National Testing Agency

Question Paper Name:	Paper I EHG 8th April 2019 Shift 1
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Display Marks:	Yes

Paper I

Group Number :	1
Group Id :	416529153
Group Maximum Duration :	0
Group Minimum Duration :	180
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	360

Physics

Section Id :	416529253
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:	416529393
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

In SI units, the dimensions of $\sqrt{\frac{\epsilon_0}{\mu_0}}$ is :

Options :

1. $AT^2M^{-1}L^{-1}$

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3. $A^{-1}TML^3$

4. $AT^{-3}ML^{3/2}$

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

SI इकाई में, $\sqrt{\frac{\epsilon_0}{\mu_0}}$ की विमा हैं :

Options :

1. $AT^2M^{-1}L^{-1}$

2. $A^2T^3M^{-1}L^{-2}$

3. $A^{-1}TML^3$

4. $AT^{-3}ML^{3/2}$

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

SI એકમ પધ્ધતીમાં, $\sqrt{\frac{\epsilon_0}{\mu_0}}$ નું પરિમાણ _____

છે.

Options :

1. $AT^2M^{-1}L^{-1}$

2. $A^2T^3M^{-1}L^{-2}$

3. $A^{-1}TML^3$

4. $AT^{-3}ML^{3/2}$

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

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Ship A is sailing towards north-east with velocity $\vec{v}=30\hat{i}+50\hat{j}$ km/hr where $\hat{i}$ points east and $\hat{j}$, north. Ship B is at a distance of 80 km east and 150 km north of Ship A and is sailing towards west at 10 km/hr. A will be at minimum distance from B in :

Options :

1. 4.2 hrs.

2. 2.2 hrs.

3. 2.6 hrs.

4. 3.2 hrs.

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

जहाज A वेग $\vec{v}=30\hat{i}+50\hat{j}$ km/hr से उत्तर-पूर्व दिशा में जलयात्रा कर रहा है जहाँ $\hat{i}$ पूर्व तथा $\hat{j}$ उत्तर की ओर इंगित हैं। जहाज B, जहाज A से 80 km पूर्व की ओर और 150 km उत्तर की ओर, दूरी पर स्थित है और पश्चिम की ओर 10 km/hr की चाल से जलयात्रा कर रहा है। A से B की दूरी न्यूनतम होगी :

Options :

1. 4.2 घंटे में

2. 2.2 घंटे में

3. 2.6 घंटे में

4. 3.2 घंटे में

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

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$\vec{v}=30\hat{i}+50\hat{j}$ km/hr ના વેગથી એક વહાણ A ઉત્તર-પૂર્વ દિશા તરફ જઇ રહ્યું છે. અહીં $\hat{i}$ એ પૂર્વ તરફ અને $\hat{j}$ એ ઉત્તર દિશા દર્શાવે છે. વહાણ B એ વહાણ A થી પૂર્વ દિશામાં 80 km અને ઉત્તર દિશામા 150 km એ છે. અને તે પશ્ચિમ તરફ 10 km/hr ના વેગ થી જાય છે. A એ B થી _____ સમયમાં લઘુત્તમ અંતરે હશે.

Options :

1. 4.2 કલાક

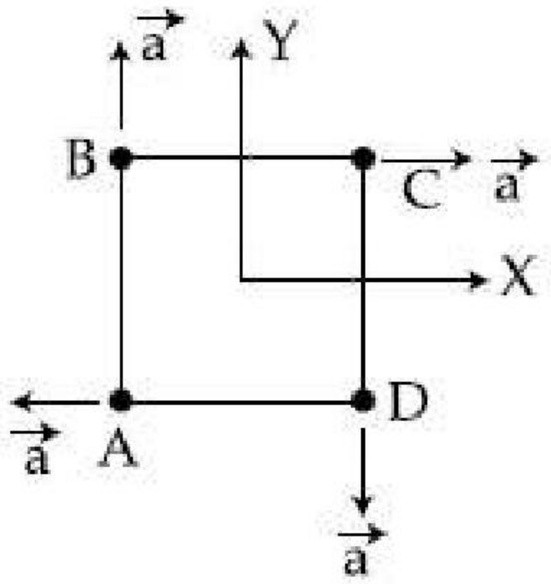
2. 2.2 કલાક

3. 2.6 કલાક

4. 3.2 કલાક

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

Four particles A, B, C and D with masses $m_A=m$, $m_B=2m$, $m_C=3m$ and $m_D=4m$ are at the corners of a square. They have accelerations of equal magnitude with directions as shown. The acceleration of the centre of mass of the particles is :



Options :

1. Zero

2. $a\left(\hat{i}+\hat{j}\right)$

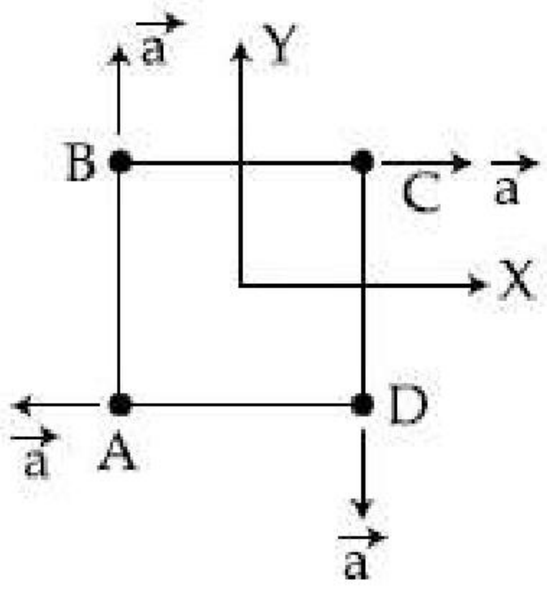
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4. $\frac{a}{5}(\hat{i}-\hat{j})$

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

द्रव्यमान $m_A = m$, $m_B = 2m$, $m_C = 3m$ और $m_D = 4m$ वाले चार कण A, B, C और D एक वर्ग के कोनों पर रखे गये हैं। उनके त्वरण एकसमान परिमाण के हैं और दर्शाए गये चित्र के अनुसार हैं। कणों के द्रव्यमान केन्द्र का त्वरण है :



Options :

1. शून्य

2. $a(\hat{i}+\hat{j})$

3. $\frac{a}{5}(\hat{i}+\hat{j})$

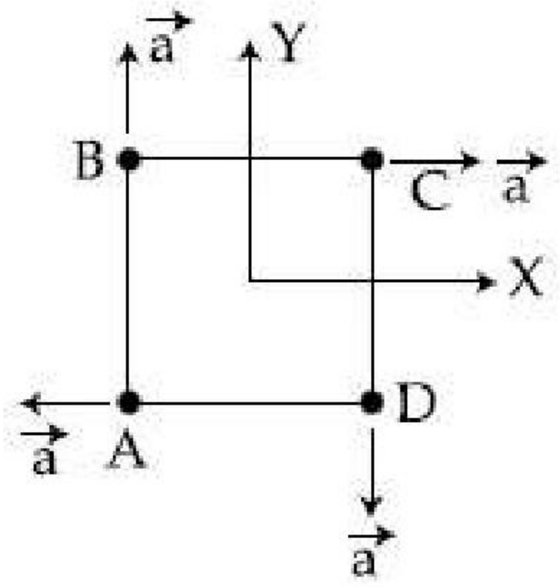
4. $\frac{a}{5}(\hat{i}-\hat{j})$

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

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ચાર કણો A, B, C અને D ના દળો અનુક્રમે $m_A = m$, $m_B = 2m$, $m_C = 3m$ અને $m_D = 4m$ છે જેઓને ચોરસના ખૂણા ઉપર મૂકવામાં આવ્યા છે. આકૃતિમાં બતાવ્યા પ્રમાણેની દિશામાં તેઓના પ્રવેગનું મૂલ્ય એકસમાન છે. કણોના દ્રવ્યમાન કેન્દ્રનો પ્રવેગ _____ છે.



Options :

1. શૂન્ય

2. $a\left(\hat{i}+\hat{j}\right)$

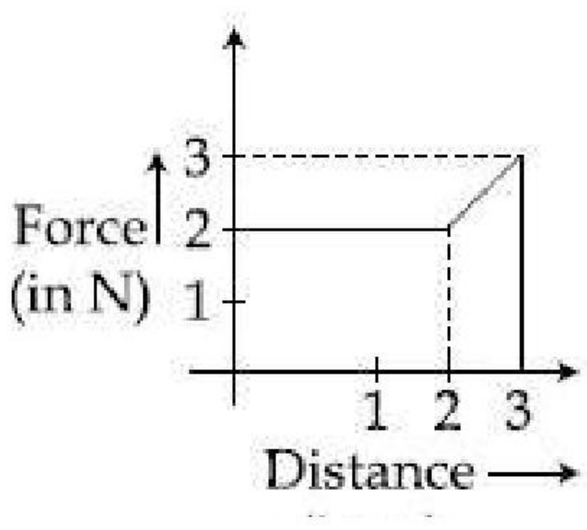
3. $\frac{a}{5}\left(\hat{i}+\hat{j}\right)$

4. $\frac{a}{5}\left(\hat{i}-\hat{j}\right)$

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

Correct Marks : 4 Wrong Marks : 1

A particle moves in one dimension from rest under the influence of a force that varies with the distance travelled by the particle as shown in the figure. The kinetic energy of the particle after it has travelled 3 m is :



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1. 5 J

2. 6.5 J

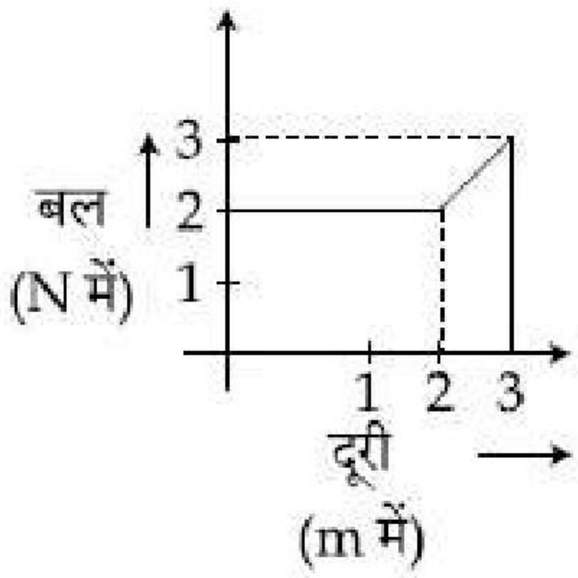
3. 4 J

4. 2.5 J

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

एक कण एक बल के प्रभाव में विराम अवस्था से गति प्रारम्भ करता है। बल, कण द्वारा चली दूरी के अनुसार इस प्रकार परिवर्तित होता है जैसा कि चित्र में दर्शाया गया है। 3 m दूरी चलने के बाद कण की गतिज ऊर्जा है :



Options :

1. 5 J

2. 6.5 J

3. 4 J

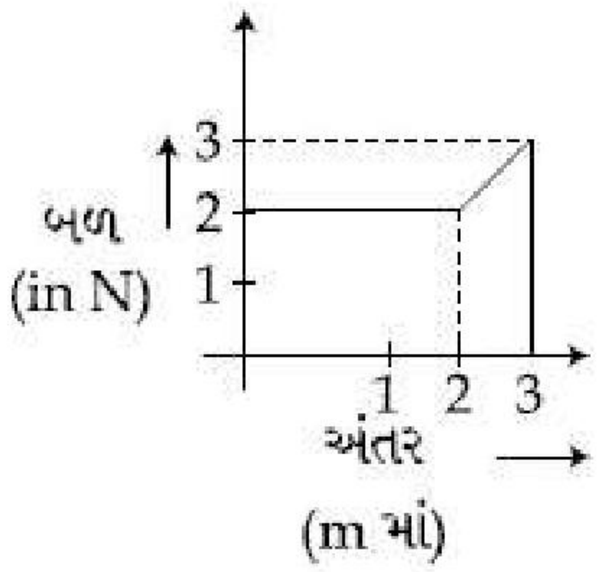
4. 2.5 J

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

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આકૃતિમાં બતાવ્યા પ્રમાણે એક કણ તેની સ્થિર સ્થિતિમાંથી કોઈ બળ ની અસર હેઠળ ગતિ કરવાનુ શરૂ કરે છે. અહીં આ બળ એ કણ દ્વારા કાપવામાં આવેલા અંતર સાથે બદલાય છે. 3 m અંતર કાપ્યા પછી કણની ગતિઉર્જા _____ છે.



Options :

1. 5 J

2. 6.5 J

3. 4 J

4. 2.5 J

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

Correct Marks : 4 Wrong Marks : 1

A thin circular plate of mass M and radius R has its density varying as $\rho(r) = \rho_0 r$ with ρ_0 as constant and r is the distance from its center. The moment of Inertia of the circular plate about an axis perpendicular to the plate and passing through its edge is $I = a MR^2$. The value of the coefficient a is :

Options :

1. $8/5$

2. $3/2$

3. $3/5$

4. $1/$

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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

द्रव्यमान M और त्रिज्या R की एक वृत्तीय प्लेट का घनत्व $\rho(r) = \rho_0 r$, के अनुसार परिवर्तित हो रहा है जहाँ ρ_0 स्थिरांक है और r उसके केन्द्र से दूरी है। प्लेट के लम्बवत् और प्लेट की परिधि से जाने वाली अक्ष के परित: वृत्तीय प्लेट का जड़त्व आघूर्ण $I = a MR^2$ है। गुणांक a का मान है :

Options :

1. $8/5$

2. $3/2$

3. $3/5$

4. $1/2$

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 દળ અને R ત્રિજ્યાવાળી એક પાતળી વર્તુળાકાર તકતીની ઘનતા માટે $\rho(r) = \rho_0 r$ અનુસાર બદલાય છે, જ્યાં ρ_0 અચળ અને r એ કેન્દ્રથી અંતર છે. તકતીને લંબ હોય અને તકતીની ધારને કાપતી (સ્પર્શતી) હોય એવી અક્ષને સાપેક્ષે વર્તુળાકાર તકતીની જડત્વની ચાકમાત્રા $I = a MR^2$ છે. તો ગુણંક a નું મૂલ્ય _____ છે.

Options :

1. $8/5$

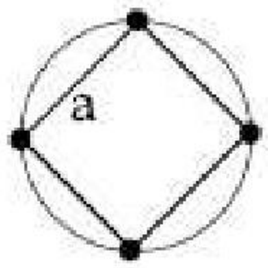
2. $3/2$

3. $3/5$

4. $1/2$

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Four identical particles of mass M are located at the corners of a square of side 'a'. What should be their speed if each of them revolves under the influence of others' gravitational field in a circular orbit circumscribing the square ?



Options :

1. $1.21\sqrt{\frac{GM}{a}}$

2. $1.35\sqrt{\frac{GM}{a}}$

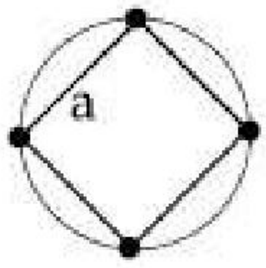
3. $1.41\sqrt{\frac{GM}{a}}$

4. $1.16\sqrt{\frac{GM}{a}}$

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

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M के चार एकसमान कण भुजा 'a' के एक वर्ग के कोनों पर स्थित है। यदि ये कण एक दूसरे के गुरुत्वाकर्षण प्रभाव में इस वर्ग के परिवृत्त एक वृत्तीय कक्षा में गतिशील हैं तो कण की चाल क्या होगी ?



Options :

1. $1.21\sqrt{\frac{GM}{a}}$

2. $1.35\sqrt{\frac{GM}{a}}$

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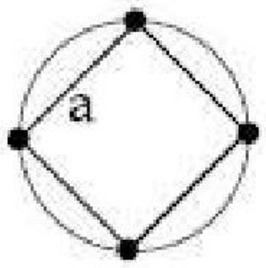
3. $1.41\sqrt{\frac{GM}{a}}$

4. $1.16\sqrt{\frac{GM}{a}}$

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

Correct Marks : 4 Wrong Marks : 1

'a' બાજુવાળા એક ચોરસના ખૂણાઓ પર M દળવાળા ચાર સમાન કણોને મૂકવામાં આવેલા છે. જો તેઓ એક બીજાના ગુરૂત્વાકર્ષી ક્ષેત્રની અસર હેઠળ ચોરસને બહારથી સ્પર્શતી વર્તુળાકાર કક્ષામાં ભ્રમણ કરતા હોય તો તેમની ઝડપ શોધો.



Options :

1. $1.21\sqrt{\frac{GM}{a}}$

2. $1.35\sqrt{\frac{GM}{a}}$

3. $1.41\sqrt{\frac{GM}{a}}$

4. $1.16\sqrt{\frac{GM}{a}}$

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

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A boy's catapult is made of rubber cord which is 42 cm long, with 6 mm diameter of cross-section and of negligible mass. The boy keeps a stone weighing 0.02 kg on it and stretches the cord by 20 cm by applying a constant force. When released, the stone flies off with a velocity of 20 ms^{-1}. Neglect the change in the area of cross-section of the cord while stretched. The Young's modulus of rubber is closest to :

Options :

1. $10^6\ Nm^{-2}$

2. $10^8\ Nm^{-2}$

3. $10^4\ Nm^{-2}$

4. $10^3\ Nm^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

एक बालक का गुलेल 42 cm लम्बी और 6 mm अनुप्रस्थ काट के व्यास की रबड़ की डोरी का बना है, जिसका द्रव्यमान नगण्य है। बालक 0.02 kg भार का एक पत्थर इस पर रखता है और डोरी को एक नियत बल से 20 cm द्वारा तानित करता है। जब इसे छोड़ता है, तब पत्थर 20 ms^{-1} के वेग से जाता है। तानित होने पर डोरी के अनुप्रस्थ काट में परिवर्तन नगण्य है। रबड़ का यंग प्रत्यास्थता गुणांक का निकटतम मान है :

Options :

1. $10^6\ Nm^{-2}$

2. $10^8\ Nm^{-2}$

3. $10^4\ Nm^{-2}$

4. $10^3\ Nm^{-2}$

Question Number : 7 Question Type : MCQ Option Shuffling : Yes Display Question Number :

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42 cm લાંબી અને 6 mm વ્યાસવાળી એક રબ્બરની પટ્ટી માંથી એક છોકરા માટે ગીલોલ બનાવવામાં આવે છે. છોકરો 0.02 kg વજન વાળા પથ્થરને ગીલોલ પર મૂકે છે અને પટ્ટીને 20 cm જેટલી ખેંચે છે. જ્યારે તેને છોડવામાં આવે છે ત્યારે પથ્થર 20 ms^{-1} ના વેગથી ફેંકાય છે. અહીં જ્યારે પટ્ટીને ખેંચવામાં આવે છે ત્યારે એના આડછેદને અવગણવામાં આવે છે. તો રબ્બરનો યંગ મોડ્યુલસ _____ ની નજીક છે.

Options :

1. $10^6\ Nm^{-2}$

2. $10^8\ Nm^{-2}$

3. $10^4\ Nm^{-2}$

4. $10^3\ Nm^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

Water from a pipe is coming at a rate of 100 liters per minute. If the radius of the pipe is 5 cm, the Reynolds number for the flow is of the order of : (density of water = 1000 kg/m^3, coefficient of viscosity of water = 1 mPa s)

Options :

1. 10^4

2. 10^3

3. 10^6

4. 10^2

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

Correct Marks : 4 Wrong Marks : 1

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एक पाइप से पानी 100 लीटर प्रति मिनट की दर से निकल रहा है। यदि पाइप की त्रिज्या 5 cm है, तब प्रवाह की रेनाल्ड संख्या की कोटि है : (पानी का घनत्व=1000 kg/m^3, पानी का श्यानता गुणांक= 1 mPa s)

Options :

1. 10^4

2. 10^3

3. 10^6

4. 10^2

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

Correct Marks : 4 Wrong Marks : 1

ફાયર બ્રીગેડના પાઈપમાંથી 100 લિટર/મીનીટ ના દરથી પાણી આવે છે. જો પાઈપની ત્રિજ્યા 5 cm હોય તો પ્રવાહનો રેનોલ્ડ નંબર _____ ના ક્રમનો છે. (પાણીની ઘનતા = 1000 kg/m^3, પાણીનો સ્નિગ્ધતા અંક = 1 mPa s)

Options :

1. 10^4

2. 10^3

3. 10^6

4. 10^2

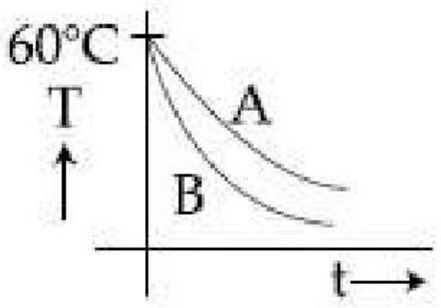
Question Number : 9 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

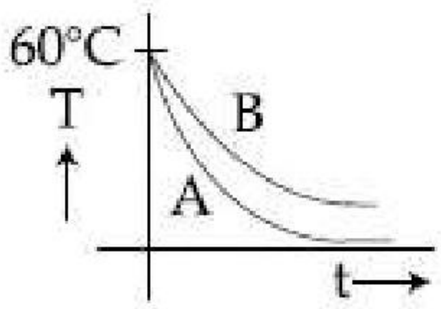
Correct Marks : 4 Wrong Marks : 1

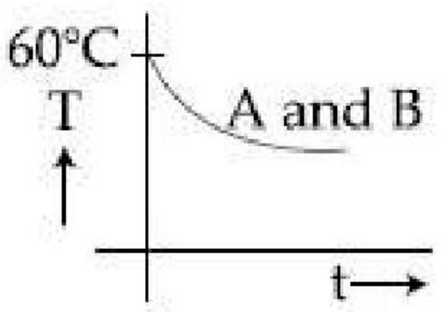
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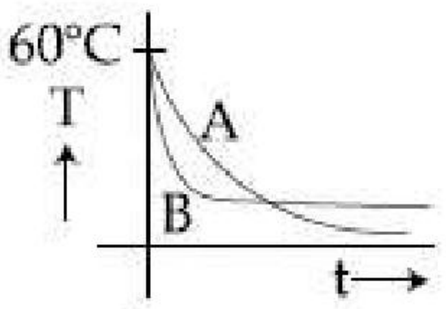
Two identical beakers A and B contain equal volumes of two different liquids at 60°C each and left to cool down. Liquid in A has density of 8×10^2 kg/m^3 and specific heat of 2000 J kg^{-1} K^{-1} while liquid in B has density of 10^3 kg m^{-3} and specific heat of 4000 J kg^{-1} K^{-1}. Which of the following best describes their temperature versus time graph schematically ? (assume the emissivity of both the beakers to be the same)

Options :

1. 

2. 

3. 

4. 

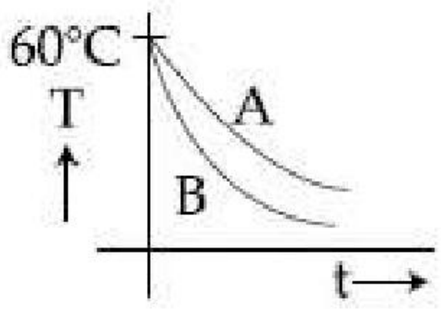
Question Number : 9 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

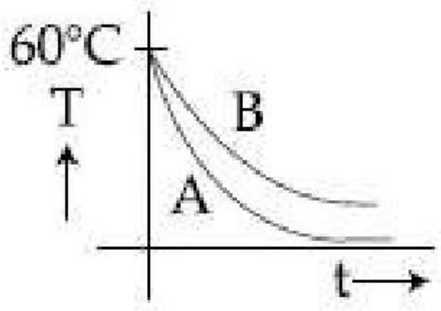
Correct Marks : 4 Wrong Marks : 1

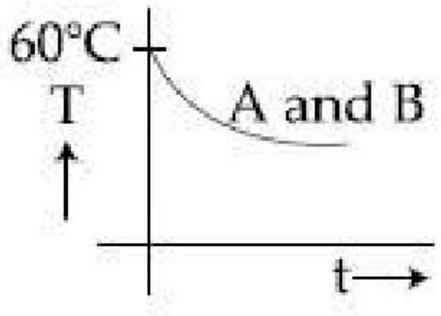
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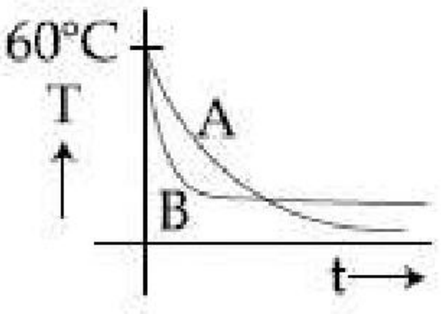
दो एकसमान बीकर A एवं B में दो भिन्न द्रवों के समान आयतन 60°C तापमान पर रखे हैं और ठंडा होने के लिए छोड़ दिए गये हैं। A में द्रव का घनत्व $8 \times 10^2 \text{ kg/m}^3$ है और विशिष्ट ऊष्मा $2000 \text{ J kg}^{-1} \text{ K}^{-1}$ जबकि B में द्रव का घनत्व 10^3 kg m^{-3} हैं और विशिष्ट ऊष्मा $4000 \text{ J kg}^{-1} \text{ K}^{-1}$ है। निम्नलिखित में से कौन-सा ग्राफ तापमान का समय के साथ परिवर्तन विधिवत् प्रदर्शित करता है? (दोनों बीकरों की उत्सर्जकता एकसमान मान लें)

Options :

1.


2.


3.


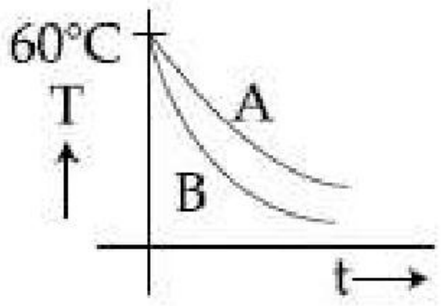
4.


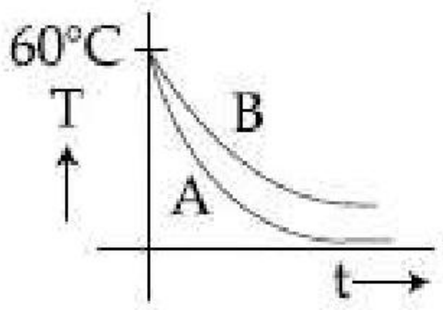
Question Number : 9 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

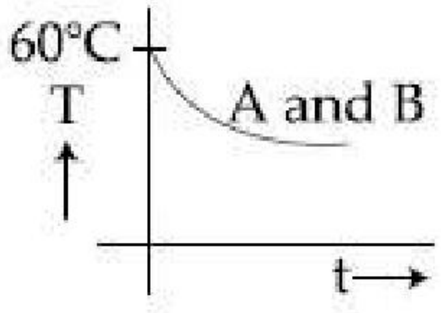
Correct Marks : 4 Wrong Marks : 1

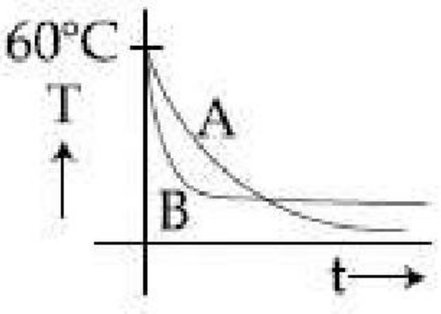
બે એકસરખા બીકર A અને B સમાન કદવાળા બે જુદા-જુદા પ્રવાહી ને દરેક 60°C તાપમાને ઠંડા થવા મૂકવામાં આવેલા છે. બીકર A માંના પ્રવાહીની ઘનતા $8 \times 10^2 \text{ kg/m}^3$ અને વિશિષ્ટ ઉષ્મા $2000 \text{ J kg}^{-1} \text{ K}^{-1}$ છે જ્યારે બીકર B માંના પ્રવાહીની ઘનતા 10^3 kg m^{-3} અને વિશિષ્ટ ઉષ્મા $4000 \text{ J kg}^{-1} \text{ K}^{-1}$ છે. નીચેનામાંથી તેમની તાપમાન વિરૂદ્ધ સમયની કઇ રેખાકૃતિ

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1. 

2. 

3. 

4. 

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

Correct Marks : 4 Wrong Marks : 1

A thermally insulated vessel contains 150 g of water at 0°C. Then the air from the vessel is pumped out adiabatically. A fraction of water turns into ice and the rest evaporates at 0°C itself. The mass of evaporated water will be closest to :

(Latent heat of vaporization of water $= 2.10 \times 10^6\ J\ kg^{-1}$ and Latent heat of Fusion of water $= 3.36 \times 10^5\ J\ kg^{-1}$)

Options :

1. 150 g

2. 20 g

3. 35 g

4. 130 g

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Correct Marks : 4 Wrong Marks : 1

$0°C$ पर $150\ g$ पानी को ऊष्मीय विलग पात्र में रखा गया है। पात्र से वायु को रूद्धोष्म प्रक्रम द्वारा निष्कासित करते हैं। पानी का एक भाग बर्फ में तथा शेष $0°C$ की वाष्प में परिवर्तित हो जाता है। वाष्पित पानी के द्रव्यमान का निकटतम मान होगा :

(पानी के वाष्पीकरण की गुप्त ऊष्मा $= 2.10 \times 10^6\ J\ kg^{-1}$ और पानी के गलन की गुप्त ऊष्मा $= 3.36 \times 10^5\ J\ kg^{-1}$)

Options :

1. $150\ g$

2. $20\ g$

3. $35\ g$

4. $130\ g$

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

એક ઉષ્મા અવાહક પાત્ર $0°C$ એ $150\ g$ પાણી ધરાવે છે. ત્યારબાદ સમોષ્મી રીતે પાત્રમાંથી હવાને ખેંચી લેવામાં આવે છે. થોડુ પાણી બરફમાં ફેરવાય છે અને બાકીના પાણીનું $0°C$ એ બાષ્પીભવન થઈ જાય છે. બાષ્પીભવન થયેલા પાણીનું દળ ગણો. (પાણીના વરાળની ગલન ગુપ્ત ઉષ્મા $= 2.10 \times 10^6\ J\ kg^{-1}$ અને ઘનીકરણ પામતા પાણીની ગલન ગુપ્ત ઉષ્મા $= 3.36 \times 10^5\ J\ kg^{-1}$)

Options :

1. $150\ g$

2. $20\ g$

3. $35\ g$

4. $130\ g$

Question Number : 11 Question Type : MCQ Option Shuffling : Yes Display Question Number

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If 10^{22} gas molecules each of mass 10^{-26} kg collide with a surface (perpendicular to it) elastically per second over an area 1 m^2 with a speed 10^4 m/s, the pressure exerted by the gas molecules will be of the order of :

Options :

1. 10^3 N/m^2

2. 10^4 N/m^2

3. 10^8 N/m^2

4. 10^{16} N/m^2

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

Correct Marks : 4 Wrong Marks : 1

यदि प्रत्येक द्रव्यमान 10^{-26} kg के 10^{22} गैस अणु 10^4 m/s की चाल से 1 m^2 क्षेत्रफल पर प्रति सेकण्ड प्रत्यास्थ संघट्ट कर रहे हैं, तब गैस अणुओं द्वारा लगाया गया दाब का कोटिमान होगा :

Options :

1. 10^3 N/m^2

2. 10^4 N/m^2

3. 10^8 N/m^2

4. 10^{16} N/m^2

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

Correct Marks : 4 Wrong Marks : 1

જ્યારે 1 m^2 ક્ષેત્રફળમાં 10^4 m/s ની ઝડપે 10^{-26} kg દળ ધરાવતા 10^{22} વાયુના અણુઓ પ્રતિ સેકન્ડે સ્થિતિસ્થાપક રીતે અથડાતા હોય ત્યારે આ વાયુના 1 m^2 ક્ષેત્રફળ પર 10^4 m/s ઝડપથી અણુઓ દ્વારા લાગતું દબાણ _____ નાં ક્રમનું હશે.

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1. $10^3\ \mathrm{N/m^2}$

2. $10^4\ \mathrm{N/m^2}$

3. $10^8\ \mathrm{N/m^2}$

4. $10^{16}\ \mathrm{N/m^2}$

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

Correct Marks : 4 Wrong Marks : 1

A steel wire having a radius of 2.0 mm, carrying a load of 4 kg, is hanging from a ceiling. Given that $g = 3.1\ \pi\ \mathrm{ms}^{-2}$, what will be the tensile stress that would be developed in the wire ?

Options :

1. $5.2 \times 10^6\ \mathrm{Nm}^{-2}$

2. $3.1 \times 10^6\ \mathrm{Nm}^{-2}$

3. $6.2 \times 10^6\ \mathrm{Nm}^{-2}$

4. $4.8 \times 10^6\ \mathrm{Nm}^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

4 kg के भार को वहन करते हुए एक 2.0 mm त्रिज्या के स्टील के एक तार को छत से लटकाया गया है। दिया है $g = 3.1\ \pi\ \mathrm{ms}^{-2}$ । तार में उत्पन्न तन्य प्रतिबल (tensile stress) का मान क्या होगा ?

Options :

1. $5.2 \times 10^6\ \mathrm{Nm}^{-2}$

2. $3.1 \times 10^6\ \mathrm{Nm}^{-2}$

3. $6.2 \times 10^6\ \mathrm{Nm}^{-2}$

4. $4.8 \times 10^6\ \mathrm{Nm}^{-2}$

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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

છત પરથી 2.0 mm ત્રિજ્યાવાળા એક સ્ટીલના તારને 4 kg વજન વડે લટકાવેલ છે. અંહી $g = 3.1\ \pi\ ms^{-2}$ છે. તારમાં ઉત્પન્ન થતું તણાવ પ્રતિબળ (tensile stress) કેટલું હશે?

Options :

1. $5.2 \times 10^6\ Nm^{-2}$

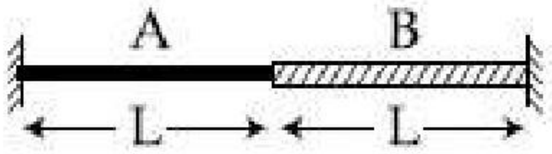
2. $3.1 \times 10^6\ Nm^{-2}$

3. $6.2 \times 10^6\ Nm^{-2}$

4. $4.8 \times 10^6\ Nm^{-2}$

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 wire of length 2L, is made by joining two wires A and B of same length but different radii r and 2r and made of the same material. It is vibrating at a frequency such that the joint of the two wires forms a node. If the number of antinodes in wire A is p and that in B is q then the ratio p : q is :

Options :

1. 1 : 2

2. 3 : 5

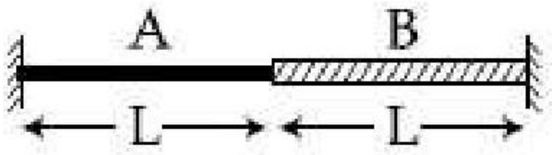
3. 4 : 9

4. 1 : 4

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

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एक ही पदार्थ के एकसमान लम्बाई परन्तु भिन्न त्रिज्या r तथा 2r के दो तारों को जोड़कर, 2L लम्बाई का एक तार बनाया जाता है। यह इस प्रकार कम्पित होता है कि दोनों तारों का जोड़ एक निस्पंद बने। यदि तार A में प्रस्पंदों की संख्या p है और B में q है, तब अनुपात p : q है :

Options :

1. 1 : 2

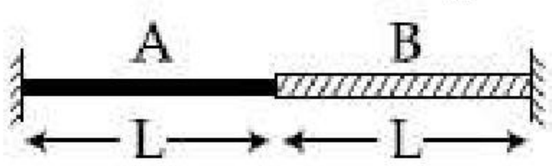
2. 3 : 5

3. 4 : 9

4. 1 : 4

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

Correct Marks : 4 Wrong Marks : 1



એક જ દ્રવ્યમાંથી બનાવેલા એક સરખી લંબાઈના પરંતુ જુદી જુદી ત્રિજ્યા r અને 2r ધરાવતા બે તાર A અને B ને એવી રીતે જોડવામાં આવે છે કે તારની લંબાઈ 2L બને છે. તે એ આવૃત્તીથી કંપન કરે છે કે જેથી બે તારના સાંધા પર નિસ્પંદ રચાય છે. જો તાર A માં પ્રસ્પંદની સંખ્યા p હોય અને તાર B માં તે q હોય તો ગુણોત્તર p : q _____ છે.

Options :

1. 1 : 2

2. 3 : 5

3. 4 : 9

4. 1 : 4

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

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The bob of a simple pendulum has mass 2 g and a charge of 5.0 μC. It is at rest in a uniform horizontal electric field of intensity 2000 V/m. At equilibrium, the angle that the pendulum makes with the vertical is :

(take $g = 10\ m/s^2$)

Options :

1. $\tan^{-1}(0.5)$
2. $\tan^{-1}(5.0)$
3. $\tan^{-1}(2.0)$
4. $\tan^{-1}(0.2)$

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

5.0 μC आवेश वाला और द्रव्यमान 2 g का एक सरल दोलक का बॉब तीव्रता 2000 V/m के एक एकसमान क्षैतिज विद्युत क्षेत्र में विराम अवस्था पर है। साम्यावस्था में, ऊर्ध्वाधर से दोलक जो कोण बनाएगा, वह है :

(g = 10 m/s² लें)

Options :

1. $\tan^{-1}(0.5)$
2. $\tan^{-1}(5.0)$
3. $\tan^{-1}(2.0)$
4. $\tan^{-1}(0.2)$

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

2000 V/m તીવ્રતાવાળા એકસમાન સમક્ષિતિજ વિદ્યુત ક્ષેત્રમાં 2 g દળ અને 5.0 μC વીજભાર વાળા એક લોલકના દોલકને સ્થિર અવસ્થામાં રાખવામાં આવેલો છે. તો ઉર્ધ્વદિશા જોડે બનતો ખૂણો છે.

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1. $\tan^{-1}(0.5)$

2. $\tan^{-1}(5.0)$

3. $\tan^{-1}(2.0)$

4. $\tan^{-1}(0.2)$

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

A solid conducting sphere, having a charge Q, is surrounded by an uncharged conducting hollow spherical shell. Let the potential difference between the surface of the solid sphere and that of the outer surface of the hollow shell be V. If the shell is now given a charge of -4 Q, the new potential difference between the same two surfaces is :

Options :

1. V

2. 2 V

3. -2 V

4. 4 V

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

आवेश Q वाले एक ठोस चालकीय गोले को एक अनावेशित चालकीय खोखले गोलीय कवच से घेरा गया है। ठोस गोले के पृष्ठ और खोखले कवच के बाह्य पृष्ठ के बीच विभवान्तर V है। यदि कवच को अब एक आवेश -4 Q दिया जाता है, तब उन्ही दोनों पृष्ठों के बीच नया विभवान्तर होगा :

Options :

1. V

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3. $-2\,V$

4. $4\,V$

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

Q વીજભાર ધરાવતા એક ઘન વાહક ગોળો કોઇ વીજભાર રહિત વાહક પોલા ગોળાકાર કવચથી ઘેરાયેલો છે. ધારોકે ઘન ગોળાની સપાટી અને પોલા કવચની બહારની સપાટી વચ્ચનો સ્થિતિમાનનો તફાવત V છે. હવે જો પોલા કવચને $-4\,Q$ જેટલો વીજભાર આપવામાં આવેતો આજ બે સપાટીઓ વચ્ચે નવો સ્થિતિમાનનો તફાવત _____ છે.

Options :

1. V

2. $2\,V$

3. $-2\,V$

4. $4\,V$

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

Voltage rating of a parallel plate capacitor is 500 V. Its dielectric can withstand a maximum electric field of 10^6 V/m. The plate area is $10^{-4}\,m^2$. What is the dielectric constant if the capacitance is 15 pF ?
(given $\epsilon_0 = 8.86 \times 10^{-12}\,C^2/Nm^2$)

Options :

1. 6.2

2. 3.8

3. 4.5

4. 8.5

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एक समान्तर प्लेट संधारित्र की वोल्टेज श्रेणी (rating) 500 V है। इसका परावैद्युत पदार्थ अधिकतम 10^6 V/m का विद्युत क्षेत्र सहन कर सकता है। प्लेट का क्षेत्रफल 10^{-4} m^2 है। यदि संधारित्र की धारिता का मान 15 pF हो तो परावैद्युतांक का मान होगा : (दिया है $\epsilon_0 = 8.86 \times 10^{-12}$ C^2/Nm^2)

Options :

1. 6.2

2. 3.8

3. 4.5

4. 8.5

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

સમાંતર પ્લેટ કેપેસિટરનું વોલ્ટેજ રેટીંગ 500 V છે. એનુ પરાવૈદ્યુત સામર્થ્ય 10^6 V/m મહત્તમ વિદ્યુતક્ષેત્ર જેટલું સહન કરી શકે છે. પ્લેટનું ક્ષેત્રફળ 10^{-4} m^2 છે. 15 pF કેપેસીટન્સ માટે પરાવૈદ્યુતાંક (ડાયઇલેક્ટ્રીક અચળાંક) કેટલો હોવો જોઇએ? ($\epsilon_0 = 8.86 \times 10^{-12}$ C^2/Nm^2 છે.)

Options :

1. 6.2

2. 3.8

3. 4.5

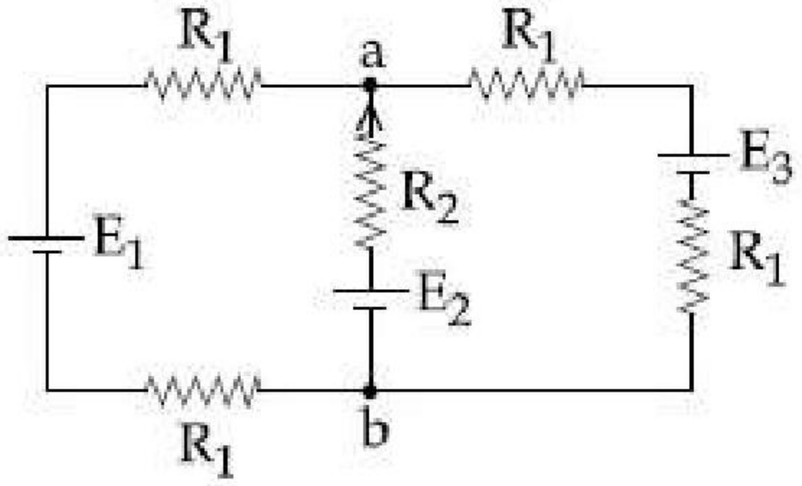
4. 8.5

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

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For the circuit shown, with $R_1 = 1.0\ \Omega$, $R_2 = 2.0\ \Omega$, $E_1 = 2$ V and $E_2 = E_3 = 4$ V, the potential difference between the points 'a' and 'b' is approximately (in V) :



Options :

1. 3.7

2. 3.3

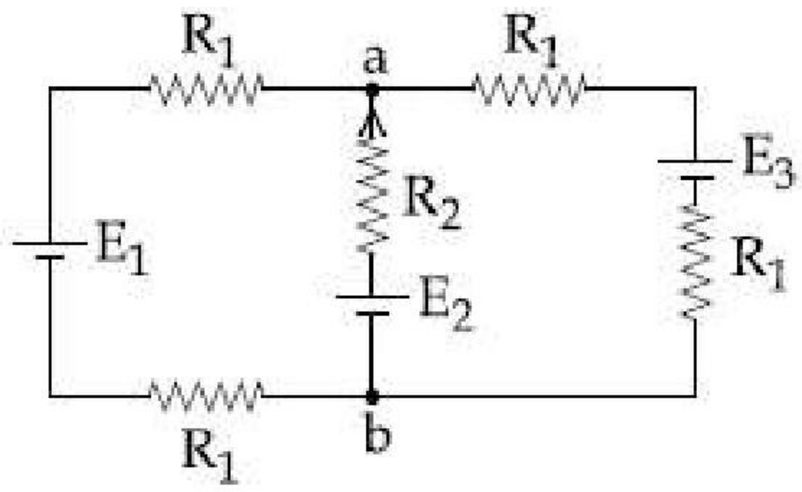
3. 2.7

4. 2.3

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

Correct Marks : 4 Wrong Marks : 1

दिखाये गये परिपथ में, $R_1 = 1.0\ \Omega$, $R_2 = 2.0\ \Omega$, $E_1 = 2$ V और $E_2 = E_3 = 4$ V हैं। बिन्दुओं 'a' एवं 'b' के बीच विभवान्तर लगभग (V में) है :



Options :

1. 3.7

2. 3.3

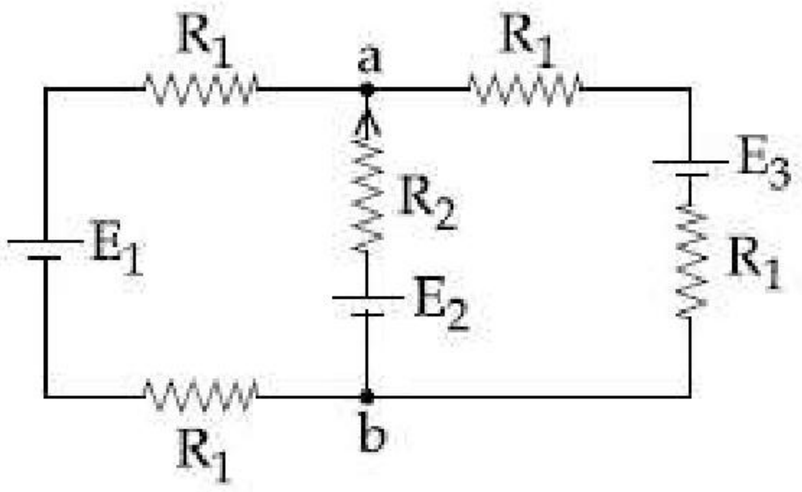
3. 2.7

4. 2.3

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Correct Marks : 4 Wrong Marks : 1

બતાવેલ પરિપથમાં $R_1 = 1.0\,\Omega, R_2 = 2.0\,\Omega, E_1 = 2V$ અને $E_2 = E_3 = 4$ V છે. બિન્દુ a અને b વચ્ચે સ્થિતિમાનનો તફાવત અંદાજીત (વોલ્ટમાં) _____ છે.



Options :

1. 3.7

2. 3.3

3. 2.7

4. 2.3

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 circular coil having N turns and radius r carries a current I. It is held in the XZ plane in a magnetic field $B\hat{i}$. The torque on the coil due to the magnetic field is :

Options :

1. $B\pi r^2 I N$

2. $\frac{B\pi r^2 I}{N}$

3. Zero

4. $\frac{Br^2 I}{\pi N}$

Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number

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त्रिज्या r और चक्कर N वाली एक वृत्तीय कुण्डली में

धारा I प्रवाहित हो रही है। इसे चुम्बकीय क्षेत्र $B\hat{i}$ में XZ समतल में रखा जाता है। चुम्बकीय क्षेत्र के कारण कुण्डली पर बलआघूर्ण होगा :

Options :

1. $B\pi r^2 I N$

2. $\frac{B\pi r^2 I}{N}$

3. शून्य

4. $\frac{Br^2 I}{\pi N}$

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

N આંટા અને r ત્રિજ્યાવાળું એક વર્તુળાકાર ગુંચળું I પ્રવાહ ધરાવે છે. તેને $B\hat{i}$ તીવ્રતાવાળા ચુંબકીય ક્ષેત્રમાં XZ સમતલમાં લટકાવેલ છે. ચુંબકીય ક્ષેત્રને લીધે ગુંચળા પર લાગતુ બળયુગ્મ (ટોર્ક) _____ હશે.

Options :

1. $B\pi r^2 I N$

2. $\frac{B\pi r^2 I}{N}$

3. શૂન્ય

4. $\frac{Br^2 I}{\pi N}$

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

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An alternating voltage $v(t) = 220 \sin 100\pi t$ volt is applied to a purely resistive load of 50 Ω. The time taken for the current to rise from half of the peak value to the peak value is :

Options :

1. 2.2 ms

2. 3.3 ms

3. 5 ms

4. 7.2 ms

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

एक प्रत्यावर्ती वोल्टेज स्रोत $v(t) = 220 \sin 100\pi t$ वोल्ट को एक 50 Ω प्रतिरोध पर लगाया गया है। धारा का मान आधे शिखर मान से पूर्ण शिखर मान तक बढ़ने में लगे समय का मान होगा :

Options :

1. 2.2 ms

2. 3.3 ms

3. 5 ms

4. 7.2 ms

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

50 Ω અવરોધ ધરાવતા અવરોધને $v(t) = 220 \sin 100\pi t$ volt વાળો અલ્ટરનેટ (ઉલટ સુલટ) વીજસ્થિતિમાન લગાવવામાં આવે છે. પ્રવાહને તેના અડધા મહત્તમ (પીક) મૂલ્ય થી મહત્તમ (પીક) મૂલ્ય સુધી જવા માટે લાગતો સમય અંતરાલ છે :

Options :

1. 2.2 ms

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2. 3.3 ms

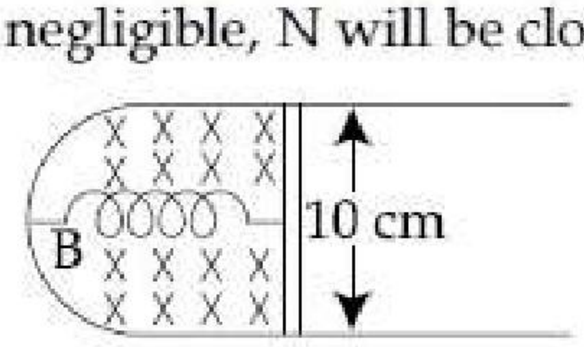
3. 5 ms

4. 7.2 ms

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 thin strip 10 cm long is on a U shaped wire of negligible resistance and it is connected to a spring of spring constant $0.5\,\mathrm{Nm}^{-1}$ (see figure). The assembly is kept in a uniform magnetic field of 0.1 T. If the strip is pulled from its equilibrium position and released, the number of oscillations it performs before its amplitude decreases by a factor of e is N. If the mass of the strip is 50 grams, its resistance 10 Ω and air drag negligible, N will be close to :



Options :

1. 1000

2. 5000

3. 10000

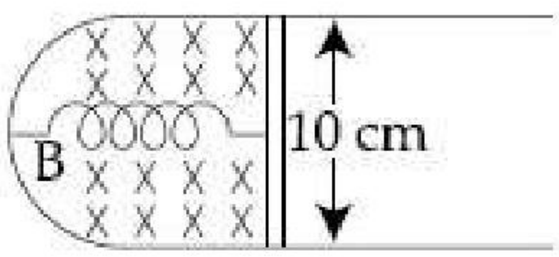
4. 50000

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

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नगण्य प्रतिरोध वाले एक U आकार के तार पर 10 cm लम्बी एक पतली पट्टी रखी है और इसे 0.5 N/m कमानी स्थिरांक वाली एक कमानी से जोड़ा गया है। (चित्र देखें)। समायोजन को एक 0.1 T के एकसमान चुम्बकीय क्षेत्र में रखा गया है। यदि पट्टी को इसकी साम्यावस्था से खींचा जाता है और फिर छोड़ दिया जाता है, तब इसके आयाम में e के गुणक से कमी आने के लिये किये गये दोलनों की संख्या N है। यदि पट्टी का द्रव्यमान 50 ग्राम है, इसका प्रतिरोध 10 Ω हैं और वायु अवरोध (drag) नगण्य है, तब N का मान लगभग होगा :



Options :

1. 1000

2. 5000

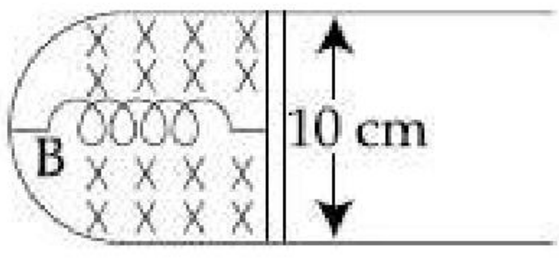
3. 10000

4. 50000

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

અવગણ્ય અવરોધ ધરાવતા U આકારના તાર પર 10 cm લાંબી એક પાતળી પટ્ટીને મુકવામાં આવેલ છે. અને તેને $0.5\ \mathrm{Nm}^{-1}$ સ્પ્રિંગ અચળાંક ધરાવતી સ્પ્રિંગ વડે જડીત કરેલ છે. (આકૃતિ જુઓ). આ રચનાને 0.1 T વાળા ચુંબકીય ક્ષેત્રમાં મુકવામાં આવે છે. જ્યારે પટ્ટીને તેની સંતુલન અવસ્થામાંથી ખેંચીને છોડવામાં આવે છે ત્યારે તેનો કંપવિસ્તાર e જેટલો ઘટે તે પહેલા થતા દોલનોની સંખ્યા N છે. જો પટ્ટીનો દળ 50 gm, અવરોધ 10 Ω અને અવગણ્ય હવાનું ખેચાણ હોય તો N _____ ની નજીક હશે.



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2. 5000

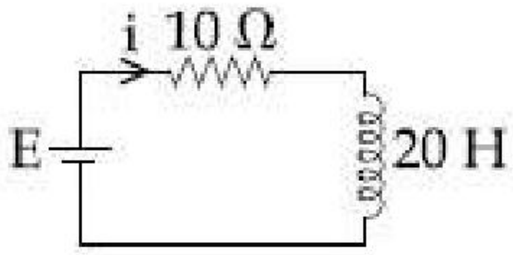
3. 10000

4. 50000

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

Correct Marks : 4 Wrong Marks : 1

A 20 Henry inductor coil is connected to a 10 ohm resistance in series as shown in figure. The time at which rate of dissipation of energy (Joule's heat) across resistance is equal to the rate at which magnetic energy is stored in the inductor, is :



Options :

1. $\frac{1}{2}ln2$

2. $2\,ln\,2$

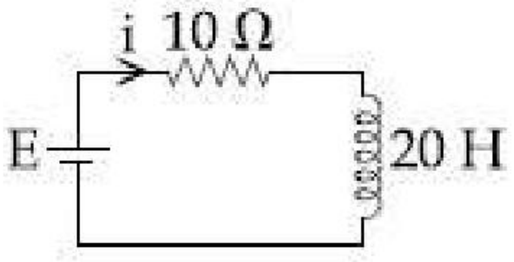
3. $\frac{2}{ln2}$

4. $ln\,2$

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

एक 20 हेनरी प्रेरण कुण्डली को 10 ओह्म प्रतिरोध से श्रेणी में जोड़ा गया है जैसा कि चित्र में दर्शाया गया है। जब प्रतिरोध में क्षय ऊर्जा (जूल ऊष्मा) की दर प्रेरण कुण्डली में संचित चुम्बकीय ऊर्जा की दर के समान हो, उस समय की गणना कीजिये।



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1. $\frac{1}{2} l\,n\,2$

2. $2\,l\,n\,2$

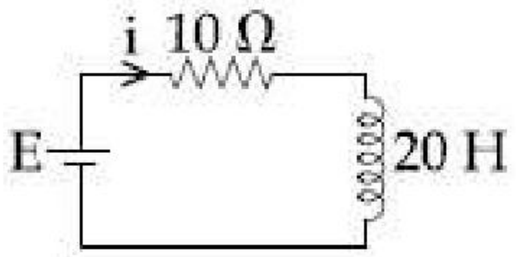
3. $\frac{2}{l\,n\,2}$

4. $l\,n\,2$

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

આકૃતિમાં બતાવ્યા પ્રમાણે 20 Henry ના ગુંચળાને $10\ \Omega$ ના અવરોધ સાથે શ્રેણીમાં જોડેલ છે. જ્યારે અવરોધને સમાંતર ઉર્જા વ્યયનો દર (જુલ ઉષ્મા) ગુંચળામાં સંગ્રહ પામતી ચુંબકીય ઉર્જાના દર બરાબર થાય તે માટે લાગતો સમય _____ છે.



Options :

1. $\frac{1}{2} l\,n\,2$

2. $2\,l\,n\,2$

3. $\frac{2}{l\,n\,2}$

4. $l\,n\,2$

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

A plane electromagnetic wave travels in free space along the x-direction. The electric field component of the wave at a particular point of space and time is $E = 6\ Vm^{-1}$ along y-direction. Its corresponding magnetic field component, B would be :

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1. 2×10^{-8} T along z-direction

2. 6×10^{-8} T along x-direction

3. 2×10^{-8} T along y-direction

4. 6×10^{-8} T along z-direction

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 समतल विद्युत चुम्बकीय तरंग मुक्त आकाश में x-दिशा में गतिशील है। आकाश के एक विशेष बिन्दु पर तरंग का विद्युत क्षेत्र घटक, एक समय पर $E=6\ Vm^{-1}$ y-दिशा में है। उसके संगत इसका चुम्बकीय क्षेत्र घटक B होगा :

Options :

1. z-दिशा में 2×10^{-8} T

2. x-दिशा में 6×10^{-8} T

3. y-दिशा में 2×10^{-8} T

4. z-दिशा में 6×10^{-8} T

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

કોઈ સમતલ વિદ્યુત ચુંબકીય તરંગો મુક્ત અવકાશમાં x-અક્ષને સમાંતર ગતિ કરે છે. y-અક્ષને સમાંતર અવકાશના કોઇ ચોક્કસ બિન્દુ અને સમયે તરંગના વિદ્યુત ક્ષેત્રનો ઘટક $E=6\ Vm^{-1}$ છે. આજ બિન્દુએ તેના ચુંબકીય ક્ષેત્રનો ઘટક B _____ હશે.

Options :

1. z-અક્ષને સમાંતર 2×10^{-8} T

2. x-અક્ષને સમાંતર 6×10^{-8} T

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4. z-અક્ષને સમાંતર 6×10^{-8} T

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

An upright object is placed at a distance of 40 cm in front of a convergent lens of focal length 20 cm. A convergent mirror of focal length 10 cm is placed at a distance of 60 cm on the other side of the lens. The position and size of the final image will be :

Options :

1. 40 cm from the convergent mirror, same size as the object

2. 20 cm from the convergent mirror, same size as the object

3. 20 cm from the convergent mirror, twice the size of the object

4. 40 cm from the convergent lens, twice the size of the object

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 फोकस लम्बाई वाले एक अभिसारी लेन्स के सामने 40 cm की दूरी पर एक सीधी वस्तु को रखा गया है। लेन्स के दूसरी ओर 60 cm की दूरी पर 10 cm फोकस लम्बाई वाले एक अभिसारी दर्पण को रखा गया है। अन्तिम प्रतिबिम्ब की स्थिति और आकार होगा :

Options :

1. अभिसारी दर्पण से 40 cm पर, वस्तु के समान आकार का

2. अभिसारी दर्पण से 20 cm पर, वस्तु के समान

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अभिसारी दर्पण से 20 cm पर, वस्तु के आकार का दोगुना

3.

अभिसारी लेन्स से 40 cm पर, वस्तु के आकार का दोगुना

4.

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

એક ઊભી વસ્તુને 20 cm કેન્દ્રલંબાઈ ધરાવતા એક કેન્દ્રાભિસારી લેન્સની સામે 40 cm અંતરે મુકેલ છે. લેન્સની બીજી બાજુએ 60 cm અંતરે એક કેન્દ્રાભિસારી અરીસો 10 cm અંતરે મુકેલ છે. પરિણામી પ્રતિબિંબની સ્થિતિ અને કદ હશે :

Options :

કેન્દ્રાભિસારી અરીસાથી 40 cm, વસ્તુના જેટલું જ કદ

1.

કેન્દ્રાભિસારી અરીસાથી 20 cm, વસ્તુના જેટલું જ કદ

2.

કેન્દ્રાભિસારી અરીસાથી 20 cm, વસ્તુથી બે ગણા કદનું

3.

કેન્દ્રાભિસારી લેન્સથી 40 cm, વસ્તુથી બે ગણા કદનું

4.

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

Correct Marks : 4 Wrong Marks : 1

In an interference experiment the ratio of amplitudes of coherent waves is $\frac{a_1}{a_2}=\frac{1}{3}$. The ratio of maximum and minimum intensities of fringes will be :

Options :

1. 2

2. 4

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4. 18

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

किसी व्यतिकरण के प्रयोग में कलाबद्ध स्रोतों के आयामों का अनुपात $\frac{a_1}{a_2}=\frac{1}{3}$ हैं। फ्रिंजों की अधिकतम और न्यूनतम तीव्रताओं का अनुपात होगा :

Options :

1. 2

2. 4

3. 9

4. 18

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

કોઈ એક વ્યતિકરણના પ્રયોગમાં સુસ્મબદ્ધ તરંગોના કંપવિસ્તારનો ગુણોત્તર $\frac{a_1}{a_2}=\frac{1}{3}$ છે. શલાકાઓની મહત્તમ અને ન્યૂનતમ તીવ્રતાનો ગુણોત્તર Imax/Imin હશે :

Options :

1. 2

2. 4

3. 9

4. 18

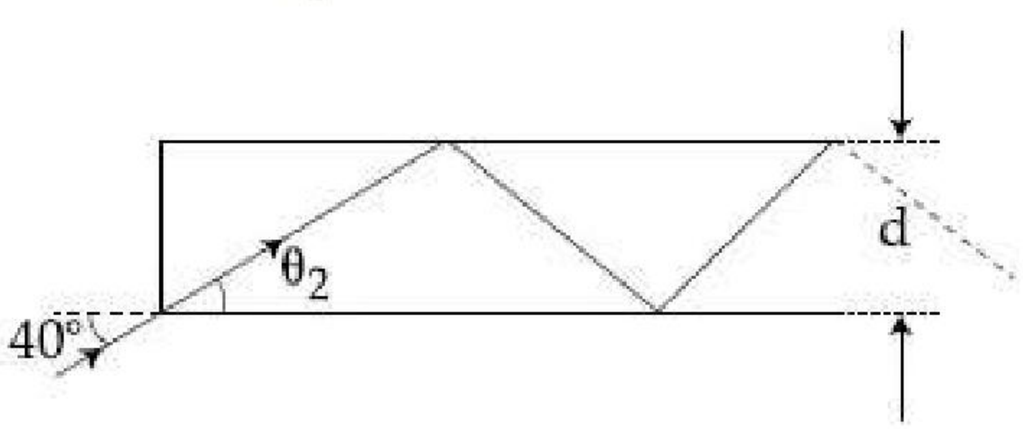
Question Number : 25 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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In figure, the optical fiber is $l=2$ m long and has a diameter of $d=20\ \mu m$. If a ray of light is incident on one end of the fiber at angle $\theta_1=40°$, the number of reflections it makes before emerging from the other end is close to :

(refractive index of fiber is 1.31 and $\sin 40°=0.64$)



Options :

1. 57000

2. 66000

3. 55000

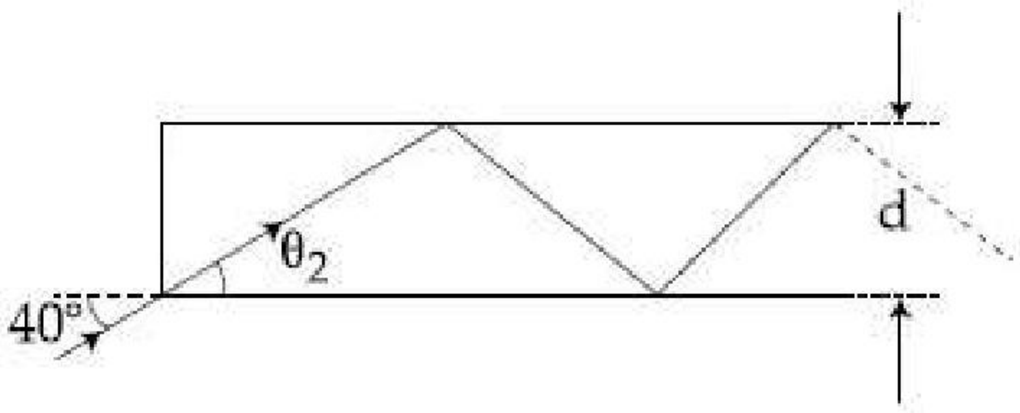
4. 45000

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

चित्र में $l=2$ मीटर लम्बे तथा $d=20\ \mu m$ व्यास के एक प्रकाश तन्तु को दिखाया है। यदि प्रकाश की किरण इस तन्तु के एक सिरे पर $\theta_1=40°$ कोण पर आपतित होती है तो दूसरे सिरे से निकलने से पूर्व इसके परावर्तनों की लगभग संख्या होगी :

(फाइबर का अपवर्तनांक 1.31 है और $\sin 40°=0.64$)



Options :

1. 57000

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3. 55000

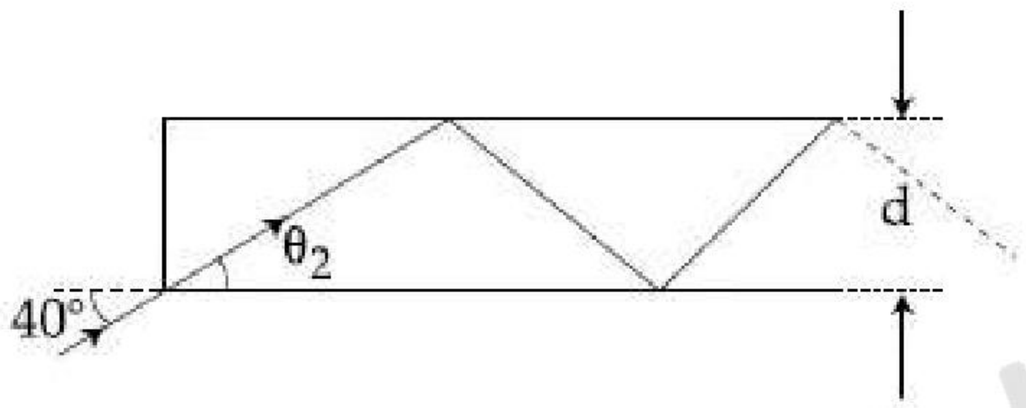
4. 45000

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

એક પ્રકાશપુંજ $\theta_1 = 40°$ ના ખૂણે $l = 2\ \text{m}$ લાંબા અને $\text{d} = 20\ \mu\text{m}$ વ્યાસ ધરાવતા ઓપ્ટીકલ ફાઇબર ના એક છેડા પર આપાત થાય છે. બીજા છેડાથી બહાર નિકળતા પહેલા એના દ્વારા કેટલા પરાવર્તનોની સંખ્યા _____ ની નજીકની હશે.

(ફાઇબરનો વક્રીભવનાંક 1.31 અને $\sin 40° = 0.64$)



Options :

1. 57000

2. 66000

3. 55000

4. 45000

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

Two particles move at right angle to each other. Their de Broglie wavelengths are λ_1 and λ_2 respectively. The particles suffer perfectly *inelastic* collision. The de Broglie wavelength λ, of the final particle, is given by :

Options :

1. $\lambda = \frac{\lambda_1 + \lambda_2}{2}$

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3. $\frac{2}{\lambda}=\frac{1}{\lambda_1}+\frac{1}{\lambda_2}$

4. $\frac{1}{\lambda^2}=\frac{1}{\lambda_1^2}+\frac{1}{\lambda_2^2}$

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

दो कण एक दूसरे से लम्बवत् दिशाओं में गतिशील हैं। इन कणों की डी-ब्राग्ली तरंग लम्बाइयाँ क्रमश: λ_1 तथा λ_2 हैं। इन कणों का पूर्णतया *अप्रत्यास्थ* संघट्ट होता है। परिणामी कण की डी-ब्राग्ली तरंगदैर्ध्य λ इस समीकरण से दी जाती है :

Options :

1. $\lambda=\frac{\lambda_1+\lambda_2}{2}$

2. $\lambda=\sqrt{\lambda_1\lambda_2}$

3. $\frac{2}{\lambda}=\frac{1}{\lambda_1}+\frac{1}{\lambda_2}$

4. $\frac{1}{\lambda^2}=\frac{1}{\lambda_1^2}+\frac{1}{\lambda_2^2}$

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

બે કણો એકબીજાની સાપેક્ષે લંબ ગતિ કરે છે. તેમની ડી બ્રોગલી તરંગલંબાઇ અનુક્રમે λ_1 અને λ_2 છે. આ કણો સંપૂર્ણ *અસ્થિતિસ્થાપક* અથડામણ અનુભવે છે. પરિણામી કણની ડી બ્રોગલી તરંગલંબાઇ _____ સમીકરણ દ્વારા આપવામાં આવે છે.

Options :

1. $\lambda=\frac{\lambda_1+\lambda_2}{2}$

2. $\lambda=\sqrt{\lambda_1\lambda_2}$

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3. $\frac{2}{\lambda}=\frac{1}{\lambda_1}+\frac{1}{\lambda_2}$

4. $\frac{1}{\lambda^2}=\frac{1}{\lambda_1^2}+\frac{1}{\lambda_2^2}$

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

Radiation coming from transitions $n=2$ to $n=1$ of hydrogen atoms fall on He^+ ions in $n=1$ and $n=2$ states. The possible transition of helium ions as they absorb energy from the radiation is :

Options :

1. $n=2 \rightarrow n=5$

2. $n=1 \rightarrow n=4$

3. $n=2 \rightarrow n=3$

4. $n=2 \rightarrow n=4$

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

हाइड्रोजन परमाणु के $n=2$ से $n=1$ संक्रमण से निकला विकिरण He^+ की $n=1$ और $n=2$ अवस्थाओं पर पड़ता है। हीलियम आयनों द्वारा इस विकिरण की ऊर्जा शोषण से संभव संक्रमण है :

Options :

1. $n=2 \rightarrow n=5$

2. $n=1 \rightarrow n=4$

3. $n=2 \rightarrow n=3$

4. $n=2 \rightarrow n=4$

Question Number : 27 Question Type : MCQ Option Shuffling : Yes Display Question Number

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હાઇડ્રોજન પરમાણુની $n=2$ થી $n=1$ સંક્રાંતિ દરમ્યાન આવતા વિકરણો હિલીયમ આયનના He^+ $n=1$ અને $n=2$ અવસ્થા પર સંપાત થાય છે. હિલીયમ આયન દ્વારા આ વિકિરણો માંથી શોષાતી ઉર્જા વડે થતી શક્ય સંક્રાંતિઓ _____ છે.

Options :

1. $n=2 \rightarrow n=5$

2. $n=1 \rightarrow n=4$

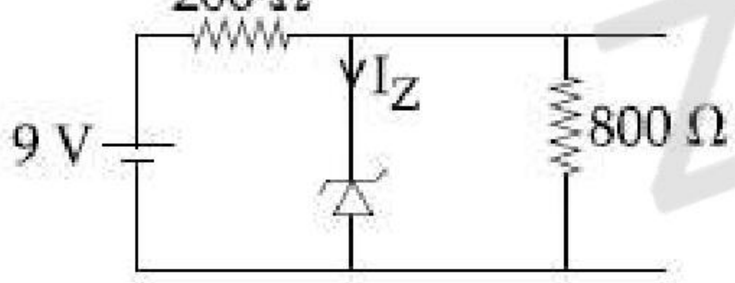
3. $n=2 \rightarrow n=3$

4. $n=2 \rightarrow n=4$

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 reverse breakdown voltage of a Zener diode is 5.6 V in the given circuit.



The current I_z through the Zener is :

Options :

1. 15 mA

2. 10 mA

3. 7 mA

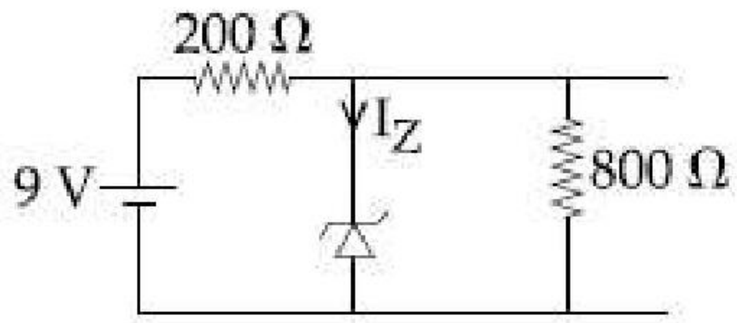
4. 17 mA

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

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परिपथ में, जीनर की पश्चदिशिक भंजन वोल्टता 5.6 V है। जीनर में धारा I_z हैं :



Options :

1. 15 mA

2. 10 mA

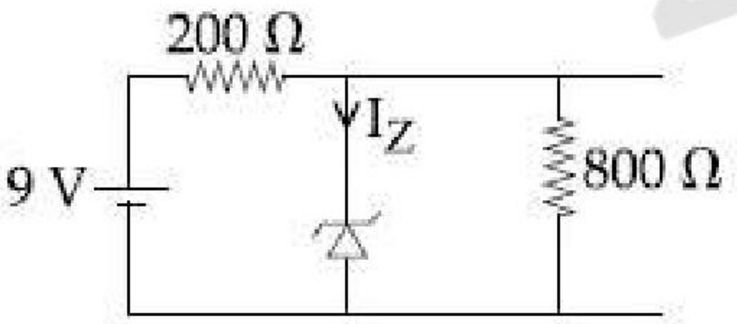
3. 7 mA

4. 17 mA

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

આપેલ પરિપથમાં ઝેનર ડાયોડનો રીવર્સ બ્રેક ડાઉન વોલ્ટેજ 5.6 V છે. ઝેનર ડાયોડ માંથી પસાર થતો પ્રવાહ I_z છે :



Options :

1. 15 mA

2. 10 mA

3. 7 mA

4. 17 mA

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 wavelength of the carrier waves in a modern optical fiber communication network is close to :

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1. 1500 nm

2. 900 nm

3. 2400 nm

4. 600 nm

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

एक आधुनिक प्रकाशीय फाइबर संचरण जाल में वाहक तरंग की निकटतम तरंगदैर्ध्य है :

Options :

1. 1500 nm

2. 900 nm

3. 2400 nm

4. 600 nm

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

આધુનિક ઓપ્ટીકલ ફાઇબર સંચાર પરિપથમાં કેરીયર તરંગની તરંગલંબાઇ _____ ની નજીક છે.

Options :

1. 1500 nm

2. 900 nm

3. 2400 nm

4. 600 nm

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

Correct Marks : 4 Wrong Marks : 1

A 200 Ω resistor has a certain color code. If

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1. 100 Ω

2. 300 Ω

3. 400 Ω

4. 500 Ω

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

200 Ω के एक प्रतिरोध का एक निश्चित वर्ण संकेत (color code) है। यदि लाल वर्ण को हरे वर्ण से विस्थापित कर देते हैं तो नया प्रतिरोध होगा :

Options :

1. 100 Ω

2. 300 Ω

3. 400 Ω

4. 500 Ω

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

200 Ω વાળા અવરોધનો કોઇક વર્ણસંકેત આપેલ છે. જો લાલ કલરની જગ્યાએ લીલો કલર લેવામાં આવેતો આ નવો અવરોધ નો હશે :

Options :

1. 100 Ω

2. 300 Ω

3. 400 Ω

4. 500 Ω

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Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

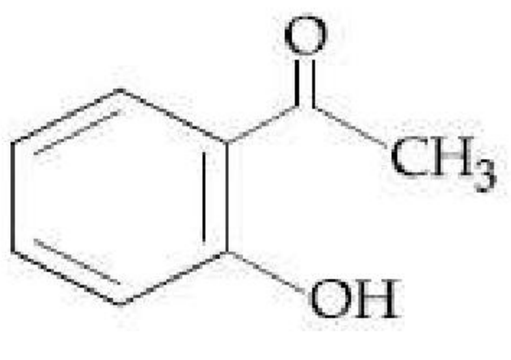
Sub-Section Number:	1
Sub-Section Id:	416529394
Question Shuffling Allowed :	Yes

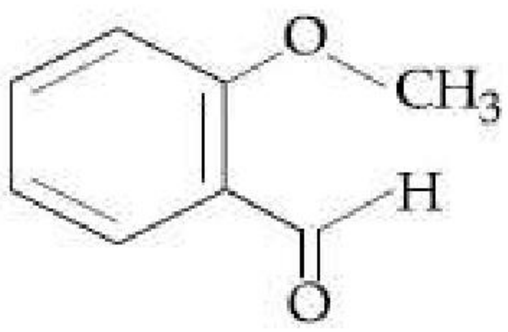
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

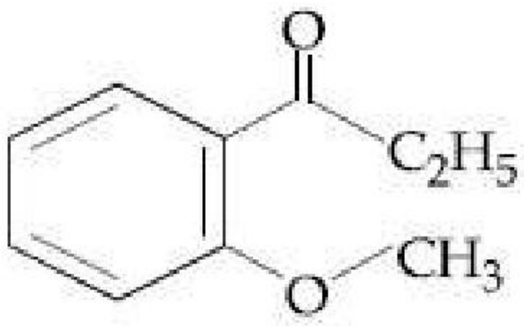
Correct Marks : 4 Wrong Marks : 1

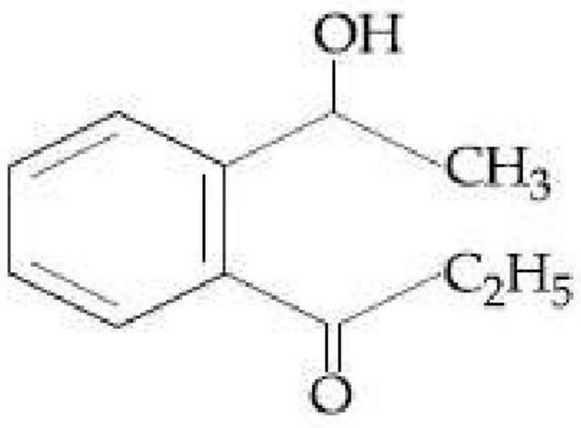
An organic compound neither reacts with neutral ferric chloride solution nor with Fehling solution. It however, reacts with Grignard reagent and gives positive iodoform test. The compound is :

Options :

1. 

2. 

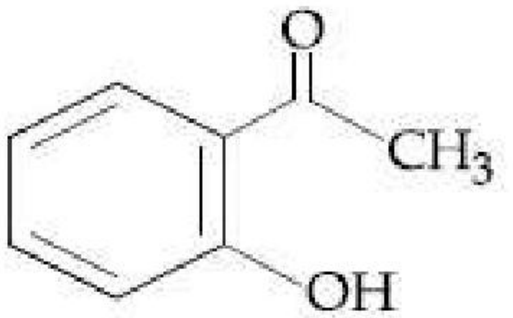
3. 

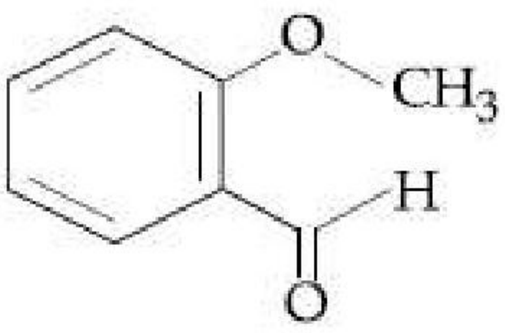
4. 

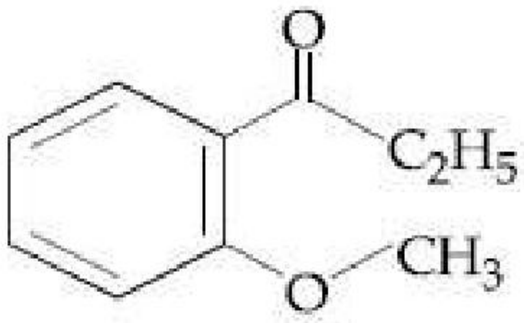
ZOLLEGE.in

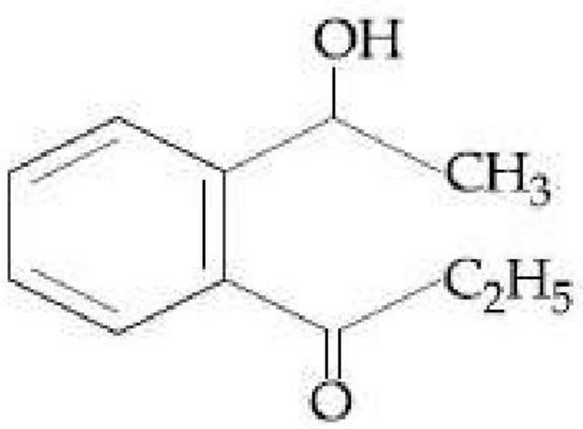
एक कार्बनिक यौगिक न तो उदासीन फेरिक क्लोराइड विलयन के साथ और न ही फेलिंग विलयन के साथ अभिक्रिया करता है। हालाँकि यह यौगिक ग्रीन्यार अभिकर्मक के साथ अभिक्रिया करता है तथा सकारात्मक आयडोफार्म टेस्ट देता है। यह यौगिक है :

Options :

1. 

2. 

3. 

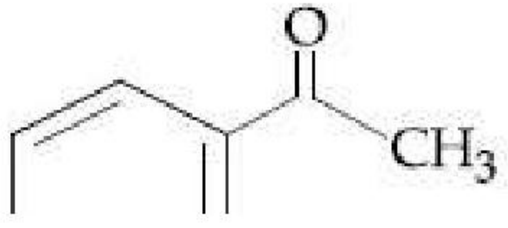
4. 

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

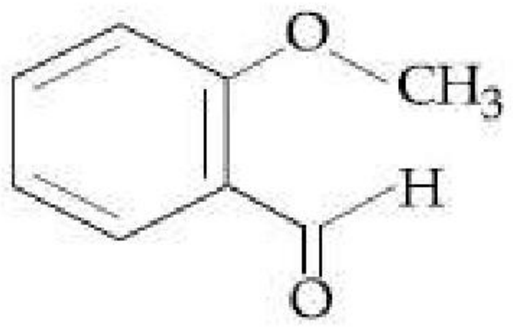
Correct Marks : 4 Wrong Marks : 1

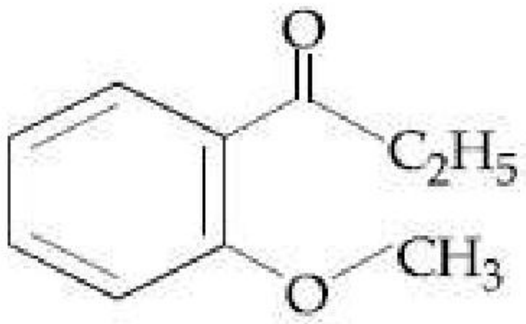
એક કાર્બનિક સંયોજન ના તો તટસ્થ ફેરિક ક્લોરાઇડના દ્રાવણ સાથે કે નહિતો ફેહલીંગ દ્રાવણથી સાથે પ્રક્રિયા કરે છે. પરંતુ તે ગ્રીગનાર્ડ પ્રક્રિયકની સાથે પ્રક્રિયા કરે છે. અને આયોડોફોર્મની હકારાત્મક કસોટી સાથે છે. આ સંયોજન છે :

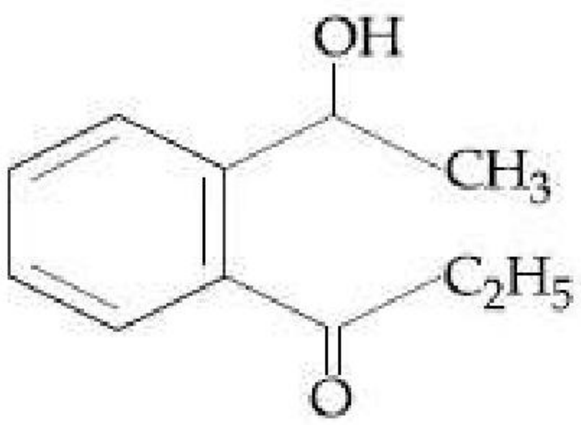
Options :



ZOLLEGE.in

2. 

3. 

4. 

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

Correct Marks : 4 Wrong Marks : 1

Maltose on treatment with dilute HCl gives :

Options :

1. D-Galactose

2. D-Glucose and D-Fructose

3. D-Fructose

4. D-Glucose

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

माल्टोस तनु HCl के साथ अभिकृत करने पर देता है :

Options :

1. D-गैलेक्टोस

2. D-ग्लुकोस तथा D-फ्रुक्टोज़

ZOLLEGE.in

4. D-ગ્લુકોસ

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

દુધ શર્કરાની મંદ HCl સાથે પ્રક્રિયા કરતા શું મળે?

Options :

1. D-ગેલેક્ટોઝ

2. D-ગ્લુકોઝ અને D-ફ્રૂક્ટોઝ

3. D-ફ્રૂક્ટોઝ

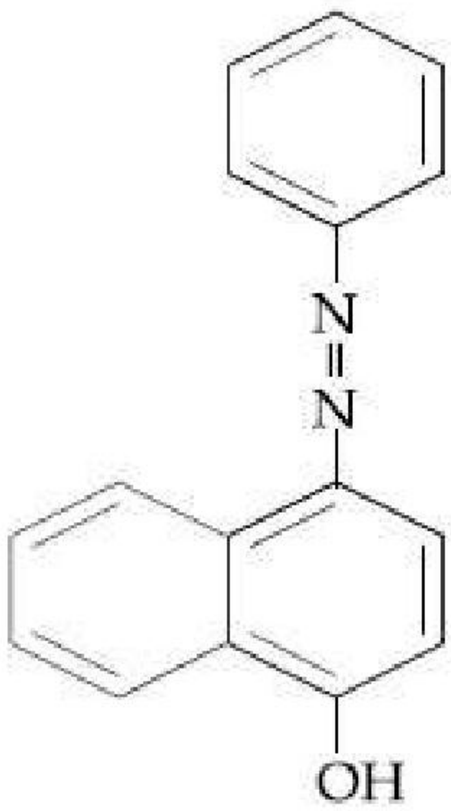
4. D-ગ્લૂકોઝ

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

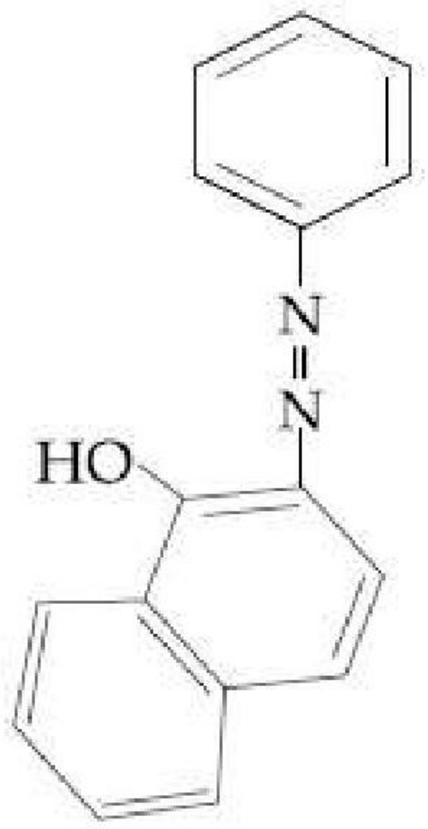
Correct Marks : 4 Wrong Marks : 1

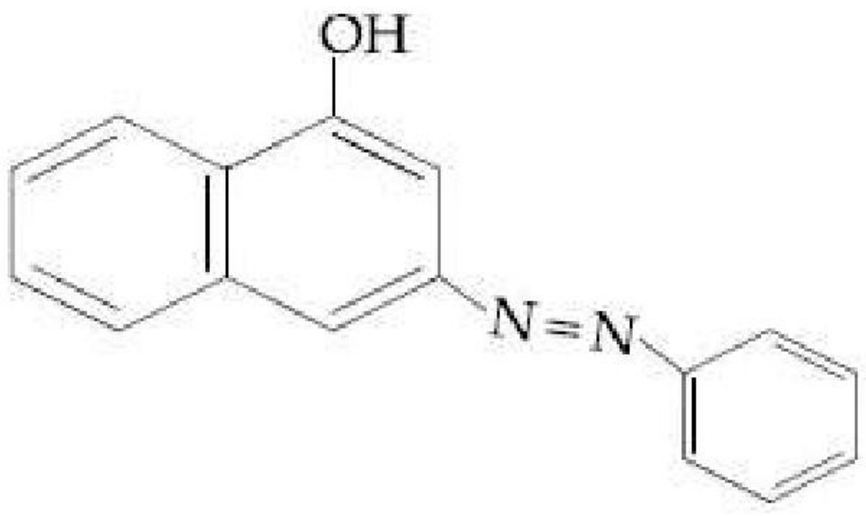
Coupling of benzene diazonium chloride with 1-naphthol in alkaline medium will give :

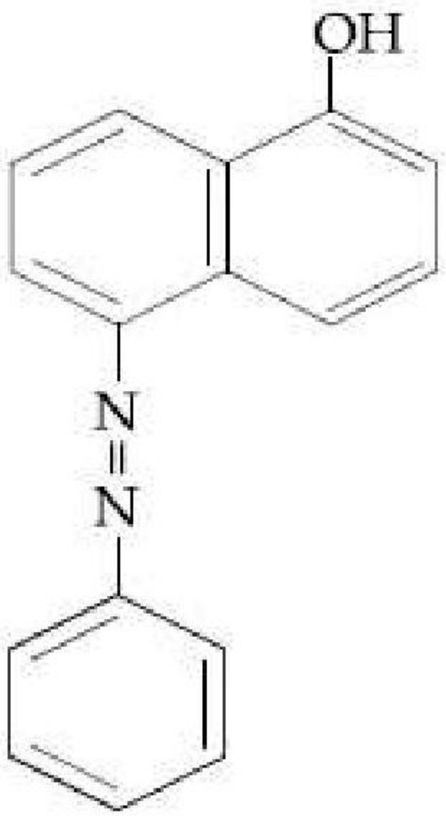
Options :

1. 

ZOLLEGE.in

2. 

3. 

4. 

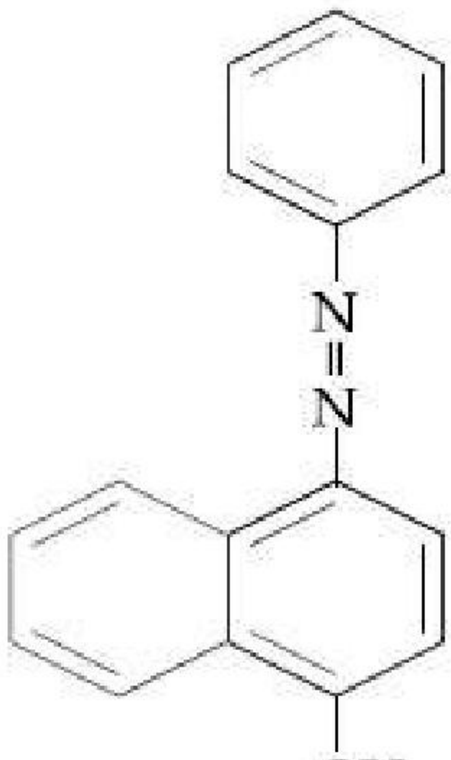
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

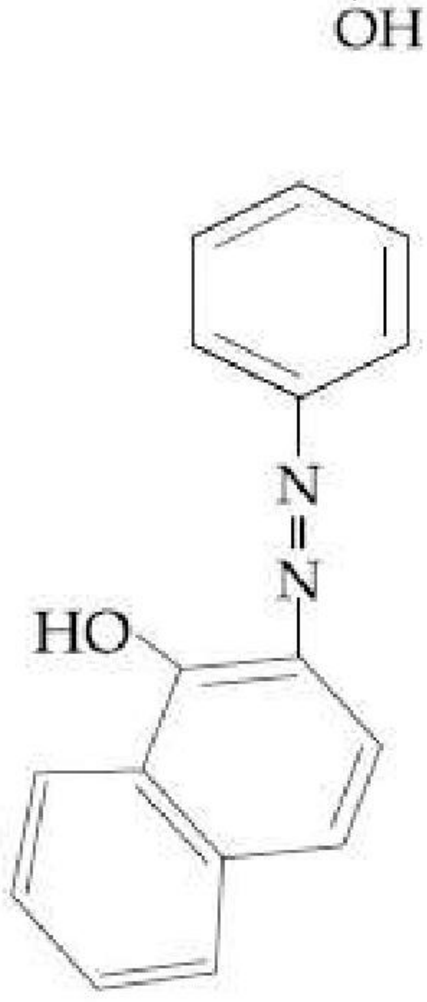
Correct Marks : 4 Wrong Marks : 1

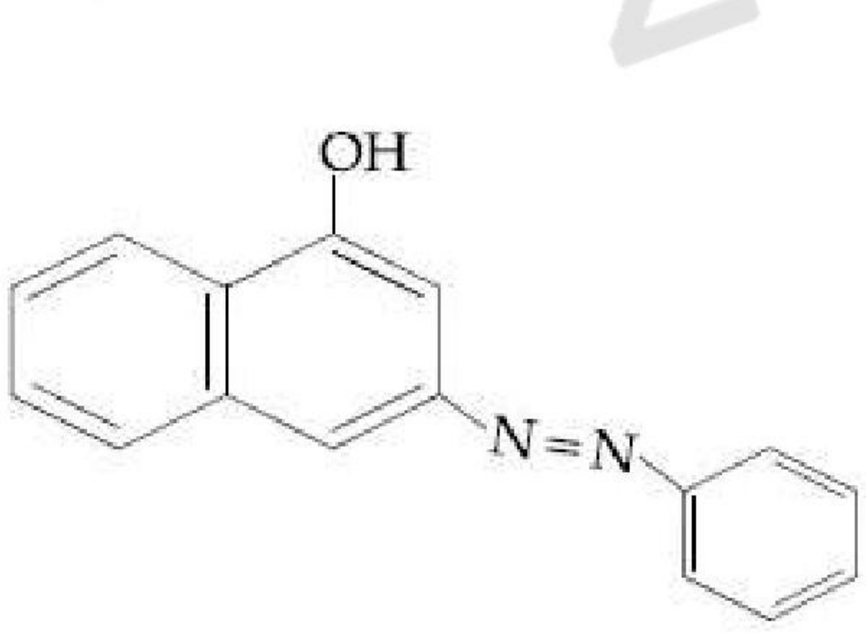
क्षारीय माध्यम में, बेंजीन डाइजोनियम क्लोराइड को 1-नैफ्थॉल के साथ युग्मित करने पर प्राप्त होता है :

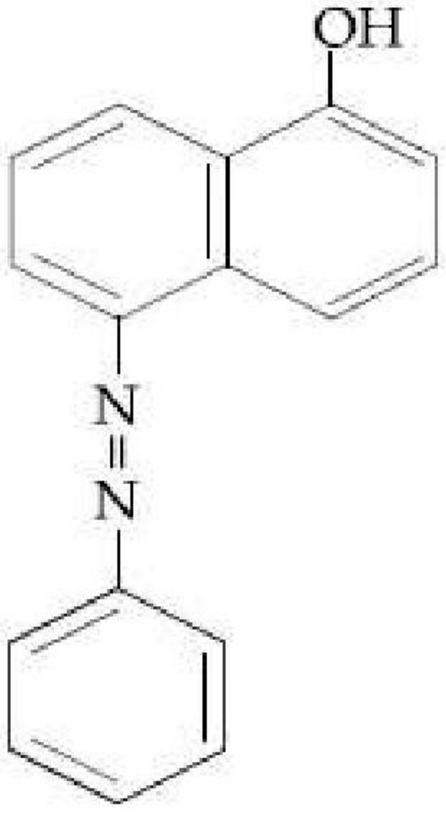
Options :

ZOLLEGE.in

1. 

2. 

3. 

4. 

ZOLLEGE.in

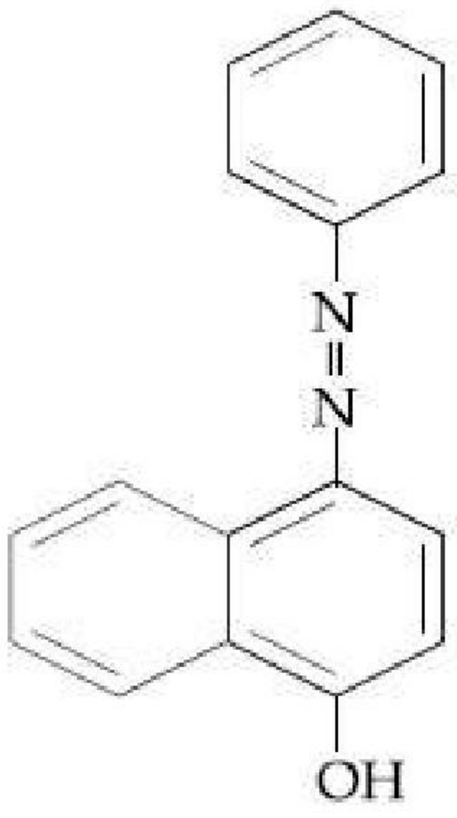
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

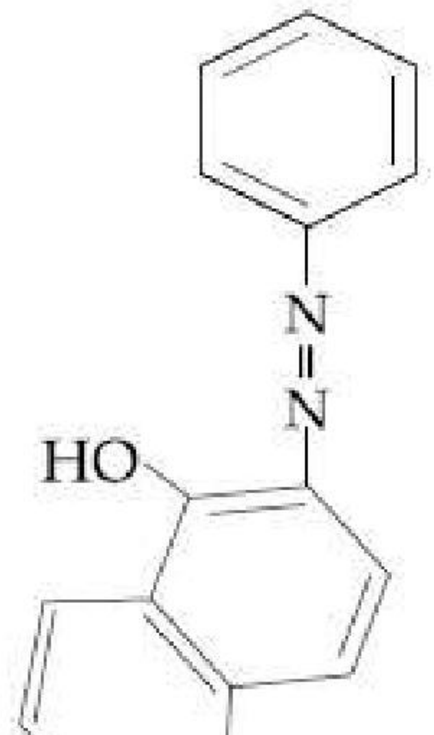
આલ્કલાઈન દ્રાવણમાં બેન્ઝીનડાય એમોનિયમ ક્લોરાઇડનું
1-નેપ્થોલની સાથે કપલીંગ (Coupling) કરતા શું મળે?

Options :

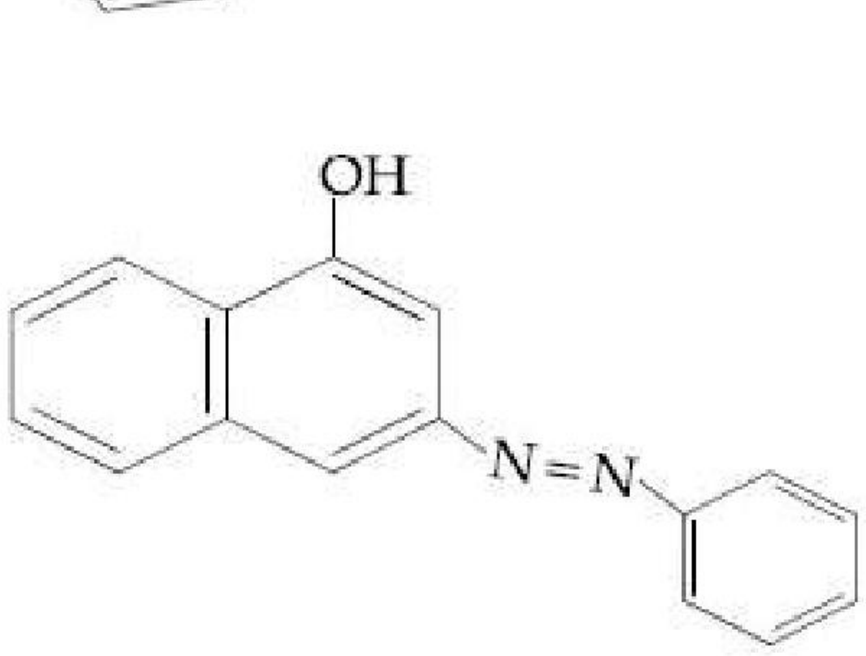
1.



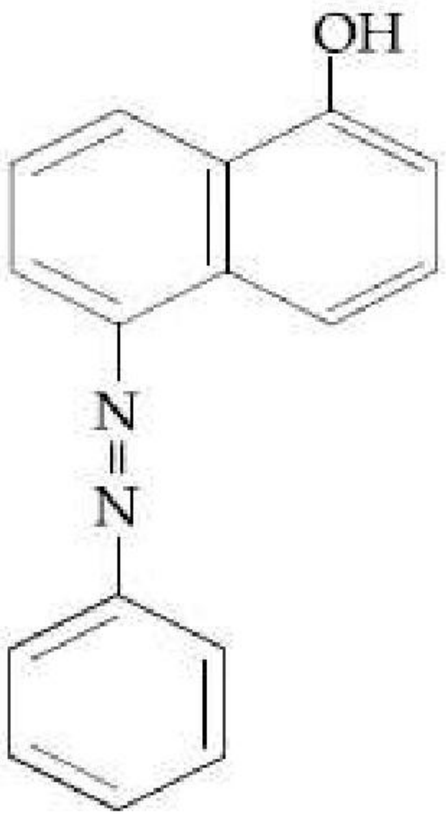
2.



3.



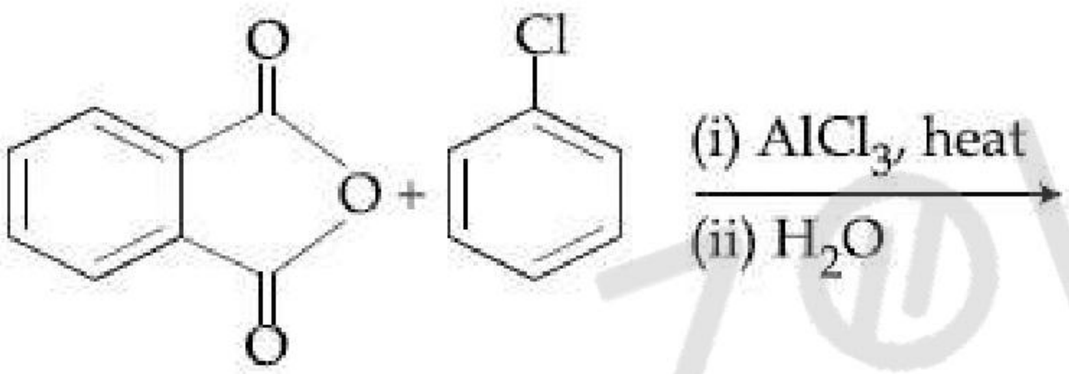
ZOLLEGE.in

4. 

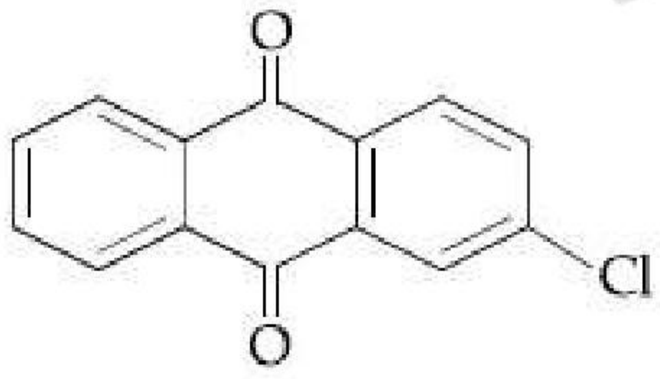
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

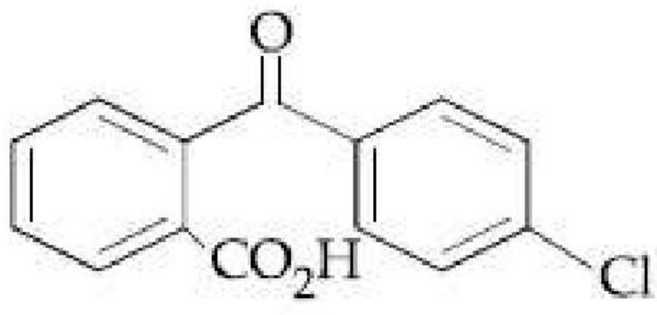
Correct Marks : 4 Wrong Marks : 1

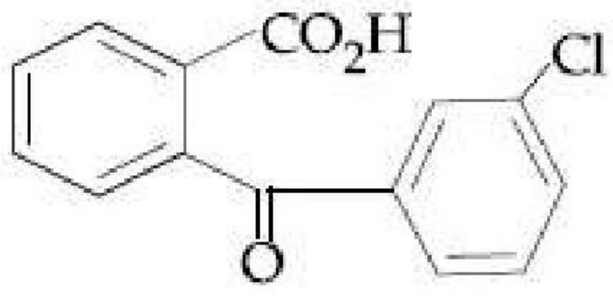
The major product of the following reaction is :



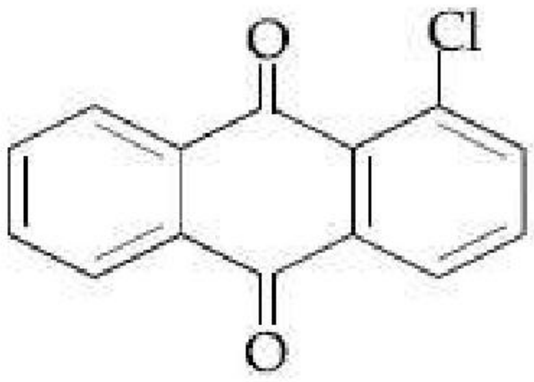
Options :

1. 

2. 

3. 

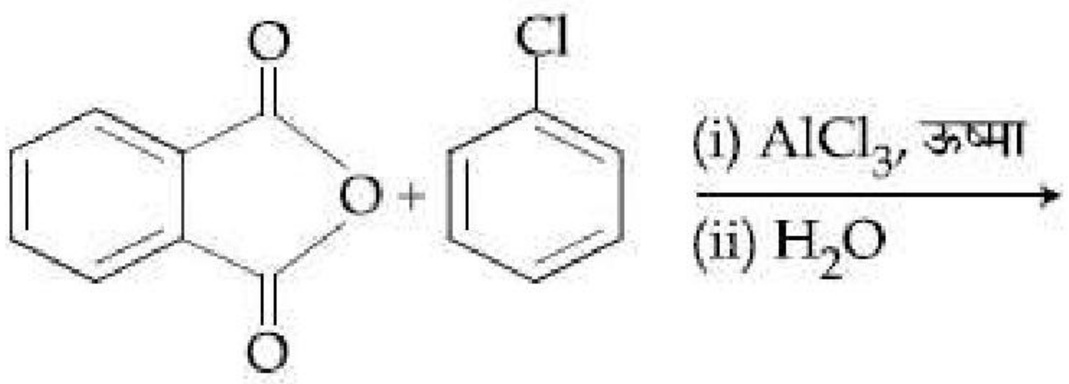
ZOLLEGE.in

4. 

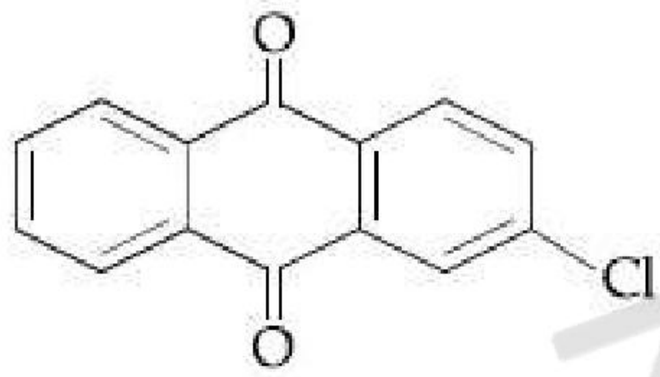
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

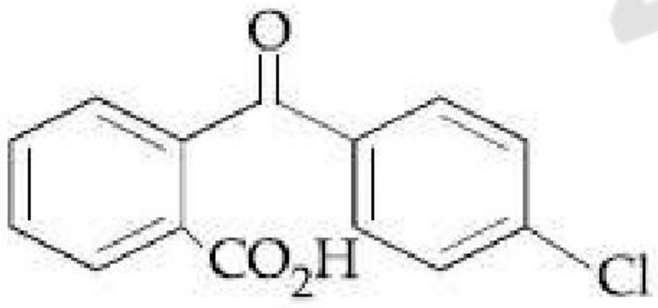
Correct Marks : 4 Wrong Marks : 1

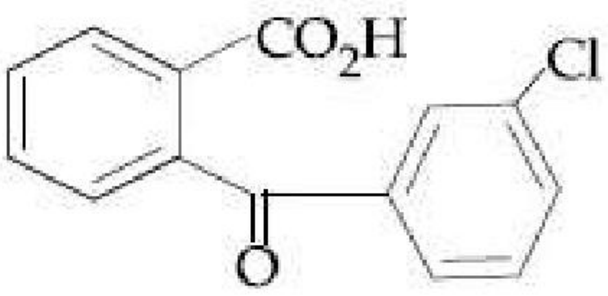
निम्न अभिक्रिया का मुख्य उत्पाद है :

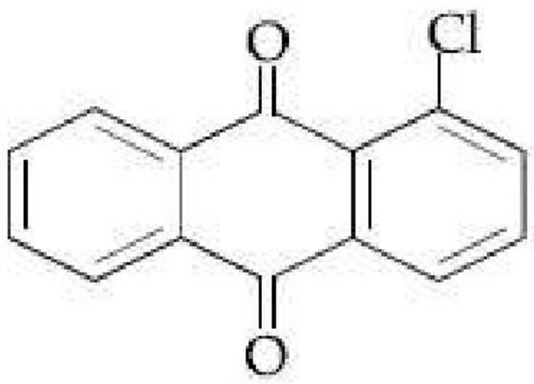


Options :

1. 

2. 

3. 

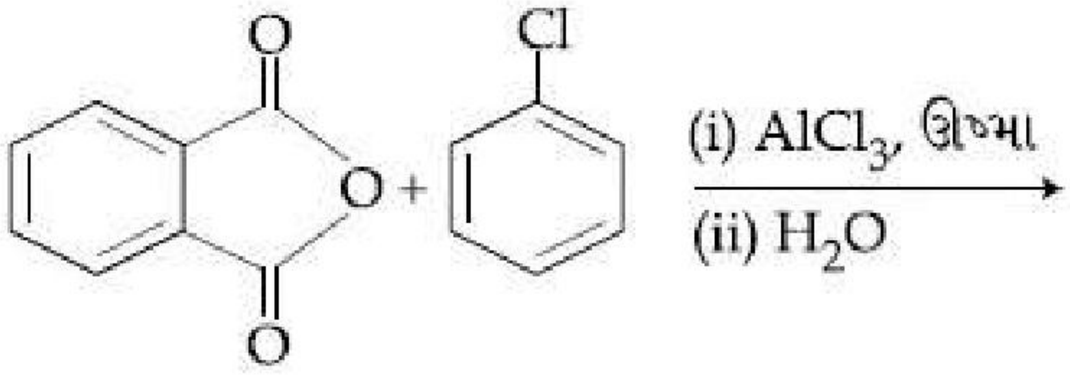
4. 

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

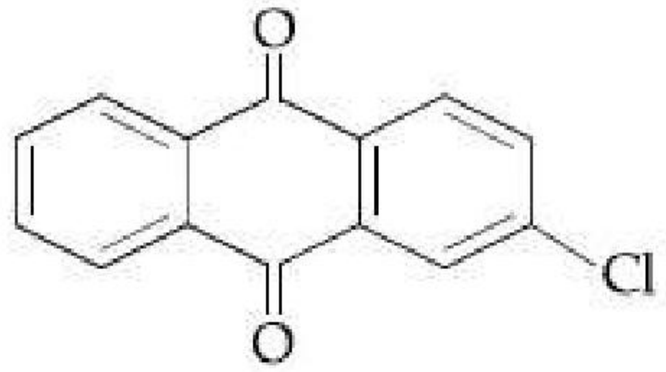
Correct Marks : 4 Wrong Marks : 1

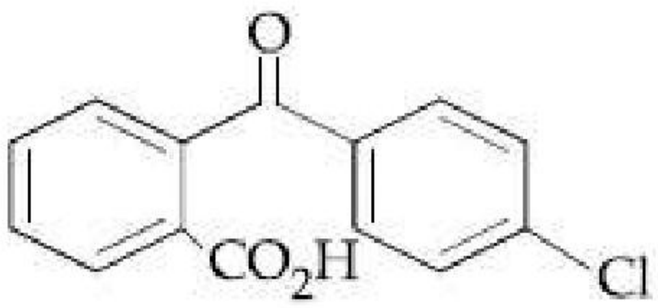
ZOLLEGE.in

નીચેની પ્રક્રિયાની મુખ્ય નીપજ :

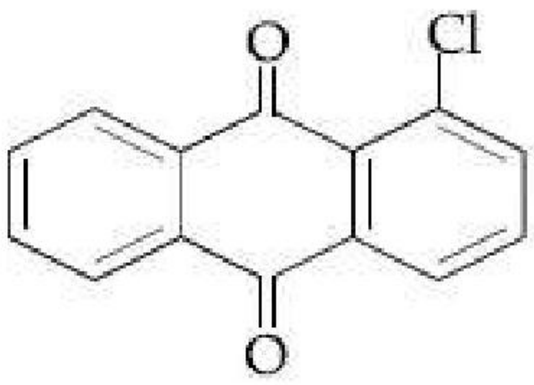


Options :

1. 

2. 

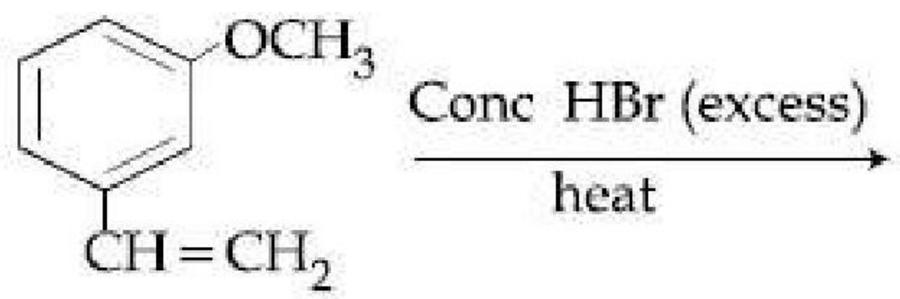
3.

4. 

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

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

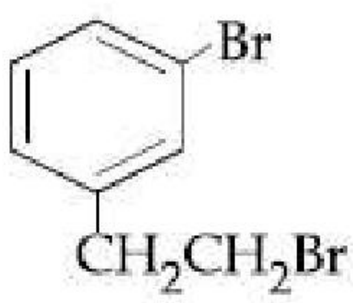


Options :

ZOLLEGE.in

1. 

2. 

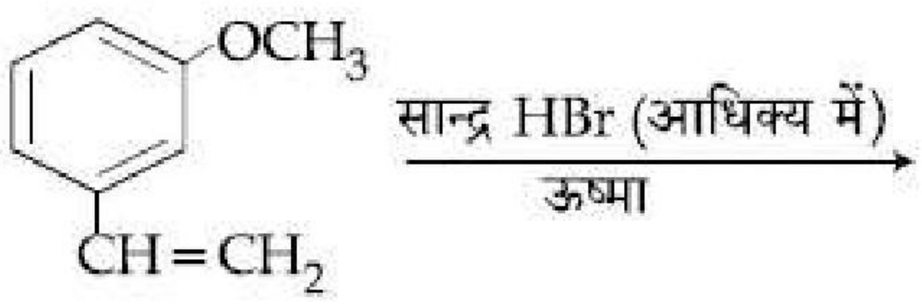
3. 

4. 

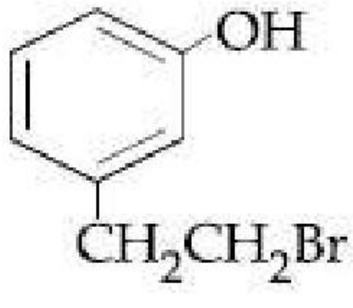
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :

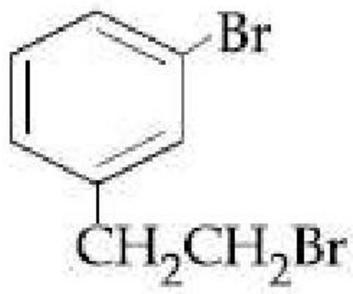


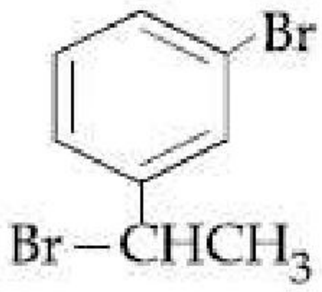
Options :

1. 

2. 

ZOLLEGE.in

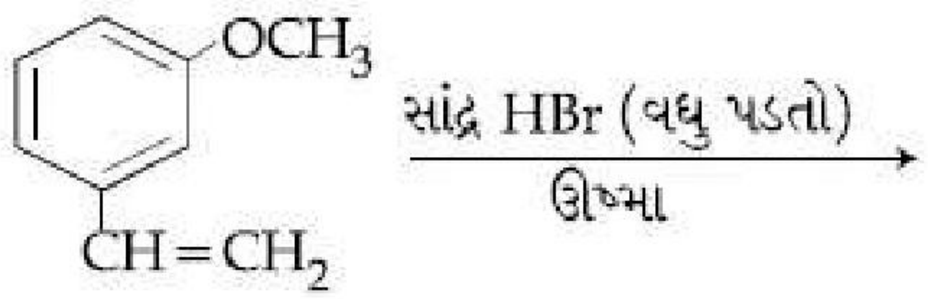
3. 

4. 

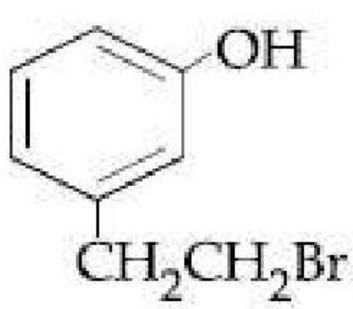
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

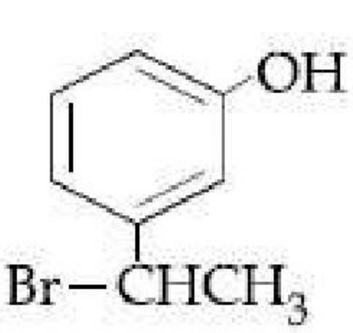
Correct Marks : 4 Wrong Marks : 1

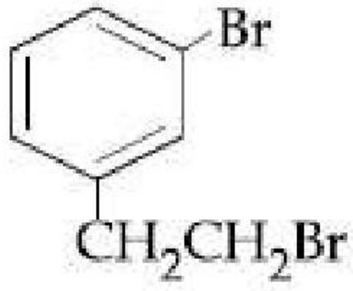
નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ છે :

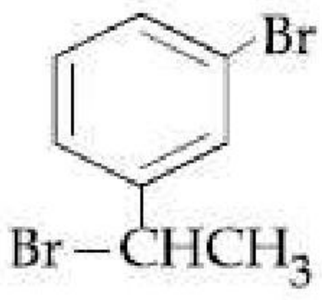


Options :

1. 

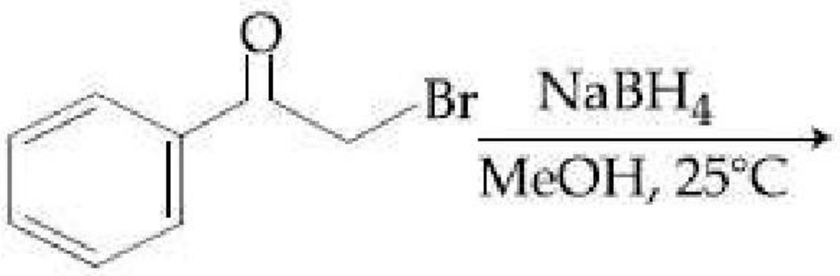
2. 

3. 

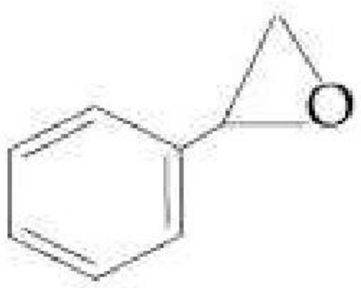
4. 

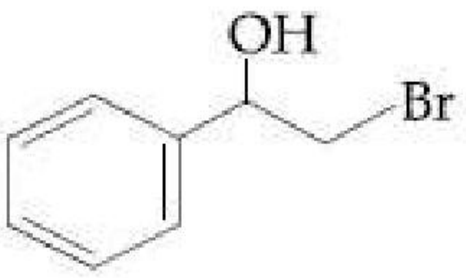
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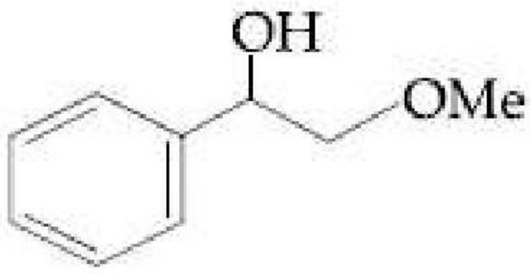
The major product of the following reaction is :

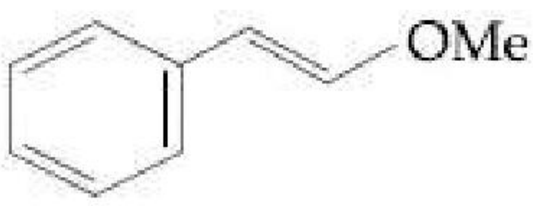


Options :

1. 

2. 

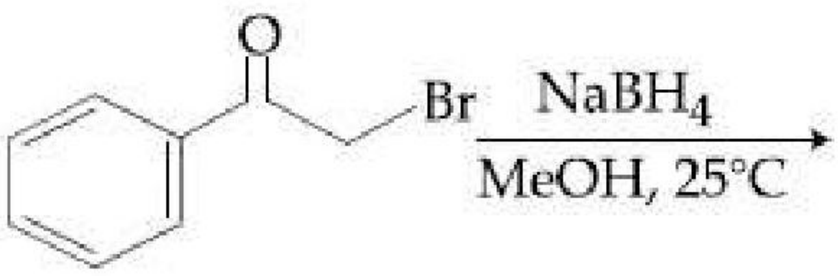
3. 

4. 

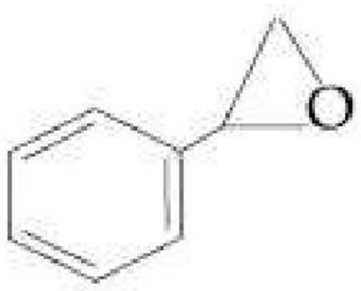
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

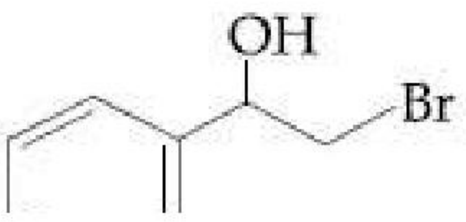
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :

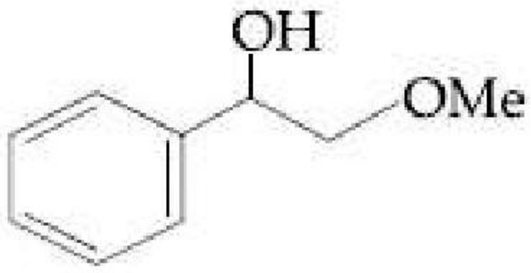


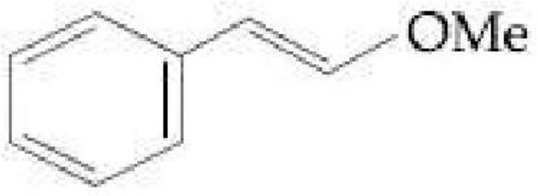
Options :

1. 



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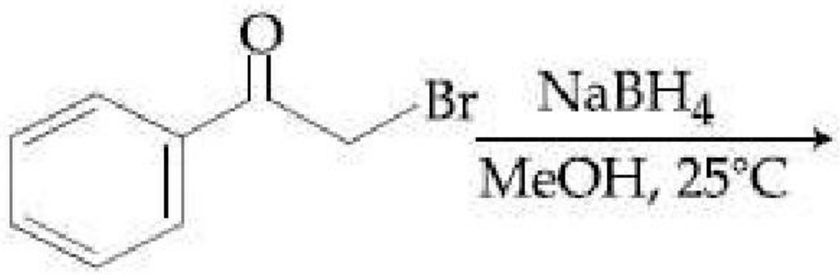
3. 

4. 

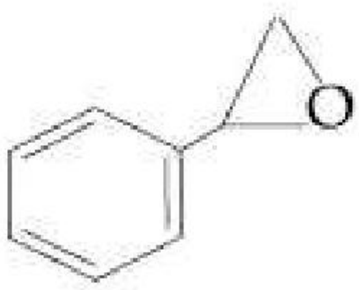
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

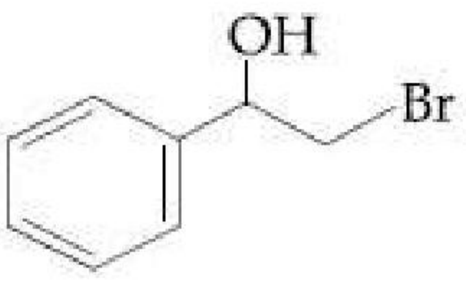
Correct Marks : 4 Wrong Marks : 1

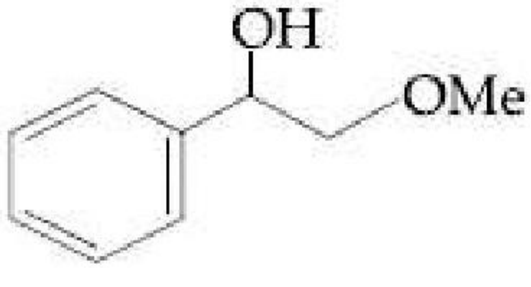
નીચેની પ્રક્રિયાની મુખ્ય નીપજ કઈ?

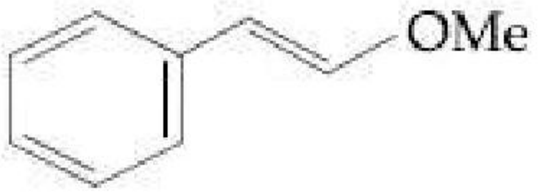


Options :

1. 

2. 

3. 

4. 

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

Correct Marks : 4 Wrong Marks : 1

Which of the following amines can be prepared by Gabriel phthalimide reaction ?

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1. neo-pentylamine

2. n-butylamine

3. t-butylamine

4. triethylamine

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

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सा ऐमीन गैब्रिएल थैलिमाइड अभिक्रिया द्वारा तैयार किया जा सकता है?

Options :

1. निओपेन्टिलऐमीन

2. n-ब्यूटिलऐमीन

3. t-ब्यूटिलऐमीन

4. ट्राईएथिलऐमीन

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

ગ્રેબિયલ થેલીમાઇડ પ્રક્રિયા દ્વારા નીચેના માંથી કયો એમાઇન બને છે?

Options :

1. નીઓ-પેન્ટાઈલએમાઈન

2. n-બ્યુટાઈલએમાઈન

3. t-બ્યુટાઈલએમાઈન

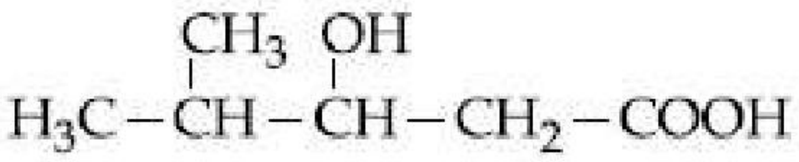
4. ટ્રાયઈથાઈલએમાઈન

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

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The IUPAC name of the following compound is :



Options :

1. 3-Hydroxy-4-methylpentanoic acid

2. 4-Methyl-3-hydroxypentanoic acid

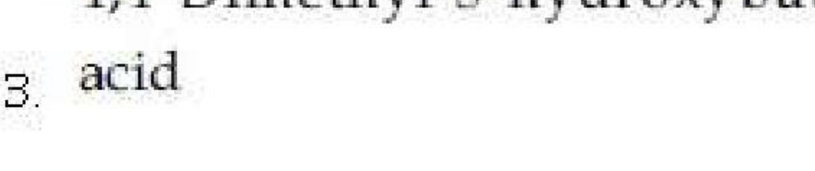
3. 4,4-Dimethyl-3-hydroxybutanoic acid

4. 2-Methyl-3-hydroxypentan-5-oic acid

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

निम्न यौगिक का आई.यू.पी.ए.सी. (IUPAC) नाम है :



Options :

1. 3-हाइड्राक्सी-4-मेथिलपेन्टानोइक एसिड

2. 4-मेथिल-3-हाइड्राक्सीपेन्टेनोइक एसिड

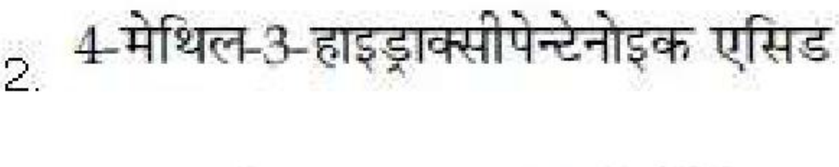
3. 4,4-डाइमेथिल-3-हाइड्राक्सीब्यूटेनोइक एसिड

4. 2-મેથિલ-3-હાઇડ્રાક્સીપેન્ટેન-5-ઓઇક એસિડ

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

નીચેના સંયોજનનું IUPAC નામ આપો.



Options :

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2. 4-મિથાઈલ-3-હાઈડ્રોક્સીપેન્ટાનોઈક એસિડ

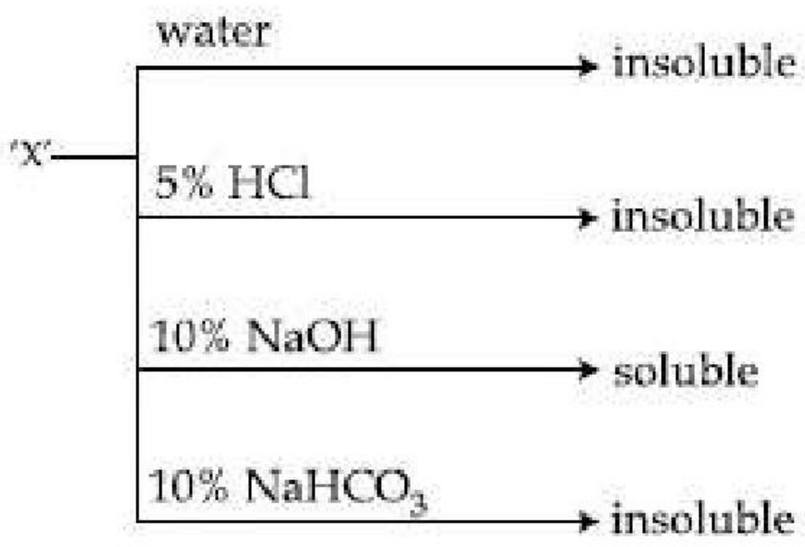
3. 4,4-ડાયમિથાઈલ -3- હાઈડ્રોક્સીબ્યુટાનોઈક એસિડ

4. 2-મિથાઈલ-3-હાઈડ્રોક્સીપેન્ટેન-5-ઓઈક એસિડ

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

An organic compound 'X' showing the following solubility profile is :



Options :

1. Oleic acid

2. m-Cresol

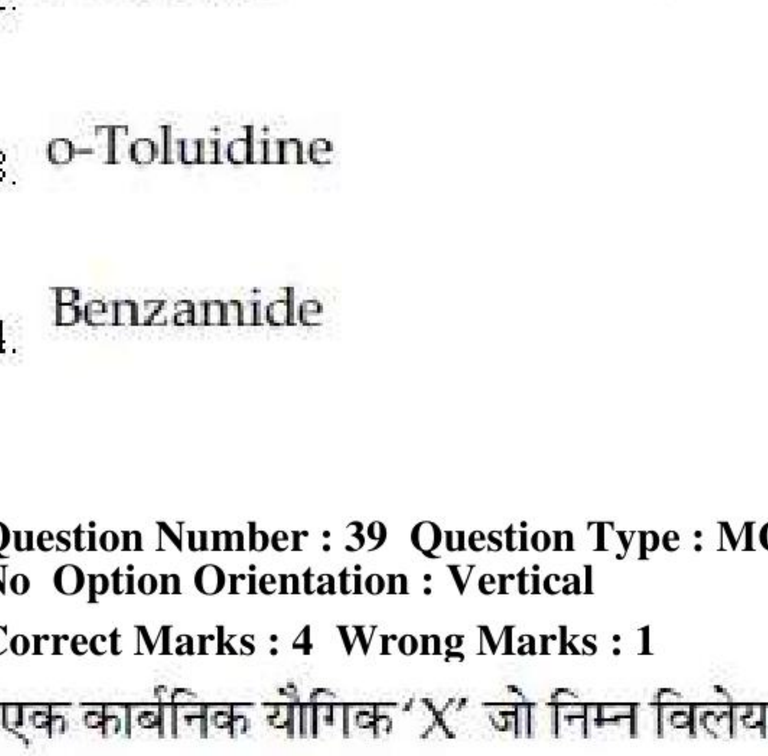
3. o-Toluidine

4. Benzamide

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

एक कार्बनिक यौगिक 'X' जो निम्न विलेयता की रूपरेखा प्रदर्शित करता है, होगा :



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2. m-क्रेसॉल

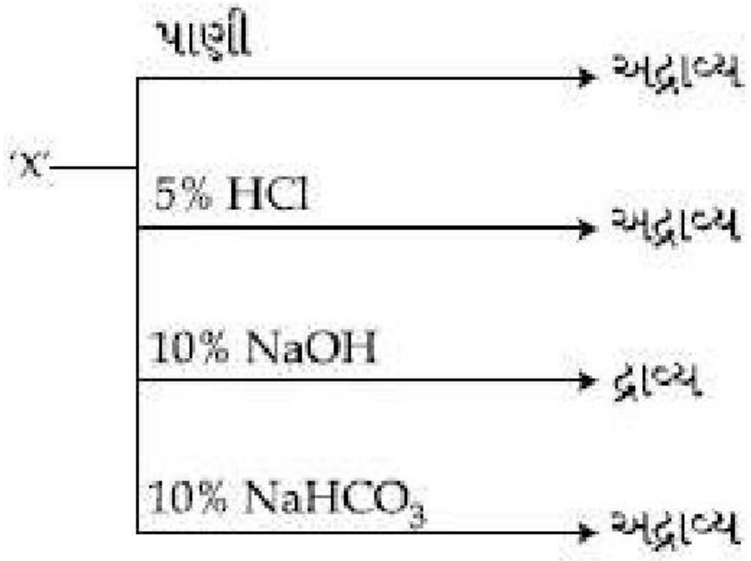
3. o-टालूडीन

4. बेंजामाइड

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

એક કાર્બનિક સંયોજન 'X' નીચે મુજબની દ્રાવ્યતા રૂપરેખા દર્શાવે છે. 'X' એ :



Options :

1. ઓલીક એસિડ

2. m-ક્રેસોલ

3. o-ટોલ્યૂડીન

4. બેન્ઝામાઈડ

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

In the following compounds, the decreasing order of basic strength will be :

Options :

1. $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

2. $NH_3 > C_2H_5NH_2 > (C_2H_5)_2NH$

3. $(C_2H_5)_2NH > NH_3 > C_2H_5NH_2$

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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

निम्नलिखित यौगिकों में, क्षारीय सामर्थ्य का घटता क्रम होगा :

Options :

1. $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

2. $NH_3 > C_2H_5NH_2 > (C_2H_5)_2NH$

3. $(C_2H_5)_2NH > NH_3 > C_2H_5NH_2$

4. $C_2H_5NH_2 > NH_3 > (C_2H_5)_2NH$

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

બેઝિક સામર્થ્યનો ઘટતો ક્રમ આપો :

Options :

1. $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

2. $NH_3 > C_2H_5NH_2 > (C_2H_5)_2NH$

3. $(C_2H_5)_2NH > NH_3 > C_2H_5NH_2$

4. $C_2H_5NH_2 > NH_3 > (C_2H_5)_2NH$

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

Correct Marks : 4 Wrong Marks : 1

The size of the iso-electronic species Cl^-, Ar and Ca^{2+} is affected by :

Options :

1. Principal quantum number of valence shell

2. nuclear charge

azimuthal quantum number of

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electron-electron interaction in the
4. outer orbitals

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

निम्न में से किसके द्वारा समइलेक्ट्रानी स्पीशीज़ Cl^-, Ar तथा Ca^{2+} का आकार प्रभावित होगा :

Options :

1. संयोजकता कोश की मुख्य क्वान्टम संख्या

2. नाभिकीय आवेश

3. संयोजकता कोश की एजीमूथल क्वान्टम संख्या

4. बाह्य कक्षकों में इलेक्ट्रान-इलेक्ट्रान अन्योन्यक्रिया

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

સમઈલેક્ટ્રોનીય સ્પીશીઝ Cl^-, Ar અને Ca^{2+} ના કદ પર શાના દ્વારા અસર થાય છે?

Options :

1. સંયોજકતા કોશના મુખ્ય ક્વૉન્ટમ આંક

2. ન્યૂક્લીયર ભાર

3. સંયોજકતા કક્ષકનો કોણીય વેગમાન ક્વૉન્ટમ આંક

4. બાહ્ય કક્ષામાં ઈલેક્ટ્રૉન-ઇલેક્ટ્રૉન ક્રિયા પ્રતિક્રિયા

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

With respect to an ore, Ellingham diagram helps to predict the feasibility of its

Options :

1. Thermal reduction

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3. Zone refining

4. Vapour phase refining

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

इलिंगम आरेख एक अयस्क के निम्न में से किसके होने की सम्भावना की प्रागुक्ति करने में हमारी मदद करता है ,

Options :

1. तापीय अपचयन

2. विद्युत अपघटन

3. जोन परिष्करण

4. वाष्प प्रावस्था परिष्करण

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

કાચી ધાતુને સંબંધિત એલીંગહામ રેખાકૃતિ (આકૃતિ) તેની કઈ શક્યતાની આગાહી કરવામાં મદદરૂપ છે?

Options :

1. ઊષ્મીય રિડક્શન

2. વિદ્યુત વિભાજ્ય

3. ઝોન શુદ્ધિકરણ

4. બાષ્પ અવસ્થા શુદ્ધિકરણ

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

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100 mL of a water sample contains 0.81 g of calcium bicarbonate and 0.73 g of magnesium bicarbonate. The hardness of this water sample expressed in terms of equivalents of $CaCO_3$ is :

(molar mass of calcium bicarbonate is 162 g mol^{-1} and magnesium bicarbonate is 146 g mol^{-1})

Options :

1. 1,000 ppm

2. 10,000 ppm

3. 100 ppm

4. 5,000 ppm

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

एक जल प्रतिदर्श के 100 mL में 0.81 g कैल्शियम बाइकार्बोनेट तथा 0.73 g मैग्नीशियम बाइकार्बोनेट हैं। इस जल प्रतिदर्श की कठोरता $CaCO_3$ के समतुल्य रूप में व्यक्त करने पर होगी :

(कैल्शियम बाइकार्बोनेट तथा मैग्नीशियम बाइकार्बोनेट के मोलर द्रव्यमान क्रमश: 162 g mol^{-1} तथा 146 g mol^{-1} हैं)

Options :

1. 1,000 ppm

2. 10,000 ppm

3. 100 ppm

4. 5,000 ppm

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

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100 mL પાણીના નમૂનામાં 0.81 g કૅલ્શિયમ બાયકાર્બોનેટ અને 0.73 g મેગ્નેશિયમ બાયકાર્બોનેટ ધરાવે છે. પાણીના આ નમૂનાની કઠિનતા $CaCO_3$ નાં ppm મા કેટલી ?

($CaCO_3$ નું મોલર દ્રળ 162 g mol^{-1} અને મેગ્નેશિયમ બાયકાર્બોનેટનું 146 g mol^{-1} છે.)

Options :

1. 1,000 ppm

2. 10,000 ppm

3. 100 ppm

4. 5,000 ppm

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 correct order of hydration enthalpies of alkali metal ions is :

Options :

1. $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$

2. $Li^+ > Na^+ > K^+ > Cs^+ > Rb^+$

3. $Na^+ > Li^+ > K^+ > Rb^+ > Cs^+$

4. $Na^+ > Li^+ > K^+ > Cs^+ > Rb^+$

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

क्षार धातु आयनों के जलयोजन एन्थैल्पी का सही क्रम है :

Options :

1. $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$

2. $Li^+ > Na^+ > K^+ > Cs^+ > Rb^+$

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4. $Na^+ > Li^+ > K^+ > Cs^+ > Rb^+$

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

આલ્કલી ધાતુ આયનોનો જલયોજન એન્થાપીઓનો સાચો ક્રમાંક છે :

Options :

1. $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$

2. $Li^+ > Na^+ > K^+ > Cs^+ > Rb^+$

3. $Na^+ > Li^+ > K^+ > Rb^+ > Cs^+$

4. $Na^+ > Li^+ > K^+ > Cs^+ > Rb^+$

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

Diborane (B_2H_6) reacts independently with O_2 and H_2O to produce, respectively :

Options :

1. H_3BO_3 and B_2O_3

2. HBO_2 and H_3BO_3

3. B_2O_3 and H_3BO_3

4. B_2O_3 and $[BH_4]^-$

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

डाइबोरेन (B_2H_6), O_2 तथा H_2O के साथ स्वतंत्र रूप से अभिक्रिया करके क्रमशः उत्पादित करती है :

Options :

1. H_3BO_3 तथा B_2O_3

2. HBO_2 तथा H_3BO_3

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3. B_2O_3 तथा H_3BO_3

4. B_2O_3 तथा $[BH_4]^-$

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

ડાયબોરેન (B_2H_6) અનુક્રમે O_2 અને H_2O સાથે સ્વતંત્ર રીતે પ્રક્રિયા કરી શું બનાવે?

Options :

1. H_3BO_3 અને B_2O_3

2. HBO_2 અને H_3BO_3

3. B_2O_3 અને H_3BO_3

4. B_2O_3 અને $[BH_4]^-$

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

Correct Marks : 4 Wrong Marks : 1

The lanthanide ion that would show colour is :

Options :

1. Gd^{3+}

2. Sm^{3+}

3. La^{3+}

4. Lu^{3+}

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

वह लैन्थनायड आयन जो रंग प्रदर्शित करेगा, है :

Options :

1. Gd^{3+}

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2. Sm^{3+}

3. La^{3+}

4. Lu^{3+}

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

લેન્થેનાઈડ આયન કે જે રંગ દર્શાવે છે તે :

Options :

1. Gd^{3+}

2. Sm^{3+}

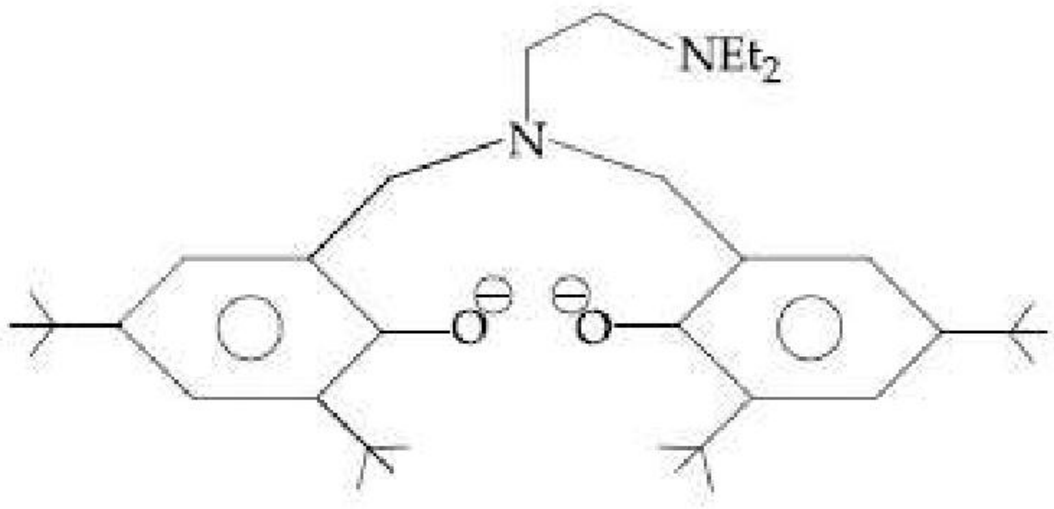
3. La^{3+}

4. Lu^{3+}

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 following ligand is :



Options :

1. bidentate

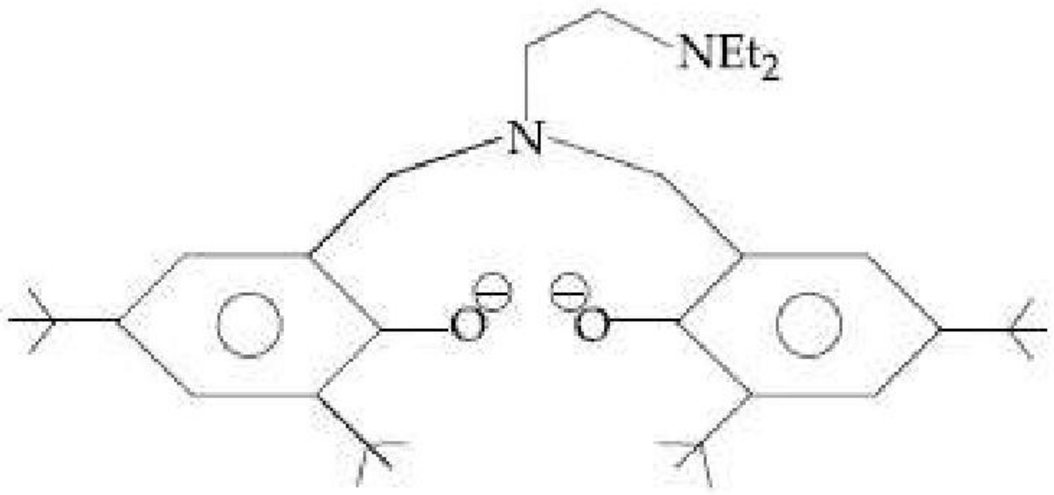
2. tridentate

3. tetradentate

4. hexadentate

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निम्नलिखित संलग्नी है :



Options :

1. द्वि-दंतुर

2. त्रि-दंतुर

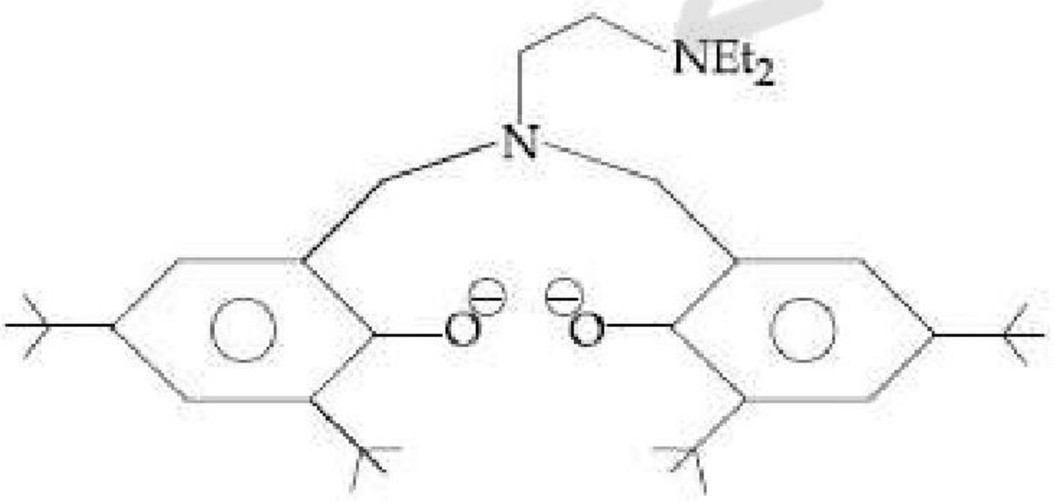
3. चतुरदंतुर

4. षट्-दंतुर

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

નીચે આપેલું લીગાન્ડ છે :



Options :

1. દ્વિદંતીય

2. ત્રિદંતીય

3. ચતુષ્દંતીય

4. ષષ્ટદંતીય

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

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The correct order of the spin-only magnetic moment of metal ions in the following low-spin complexes, $[V(CN)_6]^{4-}$, $[Fe(CN)_6]^{4-}$, $[Ru(NH_3)_6]^{3+}$, and $[Cr(NH_3)_6]^{2+}$, is :

Options :

1. $V^{2+} > Cr^{2+} > Ru^{3+} > Fe^{2+}$

2. $V^{2+} > Ru^{3+} > Cr^{2+} > Fe^{2+}$

3. $Cr^{2+} > Ru^{3+} > Fe^{2+} > V^{2+}$

4. $Cr^{2+} > V^{2+} > Ru^{3+} > Fe^{2+}$

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

दिये गये निम्न-प्रचक्रण संकरों $[V(CN)_6]^{4-}$, $[Fe(CN)_6]^{4-}$, $[Ru(NH_3)_6]^{3+}$ तथा $[Cr(NH_3)_6]^{2+}$ में धातु आयनों के प्रचक्रण मात्र चुम्बकीय आघूर्णों का सही क्रम है :

Options :

1. $V^{2+} > Cr^{2+} > Ru^{3+} > Fe^{2+}$

2. $V^{2+} > Ru^{3+} > Cr^{2+} > Fe^{2+}$

3. $Cr^{2+} > Ru^{3+} > Fe^{2+} > V^{2+}$

4. $Cr^{2+} > V^{2+} > Ru^{3+} > Fe^{2+}$

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

નીચા સ્પીન ધરાવતા સંકીર્ણો $[V(CN)_6]^{4-}$, $[Fe(CN)_6]^{4-}$, $[Ru(NH_3)_6]^{3+}$ અને $[Cr(NH_3)_6]^{2+}$ ને ધ્યાનમાં લો. તેઓમા ધાતુ આયનોનો ફક્ત સ્પીન ચુંબકીય ચાકમાત્રાનો સાચો ક્રમાંક છે :

Options :

1. $V^{2+} > Cr^{2+} > Ru^{3+} > Fe^{2+}$

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3. $Cr^{2+} > Ru^{3+} > Fe^{2+} > V^{2+}$

4. $Cr^{2+} > V^{2+} > Ru^{3+} > Fe^{2+}$

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

Which is wrong with respect to our responsibility as a human being to protect our environment ?

Options :

1. Setting up compost tin in gardens.

2. Using plastic bags.

3. Restricting the use of vehicles

4. Avoiding the use of floodlighted facilities.

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

मनुष्यता के नाते हमारे पर्यावरण के संरक्षण के लिए हमारी जिम्मेदारियों के संदर्भ में क्या **गलत** है?

Options :

1. बगीचों में कम्पोस्ट टिन लगाना

2. प्लास्टिक बैगों का प्रयोग करना

3. वाहनों के प्रयोग पर प्रतिबन्ध लगाना

4. पूर-प्रदीप्ति सुविधाओं के प्रयोग से बचाव रखना

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

મનુષ્ય તરીકે પર્યાવરણનું રક્ષણ કરવાની આપણી જવાબદારીના સંદર્ભમા ક્યું ખોટું છે?

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1. બગીચાઓમાં ખાતરના ડબ્બા ગોઠવવા

2. પ્લાસ્ટિક થેલીઓનો વપરાશ

3. વાહનોનો નિયંત્રિત ઉપયોગ

4. તીવ્ર પ્રકાશિત (floodlighted) સુવિધાઓનો ઉપયોગ ટાળવો.

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

Assertion : Ozone is destroyed by CFCs in the upper stratosphere.

Reason : Ozone holes increase the amount of UV radiation reaching the earth.

Options :

1. Assertion and reason are correct, but the reason is not the explanation for the assertion.

2. Assertion is false, but the reason is correct.

3. Assertion and reason are both correct, and the reason is the correct explanation for the assertion.

4. Assertion and reason are incorrect.

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

कथन : स्ट्रेटोस्फीयर के ऊपरी भाग में CFCs द्वारा ओज़ोन का विनाश होता है।

कारण : ओज़ोनपरत छिद्रों से पृथ्वी पर पहुँचने वाले UV विकिरणों की मात्रा बढ़ती है।

Options :

कथन तथा कारण सही हैं परन्तु कारण, कथन

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2. કથન ગલત છે પરન્તુ કારણ સહી છે।

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

4. કથન તથા કારણ દોનોં ગલત હૈં।

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

અભિધારણા : ઉપરના સમતાપી આવરણમાં CFCs દ્વારા ઓઝોન નાશ પામે છે.

કારણ : ઓઝોનના ગાબડાં પારજાંબલી વિકિરણના જથ્થાને પૃથ્વી સુધી પહોંચાડવામા વધારો કરે છે.

Options :

1. અભિધારણા અને કારણ સાચા છે, પરંતુ કારણએ અભિધારણાની સમજુતી નથી.

2. અભિધારણા ખોટી છે, પરંતુ કારણ સાચું છે.

3. અભિધારણા અને કારણ બંને સાચા છે અને કારણ એ અભિધારણા માટેની સાચી સમજૂતી છે.

4. અભિધારણા અને કારણ બંને સાચા નથી.

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

In order to oxidise a mixture of one mole of each of FeC_2O_4, $Fe_2(C_2O_4)_3$, $FeSO_4$ and $Fe_2(SO_4)_3$ in acidic medium, the number of moles of $KMnO_4$ required is :

Options :

1. 1

2. 1.5

3. 2

4. 3

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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

अम्लीय माध्यम में, FeC_2O_4, $Fe_2(C_2O_4)_3$, $FeSO_4$ तथा $Fe_2(SO_4)_3$ प्रत्येक के एक मोल मिश्रण को उपचयित करने के लिए आवश्यक $KMnO_4$ के मोलों की संख्या होगी :

Options :

1. 1

2. 1.5

3. 2

4. 3

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

એસિડિક માધ્યમમાં, FeC_2O_4, $Fe_2(C_2O_4)_3$, $FeSO_4$ અને $Fe_2(SO_4)_3$ દરેકના 1 મોલ મિશ્રણનું ઓક્સીડેશન કરવા માટે જરૂરી $KMnO_4$ ના મોલ કેટલા?

Options :

1. 1

2. 1.5

3. 2

4. 3

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

Element 'B' forms ccp structure and 'A' occupies half of the octahedral voids, while oxygen atoms occupy all the tetrahedral voids. The structure of bimetallic oxide is :

Options :

1. A_2BO_4

2. AB_2O_4

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3. A_4B_2O

4. A_2B_2O

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

तत्व 'B', ccp संरचना बनाता है तथा 'A' अष्टफलकीय रिक्तियों के आधे में उपस्थित है। जबकि ऑक्सीजन परमाणु सभी चतुष्फलकीय रिक्तियों में उपस्थित है। द्विधात्विक ऑक्साइड की संरचना है :

Options :

1. A_2BO_4

2. AB_2O_4

3. A_4B_2O

4. A_2B_2O

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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

તત્વ 'B' ccp બંધારણ બનાવે છે અને 'A' અડધા અષ્ટફલીય છિદ્રોને રોકે છે જ્યારે ઑક્સિજનના પરમાણુઓ તમામ ચતુષ્ફલકીય છિદ્રોને રોકે છે તો દ્વિધાત્વીય ઓક્સાઈડનું બંધારણ શોધો?

Options :

1. A_2BO_4

2. AB_2O_4

3. A_4B_2O

4. A_2B_2O

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

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The quantum number of four electrons are given below :

I. $n=4, l=2, m_l=-2, m_s=-½$

II. $n=3, l=2, m_l=1, m_s=+½$

III. $n=4, l=1, m_l=0, m_s=+½$

IV. $n=3, l=1, m_l=1, m_s=-½$

The correct order of their increasing energies will be :

Options :

1. I < II < III < IV

2. I < III < II < IV

3. IV < III < II < I

4. IV < II < III < I

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

चार इलेक्ट्रॉनों की क्वान्टम संख्यायें नीचे दी गई हैं :

I. $n=4, l=2, m_l=-2, m_s=-½$

II. $n=3, l=2, m_l=1, m_s=+½$

III. $n=4, l=1, m_l=0, m_s=+½$

IV. $n=3, l=1, m_l=1, m_s=-½$

इनकी बढ़ती ऊर्जाओं का सही क्रम होगा :

Options :

1. I < II < III < IV

2. I < III < II < IV

3. IV < III < II < I

4. IV < II < III < I

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

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નીચે ચાર ઈલેક્ટ્રોનના ક્વૉન્ટમ આંક આપેલા છે :

I. $n=4, l=2, m_l=-2, m_s=-½$

II. $n=3, l=2, m_l=1, m_s=+½$

III. $n=4, l=1, m_l=0, m_s=+½$

IV. $n=3, l=1, m_l=1, m_s=-½$

તેમની શક્તિનો સાચો ચઢતો ક્રમ આપો.

Options :

1. I < II < III < IV

2. I < III < II < IV

3. IV < III < II < I

4. IV < II < III < I

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

For silver, $C_p(J\,K^{-1}\,mol^{-1})=23+0.01T$. If the temperature (T) of 3 moles of silver is raised from 300 K to 1000 K at 1 atm pressure, the value of ΔH will be close to :

Options :

1. 13 kJ

2. 21 kJ

3. 16 kJ

4. 62 kJ

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

सिल्वर के लिए, $C_p(J\,K^{-1}\,mol^{-1})=23+0.01T$.
यदि 1 atm दाब पर सिल्वर के 3 मोल का ताप (T) 300 K से बढ़कर 1000 K हो जाय तो ΔH का मान किसके नजदीक होगा ?

Options :

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2. 21 kJ

3. 16 kJ

4. 62 kJ

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

સીલ્વર માટે, $C_p(J\,K^{-1}\,mol^{-1}) = 23 + 0.01T$ છે. 1 વાતાવરણ દબાણે, જો સીલ્વરનાં 3 મોલનું તાપમાન (T) 300 K થી 1000 K સુધી વધારવામાં આવે તો, ΔH ની કિંમત નીચેનામાંથી કોની નજીક છે?

Options :

1. 13 kJ

2. 21 kJ

3. 16 kJ

4. 62 kJ

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

Which one of the following equations does not correctly represent the first law of thermodynamics for the given processes involving an ideal gas ? (Assume non-expansion work is zero)

Options :

1. Isothermal process : $q = -w$

2. Cyclic process : $q = -w$

3. Isochoric process : $\Delta U = q$

4. Adiabatic process : $\Delta U = -w$

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निम्न में से कौन सा समीकरण थर्मोडायनामिक्स के प्रथम सिद्धान्त को दिये गये प्रक्रमों के लिए, जिसमें आदर्श गैस है, सही रूप में प्रस्तुत **नहीं** करता है (मान लें कि अप्रसारण कार्य शून्य है)

Options :

1. समतापी प्रक्रम : $q = -w$

2. चक्रीय प्रक्रम : $q = -w$

3. समायतनिक प्रक्रम : $\Delta U = q$

4. रुद्धोष्म प्रक्रम : $\Delta U = -w$

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

આપેલી આદર્શ વાયુને સંડોવતા પ્રક્રમ માટે નીચેના માંથી કયુ સમીકરણ ઉષ્મા ગતિશાસ્ત્રના પહેલા નિયમનું સાચું નિરૂપણ નથી કરતું? બિનવિસ્તરણ કાર્ય શૂન્ય છે.

Options :

1. સમતાપી પ્રક્રમ : $q = -w$

2. ચક્રિય પ્રક્રમ : $q = -w$

3. સમકદીય પ્રક્રમ : $\Delta U = q$

4. સમોષ્મી પ્રક્રમ : $\Delta U = -w$

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

The vapour pressures of pure liquids A and B are 400 and 600 mmHg, respectively at 298 K. On mixing the two liquids, the sum of their initial volumes is equal to the volume of the final mixture. The mole fraction of liquid B is 0.5 in the mixture. The vapour pressure of the final solution, the mole fractions of components A and B in

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1. 500 mmHg, 0.4, 0.6

2. 450 mmHg, 0.5, 0.5

3. 500 mmHg, 0.5, 0.5

4. 450 mmHg, 0.4, 0.6

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

298 K पर शुद्ध द्रव A तथा B के वाष्प दाब क्रमश: 400 तथा 600 mmHg हैं। दोनों द्रवों को मिलाने पर उनके प्रारम्भिक आयतनों का योग उनके अंतिम मिश्रण के आयतन के बराबर है। मिश्रण में द्रव B का मोल अणु अंश 0.5 है। अंतिम विलयन का वाष्प दाब एवं A तथा B अवयवों का वाष्प प्रावस्था में मोल अणु अंश क्रमश: होंगे :

Options :

1. 500 mmHg, 0.4, 0.6

2. 450 mmHg, 0.5, 0.5

3. 500 mmHg, 0.5, 0.5

4. 450 mmHg, 0.4, 0.6

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

298 K એ, પ્રવાહો A અને B ના બાષ્પ દબાણો અનુક્રમે 400 અને 600 mmHg છે. આ બે પ્રવાહીને ભેગા કરતા તેમના શરૂઆતના કદનો સરવાળો મિશ્રણના અંતિમ કદ કેટલો થાય છે. મિશ્રણમાં, પ્રવાહી B ના મોલ અંશ 0.5 છે. તો પરિણામી દ્રાવણનું બાષ્પદબાણ અને બાષ્પઅવસ્થામાં ઘટક A અને B ના મોલઅંશ અનુક્રમે :

Options :

1. 500 mmHg, 0.4, 0.6

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3. 500 mmHg, 0.5, 0.5

4. 450 mmHg, 0.4, 0.6

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

If solubility product of $Zr_3(PO_4)_4$ is denoted by K_{sp} and its molar solubility is denoted by S, then which of the following relation between S and K_{sp} is correct ?

Options :

1. $S = \left(\frac{K_{sp}}{144}\right)^{1/6}$

2. $S = \left(\frac{K_{sp}}{929}\right)^{1/9}$

3. $S = \left(\frac{K_{sp}}{6912}\right)^{1/7}$

4. $S = \left(\frac{K_{sp}}{216}\right)^{1/7}$

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

यदि $Zr_3(PO_4)_4$ के विलेयता गुणनफल को K_{sp} द्वारा तथा इसकी मोलर विलेयता को S द्वारा अभिव्यक्त करते हों तो S तथा K_{sp} के बीच **सही** सम्बन्ध है :

Options :

1. $S = \left(\frac{K_{sp}}{144}\right)^{1/6}$

2. $S = \left(\frac{K_{sp}}{929}\right)^{1/9}$

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3. $S = \left(\frac{K_{sp}}{6912}\right)^{1/7}$

4. $S = \left(\frac{K_{sp}}{216}\right)^{1/7}$

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

$Zr_3(PO_4)_4$ ના દ્રાવ્યતા ગુણાકારને K_{sp} વડે સુચિત કરેલ છે અને તેની મોલર દ્રાવ્યતાને S વડે સૂચિત કરેલ છે, તો નીચેના માંથી S અને K_{sp} વચ્ચેનો કયો સંબંધ સાચો?

Options :

1. $S = \left(\frac{K_{sp}}{144}\right)^{1/6}$

2. $S = \left(\frac{K_{sp}}{929}\right)^{1/9}$

3. $S = \left(\frac{K_{sp}}{6912}\right)^{1/7}$

4. $S = \left(\frac{K_{sp}}{216}\right)^{1/7}$

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

Given that $E^{\ominus}_{O_2/H_2O} = +1.23$ V;

$E^{\ominus}_{S_2O_8^{2-}/SO_4^{2-}} = 2.05$ V

$E^{\ominus}_{Br_2/Br^-} = +1.09$ V;

$E^{\ominus}_{Au^{3+}/Au} = +1.4$ V

The strongest oxidizing agent is :

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1. $S_2O_8^{2-}$

2. Au^{3+}

3. Br_2

4. O_2

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

Correct Marks : 4 Wrong Marks : 1

दिया गया है, $E^{\ominus}_{O_2/H_2O} = +1.23\ V;$

$E^{\ominus}_{S_2O_8^{2-}/SO_4^{2-}} = 2.05\ V$

$E^{\ominus}_{Br_2/Br^-} = +1.09\ V;$

$E^{\ominus}_{Au^{3+}/Au} = +1.4\ V$

प्रबलतम उपचायक है :

Options :

1. $S_2O_8^{2-}$

2. Au^{3+}

3. Br_2

4. O_2

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

Correct Marks : 4 Wrong Marks : 1

$E^{\ominus}_{O_2/H_2O} = +1.23\ V;$

$E^{\ominus}_{S_2O_8^{2-}/SO_4^{2-}} = 2.05\ V$

$E^{\ominus}_{Br_2/Br^-} = +1.09\ V;$

$E^{\ominus}_{Au^{3+}/Au} = +1.4\ V$ આપેલ છે. સૌથી પ્રબળ ઓક્સીડેશનકર્તા પ્રક્રિયક કયો?

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1. $S_2O_8^{2-}$

2. Au^{3+}

3. Br_2

4. O_2

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

For the reaction $2A + B \rightarrow C$, the values of initial rate at different reactant concentrations are given in the table below. The rate law for the reaction is :

[A] (mol L^{-1})	[B] (mol L^{-1})	Initial Rate (mol $L^{-1}s^{-1}$)
0.05	0.05	0.045
0.10	0.05	0.090
0.20	0.10	0.72

Options :

1. $Rate = k[A][B]$

2. $Rate = k[A]^2[B]$

3. $Rate = k[A][B]^2$

4. $Rate = k[A]^2[B]^2$

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

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अभिक्रिया $2A + B \rightarrow C$ के लिये, अभिकारकों की विभिन्न सान्द्रताओं पर प्रारम्भिक दर के मान नीचे दी गई तालिका में दिये गये हैं। अभिक्रिया के लिए दर नियम होगा :

[A] (mol L^{-1})	[B] (mol L^{-1})	प्रारम्भिक दर (mol $L^{-1}s^{-1}$)
0.05	0.05	0.045
0.10	0.05	0.090
0.20	0.10	0.72

Options :

1. दर $= k[A][B]$

2. दर $= k[A]^2[B]$

3. दर $= k[A][B]^2$

4. दर $= k[A]^2[B]^2$

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

આપેલી પ્રક્રિયા $2A + B \rightarrow C$ માટે, નીચેના ટેબલમાં પ્રક્રિયકની જૂદી-જૂદી સાંદ્રતા માટે પ્રારંભિક દરની કિંમતો આપેલી છે. પ્રક્રિયા માટે વેગનો નિયમ છે.

[A] (mol L^{-1})	[B] (mol L^{-1})	શરૂઆતની દર (mol $L^{-1}s^{-1}$)
0.05	0.05	0.045
0.10	0.05	0.090
0.20	0.10	0.72

Options :

1. વેગ $= k[A][B]$

2. વેગ $= k[A]^2[B]$

3. વેગ $= k[A][B]^2$

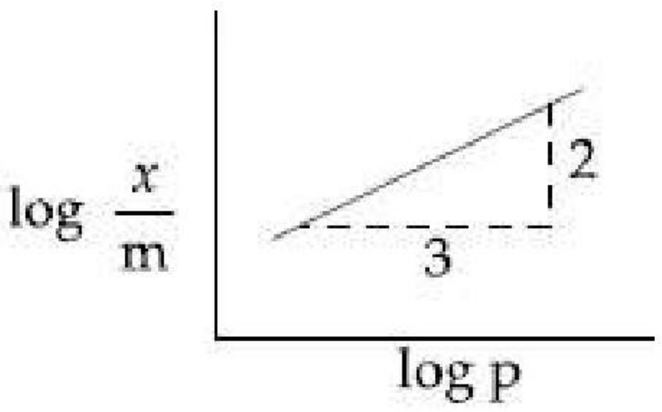
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Question Number : 60 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Adsorption of a gas follows Freundlich adsorption isotherm. x is the mass of the gas adsorbed on mass m of the adsorbent.

The plot of $\log \frac{x}{m}$ versus log p is shown in the given graph. $\frac{x}{m}$ is proportional to :



Options :

1. P^2

2. $P^{3/2}$

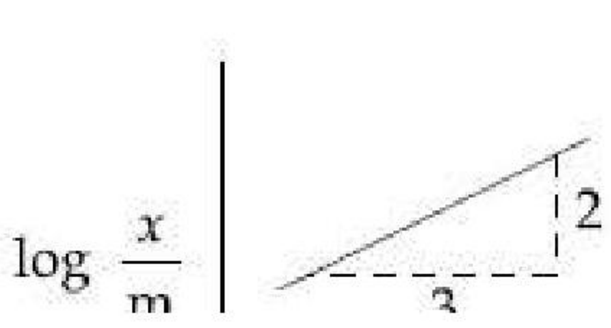
3. $P^{2/3}$

4. P^3

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

एक गैस का अधिशोषण, फ्रायन्डलिक अधिशोषण समताप का पालन करता है। अधिशोषक के m द्रव्यमान पर अधिशोषित गैस का द्रव्यमान x है। $\log \frac{x}{m}$ के विरुद्ध log p का प्लाट दिये गये ग्राफ में दर्शाया गया है। $\frac{x}{m}$ जिसके अनुपातिक है, वह है :



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Options :

1. P^2

2. $P^{3/2}$

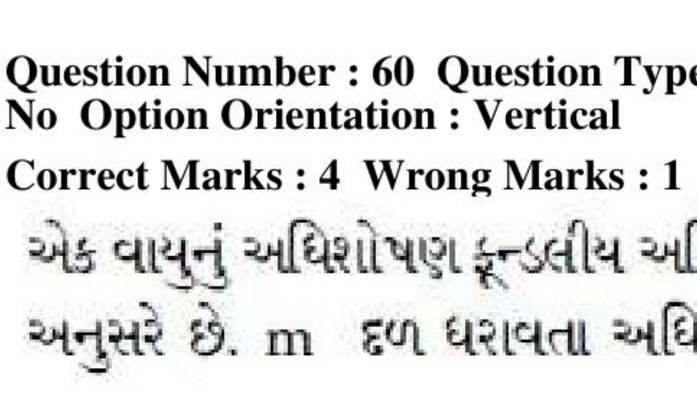
3. $P^{2/3}$

4. P^3

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

એક વાયુનું અધિશોષણ ફ્રૂન્ડલીય અધિશોષણ સમતાપીને અનુસરે છે. m દળ ધરાવતા અધિશોષણ પર x દળ ધરાવતા વાયુનું અધિશોષણ થાય છે. $\log\frac{x}{m}$ વિરુદ્ધ $\log p$ નો આલેખ નીચે દર્શાવેલ છે. $\frac{x}{m}$ એ શાને ચલે છે :



Options :

1. P^2

2. $P^{3/2}$

3. $P^{2/3}$

4. P^3

Mathematics

Section Id : 416529255

Section Number : 3

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Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529395
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

If $f(x) = \log_e\left(\frac{1-x}{1+x}\right), |x| < 1$, then

$f\left(\frac{2x}{1+x^2}\right)$ is equal to :

Options :

1. $2f(x^2)$

2. $-2f(x)$

3. $2f(x)$

4. $(f(x))^2$

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

यदि $f(x) = \log_e\left(\frac{1-x}{1+x}\right), |x| < 1$ है, तो

$f\left(\frac{2x}{1+x^2}\right)$ बराबर है :

Options :

1. $2f(x^2)$

2. $-2f(x)$

3. $2f(x)$

4. $(f(x))^2$

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જો $f(x) = \log_e\left(\frac{1-x}{1+x}\right)$, $|x| < 1$, તો

$f\left(\frac{2x}{1+x^2}\right) =$ _____.

Options :

1. $2f(x^2)$

2. $-2f(x)$

3. $2f(x)$

4. $(f(x))^2$

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

Correct Marks : 4 Wrong Marks : 1

If α and β be the roots of the equation $x^2-2x+2=0$, then the least value of n for which $\left(\frac{\alpha}{\beta}\right)^n = 1$ is :

Options :

1. 5

2. 4

3. 3

4. 2

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

Correct Marks : 4 Wrong Marks : 1

यदि समीकरण $x^2-2x+2=0$ के मूल α तथा β हैं,

तो n का न्यूनतम मान, जिसके लिए $\left(\frac{\alpha}{\beta}\right)^n = 1$ है,

है :

Options :

1. 5

2. 4

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3. 3

4. 2

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

Correct Marks : 4 Wrong Marks : 1

જો α અને β સમીકરણ $x^2-2x+2=0$ નાં બીજ

હોય, તો $\left(\frac{\alpha}{\beta}\right)^n=1$ થાય, તે માટે n ની ન્યૂનતમ કિંમત

_____ છે.

Options :

1. 5

2. 4

3. 3

4. 2

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

Correct Marks : 4 Wrong Marks : 1

The sum of the solutions of the equation

$|\sqrt{x}-2|+\sqrt{x}(\sqrt{x}-4)+2=0,\ (x>0)$

is equal to :

Options :

1. 4

2. 9

3. 10

4. 12

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

समीकरण

$|\sqrt{x}-2|+\sqrt{x}(\sqrt{x}-4)+2=0,\ (x>0)$

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1. 4

2. 9

3. 10

4. 12

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

સમીકરણ

$|\sqrt{x} - 2| + \sqrt{x}(\sqrt{x} - 4) + 2 = 0, \ (x > 0)$

ના ઉકેલોનો સરવાળો _____ છે.

Options :

1. 4

2. 9

3. 10

4. 12

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

Correct Marks : 4 Wrong Marks : 1

Let $A = \begin{pmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{pmatrix}, (\alpha \in R)$ such that

$A^{32} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$. Then a value of α is :

Options :

1. 0

2. $\frac{\pi}{64}$

3. $\frac{\pi}{32}$

4. $\frac{\pi}{16}$

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

माना $A = \begin{pmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{pmatrix}$, $(\alpha \in \mathbf{R})$ इस प्रकार

है कि $A^{32} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$, तो α का एक मान है :

Options :

1. 0
2. $\frac{\pi}{64}$
3. $\frac{\pi}{32}$
4. $\frac{\pi}{16}$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $A = \begin{pmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{pmatrix}$, $(\alpha \in \mathbf{R})$ કે જેથી

$A^{32} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$. તો α ની એક કિંમત

_____ છે.

Options :

1. 0
2. $\frac{\pi}{64}$
3. $\frac{\pi}{32}$
4. $\frac{\pi}{16}$

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

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The greatest value of $c \in \mathbf{R}$ for which the system of linear equations

$x - cy - cz = 0$

$cx - y + cz = 0$

$cx + cy - z = 0$

has a non-trivial solution, is :

Options :

1. -1

2. 0

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

4. 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

$c \in \mathbf{R}$ का अधिकतम मान, जिसके लिए रैखिक समीकरण निकाय

$x - cy - cz = 0$

$cx - y + cz = 0$

$cx + cy - z = 0$

का एक अतुच्छ हल है, है :

Options :

1. -1

2. 0

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

4. 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

સુરેખ સમીકરણ સંહતિ

$x - cy - cz = 0$

$cx - y + cz = 0$

$cx + cy - z = 0$

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Options :

1. -1

2. 0

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

4. 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

All possible numbers are formed using the digits 1, 1, 2, 2, 2, 2, 3, 4, 4 taken all at a time. The number of such numbers in which the odd digits occupy even places is :

Options :

1. 160

2. 162

3. 175

4. 180

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

सभी अंकों 1, 1, 2, 2, 2, 2, 3, 4, 4 को एक साथ लेकर सभी संभव संख्यायें बनाई गई हैं। इस प्रकार की संख्याओं, जिनमें विषम अंक सम स्थानों पर हैं, की संख्या है :

Options :

1. 160

2. 162

3. 175

4. 180

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Correct Marks : 4 Wrong Marks : 1

1, 1, 2, 2, 2, 2, 3, 4, 4 અંકોનો એક સાથે ઉપયોગ કરી શકય તેટલી તમામ સંખ્યાઓ બનાવવામાં આવે છે. તો એકી અંકો બેકી સ્થાન પર હોય તેવી કેટલી સંખ્યાઓ મળે?

Options :

1. 160

2. 162

3. 175

4. 180

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

The sum of the co-efficients of all even degree terms in x in the expansion of

$\left(x+\sqrt{x^3-1}\right)^6+\left(x-\sqrt{x^3-1}\right)^6, (x>1)$

is equal to :

Options :

1. 24

2. 26

3. 29

4. 32

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

Correct Marks : 4 Wrong Marks : 1

$\left(x+\sqrt{x^3-1}\right)^6+\left(x-\sqrt{x^3-1}\right)^6, (x>1)$

के प्रसार में x के सभी समघातीय पदों के गुणांकों का योग बराबर है :

Options :

1. 24

2. 26

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4. 32

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

Correct Marks : 4 Wrong Marks : 1

$\left(x+\sqrt{x^3-1}\right)^6+\left(x-\sqrt{x^3-1}\right)^6,\ (x>1)$

ના વિસ્તરણમાં, x ની બેકી ઘાતવાળા તમામ પદોના સહગુણકોનો સરવાળો _____ છે.

Options :

1. 24

2. 26

3. 29

4. 32

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

The sum of all natural numbers 'n' such that $100 < n < 200$ and H.C.F. $(91, n) > 1$ is :

Options :

1. 3203

2. 3221

3. 3121

4. 3303

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

ऐसी सभी प्राकृत संख्याओं 'n', जो इस प्रकार हैं कि $100 < n < 200$ तथा H.C.F. $(91, n) > 1$, का योग है :

Options :

1. 3203

2. 3221

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3. 3121

4. 3303

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 પ્રાકૃતિક સંખ્યાઓ 'n' માટે $100 < n < 200$ અને ગુ.સા.અ. $(91, n) > 1$ થાય, તેવી તમામ સંખ્યાઓનો સરવાળો _____ થાય.

Options :

1. 3203

2. 3221

3. 3121

4. 3303

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 $2 \cdot {}^{20}C_0 + 5 \cdot {}^{20}C_1 + 8 \cdot {}^{20}C_2 + 11 \cdot {}^{20}C_3 + \ldots + 62 \cdot {}^{20}C_{20}$ is equal to :

Options :

1. 2^{24}

2. 2^{25}

3. 2^{23}

4. 2^{26}

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

श्रेणी $2 \cdot {}^{20}C_0 + 5 \cdot {}^{20}C_1 + 8 \cdot {}^{20}C_2 + 11 \cdot {}^{20}C_3 + \ldots + 62 \cdot {}^{20}C_{20}$ का योग बराबर है :

Options :

1. 2^{24}

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3. 2^{23}

4. 2^{26}

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

શ્રેઢી $2\cdot{}^{20}C_0+5\cdot{}^{20}C_1+8\cdot{}^{20}C_2+11\cdot{}^{20}C_3+\ldots+62\cdot{}^{20}C_{20}$ નો સરવાળો _____ છે.

Options :

1. 2^{24}

2. 2^{25}

3. 2^{23}

4. 2^{26}

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

$\lim\limits_{x\to 0}\dfrac{\sin^2 x}{\sqrt{2}-\sqrt{1+\cos x}}$ equals :

Options :

1. $4\sqrt{2}$

2. 4

3. $\sqrt{2}$

4. $2\sqrt{2}$

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

$\lim\limits_{x\to 0}\dfrac{\sin^2 x}{\sqrt{2}-\sqrt{1+\cos x}}$ बराबर है :

Options :

1. $4\sqrt{2}$

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3. $\sqrt{2}$

4. $2\sqrt{2}$

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

$$\lim_{x\to 0} \frac{\sin^2 x}{\sqrt{2}-\sqrt{1+\cos x}} = \text{_____}.$$

Options :

1. $4\sqrt{2}$

2. 4

3. $\sqrt{2}$

4. $2\sqrt{2}$

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

$$2y = \left(\cot^{-1}\left(\frac{\sqrt{3}\cos x + \sin x}{\cos x - \sqrt{3}\sin x}\right)\right)^2, x \in \left(0, \frac{\pi}{2}\right)$$

then $\frac{dy}{dx}$ is equal to :

Options :

1. $\frac{\pi}{6} - x$

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

3. $x - \frac{\pi}{6}$

4. $2x - \frac{\pi}{3}$

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यदि

$$2y = \left(\cot^{-1}\left(\frac{\sqrt{3}\cos x + \sin x}{\cos x - \sqrt{3}\sin x}\right)\right)^2, x \in \left(0, \frac{\pi}{2}\right)$$

है, तो $\frac{dy}{dx}$ बराबर है :

Options :

1. $\frac{\pi}{6} - x$
2. $\frac{\pi}{3} - x$
3. $x - \frac{\pi}{6}$
4. $2x - \frac{\pi}{3}$

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

$$2y = \left(\cot^{-1}\left(\frac{\sqrt{3}\cos x + \sin x}{\cos x - \sqrt{3}\sin x}\right)\right)^2, x \in \left(0, \frac{\pi}{2}\right)$$

તો $\frac{dy}{dx}$ = _____ .

Options :

1. $\frac{\pi}{6} - x$
2. $\frac{\pi}{3} - x$
3. $x - \frac{\pi}{6}$
4. $2x - \frac{\pi}{3}$

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

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Let $f:[0,2]\to \mathbf{R}$ be a twice differentiable function such that $f''(x)>0$, for all $x\in(0,2)$. If $\phi(x)=f(x)+f(2-x)$, then ϕ is :

Options :

1. increasing on $(0,1)$ and decreasing on $(1,2)$.

2. decreasing on $(0,1)$ and increasing on $(1,2)$.

3. increasing on $(0,2)$

4. decreasing on $(0,2)$

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

Correct Marks : 4 Wrong Marks : 1

$f:[0,2]\to \mathbf{R}$ दो बार अवकलनीय फलन इस प्रकार है कि सभी $x\in(0,2)$ के लिए $f''(x)>0$ है। यदि $\phi(x)=f(x)+f(2-x)$ है, तो ϕ

Options :

1. $(0,1)$ पर वर्धमान तथा $(1,2)$ पर ह्रासमान है।

2. $(0,1)$ पर ह्रासमान तथा $(1,2)$ पर वर्धमान है।

3. $(0,2)$ पर वर्धमान है।

4. $(0,2)$ पर ह्रासमान 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

ધારો કે $f:[0,2]\to \mathbf{R}$ એ દ્વિવિકલનીય વિધેય છે કે જેથી $f''(x)>0$, પ્રત્યેક $x\in(0,2)$ માટે. જો $\phi(x)=f(x)+f(2-x)$, તો ϕ એ :

Options :

1. $(0,1)$ પર વધતું અને $(1,2)$ પર ઘટતું છે.

2. $(0,1)$ પર ઘટતું અને $(1,2)$ પર વધતું છે.

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4. (0, 2)પર ઘટતું છે.

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

If S_1 and S_2 are respectively the sets of local minimum and local maximum points of the function, $f(x)=9x^4+12x^3-36x^2+25, x \in \mathbf{R}$, then :

Options :

1. $S_1=\{-2, 0\}; S_2=\{1\}$

2. $S_1=\{-2, 1\}; S_2=\{0\}$

3. $S_1=\{-1\}; S_2=\{0, 2\}$

4. $S_1=\{-2\}; S_2=\{0, 1\}$

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

यदि फलन $f(x)=9x^4+12x^3-36x^2+25, x \in \mathbf{R}$, के स्थानीय निम्नतम तथा स्थानीय उच्चतम बिन्दुओं के समुच्चय क्रमशः S_1 तथा S_2 हैं, तो :

Options :

1. $S_1=\{-2, 0\}; S_2=\{1\}$

2. $S_1=\{-2, 1\}; S_2=\{0\}$

3. $S_1=\{-1\}; S_2=\{0, 2\}$

4. $S_1=\{-2\}; S_2=\{0, 1\}$

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

જો વિધેય $f(x)=9x^4+12x^3-36x^2+25, x \in \mathbf{R}$ ના સ્થાનીય ન્યૂનતમ અને સ્થાનીય મહત્તમ બિંદુઓના ગણો અનુક્રમે S_1 અને S_2 હોય, તો :

Options :

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2. $S_1 = \{-2, 1\}; S_2 = \{0\}$

3. $S_1 = \{-1\}; S_2 = \{0, 2\}$

4. $S_1 = \{-2\}; S_2 = \{0, 1\}$

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

$\int \frac{\sin\frac{5x}{2}}{\sin\frac{x}{2}} dx$ is equal to :

(where c is a constant of integration.)

Options :

1. $x + 2\sin x + \sin 2x + c$

2. $x + 2\sin x + 2\sin 2x + c$

3. $2x + \sin x + \sin 2x + c$

4. $2x + \sin x + 2\sin 2x + c$

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

Correct Marks : 4 Wrong Marks : 1

$\int \frac{\sin\frac{5x}{2}}{\sin\frac{x}{2}} dx$ बराबर है :

(जहाँ c एक समाकलन अचर है।)

Options :

1. $x + 2\sin x + \sin 2x + c$

2. $x + 2\sin x + 2\sin 2x + c$

3. $2x + \sin x + \sin 2x + c$

4. $2x + \sin x + 2\sin 2x + c$

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$$\int \frac{\sin\frac{5x}{2}}{\sin\frac{x}{2}}\,dx = _____.$$

(જ્યાં c એ સંકલનનો અચળાંક છે)

Options :

1. $x+2\sin x+\sin 2x+c$

2. $x+2\sin x+2\sin 2x+c$

3. $2x+\sin x+\sin 2x+c$

4. $2x+\sin x+2\sin 2x+c$

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

Correct Marks : 4 Wrong Marks : 1

If $f(x)=\dfrac{2-x\cos x}{2+x\cos x}$ and $g(x)=\log_e x$,

$(x > 0)$ then the value of the integral

$\int_{-\pi/4}^{\pi/4} g(f(x))\,dx$ is :

Options :

1. $\log_e 2$

2. $\log_e 3$

3. $\log_e 1$

4. $\log_e e$

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

यदि $f(x)=\dfrac{2-x\cos x}{2+x\cos x}$ तथा $g(x)=\log_e x$,

$(x > 0)$ हैं, तो समाकल $\int_{-\pi/4}^{\pi/4} g(f(x))\,dx$ का मान

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1. $\log_e 2$

2. $\log_e 3$

3. $\log_e 1$

4. $\log_e e$

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

જો $f(x) = \dfrac{2 - x\cos x}{2 + x\cos x}$ અને $g(x) = \log_e x$,

$(x > 0)$, તો $\int_{-\pi/4}^{\pi/4} g(f(x))\,dx$ = _____ .

Options :

1. $\log_e 2$

2. $\log_e 3$

3. $\log_e 1$

4. $\log_e e$

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
$A = \{(x, y) \in \mathbf{R} \times \mathbf{R} | 0 \le x \le 3,\ 0 \le y \le 4,$
$y \le x^2 + 3x\}$ is :

Options :

1. 8

2. $\dfrac{26}{3}$

3. $\dfrac{59}{6}$

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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 $A = \{(x, y) \in \mathbf{R} \times \mathbf{R} | 0 \leq x \leq 3,\ 0 \leq y \leq 4,\ y \leq x^2 + 3x\}$ का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1. 8

2. $\frac{26}{3}$

3. $\frac{59}{6}$

4. $\frac{53}{6}$

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

પ્રદેશ $A = \{(x, y) \in \mathbf{R} \times \mathbf{R} | 0 \leq x \leq 3,\ 0 \leq y \leq 4,\ y \leq x^2 + 3x\}$ નું ક્ષેત્રફળ (ચો. એકમમાં) _____ છે.

Options :

1. 8

2. $\frac{26}{3}$

3. $\frac{59}{6}$

4. $\frac{53}{6}$

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

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Let $y = y(x)$ be the solution of the differential equation, $(x^2+1)^2\frac{dy}{dx} + 2x(x^2+1)y = 1$ such that $y(0) = 0$. If $\sqrt{a}\, y(1) = \frac{\pi}{32}$, then the value of 'a' is :

Options :

1. $\frac{1}{16}$
2. $\frac{1}{2}$
3. 1
4. $\frac{1}{4}$

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

माना $y = y(x)$, अवकल समीकरण $(x^2+1)^2\frac{dy}{dx} + 2x(x^2+1)y = 1$ का हल है, जबकि $y(0) = 0$ है। यदि $\sqrt{a}\, y(1) = \frac{\pi}{32}$ है, तो 'a' का मान है :

Options :

1. $\frac{1}{16}$
2. $\frac{1}{2}$
3. 1
4. $\frac{1}{4}$

Question Number : 77 Question Type : MCQ Option Shuffling : Yes Display Question Number

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ધારો કે $y=y(x)$ એ વિકલ સમીકરણ $(x^2+1)^2\frac{dy}{dx}+2x(x^2+1)y=1$ નો ઉકેલ છે તથા $y(0)=0$ છે. જો $\sqrt{a}\,y(1)=\frac{\pi}{32}$, તો 'a' ની કિંમત _____ છે.

Options :

1. $\frac{1}{16}$
2. $\frac{1}{2}$
3. 1
4. $\frac{1}{4}$

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

Correct Marks : 4 Wrong Marks : 1

Let O(0, 0) and A(0, 1) be two fixed points. Then the locus of a point P such that the perimeter of ΔAOP is 4, is :

Options :

1. $9x^2-8y^2+8y=16$
2. $9x^2+8y^2-8y=16$
3. $8x^2-9y^2+9y=18$
4. $8x^2+9y^2-9y=18$

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

माना O(0, 0) तथा A(0, 1) दो निश्चित बिंदु हैं, तो ऐसे बिंदु P जिनके लिए ΔAOP का परिमाप 4 हो, का बिंदुपथ है :

Options :

$9x^2-8y^2+8y=16$

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2. $9x^2+8y^2-8y=16$

3. $8x^2-9y^2+9y=18$

4. $8x^2+9y^2-9y=18$

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

ધારો કે O(0, 0) અને A(0, 1) બે નિશ્ચિત બિંદુઓ છે. તો ΔAOP ની પરિમિતિ 4 થાય તેવા બિંદુ P નો બિંદુપથ _____ છે.

Options :

1. $9x^2-8y^2+8y=16$

2. $9x^2+8y^2-8y=16$

3. $8x^2-9y^2+9y=18$

4. $8x^2+9y^2-9y=18$

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

Correct Marks : 4 Wrong Marks : 1

A point on the straight line, $3x+5y=15$ which is equidistant from the coordinate axes will lie only in :

Options :

1. 1^{st}, 2^{nd} and 4^{th} quadrants

2. 1^{st} quadrant

3. 1^{st} and 2^{nd} quadrants

4. 4^{th} quadrant

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

सरल रेखा $3x+5y=15$ पर स्थित एक बिंदु, जो

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1. પ્રથમ, દ્વિતીય તથા ચતુર્થ ચતુર્થાંશોં મેં

2. પ્રથમ ચતુર્થાંશ મેં

3. પ્રથમ તથા દ્વિતીય ચતુર્થાંશોં મેં

4. ચતુર્થ ચતુર્થાંશ મેં

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

રેખા $3x+5y=15$ પરનું એવુ બિંદુ કે જે અક્ષોથી સમાન અંતરે આવેલું છે, તે ફક્ત _____ .

Options :

1. પ્રથમ, દ્વિતીય અને ચતુર્થ ચરણમાં આવશે.

2. પ્રથમ ચરણમાં આવશે.

3. પ્રથમ અને દ્વિતીય ચરણમાં આવશે.

4. ચતુર્થ ચરણમાં આવશે.

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 sum of the squares of the lengths of the chords intercepted on the circle, $x^2+y^2=16$, by the lines, $x+y=n$, $n\in N$, where N is the set of all natural numbers, is :

Options :

1. 105

2. 210

3. 320

4. 160

Question Number : 80 Question Type : MCQ Option Shuffling : Yes Display Question Number

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वृत्त $x^2+y^2=16$ पर रेखाओं $x+y=n$, $n\epsilon N$ जहाँ N सभी प्राकृत संख्याओं का समुच्चय है, द्वारा काटी गई जीवाओं की लंबाइयों के वर्गों का योग है :

Options :

1. 105

2. 210

3. 320

4. 160

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

રેખાઓ $x+y=n$, $n\epsilon N$ (જ્યાં N એ પ્રાકૃતિક સંખ્યાઓનો ગણ છે), દ્વારા વર્તુળ $x^2+y^2=16$ પર અંતરિત જીવાઓની લંબાઇઓના વર્ગોનો સરવાળો _____ છે.

Options :

1. 105

2. 210

3. 320

4. 160

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 shortest distance between the line $y=x$ and the curve $y^2=x-2$ is :

Options :

1. $\frac{11}{4\sqrt{2}}$

2. $\frac{7}{4\sqrt{2}}$

7

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4. 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

रेखा $y=x$ तथा वक्र $y^2=x-2$ के बीच की न्यूनतम दूरी है :

Options :

1. $\frac{11}{4\sqrt{2}}$

2. $\frac{7}{4\sqrt{2}}$

3. $\frac{7}{8}$

4. 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

રેખા $y=x$ અને વક્ર $y^2=x-2$ વચ્ચેનું ન્યૂનતમ અંતર _____ છે.

Options :

1. $\frac{11}{4\sqrt{2}}$

2. $\frac{7}{4\sqrt{2}}$

3. $\frac{7}{8}$

4. 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 tangents on the ellipse $4x^2+y^2=8$ at the points (1, 2) and (a, b) are perpendicular to each other, then a^2 is equal to :

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1. $\frac{2}{17}$

2. $\frac{128}{17}$

3. $\frac{4}{17}$

4. $\frac{64}{17}$

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

यदि दीर्घवृत्त $4x^2+y^2=8$ के बिंदुओं (1, 2) तथा (a, b) पर खींची गई स्पर्शरेखाएँ परस्पर लंबवत हैं, तो a^2 बराबर है :

Options :

1. $\frac{2}{17}$

2. $\frac{128}{17}$

3. $\frac{4}{17}$

4. $\frac{64}{17}$

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 ઉપવલય $4x^2+y^2=8$ ના બિંદુઓ (1, 2) અને (a, b) આગળના સ્પર્શકો પરસ્પર લંબ હોય, તો a^2 = _____ .

Options :

1. $\frac{2}{17}$

2. 128

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3. $\frac{4}{17}$

4. $\frac{64}{17}$

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

Correct Marks : 4 Wrong Marks : 1

The length of the perpendicular from the point $(2, -1, 4)$ on the straight line, $\frac{x+3}{10} = \frac{y-2}{-7} = \frac{z}{1}$ is :

Options :

1. less than 2

2. greater than 2 but less than 3

3. greater than 3 but less than 4

4. greater than 4

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

Correct Marks : 4 Wrong Marks : 1

बिंदु $(2, -1, 4)$ से सरल रेखा $\frac{x+3}{10} = \frac{y-2}{-7} = \frac{z}{1}$ पर खींचे गए लंब की लंबाई :

Options :

1. 2 से कम है।

2. 2 से अधिक परंतु 3 से कम है।

3. 3 से अधिक परंतु 4 से कम है।

4. 4 से अधिक है।

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

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બિંદુ $(2, -1, 4)$ થી રેખા $\frac{x+3}{10} = \frac{y-2}{-7} = \frac{z}{1}$ પરના લંબની લંબાઇ _____ છે.

Options :

1. 2 કરતાં ઓછી

2. 2 કરતાં વધારે પણ 3 કરતાં ઓછી

3. 3 કરતાં વધારે પણ 4 કરતાં ઓછી

4. 4 કરતાં વધારે

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

The equation of a plane containing the line of intersection of the planes $2x-y-4=0$ and $y+2z-4=0$ and passing through the point $(1, 1, 0)$ is :

Options :

1. $x-y-z=0$

2. $x+3y+z=4$

3. $x-3y-2z=-2$

4. $2x-z=2$

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

समतलों $2x-y-4=0$ तथा $y+2z-4=0$ की प्रतिच्छेदन रेखा को अंतर्विष्ट करने वाले तथा बिंदु $(1, 1, 0)$ से होकर जाने वाले समतल का समीकरण है :

Options :

1. $x-y-z=0$

2. $x+3y+z=4$

3. $x-3y-2z=-2$

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4. $2x-z=2$

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

સમતલો $2x-y-4=0$ અને $y+2z-4=0$ ની છેદરેખાને સમાવતા અને બિંદુ (1, 1, 0) માંથી પસાર થતા સમતલનું સમીકરણ _____ છે.

Options :

1. $x-y-z=0$

2. $x+3y+z=4$

3. $x-3y-2z=-2$

4. $2x-z=2$

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

The magnitude of the projection of the vector $2\hat{i}+3\hat{j}+\hat{k}$ on the vector perpendicular to the plane containing the vectors $\hat{i}+\hat{j}+\hat{k}$ and $\hat{i}+2\hat{j}+3\hat{k}$, is :

Options :

1. $3\sqrt{6}$

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

3. $\sqrt{6}$

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

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

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सदिश $2\hat{i} + 3\hat{j} + \hat{k}$ के सदिशों $\hat{i} + \hat{j} + \hat{k}$ तथा $\hat{i} + 2\hat{j} + 3\hat{k}$ को अंतर्विष्ट करने वाले समतल के लंबवर्तीय सदिश पर प्रक्षेप का परिमाण है :

Options :

1. $3\sqrt{6}$
2. $\frac{\sqrt{3}}{2}$
3. $\sqrt{6}$
4. $\sqrt{\frac{3}{2}}$

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

સદિશો $\hat{i} + \hat{j} + \hat{k}$ અને $\hat{i} + 2\hat{j} + 3\hat{k}$ ને સમાવતા સમતલ ને લંબ હોય તેવા સદિશ પર, સદિશ $2\hat{i} + 3\hat{j} + \hat{k}$ ના પ્રક્ષેપનો માન _____ છે.

Options :

1. $3\sqrt{6}$
2. $\frac{\sqrt{3}}{2}$
3. $\sqrt{6}$
4. $\sqrt{\frac{3}{2}}$

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 variance of seven observations are 8 and 16, respectively. If 5 of the observations are 2. 4. 10. 12. 14. then

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1. 40

2. 49

3. 45

4. 48

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

सात प्रेक्षणों के माध्य तथा प्रसरण क्रमशः 8 तथा 16 हैं। यदि इनमें से 5 प्रेक्षण 2, 4, 10, 12, 14 हैं, तो शेष दो प्रेक्षणों का गुणनफल है :

Options :

1. 40

2. 49

3. 45

4. 48

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

સાત અવલોકનોના મધ્યક અને વિચરણ અનુક્રમે 8 અને 16 છે. જો આ અવલોકનોમાંનાં 5 અવલોકનો 2, 4, 10, 12, 14 હોય, તો બાકીના બે અવલોકનોનો ગુણાકાર _____ છે.

Options :

1. 40

2. 49

3. 45

4. 48

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

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Let A and B be two non-null events such that $A \subset B$. Then, which of the following statements is always correct ?

Options :

1. $P(A|B)=1$

2. $P(A|B) \leq P(A)$

3. $P(A|B) \geq P(A)$

4. $P(A|B)=P(B)-P(A)$

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

माना A तथा B दो ऐसी अरिक्त (non-null) घटनायें हैं कि $A \subset B$ है। तो निम्न में से कौन सा कथन हमेशा सही है?

Options :

1. $P(A|B)=1$

2. $P(A|B) \leq P(A)$

3. $P(A|B) \geq P(A)$

4. $P(A|B)=P(B)-P(A)$

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

ધારો કે A અને B બે અરિક્ત ઘટનાઓ છે તથા $A \subset B$.
તો નીચેના પૈકી કયું વિધાન હમેશાં સાચું છે?

Options :

1. $P(A|B)=1$

2. $P(A|B) \leq P(A)$

3. $P(A|B) \geq P(A)$

4. $P(A|B)=P(B)-P(A)$

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Correct Marks : 4 Wrong Marks : 1

If $\cos(\alpha+\beta)=\frac{3}{5}$, $\sin(\alpha-\beta)=\frac{5}{13}$ and

$0<\alpha, \beta<\frac{\pi}{4}$, then $\tan(2\alpha)$ is equal to :

Options :

1. $\frac{21}{16}$

2. $\frac{63}{16}$

3. $\frac{63}{52}$

4. $\frac{33}{52}$

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

यदि $\cos(\alpha+\beta)=\frac{3}{5}$, $\sin(\alpha-\beta)=\frac{5}{13}$ तथा

$0<\alpha, \beta<\frac{\pi}{4}$ हैं, तो $\tan(2\alpha)$ बराबर है :

Options :

1. $\frac{21}{16}$

2. $\frac{63}{16}$

3. $\frac{63}{52}$

4. $\frac{33}{52}$

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

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જો $\cos(\alpha+\beta)=\frac{3}{5}$, $\sin(\alpha-\beta)=\frac{5}{13}$ અને

$0<\alpha, \beta<\frac{\pi}{4}$, તો $\tan(2\alpha)=$ _____ .

Options :

1. $\frac{21}{16}$

2. $\frac{63}{16}$

3. $\frac{63}{52}$

4. $\frac{33}{52}$

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

If $\alpha=\cos^{-1}\left(\frac{3}{5}\right)$, $\beta=\tan^{-1}\left(\frac{1}{3}\right)$, where

$0<\alpha, \beta<\frac{\pi}{2}$, then $\alpha-\beta$ is equal to :

Options :

1. $\tan^{-1}\left(\frac{9}{14}\right)$

2. $\sin^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

3. $\cos^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

4. $\tan^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

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

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यदि $\alpha = \cos^{-1}\left(\frac{3}{5}\right), \beta = \tan^{-1}\left(\frac{1}{3}\right)$ हैं, जहाँ

$0 < \alpha, \beta < \frac{\pi}{2}$, तो $\alpha - \beta$ बराबर है :

Options :

1. $\tan^{-1}\left(\frac{9}{14}\right)$

2. $\sin^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

3. $\cos^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

4. $\tan^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

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

જો $\alpha = \cos^{-1}\left(\frac{3}{5}\right), \beta = \tan^{-1}\left(\frac{1}{3}\right)$, જ્યાં

$0 < \alpha, \beta < \frac{\pi}{2}$, તો $\alpha - \beta =$ _____ .

Options :

1. $\tan^{-1}\left(\frac{9}{14}\right)$

2. $\sin^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

3. $\cos^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

4. $\tan^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

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

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The contrapositive of the statement "If you are born in India, then you are a citizen of India", is :

Options :

1. If you are born in India, then you are not a citizen of India.

2. If you are a citizen of India, then you are born in India.

3. If you are not born in India, then you are not a citizen of India.

4. If you are not a citizen of India, then you are not born in India.

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

कथन

"यदि आप भारत में जन्में हैं, तो आप भारत के एक नागरिक हैं" का प्रतिधनात्मक कथन है :

Options :

1. यदि आप भारत में जन्में हैं, तो आप भारत के नागरिक नहीं हैं।

2. यदि आप भारत के एक नागरिक हैं, तो आप भारत में जन्में हैं।

3. यदि आप भारत में नहीं जन्में, तो आप भारत के नागरिक नहीं हैं।

4. यदि आप भारत के नागरिक नहीं हैं, तो आप भारत में नहीं जन्में हैं।

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

Correct Marks : 4 Wrong Marks : 1

વિધાન "જો તમારો જન્મ ભારતમાં થયો હોય, તો તમે ભારતના નાગરિક છો", નું સમાનાર્થી પ્રેરણ છે.

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1. જો તમારો જન્મ ભારતમાં થયો હોય, તો તમે ભારતના નાગરિક નથી.

2. જો તમે ભારતના નાગરિક હોવ, તો તમારો જન્મ ભારતમાં થયો છે.

3. જો તમારો જન્મ ભારતમાં નથી થયો, તો તમે ભારતના નાગરિક નથી.

4. જો તમે ભારતના નાગરિક નથી, તો તમારો જન્મ ભારતમાં નથી થયો.

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