

National Testing Agency

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Paper I

Group Number : 1
Group Id : 416529130
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Break time: 0
Group Marks: 360

Physics

Section Id : 416529172
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: 416529181
Question Shuffling Allowed : Yes

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

Correct Marks : 4 Wrong Marks : 1

The diameter and height of a cylinder are measured by a meter scale to be 12.6 ± 0.1 cm and 34.2 ± 0.1 cm, respectively. What will be the value of its volume in appropriate significant figures ?

Options :

1261.13 cm³ 1261.3 cm³ 1261.13 cm³ 1261.3 cm³

2. $4260 \pm 80 \text{ cm}^3$
3. $4264 \pm 81 \text{ cm}^3$
4. $4300 \pm 80 \text{ cm}^3$

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

Correct Marks : 4 Wrong Marks : 1

एक मीटर स्केल द्वारा नापने पर किसी बेलन का व्यास और ऊँचाई क्रमशः $12.6 \pm 0.1 \text{ cm}$ और $34.2 \pm 0.1 \text{ cm}$ आते हैं। उपयुक्त सार्थक अंकों में इसके आयतन का मान क्या होगा ?

Options :

1. $4264.4 \pm 81.0 \text{ cm}^3$
2. $4260 \pm 80 \text{ cm}^3$
3. $4264 \pm 81 \text{ cm}^3$
4. $4300 \pm 80 \text{ cm}^3$

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

એક માપપટ્ટીથી એક નળાકારનો વ્યાસ અને ઊંચાઈ માપતા તે અનુક્રમે $12.6 \pm 0.1 \text{ cm}$ અને $34.2 \pm 0.1 \text{ cm}$ છે. તો તેને અનુરૂપ સાર્થક અંકોમાં તેનું કદ કેટલું હશે ?

Options :

1. $4264.4 \pm 81.0 \text{ cm}^3$
2. $4260 \pm 80 \text{ cm}^3$
3. $4264 \pm 81 \text{ cm}^3$
4. $4300 \pm 80 \text{ cm}^3$

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

Correct Marks : 4 Wrong Marks : 1

Two vectors $\vec{A}$ and $\vec{B}$ have equal magnitudes. The magnitude of $(\vec{A} + \vec{B})$ is 'n' times the magnitude of $(\vec{A} - \vec{B})$. The angle between $\vec{A}$ and $\vec{B}$ is:

Options :

1. $\cos^{-1} \left[\frac{n^2 - 1}{n^2 + 1} \right]$

2. $\cos^{-1} \left[\frac{n - 1}{n + 1} \right]$

3. $\sin^{-1} \left[\frac{n^2 - 1}{n^2 + 1} \right]$

4. $\sin^{-1} \left[\frac{n - 1}{n + 1} \right]$

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

Correct Marks : 4 Wrong Marks : 1

दो सदिशों $\vec{A}$ तथा $\vec{B}$ के परिमाण बराबर हैं।

$(\vec{A} + \vec{B})$ का परिमाण $(\vec{A} - \vec{B})$ के परिमाण का

'n' गुना है। $\vec{A}$ तथा $\vec{B}$ के बीच का कोण है :

Options :

1. $\cos^{-1} \left[\frac{n^2 - 1}{n^2 + 1} \right]$

2. $\cos^{-1} \left[\frac{n - 1}{n + 1} \right]$

$\sin^{-1} \left[\frac{n^2 - 1}{n^2 + 1} \right]$

$$\sin^{-1} \left[\frac{n-1}{n+1} \right]$$

4.

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

Correct Marks : 4 Wrong Marks : 1

બે સદિશો $\vec{A}$ અને $\vec{B}$ સમાન માન ધરાવે છે.

$(\vec{A} + \vec{B})$ નું માન એ $(\vec{A} - \vec{B})$ ના માન કરતા 'n'

ગણું છે. $\vec{A}$ અને $\vec{B}$ વચ્ચેનો કોણ :

Options :

$$\cos^{-1} \left[\frac{n^2 - 1}{n^2 + 1} \right]$$

1.

$$\cos^{-1} \left[\frac{n-1}{n+1} \right]$$

2.

$$\sin^{-1} \left[\frac{n^2 - 1}{n^2 + 1} \right]$$

3.

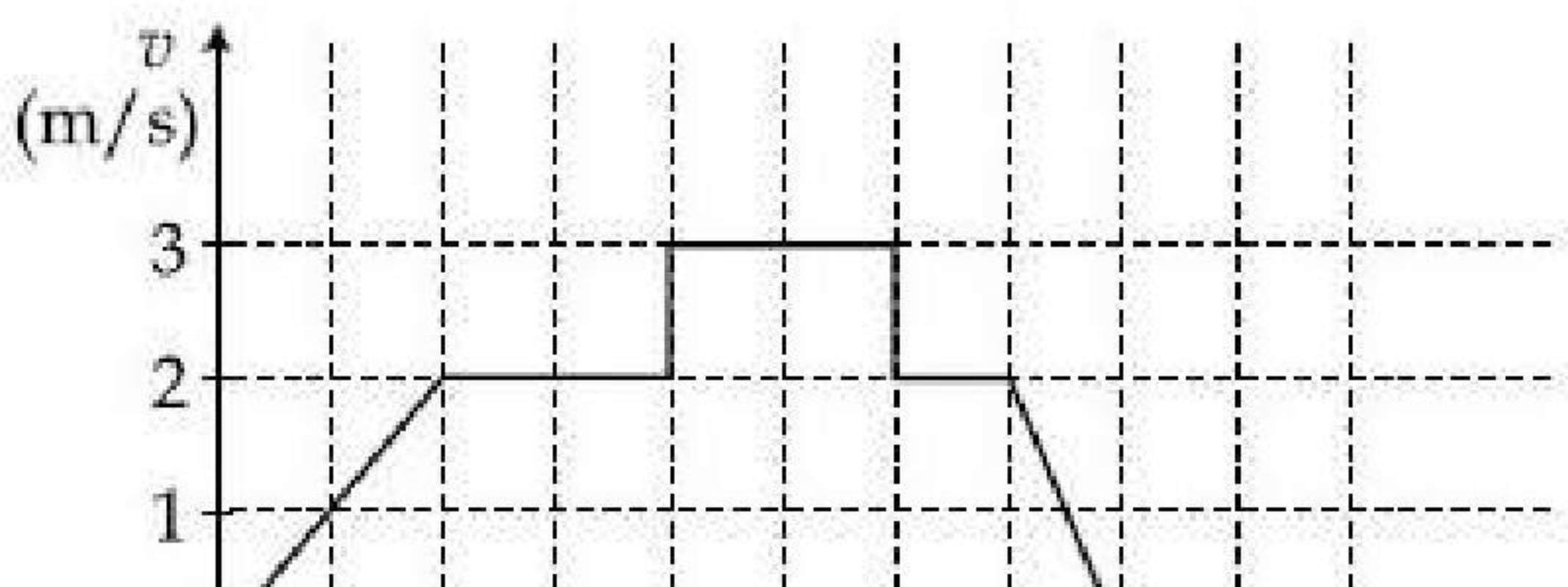
$$\sin^{-1} \left[\frac{n-1}{n+1} \right]$$

4.

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

Correct Marks : 4 Wrong Marks : 1

A particle starts from the origin at time $t = 0$ and moves along the positive x -axis. The graph of velocity with respect to time is shown in figure. What is the position of the particle at time $t = 5s$?

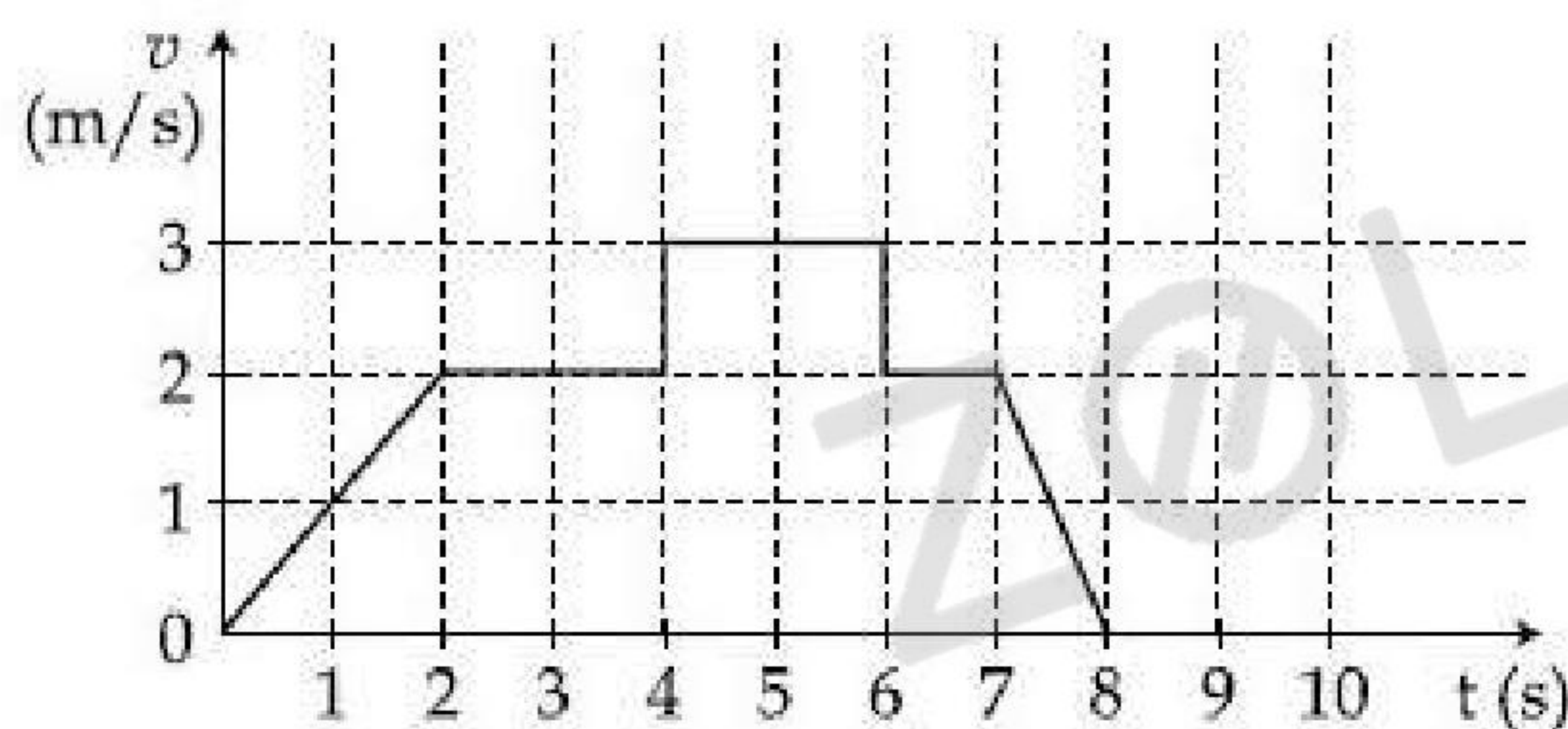


1. 3 m
2. 6 m
3. 10 m
4. 9 m

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

Correct Marks : 4 Wrong Marks : 1

एक कण $t=0$ पर मूल बिन्दु से चलना आरम्भ करता है और धनात्मक x -अक्ष की दिशा में गति करता है। चित्र में वेग का समय के सापेक्ष ग्राफ दिखाया गया है। $t=5s$ पर कण की स्थिति क्या होगी?



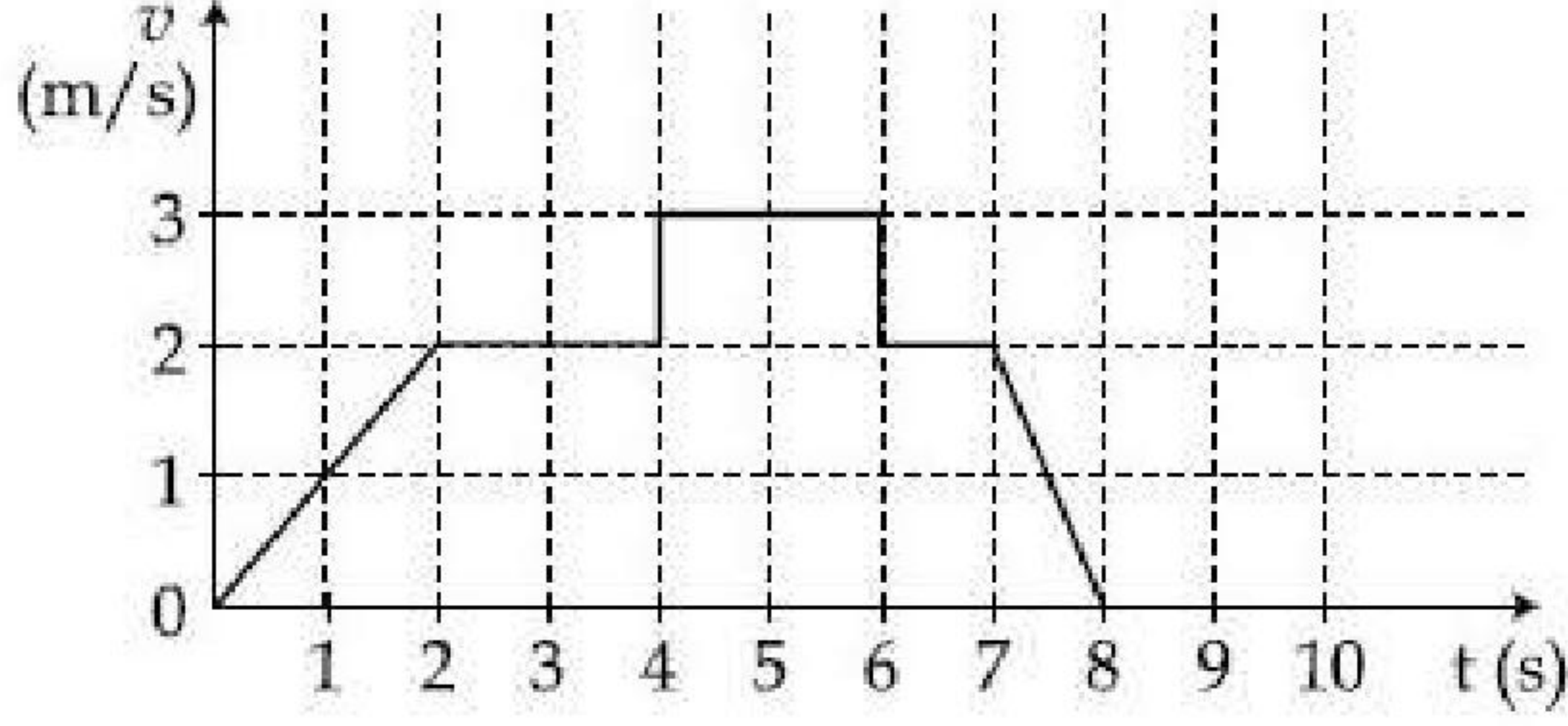
Options :

1. 3 m
2. 6 m
3. 10 m
4. 9 m

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

$t=0$ સમયે એક કણ ઉદ્દગમ પરથી ધન x -અક્ષ તરફ ગતિ કરવાનું શરૂ કરે છે. વેગનો સમય સાપેક્ષે આલેખ આકૃતિમાં બતાવેલ છે. સમય $t=5\text{s}$ પર કણનું સ્થાન શું હશે?



Options :

1. 3 m
2. 6 m
3. 10 m
4. 9 m

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

Correct Marks : 4 Wrong Marks : 1

Two forces P and Q, of magnitude $2F$ and $3F$, respectively, are at an angle θ with each other. If the force Q is doubled, then their resultant also gets doubled. Then, the angle θ is :

Options :

1. 30°
2. 60°
3. 90°
4. 120°

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

दो बल P और Q जिनके परिमाण क्रमशः 2F और 3F हैं, परस्पर θ कोण बनाते हैं। यदि बल Q को दोगुना कर दें तो इनका परिणामी बल भी दोगुना हो जाता है। तब कोण θ होगा :

Options :

1. 30°
2. 60°
3. 90°
4. 120°

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

અનુક્રમે 2F અને 3F માનના બે બળો P અને Q એક બીજા સાથે θ કોણ બનાવે છે. જો બળ Q ને બમણો કરીએ તો તેમનું પરિણામી પણ બમણું થાય છે. તો આ ખૂણો θ _____ હશે.

Options :

1. 30°
2. 60°
3. 90°
4. 120°

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 particle which is experiencing a force,

given by $\vec{F} = 3\vec{i} - 12\vec{j}$, undergoes a

displacement of $\vec{d} = 4\vec{i}$. If the particle had a kinetic energy of 3 J at the beginning of the displacement, what is its kinetic energy at the end of the displacement?

Options :

2. 12 J

3. 9 J

4. 10 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

एक कण किसी एक बल $\vec{F} = 3\vec{i} - 12\vec{j}$ के

अन्तर्गत $\vec{d} = 4\vec{i}$ से विस्थापित होता है। यदि कण की विस्थापन से पूर्व गतिज ऊर्जा 3 J थी तो विस्थापन के बाद उसकी गतिज ऊर्जा का मान होगा :

Options :

1. 15 J

2. 12 J

3. 9 J

4. 10 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

એક કણ કે જે $\vec{F} = 3\vec{i} - 12\vec{j}$ બળ અનુભવે છે તેનું

$\vec{d} = 4\vec{i}$ સ્થાનાંતર થાય છે. સ્થાનાંતરની શરૂઆતમાં જે આ કણની ગતિ ઊર્જા 3 J હોય તો સ્થાનાંતરના અંતે તેની ગતિ ઊર્જા શું હશે?

Options :

1. 15 J

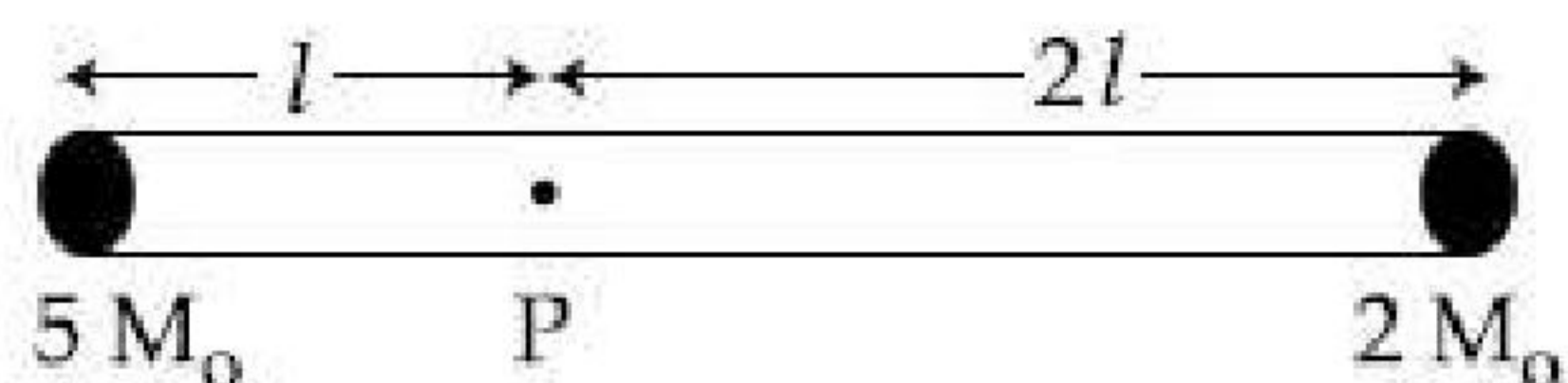
2. 12 J

3. 9 J

4. 10 J

Correct Marks : 4 Wrong Marks : 1

A rigid massless rod of length $3l$ has two masses attached at each end as shown in the figure. The rod is pivoted at point P on the horizontal axis (see figure). When released from initial horizontal position, its instantaneous angular acceleration will be :



Options :

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

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

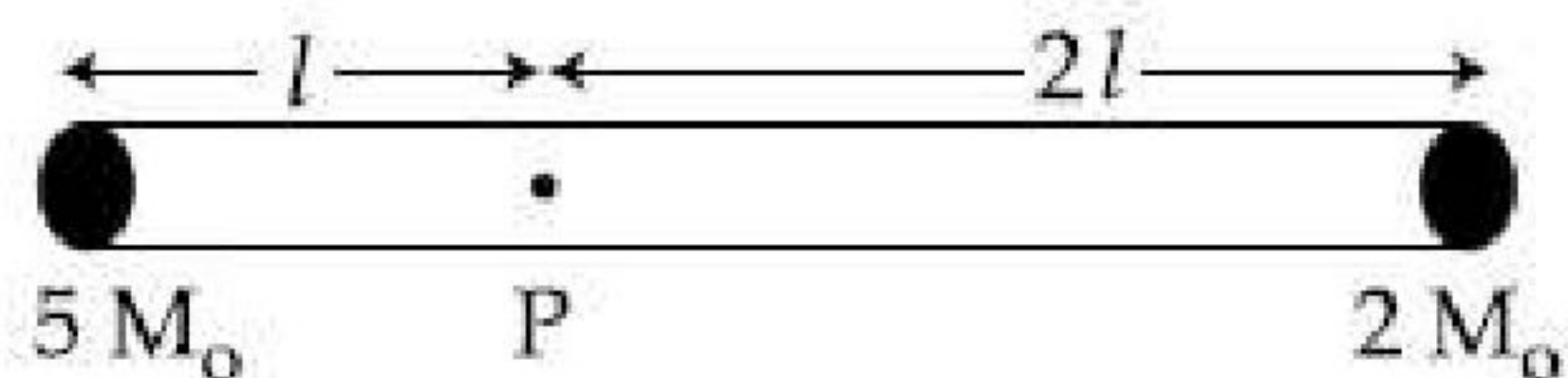
3. $\frac{7g}{3l}$

4. $\frac{g}{13l}$

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

Correct Marks : 4 Wrong Marks : 1

एक द्रव्यमान रहित तथा $3l$ लम्बाई की छड़ पर दो द्रव्यमान चित्रानुसार उसके सिरों पर लगाये हैं तथा उसे एक क्षैतिज अक्ष पर बिन्दु P से कीलकित किया जाता है। जब इस छड़ को क्षैतिज अवस्था से छोड़ा जाता है तो उसका तात्क्षणिक कोणीय त्वरण होगा :



Options :

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

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

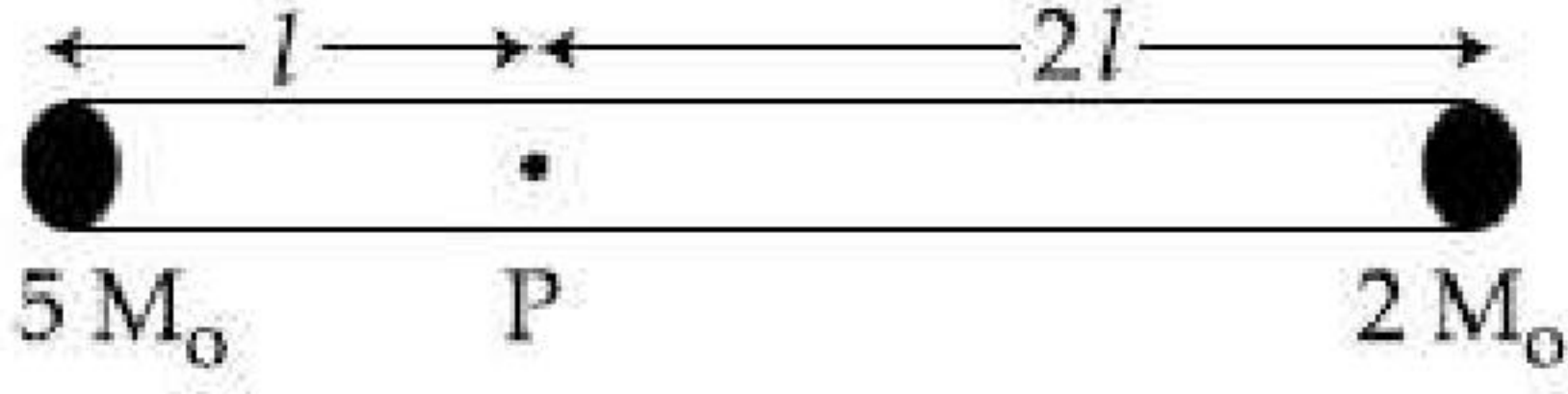
3. $\frac{7g}{3l}$

4. $\frac{g}{13l}$

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

3l લંબાઈ ધરાવતા એક દૃઢ અને દળરહિત સળીયાના બે છેડા આગળ આકૃતિમાં દર્શાવ્યા પ્રમાણે બે દળો લગાડવામાં આવ્યા છે. એક સમક્ષિતિજ અક્ષના P બિંદુ આગળથી કિલ્કિત કરવામાં આવેલ છે (આકૃતિ જુઓ). જ્યારે તેને પ્રારંભિક સમક્ષિતિજ સ્થિતિમાથી મુક્ત કરવામાં આવે છે ત્યારે તેનો તત્કાલિક કોણીય પ્રવેગ _____ થશે.



Options :

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

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

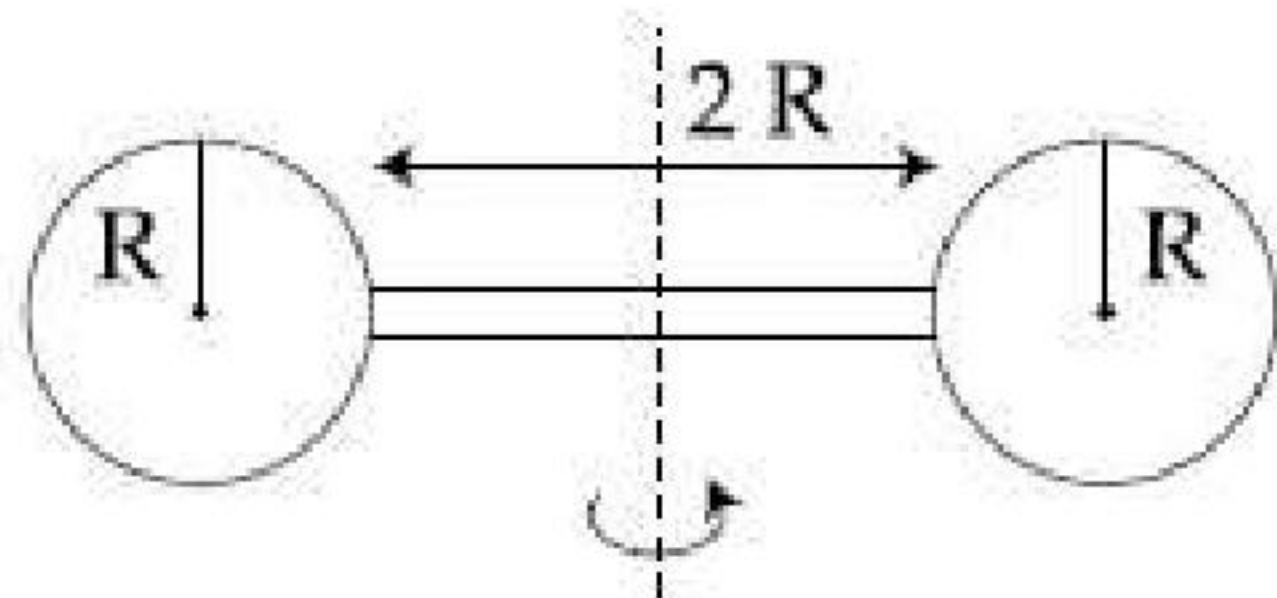
3. $\frac{7g}{3l}$

4. $\frac{g}{13l}$

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

Two identical spherical balls of mass M and radius R each are stuck on two ends of a rod of length $2R$ and mass M (see figure). The moment of inertia of the system about the axis passing perpendicularly through the centre of the rod is :



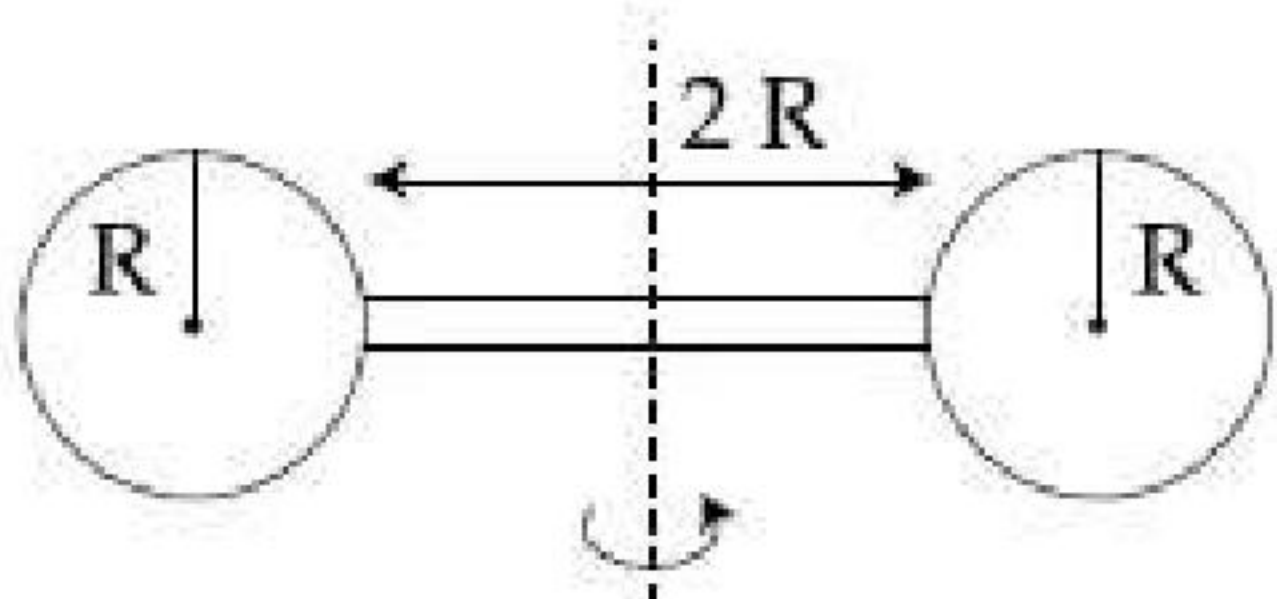
Options :

1. $\frac{17}{15} MR^2$
2. $\frac{137}{15} MR^2$
3. $\frac{152}{15} MR^2$
4. $\frac{209}{15} MR^2$

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

द्रव्यमान M तथा त्रिज्या R की दो एकसमान गोलाकार गेंदों को $2R$ लम्बाई तथा द्रव्यमान M की एक छड़ के सिरों पर चित्रानुसार जोड़ा गया है। इस संयोजन का छड़ के केन्द्र से जाने वाली तथा छड़ के लम्बवत् अक्ष के परितः जड़त्व आघूर्ण का मान होगा :



Options :

1. $\frac{17}{15} MR^2$

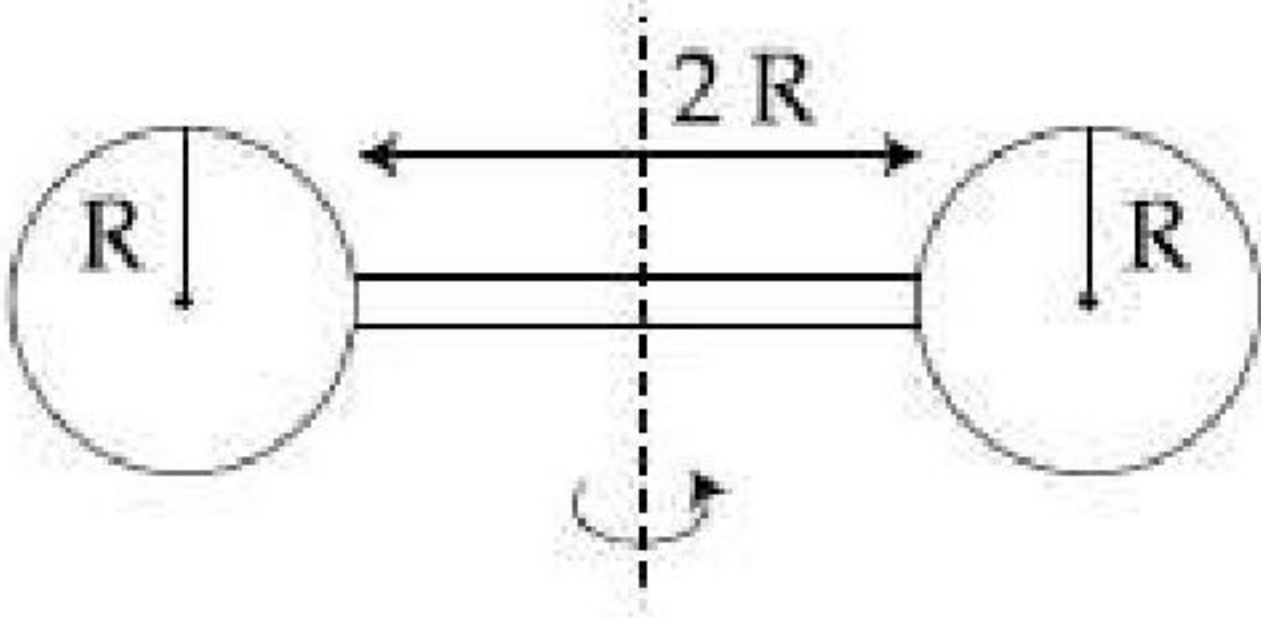
3. $\frac{152}{15} MR^2$

4. $\frac{209}{15} MR^2$

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

2R લંબાઈના અને M દ્રવ્યમાનના એક સળીયાના બે છેડા પર M દ્રવ્યમાન અને R ત્રિજ્યાના બે સમાન ગોલીય બોલ લગાડેલ છે (આકૃતિ જુઓ). આ સળીયાની મધ્યમાંથી લંબરૂપે પસાર થતી અક્ષને સાપેક્ષે આ તંત્રની જડત્વની ચાકમાત્રા _____ છે.



Options :

1. $\frac{17}{15} MR^2$

2. $\frac{137}{15} MR^2$

3. $\frac{152}{15} MR^2$

4. $\frac{209}{15} MR^2$

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

Two stars of masses 3×10^{31} kg each, and at distance 2×10^{11} m rotate in a plane about their common centre of mass O. A meteorite passes through O moving perpendicular to the star's rotation plane. In order to escape from the gravitational field of this double star, the minimum speed that meteorite should have at O is :

(Take Gravitational constant $G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$)

Options :

1. $2.8 \times 10^5 \text{ m/s}$
2. $3.8 \times 10^4 \text{ m/s}$
3. $1.4 \times 10^5 \text{ m/s}$
4. $2.4 \times 10^4 \text{ m/s}$

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

दो तारे, जिनमें प्रत्येक का द्रव्यमान 3×10^{31} kg है तथा उनके बीच की दूरी 2×10^{11} m है, अपने उभयनिष्ठ द्रव्यमान केन्द्र O के परितः किसी समतल में घूम रहे हैं। एक उल्कापिण्ड O से तथा उनके घूर्णन समतल के लम्बवत् दिशा से गुजरता है। इन दो तारों के गुरुत्वाकर्षण से पलायन करने के लिए उल्कापिण्ड की बिन्दु O पर न्यूनतम गति का मान होगा :

(सार्वत्रिक गुरुत्वीय स्थिरांक $G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$)

Options :

1. $2.8 \times 10^5 \text{ m/s}$
2. $3.8 \times 10^4 \text{ m/s}$
3. $1.4 \times 10^5 \text{ m/s}$
4. $2.4 \times 10^4 \text{ m/s}$

જે દરેકનું દ્રવ્યમાન $3 \times 10^{31} \text{ kg}$ છે તેવા બે તારાઓ તેમનાથી $2 \times 10^{11} \text{ m}$ દુર એવા એકજ (સામાન્ય) દ્રવ્યમાન કેન્દ્રની આસપાસ ભ્રમણ કરવાનું શરૂ કરે છે. જો કોઈ એક ઉલ્કા આ દ્રવ્યમાન કેન્દ્રમાંથી બે તારાઓને જોડતી રેખાને લંબ પસાર થઈ O તરફ ગતિ કરે છે, તો આ બે તારાના ગુરૂત્વાકર્ષણ ક્ષેત્રમાંથી છટકવામાટે આ ઉલ્કાને O પર જરૂરી લઘુત્તમ ઝડપ _____ છે.

(સાર્વત્રિક ગુરૂત્વાકર્ષી અચળાંક

$$G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2})$$

Options :

1. $2.8 \times 10^5 \text{ m/s}$
2. $3.8 \times 10^4 \text{ m/s}$
3. $1.4 \times 10^5 \text{ m/s}$
4. $2.4 \times 10^4 \text{ m/s}$

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

A cylindrical plastic bottle of negligible mass is filled with 310 ml of water and left floating in a pond with still water. If pressed downward slightly and released, it starts performing simple harmonic motion at angular frequency ω . If the radius of the bottle is 2.5 cm then ω is close to : (density of water = 10^3 kg/m^3)

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

Options :

1. 1.25 rad s^{-1}
2. 2.50 rad s^{-1}
3. 3.75 rad s^{-1}
4. 5.00 rad s^{-1}

અવગણ્ય દ્રવ્યમાન ધરાવતી એક પ્લાસ્ટિકની બોટલમાં 310 ml પાણી ભરેલ છે અને તેને શાંત પાણી ભરેલ તલાબમાં તરતી મુકવામાં આવે છે. જો થોડુક નીચે તરફ દબાવીને છોડી દેવામાં આવે તો તે ω જેટલી કોણીય આવૃત્તિથી સરળ આવર્ત ગતિ શરૂ કરે છે. આ બોટલની ત્રિજ્યા 2.5 cm છે, તો ω _____ ની નજીકની હશે.

(પાણીની ઘનતા $= 10^3 \text{ kg/m}^3$ આપેલ છે.)

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

Options :

1. 1.25 rad s^{-1}
2. 2.50 rad s^{-1}
3. 3.75 rad s^{-1}
4. 5.00 rad s^{-1}

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

नगण्य द्रव्यमान की प्लास्टिक की एक बेलनाकार बोतल में 310 ml पानी भरा है तथा यह बोतल शांत पानी के तालाब में तैरती है। यदि इसे थोड़ा नीचे को दबा कर छोड़ते हैं तो यह कोणीय आवृत्ति ω से सरल आवर्त गति करती है। यदि बोतल की त्रिज्या 2.5 cm है, तो ω का मान होगा :

(दिया है : पानी का घनत्व $= 10^3 \text{ kg/m}^3$)

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

Options :

1. 1.25 rad s^{-1}
2. 2.50 rad s^{-1}
3. 3.75 rad s^{-1}
4. 5.00 rad s^{-1}

Half mole of an ideal monoatomic gas is heated at constant pressure of 1 atm from 20°C to 90°C. Work done by gas is close to : (Gas constant $R = 8.31 \text{ J/mol}\cdot\text{K}$)

Options :

1. 581 J
2. 291 J
3. 146 J
4. 73 J

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

एकपरमाणुक आदर्श गैस के आधे मोल को 1 atm के नियत दाब पर 20°C से 90°C तक गर्म करते हैं। इस गैस द्वारा किये गये कार्य का सन्निकट मान होगा : (दिया है : $R = 8.31 \text{ J/mol}\cdot\text{K}$)

Options :

1. 581 J
2. 291 J
3. 146 J
4. 73 J

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

અડધામોલ એક પરમાણ્વીય આદર્શ વાયુને 1 atm અચળ દબાણે 20°C થી 90°C સુધી ગરમ કરવામાં આવે છે. વાયુ વડે થતું કાર્ય _____ ની નજીકનું છે. (વાયુ અચળાંક $R = 8.31 \text{ J/mol}\cdot\text{K}$)

Options :

1. 581 J
2. 291 J

3. 146 J

4. 73 J

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

Two kg of a monoatomic gas is at a pressure of $4 \times 10^4 \text{ N/m}^2$. The density of the gas is 8 kg/m^3 . What is the order of energy of the gas due to its thermal motion ?

Options :

1. 10^3 J

2. 10^4 J

3. 10^5 J

4. 10^6 J

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

દો kg એકપરમાણુક ગૈસ $4 \times 10^4 \text{ N/m}^2$ કે દાબ પર છે. ગૈસ કા ઘનત્વ 8 kg/m^3 છે. ઇસ ગૈસ મેં ઝખ્મીય ગતિ કે કારણ ઝર્જા કી પરિમાણ કોટિ હોગી :

Options :

1. 10^3 J

2. 10^4 J

3. 10^5 J

4. 10^6 J

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

2 kg એક પરમાણ્વીય વાયુ એ $4 \times 10^4 \text{ N/m}^2$ દબાણ પર છે. આ વાયુની ઘનતા 8 kg/m^3 છે. ઊષ્મીય

1. 10^3 J
2. 10^4 J
3. 10^5 J
4. 10^6 J

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 particle executes simple harmonic motion with an amplitude of 5 cm. When the particle is at 4 cm from the mean position, the magnitude of its velocity in SI units is equal to that of its acceleration. Then, its periodic time in seconds is :

Options :

1. $\frac{4\pi}{3}$
2. $\frac{8\pi}{3}$
3. $\frac{3}{8}\pi$
4. $\frac{7}{3}\pi$

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

Correct Marks : 4 Wrong Marks : 1

एक कण 5 cm आयाम से सरल आवर्त गति कर रहा है। जब कण अपनी मध्य स्थिति से 4 cm दूरी पर है तब इसके वेग का परिमाण SI मानकों में इसके त्वरण में परिमाण के बराबर है। तो कण का सेकण्ड में आवर्तकाल होगा :

Options :

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

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

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

4. $\frac{7}{3}\pi$

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

Correct Marks : 4 Wrong Marks : 1

એક કણ 5 cm કંપવિસ્તારની રેખીય સરળ આવર્ત ગતિ કરે છે. જ્યારે આ કણ મધ્યમાન સ્થિતિથી 4 cm પર છે ત્યારે તેના SI એકમમાં વેગનું માન તેના પ્રેવગ જેટલું છે. તો તેનો સેકન્ડમાં આવર્તકાળ _____ હશે.

Options :

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

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

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

4. $\frac{7}{3}\pi$

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 closed organ pipe has a fundamental frequency of 1.5 kHz. The number of overtones that can be distinctly heard by a person with this organ pipe will be : (Assume that the highest frequency a person can hear is 20,000 Hz)

Options :

1. 6

3. 4

4. 5

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

Correct Marks : 4 Wrong Marks : 1

एक बंद ऑर्गन - पाईप की मूलभूत आवृत्ति 1.5 kHz है। इस ऑर्गन - पाईप से एक व्यक्ति को स्पष्ट सुनाई देने वाले अधिस्वरों की संख्या होगी : (व्यक्ति अधिकतम 20,000 Hz आवृत्ति की ध्वनि सुन सकता है)

Options :

1. 6

2. 7

3. 4

4. 5

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 બંધ ધ્વનિ (ઓર્ગન) નળીની મૂળભૂત આવૃત્તિ 1.5 kHz છે. આ ધ્વનિ-નળી વડે એક વ્યક્તિ દ્વારા સ્પષ્ટપણે સાંભળી શકતા અધિસ્વરોની સંખ્યા _____ છે. (વ્યક્તિદ્વારા સાંભળી શકાતી મહત્તમ આવૃત્તિ 20,000 Hz છે તેમ ધારો.)

Options :

1. 6

2. 7

3. 4

4. 5

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

Correct Marks : 4 Wrong Marks : 1

A parallel plate capacitor having capacitance 12 pF is charged by a battery to a potential difference of 10 V between its plates. The charging battery is now disconnected and a porcelain slab of dielectric constant 6.5 is slipped between the plates. The work done by the capacitor on the slab is :

Options :

1. 508 pJ
2. 600 pJ
3. 692 pJ
4. 560 pJ

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

12 pF धारिता के एक समानांतर पट्टे संधारित्र को 10 V विभवांतर की सेल से आवेशित किया जाता है। सेल को हटाने के पश्चात उसमें परावैद्युतांक 6.5 की एक पोर्सिलीन पट्टी को प्लेटों के ठीक बीच में डाल दिया जाता है। संधारित्र द्वारा पट्टी पर किया गया कार्य होगा :

Options :

1. 508 pJ
2. 600 pJ
3. 692 pJ
4. 560 pJ

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

12 pF કેપેસિટન્સ ધરાવતા એક સમાંતર પ્લેટ કેપેસિટરને એક બેટરી વડે તેની બે પ્લેટો વચ્ચે 10 V વિજસ્થિતિમાનના તફાવત સુધી ચાર્જ કરવામાં આવે છે. આ ચાર્જિંગ બેટરીને દૂર કરીને એક પોર્સેલિનના ચોસલા કે જેનો પરાવૈદ્યતાંક 6.5 છે તેને આ બે પ્લેટો વચ્ચે સરકાવવામાં આવે છે. આ કેપેસિટર વડે ચોસલા પર થતું કાર્ય _____ છે.

Options :

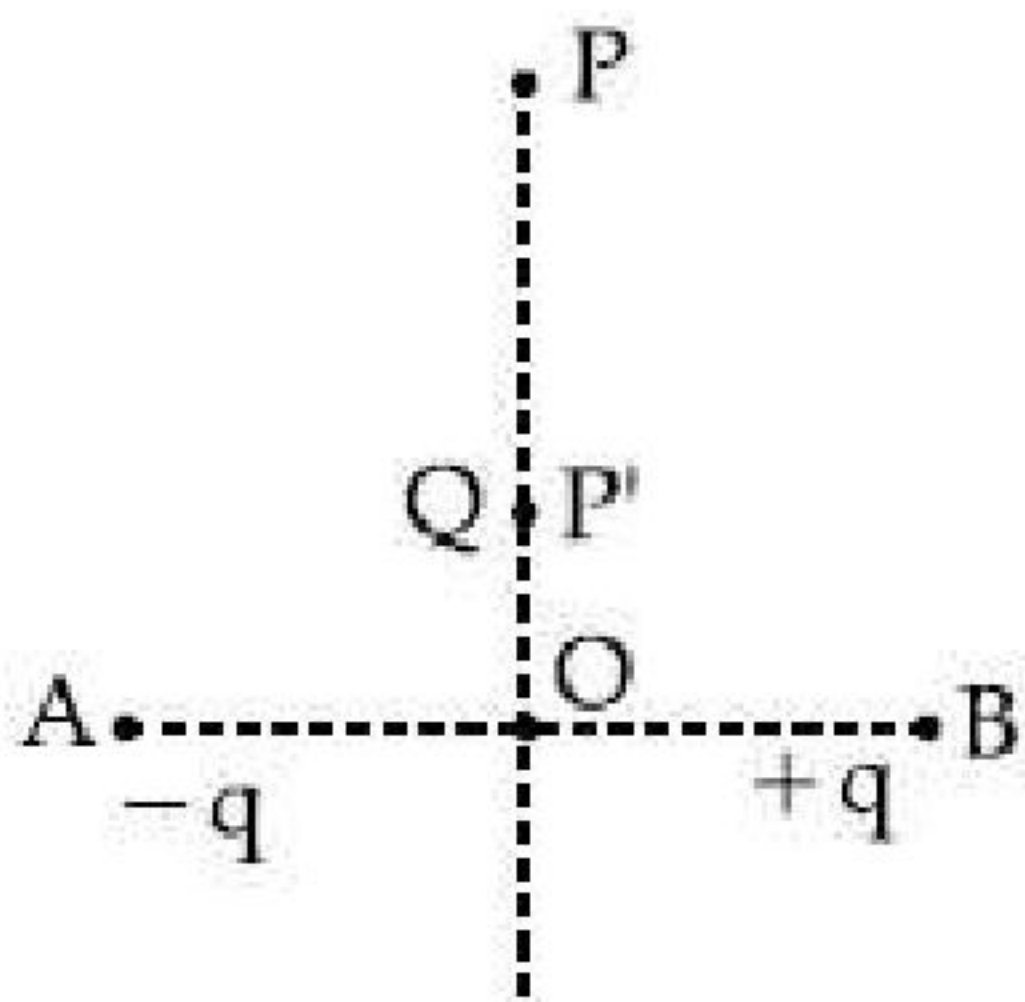
1. 508 pJ
2. 600 pJ
3. 692 pJ
4. 560 pJ

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

Charges $-q$ and $+q$ located at A and B, respectively, constitute an electric dipole. Distance $AB = 2a$, O is the mid point of the dipole and OP is perpendicular to AB. A charge Q is placed at P where $OP = y$ and $y \gg 2a$. The charge Q experiences an electrostatic force F. If Q is now moved along the equatorial line to P' such that

$OP' = \left(\frac{y}{3}\right)$, the force on Q will be close to : $\left(\frac{y}{3} \gg 2a\right)$



Options :

F

2. 3F
3. 9F
4. 27F

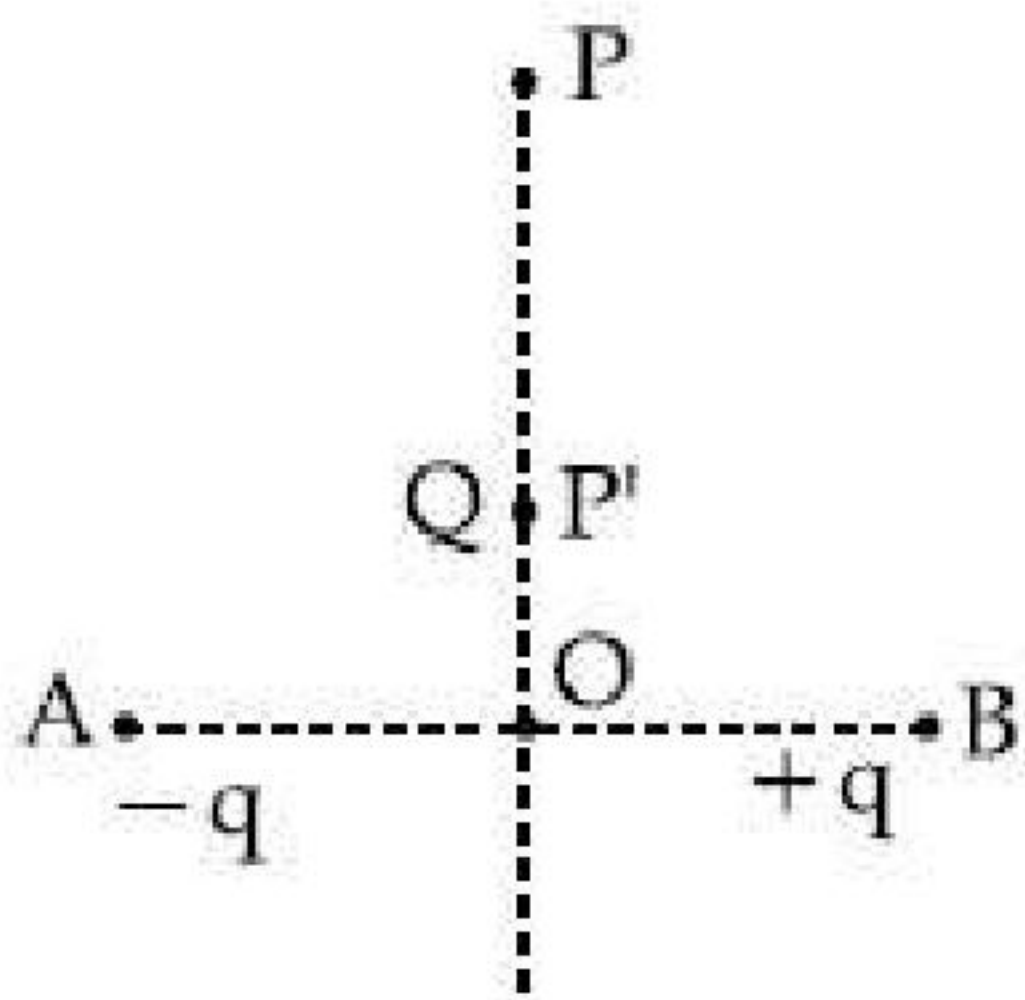
Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A तथा B पर रखे हुये आवेश, क्रमशः $-q$ और $+q$ एक विद्युत द्विध्रुव बनाते हैं। दूरी $AB = 2a$ है तथा AB का मध्य बिन्दु O है। OP रेखा AB के लम्बवत् है तथा $OP = y$ है, जहाँ $y \gg 2a$, P पर रखे एक Q आवेश पर F विद्युत बल द्विध्रुव द्वारा लगता है। यदि Q को P

से OP की दिशा में P' पर ले जाते हैं जहाँ $OP' = \left(\frac{y}{3}\right)$, तो इस पर लगे बल का सन्निकट मान होगा :

(दिया है: $\frac{y}{2} \gg 2a$)



Options :

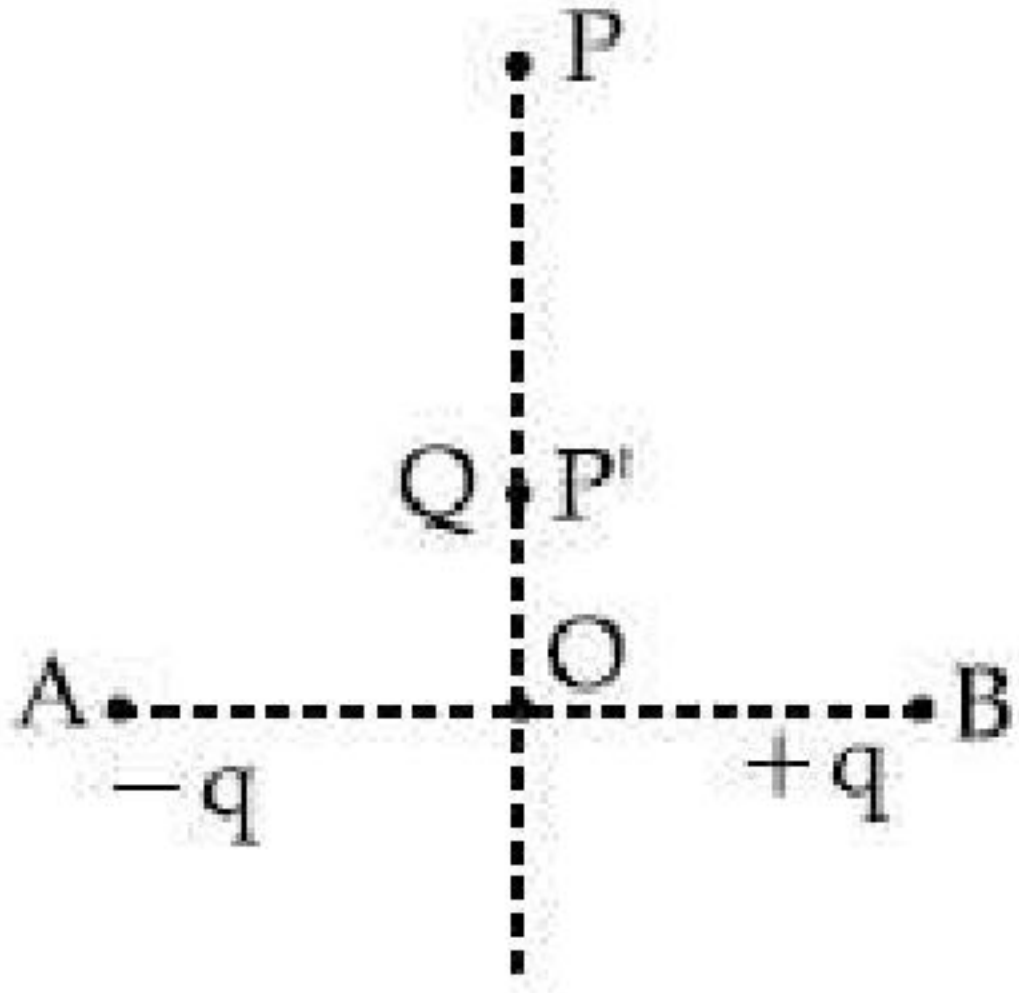
1. $\frac{F}{3}$
2. 3F
3. 9F
4. 27F

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

વિદ્યુતભારો $-q$ અને $+q$ એ અનુક્રમે A અને B પર સ્થિત છે જે વિદ્યુતદ્વિધ્રુવી રચે છે. અંતર $AB=2a$ અને O એ આ દ્વિધ્રુવી AB નું મધ્યબિંદુ છે. OP એ આ દ્વિધ્રુવી વિષુવ-રેખા અને OP એ AB લંબ છે. એક વિદ્યુતભાર Q ને P પર મુકવામાં આવે છે, જ્યાં $OP=y$ અને $y \gg 2a$. આ વિદ્યુતભાર, F જેટલું સ્થિત વિદ્યુત બળ અનુભવે છે. હવે જો Q ને વિષુવરેખા પર P' કે

જેથી $OP' = \left(\frac{y}{3}\right)$ સુધી ખસેડવામાં આવે તો Q પરનું બળ _____ ની નજીકનું હશે.

($\frac{y}{3} \gg 2a$ આપેલ છે.)



Options :

1. $\frac{F}{3}$
2. $3F$
3. $9F$
4. $27F$

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

Correct Marks : 4 Wrong Marks : 1

Four equal point charges Q each are placed in the xy plane at $(0, 2)$, $(4, 2)$, $(4, -2)$ and $(0, -2)$. The work required to put a fifth charge Q at the origin of the coordinate system will be :

Options :

$$\frac{Q^2}{\epsilon_0} \left(1 + \frac{1}{\epsilon_0} \right)$$

2. $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

3. $\frac{Q^2}{4\pi\epsilon_0}$

4. $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{3}}\right)$

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

Correct Marks : 4 Wrong Marks : 1

ચાર બરાબર બિન્દુ આવેશો Q કો xy સમતલ મેં બિન્દુ $(0, 2)$, $(4, 2)$, $(4, -2)$ તથા $(0, -2)$ પર રખા હૈ।
 ઇક પાંચવે આવેશ Q કો મૂલ બિન્દુ પર રખને મેં કિયા
 ગયા કાર્ય હોગા :

Options :

1. $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{5}}\right)$

2. $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

3. $\frac{Q^2}{4\pi\epsilon_0}$

4. $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{3}}\right)$

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

Correct Marks : 4 Wrong Marks : 1

ચાર સમાન વિદ્યુતભારો Q ને xy સમતલમાં $(0, 2)$, $(4, 2)$, $(4, -2)$ અને $(0, -2)$ બિંદુઓ પર મુકવામાં આવેલ છે. આ તંત્રના ઉગમ બિંદુ પર પાંચમા વિદ્યુતભાર Q ને મુકવા જરૂરી કાર્ય _____ છે.

Options :

1. $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{5}}\right)$

2. $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

3. $\frac{Q^2}{4\pi\epsilon_0}$

4. $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{3}}\right)$

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

Correct Marks : 4 Wrong Marks : 1

A current of 2 mA was passed through an unknown resistor which dissipated a power of 4.4 W. Dissipated power when an ideal power supply of 11 V is connected across it is :

Options :

1. $11 \times 10^{-3} \text{ W}$

2. $11 \times 10^{-4} \text{ W}$

3. $11 \times 10^{-5} \text{ W}$

4. $11 \times 10^5 \text{ W}$

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

एक अज्ञात प्रतिरोध से जब 2 mA की धारा बहती है तो 4.4 W शक्ति का क्षय होता है। यदि इस प्रतिरोध को 11 V की एक आदर्श बैटरी से जोड़ा जाये तो शक्ति क्षय का मान होगा :

Options :

1. $11 \times 10^{-3} \text{ W}$

3. $11 \times 10^{-5} \text{ W}$

4. $11 \times 10^5 \text{ W}$

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

Correct Marks : 4 Wrong Marks : 1

એક અજ્ઞાત અવરોધમાંથી 2 mA પ્રવાહ પસાર કરતા તે 4.4 W પાવર વિખેરત કરે છે. જ્યારે તેને 11 V ના આદર્શ પાવર સપ્લાય સાથે જોડવામાં આવે ત્યારે વિખેરત થતો પાવર _____ છે.

Options :

1. $11 \times 10^{-3} \text{ W}$

2. $11 \times 10^{-4} \text{ W}$

3. $11 \times 10^{-5} \text{ W}$

4. $11 \times 10^5 \text{ W}$

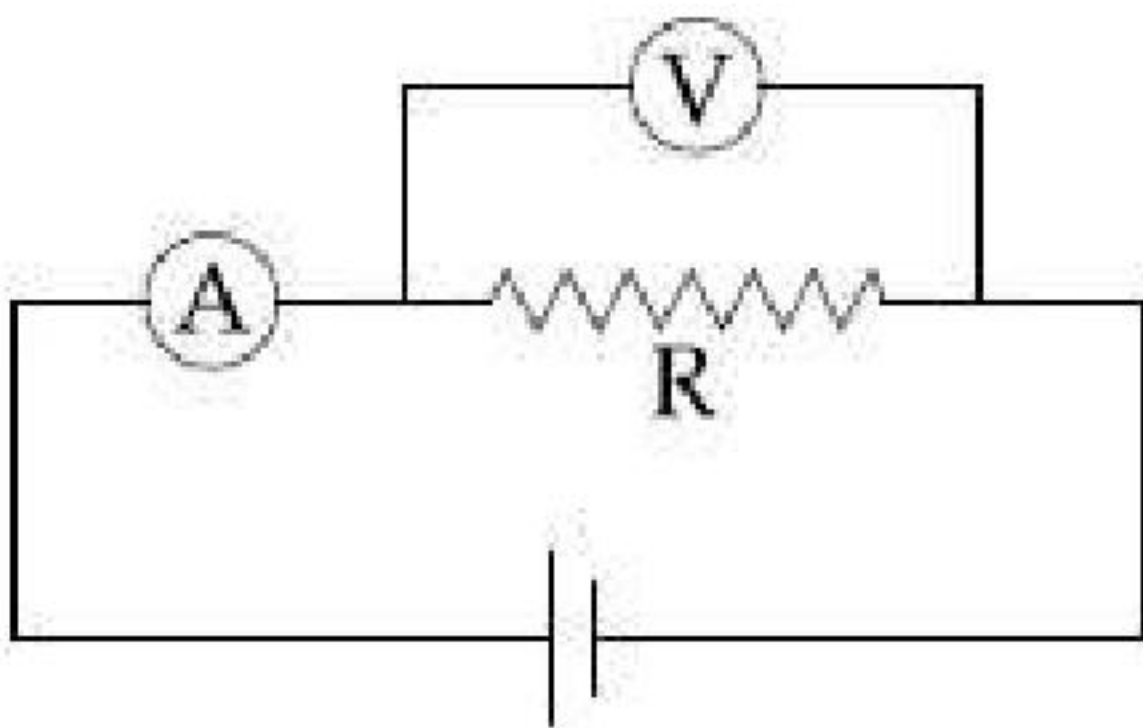
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The actual value of resistance R , shown in the figure is 30Ω . This is measured in an experiment as shown using the standard

formula $R = \frac{V}{I}$, where V and I are the

readings of the voltmeter and ammeter, respectively. If the measured value of R is 5% less, then the internal resistance of the voltmeter is :



Options :

1. 35Ω

2. 570Ω

3. $350\ \Omega$
4. $600\ \Omega$

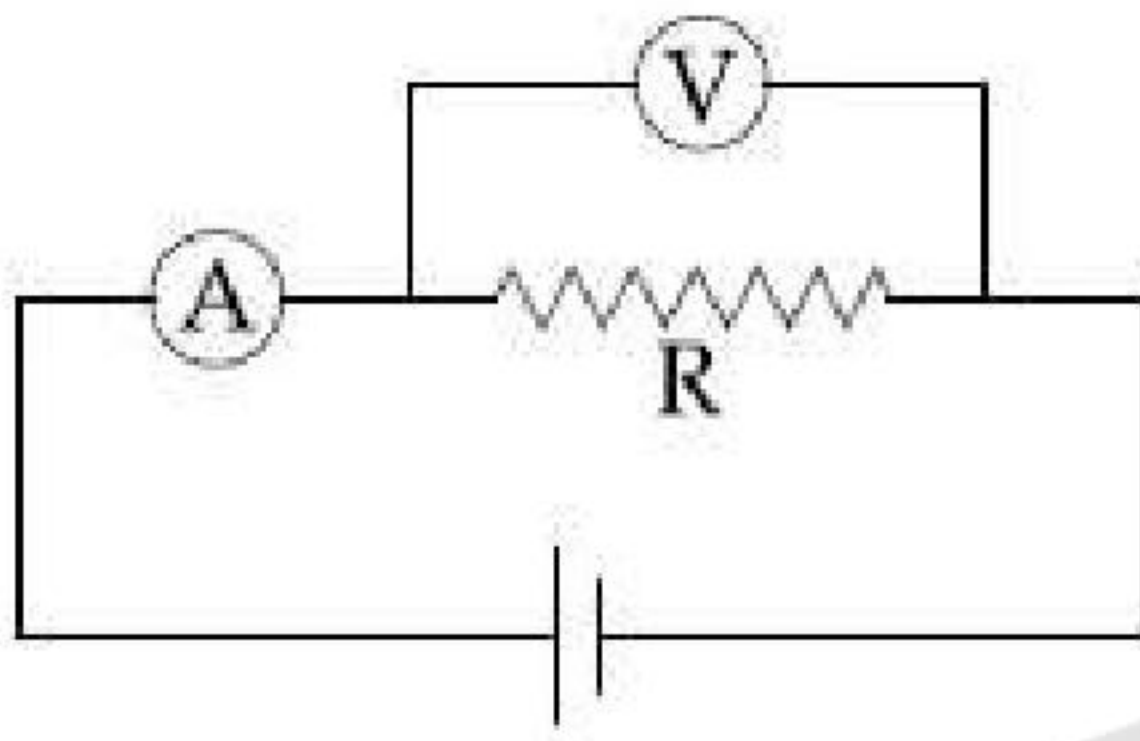
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाये गये प्रतिरोध R का वास्तविक मान

$30\ \Omega$ है। इसे एक मानक सूत्र $R = \frac{V}{I}$ का उपयोग

करके मापा जाता है। यहाँ V तथा I , क्रमशः वोल्टमीटर तथा ऐमीटर की रीडिंग हैं। यदि R का मापा गया मान 5% कम आता है तो वोल्टमीटर के आंतरिक प्रतिरोध का मान होगा :



Options :

1. $35\ \Omega$
2. $570\ \Omega$
3. $350\ \Omega$
4. $600\ \Omega$

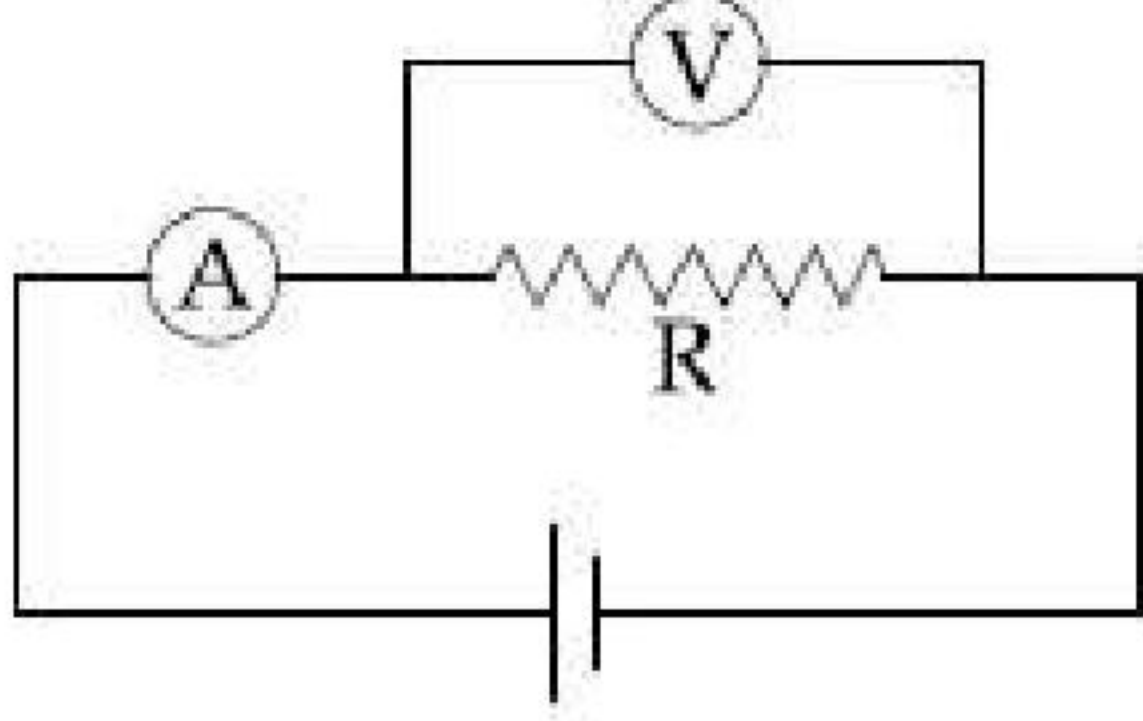
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવેલ અવરોધ R નું વાસ્તવિક મૂલ્ય

30Ω છે. આનું માપન એક પ્રયોગ દ્વારા $R = \frac{V}{I}$ ના

પ્રમાણિત સંબંધથી માપવામાં આવે છે, જ્યાં V અને I એ અનુક્રમે વોલ્ટમીટર અને એમીટરના વાંચનો છે. જો માપવામાં આવેલ R નું મૂલ્ય 5% ઓછું હોય, તો આ વોલ્ટમીટરનો આંતરિક અવરોધ _____ છે.



Options :

1. 35Ω
2. 570Ω
3. 350Ω
4. 600Ω

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

Correct Marks : 4 Wrong Marks : 1

A hoop and a solid cylinder of same mass and radius are made of a permanent magnetic material with their magnetic moment parallel to their respective axes. But the magnetic moment of hoop is twice of solid cylinder. They are placed in a uniform magnetic field in such a manner that their magnetic moments make a small angle with the field. If the oscillation periods of hoop and cylinder are T_h and T_c respectively, then :

Options :

1. $T_h = 0.5T_c$
2. $T_h = 2T_c$
3. $T_h = T_c$

4. $T_h = 1.5T_c$

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

સ્થાયી ચુમ્બકીય પદાર્થો સે બને હુએ એક છલ્લે તથા એક ઠોસ બેલન કા દ્રવ્યમાન તથા ત્રિજ્યા બરાબર હૈં. ઇનકે ચુમ્બકીય આઘૂર્ણ ડનકી અપની અક્ષ કે સમાન્તર હૈં, લેકિન છલ્લે કા ચુમ્બકીય આઘૂર્ણ બેલન સે ડો ગુના હૈં. ઇન ડોનોં કો એક હી, એકસમાન ચુમ્બકીય ક્ષેત્ર મેં ઇસ તરહ છોડા જાતા હૈ કિ ઇનકા ચુમ્બકીય આઘૂર્ણ, ચુમ્બકીય ક્ષેત્ર કી દિશા સે એક છોટા સા કોણ બનાતા હૈ. યદિ છલ્લે એવં બેલન કે ડોલન કા આવર્તકાલ ક્રમશઃ T_h તથા T_c હૈં તો :

Options :

1. $T_h = 0.5T_c$

2. $T_h = 2T_c$

3. $T_h = T_c$

4. $T_h = 1.5T_c$

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

Correct Marks : 4 Wrong Marks : 1

એક ચુંબકીય દ્રવ્યમાંથી સમાન દ્રવ્યમાન અને સમાન ત્રિજ્યાનો એક પાટો (Hoop) અને એક ઘન નળાકાર બનાવેલ છે. ઘન નળાકાર કરતા આ પાટા (Hoop) ની ચુંબકીય ચાકમાત્રા બમણી છે. તેને સમાન ચુંબકીય ક્ષેત્રમાં એવી રીતે મુકવામાં આવે છે કે તેમની મધ્ય અક્ષ આ ક્ષેત્ર સાથે નાનો કોણ બનાવે. જો પાટા (Hoop) અને નળાકારના દોલનનો આવર્તકાળ અનુક્રમે T_h અને T_c હોય તો :

Options :

1. $T_h = 0.5T_c$

2. $T_h = 2T_c$

3. $T_h = T_c$

4. $T_h = 1.5T_c$

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

At some location on earth the horizontal component of earth's magnetic field is $18 \times 10^{-6} \text{ T}$. At this location, magnetic needle of length 0.12 m and pole strength 1.8 Am is suspended from its mid-point using a thread, it makes 45° angle with horizontal in equilibrium. To keep this needle horizontal, the vertical force that should be applied at one of its ends is :

Options :

1. $6.5 \times 10^{-5} \text{ N}$
2. $1.8 \times 10^{-5} \text{ N}$
3. $1.3 \times 10^{-5} \text{ N}$
4. $3.6 \times 10^{-5} \text{ N}$

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

किसी स्थान पर पृथ्वी के चुम्बकीय क्षेत्र का क्षैतिज घटक $18 \times 10^{-6} \text{ T}$ है। इस स्थान पर 0.12 m लम्बाई तथा 1.8 Am ध्रुव की तीव्रता वाली एक चुम्बकीय सुई को उसके मध्य बिन्दु से एक धागे द्वारा लटकाया जाता है। साम्यावस्था में यह सुई क्षैतिज से 45° का कोण बनाती है। सुई को क्षैतिज रखने हेतु इसके कोई एक सिरे पर ऊर्ध्वाधर बल लगाना चाहिये :

Options :

1. $6.5 \times 10^{-5} \text{ N}$
2. $1.8 \times 10^{-5} \text{ N}$
3. $1.3 \times 10^{-5} \text{ N}$
4. $3.6 \times 10^{-5} \text{ N}$

Correct Marks : 4 Wrong Marks : 1

0.12 m લંબાઈની એક ચુંબકીય સોયને તેના મધ્યબિંદુમાંથી એક દોરી વડે એ રીતે લટકાવામાં આવે છે કે જેથી તે સમક્ષિતિજ સાથે 45° કોણ બનાવે છે. પૃથ્વીના ચુંબકીય ક્ષેત્રનો સમક્ષિતિજ ઘટક $18 \times 10^{-6} \text{ T}$ છે. જો આ સોયના ધ્રુવની પ્રબળતા 1.8 Am હોય તો આ સોયને તેના મધ્યબિંદુથી સમક્ષિતિજ સ્થિતિમાં લટકાવવામાં આવે છે. તેને સમક્ષિતિજ રાખવા તેના છેડા પર લગાડવું પડતું ઊર્ધ્વબળ _____ છે.

Options :

1. $6.5 \times 10^{-5} \text{ N}$
2. $1.8 \times 10^{-5} \text{ N}$
3. $1.3 \times 10^{-5} \text{ N}$
4. $3.6 \times 10^{-5} \text{ N}$

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

The self induced emf of a coil is 25 volts. When the current in it is changed at uniform rate from 10 A to 25 A in 1 s, the change in the energy of the inductance is :

Options :

1. 437.5 J
2. 540 J
3. 637.5 J
4. 740 J

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

Correct Marks : 4 Wrong Marks : 1

એક ગુંચળાનું આત્મપ્રેરિત emf 25 V છે, જ્યારે તેમાંનો પ્રવાહ સમાન દરથી 1 s માં 10 A થી 25 A કરવામાં આવે છે. ઊર્જામાં થતો ફેરફાર _____ છે.

2. 540 J
3. 637.5 J
4. 740 J

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

Correct Marks : 4 Wrong Marks : 1

जब एक कुण्डली में धारा को 1 s में एकसमान दर से 10 A से 25 A बढ़ाते हैं तो कुण्डली में स्वप्रेरित विद्युत वाहक बल 25 V है। कुण्डली की ऊर्जा में परिवर्तन का मान होगा :

Options :

1. 437.5 J
2. 540 J
3. 637.5 J
4. 740 J

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

Correct Marks : 4 Wrong Marks : 1

The electric field of a plane polarized electromagnetic wave in free space at time $t = 0$ is given by an expression

$$\vec{E}(x, y) = 10 \hat{j} \cos [(6x + 8z)]$$

The magnetic field $\vec{B}(x, z, t)$ is given by : (c is the velocity of light)

Options :

1. $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z - 10ct)]$
2. $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x - 8z + 10ct)]$

3. $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x + 8z - 10ct)]$

4. $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z + 10ct)]$

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 मुक्त आकाश में समतल ध्रुवित विद्युत चुम्बकीय तरंग का $t=0$ पर विद्युत क्षेत्र निम्न है,

$$\vec{E}(x, y) = 10 \hat{j} \cos [(6x + 8z)]$$

इसका चुम्बकीय क्षेत्र $\vec{B}(x, z, t)$ होगा : (c , प्रकाश की चाल है)

Options :

1. $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z - 10ct)]$

2. $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x - 8z + 10ct)]$

3. $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x + 8z - 10ct)]$

4. $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z + 10ct)]$

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

મુક્ત અવકાશમાં $t=0$ સમયે એક સમતલ ધ્રુવીભૂત વિદ્યુતચુંબકીય તરંગના વિદ્યુતક્ષેત્રને

$$\vec{E}(x, y) = 10 \hat{j} \cos [(6x + 8z)]$$

વડે આપવામાં આવે છે. ચુંબકીય ક્ષેત્ર $\vec{B}(x, z, t)$ ને આપવામાં આવે છે : (c એ પ્રકાશનો વેગ છે.)

1. $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z - 10 ct)]$
2. $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x - 8z + 10 ct)]$
3. $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x + 8z - 10 ct)]$
4. $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z + 10 ct)]$

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

The eye can be regarded as a single refracting surface. The radius of curvature of this surface is equal to that of cornea (7.8 mm). This surface separates two media of refractive indices 1 and 1.34. Calculate the distance from the refracting surface at which a parallel beam of light will come to focus.

Options :

1. 2 cm
2. 1 cm
3. 3.1 cm
4. 4.0 cm

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

माना कि आँख एक एकल अपवर्तक पृष्ठ है। इस पृष्ठ की वक्रता त्रिज्या कॉर्निया की वक्रता त्रिज्या (7.8 mm) के बराबर है। यह पृष्ठ अपवर्तनांक 1 तथा 1.34 के माध्यमों को पृथक् करता है। इस अपवर्तक पृष्ठ से वह दूरी जिस पर प्रकाश की समान्तर किरणें फोकस में आयेंगी, होगी :

1. 2 cm
2. 1 cm
3. 3.1 cm
4. 4.0 cm

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

આંખને 7.8 mm વક્રતા ત્રિજ્યાના પડદા (cornea) થી એક વક્રીભૂત સપાટી તરીકે લઈ શકાય કે જે 1 અને 1.34 વક્રીભવનાંક ધરાવતા બે માધ્યમોને જુદા પાડે છે. એક સમાંતર પ્રકાશપૂંજ આ વક્રીભૂત સપાટીથી જે અંતર પર કેન્દ્રિત થાય તે અંતર ગણો :

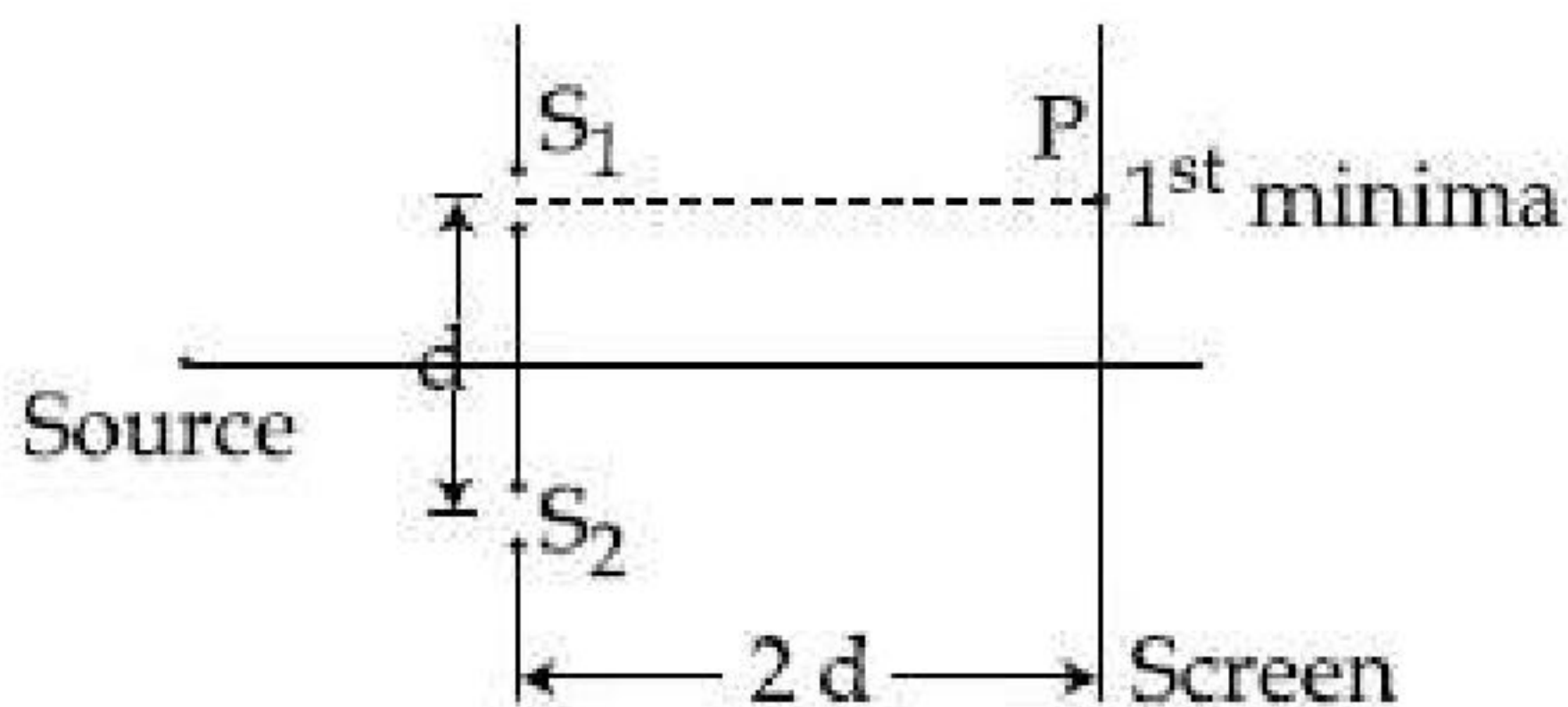
Options :

1. 2 cm
2. 1 cm
3. 3.1 cm
4. 4.0 cm

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

Consider a Young's double slit experiment as shown in figure. What should be the slit separation d in terms of wavelength λ such that the first minima occurs directly in front of the slit (S_1) ?



Options :

1. $\frac{\lambda}{(\sqrt{5} - 2)}$

2. $\frac{\lambda}{2(\sqrt{5} - 2)}$

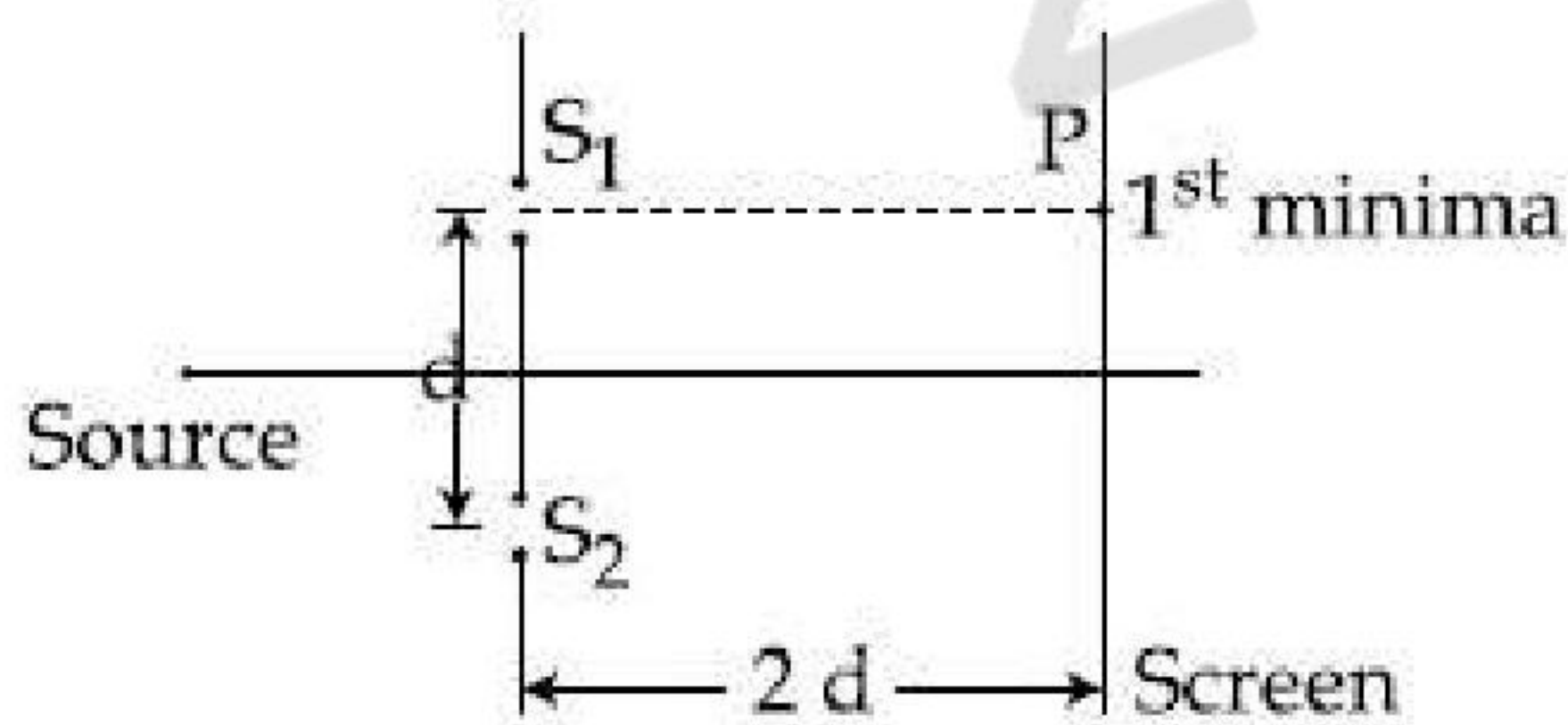
3. $\frac{\lambda}{(5 - \sqrt{2})}$

4. $\frac{\lambda}{2(5 - \sqrt{2})}$

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

चित्र में दिखाये गये यंग के द्विझिरी प्रयोग के अनुसार तरंगदैर्घ्य λ के रूप में झिरियों के बीच की वह दूरी d क्या होगी जिससे प्रथम निम्निष्ठ झिरी S_1 के ठीक सामने बनता है?



Options :

1. $\frac{\lambda}{(\sqrt{5} - 2)}$

2. $\frac{\lambda}{2(\sqrt{5} - 2)}$

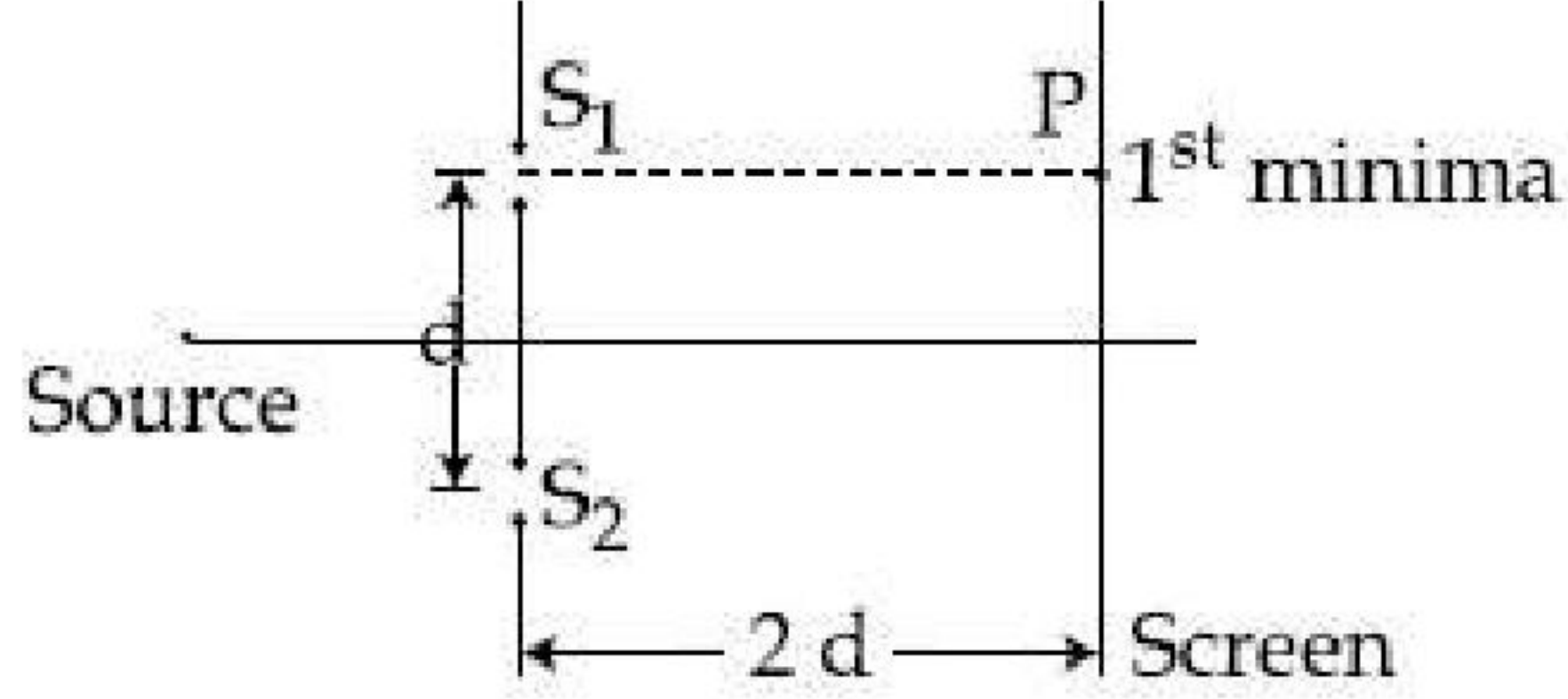
3. $\frac{\lambda}{(5 - \sqrt{2})}$

4. $\frac{\lambda}{2(5 - \sqrt{2})}$

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

આકૃતિમાં બતાવ્યા પ્રમાણેનો એક યંગનો ડબલ સ્લિટનો પ્રયોગ ધ્યાનમાં લો પ્રથમ લઘુત્તમ સ્લિટ S_1 ની સામે આવે તે માટે તરંગ લંબાઈ λ ના પદમાં આ સ્લિટો વચ્ચેનું અંતર d કેટલું હશે?



Options :

1. $\frac{\lambda}{(\sqrt{5} - 2)}$
2. $\frac{\lambda}{2(\sqrt{5} - 2)}$
3. $\frac{\lambda}{(5 - \sqrt{2})}$
4. $\frac{\lambda}{2(5 - \sqrt{2})}$

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

Correct Marks : 4 Wrong Marks : 1

A metal plate of area $1 \times 10^{-4} \text{ m}^2$ is illuminated by a radiation of intensity 16 mW/m^2 . The work function of the metal is 5 eV . The energy of the incident photons is 10 eV and only 10% of it produces photo electrons. The number of emitted photo electrons per second and their maximum energy, respectively, will be ;
[$1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$]

Options :

1. 10^{10} and 5 eV

3. 10^{12} and 5 eV
4. 10^{14} and 10 eV

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

$1 \times 10^{-4} \text{ m}^2$ क्षेत्रफल की धातु की एक प्लेट को 16 mW/m^2 तीव्रता के प्रकाश से प्रकाशित किया जाता है। धातु का कार्यफलन 5 eV है। आपतित फोटॉनों की ऊर्जा 10 eV है तथा केवल 10% फोटॉनों से इलेक्ट्रॉन उत्सर्जित होते हैं। प्रति सेकण्ड उत्सर्जित हुए कुल फोटोइलेक्ट्रॉन तथा उनकी अधिकतम ऊर्जा, क्रमशः होगी :

[दिया है : $1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$]

Options :

1. 10^{10} तथा 5 eV
2. 10^{11} तथा 5 eV
3. 10^{12} तथा 5 eV
4. 10^{14} तथा 10 eV

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

$1 \times 10^{-4} \text{ m}^2$ क्षेत्रફળની ધાતુની એક પ્લેટને 16 mW/m^2 તીવ્રતાના વિકિરણ વડે પ્રકાશિત કરવામાં આવે છે. આ ધાતુનું કાર્યવિધેય 5 eV છે. આપાત ફોટોન્સની ઊર્જા 10 eV છે અને તેના ફક્ત 10% જ ફોટો ઇલેક્ટ્રોન ઉત્પન્ન કરે છે. પ્રતિ સેકન્ડ ઉત્સર્જિત ફોટોઇલેક્ટ્રોન્સની સંખ્યા અને તેની મહત્તમ ઊર્જા ગણો. [1 eV = $1.6 \times 10^{-19} \text{ J}$ આપેલ છે.]

Options :

1. 10^{10} અને 5 eV
2. 10^{11} અને 5 eV

4. 10^{14} અને 10 eV

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

Correct Marks : 4 Wrong Marks : 1

Consider the nuclear fission



Given that the binding energy/nucleon of Ne^{20} , He^4 and C^{12} are, respectively, 8.03 MeV , 7.07 MeV and 7.86 MeV , identify the correct statement :

Options :

1. energy of 11.9 MeV has to be supplied
2. energy of 3.6 MeV will be released
3. energy of 12.4 MeV will be supplied
4. 8.3 MeV energy will be released

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

Correct Marks : 4 Wrong Marks : 1

एक नाभिकीय विघटन है,



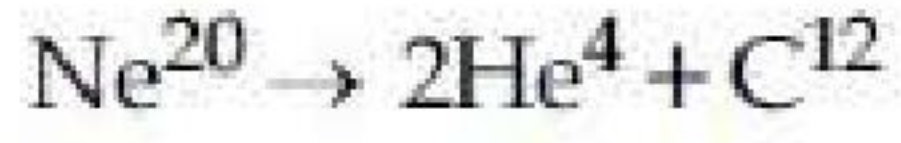
यदि Ne^{20} , He^4 तथा C^{12} की प्रति न्यूक्लियॉन बन्धन ऊर्जा क्रमशः 8.03 MeV , 7.07 MeV तथा 7.86 MeV हैं तो निम्न में कौन-सा कथन सत्य है?

Options :

1. 11.9 MeV ऊर्जा को बाहर से देना पड़ेगा
2. 3.6 MeV ऊर्जा उत्सर्जित होगी
3. 12.4 MeV ऊर्जा को बाहर से देना पड़ेगा
4. 8.3 MeV ऊर्जा उत्सर्जित होगी

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



વિખંડન ધ્યાનમાં લો. જો Ne^{20} , He^4 અને C^{12} ની બંધનઊર્જા/નાભીકરણ ક્રમશઃ 8.03 MeV, 7.07 MeV અને 7.86 MeV આપેલ છે. સાચુ વિધાન પસંદ કરો :

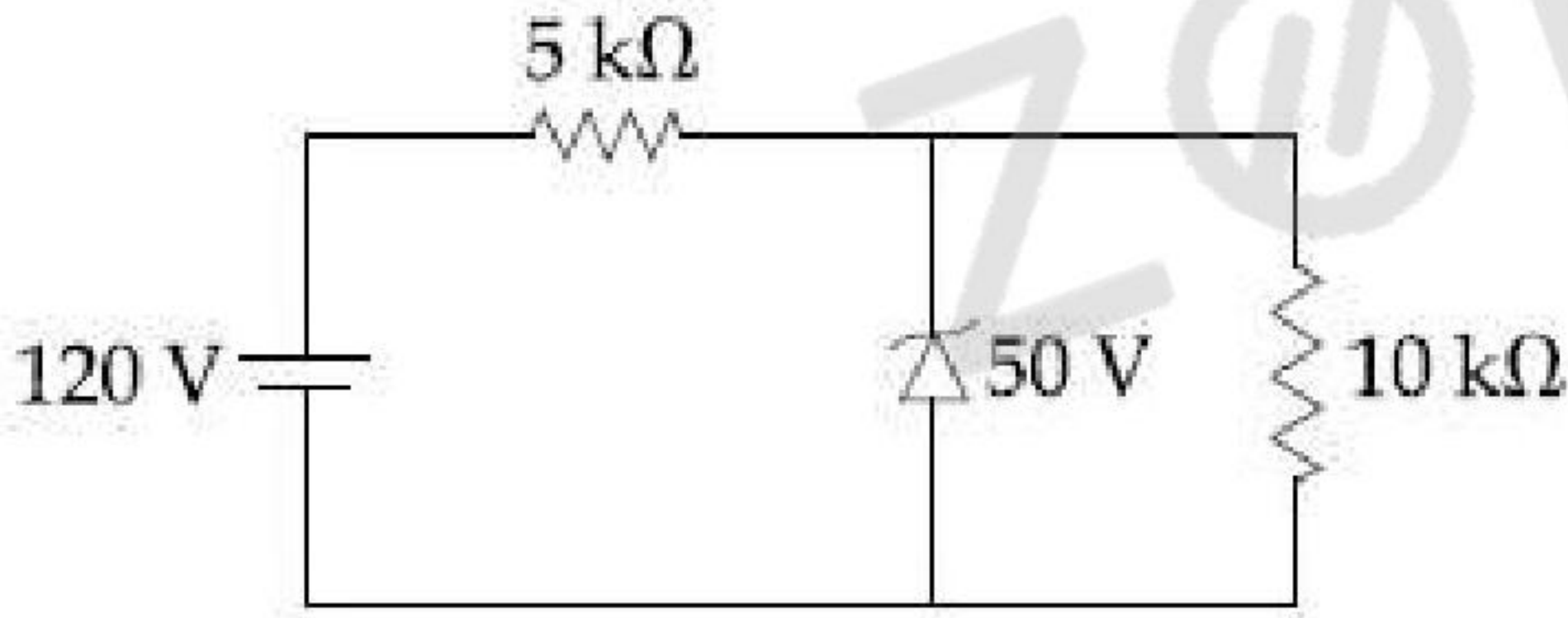
Options :

1. 11.9 MeV ઊર્જા આપવી પડે છે.
2. 3.6 MeV ઊર્જા મુક્ત થાય છે.
3. 12.4 MeV ઊર્જા આપવી પડે છે.
4. 8.3 MeV ઊર્જા મુક્ત થાય છે.

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

For the circuit shown below, the current through the Zener diode is :



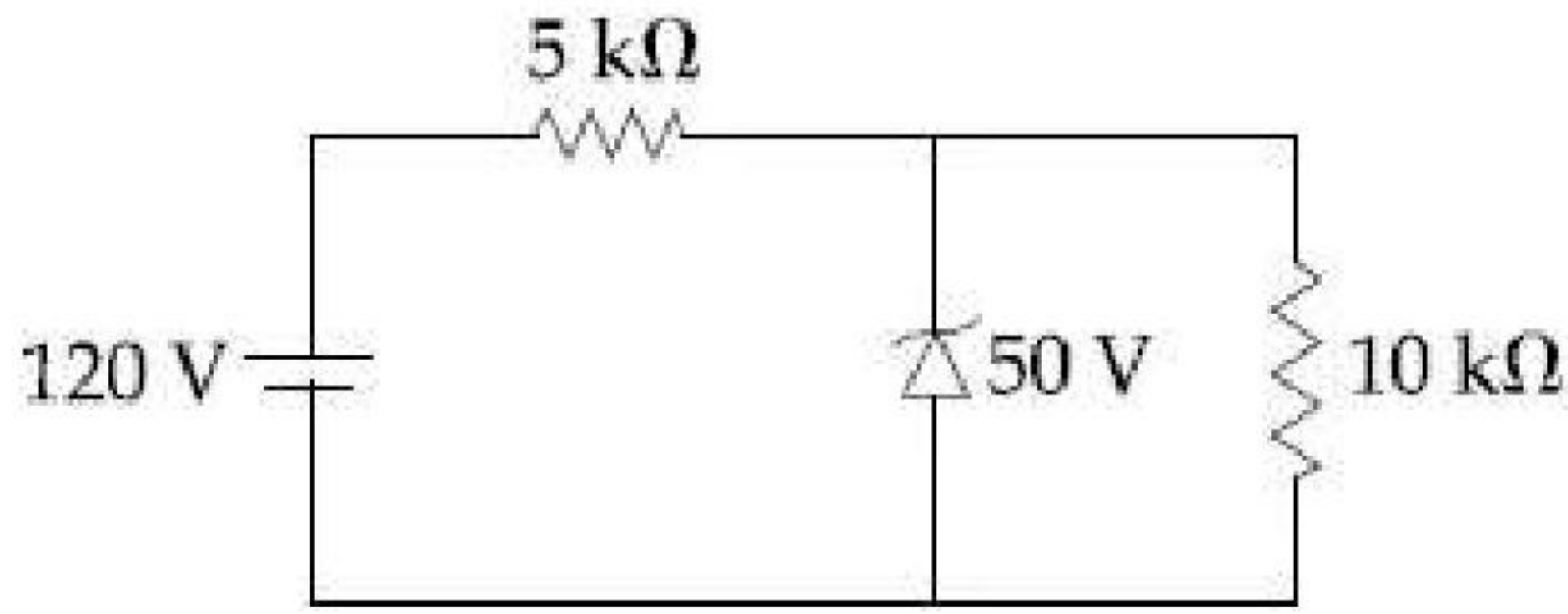
Options :

1. Zero
2. 5 mA
3. 14 mA
4. 9 mA

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

Correct Marks : 4 Wrong Marks : 1

दिये गये परिपथ में ज़ीनर डायोड में धारा का मान होगा :



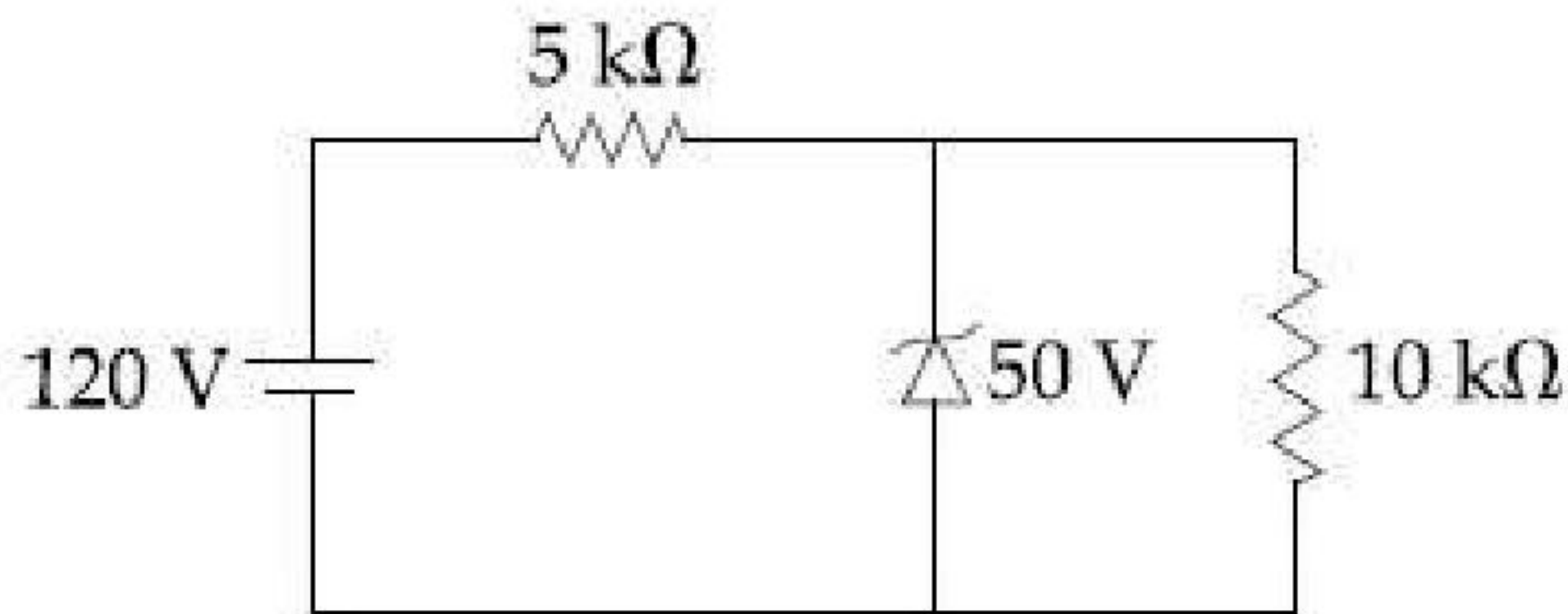
Options :

1. Zero
2. 5 mA
3. 14 mA
4. 9 mA

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

નીચે આપેલ પરિપથમાં ઝેનર ડાયોડમાંથી પસાર થતો પ્રવાહ _____ છે.



Options :

1. શૂન્ય
2. 5 mA
3. 14 mA
4. 9 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

The modulation frequency of an AM radio station is 250 kHz, which is 10% of the carrier wave. If another AM station approaches you for license what broadcast frequency will you allot ?

Options :

1. 2000 kHz
2. 2250 kHz
3. 2750 kHz
4. 2900 kHz

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

Correct Marks : 4 Wrong Marks : 1

एक AM रेडियो स्टेशन की माडुलन आवृत्ति 250 kHz है, जो कि उसकी वाहक तरंग आवृत्ति की 10% है। यदि एक और रेडियो स्टेशन लाइसेंस के लिए आता है तो आप कौन-सी प्रसार आवृत्ति आवंटित करेंगे ?

Options :

1. 2000 kHz
2. 2250 kHz
3. 2750 kHz
4. 2900 kHz

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

Correct Marks : 4 Wrong Marks : 1

એક AM રેડિયો સ્ટેશનની મોડ્યુલેશન આવૃત્તિ 250 kHz છે, જે કેરિયર તરંગની 10% છે. જો કોઈ બીજો AM રેડિયો સ્ટેશન લાયસન્સ માટે તમારો સંપર્ક કરે છે, તો તમે કઈ પ્રસારણ આવૃત્તિ ફાળવશો ?

Options :

1. 2000 kHz
2. 2250 kHz

3. 2750 kHz

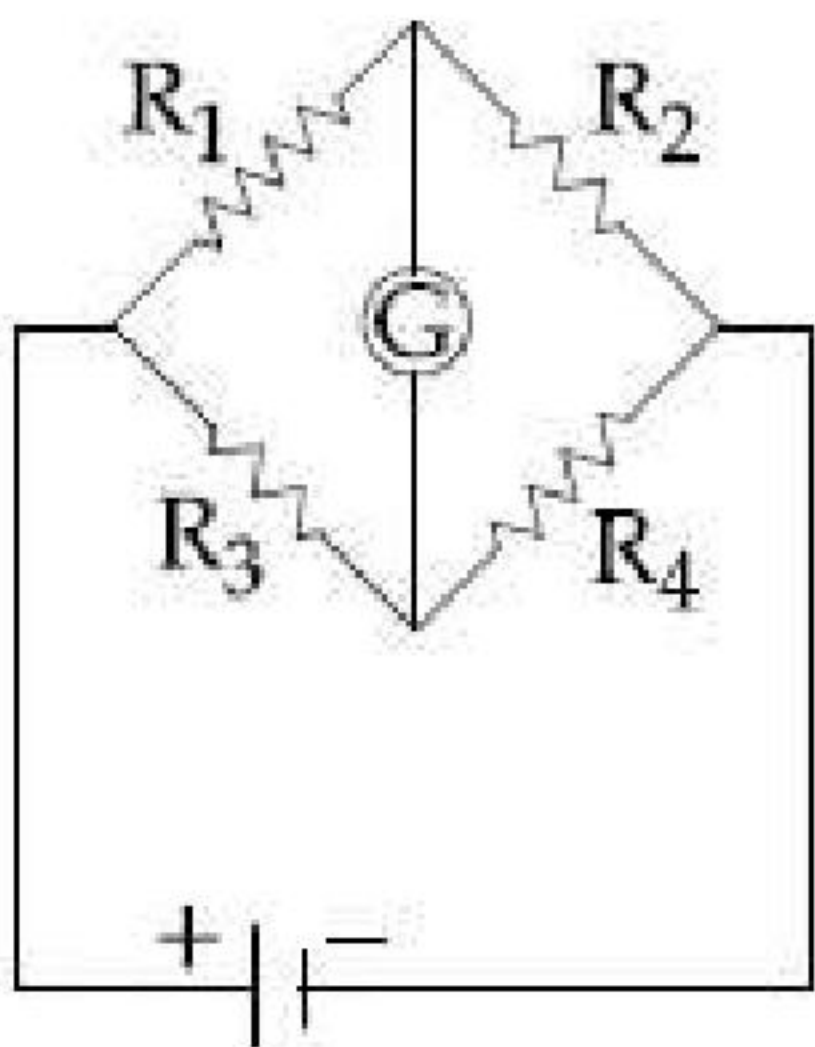
4. 2900 kHz

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 Wheatstone bridge shown in Fig. here, gets balanced when the carbon resistor used as R_1 has the colour code (Orange, Red, Brown). The resistors R_2 and R_4 are $80\ \Omega$ and $40\ \Omega$, respectively.

Assuming that the colour code for the carbon resistors gives their accurate values, the colour code for the carbon resistor, used as R_3 , would be :



Options :

1. Grey, Black, Brown

2. Red, Green, Brown

3. Brown, Blue, Black

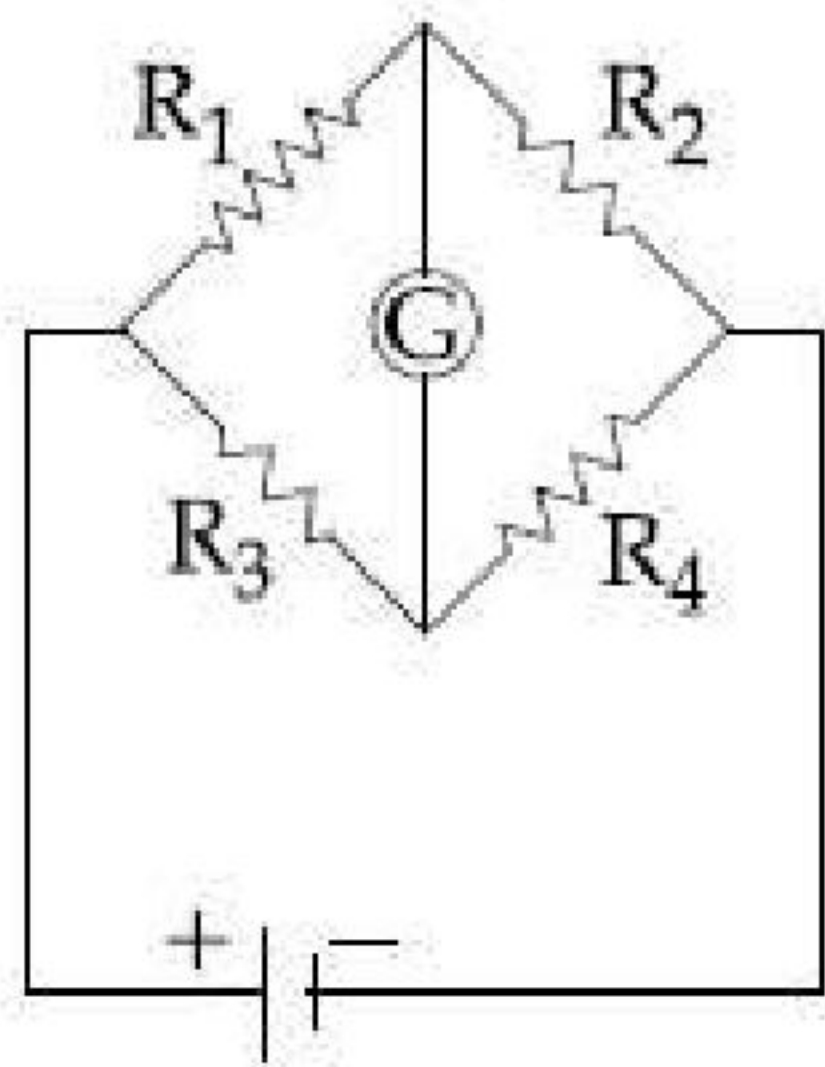
4. Brown, Blue, Brown

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

दिखाये गया चित्र में व्हीटस्टोन सेतु संतुलित होता है जब कार्बन प्रतिरोध R_1 का कलर कोड नारंगी, लाल तथा भूरा है। प्रतिरोध R_2 व R_4 क्रमशः $80\ \Omega$ तथा $40\ \Omega$ हैं।

यह मानते हुये कि कलर कोड कार्बन प्रतिरोध का यथार्थ मान देता है, R_3 को कार्बन प्रतिरोध मानते हुए उसका कलर कोड होगा :



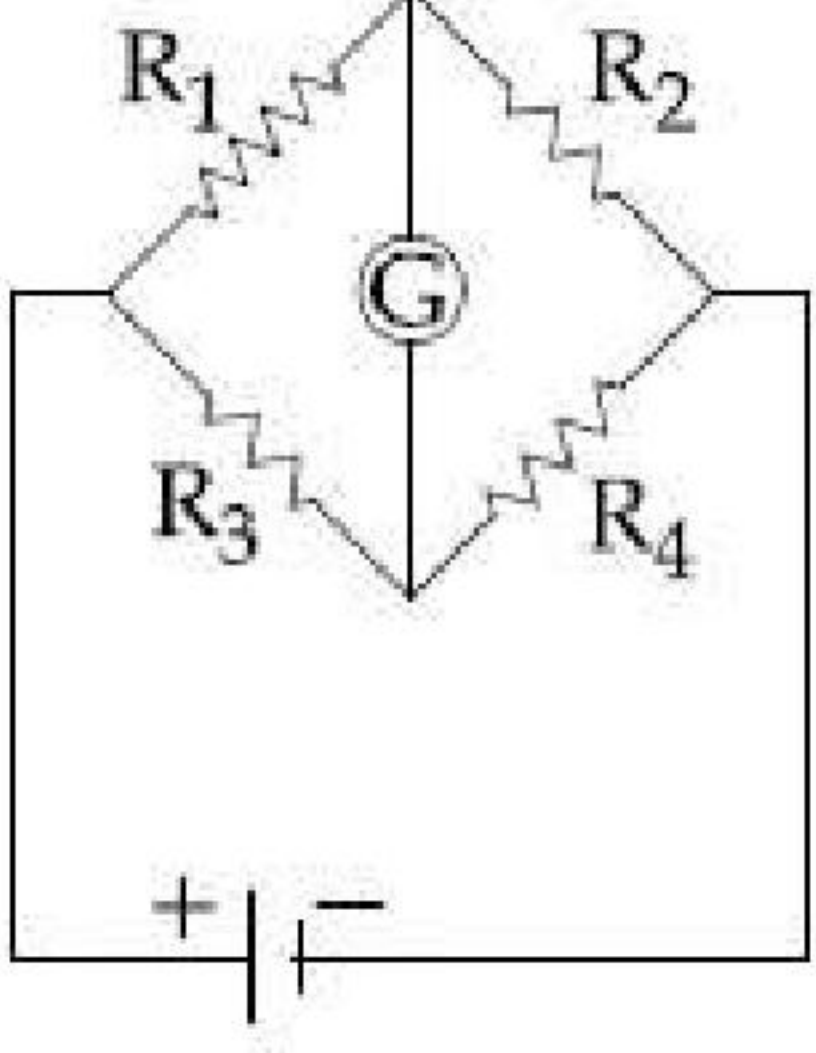
Options :

1. सलेटी, काला, भूरा
2. लाल, हरा, भूरा
3. भूरा, नीला, काला
4. भूरा, नीला, भूरा

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

આકૃતિમાંનો વ્હીસ્ટોન બ્રીજ ત્યારે સંતુલિત થાય છે કે જ્યારે ઉપયોગમાં લેવાયેલ કાર્બન અવરોધ R_1 ના વર્ણ સંકેત (નારંગી, લાલ, કથથઈ) છે. અવરોધો R_2 અને R_4 અનુક્રમે 80Ω અને 40Ω છે. આ વર્ણ સંકેત કાર્બન અવરોધોનો સચોટ મૂલ્ય આપે છે એમ ધારતા, R_3 તરીકે વાપરેલ કાર્બન અવરોધનો વર્ણ સંકેત _____ હશે.



Options :

1. ભૂખરો, કાળો, કથથઈ
2. લાલ, લીલો, કથથઈ
3. કથથઈ, વાદળી, કાળો
4. કથથઈ, વાદળી, કથથઈ

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

An unknown metal of mass 192 g heated to a temperature of 100°C was immersed into a brass calorimeter of mass 128 g containing 240 g of water at a temperature of 8.4°C . Calculate the specific heat of the unknown metal if water temperature stabilizes at 21.5°C . (Specific heat of brass is $394 \text{ J kg}^{-1} \text{ K}^{-1}$)

Options :

1. $916 \text{ J kg}^{-1} \text{ K}^{-1}$
2. $458 \text{ J kg}^{-1} \text{ K}^{-1}$
3. $654 \text{ J kg}^{-1} \text{ K}^{-1}$

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

192 g દ્રવ્યમાન કી એક અજ્ઞાત ધાતુ કો 100°C તક ગર્મ કરકે ડસે પીતલ કે એક કૈલોરીમીટર મેં, જિસકા દ્રવ્યમાન 128 g હૈ તથા ઇસમેં 240 g પાની 8.4°C પર ભરા હૈ, ડાલતે હૈં। યદિ પાની કા તાપમાન 21.5°C પર સ્થાયી હો જાતા હૈ તો અજ્ઞાત ધાતુ કી વિશિષ્ટ ઊષ્મા હોગી : (પીતલ કી વિશિષ્ટ ઊષ્મા $394\text{ J kg}^{-1}\text{ K}^{-1}$ હૈ)

Options :

1. $916\text{ J kg}^{-1}\text{ K}^{-1}$
2. $458\text{ J kg}^{-1}\text{ K}^{-1}$
3. $654\text{ J kg}^{-1}\text{ K}^{-1}$
4. $1232\text{ J kg}^{-1}\text{ K}^{-1}$

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

100°C એ તપાવેલ એક 192 g અજ્ઞાત ધાતુને 8.4°C તાપમાન ધરાવતા 240 g પાણી ભરેલ 128 g પિત્તળના કેલોરિમીટરમાં ડુબાડવામાં આવે છે. જો પાણીનું તાપમાન 21.5°C પર સ્થિર થતુ હોય તો અજ્ઞાત ધાતુની વિશિષ્ટ ઊષ્મા ગણો. (પિત્તળની વિશિષ્ટ ઊષ્મા $394\text{ J kg}^{-1}\text{ K}^{-1}$ છે.)

Options :

1. $916\text{ J kg}^{-1}\text{ K}^{-1}$
2. $458\text{ J kg}^{-1}\text{ K}^{-1}$
3. $654\text{ J kg}^{-1}\text{ K}^{-1}$
4. $1232\text{ J kg}^{-1}\text{ K}^{-1}$

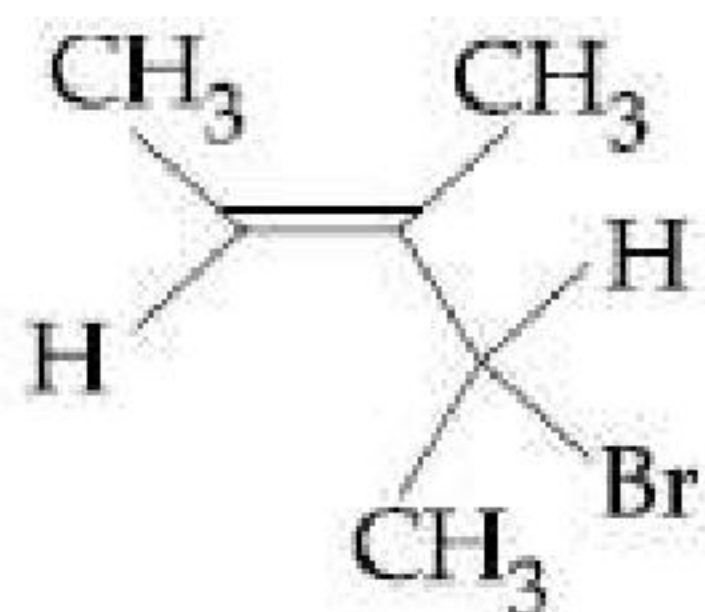
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529182
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

निम्नलिखित यौगिक का IUPAC नाम क्या है?



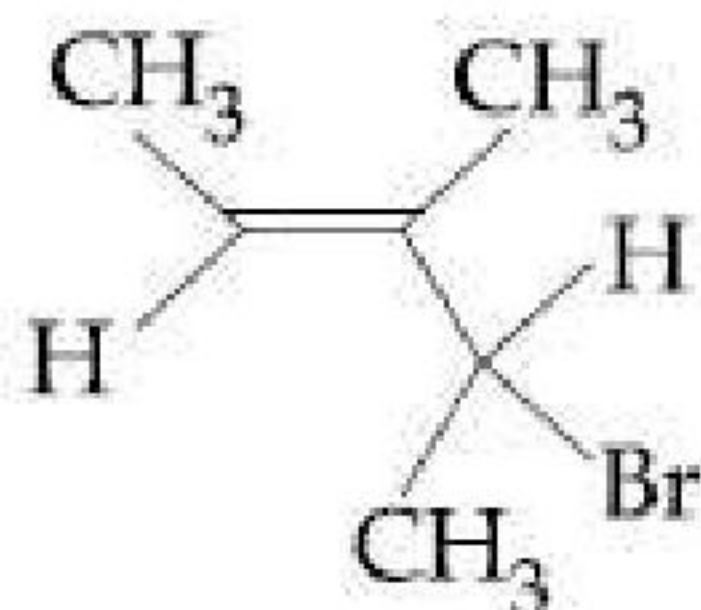
Options :

- 3-ब्रोमो-3-मेथिल-1,2-डाइमेथिलप्रोप-1-ईन
- 3-ब्रोमो-1, 2-डाइमेथिलब्यूट-1-ईन
- 4-ब्रोमो-3-मेथिलपेन्ट-2-ईन
- 2-ब्रोमो-3-मेथिलपेन्ट-3-ईन

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

What is the IUPAC name of the following compound ?



Options :

- 3-Bromo-3-methyl-1, 2-dimethylprop-1-ene

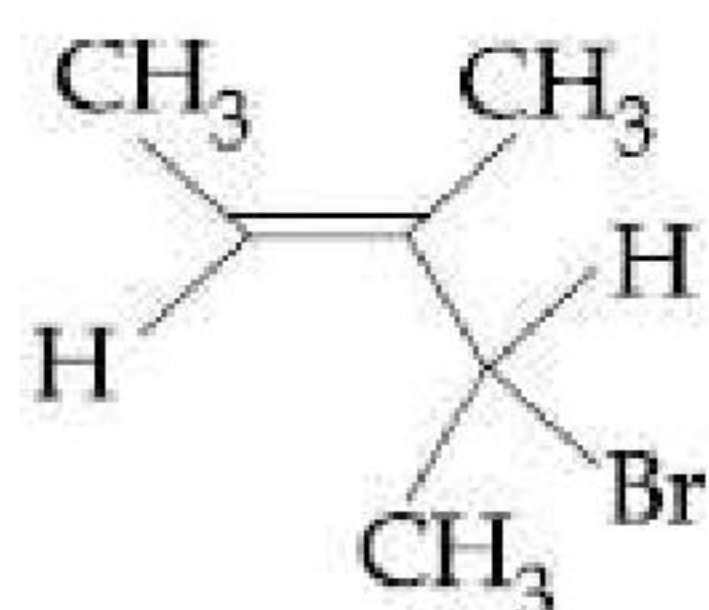
3. 4-Bromo-3-methylpent-2-ene

4. 2-Bromo-3-methylpent-3-ene

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંયોજનું IUPAC નામ આપો?



Options :

1. 3-બ્રોમો-3-મિથાઈલ-1,2-ડાયમિથાઈલપ્રોપ-1-ઈન

2. 3-બ્રોમો-1,2-ડાયમિથાઈલબ્યુટ-1-ઈન

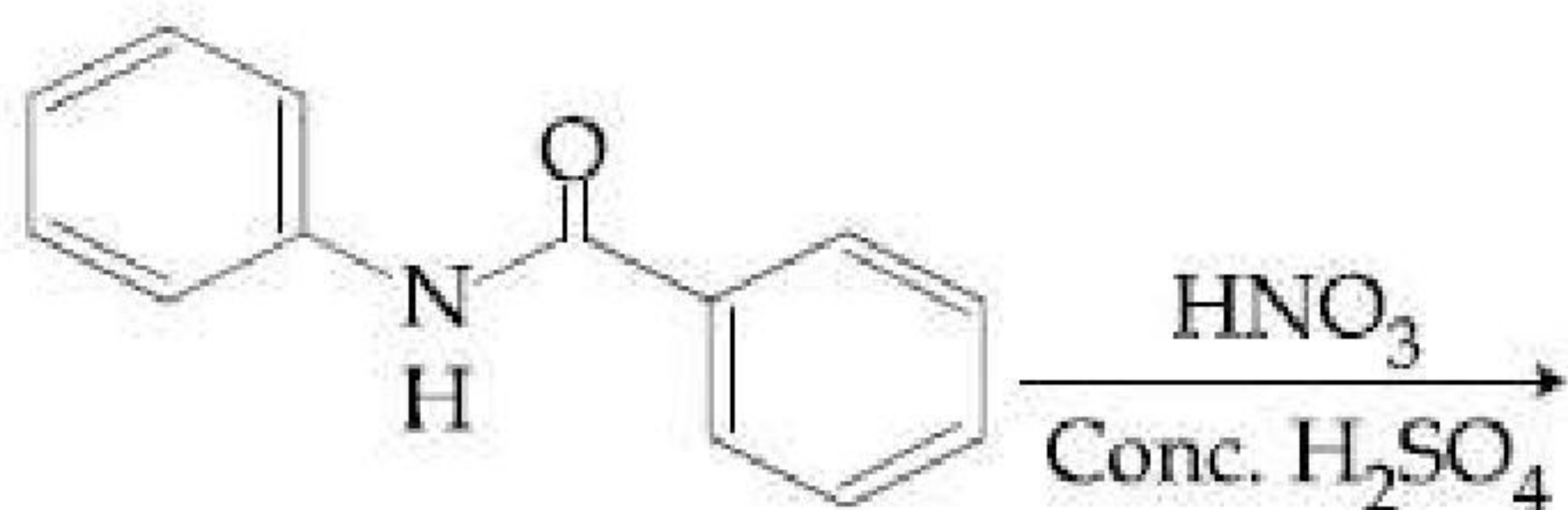
3. 4-બ્રોમો-3-મિથાઈલપેન્ટ-2-ઈન

4. 2-બ્રોમો-3-મિથાઈલપેન્ટ-3-ઈન

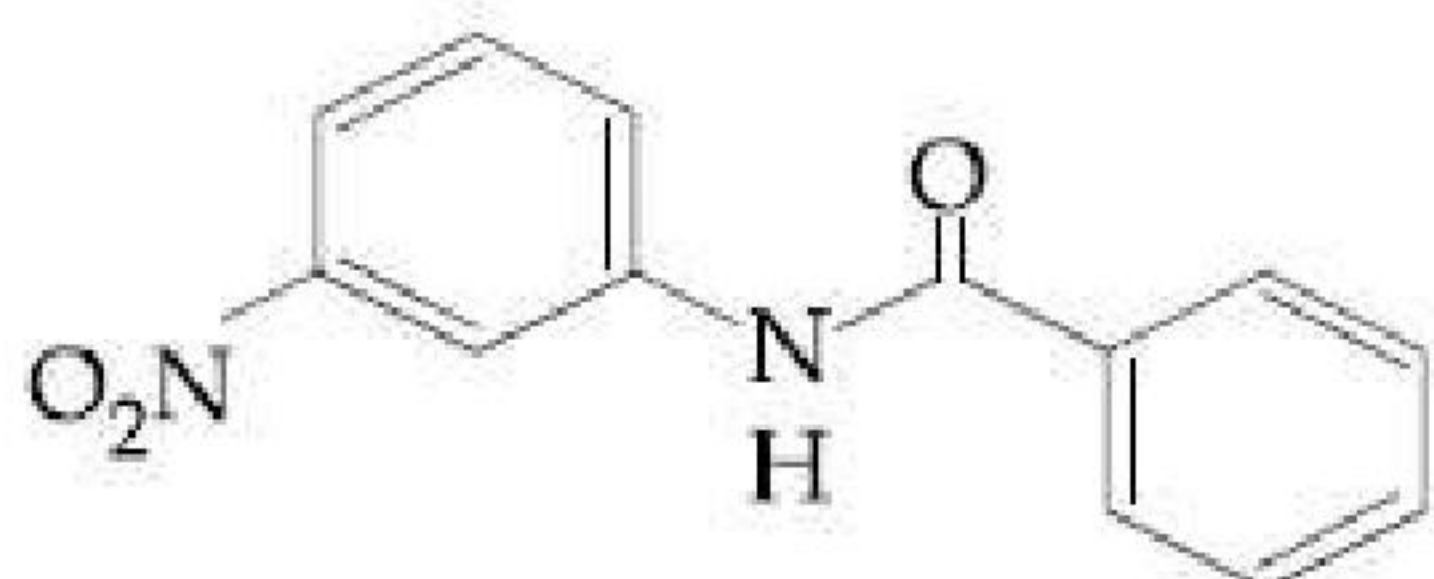
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

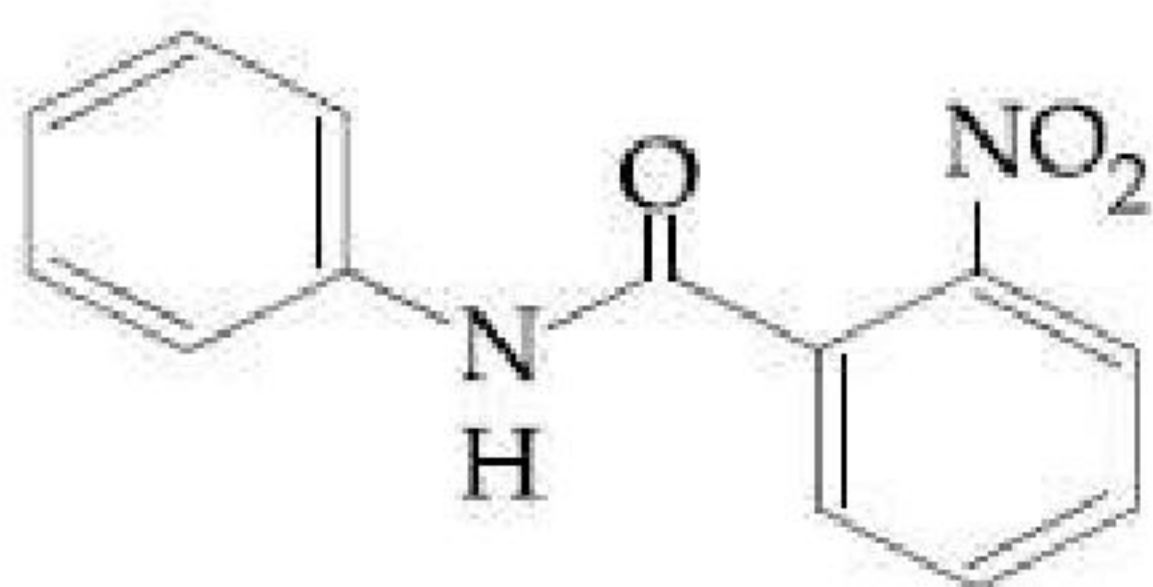
What will be the major product in the following mononitration reaction ?



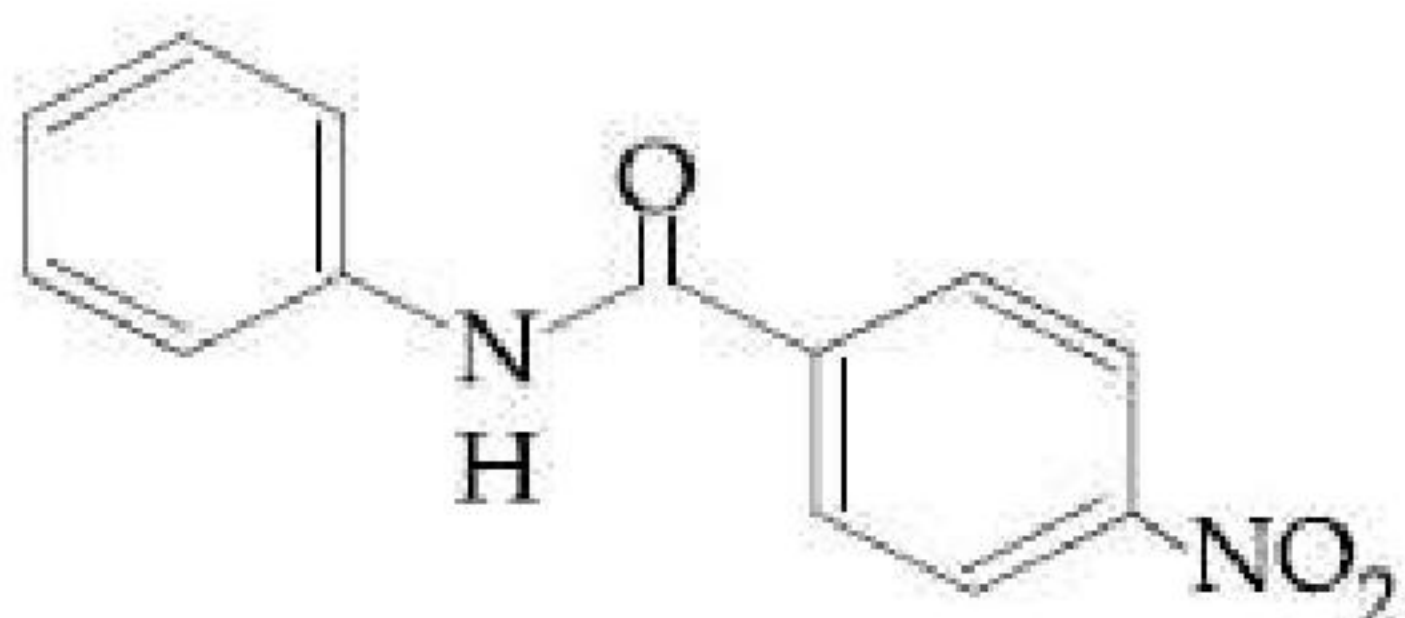
Options :



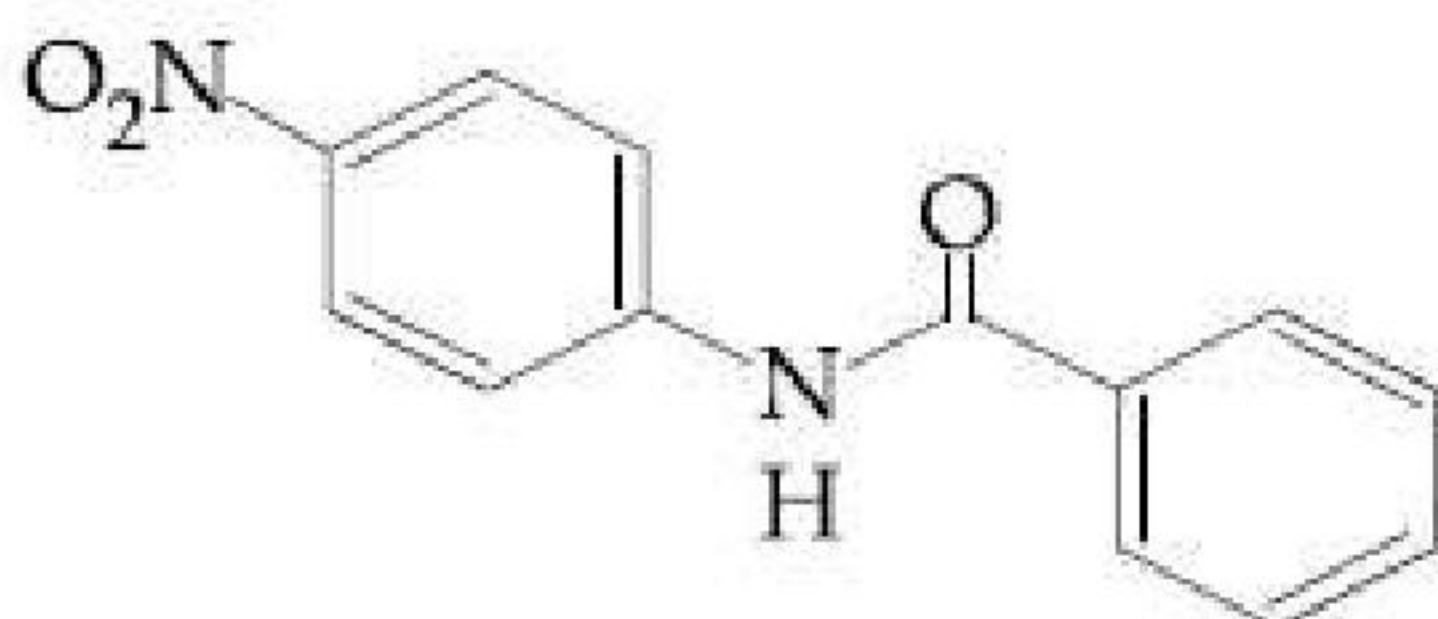
1.



2.



3.

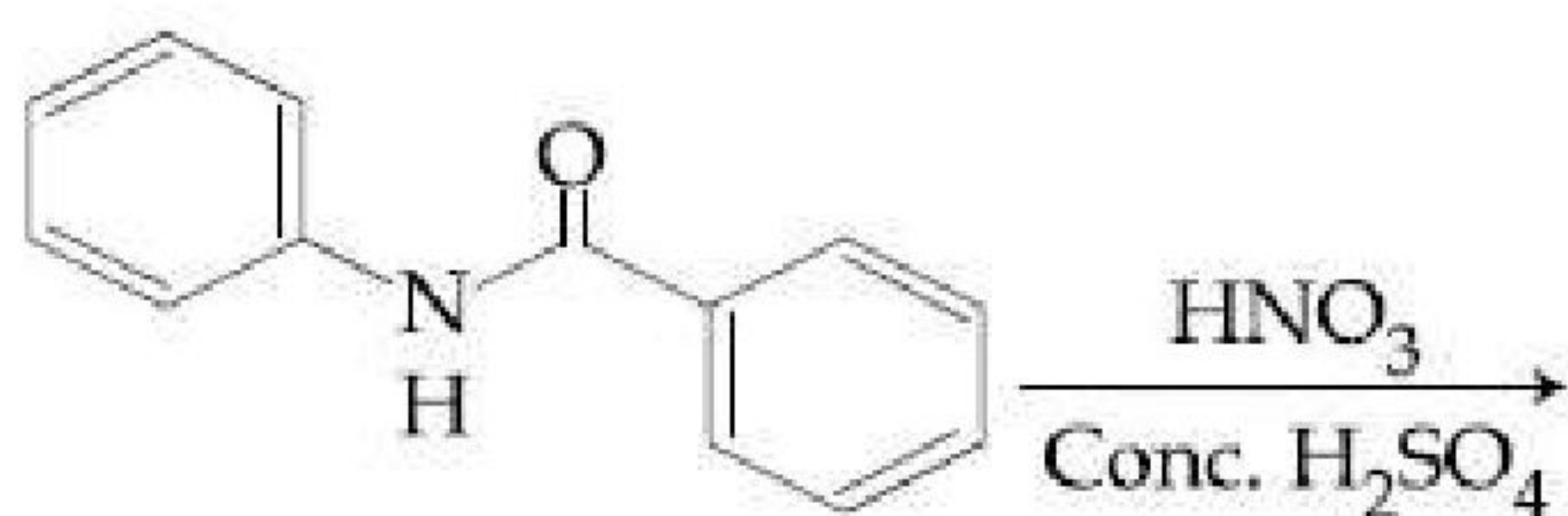


4.

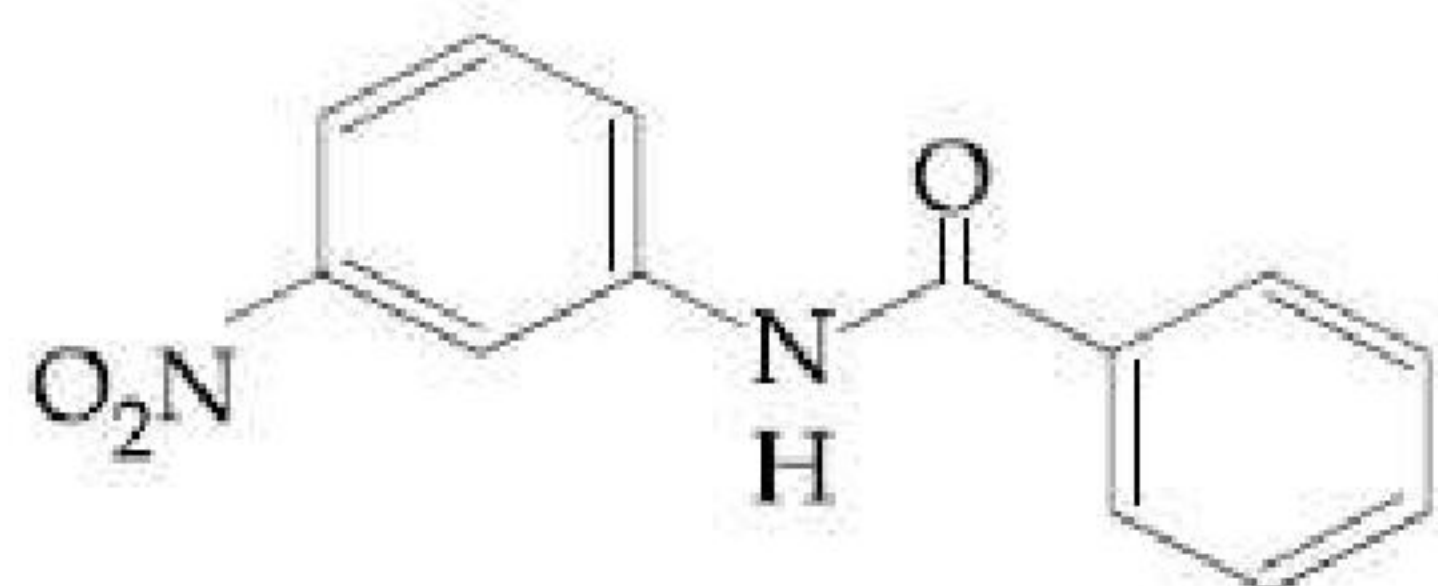
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

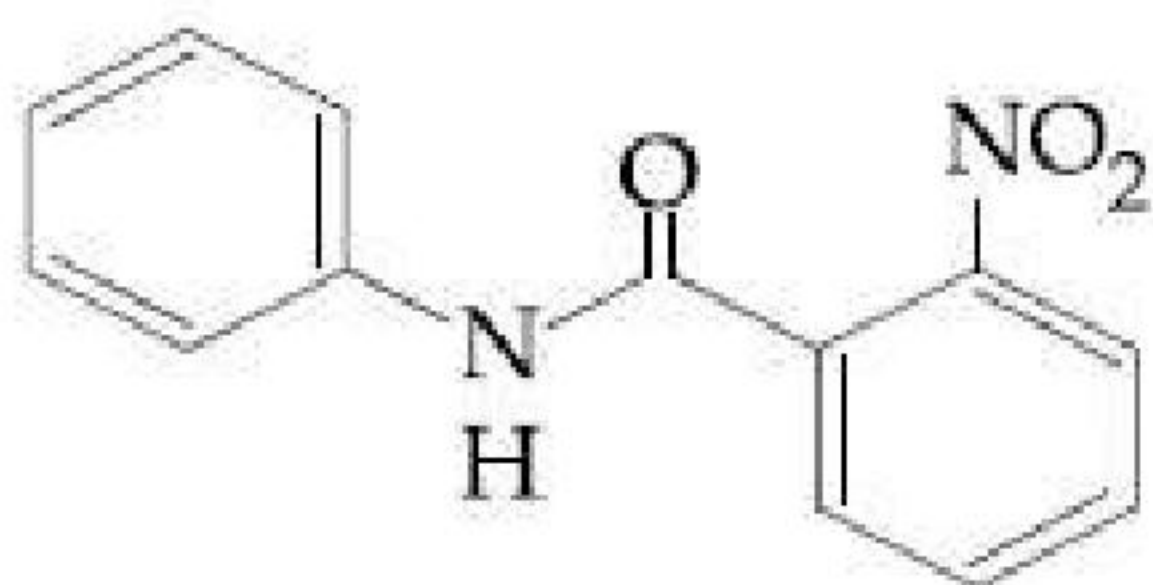
निम्नलिखित मोनोनाइट्रेशन अभिक्रिया में कौन सा मुख्य उत्पाद होगा ?



Options :

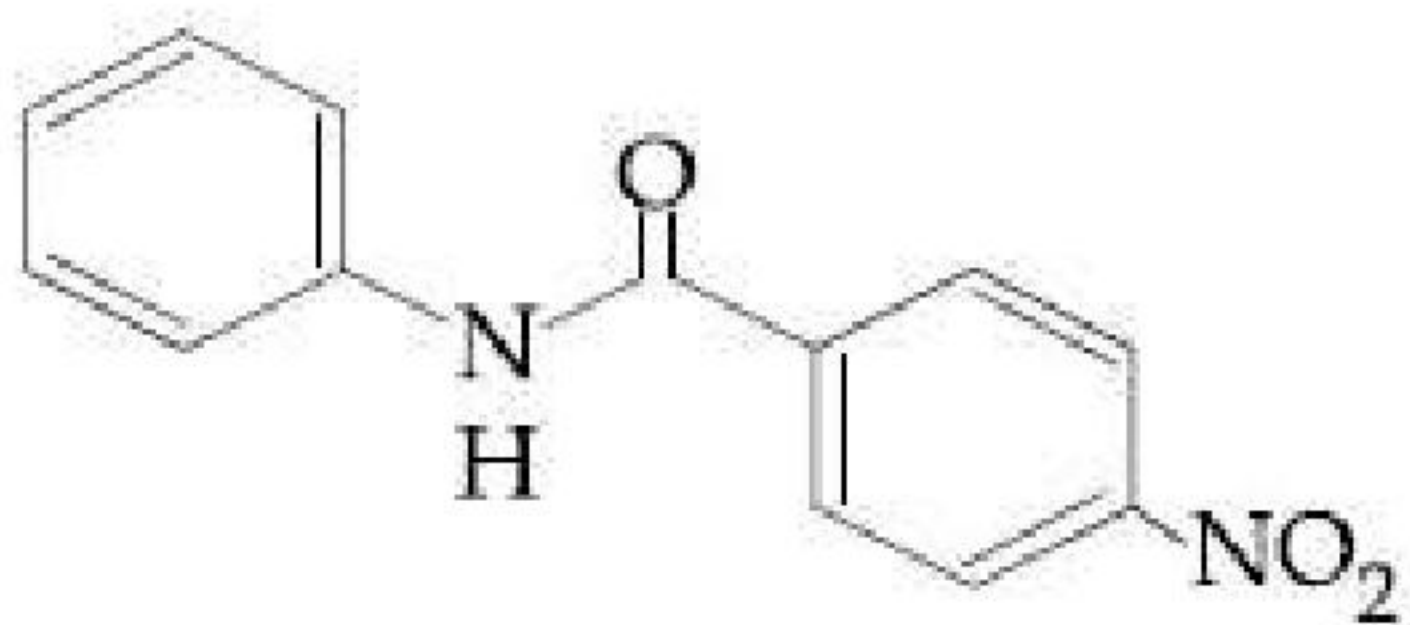


1.

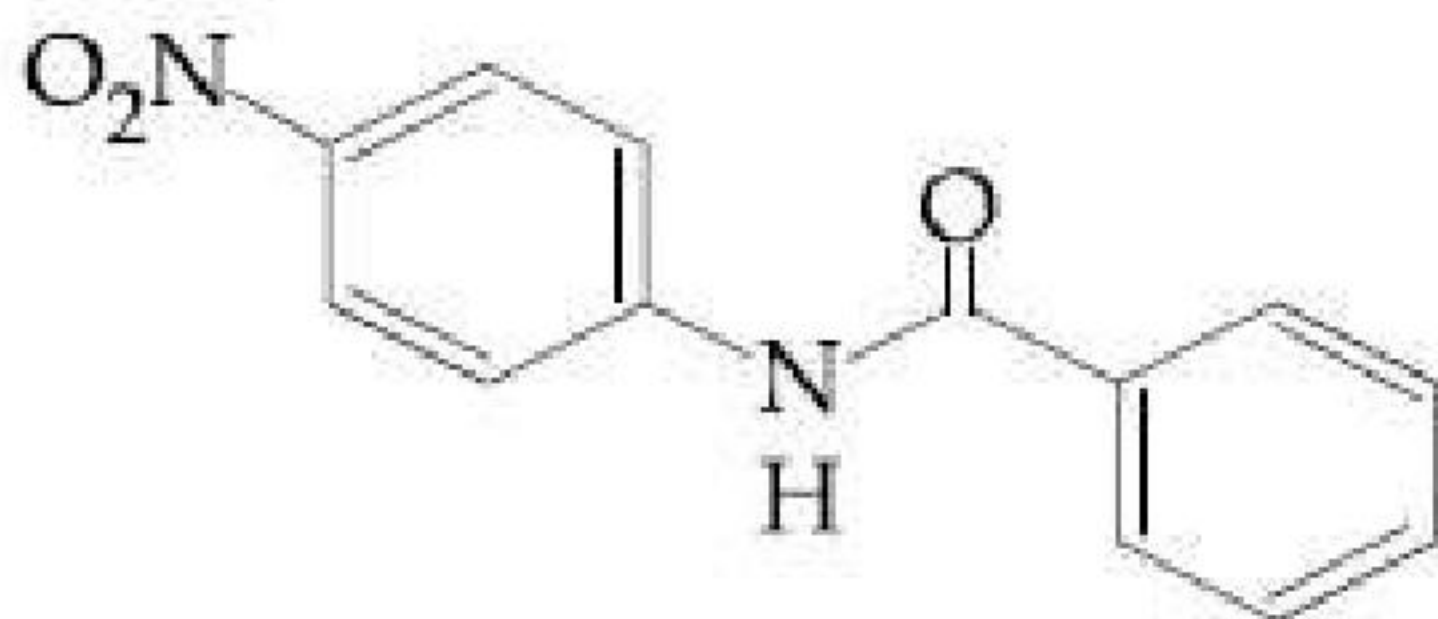


2.

3.



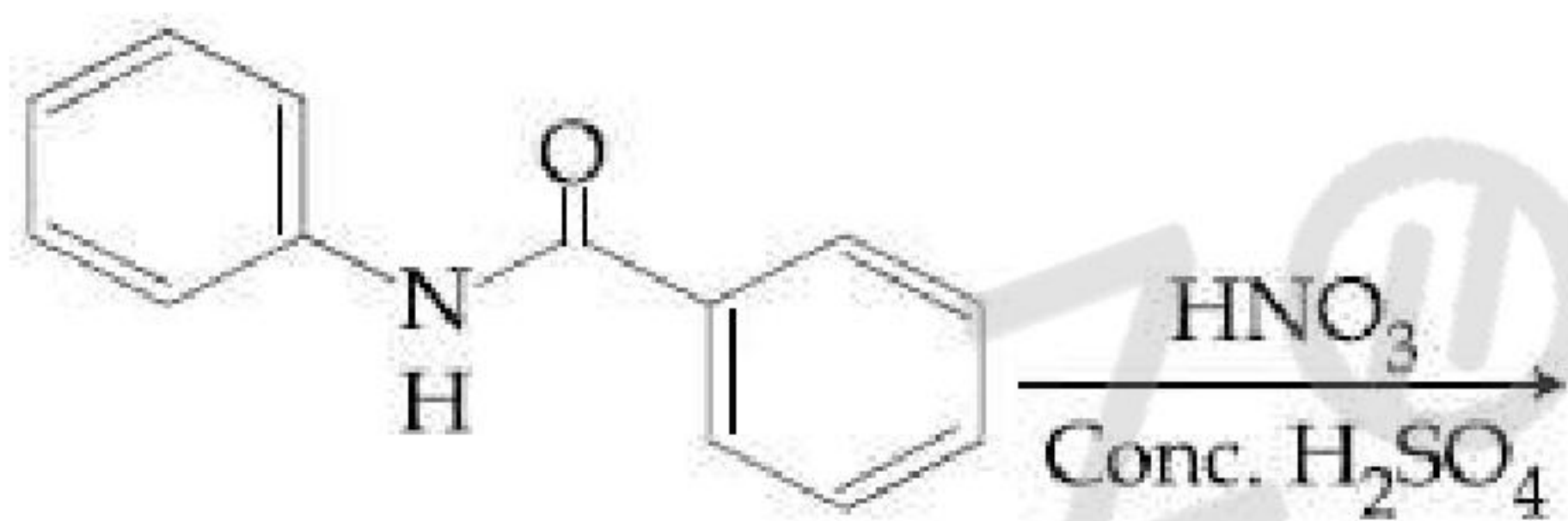
4.



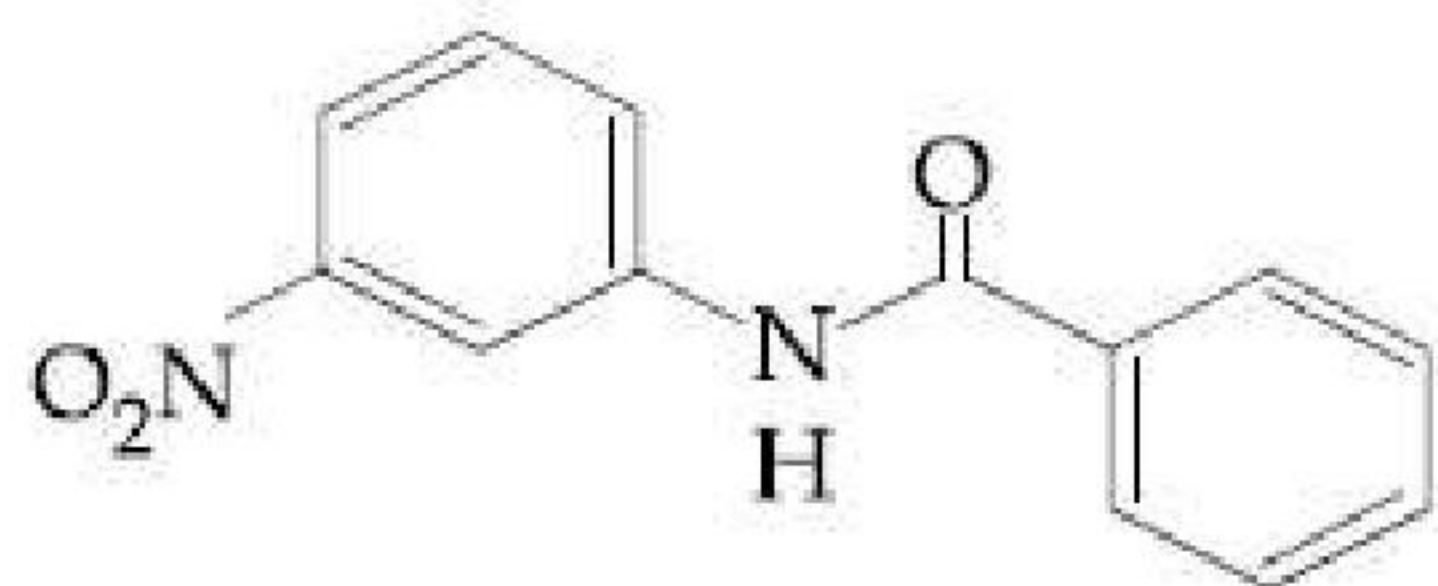
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

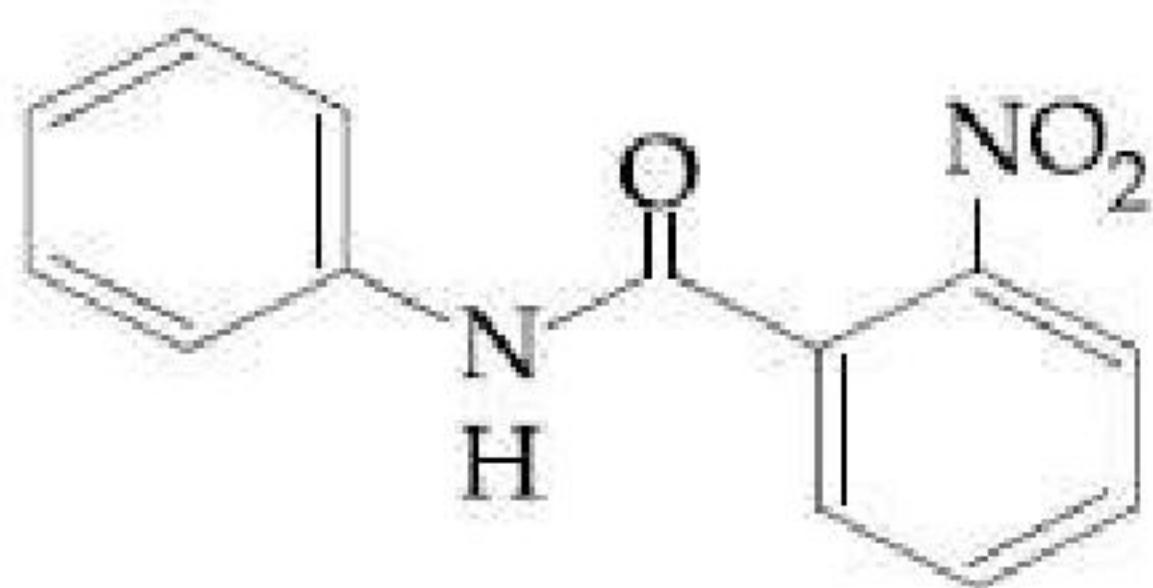
નીચે આપેલી પ્રક્રિયામાં મોનોનાઈટ્રેશન કરતા મળતી મુખ્ય નીપજ શોધો?



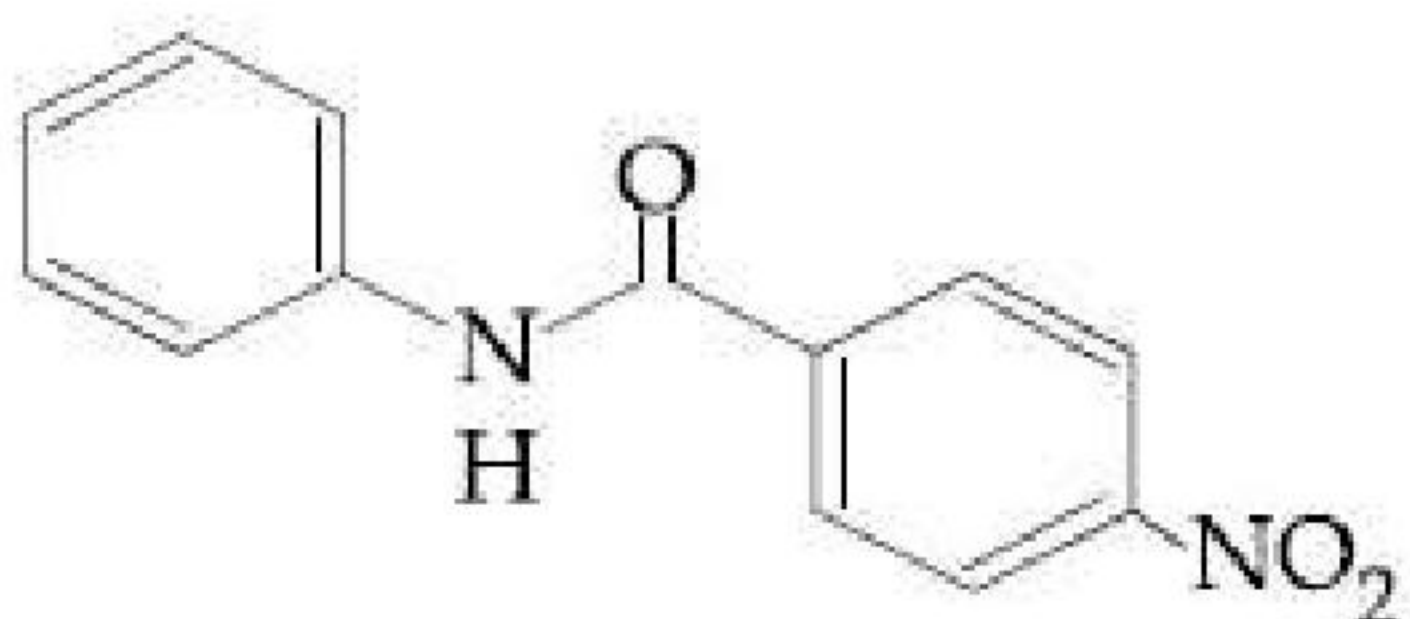
Options :



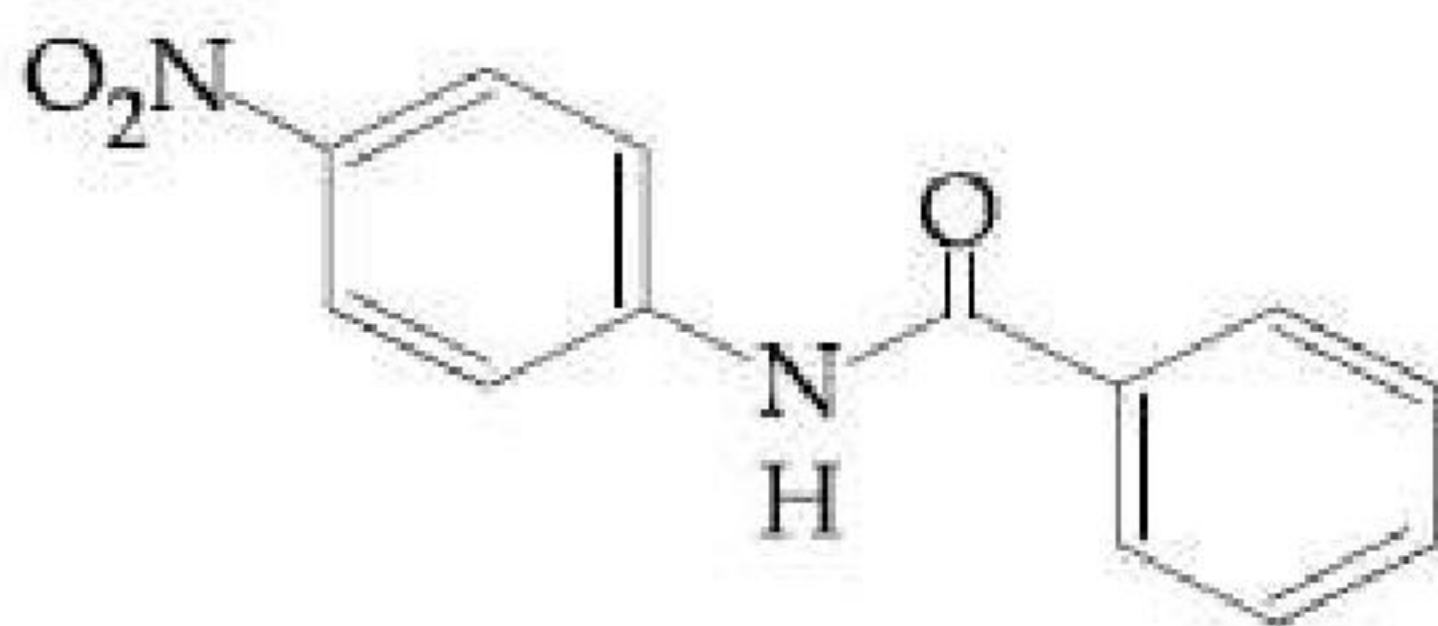
1.



2.



3.



4.

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

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



Options :

1.



2.



3.



4.



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

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



Options :

1.



OH



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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?



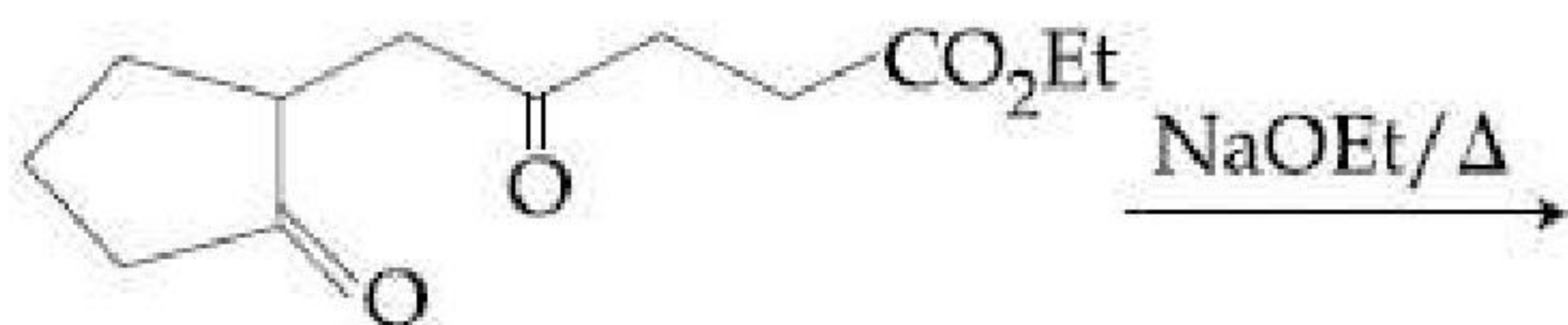
Options :



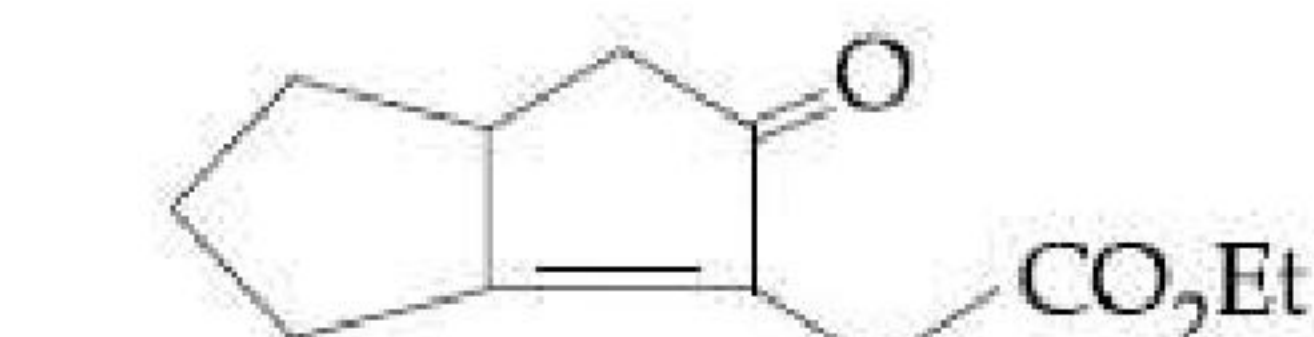
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

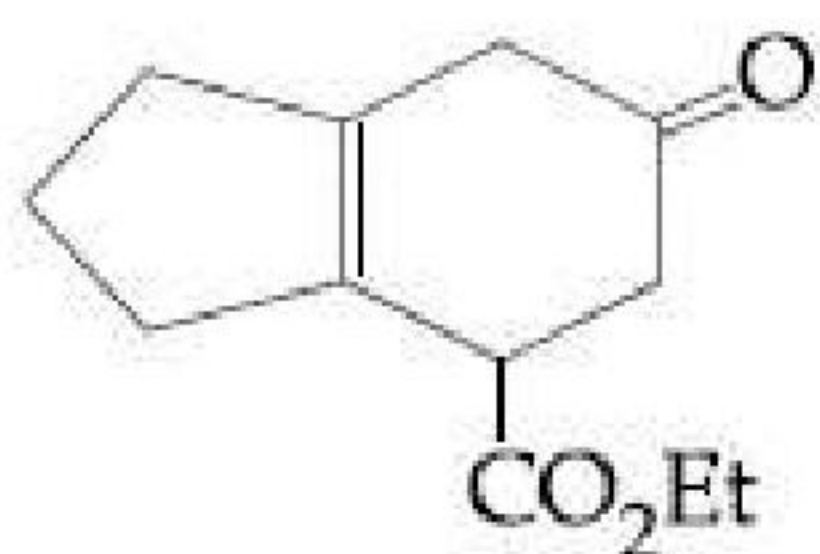
નિમ્નલિખિત અભિક્રિયા મેં પ્રાપ્ત હોને વાલા મુખ્ય ઉત્પાદ
હૈ :



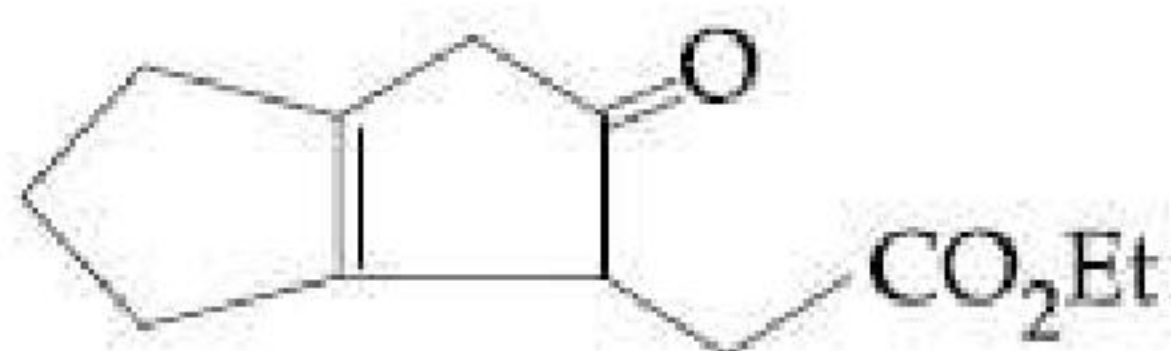
Options :



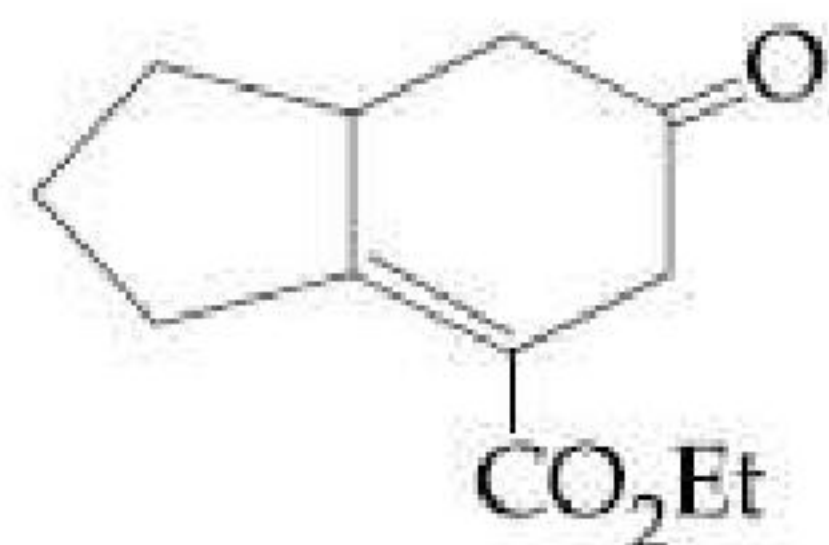
2.



3.



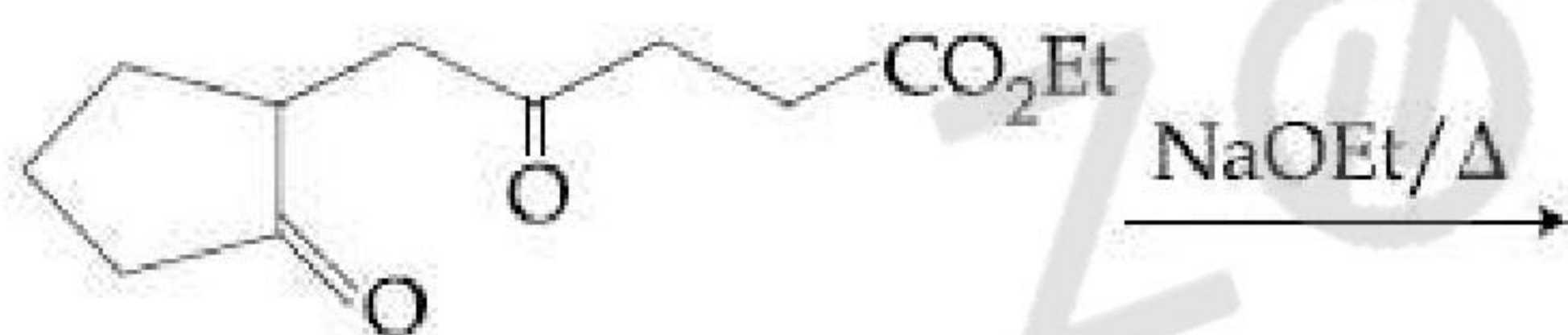
4.



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

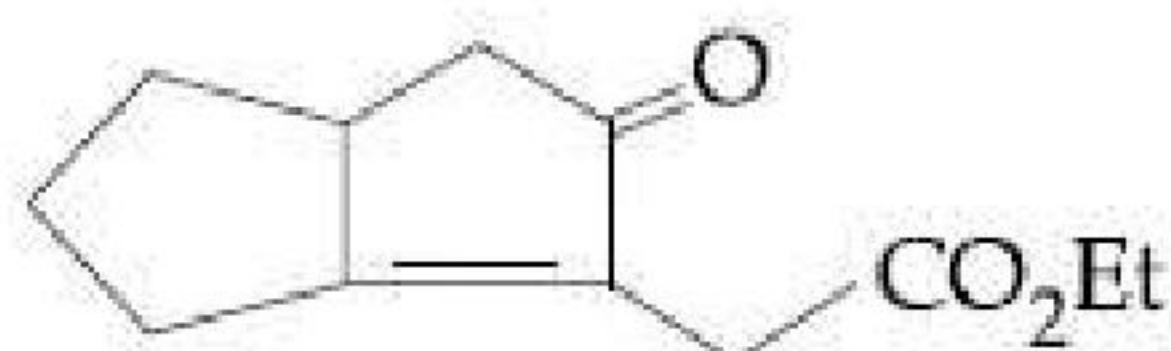
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો?

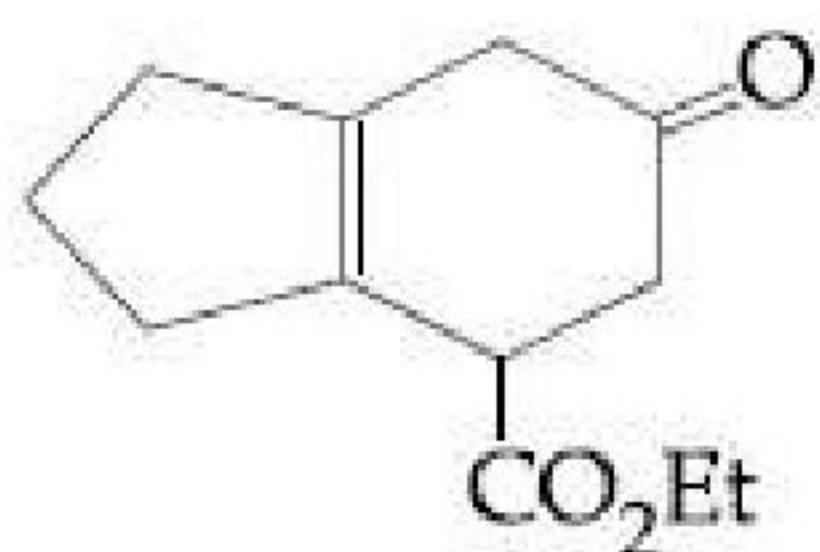


Options :

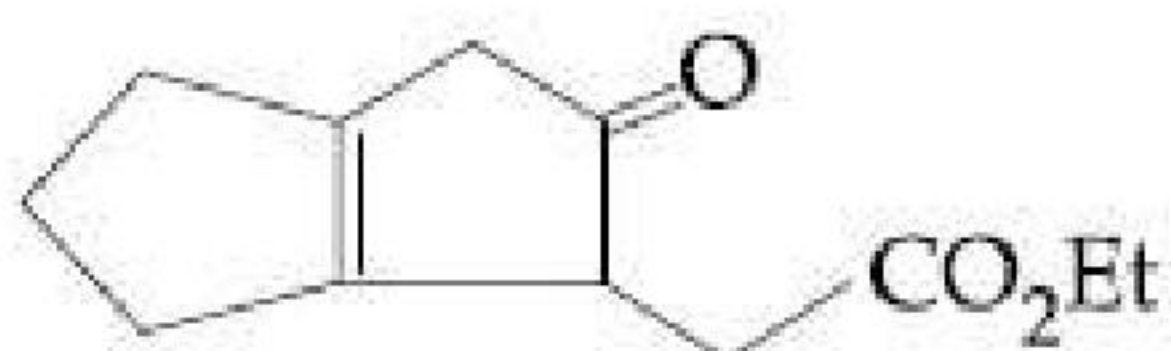
1.



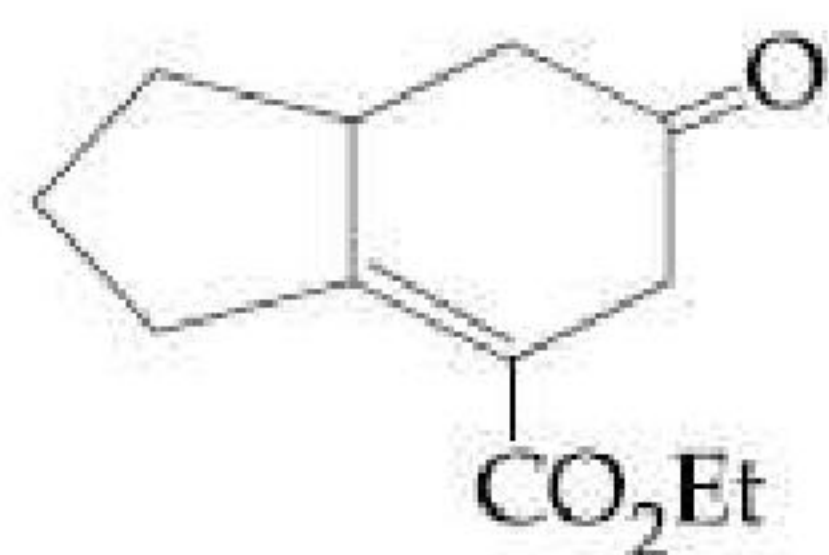
2.



3.



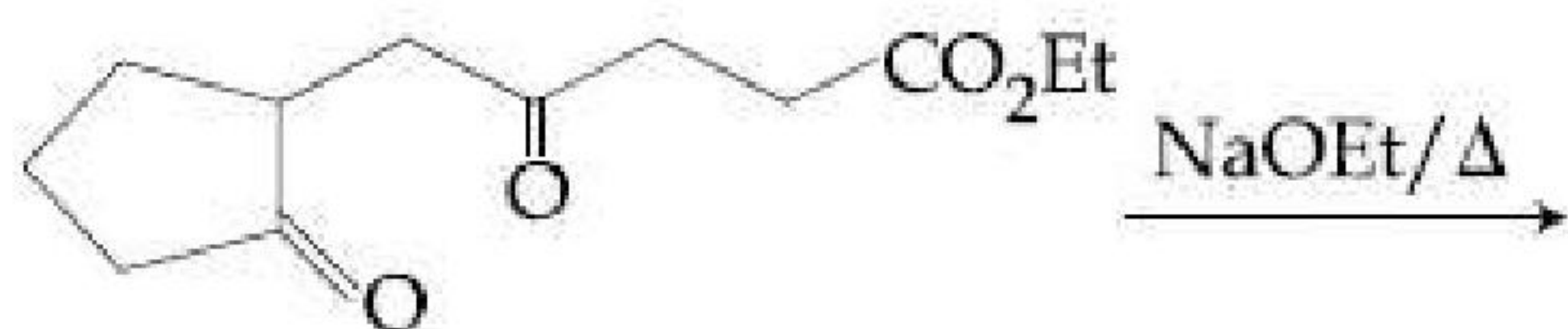
4.



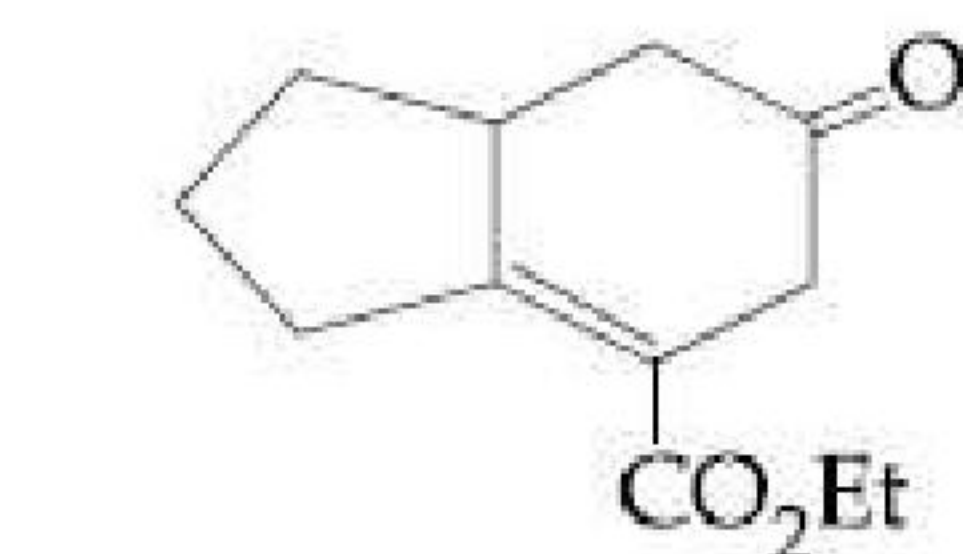
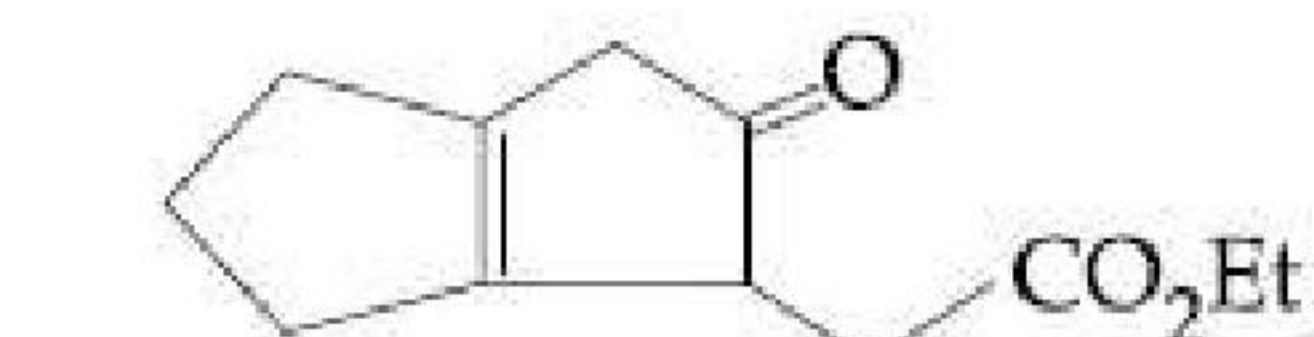
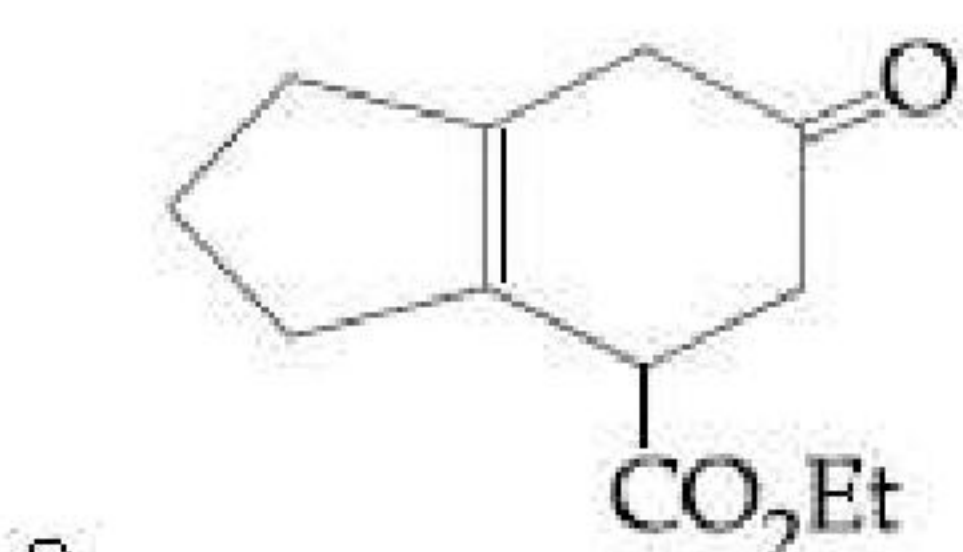
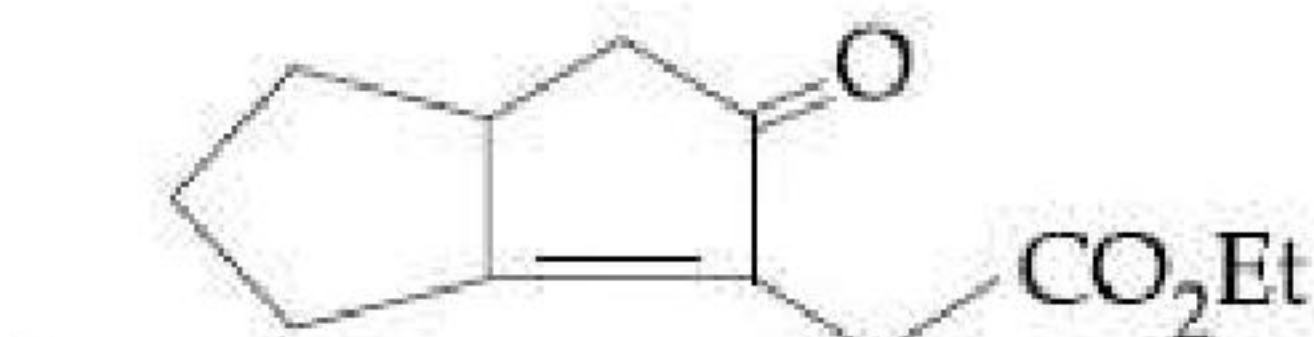
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product obtained in the following reaction is :



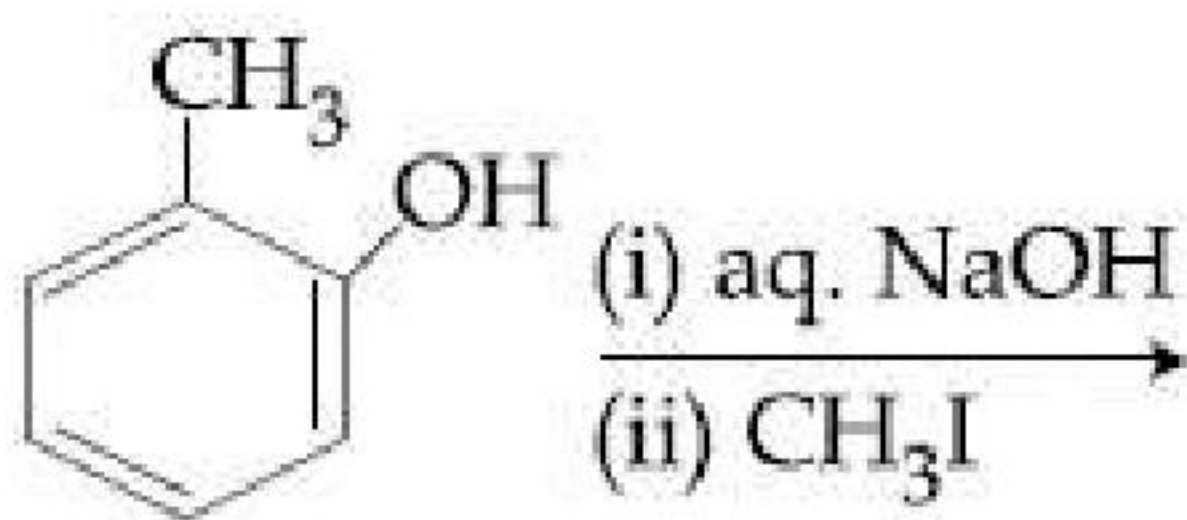
Options :



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

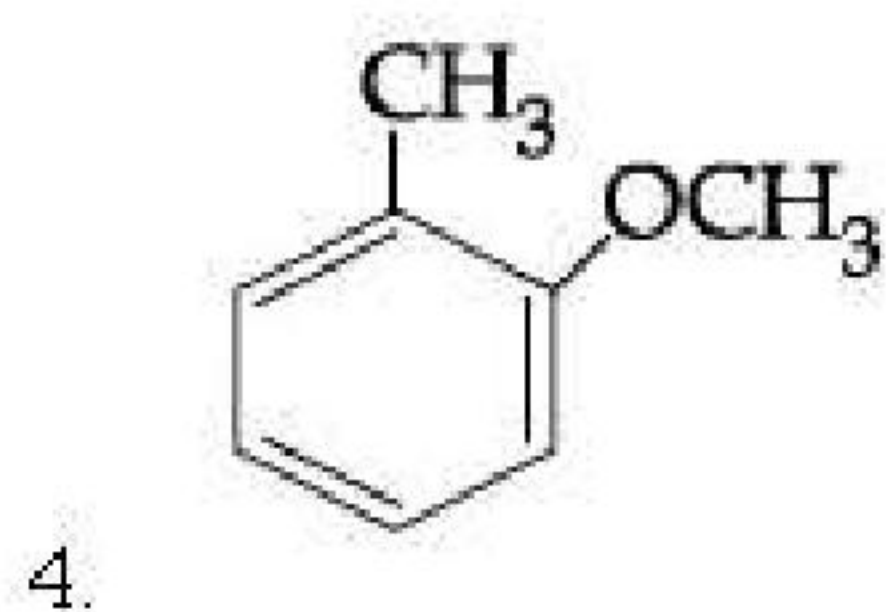
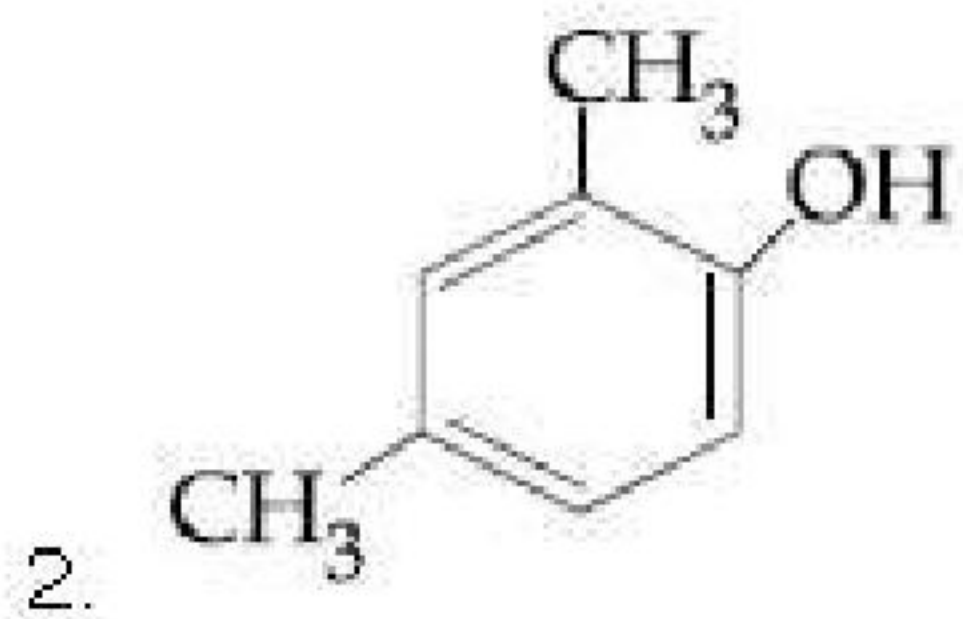
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



Options :

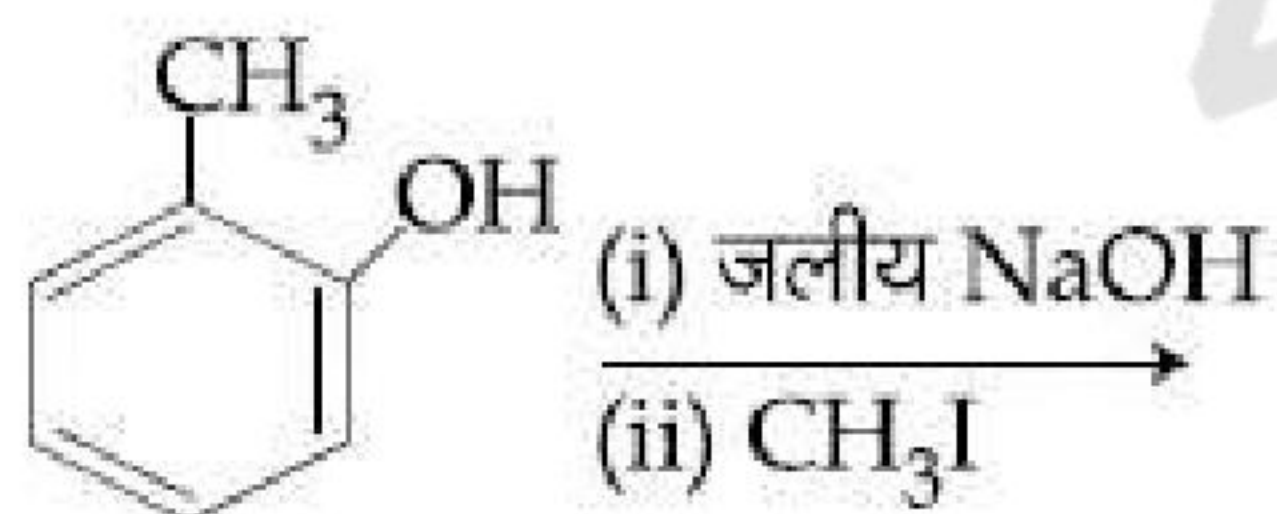




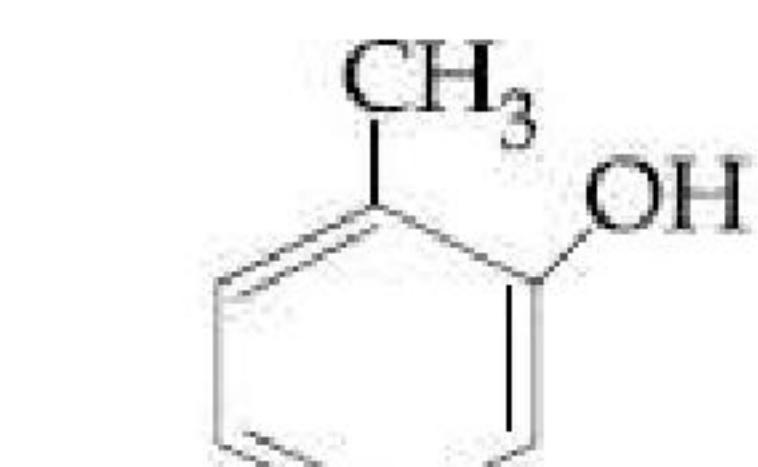
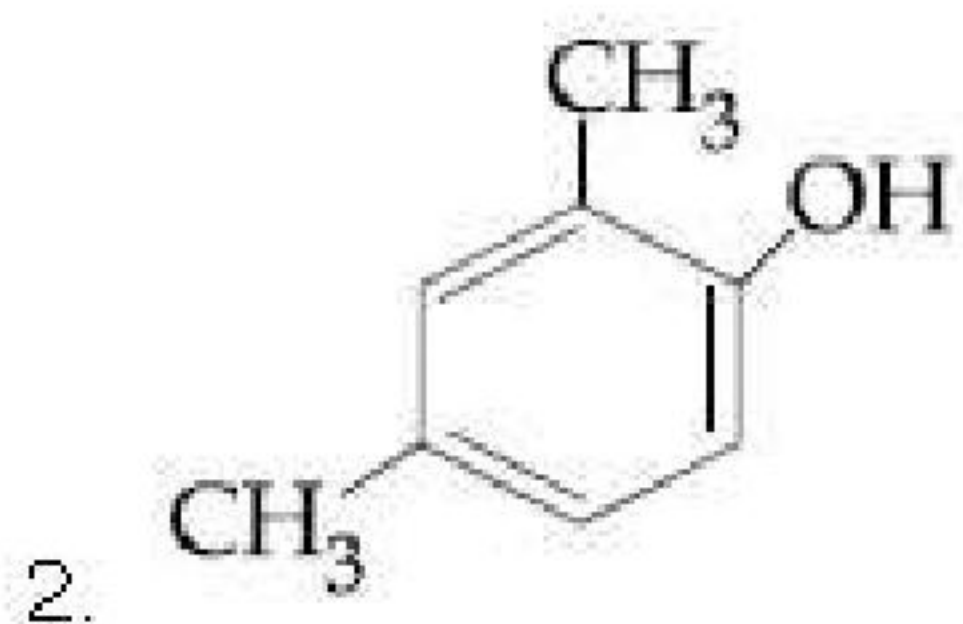
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :



Options :



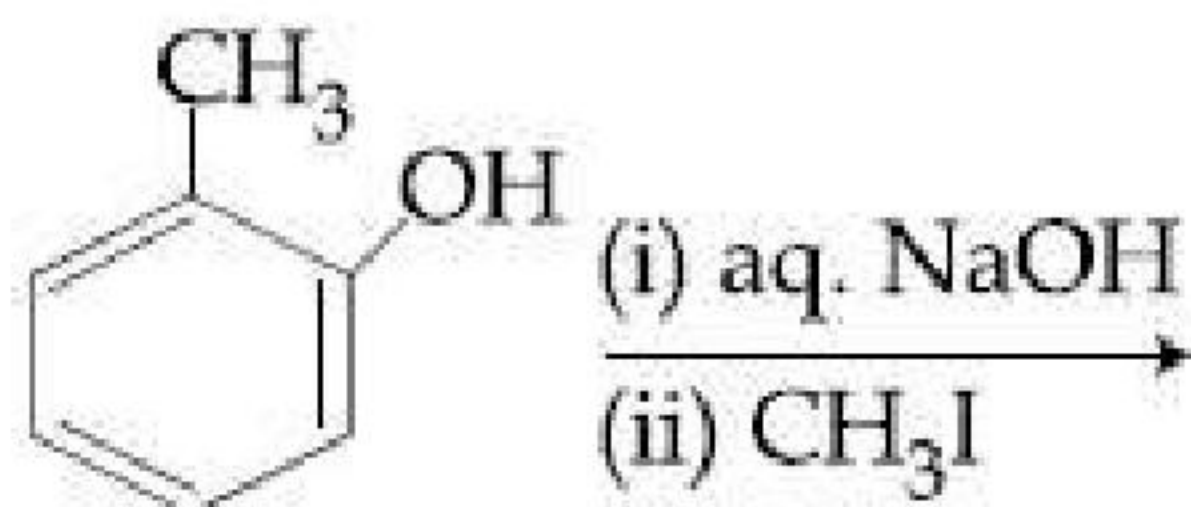
4.



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 શોધો ?



Options :

1.



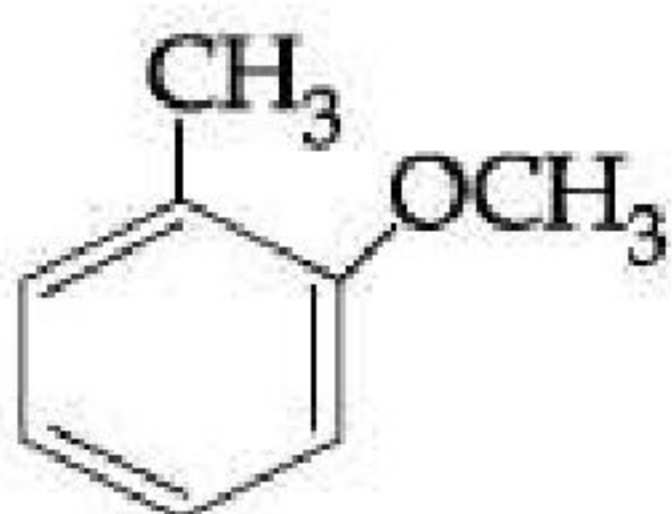
2.



3.



4.

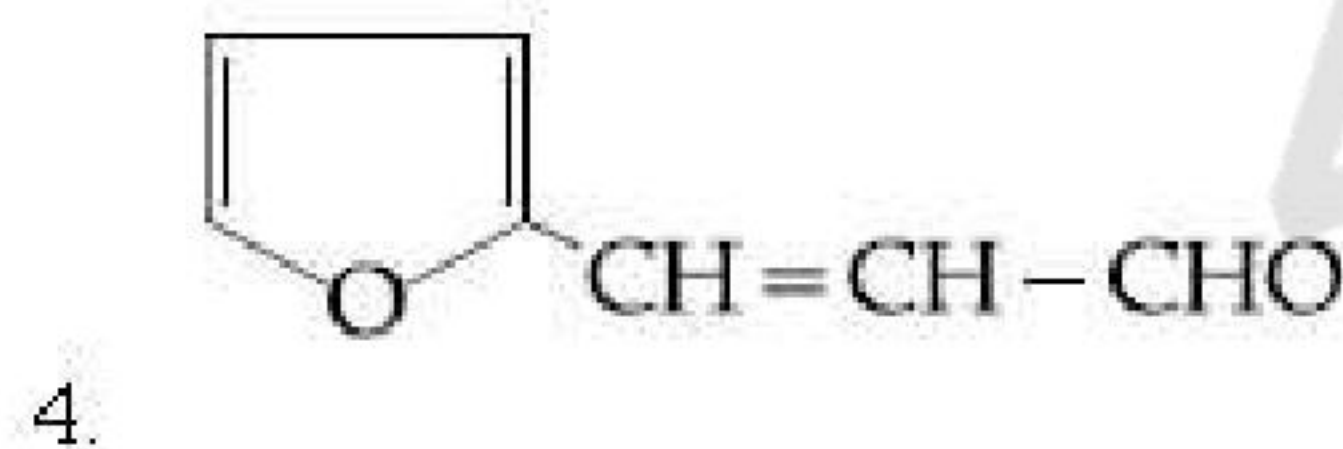
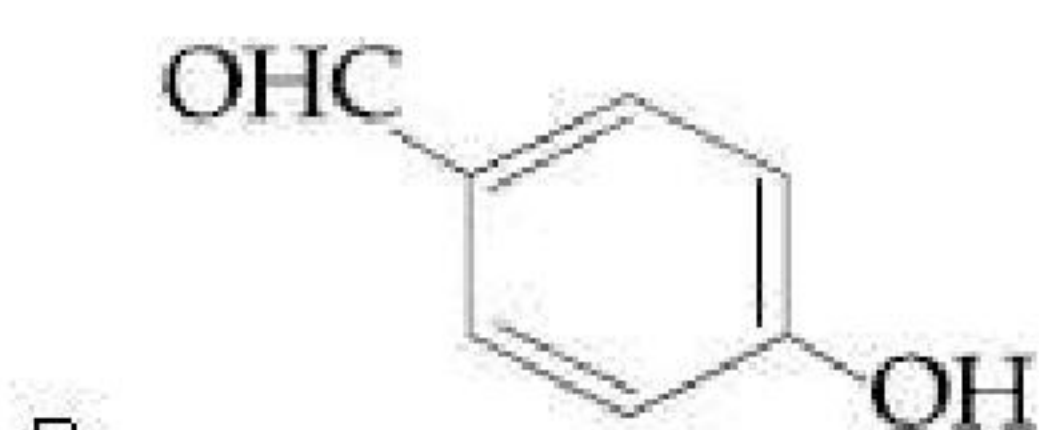
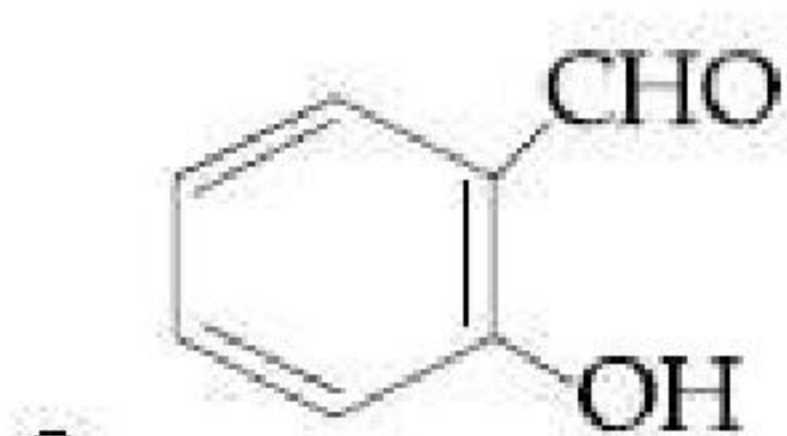


Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An aromatic compound 'A' having molecular formula $C_7H_6O_2$ on treating with aqueous ammonia and heating forms compound 'B'. The compound 'B' on reaction with molecular bromine and potassium hydroxide provides compound 'C' having molecular formula C_6H_7N . The structure of 'A' is :

Options :

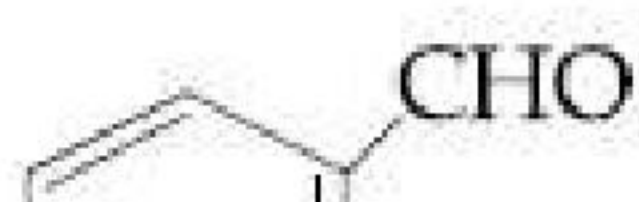
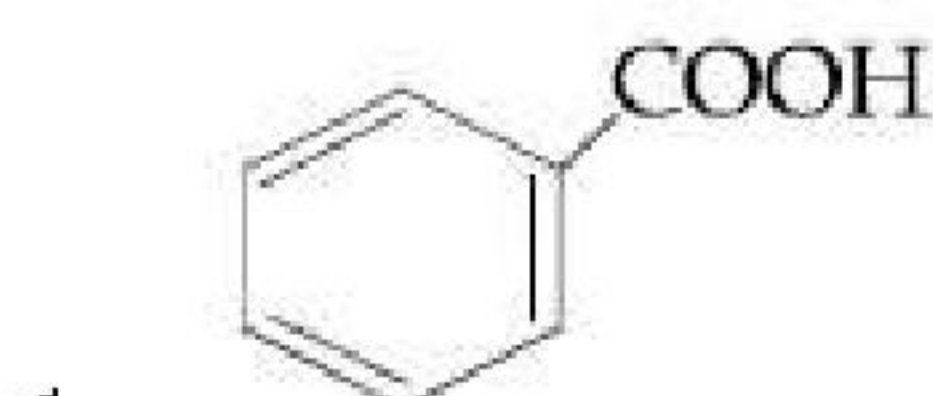


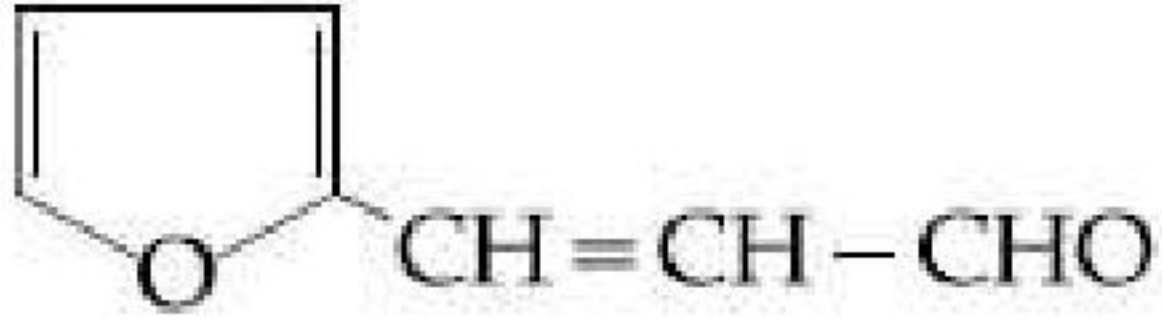
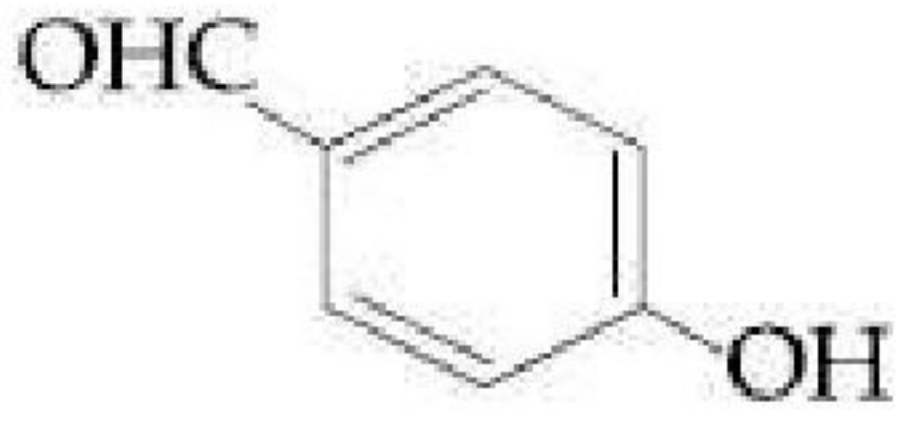
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक कार्बनिक यौगिक 'A' जिसका आण्विक सूत्र $C_7H_6O_2$ है, जलीय अमोनिया के साथ गर्म करने पर यौगिक 'B' बनाता है। यौगिक 'B' आण्विक ब्रोमीन तथा पोटेशियम हाइड्रॉक्साइड के साथ अभिक्रिया करके यौगिक 'C' देता है जिसका आण्विक सूत्र C_6H_7N है। 'A' की संरचना है :

Options :



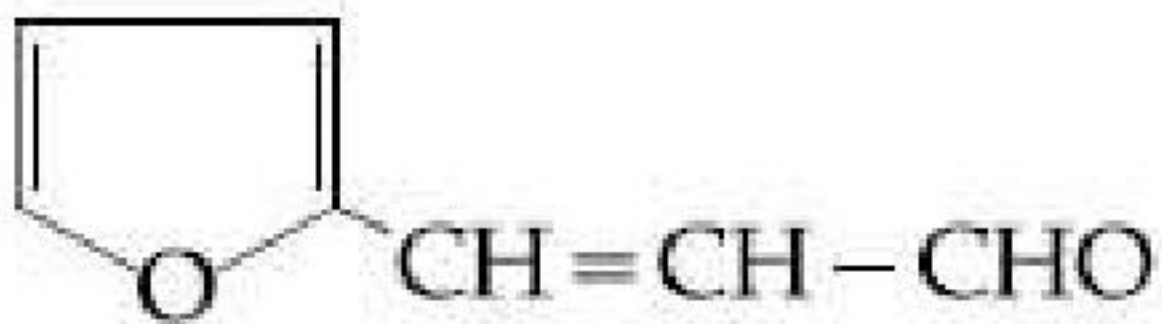
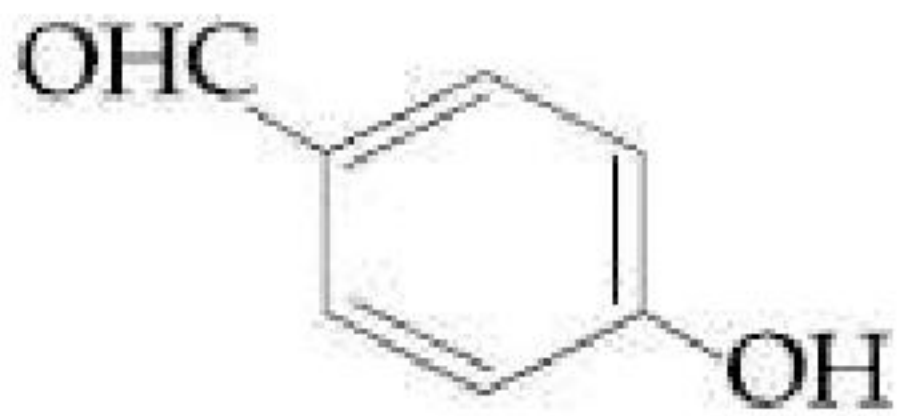
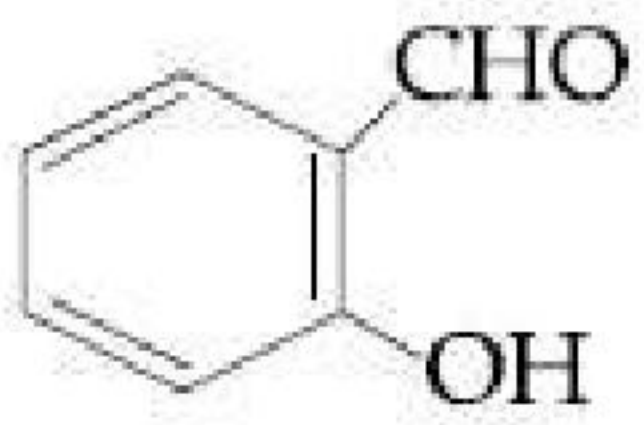
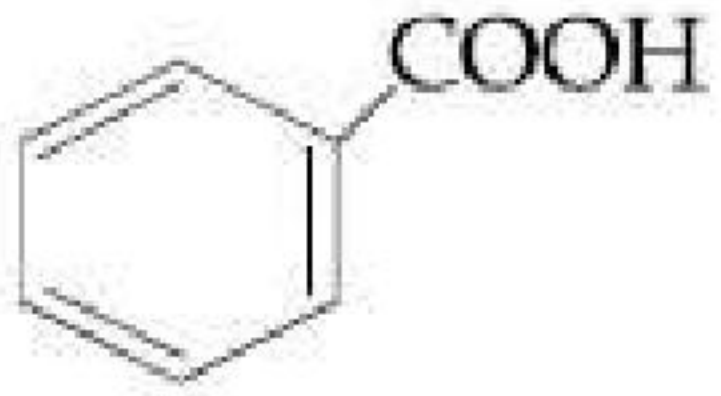


Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક એરોમેટિક સંયોજન 'A' જેનું આણુસૂત્ર $C_7H_6O_2$ છે તેને જલીય એમોનિયા સાથે પ્રક્રિયા કરી અને ગરમ કરતા સંયોજન 'B' આપે છે. સંયોજન 'B' બ્રોમિન આણુ અને પોટેશિયમ હાઈડ્રોક્સાઈડ સાથે પ્રક્રિયા કરી સંયોજન 'C' આપે છે જેનું આણુસૂત્ર C_6H_7N છે. તો 'A' નું બંધારણ શોધો ?

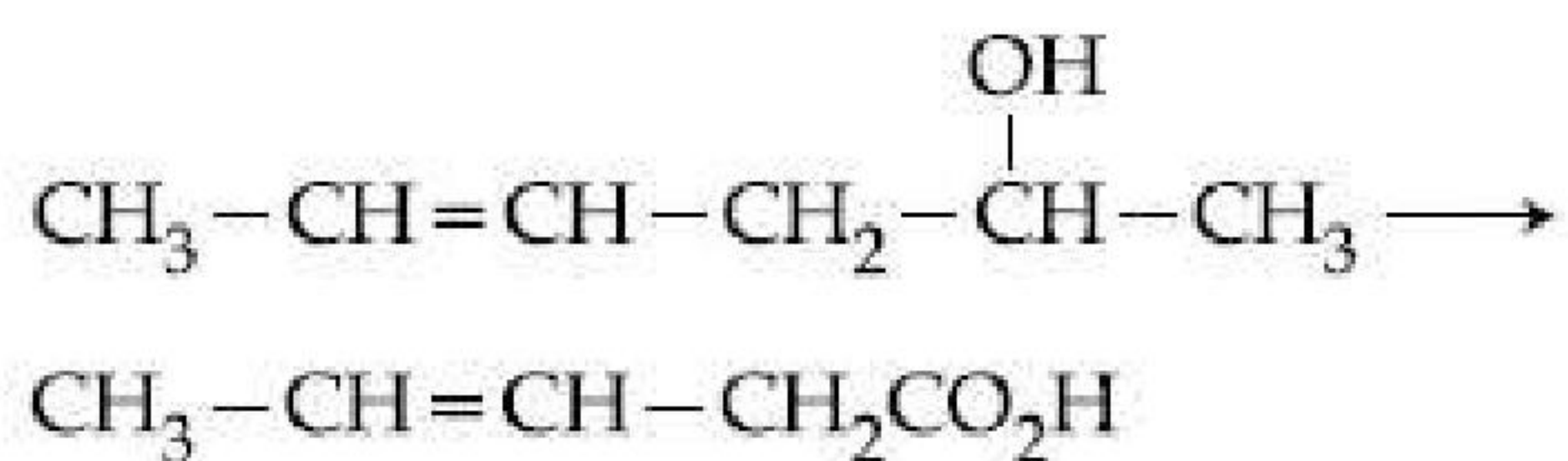
Options :



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

Correct Marks : 4 Wrong Marks : 1

Which is the most suitable reagent for the following transformation ?



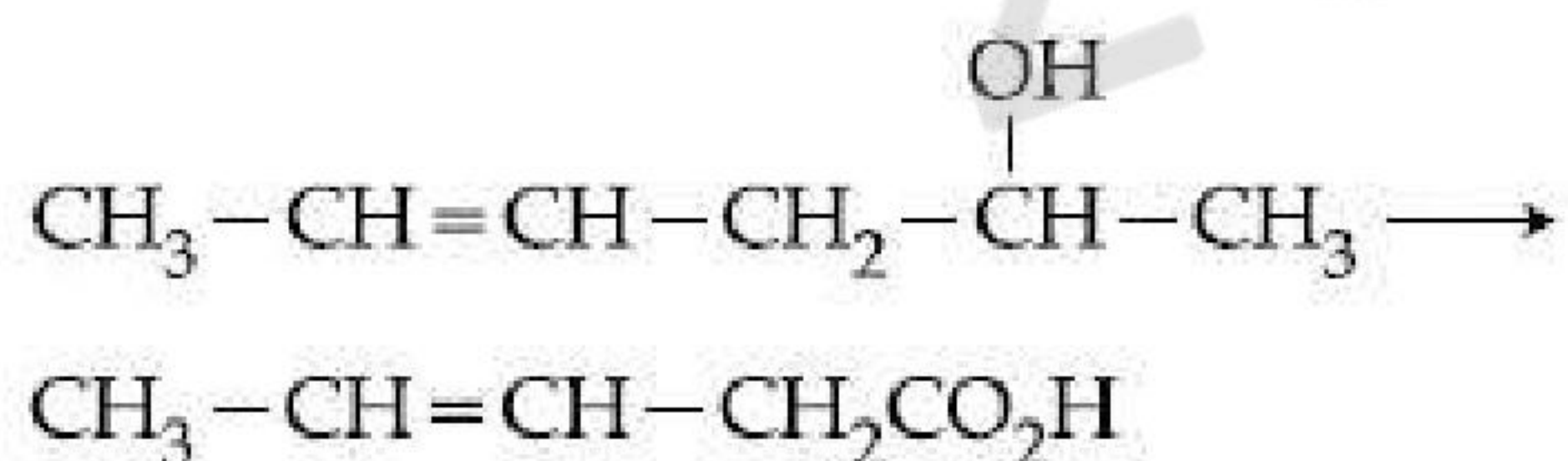
Options :

1. Tollen's reagent
2. I_2/NaOH
3. alkaline KMnO_4
4. $\text{CrO}_2\text{Cl}_2/\text{CS}_2$

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

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित रूपान्तरण के लिए सर्वाधिक उपयुक्त अभिकर्मक क्या है ?



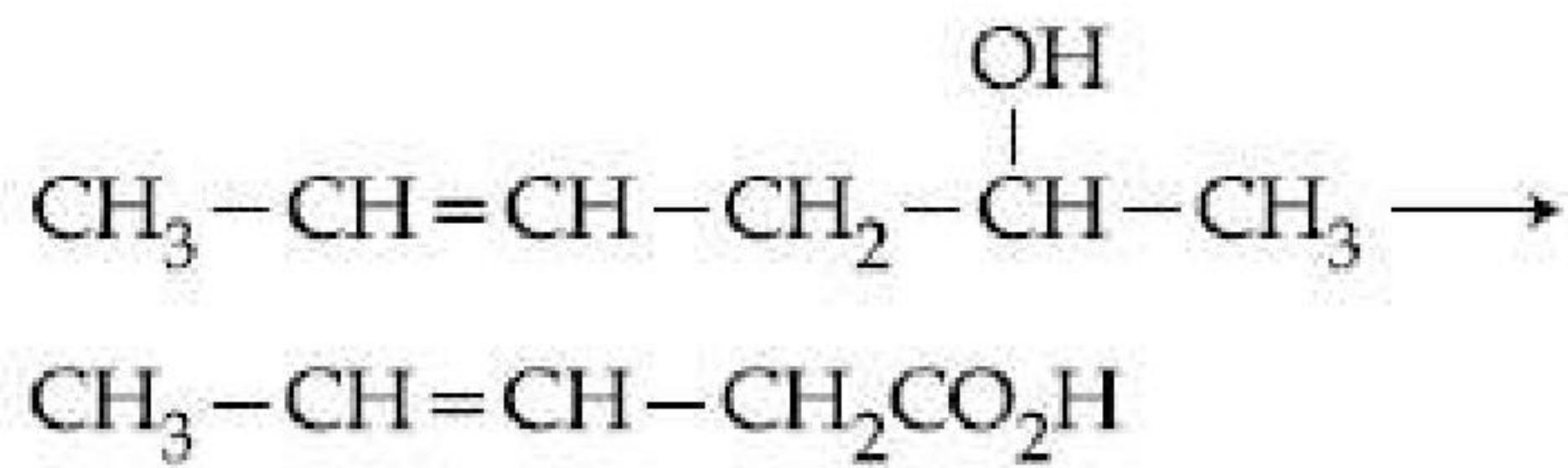
Options :

1. टॉलेन अभिकर्मक
2. I_2/NaOH
3. क्षारीय KMnO_4
4. $\text{CrO}_2\text{Cl}_2/\text{CS}_2$

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

નીચેના રૂપાંતરણ માટે સૌથી યોગ્ય પ્રક્રિયક શોધો?



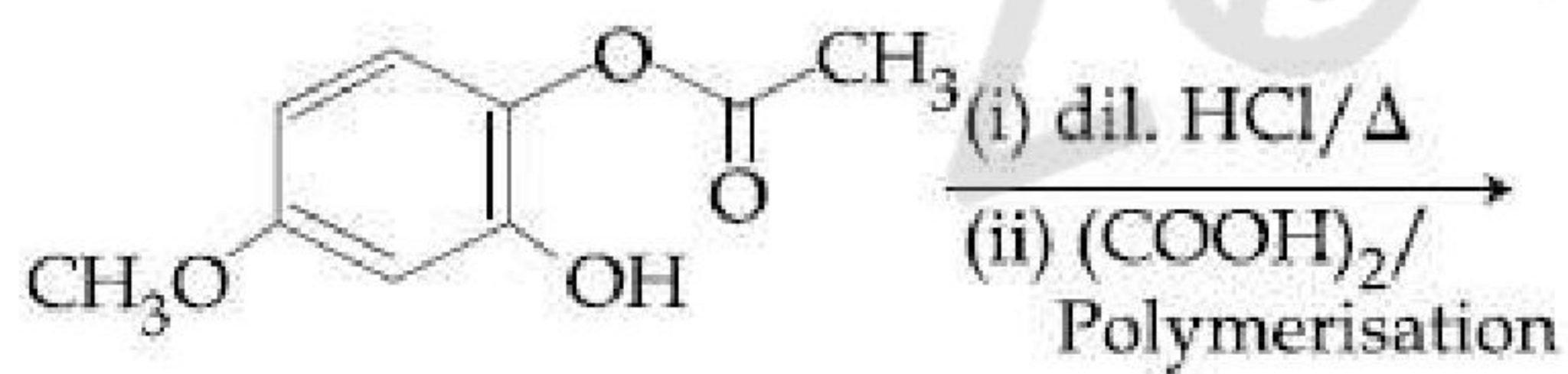
Options :

1. ટોલાન્સ પ્રક્રિયક
2. I_2/NaOH
3. આલ્કલાઈન KMnO_4
4. $\text{CrO}_2\text{Cl}_2/\text{CS}_2$

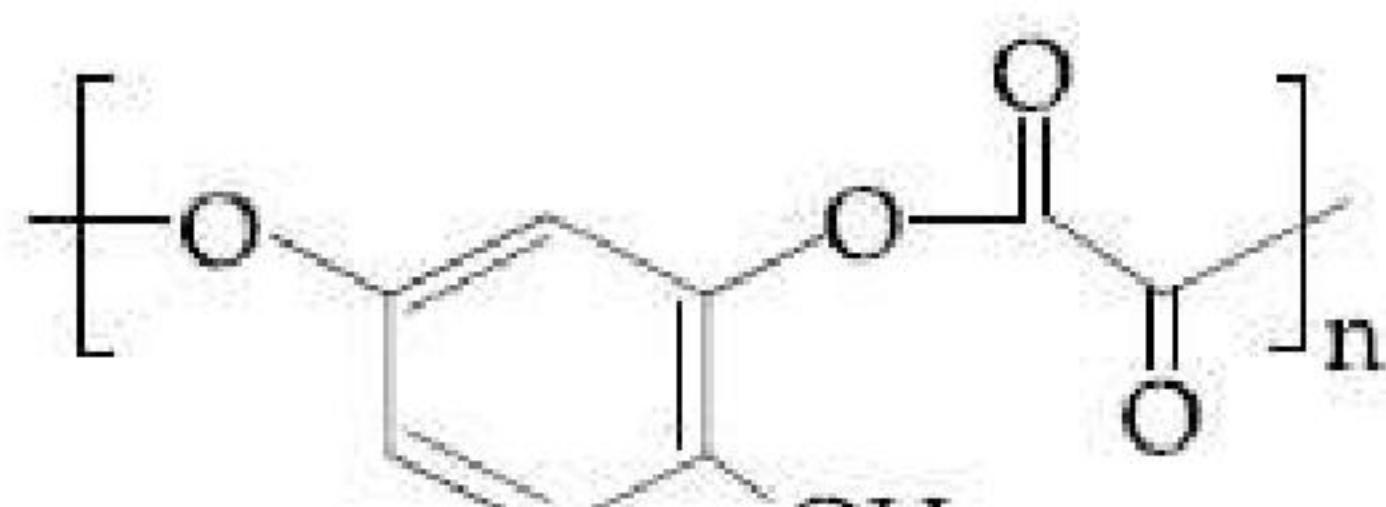
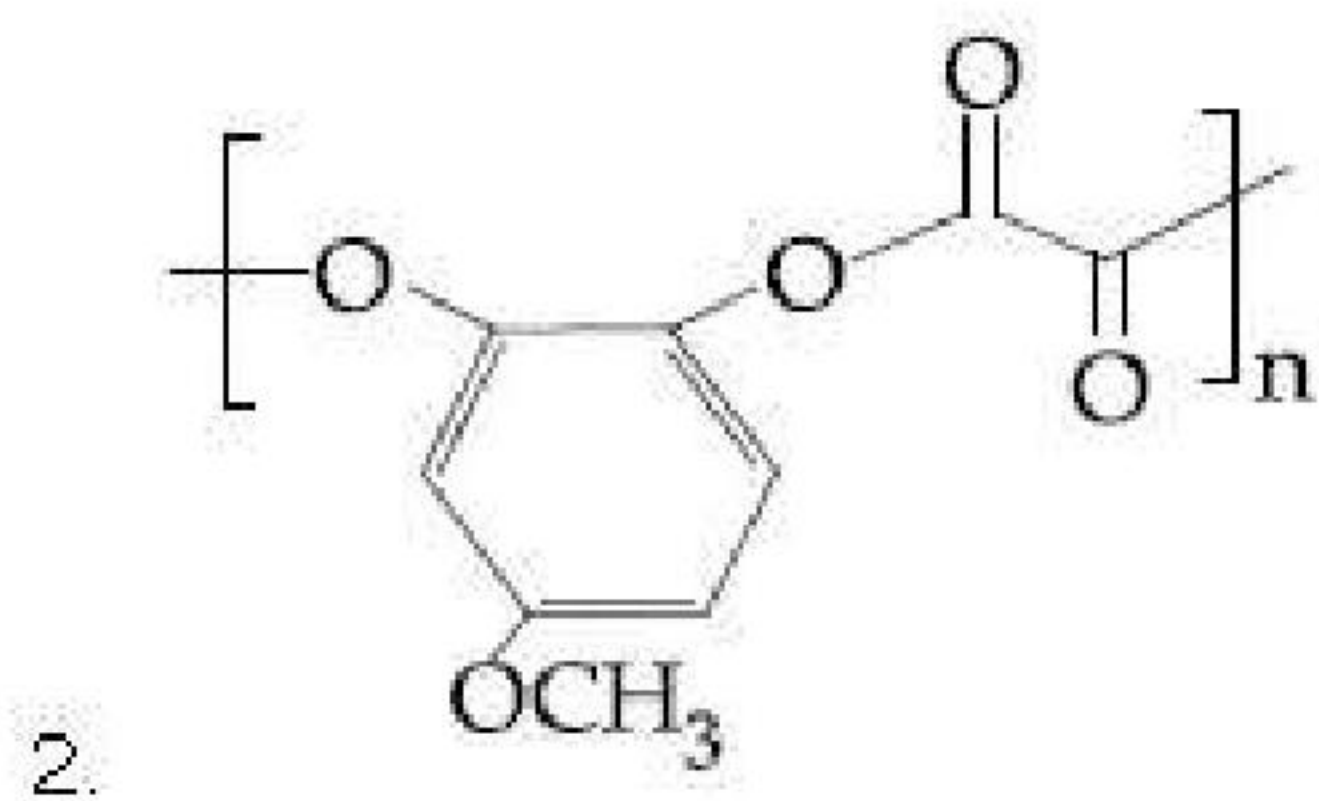
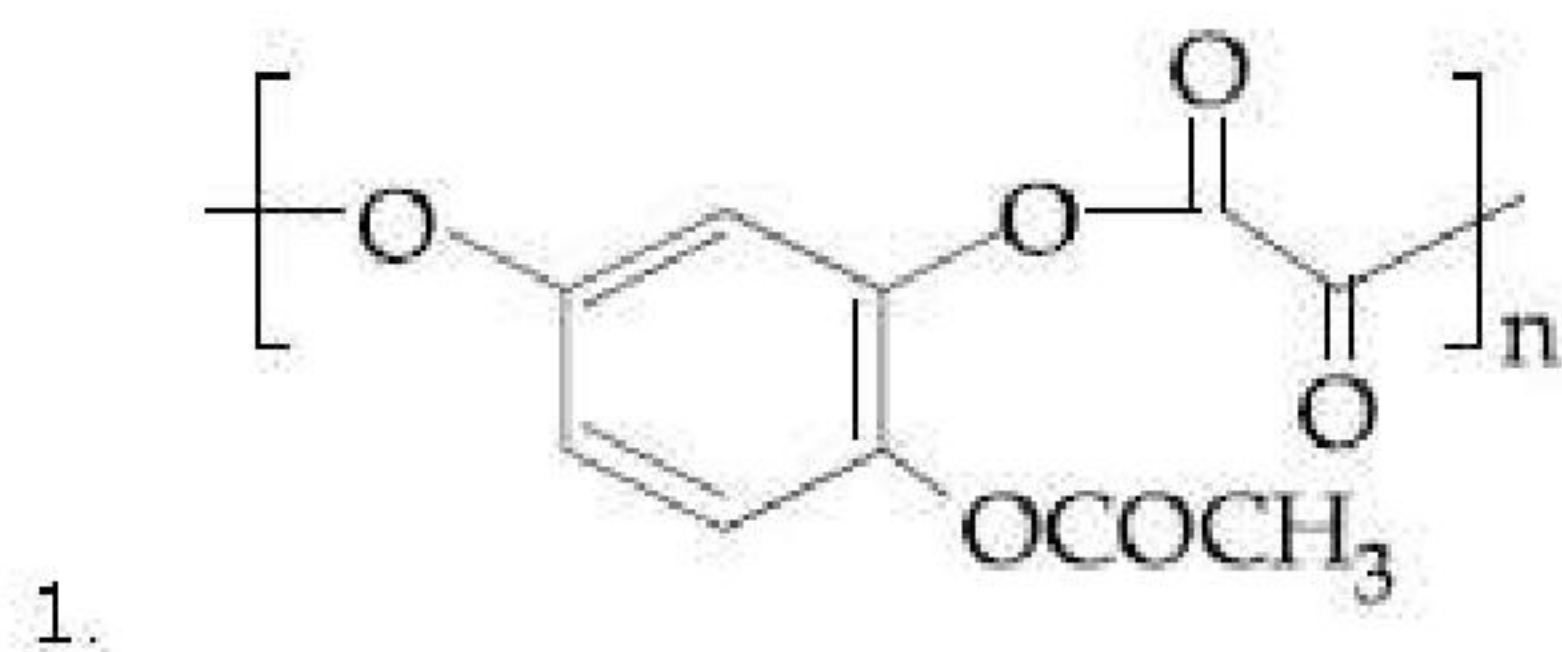
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

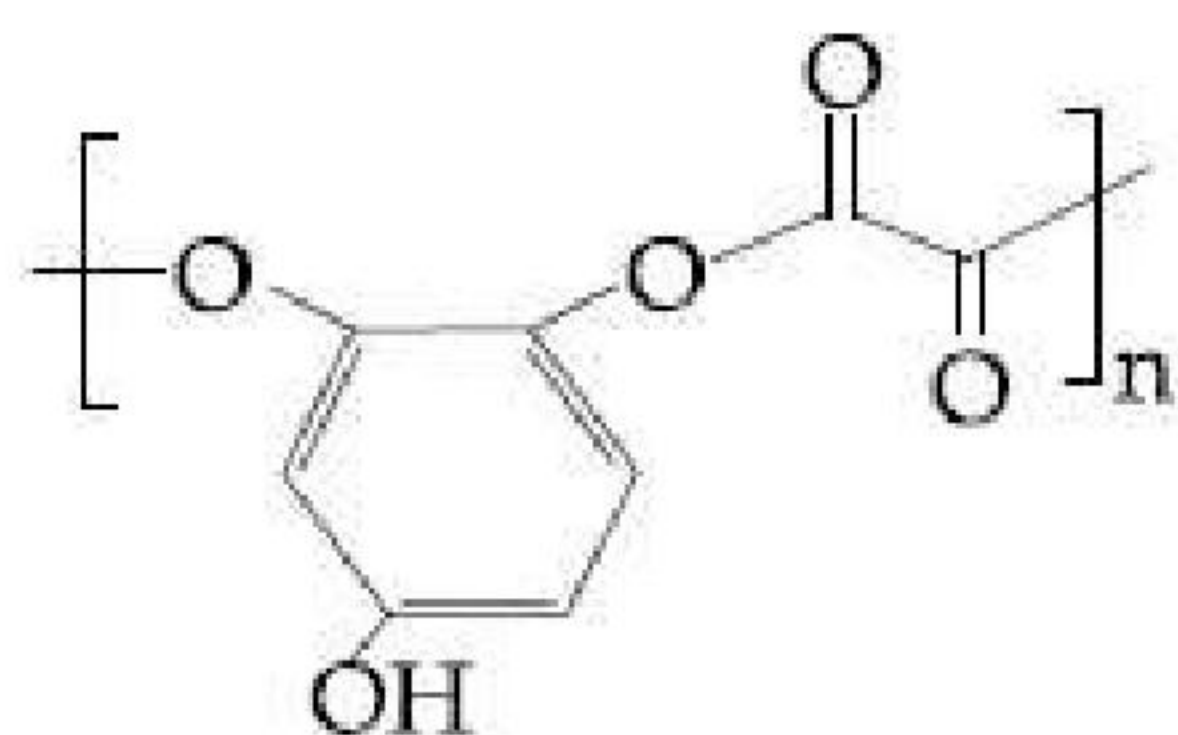
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



Options :



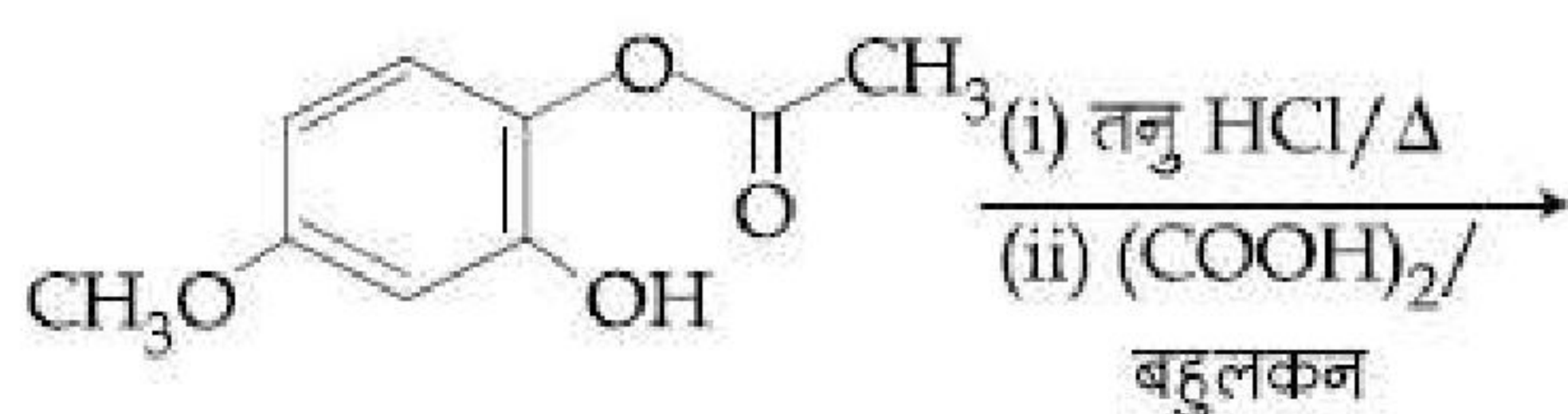


4.

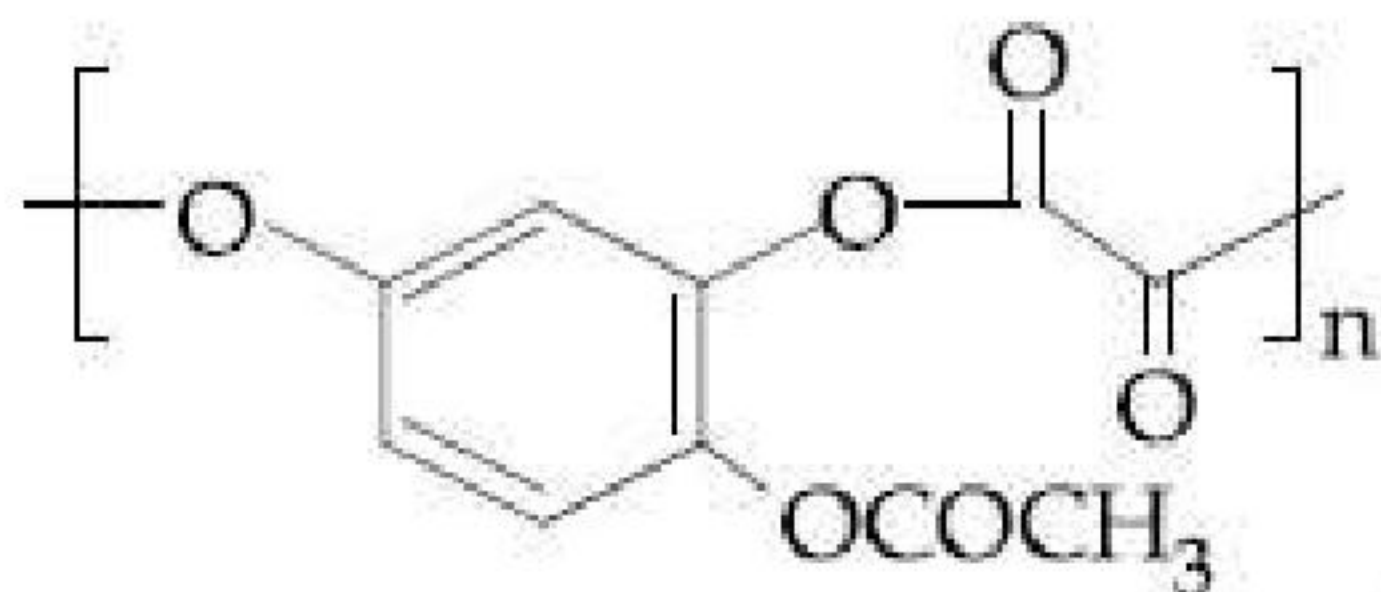
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

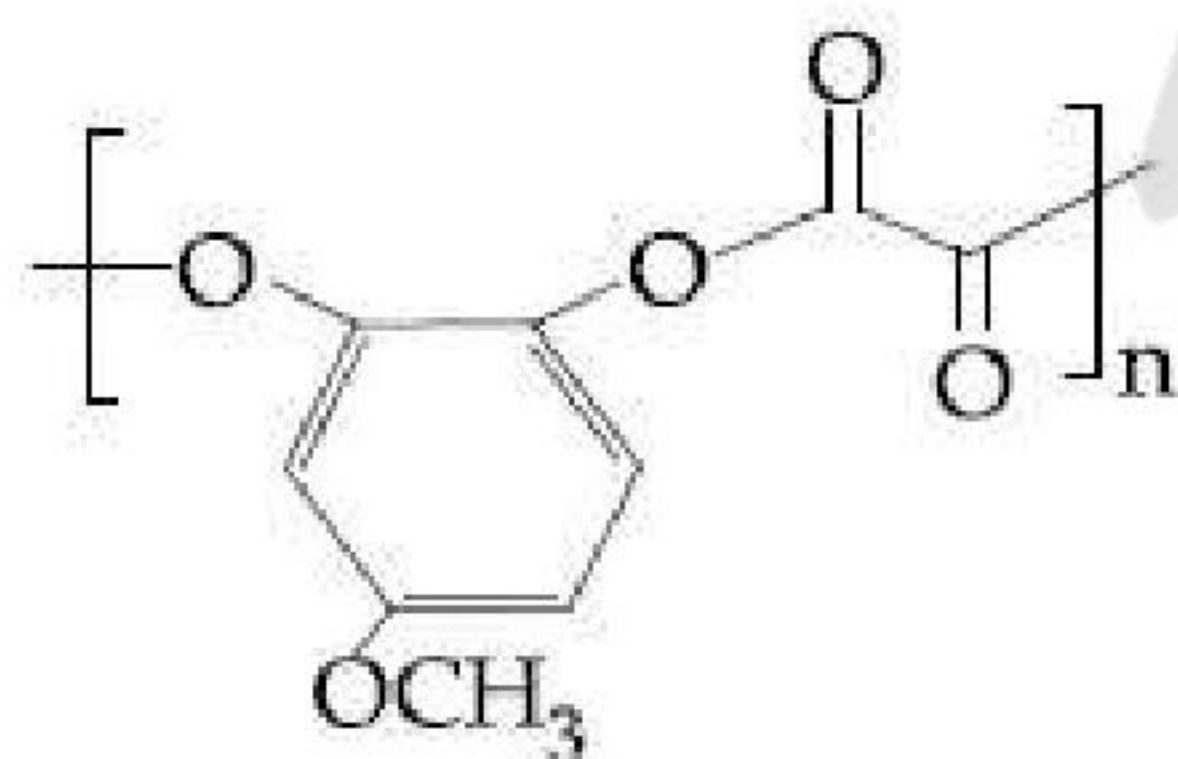
निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



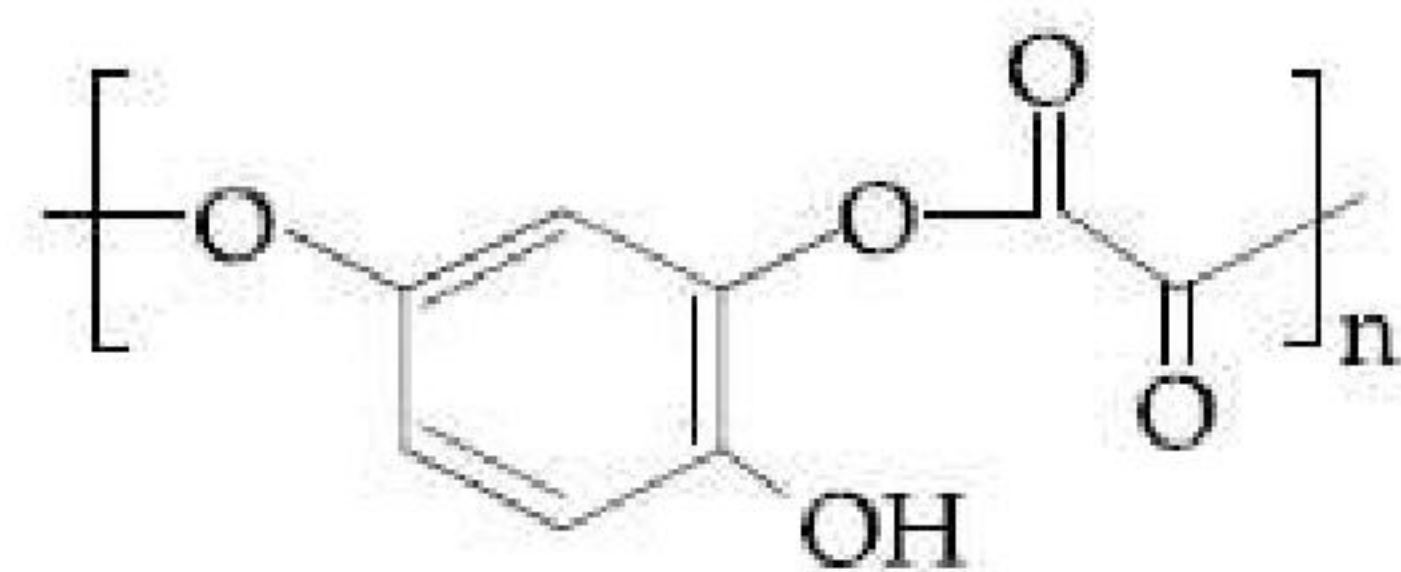
Options :



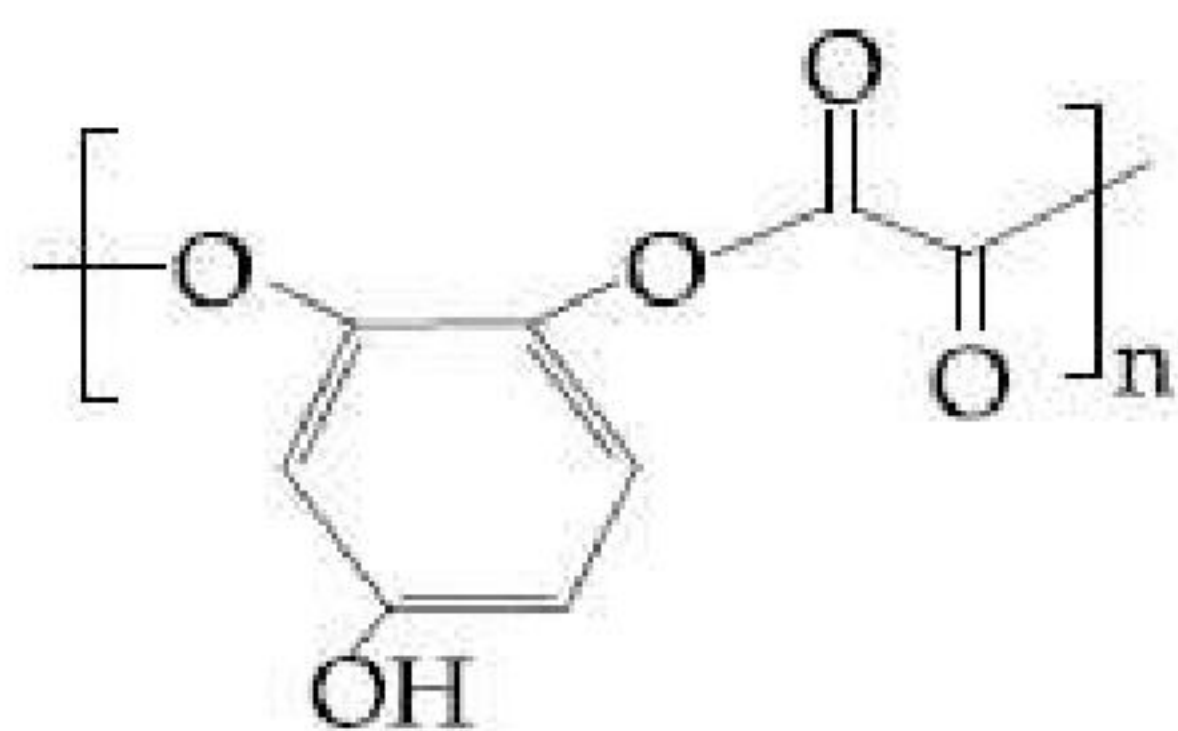
1.



2.

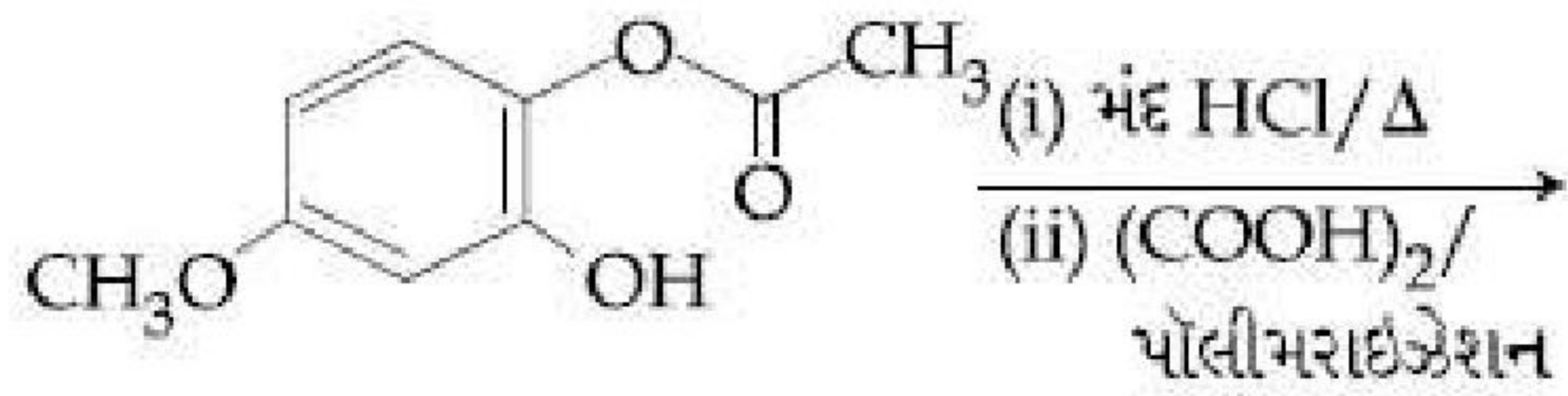


3.

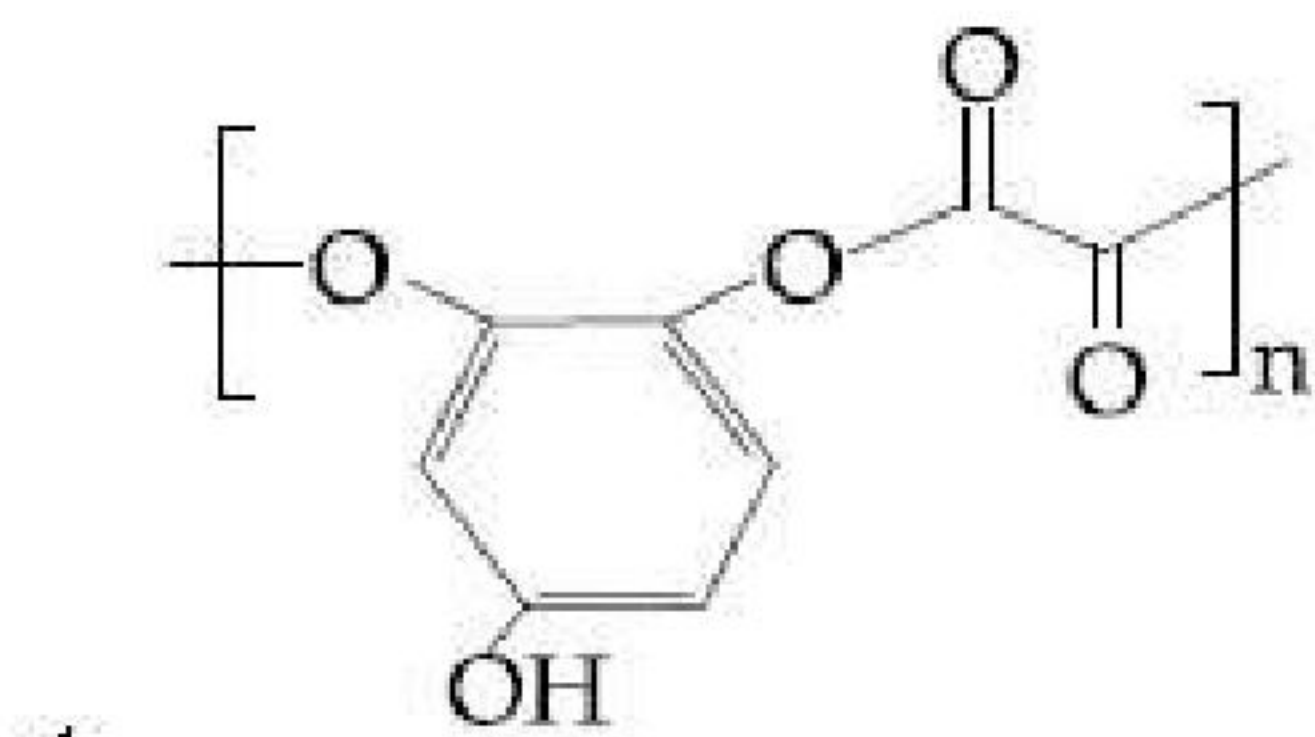
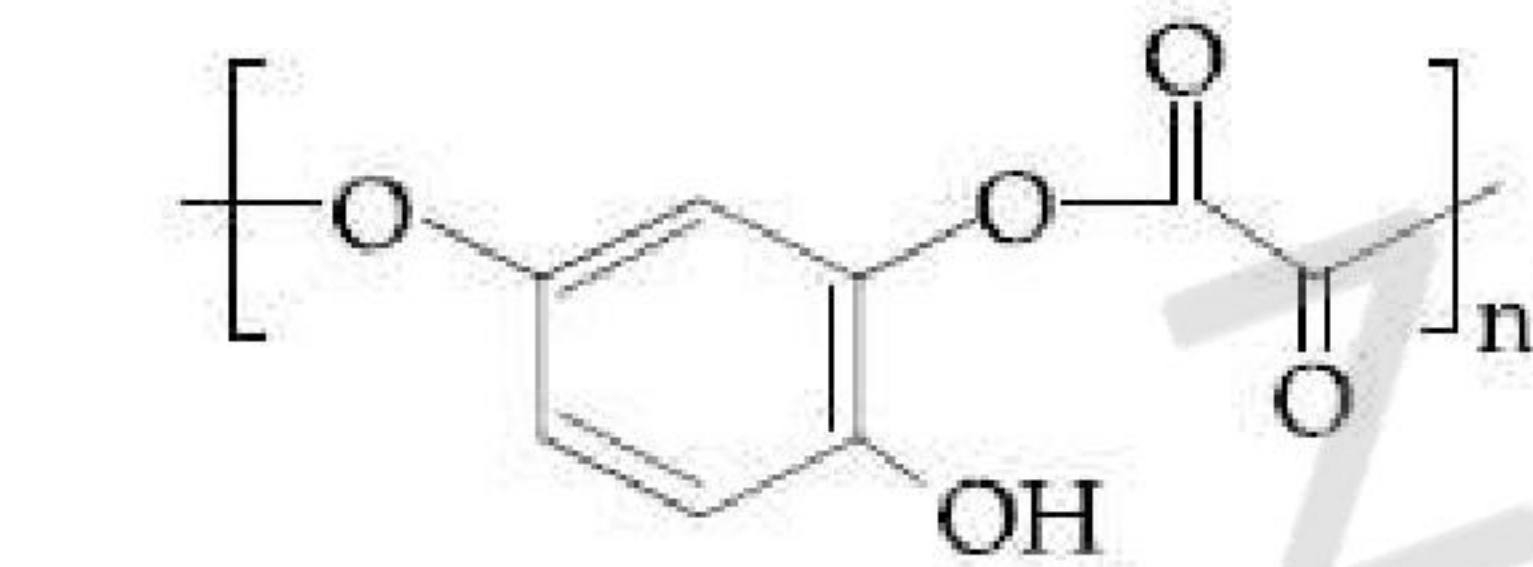
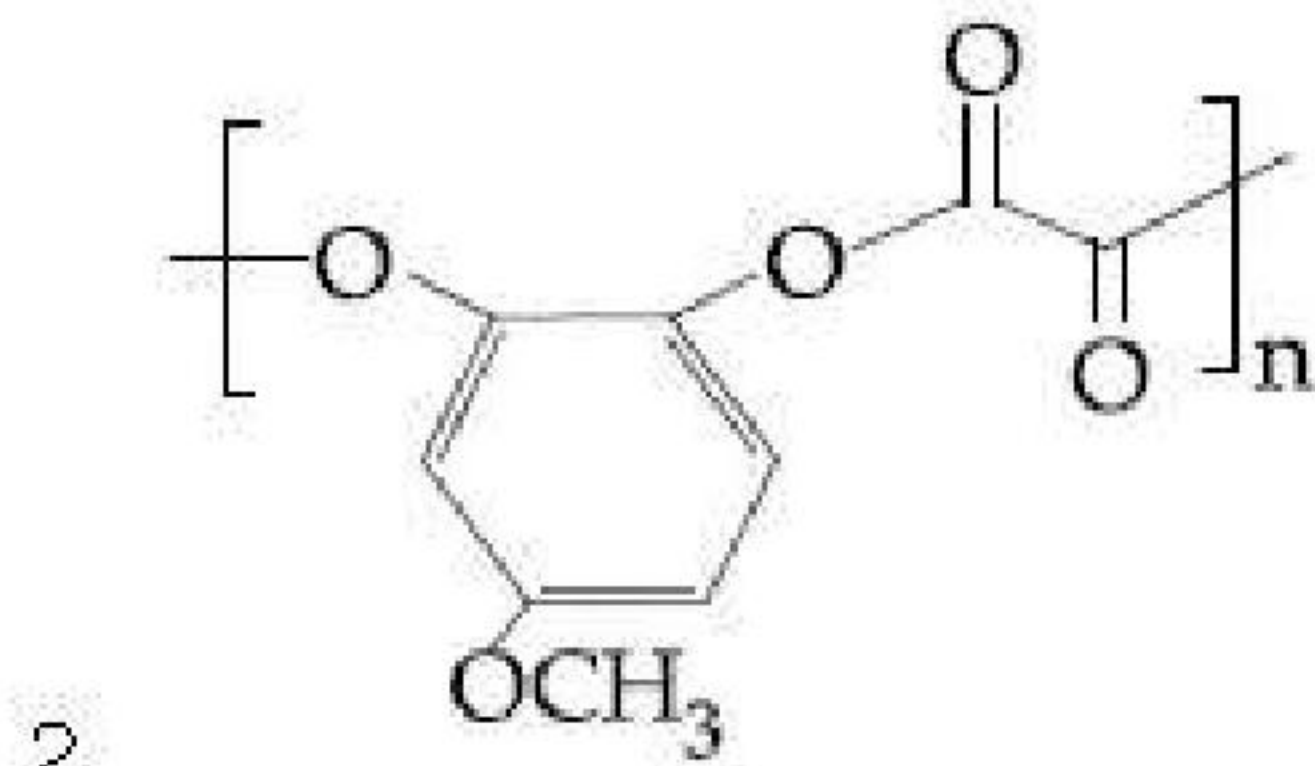
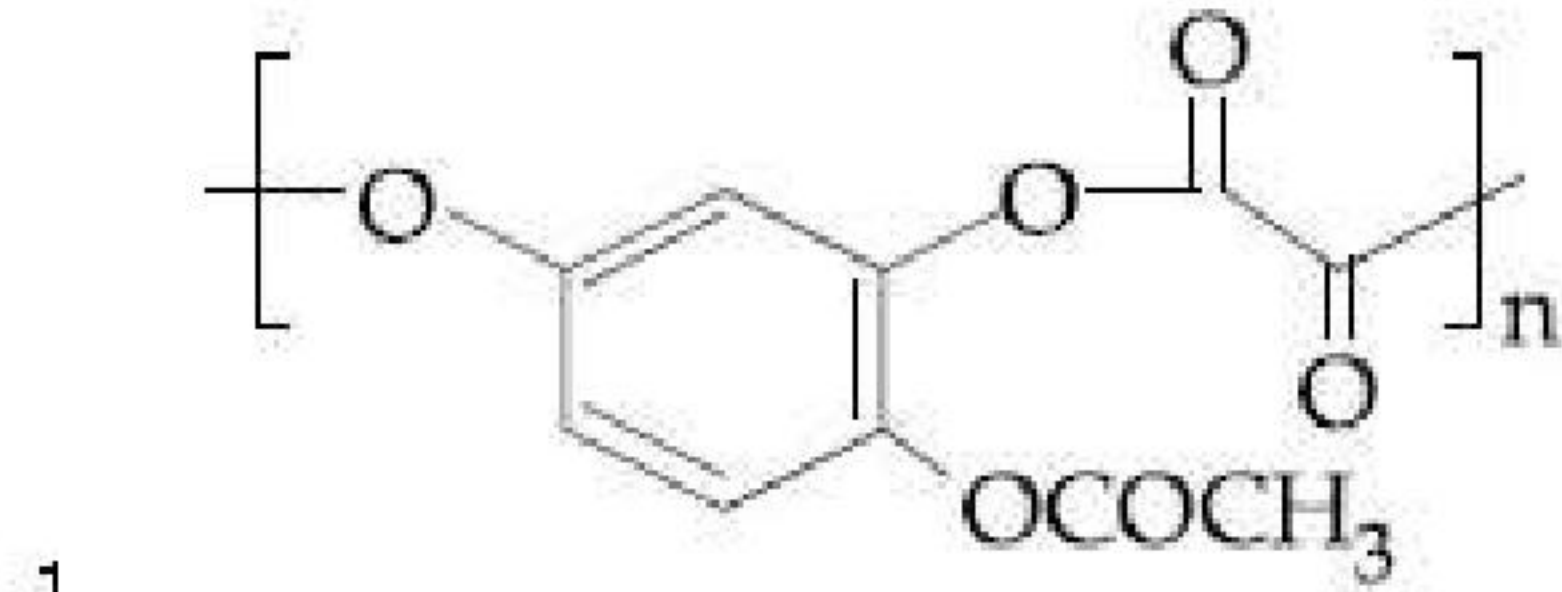


4.

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો?



Options :



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

Correct Marks : 4 Wrong Marks : 1

Which of the following tests cannot be used for identifying amino acids ?

Options :

1. Xanthoproteic test

2. Barfoed test

3. Biuret test

4. Ninhydrin test

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

ऐमीनो अम्लों को पहचानने के लिए निम्नलिखित में से कौन से परीक्षण का उपयोग नहीं कर सकते हैं?

Options :

1. जैन्थोप्रोटीइक परीक्षण
2. बाफोर्ड परीक्षण
3. बाइयूरेट परीक्षण
4. निनहाइड्रिन परीक्षण

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

એમીનો એસિડ ને પારખવા નીચેના માંથી કઈ કસોટી ઉપયોગી નથી?

Options :

1. જૈન્થોપ્રોટીક કસોટી
2. બાફોર્ડ કસોટી
3. બાયયુરેટ કસોટી
4. નીનહાઈડ્રીન કસોટી

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

The correct match between item 'I' and item 'II' is :

Item 'I' (compound)	Item 'II' (reagent)
(A) Lysine	(P) 1-naphthol
(B) Furfural	(Q) ninhydrin
(C) Benzyl alcohol	(R) KMnO_4
(D) Styrene	(S) Ceric ammonium nitrate

Options :

1. (A)→(Q); (B)→(P); (C)→(R); (D)→(S)
2. (A)→(R); (B)→(P); (C)→(Q); (D)→(S)
3. (A)→(Q); (B)→(P); (C)→(S); (D)→(R)
4. (A)→(Q); (B)→(R); (C)→(S); (D)→(P)

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

मदों 'I' तथा 'II' के मध्य सही सुमेल है :

मद 'I' (यौगिक)	मद 'II' (अभिकर्मक)
(A) लाइसीन	(P) 1-नैफ्थॉल
(B) फरफ्यूरल	(Q) निनहाइड्रिन
(C) बिन्जिल एल्कोहाल	(R) KMnO_4
(D) स्टाइरीन	(S) सेरिक अमोनियम नाइट्रेट

Options :

1. (A)→(Q); (B)→(P); (C)→(R); (D)→(S)
2. (A)→(R); (B)→(P); (C)→(Q); (D)→(S)
3. (A)→(Q); (B)→(P); (C)→(S); (D)→(R)
4. (A)→(Q); (B)→(R); (C)→(S); (D)→(P)

સુચી - I ને સુચી - II સાથે યોગ્ય રીતે જોડો.

સુચી - I (સંયોજન)	સુચી - II (પ્રક્રિયક)
(A) લાયસીન	(P) 1-નેફથોલ
(B) ફરફ્યુરાલ	(Q) નીનહાઈડ્રીન
(C) બેન્ઝાઈલ આલ્કોહોલ	(R) KMnO_4
(D) સ્ટાયરીન	(S) સેરીક અમોનિયમ નાઈટ્રેટ

Options :

1. (A)→(Q); (B)→(P); (C)→(R); (D)→(S)
2. (A)→(R); (B)→(P); (C)→(Q); (D)→(S)
3. (A)→(Q); (B)→(P); (C)→(S); (D)→(R)
4. (A)→(Q); (B)→(R); (C)→(S); (D)→(P)

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 71st electron of an element X with an atomic number of 71 enters into the orbital :

Options :

1. 6s
2. 4f
3. 5d
4. 6p

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

एक तत्व X, जिसकी परमाणु संख्या 71 है, उसका 71वाँ इलेक्ट्रॉन जिस कक्षक में प्रवेश करता है, वह है :

Options :

1. 6s

2. 4f

3. 5d

4. 6p

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

પરમાણ્વિક ક્રમાંક 71 ધરાવતો તત્વ X નો 71મો ઇલેક્ટ્રોન નીચે આપેલા માંથી કઈ કક્ષકમાં દાખલ થયે?

Options :

1. 6s

2. 4f

3. 5d

4. 6p

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

Correct Marks : 4 Wrong Marks : 1

The electrolytes usually used in the electroplating of gold and silver, respectively, are :

Options :

1. $[\text{Au}(\text{CN})_2]^-$ and $[\text{Ag}(\text{CN})_2]^-$

2. $[\text{Au}(\text{NH}_3)_2]^+$ and $[\text{Ag}(\text{CN})_2]^-$

3. $[\text{Au}(\text{CN})_2]^-$ and $[\text{AgCl}_2]^-$

4. $[\text{Au}(\text{OH})_4]^-$ and $[\text{Ag}(\text{OH})_2]^-$

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

સોના તથા ચાંદી કે વૈદ્યુત લેપન મેં ઉપયોગ હોને વાલે વૈદ્યુત અપઘટ્ય ક્રમશઃ હૈં :

1. $[\text{Au}(\text{CN})_2]^-$ તથા $[\text{Ag}(\text{CN})_2]^-$
2. $[\text{Au}(\text{NH}_3)_2]^+$ તથા $[\text{Ag}(\text{CN})_2]^-$
3. $[\text{Au}(\text{CN})_2]^-$ તથા $[\text{AgCl}_2]^-$
4. $[\text{Au}(\text{OH})_4]^-$ તથા $[\text{Ag}(\text{OH})_2]^-$

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

સોના અને ચાંદીનો દોળ ચઢાવવા માટે નીચેના માંથી
અનુક્રમે કયા વિદ્યુત વિભાજ્યો નો ઉપયોગ થાય છે?

Options :

1. $[\text{Au}(\text{CN})_2]^-$ અને $[\text{Ag}(\text{CN})_2]^-$
2. $[\text{Au}(\text{NH}_3)_2]^+$ અને $[\text{Ag}(\text{CN})_2]^-$
3. $[\text{Au}(\text{CN})_2]^-$ અને $[\text{AgCl}_2]^-$
4. $[\text{Au}(\text{OH})_4]^-$ અને $[\text{Ag}(\text{OH})_2]^-$

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

Among the following reactions of
hydrogen with halogens, the one that
requires a catalyst is :

Options :

1. $\text{H}_2 + \text{F}_2 \rightarrow 2 \text{HF}$
2. $\text{H}_2 + \text{Cl}_2 \rightarrow 2 \text{HCl}$
3. $\text{H}_2 + \text{Br}_2 \rightarrow 2 \text{HBr}$
4. $\text{H}_2 + \text{I}_2 \rightarrow 2 \text{HI}$

Question Number : 43 Question Type : MCQ Option Shuffling : Yes Display Question Number

હૈલોજન કે સાથ હાઇડ્રોજન કી નિમ્નલિખિત અભિક્રિયાઓં મેં સે જિસમેં એક ઉત્પ્રેરક કી આવશ્યકતા હોતી હૈ, વહ હૈ :

Options :

1. $H_2 + F_2 \rightarrow 2 HF$
2. $H_2 + Cl_2 \rightarrow 2 HCl$
3. $H_2 + Br_2 \rightarrow 2 HBr$
4. $H_2 + I_2 \rightarrow 2 HI$

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

Correct Marks : 4 Wrong Marks : 1

હાઇડ્રોજન સાથે હેલોજનની નીચે આપેલી પ્રક્રિયાઓ પૈકી કઈ એકમાં ઉદ્દીપકની જરૂર પડશે?

Options :

1. $H_2 + F_2 \rightarrow 2 HF$
2. $H_2 + Cl_2 \rightarrow 2 HCl$
3. $H_2 + Br_2 \rightarrow 2 HBr$
4. $H_2 + I_2 \rightarrow 2 HI$

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

Sodium metal on dissolution in liquid ammonia gives a deep blue solution due to the formation of :

Options :

1. sodamide
2. sodium-ammonia complex
3. sodium ion-ammonia complex
4. ammoniated electrons

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

द्रव अमोनिया में सोडियम धातु को विलयित करने पर एक गहरे नीले रंग का विलयन देता है, इसका कारण है :

Options :

1. सोडामाइड का बनना
2. सोडियम-अमोनिया संकुल का बनना
3. सोडियम आयन-अमोनिया संकुल का बनना
4. अमोनियित इलेक्ट्रॉनों का बनना

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

સોડિયમ ધાતુને પ્રવાહી એમોનિયામાં ઓગાળતા ઘેરા ભુરા રંગનું દ્રાવણ બને છે જે નીચેનામાંથી કોને આભારી છે ?

Options :

1. સોડામાઇડ
2. સોડિયમ-એમોનિયા સંક્રિષ્ટ
3. સોડિયમ-આયન-એમોનિયા સંક્રિષ્ટ
4. એમોનિયામય ઇલેક્ટ્રોનસ્

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

Correct Marks : 4 Wrong Marks : 1

The pair that contains two P – H bonds in each of the oxoacids is :

Options :

1. H_3PO_3 and H_3PO_2
2. $\text{H}_4\text{P}_2\text{O}_5$ and H_3PO_3
3. H_3PO_2 and $\text{H}_4\text{P}_2\text{O}_5$

4. $\text{H}_4\text{P}_2\text{O}_5$ and $\text{H}_4\text{P}_2\text{O}_6$

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

निम्नलिखित युग्मों में से जिस युग्म के प्रत्येक आक्सोअम्लों में दो P – H आबंध हैं, वह है :

Options :

1. H_3PO_3 तथा H_3PO_2
2. $\text{H}_4\text{P}_2\text{O}_5$ तथा H_3PO_3
3. H_3PO_2 तथा $\text{H}_4\text{P}_2\text{O}_5$
4. $\text{H}_4\text{P}_2\text{O}_5$ तथा $\text{H}_4\text{P}_2\text{O}_6$

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

દરેક ઓક્સોએસિડમાં નીચે આપેલી કઈ જોડ બે P – H બંધો ધરાવે છે?

Options :

1. H_3PO_3 અને H_3PO_2
2. $\text{H}_4\text{P}_2\text{O}_5$ અને H_3PO_3
3. H_3PO_2 અને $\text{H}_4\text{P}_2\text{O}_5$
4. $\text{H}_4\text{P}_2\text{O}_5$ અને $\text{H}_4\text{P}_2\text{O}_6$

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 number of 2-centre-2-electron and 3-centre-2-electron bonds in B_2H_6 , respectively, are :

Options :

1. 2 and 2

3. 2 and 4

4. 2 and 1

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

B_2H_6 में 2-केन्द्र-2-इलेक्ट्रॉन तथा 3-केन्द्र-2-इलेक्ट्रॉन
आबंधों की संख्या क्रमशः हैं :

Options :

1. 2 तथा 2

2. 4 तथा 2

3. 2 तथा 4

4. 2 तथा 1

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

B_2H_6 માં 2-કેન્દ્ર-2-ઇલેક્ટ્રોન અને 3-કેન્દ્ર-2-ઇલેક્ટ્રોન
બંધોની સંખ્યા અનુક્રમે કઈ હશે તે શોધો?

Options :

1. 2 અને 2

2. 4 અને 2

3. 2 અને 4

4. 2 અને 1

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

In the reaction of oxalate with permanganate in acidic medium, the number of electrons involved in producing one molecule of CO_2 is :

Options :

1. 5

2. 1

3. 2

4. 10

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

અમ્લીય માધ્યમ મેં આક્સેલેટ કી પરમેંગનેટ કે સાથ અભિક્રિયા મેં, CO_2 કે એક અણુ કો બનાને મેં નિહિત ઇલેક્ટ્રોનૉં કી સંખ્યા હૈ :

Options :

1. 5

2. 1

3. 2

4. 10

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

ઓક્ઝલેટની પરમેંગેનેટ સાથે એસિડિક માધ્યમમાં થતી પ્રક્રિયામાં એક મોલ CO_2 ના ઉત્પાદન માટે કેટલા ઇલેક્ટ્રોન શામેલ છે તે શોધો ?

Options :

1. 5

2. 1

3. 2

4. 10

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

Correct Marks : 4 Wrong Marks : 1

The difference in the number of unpaired electrons of a metal ion in its high spin and

Options :

1. Ni^{2+}
2. Mn^{2+}
3. Co^{2+}
4. 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

एक धातु आयन के उच्च-प्रचक्रण तथा निम्न-प्रचक्रण वाले अष्टफलकीय संकुलों के अयुग्मित इलेक्ट्रॉनों की संख्याओं में दो का अन्तर है। धातु आयन है :

Options :

1. Ni^{2+}
2. Mn^{2+}
3. Co^{2+}
4. 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

એક ધાતુ આયનના તેનાં ઊંચી-સ્પીન અને નીચી-સ્પીન ધરાવતા અષ્ટફલકીય સંકુલોમાં અયુગ્મિત ઇલેક્ટ્રોન ની સંખ્યાનો તફાવત બે છે. તો ધાતુ આયન શોધો?

Options :

1. Ni^{2+}
2. Mn^{2+}
3. Co^{2+}
4. Fe^{2+}

A reaction of cobalt(III) chloride and ethylenediamine in a 1 : 2 mole ratio generates two isomeric products A (violet coloured) and B (green coloured). A can show optical activity, but, B is optically inactive. What type of isomers does A and B represent ?

Options :

1. Coordination isomers
2. Geometrical isomers
3. Ionisation isomers
4. Linkage isomers

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

કોબાલ્ટ (III) ક્લોરાઇડ તથા એથિલીનડાઇએમીન કી 1 : 2 મોલ અનુપાત મેં અભિક્રિયા સે દો સમાવયવી ઉત્પાદ A (બૈંગની રંગ કા) તથા ઉત્પાદ B (હરે રંગ કા) ઉત્પન્ન હોતે હૈં। A ધ્રુવણ ઘૂર્ણકતા પ્રદર્શિત કરતા હૈ, પરન્તુ B ધ્રુવણ ઘૂર્ણક નહીં હૈ। કિસ પ્રકાર કી સમાવયતા A તથા B નિરૂપિત કરતે હૈં?

Options :

1. ઉપસહસંયોજન સમાવયતા
2. જ્યામિતીય સમાવયતા
3. આયનન સમાવયતા
4. બંધની સમાવયતા

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

કોબાલ્ટ (III) ક્લોરાઇડ અને ઈથિલીનડાયએમાઇન 1 : 2 મોલ ગુણોત્તર માં બે સમઘટક પદાર્થો A (જાંબલી રંગનો) અને B (લીલા રંગનો) આપે છે. A પ્રકાશ ક્રિયાશીલતા બતાવી શકે. જ્યારે B પ્રકાશ અક્રિયાશીલ

1. સંવર્ગ (Coordination) સમઘટકો
2. ભૌમિતિક સમઘટકો
3. આયનીકરણ સમઘટકો
4. જોડાણ (Linkage) સમઘટકો

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

Correct Marks : 4 Wrong Marks : 1

The reaction that is NOT involved in the ozone layer depletion mechanism in the stratosphere is :

Options :

1. $\text{HOCl(g)} \xrightarrow{h\nu} \dot{\text{O}}\text{H(g)} + \dot{\text{Cl}}\text{(g)}$
2. $\text{Cl}\dot{\text{O}}\text{(g)} + \text{O(g)} \rightarrow \dot{\text{Cl}}\text{(g)} + \text{O}_2\text{(g)}$
3. $\text{CH}_4 + 2 \text{O}_3 \rightarrow 3 \text{CH}_2=\text{O} + 3 \text{H}_2\text{O}$
4. $\text{CF}_2\text{Cl}_2\text{(g)} \xrightarrow{\text{uv}} \dot{\text{Cl}}\text{(g)} + \dot{\text{C}}\text{F}_2\text{Cl(g)}$

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

સમતાપમંડલ મેં ઓઝોન પરતોં કે અવક્ષય મેં જો અભિક્રિયા નહીં સમ્મિલિત હોતી હૈ, વહ હૈ :

Options :

1. $\text{HOCl(g)} \xrightarrow{h\nu} \dot{\text{O}}\text{H(g)} + \dot{\text{Cl}}\text{(g)}$
2. $\text{Cl}\dot{\text{O}}\text{(g)} + \text{O(g)} \rightarrow \dot{\text{Cl}}\text{(g)} + \text{O}_2\text{(g)}$
3. $\text{CH}_4 + 2 \text{O}_3 \rightarrow 3 \text{CH}_2=\text{O} + 3 \text{H}_2\text{O}$
4. $\text{CF}_2\text{Cl}_2\text{(g)} \xrightarrow{\text{uv}} \dot{\text{Cl}}\text{(g)} + \dot{\text{C}}\text{F}_2\text{Cl(g)}$

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

નીચે આપેલી પ્રક્રિયા પૈકી કઈ એક સમતાપ વાતાવરણમાં
ઓઝોન સ્તરનું ગાબડું પાડવા માટે જવાબદાર નથી

Options :

1. $\text{HOCl(g)} \xrightarrow{h\nu} \dot{\text{O}}\text{H(g)} + \dot{\text{Cl}}\text{(g)}$
2. $\text{Cl}\dot{\text{O}}\text{(g)} + \text{O(g)} \rightarrow \dot{\text{Cl}}\text{(g)} + \text{O}_2\text{(g)}$
3. $\text{CH}_4 + 2 \text{O}_3 \rightarrow 3 \text{CH}_2=\text{O} + 3 \text{H}_2\text{O}$
4. $\text{CF}_2\text{Cl}_2\text{(g)} \xrightarrow{\text{uv}} \dot{\text{Cl}}\text{(g)} + \dot{\text{C}}\text{F}_2\text{Cl(g)}$

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

The amount of sugar ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) required
to prepare 2 L of its 0.1 M aqueous solution
is :

Options :

1. 34.2 g
2. 68.4 g
3. 17.1 g
4. 136.8 g

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

શર્કરા કે દો લીટર 0.1 M જલીય વિલયન કો બનાવે
કે લીધે શર્કરા ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) કી આવશ્યક માત્રા
હૈ :

Options :

1. 34.2 g

3. 17.1 g
4. 136.8 g

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

શર્કરાનું ($C_{12}H_{22}O_{11}$) 2 L, 0.1 M જલીય દ્રાવણ બનાવવા કેટલી માત્રા જરૂરી?

Options :

1. 34.2 g
2. 68.4 g
3. 17.1 g
4. 136.8 g

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

A compound of formula A_2B_3 has the hcp lattice. Which atom forms the hcp lattice and what fraction of tetrahedral voids is occupied by the other atoms :

Options :

1. hcp lattice - A, $\frac{2}{3}$ Tetrahedral voids - B
2. hcp lattice - B, $\frac{2}{3}$ Tetrahedral voids - A
3. hcp lattice - A, $\frac{1}{3}$ Tetrahedral voids - B
4. hcp lattice - B, $\frac{1}{3}$ Tetrahedral voids - A

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

A_2B_3 સૂત્ર વાલે એક યૌગિક મેં hcp જાલક હૈ। કૌન સા પરમાણુ hcp જાલક બનાતા હૈ તથા ચતુષ્ફલકીય રિક્તિયોં કા કૌન સા અંશ દૂસરે પરમાણુ દ્વારા અધ્યાસિત હોતા હૈ ?

Options :

1. hcp જાલક - A, $\frac{2}{3}$ ચતુષ્ફલકીય રિક્તિયોં - B
2. hcp જાલક - B, $\frac{2}{3}$ ચતુષ્ફલકીય રિક્તિયોં - A
3. hcp જાલક - A, $\frac{1}{3}$ ચતુષ્ફલકીય રિક્તિયોં - B
4. hcp જાલક - B, $\frac{1}{3}$ ચતુષ્ફલકીય રિક્તિયોં - A

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

Correct Marks : 4 Wrong Marks : 1

એક સંયોજન જેનું સુત્ર A_2B_3 છે તે hcp સ્ફટિક છે. કયો પરમાણુ hcp સ્ફટિક બનાવે છે અને ચતુષ્ફલકીય છિદ્રો નો કેટલામો ભાગ બીજા પરમાણુ ના કબજા માં હશે તે શોધો ?

Options :

1. hcp સ્ફટિક - A, $\frac{2}{3}$ ચતુષ્ફલકીય છિદ્રો - B
2. hcp સ્ફટિક - B, $\frac{2}{3}$ ચતુષ્ફલકીય છિદ્રો - A
3. hcp સ્ફટિક - A, $\frac{1}{3}$ ચતુષ્ફલકીય છિદ્રો - B

4. hcp સફટિક - B, $\frac{1}{3}$ ચતુષ્ફલકિય છિદ્રો - A

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

The ground state energy of hydrogen atom is -13.6 eV. The energy of second excited state of He^+ ion in eV is :

Options :

1. -54.4
2. -27.2
3. -3.4
4. -6.04

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

હાઇડ્રોજન પરમાણુ કી મૂલ અવસ્થા ઊર્જા -13.6 eV છે. He^+ આયન કી દ્વિતીય ઉત્તેજિત અવસ્થા કી ઊર્જા, eV મેં, છે :

Options :

1. -54.4
2. -27.2
3. -3.4
4. -6.04

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

હાઇડ્રોજન પરમાણુની ધરા અવસ્થામાં ઊર્જા -13.6 eV છે. He^+ આયનની દ્વિતીય ઉત્તેજિત અવસ્થાની ઊર્જા eV માં શોધો?

Options :

2. -27.2

3. -3.4

4. -6.04

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

An ideal gas undergoes isothermal compression from 5 m^3 to 1 m^3 against a constant external pressure of 4 Nm^{-2} . Heat released in this process is used to increase the temperature of 1 mole of Al. If molar heat capacity of Al is $24 \text{ J mol}^{-1}\text{K}^{-1}$, the temperature of Al increases by :

Options :

1. 1 K

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

3. 2 K

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

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

4 Nm^{-2} के स्थिर बाह्य दाब के विरुद्ध, एक आदर्श गैस का समतापी संपीड़न 5 m^3 से 1 m^3 तक किया जाता है। इस प्रक्रम में उत्सर्जित ऊष्मा का प्रयोग 1 मोल Al के ताप को बढ़ाने के लिए किया जाता है। यदि Al की मोलर ऊष्मा धारिता $24 \text{ J mol}^{-1}\text{K}^{-1}$ है तो Al का ताप जितना बढ़ता है, वह है :

Options :

1. 1 K

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

3. 2 K

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

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

4 Nm^{-2} ના અચળ બાહ્ય દબાણે, એક આદર્શ વાયુ 5 m^3 થી 1 m^3 સુધી સમતાપી સંકોચન પામે છે. આ પ્રક્રિયામાં ઉત્સર્જિત ઉષ્માનો ઉપયોગ 1 મોલ Al ને ગરમ કરવા માટે આવે છે. જો Al ની મોલર ઉષ્મા ક્ષમતા $24\text{ J mol}^{-1}\text{K}^{-1}$ હોય તો, Al નું તાપમાન કેટલું વધશે?

Options :

1. 1 K

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

3. 2 K

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

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

Correct Marks : 4 Wrong Marks : 1

The process with negative entropy change is :

Options :

1. Sublimation of dry ice

2. Dissolution of iodine in water

3. Dissociation of $\text{CaSO}_4(\text{s})$ to $\text{CaO}(\text{s})$ and $\text{SO}_3(\text{g})$

4. Synthesis of ammonia from N_2 and H_2

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

Correct Marks : 4 Wrong Marks : 1

ઋણાત્મક એન્ટ્રોપી પરિવર્તન વાળા પ્રક્રમ હૈ :

Options :

1. શુષ્ક વર્ફ કા ઊર્ધ્વપાતન

2. આયોડીન કા જલ મૈં વિલયન

3. $\text{CaSO}_4(\text{s})$ કા $\text{CaO}(\text{s})$ તથા $\text{SO}_3(\text{g})$ મૈં વિયોજન

4. N_2 તથા H_2 સૈં અમોનિયા કા સંશ્લેષણ

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

પ્રક્રમ જૈમાં એન્ટ્રોઇપી માં થતો ફેરફાર કણ છે તે :

Options :

1. શુષ્ક બરફનું ઉર્ધ્વપાતન

2. આયોડીન નું પાણીમાં વિલયન

3. $\text{CaSO}_4(\text{s})$ નું $\text{CaO}(\text{s})$ અને $\text{SO}_3(\text{g})$ માં વિયોજન.

4. એમોનિયા નું N_2 અને H_2 માંથી સંશ્લેષણ

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

Elevation in the boiling point for 1 molal solution of glucose is 2 K. The depression in the freezing point for 2 molal solution of glucose in the same solvent is 2 K. The relation between K_b and K_f is :

Options :

1. $K_b = 1.5 K_f$

2. $K_b = 0.5 K_f$

4. $K_b = 2 K_f$

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

ग्लूकोस के 1 मोलल विलयन के क्वथनांक में उन्नयन $2 K$ है। ग्लूकोस के उसी विलायक में 2 मोलल विलयन के हिमांक में अवनमन $2 K$ है। K_b तथा K_f में संबंध है :

Options :

1. $K_b = 1.5 K_f$

2. $K_b = 0.5 K_f$

3. $K_b = K_f$

4. $K_b = 2 K_f$

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

1 મોલલ ગ્લુકોઝના દ્રાવણ માટે તેના ઉત્કલન બિંદુમાં ઘટો વધારો $2 K$ છે. એ જ દ્રાવકમાં, 2 મોલલ ગ્લુકોઝના દ્રાવણ માટે તેના ઠારબિંદુ નું અવનયન $2 K$ છે. તો K_b અને K_f વચ્ચેનો સંબંધ?

Options :

1. $K_b = 1.5 K_f$

2. $K_b = 0.5 K_f$

3. $K_b = K_f$

4. $K_b = 2 K_f$

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

5.1 g NH_4SH is introduced in 3.0 L evacuated flask at 327°C . 30% of the solid NH_4SH decomposed to NH_3 and H_2S as gases. The K_p of the reaction at 327°C is ($R = 0.082 \text{ L atm mol}^{-1}\text{K}^{-1}$, Molar mass of $\text{S} = 32 \text{ g mol}^{-1}$, molar mass of $\text{N} = 14 \text{ g mol}^{-1}$)

Options :

1. $1 \times 10^{-4} \text{ atm}^2$
2. $4.9 \times 10^{-3} \text{ atm}^2$
3. 0.242 atm^2
4. $0.242 \times 10^{-4} \text{ atm}^2$

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

Correct Marks : 4 Wrong Marks : 1

5.1 g NH_4SH को 327°C पर 3.0 L के एक रिक्त किये गये फ्लास्क में डाला जाता है। 30% ठोस NH_4SH , NH_3 तथा H_2S गैसों में अपघटित हो जाता है। 327°C पर इस अभिक्रिया का K_p है : ($R = 0.082 \text{ L atm mol}^{-1}\text{K}^{-1}$, मोलर द्रव्यमान $\text{S} = 32 \text{ g mol}^{-1}$, मोलर द्रव्यमान $\text{N} = 14 \text{ g mol}^{-1}$)

Options :

1. $1 \times 10^{-4} \text{ atm}^2$
2. $4.9 \times 10^{-3} \text{ atm}^2$
3. 0.242 atm^2
4. $0.242 \times 10^{-4} \text{ atm}^2$

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

Correct Marks : 4 Wrong Marks : 1

5.1 g NH_4SH ને 327°C પર એક 3.0 L (નિર્વાતિત) ખાલી કરેલા ફ્લાસ્કમાં નાખવામાં આવે છે. 30% જેટલા ધન NH_4SH નું NH_3 અને H_2S વાયું સ્વરૂપે વિઘટન થાય છે. તો 327°C પર પ્રક્રિયાનો K_p શોધો?

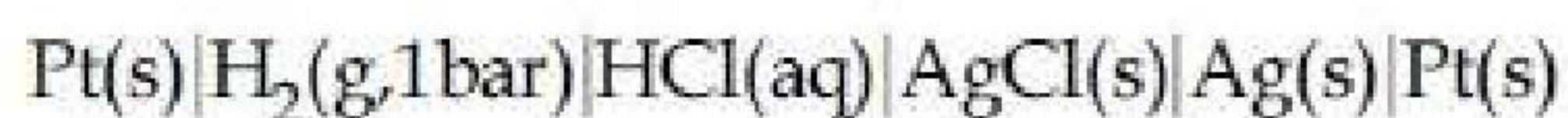
Options :

1. $1 \times 10^{-4} \text{ atm}^2$
2. $4.9 \times 10^{-3} \text{ atm}^2$
3. 0.242 atm^2
4. $0.242 \times 10^{-4} \text{ atm}^2$

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

જ્યારે 10^{-6} મોલલ HCl ના દ્રાવણનો ઉપયોગ કરવામાં આવે ત્યારે એક કોષ,



માટે કોષ પોટેન્શિયલ 0.92 V છે. તો $(\text{AgCl}/\text{Ag}, \text{Cl}^-)$ ઈલેક્ટ્રોડનો પ્રમાણિત ઈલેક્ટ્રોડ પોટેન્શિયલ શોધો?

$$\left\{ \text{આપેલ } \frac{2.303RT}{F} = 0.06 \text{ V, } 298 \text{ K એ} \right\}$$

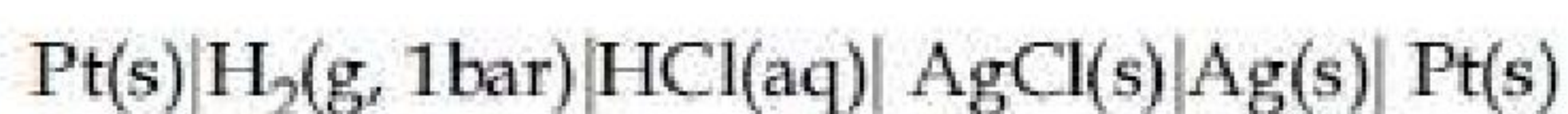
Options :

1. 0.40 V
2. 0.76 V
3. 0.20 V
4. 0.94 V

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

निम्नलिखित सेल में



यदि 10^{-6} molal HCl विलयन का उपयोग होता है तो सेल का विभव 0.92 V है। $(\text{AgCl}/\text{Ag}, \text{Cl}^-)$ इलेक्ट्रोड का मानक इलेक्ट्रोड विभव है : दिया गया है,

- sed. The standard
f (AgCl/Ag, Cl⁻)
6 V at 298 K}

Correct Marks : 4 Wrong Marks : 1

$\text{Pt(s)}|\text{H}_2(\text{g}, 1\text{bar})|\text{HCl}(\text{aq})|\text{AgCl(s)}|\text{Ag(s)}|\text{Pt(s)}$
the cell potential is 0.92 V when a 10^{-6} molal HCl solution is used. The standard electrode potential of $(\text{AgCl}/\text{Ag}, \text{Cl}^-)$ electrode is :

$$\left\{ \text{Given, } \frac{2.303RT}{F} = 0.06 \text{ V at } 298 \text{ K} \right\}$$

1. 0.40 V
2. 0.76 V
3. 0.20 V
4. 0.94 V

Correct Marks : 4 Wrong Marks : 1

For an elementary chemical reaction,

$A_2 \xrightleftharpoons[k_{-1}]{k_1} 2A$, the expression for $\frac{d[A]}{dt}$ is :

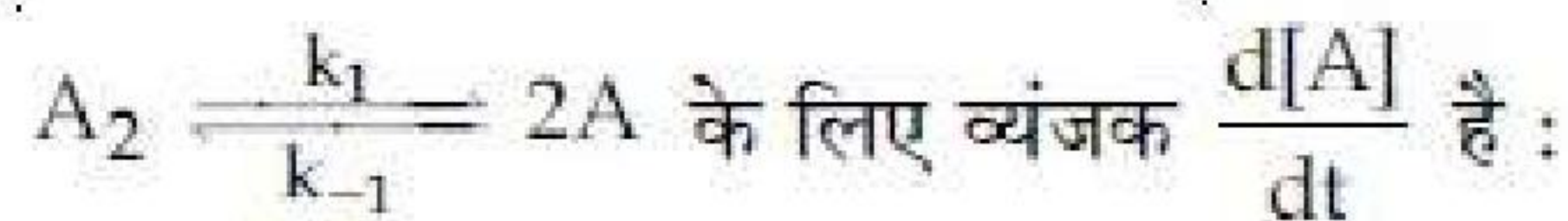
1. $k_1[A_2] - k_{-1}[A]^2$
2. $2k_1[A_2] - 2k_{-1}[A]^2$

4. $k_1[A_2] + k_{-1}[A]^2$

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

एक प्रारम्भिक रासायनिक अभिक्रिया



Options :

1. $k_1[A_2] - k_{-1}[A]^2$

2. $2k_1[A_2] - 2k_{-1}[A]^2$

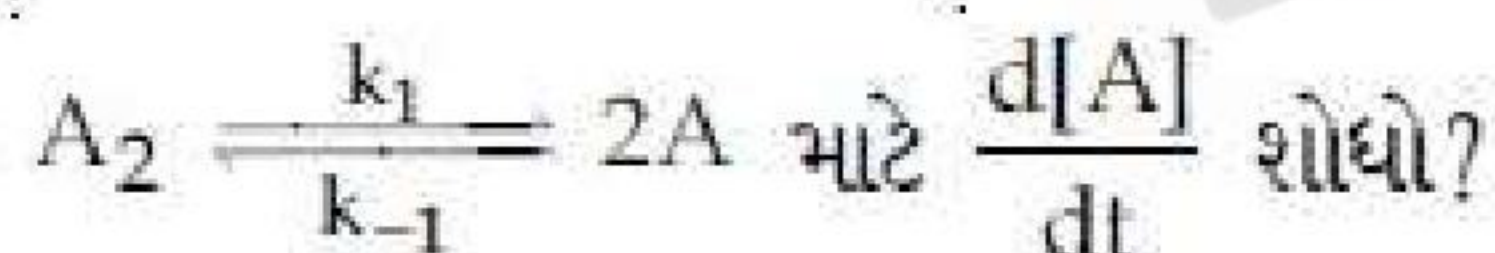
3. $2k_1[A_2] - k_{-1}[A]^2$

4. $k_1[A_2] + k_{-1}[A]^2$

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 પ્રાથમિક રાસાયણિક પ્રક્રિયા,



Options :

1. $k_1[A_2] - k_{-1}[A]^2$

2. $2k_1[A_2] - 2k_{-1}[A]^2$

3. $2k_1[A_2] - k_{-1}[A]^2$

4. $k_1[A_2] + k_{-1}[A]^2$

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

Haemoglobin and gold sol are examples of :

Options :

1. positively charged sols

2. negatively charged sols
3. positively and negatively charged sols, respectively
4. negatively and positively charged sols, respectively

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

हीमोग्लोबिन तथा गोल्ड सॉल उदाहरण हैं :

Options :

1. धनात्मक आवेशित सॉलों के
2. ऋणात्मक आवेशित सॉलों के
3. क्रमशः धनात्मक तथा ऋणात्मक आवेशित सॉलों के
4. क्रमशः ऋणात्मक तथा धनात्मक आवेशित सॉलों के

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

હિમોગ્લોબિન અને સોનાના સોલ નીચેના માંથી કોના ઉદાહરણ છે ?

Options :

1. ધન ભારીત સોલ
2. ઋણ ભારીત સોલ
3. અનુક્રમે, ધન અને ઋણ ભારીત સોલ
4. અનુક્રમે, ઋણ અને ધન ભારીત સોલ

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:	416529183
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

Let N be the set of natural numbers and two functions f and g be defined as $f, g : N \rightarrow N$ such that

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{if } n \text{ is odd} \\ \frac{n}{2} & \text{if } n \text{ is even} \end{cases}$$

and $g(n) = n - (-1)^n$. Then $f \circ g$ is :

Options :

1. both one-one and onto.
2. one-one but not onto.
3. onto but not one-one.
4. neither one-one nor onto.

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

माना समुच्चय N प्राकृत संख्याओं को दर्शाता है तथा दो फलन f और g निम्न तरीके से परिभाषित है :

$$f, g : N \rightarrow N$$

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{जब } n \text{ विषम है} \\ \frac{n}{2} & \text{जब } n \text{ सम है} \end{cases}$$

1. एकैकी तथा आच्छादी दोनों हैं।
2. एकैकी है परन्तु आच्छादी नहीं है।
3. आच्छादी है परन्तु एकैकी नहीं है।
4. न आच्छादी है और न ही एकैकी है।

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

ધારો કે N એ પ્રાકૃતિક સંખ્યાઓનો ગણ છે તથા બે વિધેયો f અને g એવી રીતે વ્યાખ્યાયિત કરેલ છે કે જેથી

$f, g : N \rightarrow N$ જ્યાં

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{જો } n \text{ અયુગ્મ હોય} \\ \frac{n}{2} & \text{જો } n \text{ યુગ્મ હોય} \end{cases}$$

તથા $g(n) = n - (-1)^n$. તો $f \circ g$ એ _____.

Options :

1. એક-એક અને વ્યાપ્ત બંને છે.
2. એક-એક છે પણ વ્યાપ્ત નથી.
3. વ્યાપ્ત છે પણ એક-એક નથી.
4. એક-એક પણ નથી અને વ્યાપ્ત પણ નથી.

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

The value of λ such that sum of the squares of the roots of the quadratic equation, $x^2 + (3 - \lambda)x + 2 = \lambda$ has the least value is :

Options :

1. $\frac{4}{9}$

3. 1
4. $\frac{15}{8}$

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

λ का वह मान जिसके लिए द्विघात समीकरण $x^2 + (3 - \lambda)x + 2 = \lambda$ के मूलों के वर्गों के योग का मान न्यूनतम है, है :

Options :

1. $\frac{4}{9}$
2. 2
3. 1
4. $\frac{15}{8}$

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

द्विघात समीकरण $x^2 + (3 - \lambda)x + 2 = \lambda$ નાં બીજો ના વર્ગોનો સરવાળો ન્યૂનતમ થાય તેવી λ ની કિંમત _____ છે.

Options :

1. $\frac{4}{9}$
2. 2
3. 1
4. $\frac{15}{8}$

Let $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$. If $R(z)$

and $I(z)$ respectively denote the real and imaginary parts of z , then :

Options :

1. $R(z) > 0$ and $I(z) > 0$
2. $R(z) < 0$ and $I(z) > 0$
3. $R(z) = -3$
4. $I(z) = 0$

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

माना $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$ है।

यदि $R(z)$ तथा $I(z)$ क्रमशः z के वास्तविक तथा काल्पनिक भागों को दर्शाता हैं, तो :

Options :

1. $R(z) > 0$ तथा $I(z) > 0$
2. $R(z) < 0$ तथा $I(z) > 0$
3. $R(z) = -3$
4. $I(z) = 0$

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

ધારો કે $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$ છે.

જો $R(z)$ અને $I(z)$ અનુક્રમે z ના વાસ્તવિક ભાગ અને કાલ્પનિક ભાગ હોય, તો

Options :

2. $R(z) < 0$ અને $I(z) > 0$

3. $R(z) = -3$

4. $I(z) = 0$

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

માના $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2 + 1 & b \\ 1 & b & 2 \end{bmatrix}$ જ્યાં $b > 0$ છે. તો

$\frac{\det(A)}{b}$ ના ન્યૂનતમ માન છે :

Options :

1. $-2\sqrt{3}$

2. $-\sqrt{3}$

3. $\sqrt{3}$

4. $2\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

જો $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2 + 1 & b \\ 1 & b & 2 \end{bmatrix}$ જ્યાં $b > 0$ હોય, તો

$\frac{\det(A)}{b}$ ની ન્યૂનતમ કિંમત _____ છે.

Options :

1. $-2\sqrt{3}$

2. $-\sqrt{3}$

4. $2\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

Let $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2 + 1 & b \\ 1 & b & 2 \end{bmatrix}$ where $b > 0$. Then

the minimum value of $\frac{\det(A)}{b}$ is :

Options :

1. $-2\sqrt{3}$

2. $-\sqrt{3}$

3. $\sqrt{3}$

4. $2\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

The number of values of $\theta \in (0, \pi)$ for which the system of linear equations

$$x + 3y + 7z = 0$$

$$-x + 4y + 7z = 0$$

$$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$$

has a non-trivial solution, is :

Options :

1. four

2. three

3. two

4. one

Question Number : 65 Question Type : MCO Option Shuffling : Yes Display Question Number

$\theta \in (0, \pi)$ के ऐसे मानों की संख्या, जिनके लिए निम्न

रैखिक समीकरण निकाय

$$x + 3y + 7z = 0$$

$$-x + 4y + 7z = 0$$

$$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$$

का एक अतुच्छ हल है, है :

Options :

1. चार
2. तीन
3. दो
4. एक

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 સંહિતિ

$$x + 3y + 7z = 0$$

$$-x + 4y + 7z = 0$$

$$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$$

ને થોડ્ય ઉકેલો (non-trivial solution) હોય તેવી

$\theta \in (0, \pi)$ ની કિંમતોની સંખ્યા _____ છે.

Options :

1. ચાર
2. ત્રણ
3. બે
4. એક

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

$$\text{If } \sum_{r=0}^{25} \left\{ {}^{50}C_r \cdot {}^{50-r}C_{25-r} \right\} = K \left({}^{50}C_{25} \right),$$

then K is equal to :

1. $(25)^2$
2. 2^{24}
3. $2^{25} - 1$
4. 2^{25}

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

$$\text{यदि } \sum_{r=0}^{25} \left\{ {}^{50}C_r \cdot {}^{50-r}C_{25-r} \right\} = K \left({}^{50}C_{25} \right)$$

है, तो K बराबर है :

Options :

1. $(25)^2$
2. 2^{24}
3. $2^{25} - 1$
4. 2^{25}

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

$$\text{यदि } \sum_{r=0}^{25} \left\{ {}^{50}C_r \cdot {}^{50-r}C_{25-r} \right\} = K \left({}^{50}C_{25} \right)$$

है, तो K = _____.

Options :

1. $(25)^2$
2. 2^{24}
3. $2^{25} - 1$
4. 2^{25}

Question Number : 67 Question Type : MCQ Option Shuffling : Yes Display Question Number

The positive value of λ for which the co-efficient of x^2 in the expression

$$x^2 \left(\sqrt{x} + \frac{\lambda}{x^2} \right)^{10} \text{ is } 720, \text{ is :}$$

Options :

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

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

λ का वह धनात्मक मान जिसके लिए व्यंजक

$$x^2 \left(\sqrt{x} + \frac{\lambda}{x^2} \right)^{10} \text{ में } x^2 \text{ का गुणांक } 720 \text{ है, है :}$$

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

$$x^2 \left(\sqrt{x} + \frac{\lambda}{x^2} \right)^{10} \text{ ના વિસ્તરણમાં } x^2 \text{ નો સહગુણક}$$

720 હોય, તો λ ની ધન કિંમત _____ છે.

Options :

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

3. 3

4. 4

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

Correct Marks : 4 Wrong Marks : 1

Let $a_1, a_2, a_3, \dots, a_{10}$ be in G.P. with $a_i > 0$ for $i = 1, 2, \dots, 10$ and S be the set of pairs (r, k) , $r, k \in \mathbb{N}$ (the set of natural numbers) for which

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

Then the number of elements in S , is :

Options :

1. 2

2. 4

3. 10

4. infinitely many

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

माना $a_1, a_2, a_3, \dots, a_{10}$ गुणोत्तर श्रेणी में हैं तथा $i = 1, 2, \dots, 10$ के लिए $a_i > 0$ है और S , ऐसे युग्मों (r, k) , $r, k \in \mathbb{N}$ (प्राकृत संख्याओं का समुच्चय) का समुच्चय है जिनके लिए

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

तो S के अवयवों की संख्या है :

Options :

1. 2

3. 10

4. अनन्त

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

ધારો કે $a_1, a_2, a_3, \dots, a_{10}$ એ સમગુણોત્તર શ્રેણીમાં છે જ્યાં $a_i > 0, i = 1, 2, \dots, 10$ અને S એ એવી ક્રમયુક્ત જોડો $(r, k), r, k \in \mathbb{N}$ (પ્રાકૃતિક સંખ્યાઓનો ગણ) નો ગણ છે કે જેથી

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

થાય. તો S માં સભ્યોની સંખ્યા _____ છે.

Options :

1. 2

2. 4

3. 10

4. अनन्त

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

$$\cot \left(\sum_{n=1}^{19} \cot^{-1} \left(1 + \sum_{p=1}^n 2p \right) \right) \text{ का मान है :}$$

Options :

1. $\frac{22}{23}$

2. $\frac{23}{22}$

3. $\frac{21}{22}$

4. $\frac{19}{21}$

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

$\cot\left(\sum_{n=1}^{19} \cot^{-1}\left(1 + \sum_{p=1}^n 2p\right)\right)$ ની કિંમત _____ છે.

Options :

1. $\frac{22}{23}$

2. $\frac{23}{22}$

3. $\frac{21}{19}$

4. $\frac{19}{21}$

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 value of $\cot\left(\sum_{n=1}^{19} \cot^{-1}\left(1 + \sum_{p=1}^n 2p\right)\right)$ is :

Options :

1. $\frac{22}{23}$

2. $\frac{23}{22}$

3. $\frac{21}{19}$

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

Let f be a differentiable function such that

$$f'(x) = 7 - \frac{3}{4} \frac{f(x)}{x}, (x > 0) \quad \text{and}$$

$$f(1) \neq 4. \text{ Then } \lim_{x \rightarrow 0^+} x f\left(\frac{1}{x}\right) :$$

Options :

1. does not exist.
2. exists and equals 4.
3. exists and equals $\frac{4}{7}$.
4. exists and equals 0.

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

माना f एक ऐसा अवकलनीय फलन है कि

$$f'(x) = 7 - \frac{3}{4} \frac{f(x)}{x}, (x > 0) \quad \text{तथा}$$

$$f(1) \neq 4 \text{ है। तो } \lim_{x \rightarrow 0^+} x f\left(\frac{1}{x}\right)$$

Options :

1. का अस्तित्व नहीं है ।
2. का अस्तित्व है तथा 4 के समान है।
3. का अस्तित्व है तथा $\frac{4}{7}$ के समान है।
4. का अस्तित्व है तथा 0 के समान है।

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે f એ એવું વિકલનીય વિધેય છે કે જેથી

$$f'(x) = 7 - \frac{3}{4} \frac{f(x)}{x}, (x > 0) \text{ અને}$$

$$f(1) \neq 4 \text{ થાય. તો } \lim_{x \rightarrow 0^+} x f\left(\frac{1}{x}\right) \text{ નું}$$

Options :

1. અસ્તિત્વ નથી.
2. અસ્તિત્વ છે અને તે 4 છે.
3. અસ્તિત્વ છે અને તે $\frac{4}{7}$ છે.
4. અસ્તિત્વ છે અને તે 0 છે.

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

Correct Marks : 4 Wrong Marks : 1

Let $f: (-1, 1) \rightarrow \mathbb{R}$ be a function defined by

$$f(x) = \max \left\{ -|x|, -\sqrt{1-x^2} \right\}. \text{ If } K \text{ be}$$

the set of all points at which f is not differentiable, then K has exactly :

Options :

1. one element
2. two elements
3. three elements
4. five elements

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

માના $f: (-1, 1) \rightarrow \mathbb{R}$ એક ફલન છે જો

$$f(x) = \max \left\{ -|x|, -\sqrt{1-x^2} \right\} \text{ દ્વારા}$$

પરિભાષિત છે। યદિ K એ તે સર્વ બિંદુઓનો સમુચ્ચય છે

Options :

1. एक अवयव है।
2. दो अवयव हैं।
3. तीन अवयव हैं।
4. पाँच अवयव हैं।

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f: (-1, 1) \rightarrow \mathbb{R}$ એ

$$f(x) = \max \left\{ -|x|, -\sqrt{1-x^2} \right\} \quad \text{દ્વારા}$$

વ્યાખ્યાયિત વિધેય છે. જો K એ એવા તમામ બિંદુઓનો ગણ છે કે જ્યાં f વિકલનીય ન હોય તો K માં બરાબર

Options :

1. એક જ સભ્ય છે.
2. બે જ સભ્યો છે.
3. ત્રણ જ સભ્યો છે.
4. પાંચ જ સભ્યો છે.

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

The tangent to the curve, $y = xe^{x^2}$ passing through the point $(1, e)$ also passes through the point :

Options :

1. $(2, 3e)$
2. $(3, 6e)$
3. $\left(\frac{4}{3}, 2e\right)$

4. $\left(\frac{5}{3}, 2e\right)$

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

વક્ર $y = xe^{x^2}$ કી વહ સ્પર્શ રેખા જો બિંદુ $(1, e)$ સે હો કર જાતી હૈ, નિમ્ન મેં સે કિસ બિંદુ સે બી હોકર જાતી હૈ?

Options :

1. $(2, 3e)$

2. $(3, 6e)$

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

4. $\left(\frac{5}{3}, 2e\right)$

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

વક્ર $y = xe^{x^2}$ નો, બિંદુ $(1, e)$ માંથી પસાર થતો સ્પર્શક એ બિંદુ _____ માંથી પણ પસાર થાય છે.

Options :

1. $(2, 3e)$

2. $(3, 6e)$

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

4. $\left(\frac{5}{3}, 2e\right)$

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

A helicopter is flying along the curve given

by $y - x^{3/2} = 7, (x \geq 0)$. A soldier

positioned at the point $\left(\frac{1}{2}, 7\right)$ wants to

shoot down the helicopter when it is nearest to him. Then this nearest distance is :

Options :

1. $\frac{\sqrt{5}}{6}$
2. $\frac{1}{2}$
3. $\frac{1}{3}\sqrt{\frac{7}{3}}$
4. $\frac{1}{6}\sqrt{\frac{7}{3}}$

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

Correct Marks : 4 Wrong Marks : 1

एक हेलीकॉप्टर वक्र $y - x^{3/2} = 7, (x \geq 0)$ के

अनुदिश उड़ रहा है। एक सैनिक बिंदु $\left(\frac{1}{2}, 7\right)$ पर है

तथा हेलीकॉप्टर को उस समय गोली मार कर गिराना चाहता है जब यह उसके निकटतम है। तो यह निकटतम दूरी है :

Options :

1. $\frac{\sqrt{5}}{6}$
2. $\frac{1}{2}$
3. $\frac{1}{3}\sqrt{\frac{7}{3}}$

4. $\frac{1}{6}\sqrt{\frac{7}{3}}$

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

એક હેલિકોપ્ટર વક્ર $y - x^{3/2} = 7, (x \geq 0)$ પર

ઉડે છે. બિન્દુ $\left(\frac{1}{2}, 7\right)$ આગળ ઉભેલો એક સૈનિક,

જ્યારે હેલિકોપ્ટર તેનાથી લઘુત્તમ અંતરે હોય ત્યારે તેને તોડી પાડવા ઇચ્છે છે. તો આ લઘુત્તમ અંતર _____ છે.

Options :

1. $\frac{\sqrt{5}}{6}$

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

3. $\frac{1}{3}\sqrt{\frac{7}{3}}$

4. $\frac{1}{6}\sqrt{\frac{7}{3}}$

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

Correct Marks : 4 Wrong Marks : 1

If $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C,$

where C is a constant of integration, then $f(x)$ is equal to :

Options :

1. $-2x^3 - 1$

2. $-4x^3 - 1$

3. $4x^3 + 1$

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

यदि $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C$ है,

जहाँ C एक समाकलन अचर है, तो $f(x)$ बराबर है :

Options :

1. $-2x^3 - 1$
2. $-4x^3 - 1$
3. $4x^3 + 1$
4. $-2x^3 + 1$

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

જો $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C$, જ્યાં

C એ સંકલનનો અચળાંક છે, તો $f(x) = \underline{\hspace{2cm}}$.

Options :

1. $-2x^3 - 1$
2. $-4x^3 - 1$
3. $4x^3 + 1$
4. $-2x^3 + 1$

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

The value of $\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4}$, where

$[t]$ denotes the greatest integer less than or equal to t , is :

$$1. \quad \frac{3}{20} (4\pi - 3)$$

$$2. \quad \frac{3}{10} (4\pi - 3)$$

$$3. \quad \frac{1}{12} (7\pi + 5)$$

$$4. \quad \frac{1}{12} (7\pi - 5)$$

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

Correct Marks : 4 Wrong Marks : 1

$$\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4} \text{ का मान, जहाँ } [t] \text{ वह}$$

महत्तम पूर्णांक है जो t से कम या उसके बराबर है, है :

Options :

$$1. \quad \frac{3}{20} (4\pi - 3)$$

$$2. \quad \frac{3}{10} (4\pi - 3)$$

$$3. \quad \frac{1}{12} (7\pi + 5)$$

$$4. \quad \frac{1}{12} (7\pi - 5)$$

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

Correct Marks : 4 Wrong Marks : 1

$$\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4} \text{ ની કિંમત } \underline{\hspace{2cm}} \text{ છે,}$$

જ્યાં $[t]$ એ t થી નાના અથવા t ને સમાન તમામ પૂર્ણાંકોમાં મોટામાં મોટો પૂર્ણાંક દર્શાવે છે.

Options :

1. $\frac{3}{20} (4\pi - 3)$

2. $\frac{3}{10} (4\pi - 3)$

3. $\frac{1}{12} (7\pi + 5)$

4. $\frac{1}{12} (7\pi - 5)$

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

Correct Marks : 4 Wrong Marks : 1

If $\int_0^x f(t) dt = x^2 + \int_x^1 t^2 f(t) dt$, then

$f'(1/2)$ is :

Options :

1. $\frac{18}{25}$

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

3. $\frac{24}{25}$

4. $\frac{6}{25}$

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

Correct Marks : 4 Wrong Marks : 1

यदि $\int_0^x f(t) dt = x^2 + \int_x^1 t^2 f(t) dt$ है, तो

$f'(1/2)$ है :

Options :

1. $\frac{18}{25}$

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

3. $\frac{24}{25}$

4. $\frac{6}{25}$

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

Correct Marks : 4 Wrong Marks : 1

यदि $\int_0^x f(t) dt = x^2 + \int_x^1 t^2 f(t) dt$, तो

$f'(1/2) =$ _____.

Options :

1. $\frac{18}{25}$

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

3. $\frac{24}{25}$

4. $\frac{6}{25}$

Correct Marks : 4 Wrong Marks : 1

The curve amongst the family of curves represented by the differential equation, $(x^2 - y^2)dx + 2xy dy = 0$ which passes through $(1, 1)$, is :

Options :

1. a circle with centre on the x -axis.
2. a circle with centre on the y -axis.
3. an ellipse with major axis along the y -axis.
4. a hyperbola with transverse axis along the x -axis.

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

અવકલ સમીકરણ $(x^2 - y^2)dx + 2xy dy = 0$ દ્વારા નિરૂપિત વક્રોં કે કુલ (family) કા વહ વક્ર જો $(1, 1)$ સે હોકર જાતા હૈ, હૈ :

Options :

1. એક વૃત્ત જિસકા કેન્દ્ર x -અક્ષ પર હૈ।
2. એક વૃત્ત જિસકા કેન્દ્ર y -અક્ષ પર હૈ।
3. એક દીર્ઘવૃત્ત જિસકા દીર્ઘ અક્ષ y -અક્ષ કી દિશા મેં હૈ।
4. એક અતિપરવલય જિસકા અનુપ્રસ્થ-અક્ષ x -અક્ષ કી દિશા મેં હૈ।

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

વિકલ સમીકરણ $(x^2 - y^2)dx + 2xy dy = 0$ દ્વારા દર્શાવાતી વક્રોની સંહિતિમાંનો, $(1, 1)$ માંથી પસાર થતો વક્ર એ _____.

Options :

1. x -અક્ષ પર કેન્દ્ર હોય તેવું વર્તળ છે.

2. y -અક્ષ પર કેન્દ્ર હોય તેવું વર્તુળ છે.
3. પ્રધાન અક્ષ y -અક્ષ હોય તેવો ઉપવલય છે.
4. મુખ્ય અક્ષ x - અક્ષ હોય તેવો અતિવલય છે.

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

Two vertices of a triangle are $(0, 2)$ and $(4, 3)$. If its orthocentre is at the origin, then its third vertex lies in which quadrant ?

Options :

1. first
2. second
3. third
4. fourth

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

एक त्रिभुज के दो शीर्ष $(0, 2)$ तथा $(4, 3)$ हैं। यदि इसका लंबकेंद्र मूलबिंदु पर है, तो इसका तीसरा शीर्ष किस चतुर्थांश में है ?

Options :

1. प्रथम
2. दूसरा
3. तीसरा
4. चौथा

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

એક ત્રિકોણના બે શિરોબિંદુઓ $(0, 2)$ અને $(4, 3)$ છે.

Options :

1. પ્રથમ
2. દ્વિતીય
3. તૃતીય
4. ચતુર્થ

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

Two sides of a parallelogram are along the lines, $x + y = 3$ and $x - y + 3 = 0$. If its diagonals intersect at $(2, 4)$, then one of its vertex is :

Options :

1. $(2, 6)$
2. $(2, 1)$
3. $(3, 6)$
4. $(3, 5)$

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

Correct Marks : 4 Wrong Marks : 1

एक समांतर चतुर्भुज की दो भुजाएँ, रेखाओं $x + y = 3$ तथा $x - y + 3 = 0$ के अनुदिश हैं। यदि इसके विकर्ण $(2, 4)$ पर प्रतिच्छेद करते हैं, तो इसका एक शीर्ष है :

Options :

1. $(2, 6)$
2. $(2, 1)$
3. $(3, 6)$
4. $(3, 5)$

એક સમાંતરબાજુ ચતુષ્કોણની બે બાજુઓ, રેખાઓ $x + y = 3$ અને $x - y + 3 = 0$ પર છે. જો તેના વિકર્ણો $(2, 4)$ બિંદુએ છેદે તો તેનું કોઈ એક શિરોબિંદુ _____ છે.

Options :

1. $(2, 6)$
2. $(2, 1)$
3. $(3, 6)$
4. $(3, 5)$

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

Correct Marks : 4 Wrong Marks : 1

If the area of an equilateral triangle inscribed in the circle, $x^2 + y^2 + 10x + 12y + c = 0$ is $27\sqrt{3}$ sq. units then c is equal to :

Options :

1. 13
2. 20
3. 25
4. -25

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

Correct Marks : 4 Wrong Marks : 1

एक वृत्त $x^2 + y^2 + 10x + 12y + c = 0$ के अंतर्गत एक समबाहु त्रिभुज का क्षेत्रफल $27\sqrt{3}$ वर्ग इकाई है, तो c बराबर है :

Options :

1. 13
2. 20

4. -25

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

Correct Marks : 4 Wrong Marks : 1

જો વર્તુળ $x^2 + y^2 + 10x + 12y + c = 0$ માં અંતર્ગત
એક સમબાજુ ત્રિકોણનું ક્ષેત્રફળ $27\sqrt{3}$ થો. એકમ હોય,
તો $c =$ _____.

Options :

1. 13
2. 20
3. 25
4. -25

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

Let

$$S = \left\{ (x, y) \in \mathbb{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1 \right\},$$

where $r \neq \pm 1$. Then S represents :

Options :

an ellipse whose eccentricity is

1. $\sqrt{\frac{2}{r+1}}$, when $r > 1$.

an ellipse whose eccentricity is

2. $\frac{1}{\sqrt{r+1}}$, when $r > 1$.

a hyperbola whose eccentricity is

3. $\frac{2}{\sqrt{r+1}}$, when $0 < r < 1$.

a hyperbola whose eccentricity is

4. $\frac{2}{\sqrt{1-r}}$, when $0 < r < 1$.

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

માના

$$S = \left\{ (x, y) \in \mathbb{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1 \right\},$$

જ્યાં $r \neq \pm 1$ છે, તો S જિસે નિરૂપિત કરતા છે, વહ છે :

Options :

1. એક દીર્ઘવૃત્ત જિસકી ઉત્કેન્દ્રતા $\sqrt{\frac{2}{r+1}}$ છે,
જબકિ $r > 1$ છે।

2. એક દીર્ઘવૃત્ત જિસકી ઉત્કેન્દ્રતા $\frac{1}{\sqrt{r+1}}$ છે,
જબકિ $r > 1$ છે।

3. એક અતિપરવલય જિસકી ઉત્કેન્દ્રતા $\frac{2}{\sqrt{r+1}}$
છે, જબકિ $0 < r < 1$ છે।

4. એક અતિપરવલય જિસકી ઉત્કેન્દ્રતા $\frac{2}{\sqrt{1-r}}$
છે, જબકિ $0 < r < 1$ છે।

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

Correct Marks : 4 Wrong Marks : 1

જો $S = \left\{ (x, y) \in \mathbb{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1 \right\}$ જ્યાં

$r \neq \pm 1$, તો S એ _____ દર્શાવે છે.

Options :

જેની ઉત્કેન્દ્રતા $\sqrt{\frac{2}{r+1}}$, જ્યારે $r > 1$, હોય

જેની ઉત્કેન્દ્રતા $\frac{1}{\sqrt{r+1}}$, જ્યારે $r > 1$, હોય

2. તેવો ઉપવલય

જેની ઉત્કેન્દ્રતા $\frac{2}{\sqrt{r+1}}$, જ્યારે $0 < r < 1$,

3. હોય તેવો અતિવલય

જેની ઉત્કેન્દ્રતા $\frac{2}{\sqrt{1-r}}$, જ્યારે $0 < r < 1$,

4. હોય તેવો અતિવલય

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

Correct Marks : 4 Wrong Marks : 1

The length of the chord of the parabola $x^2 = 4y$ having equation

$x - \sqrt{2}y + 4\sqrt{2} = 0$ is :

Options :

1. $3\sqrt{2}$

2. $2\sqrt{11}$

3. $6\sqrt{3}$

4. $8\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

પરવલય $x^2 = 4y$ કી ડસ જીવા, જિસકા સમીકરણ

$x - \sqrt{2}y + 4\sqrt{2} = 0$ હૈ, કી લંબાઈ હૈ :

Options :

1. $3\sqrt{2}$

2. $2\sqrt{11}$

3. $6\sqrt{3}$

4. $8\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

જેનું સમીકરણ $x - \sqrt{2}y + 4\sqrt{2} = 0$ હોય તેવી,
પરવલય $x^2 = 4y$ ની જીવાની લંબાઈ _____ છે.

Options :

1. $3\sqrt{2}$

2. $2\sqrt{11}$

3. $6\sqrt{3}$

4. $8\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

The plane which bisects the line segment joining the points $(-3, -3, 4)$ and $(3, 7, 6)$ at right angles, passes through which one of the following points ?

Options :

1. $(4, -1, 7)$

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

3. $(2, 1, 3)$

4. $(-2, 3, 5)$

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

Correct Marks : 4 Wrong Marks : 1

વહ સમતલ જો બિંદુઓ $(-3, -3, 4)$ તથા $(3, 7, 6)$
કો મિલારે વાલે રેલાલખણડ કા લંબસમદ્વિભાજન કરતા
હૈ, નિમ્ન મેં સે કિસ ઁક બિંદુ સે હો કર જાતા હૈ?

Options :

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

3. $(2, 1, 3)$

4. $(-2, 3, 5)$

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

Correct Marks : 4 Wrong Marks : 1

બિંદુઓ $(-3, -3, 4)$ અને $(3, 7, 6)$ ને જોડતા રેખાખંડનું લંબદ્વિભાજક સમતલ, નીચેના પૈકી કયું બિંદુ સમાવે છે?

Options :

1. $(4, -1, 7)$

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

3. $(2, 1, 3)$

4. $(-2, 3, 5)$

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

Correct Marks : 4 Wrong Marks : 1

On which of the following lines lies the point of intersection of the line,

$$\frac{x-4}{2} = \frac{y-5}{2} = \frac{z-3}{1} \text{ and the plane,}$$

$$x+y+z=2?$$

Options :

1. $\frac{x-1}{1} = \frac{y-3}{2} = \frac{z+4}{-5}$

2. $\frac{x-4}{1} = \frac{y-5}{1} = \frac{z-5}{-1}$

3. $\frac{x-2}{2} = \frac{y-3}{2} = \frac{z+3}{3}$

$x+3 \quad 4-y \quad z+1$

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

Correct Marks : 4 Wrong Marks : 1

रेखा $\frac{x-4}{2} = \frac{y-5}{2} = \frac{z-3}{1}$ तथा समतल

$x+y+z=2$ का प्रतिच्छेदन बिंदु निम्न में से किस रेखा पर स्थित है?

Options :

1. $\frac{x-1}{1} = \frac{y-3}{2} = \frac{z+4}{-5}$

2. $\frac{x-4}{1} = \frac{y-5}{1} = \frac{z-5}{-1}$

3. $\frac{x-2}{2} = \frac{y-3}{2} = \frac{z+3}{3}$

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

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

રેખા $\frac{x-4}{2} = \frac{y-5}{2} = \frac{z-3}{1}$ અને સમતલ

$x+y+z=2$ નું છેદબિંદુ, નીચેનામાંથી કઈ રેખા પર આવેલું છે?

Options :

1. $\frac{x-1}{1} = \frac{y-3}{2} = \frac{z+4}{-5}$

2. $\frac{x-4}{1} = \frac{y-5}{1} = \frac{z-5}{-1}$

3. $\frac{x-2}{2} = \frac{y-3}{2} = \frac{z+3}{3}$

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

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

Let $\vec{\alpha} = (\lambda - 2) \vec{a} + \vec{b}$ and

$\vec{\beta} = (4\lambda - 2) \vec{a} + 3\vec{b}$ be two given

vectors where vectors $\vec{a}$ and $\vec{b}$ are non-collinear. The value of λ for which

vectors $\vec{\alpha}$ and $\vec{\beta}$ are collinear, is :

Options :

1. -3
2. 3
3. 4
4. -4

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

Correct Marks : 4 Wrong Marks : 1

यदि $\vec{\alpha} = (\lambda - 2) \vec{a} + \vec{b}$ तथा

$\vec{\beta} = (4\lambda - 2) \vec{a} + 3\vec{b}$ दो दिए गए सदिश

हैं, जहाँ सदिश $\vec{a}$ तथा $\vec{b}$ संरेख नहीं हैं। λ का वह

मान जिसके लिए $\vec{\alpha}$ तथा $\vec{\beta}$ संरेख हैं, है :

Options :

1. -3
2. 3
3. 4
4. -4

ધારો કે $\vec{\alpha} = (\lambda - 2) \vec{a} + \vec{b}$ અને

$\vec{\beta} = (4\lambda - 2) \vec{a} + 3 \vec{b}$ એ બે આપેલ સદિશો છે

જ્યાં $\vec{a}$ અને $\vec{b}$ એ સમરેખ સદિશો નથી. તો સદિશો

$\vec{\alpha}$ અને $\vec{\beta}$ સમરેખ થાય તે માટે λ ની કિંમત _____ છે.

Options :

1. -3

2. 3

3. 4

4. -4

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

Correct Marks : 4 Wrong Marks : 1

If mean and standard deviation of 5 observations x_1, x_2, x_3, x_4, x_5 are 10 and 3, respectively, then the variance of 6 observations $x_1, x_2, \dots, x_5$ and -50 is equal to :

Options :

1. 507.5

2. 582.5

3. 509.5

4. 586.5

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

यदि पाँच प्रेक्षणों x_1, x_2, x_3, x_4, x_5 का माध्य तथा मानक विचलन क्रमशः 10 तथा 3 है, तो 6 प्रेक्षणों $x_1, x_2, \dots, x_5$ तथा -50 का प्रसरण है :

1. 507.5
2. 582.5
3. 509.5
4. 586.5

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

જો 5 અવલોકનો x_1, x_2, x_3, x_4, x_5 નો મધ્યક અને પ્રમાણિત વિચલન અનુક્રમે 10 અને 3 હોય, તો 6 અવલોકનો $x_1, x_2, \dots, x_5$ અને -50 નું વિચરણ _____ છે.

Options :

1. 507.5
2. 582.5
3. 509.5
4. 586.5

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

If the probability of hitting a target by a shooter, in any shot, is $\frac{1}{3}$, then the minimum number of independent shots at the target required by him so that the probability of hitting the target at least once is greater than $\frac{5}{6}$, is :

Options :

1. 3
2. 4

4. 6

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

Correct Marks : 4 Wrong Marks : 1

एक गोली चलाने वाले द्वारा एक लक्ष्य को किसी प्रयास में भेदने की प्रायिकता $\frac{1}{3}$ है, तो लक्ष्य को कम से कम बार भेदने की प्रायिकता $\frac{5}{6}$ से अधिक होने के लिए उसे लक्ष्य भेदने के कम से कम कितने स्वतंत्र प्रयासों की आवश्यकता है?

Options :

1. 3

2. 4

3. 5

4. 6

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 એક નિશાનબાજ કોઈપણ પ્રયત્નમાં નિશાન વેધી શકે તેની સંભાવના $\frac{1}{3}$ છે. નિશાનબાજ ઓછામાં ઓછું એક વાર નિશાન વેધી શકે તેની સંભાવના $\frac{5}{6}$ થી વધુ થાય તે માટે તેણે નિશાન તાકવાના ઓછામાં ઓછા કેટલા પ્રયત્ન કરવા પડે?

Options :

1. 3

2. 4

3. 5

4. 6

Correct Marks : 4 Wrong Marks : 1

The value of

$$\cos \frac{\pi}{2^2} \cdot \cos \frac{\pi}{2^3} \cdot \dots \cdot \cos \frac{\pi}{2^{10}} \cdot \sin \frac{\pi}{2^{10}}$$

is :

Options :

1. $\frac{1}{1024}$

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

3. $\frac{1}{512}$

4. $\frac{1}{256}$

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

$$\cos \frac{\pi}{2^2} \cdot \cos \frac{\pi}{2^3} \cdot \dots \cdot \cos \frac{\pi}{2^{10}} \cdot \sin \frac{\pi}{2^{10}}$$

का मान है :

Options :

1. $\frac{1}{1024}$

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

3. $\frac{1}{512}$

4. $\frac{1}{256}$

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

$$\cos \frac{\pi}{2^2} \cdot \cos \frac{\pi}{2^3} \cdot \dots \cdot \cos \frac{\pi}{2^{10}} \cdot \sin \frac{\pi}{2^{10}} \text{ ની}$$

કિંમત _____ છે.

Options :

1. $\frac{1}{1024}$

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

3. $\frac{1}{512}$

4. $\frac{1}{256}$

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

With the usual notation, in ΔABC , if

$$\angle A + \angle B = 120^\circ, \quad a = \sqrt{3} + 1 \quad \text{and}$$

$b = \sqrt{3} - 1$, then the ratio $\angle A : \angle B$, is :

Options :

1. $5:3$

2. $3:1$

3. $9:7$

4. $7:1$

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

Correct Marks : 4 Wrong Marks : 1

સામાન્ય સંકેતોં મેં ΔABC મેં યદિ $\angle A + \angle B = 120^\circ$,

$a = \sqrt{3} + 1$ તથા $b = \sqrt{3} - 1$ હૈ, તો અનુપાત

$\angle A : \angle B$ બરાબર હૈ :

Options :

1. $5:3$

2. 3:1

3. 9:7

4. 7:1

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

Correct Marks : 4 Wrong Marks : 1

પ્રચલિત સંકેતો મુજબ, ΔABC માં જો

$\angle A + \angle B = 120^\circ$, $a = \sqrt{3} + 1$ અને

$b = \sqrt{3} - 1$ હોય, તો ગુણોત્તર $\angle A : \angle B$

= _____.

Options :

1. 5:3

2. 3:1

3. 9:7

4. 7:1

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

Correct Marks : 4 Wrong Marks : 1

Consider the following three statements :

P : 5 is a prime number.

Q : 7 is a factor of 192.

R : L.C.M. of 5 and 7 is 35.

Then the truth value of which one of the following statements is true ?

Options :

1. $(P \wedge Q) \vee (\sim R)$

2. $(\sim P) \wedge (\sim Q \wedge R)$

3. $P \vee (\sim Q \wedge R)$

4. $(\sim P) \vee (Q \wedge R)$

Correct Marks : 4 Wrong Marks : 1

निम्न तीन कथनों पर विचार कीजिए :

P : 5 एक अभाज्य संख्या है।

Q : सात 192 का एक गुणनखण्ड है।

R : 5 तथा 7 का L.C.M. 35 है।

तो निम्न में से कौन से एक कथन का सत्यमान (truth value) सत्य (T) है?

Options :

1. $(P \wedge Q) \vee (\sim R)$

2. $(\sim P) \wedge (\sim Q \wedge R)$

3. $P \vee (\sim Q \wedge R)$

4. $(\sim P) \vee (Q \wedge R)$

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

નીચેના ત્રણ વિધાનો ધ્યાને લો.

P : 5 એ એક અવિભાજ્ય સંખ્યા છે.

Q : 7 એ 192 નો એક અવયવ છે.

R : 5 અને 7 નો લ.સા.અ. (L.C.M.) 35 છે.

તો નીચેના પૈકી કયા વિધાનું સત્યાર્થતા મૂલ્ય 'સત્ય' છે?

Options :

1. $(P \wedge Q) \vee (\sim R)$

2. $(\sim P) \wedge (\sim Q \wedge R)$

3. $P \vee (\sim Q \wedge R)$

4. $(\sim P) \vee (Q \wedge R)$