac{z}{4}$ પર આવેલાં

શિરોબિંદુઓ B અને C એવાં છે કે જેથી $BC=5$ એકમ થાય. બિંદુ $A(1, -1, 2)$ આપેલ છે, તો આ ત્રિકોણનું ક્ષેત્રફળ (ચો. એકમ માં) _____ થાય.

Options :

2. $\sqrt{34}$
3. 6
4. $2\sqrt{34}$

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

If a unit vector $\vec{a}$ makes angles $\pi/3$ with $\hat{i}$, $\pi/4$ with $\hat{j}$ and $\theta \in (0, \pi)$ with $\hat{k}$, then a value of θ is :

Options :

1. $\frac{5\pi}{12}$
2. $\frac{2\pi}{3}$
3. $\frac{\pi}{4}$
4. $\frac{5\pi}{6}$

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

यदि एक मात्रक सदिश $\vec{a}$, $\hat{i}$ से $\pi/3$, $\hat{j}$ से $\pi/4$ तथा $\hat{k}$ से $\theta \in (0, \pi)$ कोण बनाता है, तो θ का एक मान है :

Options :

1. $\frac{5\pi}{12}$
2. $\frac{2\pi}{3}$

3. $\frac{5\pi}{6}$

4. $\frac{5\pi}{6}$

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

જો એકમ સદિશ $\vec{a}$ એ $\hat{i}$ સાથે $\pi/3$, $\hat{j}$ સાથે

$\pi/4$ સાથે $\hat{k}$ સાથે $\theta \in (0, \pi)$ ખૂણા બનાવે, તો θ ની
એક કિંમત _____ છે.

Options :

1. $\frac{5\pi}{12}$

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

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

4. $\frac{5\pi}{6}$

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 and the median of the following
ten numbers in increasing order

10, 22, 26, 29, 34, x , 42, 67, 70, y

are 42 and 35 respectively, then $\frac{y}{x}$ is equal

to :

Options :

1. $7/2$

2. $8/3$

3. $7/3$

4. $9/4$

Correct Marks : 4 Wrong Marks : 1

वर्धमान क्रम में निम्न दस संख्याओं

10, 22, 26, 29, 34, x , 42, 67, 70, y

के माध्य तथा माध्यिका क्रमशः 42 तथा 35 हैं, तो $\frac{y}{x}$

बराबर है :

Options :

1. $7/2$

2. $8/3$

3. $7/3$

4. $9/4$

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

નીચેની ચડતા ક્રમમાં આપેલ 10 સંખ્યાઓ

10, 22, 26, 29, 34, x , 42, 67, 70, y

નો મધ્યક અને મધ્યસ્થ અનુક્રમે 42 અને 35 હોય, તો

$\frac{y}{x}$ બરાબર _____ થાય.

Options :

1. $7/2$

2. $8/3$

3. $7/3$

4. $9/4$

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

Two newspapers A and B are published in a city. It is known that 25% of the population reads A and 20% reads B while 8% reads both A and B. Further, 30% of those who read A but not B look into advertisements and 40% of those who read B but not A also look into advertisements, while 50% of those who read both A and B look into advertisements. Then the percentage of the population who look into advertisements is :

Options :

1. 12.8
2. 13
3. 13.5
4. 13.9

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 शहर में दो समाचार पत्र A तथा B प्रकाशित होते हैं। यह ज्ञात है कि शहर की 25% जनसंख्या A पढ़ती है तथा 20% B पढ़ती है जब कि 8% A तथा B दोनों को पढ़ती है। इसके अतिरिक्त, A पढ़ने तथा B न पढ़ने वालों में 30% विज्ञापन देखते हैं और B पढ़ने तथा A न पढ़ने वालों में भी 40% विज्ञापन देखते हैं, जब कि A तथा B दोनों को पढ़ने वालों में से 50% विज्ञापन देखते हैं। तो जनसंख्या में विज्ञापन देखने वालों का प्रतिशत है :

Options :

1. 12.8
2. 13
3. 13.5
4. 13.9

છે. આ શહેરની વસ્તીના 25%, A વાંચે છે તથા 20%, B વાંચે છે જ્યારે 8%, A અને B બંને વાંચે છે. ઉપરાંત, A વાંચતા હોય પણ B ન વાંચતા હોય તેઓના 30%, જાહેરાતો જુએ છે અને B વાંચતા હોય પણ A ન વાંચતા હોય તેઓના 40% પણ જાહેરાતો જુએ છે, જ્યારે A અને B બંને વાંચતા હોય તેઓના 50%, જાહેરાતો જુએ છે. તો જાહેરાતો જોતી હોય તેની વસ્તીની ટકાવારી _____ છે.

Options :

1. 12.8
2. 13
3. 13.5
4. 13.9

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 value of $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ$ is :

Options :

1. $\frac{1}{32}$
2. $\frac{1}{16}$
3. $\frac{1}{18}$
4. $\frac{1}{36}$

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

$\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ$ का मान है :

Options :

1. $\frac{1}{32}$

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

3. $\frac{1}{18}$

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

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

$\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ$ ની કિંમત _____ છે.

Options :

1. $\frac{1}{32}$

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

3. $\frac{1}{18}$

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

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

Two poles standing on a horizontal ground are of heights 5 m and 10 m respectively. The line joining their tops makes an angle of 15° with the ground. Then the distance (in m) between the poles, is :

Options :

1. $\frac{5}{2}(2+\sqrt{3})$

3. $5(2 + \sqrt{3})$

4. $5(\sqrt{3} + 1)$

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

કૌતિજ ધરાતલ પર ખડે દો યમ્બોં કી ઁંચાઈ ક્રમશઃ
5 મીટર તથા 10 મીટર હૈ। ઁનકે શિયરોં કો મિલાને
વાલી રેખા ધરાતલ સે 15° કા કોણ બનાતી હૈ। તો
યમ્બોં કે બીચ કી દૂરી (મીટર મેં) હૈ :

Options :

1. $\frac{5}{2}(2 + \sqrt{3})$

2. $10(\sqrt{3} - 1)$

3. $5(2 + \sqrt{3})$

4. $5(\sqrt{3} + 1)$

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

સમકૌતિજ જમીન પર અનુક્રમે 5 મી અને 10 મી
ઊંચાઈવાળા બે સ્તંભ ઊભેલ છે. તેઓની ટોચને જોડતી
રેખા જમીન સાથે 15° નો ખૂણો બનાવે છે. તો આ
સ્તંભો વચ્ચેનું અંતર (મી.માં) _____ છે.

Options :

1. $\frac{5}{2}(2 + \sqrt{3})$

2. $10(\sqrt{3} - 1)$

3. $5(2 + \sqrt{3})$

4. $5(\sqrt{3} + 1)$

If $p \Rightarrow (q \vee r)$ is false, then the truth values of p, q, r are respectively :

Options :

1. F, T, T
2. T, T, F
3. T, F, F
4. F, F, F

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

यदि $p \Rightarrow (q \vee r)$ सत्य नहीं है, तो p, q, r के सत्य मान क्रमशः हैं :

Options :

1. F, T, T
2. T, T, F
3. T, F, F
4. F, F, F

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

જો $p \Rightarrow (q \vee r)$ અસત્ય હોય, તો p, q, r ના સત્યાર્થતા મૂલ્યો અનુક્રમે _____ છે.

Options :

1. F, T, T
2. T, T, F
3. T, F, F
4. F, F, F