

National Testing Agency

Question Paper Name: Paper I EHG 10th Jan 2019 Shift 1
Subject Name: Paper I EHG
Creation Date: 2019-01-10 14:07:57
Duration: 180
Total Marks: 360
Display Marks: Yes

Paper I

Group Number : 1
Group Id : 416529118
Group Maximum Duration : 0
Group Minimum Duration : 180
Revisit allowed for view? : No
Revisit allowed for edit? : No
Break time: 0
Group Marks: 360

Physics

Section Id : 416529136
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: 416529145
Question Shuffling Allowed : Yes

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

2. 410
3. 640
4. 16

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

Correct Marks : 4 Wrong Marks : 1

SI માત્રકોં મેં એક પદાર્થ કા ઘનત્વ 128 kg m^{-3} હૈ।
એક એસે માત્રકોં મેં, જિસમેં લમ્બાઈ કી ઇકાઈ 25 cm
તથા દ્રવ્યમાન કી ઇકાઈ 50 g હૈ, ઇસ પદાર્થ કે ઘનત્વ
કા ઑકિક માન હોગા :

Options :

1. 40
2. 410
3. 640
4. 16

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

Correct Marks : 4 Wrong Marks : 1

SI એકમ પદ્ધતિમાં એક પદાર્થની ઘનતા 128 kg m^{-3}
છે. કોઈ ચોક્કસ એકમ પદ્ધતિ કે જેમાં લંબાઈનો એકમ
 25 cm અને દળનો એકમ 50 g હોય, તો પદાર્થની
ઘનતાનું મૂલ્ય હશે :

Options :

1. 40
2. 410
3. 640
4. 16

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 1 : 2
2. 1 : 16
3. 1 : 8
4. 1 : 4

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

Correct Marks : 4 Wrong Marks : 1

દો બન્દૂકો A તથા B દ્વારા આરમ્ભિક ચાલોં ક્રમશઃ 1 km/s તથા 2 km/s સે ગોલી ચલાયી જા સકતી હૈ। ક્ષૈતિજ ભૂમિ કે કિસી બિન્દુ સે સભી સમ્ભવ દિશાઓં મેં ઇન્કો ચલાયા જાતા હૈ। દોનોં બન્દૂકોં દ્વારા ઢાગી ગઈ ગોલિયોં સે ભૂમિ પર છાદિત અધિકતમ ક્ષેત્રફલોં કા અનુપાત હૈ :

Options :

1. 1 : 2
2. 1 : 16
3. 1 : 8
4. 1 : 4

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

Correct Marks : 4 Wrong Marks : 1

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

2. $1 : 16$

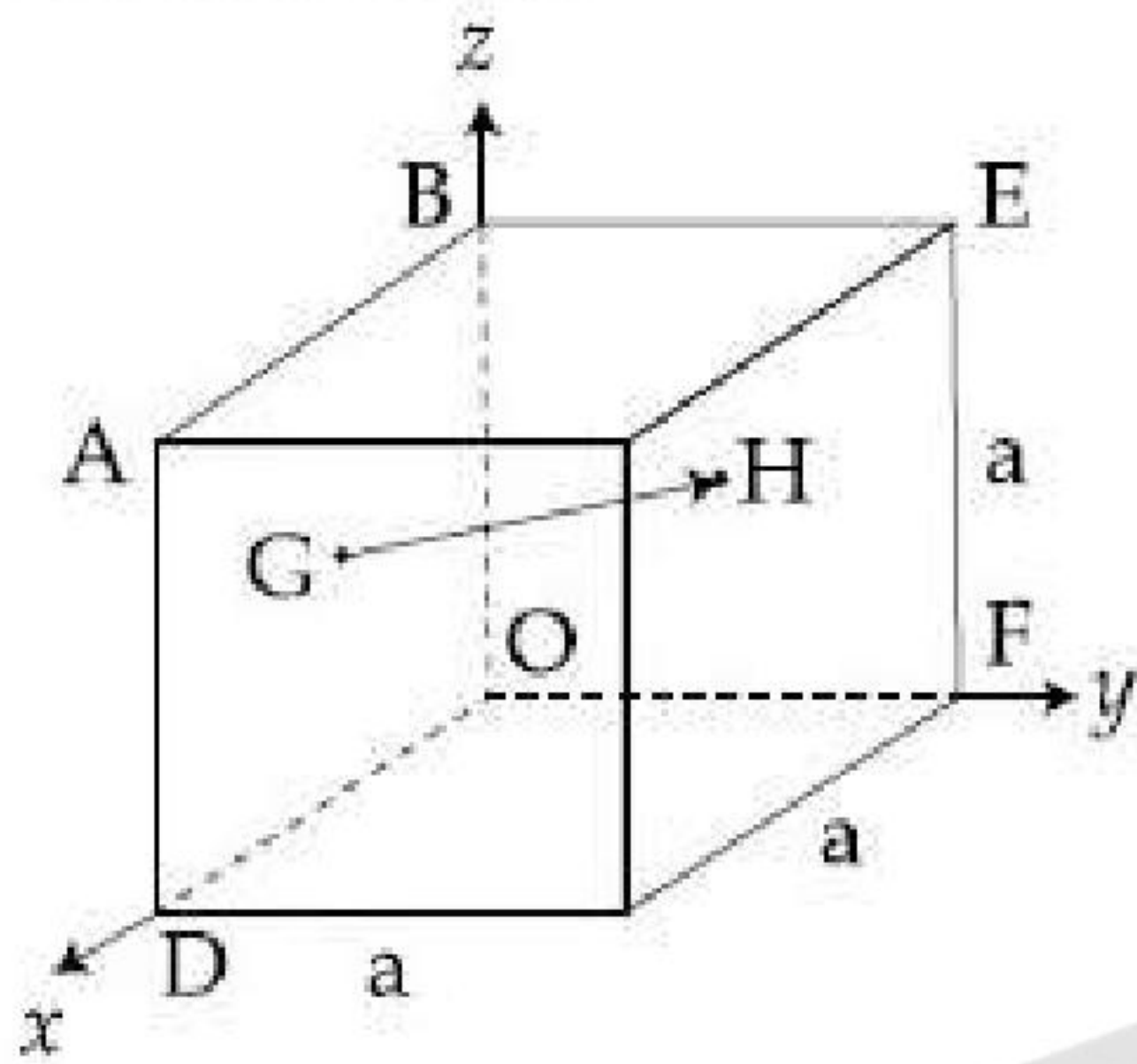
3. $1 : 8$

4. $1 : 4$

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

Correct Marks : 4 Wrong Marks : 1

In the cube of side 'a' shown in the figure, the vector from the central point of the face ABOD to the central point of the face BEFO will be :



Options :

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

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

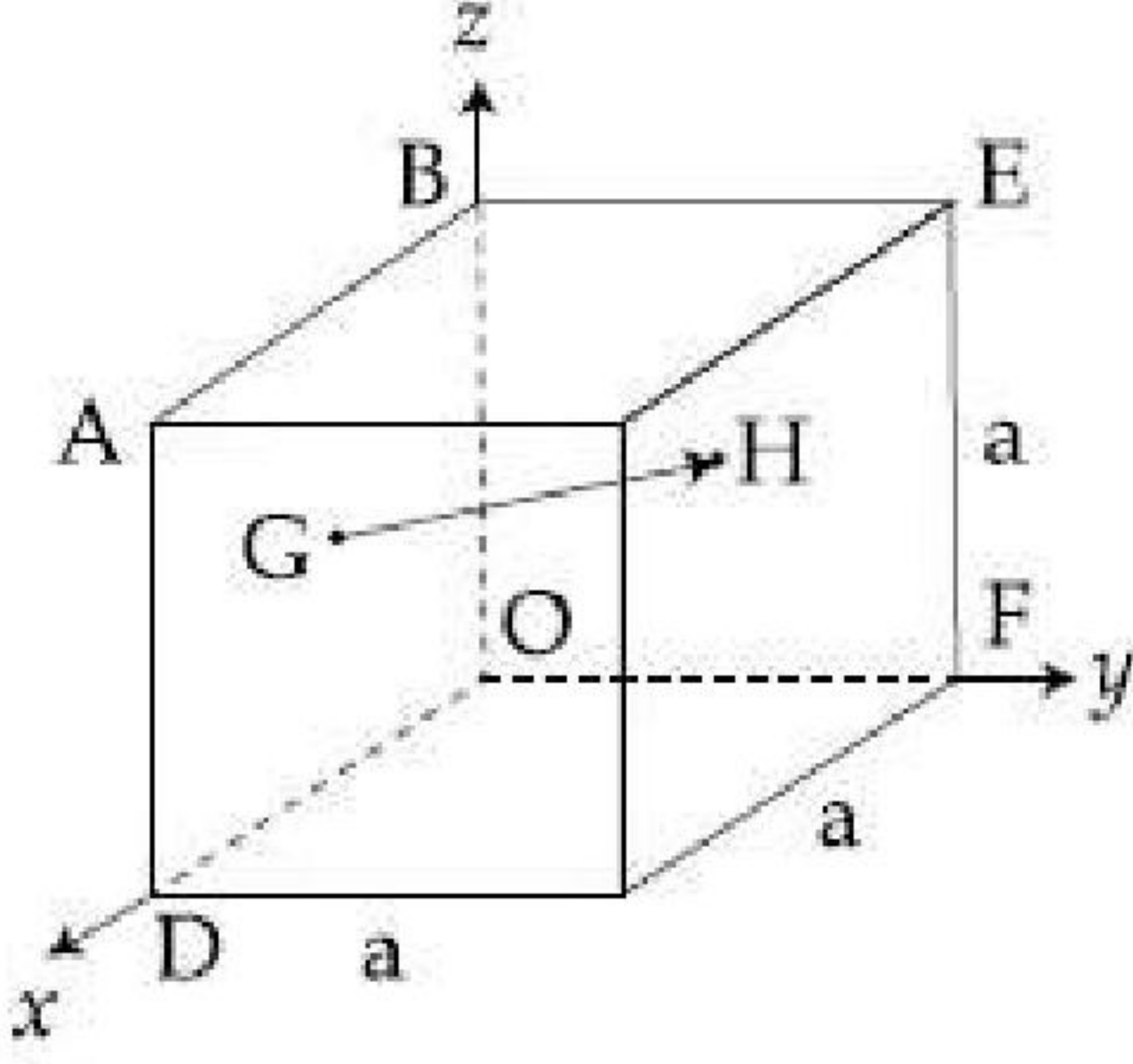
3. $\frac{1}{2}a(\hat{j} - \hat{i})$

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

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

Correct Marks : 4 Wrong Marks : 1

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



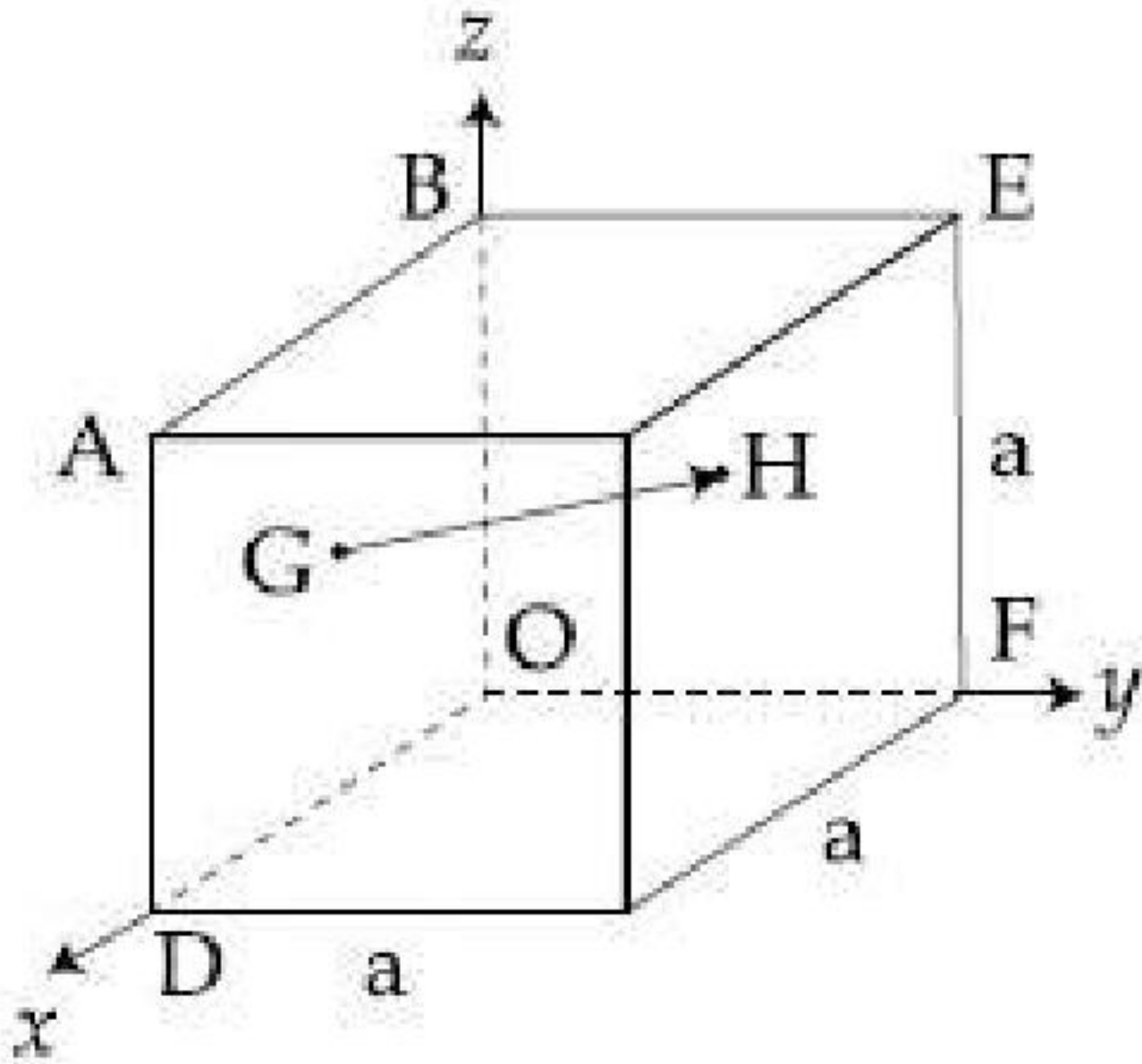
Options :

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

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

Correct Marks : 4 Wrong Marks : 1

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



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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 40 m

2. 30 m

3. 20 m

4. 10 m

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

Correct Marks : 4 Wrong Marks : 1

0.03 kg દ્રવ્યમાન કે લકડી કે એક ટુકડે કો એક 100 m ઊંચાઈ કી ઇમારત કી છત સે છોડા જાતા હૈ। ડસી સમય 0.02 kg દ્રવ્યમાન કી એક ગોલી કો ધરાતલ સે 100 ms^{-1} કી ગતિ સે ઊર્ધ્વાધર દિશા મેં ડપર કી તરફ દાગા જાતા હૈ। ગોલી લકડી મેં ગડ જાતી હૈ, તો ઇસ સંયુક્ત નિકાય દ્વારા નીચે આને સે પહેલે ઇમારત કી શીર્ષ સે ડપર તય કી ગયી અધિકતમ ઊંચાઈ કા માન હોગા : (દિયા હૈ $g = 10 \text{ ms}^{-2}$)

Options :

1. 40 m
2. 30 m
3. 20 m
4. 10 m

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 40 m
2. 30 m
3. 20 m
4. 10 m

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

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



Options :

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

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

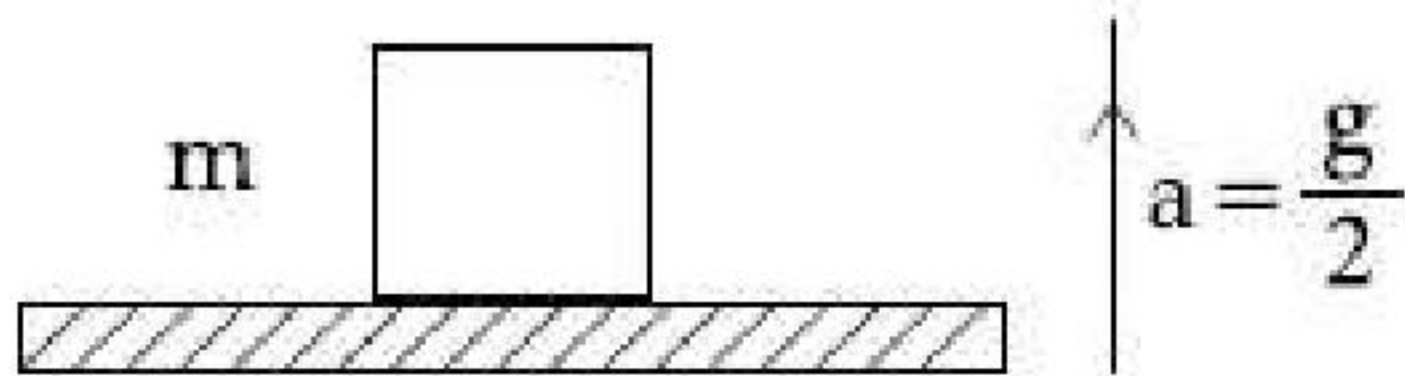
3. $\frac{m g^2 t^2}{8}$

4. 0

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

Correct Marks : 4 Wrong Marks : 1

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



Options :

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

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

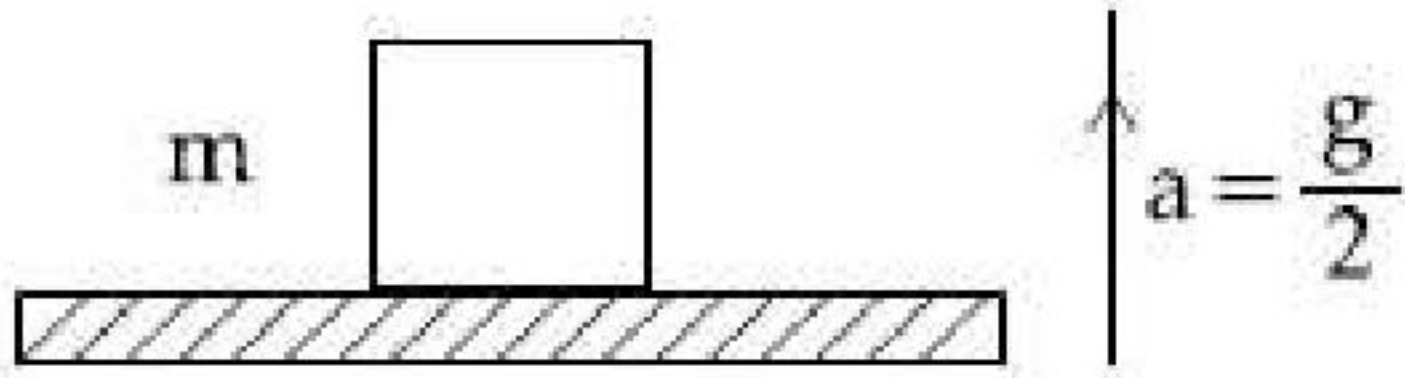
3. $\frac{m g^2 t^2}{8}$

4. 0

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

Correct Marks : 4 Wrong Marks : 1

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



Options :

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

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

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

4. 0

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

દ્રવ્યમાન M તથા ત્રિજ્યા R કે એક ઠોસ સમાંગ બેલનાકાર રોલર કો એક ક્રિકેટ પિચ પર ક્ષેતિજ બલ F , સે ઝીંચા જા રહા હૈ। યહ માનતે હુયે કિ બેલન બિના ફિસલે લુઢકતા હૈ, ઇસકે કોણીય ત્વરણ કા માન હોગા :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

3. $\frac{F}{3\pi R}$

4. $\frac{F}{2\pi R}$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $\mu FR/6$

2. $\mu FR/3$

3. $\mu FR/2$

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $\mu FR/6$

2. $\mu FR/3$

3. $\mu FR/2$

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $\mu FR/6$

2. $\mu FR/3$

3. $\mu FR/2$

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

2. $m v^2$

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

4. $2 m v^2$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

2. $m v^2$

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

4. $2 m v^2$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

2. $m v^2$

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

4. $2 m v^2$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 5.1 cm
2. 4 cm
3. 2.9 cm
4. 1.7 cm

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 5.1 cm
2. 4 cm
3. 2.9 cm
4. 1.7 cm

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 5.1 cm
2. 4 cm
3. 2.9 cm
4. 1.7 cm

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

Correct Marks : 4 Wrong Marks : 1

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

T_1

☐ ϵ_1

T_2

☐ ϵ_2

T_3

☐ ϵ_3

T_4

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

T_1

☐ ϵ_1

T_2

☐ ϵ_2

T_3

☐ ϵ_3

T_4

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

T_1

☐ ϵ_1

T_2

☐ ϵ_2

T_3

☐ ϵ_3

T_4

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

A heat source at $T = 10^3$ K is connected to another heat reservoir at $T = 10^2$ K by a copper slab which is 1 m thick. Given that the thermal conductivity of copper is $0.1 \text{ WK}^{-1}\text{m}^{-1}$ the energy flow through it

1. 90 Wm^{-2}
2. 120 Wm^{-2}
3. 65 Wm^{-2}
4. 200 Wm^{-2}

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

Correct Marks : 4 Wrong Marks : 1

$T = 10^3 \text{ K}$ તાપમાન કે ગર્મ ઝબ્મા ભણ્ડાર કો
 $T = 10^2 \text{ K}$ તાપમાન કે ઝબ્મા ભણ્ડાર સે, 1 મી. મોટાઈ
કે તાંબે કે પટલ દ્વારા જોડતે હૈં. દિયા હૈ, તાંબે કી
ઝબ્મા ચાલકતા $0.1 \text{ WK}^{-1}\text{m}^{-1}$ હૈ. સામ્યાવસ્થા
મેં ઇસસે ગુજરને વાલા ઝર્જા ફલક્સ હોગા :

Options :

1. 90 Wm^{-2}
2. 120 Wm^{-2}
3. 65 Wm^{-2}
4. 200 Wm^{-2}

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 90 Wm^{-2}
2. 120 Wm^{-2}
3. 65 Wm^{-2}

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 10.0 cm
2. 16.6 cm
3. 20.0 cm
4. 33.3 cm

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 10.0 cm
2. 16.6 cm
3. 20.0 cm
4. 33.3 cm

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 10.0 cm
2. 16.6 cm
3. 20.0 cm
4. 33.3 cm

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 18/17
2. 21/20
3. 20/19
4. 19/18

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. $18/17$
2. $21/20$
3. $20/19$
4. $19/18$

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

Correct Marks : 4 Wrong Marks : 1

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

ગુણોત્તર $\frac{f_1}{f_2}$ હશે :

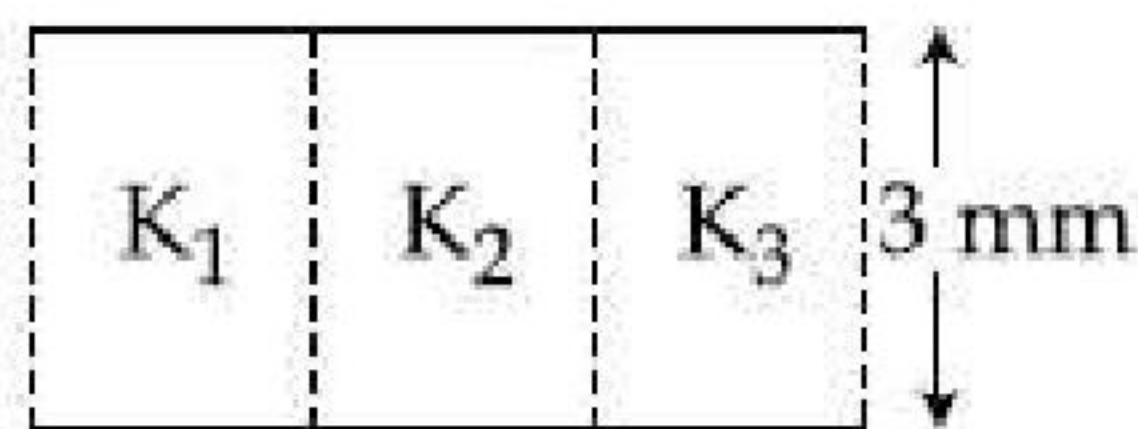
Options :

1. $18/17$
2. $21/20$
3. $20/19$
4. $19/18$

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

Correct Marks : 4 Wrong Marks : 1

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



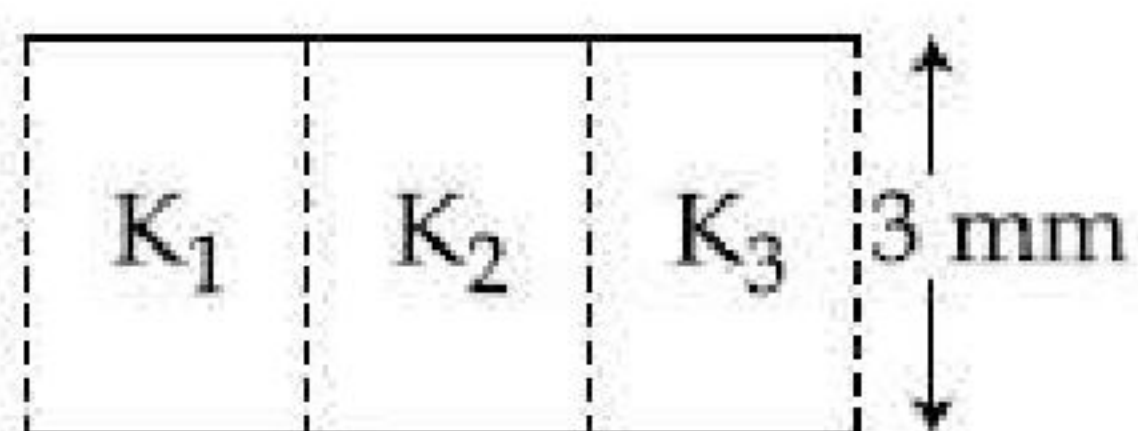
Options :

1. 36
2. 12
3. 4
4. 14

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

Correct Marks : 4 Wrong Marks : 1

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



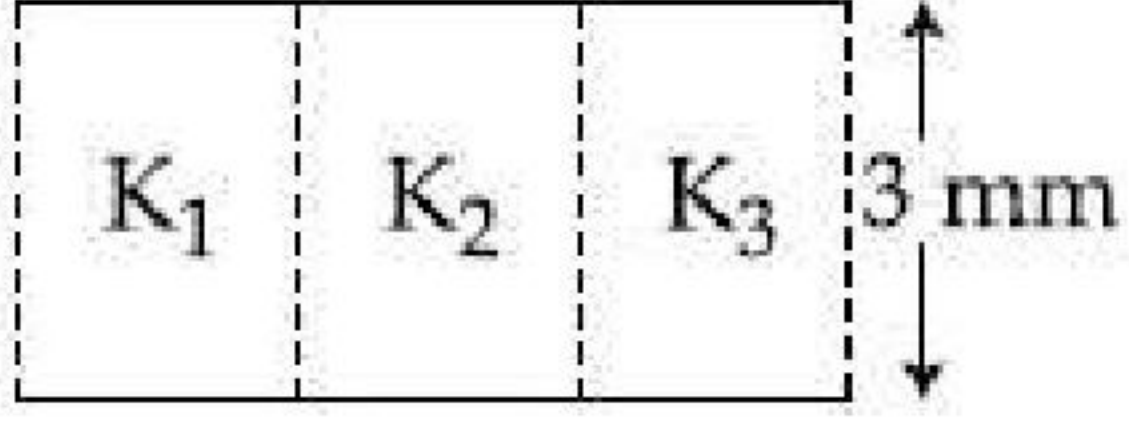
Options :

1. 36
2. 12
3. 4

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

Correct Marks : 4 Wrong Marks : 1

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



Options :

1. 36
2. 12
3. 4
4. 14

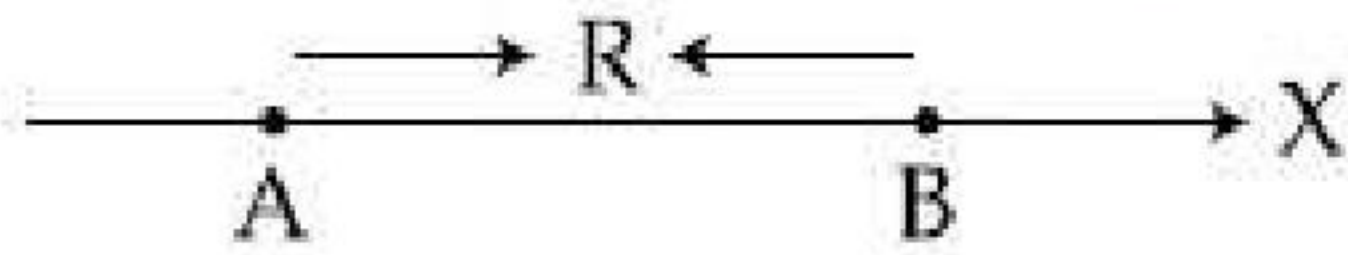
Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two electric dipoles, A, B with respective

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

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



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

Options :

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

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

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

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

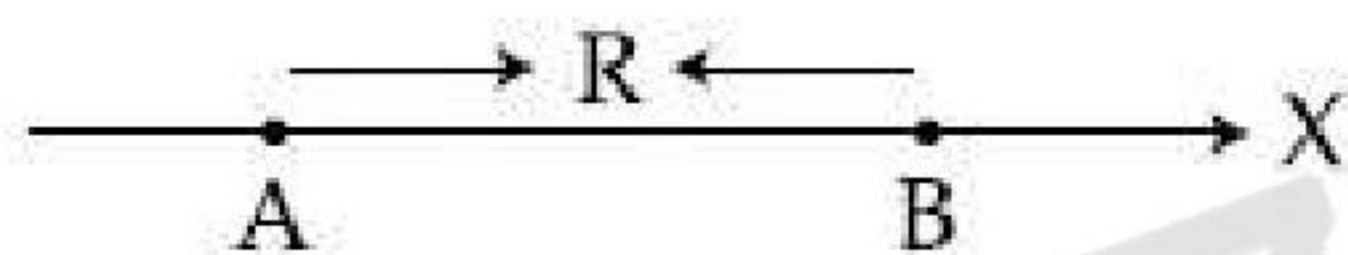
Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

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

Correct Marks : 4 Wrong Marks : 1

दो विद्युत द्विध्रुव, A तथा B जिनके द्विध्रुव आघूर्ण

क्रमशः $\vec{d}_A = -4 qa \hat{i}$ तथा $\vec{d}_B = -2 qa \hat{i}$ हैं, को x -अक्ष पर R दूरी पर चित्रानुसार रखा गया है।



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

Options :

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

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

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

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

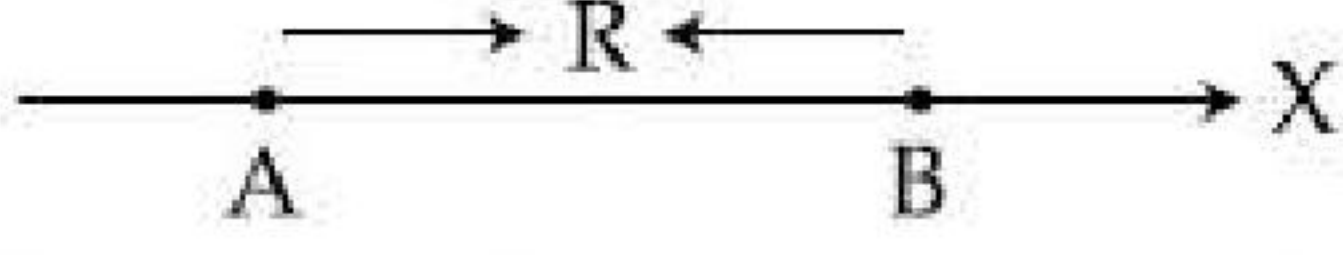
Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

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

Correct Marks : 4 Wrong Marks : 1

બે વિદ્યુત દ્વિધ્રુવી A અને B ની દ્વિધ્રુવી ચાકમાત્રા અનુક્રમે

$\vec{d}_A = -4qa\hat{i}$ અને $\vec{d}_B = -2qa\hat{i}$, અને તેમની વચ્ચેનું અંતર R છે. તેઓ આકૃતિમાં દર્શાવ્યા મુજબ x-અક્ષની દિશામાં મુકેલ છે.



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

Options :

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

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

આવેશ Q કો ત્રીણ સમકેન્દ્રીય તથા ત્રિજ્યા a, b, c ($a < b < c$) કે ગોલાકાર કોશોં પર ઇસ તરહ વિતરિત કિયા હૈ કિ ત્રીણોં પર ક્ષેત્રીય આવેશ ઘનત્વ બરાબર હૈ। કોશોં કે કેન્દ્ર સે દૂરી r ($r < a$) પર સ્થિત ઇક બિન્દુ પર કુલ વિભવ કા માન હોગા :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

$$1. 2 \Omega$$

$$2. 12 \Omega$$

$$3. 4 \Omega$$

$$4. 8 \Omega$$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

$$1. 2 \Omega$$

$$2. 12 \Omega$$

4. 8Ω

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

Options :

1. 2Ω

2. 12Ω

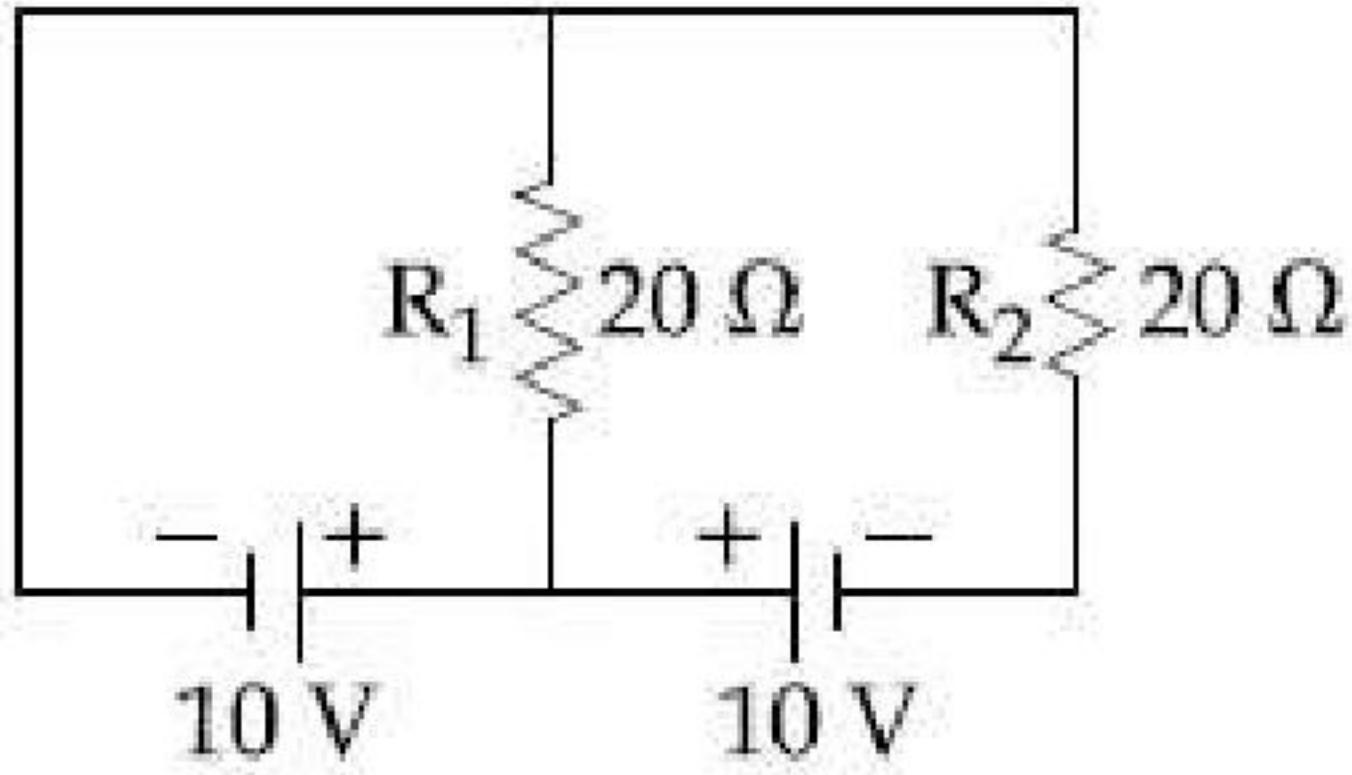
3. 4Ω

4. 8Ω

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

Correct Marks : 4 Wrong Marks : 1

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



Options :

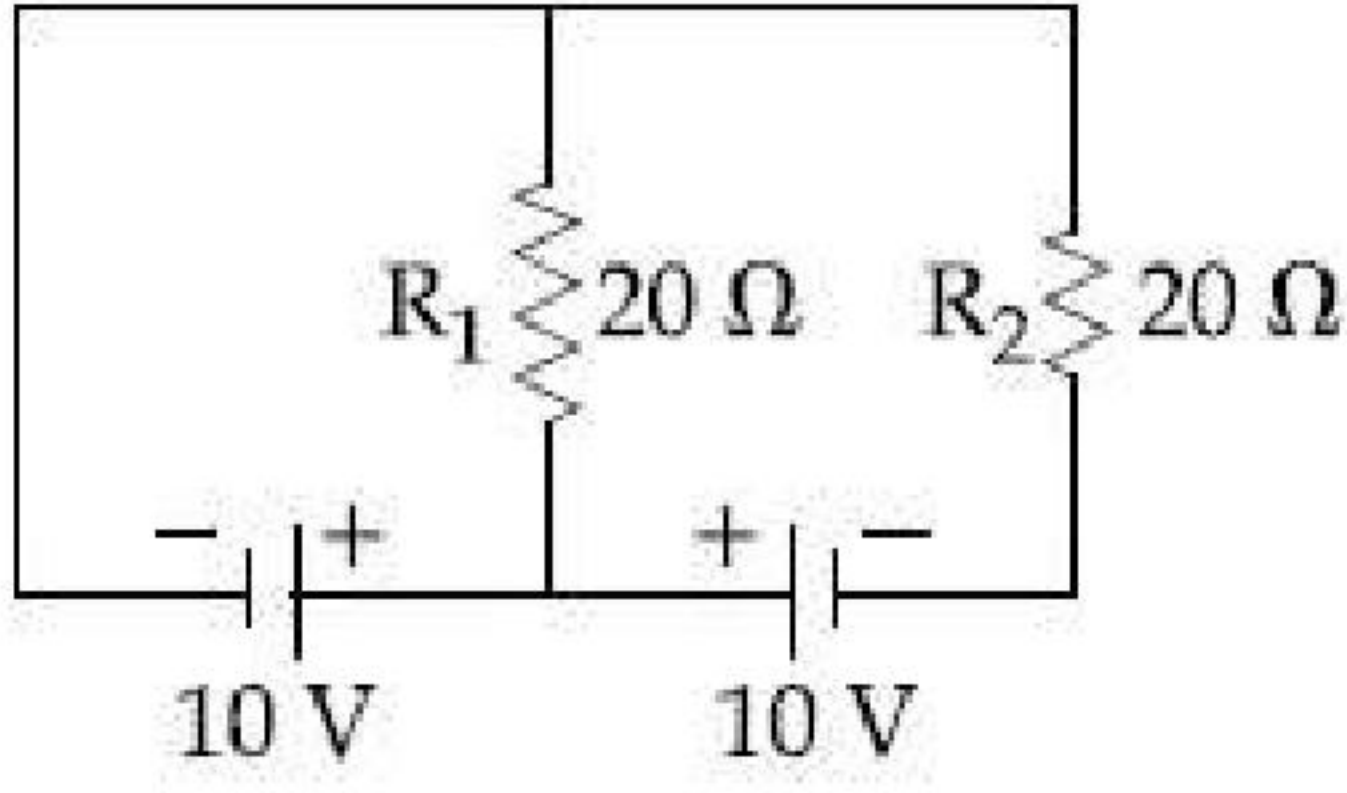
1. 0.5, 0

2. 1, 2

3. 2, 2

4. 0, 1

दिये गये परिपथ में सेलों का आंतरिक प्रतिरोध शून्य है। प्रतिरोधों R_1 तथा R_2 में, क्रमशः धारा (Ampere में) के मान होंगे :



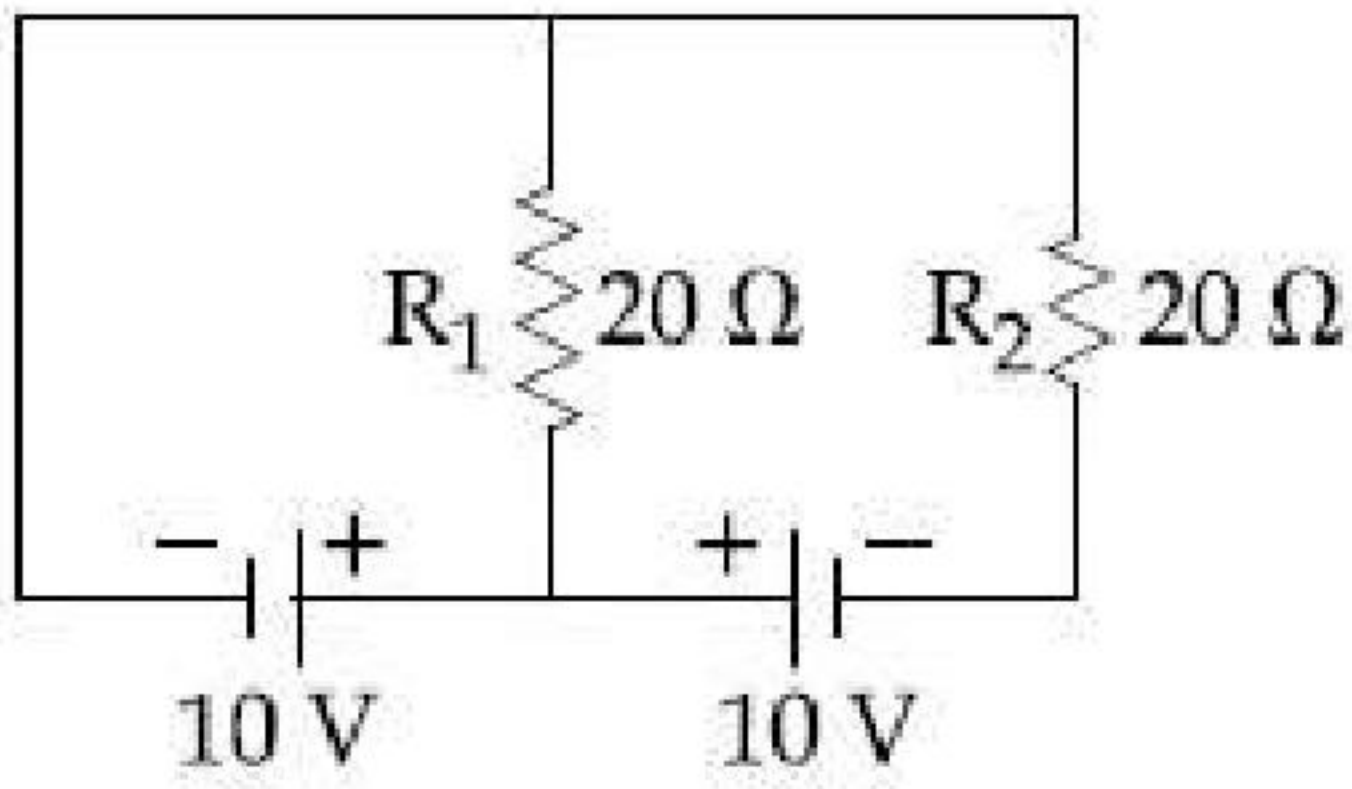
Options :

1. 0.5, 0
2. 1, 2
3. 2, 2
4. 0, 1

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

Correct Marks : 4 Wrong Marks : 1

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



Options :

1. 0.5, 0
2. 1, 2
3. 2, 2
4. 0, 1

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

Options :

1. 1 mV
2. 6 mV
3. 12 mV
4. 2 mV

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

Correct Marks : 4 Wrong Marks : 1

2 cm કોર કા ઠોસ ધાતુ કા ઘન, ધનાત્મક y -અક્ષ કી દિશા મેં 6 m/s કી ગતિ સે જા રહા હૈ। યહાં 0.1 T કા ચુમ્બકીય ક્ષેત્ર ધનાત્મક z -અક્ષ કી દિશા મેં ઉપસ્થિત હૈ। x -અક્ષ કે લમ્બવત્ ઘન કે દો ફલકોં કે બીચ વિભવાન્તર કા માન હોગા :

Options :

1. 1 mV
2. 6 mV
3. 12 mV
4. 2 mV

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

Correct Marks : 4 Wrong Marks : 1

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

2. 6 mV
3. 12 mV
4. 2 mV

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

Correct Marks : 4 Wrong Marks : 1

એક અવાહક પાતળા l લંબાઈના સળીયા પર

$\rho(x) = \rho_0 \frac{x}{l}$ જેટલી રેખીય વિજભાર ઘનતા છે. ઉગમ

બિંદુ ($x=0$) માંથી પસાર થતી અને સળીયાને લંબ અક્ષને અનુલક્ષીને સળીયાને પરિભ્રમણ કરાવવામાં આવે છે. જો સળીયો n પરિભ્રમણ પ્રતિ સેકન્ડ ફરતો હોય તો સળીયા માટે સમય સરેરાશ ચુંબકીય ચાક માત્રા હશે :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

An insulating thin rod of length l has a

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

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

Options :

1. $n \rho l^3$

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

लम्बाई l की एक पतली रोधी छड़ पर रेखीय आवेश

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

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

इस छड़ का कालिक माध्य चुम्बकीय आघूर्ण होगा :

Options :

1. $n \rho l^3$

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

A magnet of total magnetic moment

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

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

Note: For this question discrepancy is found in question/answer Full Ma

1. 0.014 J
2. 0.007 J
3. 0.01 J
4. 0.028 J

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

Correct Marks : 4 Wrong Marks : 1

$10^{-2} \hat{i}$ A-m² ચુમ્બકીય આઘૂર્ણ વાલે એક ચુમ્બક

કો સમય કે સાથ $B \hat{i}(\cos \omega t)$ કે અનુસાર બદલતે હુયે એક ચુમ્બકીય ક્ષેત્ર મેં રખતે હૈં. યહાં $B=1$ Tesla તથા $\omega=0.125$ rad/s હૈં. $t=1$ s પર ચુમ્બકીય આઘૂર્ણ કી દિશા કો વિપરીત કરને મેં કિયા ગયા કાર્ય હોગા :

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

Options :

1. 0.014 J
2. 0.007 J
3. 0.01 J
4. 0.028 J

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

Correct Marks : 4 Wrong Marks : 1

$10^{-2} \hat{i}$ A-m² જેટલી કુલ ચુંબકીય ચાકમાત્રા ધરાવતા એક ચુંબકને સયમ સાથે બદલાતા ચુંબકીય ક્ષેત્ર

$B \hat{i}(\cos \omega t)$, જ્યાં $B=1$ ટેસ્લા અને $\omega=0.125$ rad/s, માં મૂકવામાં આવે છે. $t=1$ સેકન્ડે ચુંબકીય ચાકમાત્રાની દિશા ઉલટાવવા માટે કરવું પડતું કાર્ય :

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

2. 0.007 J

3. 0.01 J

4. 0.028 J

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

Correct Marks : 4 Wrong Marks : 1

If the magnetic field of a plane electromagnetic wave is given by (The speed of light $= 3 \times 10^8$ m/s)

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

then the maximum electric field associated with it is :

Options :

1. 4×10^4 N/C

2. 6×10^4 N/C

3. 3×10^4 N/C

4. 4.5×10^4 N/C

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

Correct Marks : 4 Wrong Marks : 1

જો સમતલ વિદ્યુતચુંબકીય તરંગમાં ચુંબકીય ક્ષેત્ર

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

મુજબ આપી શકાય તો તેની સાથે સંકળાયેલ મહત્તમ વિદ્યુતક્ષેત્ર :

(પ્રકાશની ઝડપ $= 3 \times 10^8$ m/s)

Options :

1. 4×10^4 N/C

2. 6×10^4 N/C

4. $4.5 \times 10^4 \text{ N/C}$

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

Correct Marks : 4 Wrong Marks : 1

यदि एक समतल विद्युत चुम्बकीय तरंग का चुम्बकीय क्षेत्र निम्न है :

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

तो इसके संगत विद्युत क्षेत्र का अधिकतम मान होगा :

[प्रकाश की चाल $= 3 \times 10^8 \text{ m/s}$]

Options :

1. $4 \times 10^4 \text{ N/C}$
2. $6 \times 10^4 \text{ N/C}$
3. $3 \times 10^4 \text{ N/C}$
4. $4.5 \times 10^4 \text{ N/C}$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

Question Number : 23 Question Type : MCQ Option Shuffling : Yes Display Question Number

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

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

In a Young's double slit experiment with slit separation 0.1 mm, one observes a

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

Options :

1. 380 nm, 525 nm
2. 625 nm, 500 nm
3. 380 nm, 500 nm
4. 400 nm, 500 nm

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

Correct Marks : 4 Wrong Marks : 1

एक यंग द्वि-झिरी प्रयोग जिसमें झिरियों के बीच की दूरी 0.1 mm है, तरंगदैर्घ्य λ_1 के प्रकाश द्वारा $\frac{1}{40}$ rad कोण पर दीप्त फ्रिन्ज देखी जाती है। जब इसी प्रयोग में λ_2 तरंगदैर्घ्य के प्रकाश का उपयोग करते हैं तो उसी कोण पर दीप्त फ्रिन्ज देखी जाती है। दिया है कि λ_1 तथा λ_2 दृश्य प्रकाश के परास (380 nm से 740 nm तक) में हैं। तो उनके मान होंगे :

Options :

1. 380 nm, 525 nm
2. 625 nm, 500 nm
3. 380 nm, 500 nm
4. 400 nm, 500 nm

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

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

Options :

1. 380 nm, 525 nm
2. 625 nm, 500 nm
3. 380 nm, 500 nm
4. 400 nm, 500 nm

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 1 keV
2. 25 keV
3. 500 keV
4. 100 keV

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

Correct Marks : 4 Wrong Marks : 1

एक इलेक्ट्रॉन सूक्ष्मदर्शी की विभेदन क्षमता उसमें प्रयोग किये गये इलेक्ट्रॉनों की तरंगदैर्घ्य की कोटि की है। $7.5 \times 10^{-12} \text{ m}$ की चौड़ाई के विभेदन हेतु इलेक्ट्रॉन की न्यूनतम ऊर्जा का निकटतम मान होगा :

Options :

1. 1 keV
2. 25 keV
3. 500 keV
4. 100 keV

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

Correct Marks : 4 Wrong Marks : 1

ઇલેક્ટ્રોન માઇક્રોસ્કોપમાં મેળવી શકાતું વિભેદન એ તેમાં વપરાતા ઇલેક્ટ્રોનની તરંગલંબાઈના ક્રમનું હોય છે. $7.5 \times 10^{-12} \text{ m}$ ની પહોળાઈને છૂટી પાડવા (છૂટી જોવા) ઇલેક્ટ્રોનની જરૂરી લઘુત્તમ ઊર્જા _____ ની નજીકની હશે.

Options :

1. 1 keV
2. 25 keV
3. 500 keV
4. 100 keV

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

Correct Marks : 4 Wrong Marks : 1

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

2. 200
3. 360
4. 400

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 150
2. 200
3. 360
4. 400

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

Correct Marks : 4 Wrong Marks : 1

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

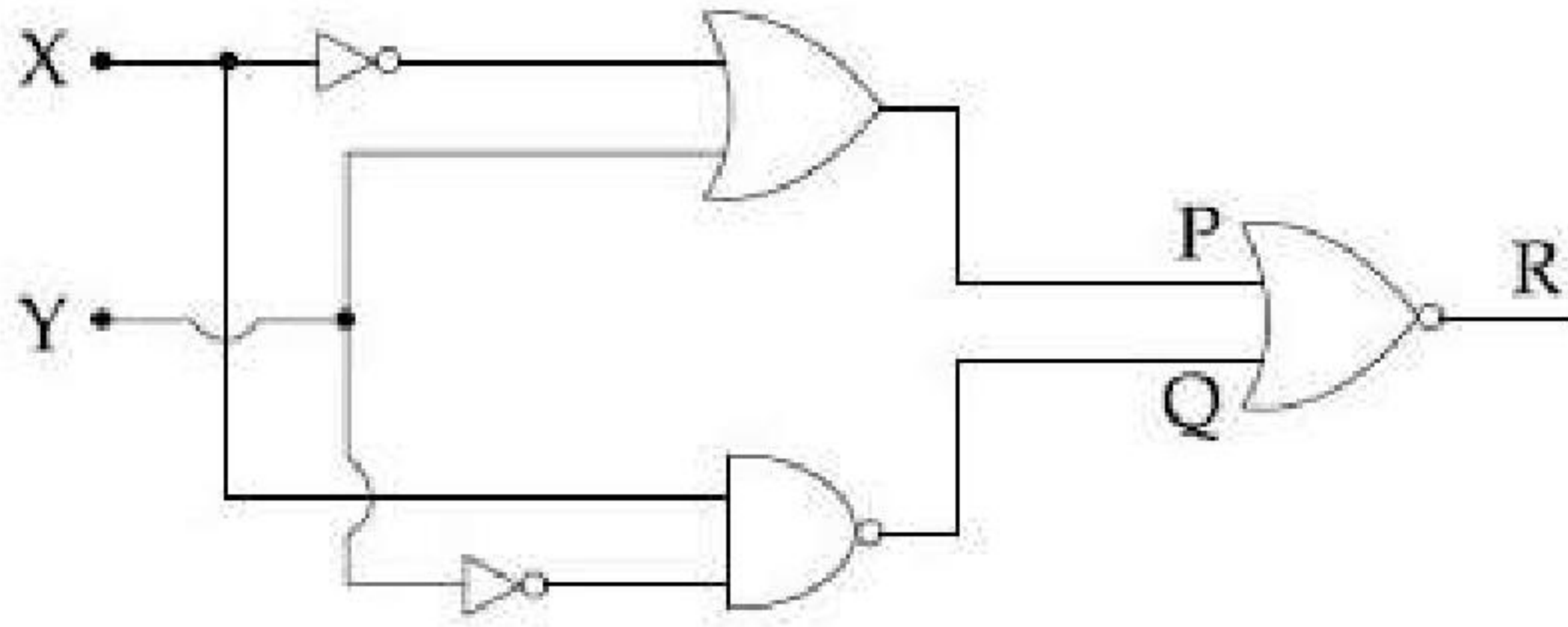
Options :

1. 150
2. 200
3. 360

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

Correct Marks : 4 Wrong Marks : 1

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



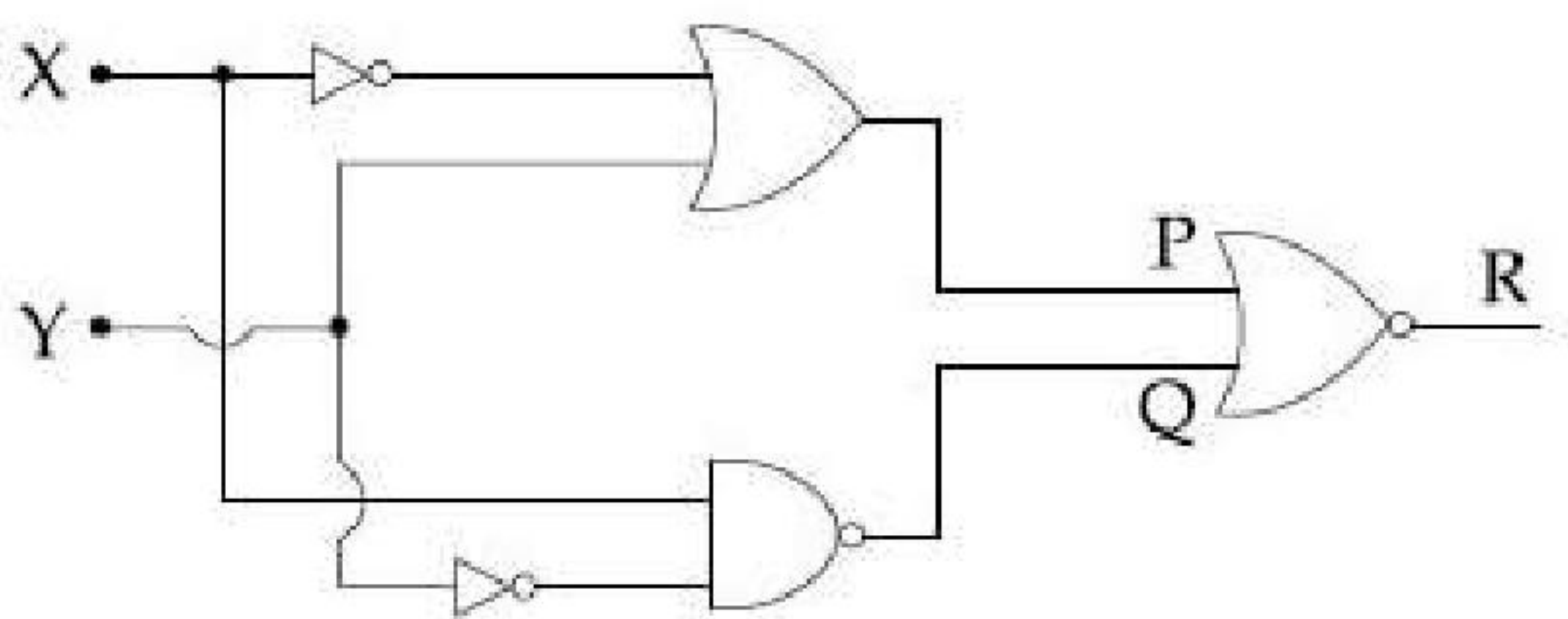
Options :

1. $X=0, Y=0$
2. $X=0, Y=1$
3. $X=1, Y=0$
4. $X=1, Y=1$

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

Correct Marks : 4 Wrong Marks : 1

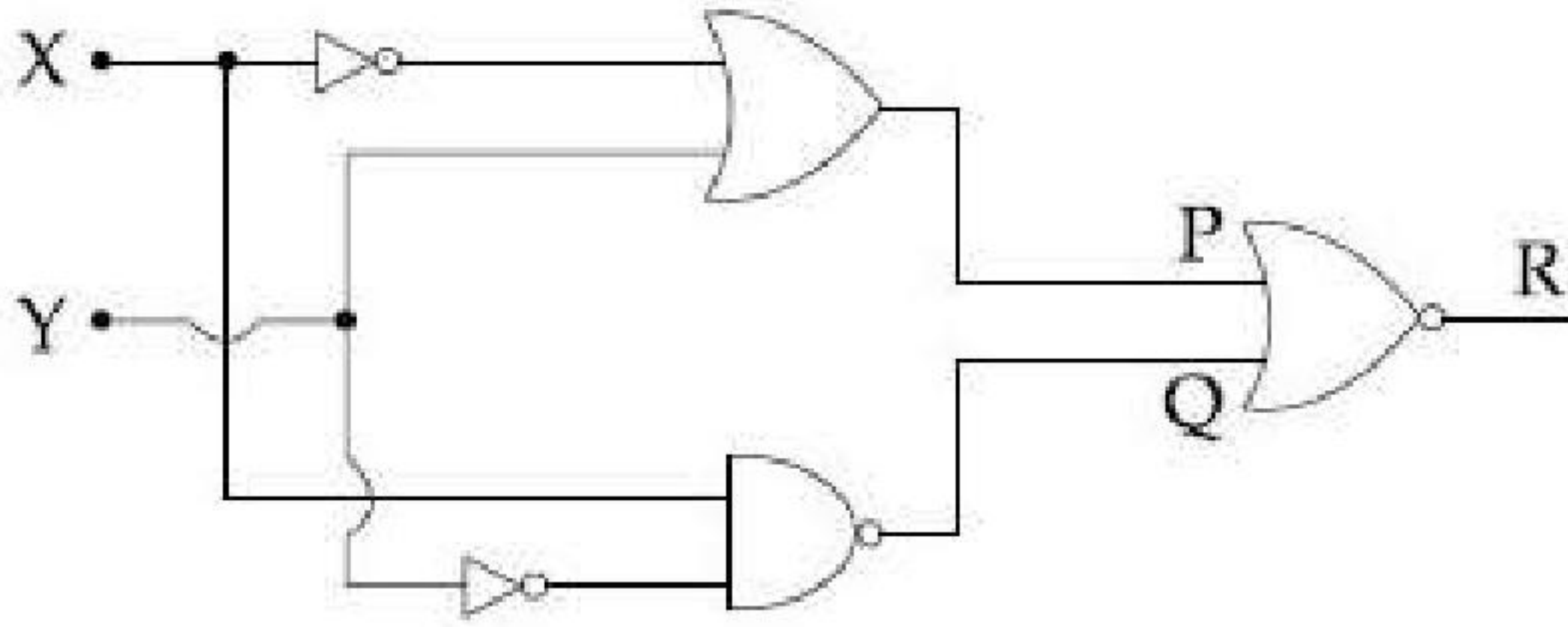
R पर निर्गत मान '1' के लिये दिये गये लॉजिक गेट परिपथ में, निवेशों का मान होना चाहिए :



Options :

1. $X=0, Y=0$
2. $X=0, Y=1$
3. $X=1, Y=0$
4. $X=1, Y=1$

આપેલ લોજિક ગેટ પરિપથ માટે, R આગળ '1' મળે તે માટે ઇનપુટ મૂલ્ય _____ જોઈશે જ.



Options :

1. $X=0, Y=0$
2. $X=0, Y=1$
3. $X=1, Y=0$
4. $X=1, Y=1$

Question Number : 28 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 40 km
2. 80 km
3. 65 km
4. 48 km

Question Number : 28 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

एक TV संचरण मीनार की ऊँचाई 140 m तथा अभिग्राही ऐन्टिना की ऊँचाई 40 m है। इस मीनार से दृष्टि रेखा विधा (LOS) में कितनी अधिकतम दूरी तक सिग्नल प्रसारित कर सकते हैं? (दिया है, पृथ्वी की त्रिज्या = 6.4×10^6 m)

Options :

1. 40 km
2. 80 km
3. 65 km
4. 48 km

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

Correct Marks : 4 Wrong Marks : 1

એક ટીવી ટ્રાન્સમીશન (પ્રસારણ) ટાવરની ઊંચાઈ 140 m અને રિસિવિંગ (ગ્રહણ) એન્ટિનાની ઊંચાઈ 40 m છે. તો આ ટાવર પર થી દૃષ્ટિ-રેખા (Line of Sight) અવસ્થામાં કેટલા મહત્તમ અંતર સુધી સિગ્નલને પ્રસારિત કરી શકાય? (પૃથ્વીની ત્રિજ્યા = 6.4×10^6 m આપેલ છે.)

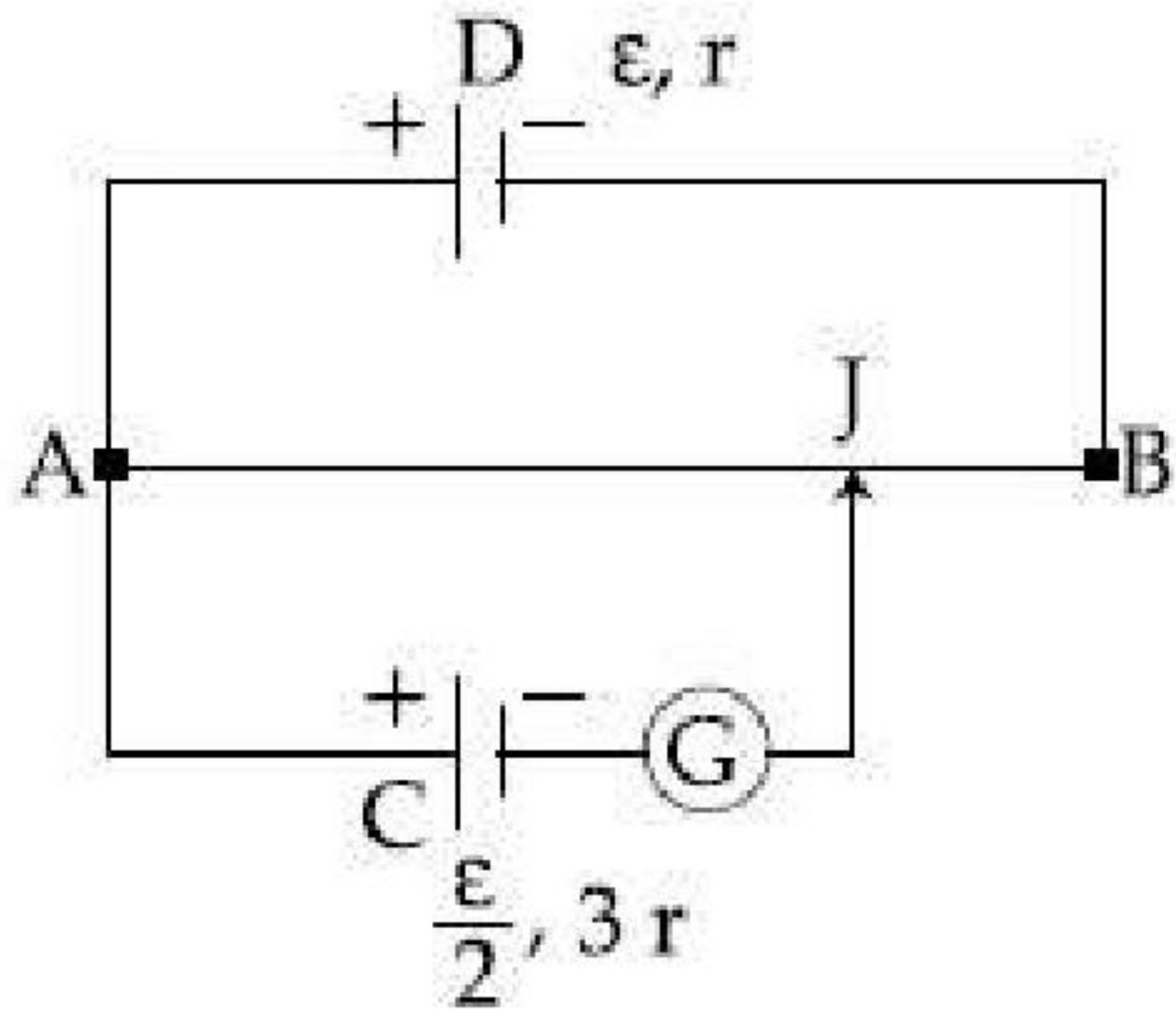
Options :

1. 40 km
2. 80 km
3. 65 km
4. 48 km

Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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



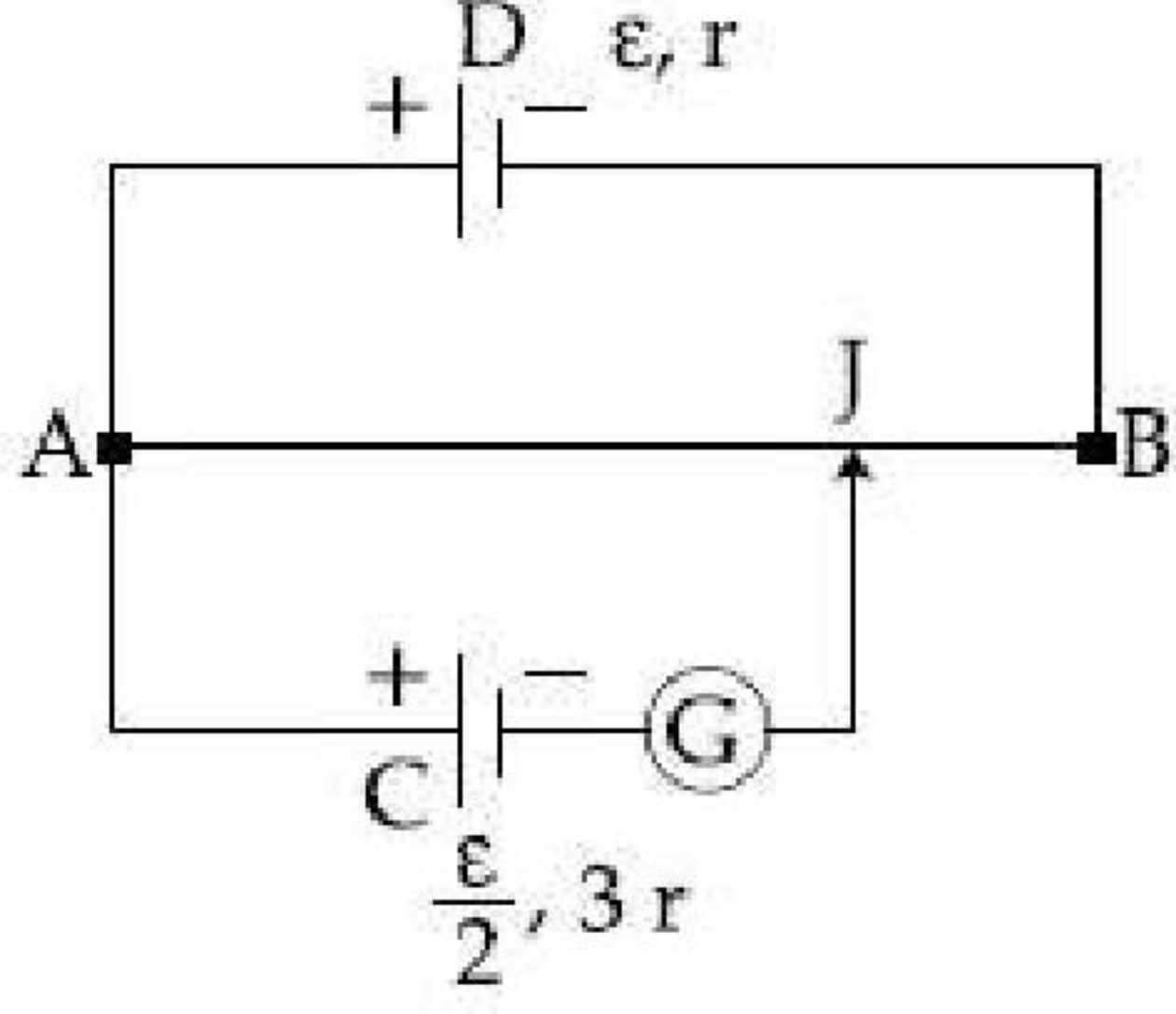
Options :

1. $\frac{13}{24} L$
2. $\frac{5}{12} L$
3. $\frac{11}{24} L$
4. $\frac{11}{12} L$

Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

L લંબાઈનો અને $12r$ નો અવરોધ ધરાવતા એક પોટેન્શીયોમીટર તાર AB અને $\mathcal{E}$ જેટલું emf અને r જેટલો આંતરિક અવરોધ ધરાવતા કોષ D સાથે જોડવામાં આવે છે. $\mathcal{E}/2$ જેટલું emf અને $3r$ જેટલો આંતરિક અવરોધ ધરાવતા કોષ C ને આકૃતિમાં દર્શાવ્યા મુજબ જોડવામાં આવે છે. ગેલ્વેનોમીટરમાં દર્શાવતું શૂન્ય આવર્તન માટેની લંબાઈ AJ _____ હશે.



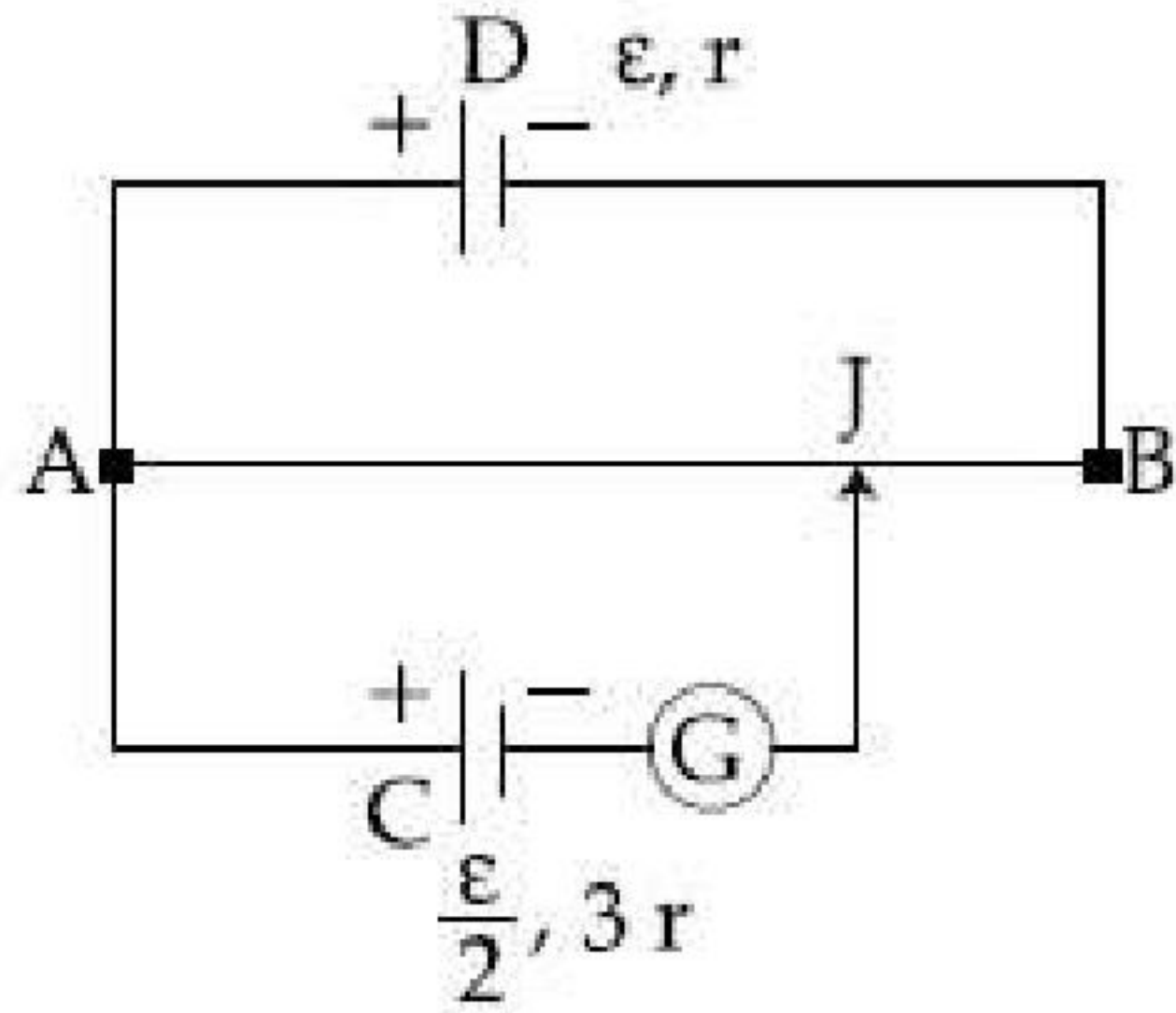
Options :

1. $\frac{13}{24} L$
2. $\frac{5}{12} L$
3. $\frac{11}{24} L$
4. $\frac{11}{12} L$

Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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



Options :

1. $\frac{13}{24} L$
2. $\frac{5}{12} L$
3. $\frac{11}{24} L$
4. $\frac{11}{12} L$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 0.4 mA
2. 20 mA
3. 63 mA

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 0.4 mA
2. 20 mA
3. 63 mA
4. 100 mA

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 0.4 mA
2. 20 mA
3. 63 mA
4. 100 mA

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Chemistry

416529137

2

Online

Mandatory

30

30

120

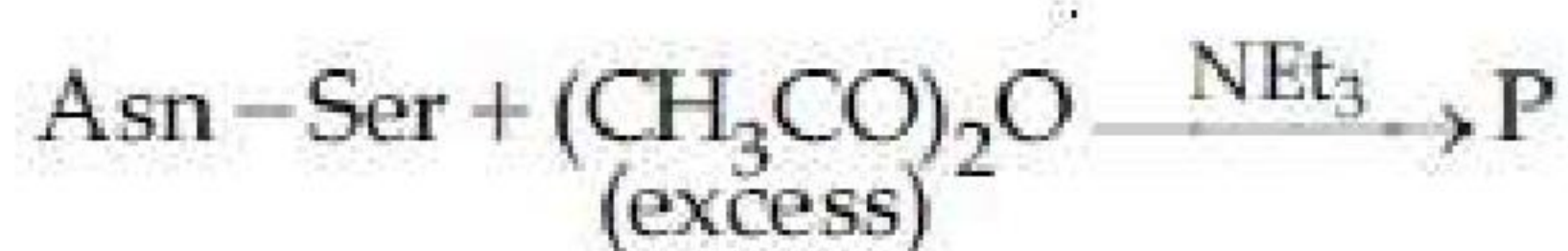
Yes

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

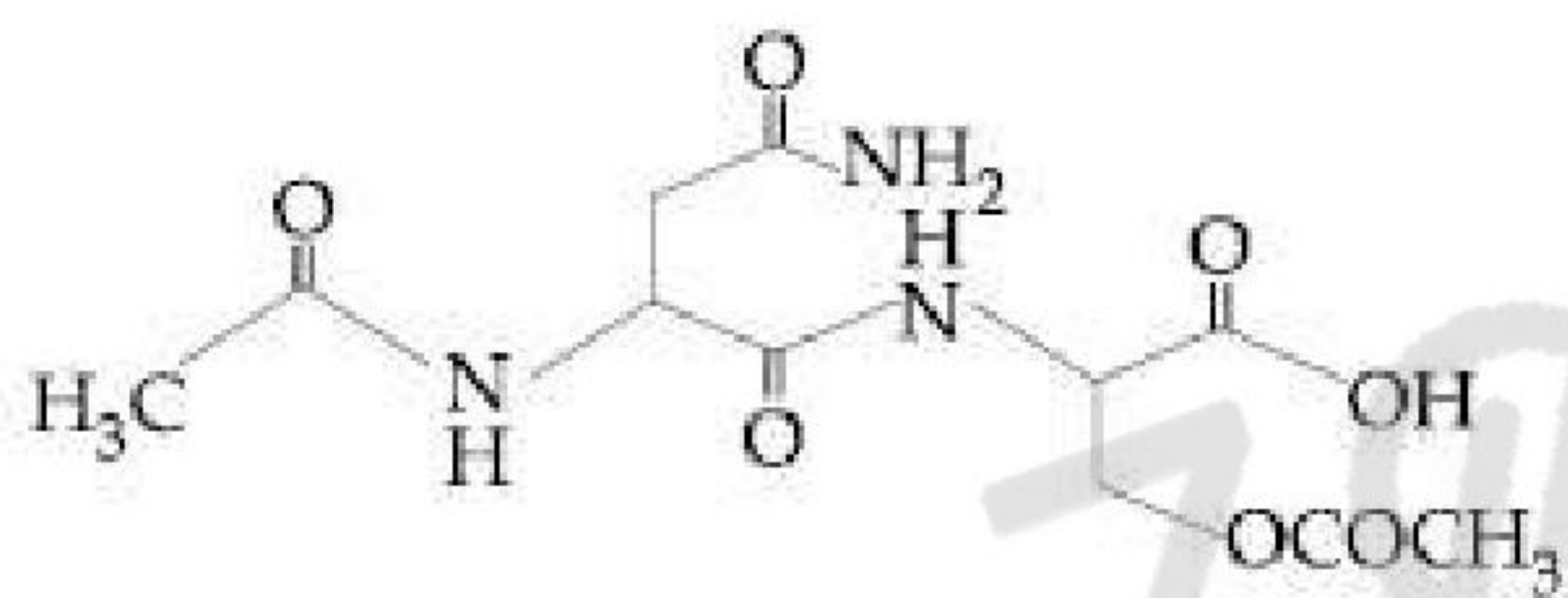
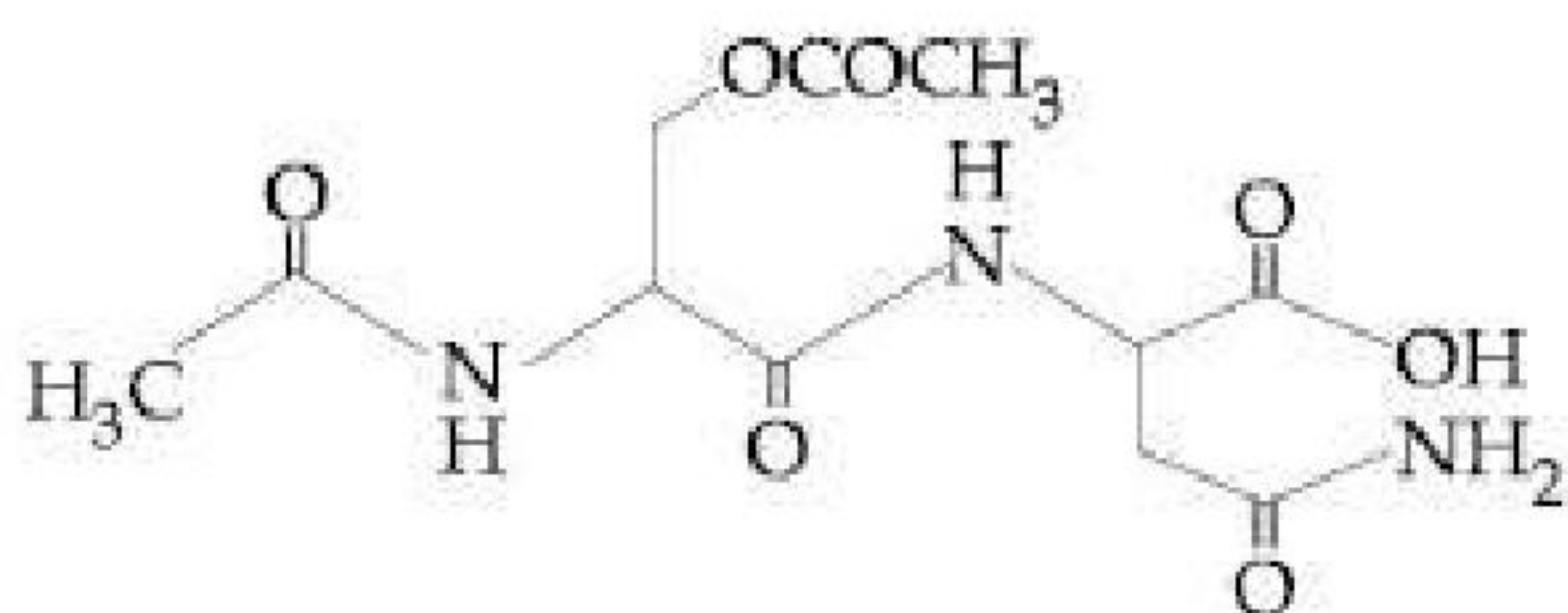
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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



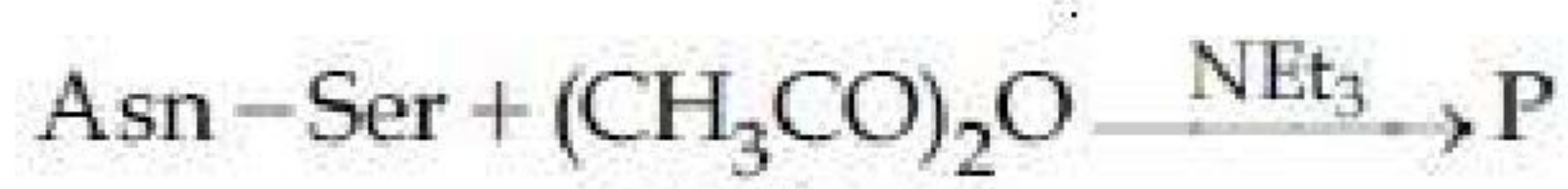
Options :

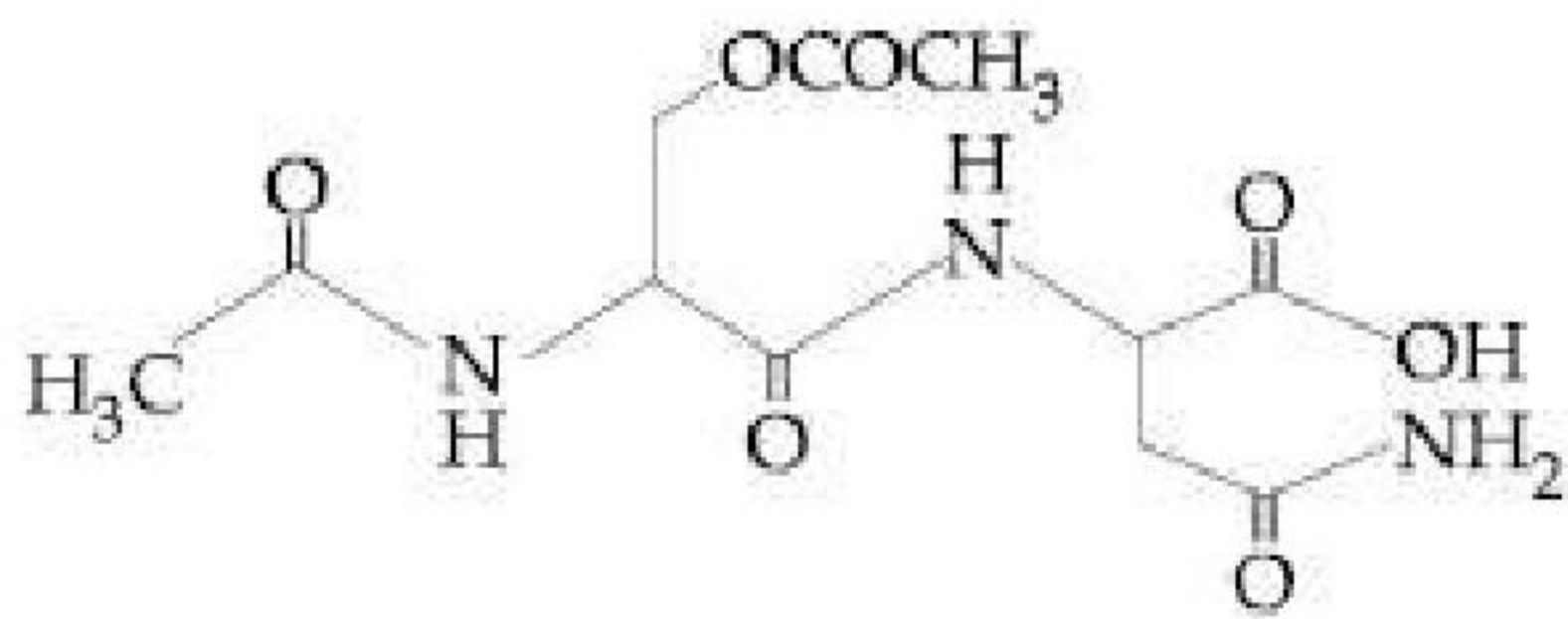


Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में उत्पाद 'P' की सही संरचना है





1.



2.



3.

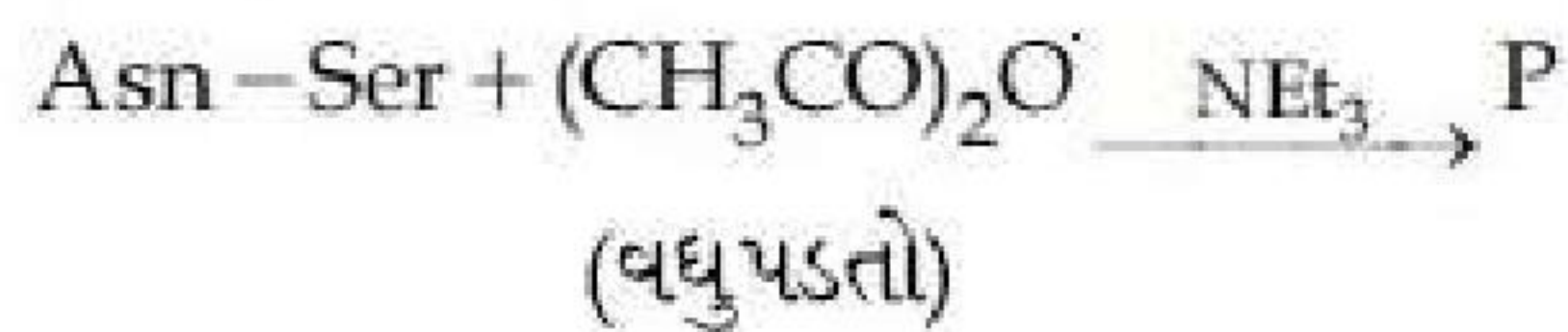


4.

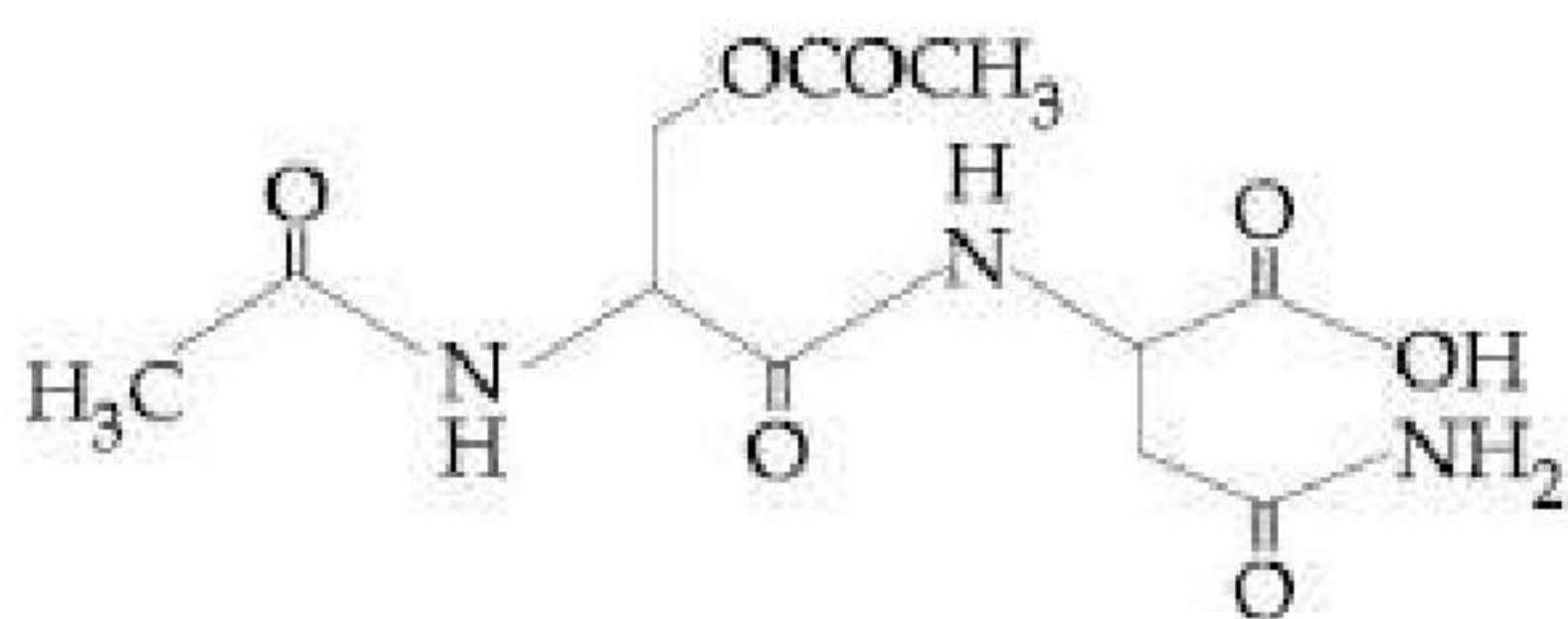
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

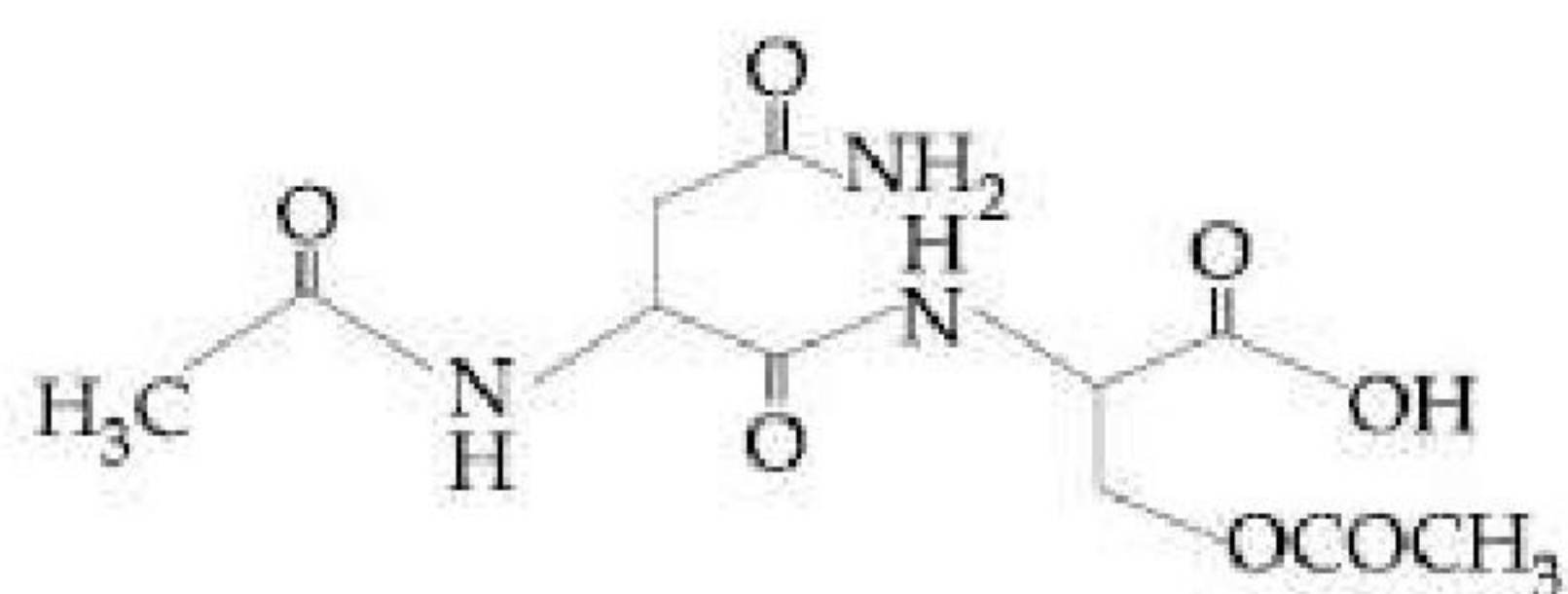
નીચેની પ્રક્રિયામાં મળતી નીપજ 'P' નું સાચું બંધારણ
આપો ?



Options :



1.



2.



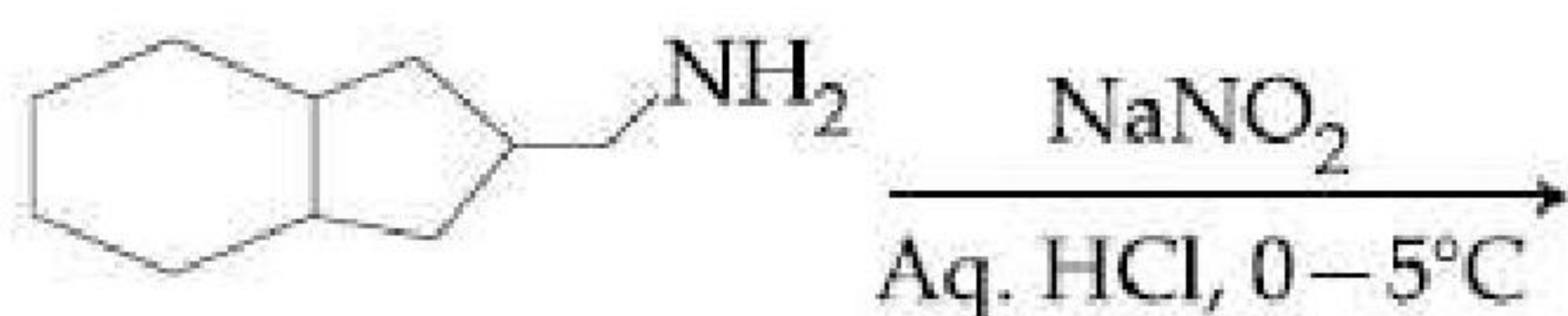
3.



4.

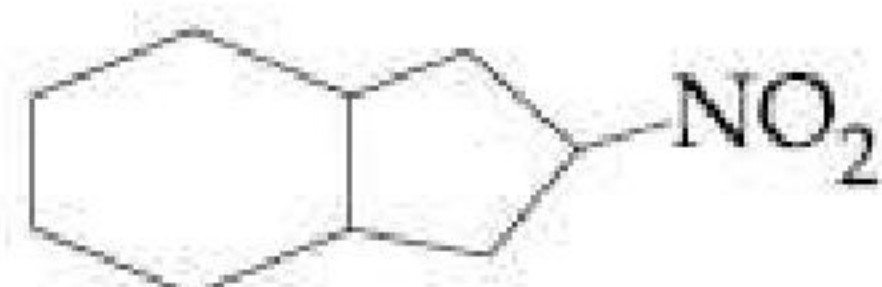
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

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



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

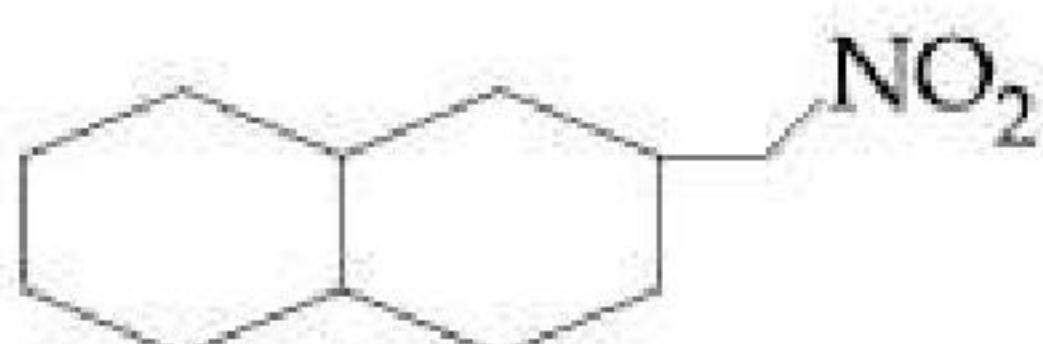
Options :



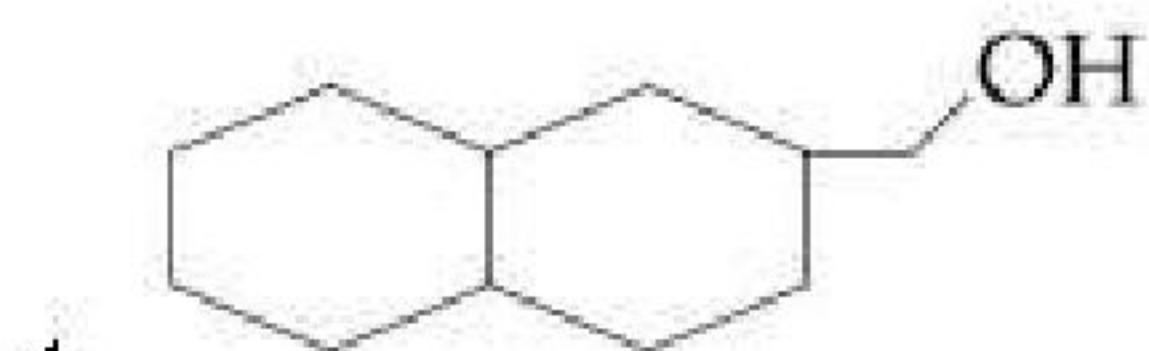
1.



2.



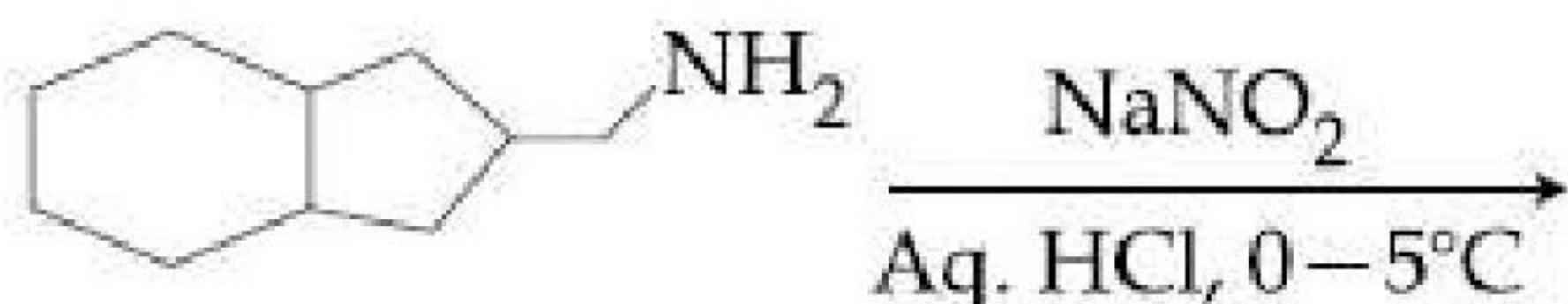
3.



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

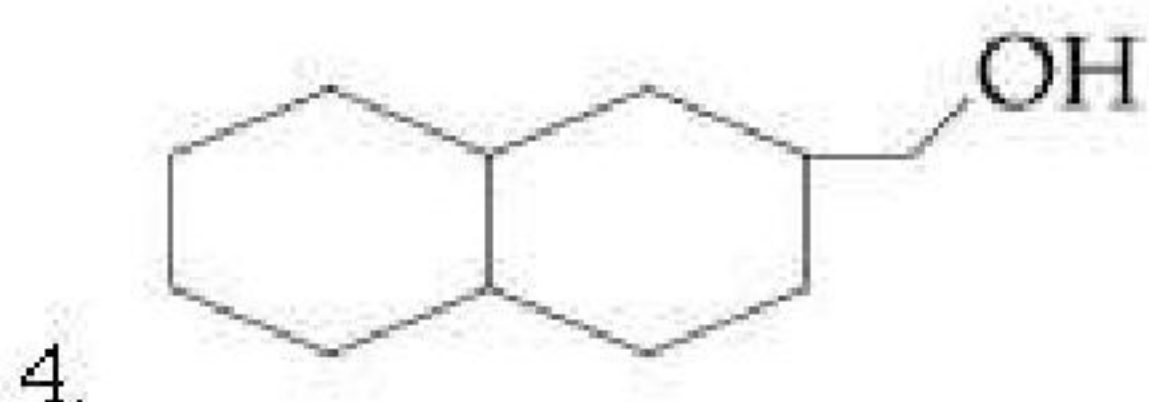
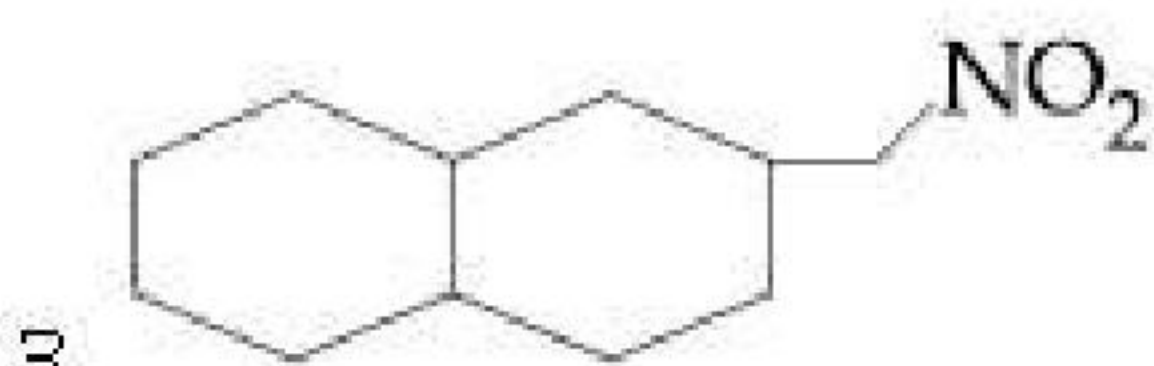
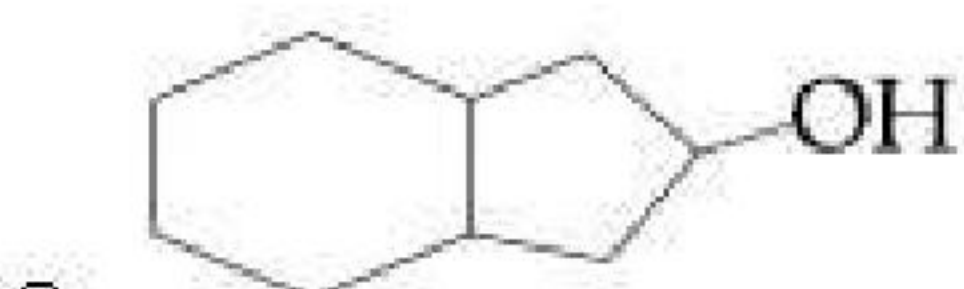
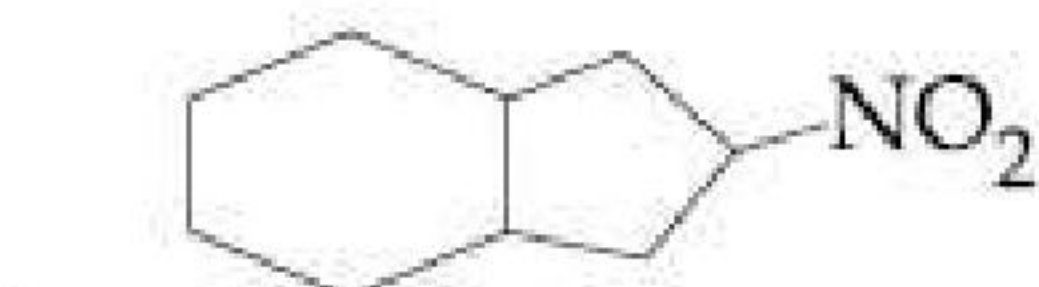
Correct Marks : 4 Wrong Marks : 1

नीचे दी गई अभिक्रिया में बनने वाला मुख्य उत्पाद होगा :



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

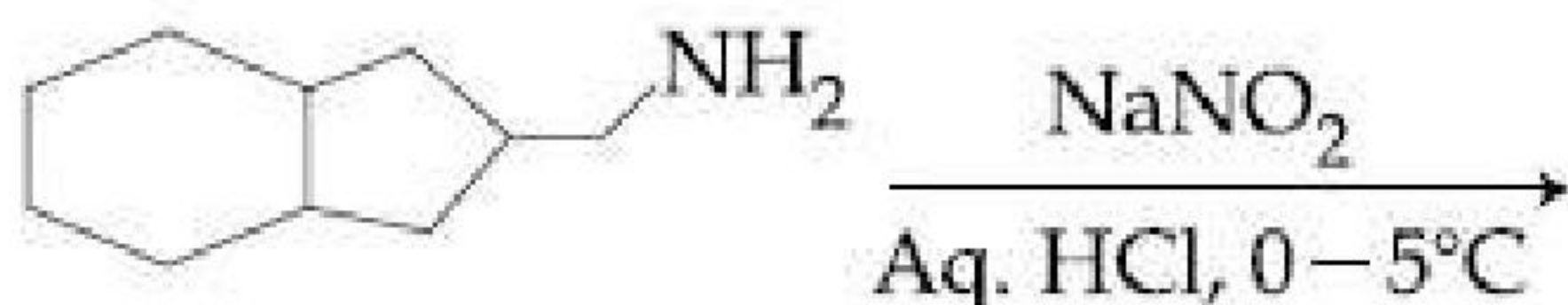
Options :



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

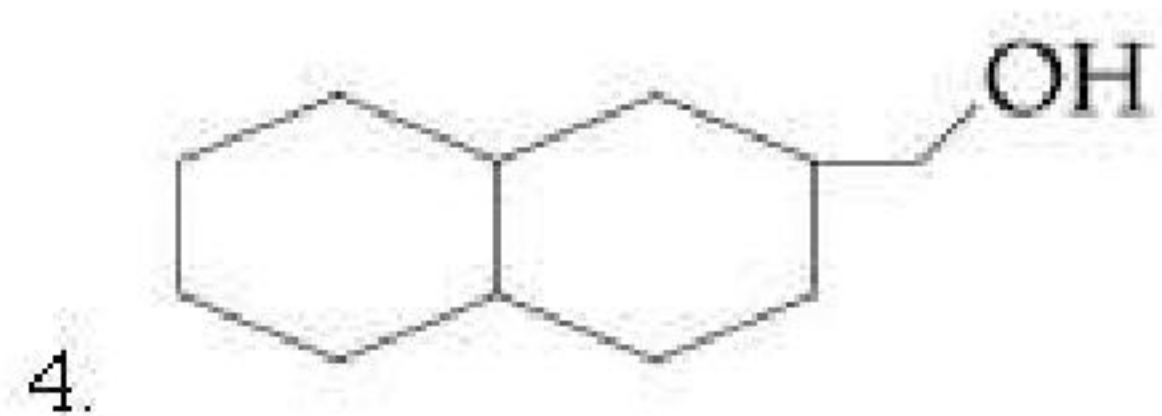
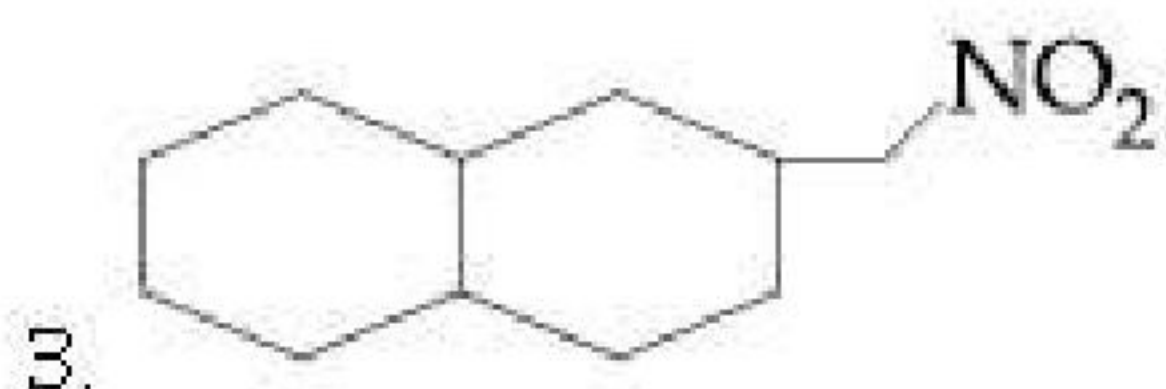
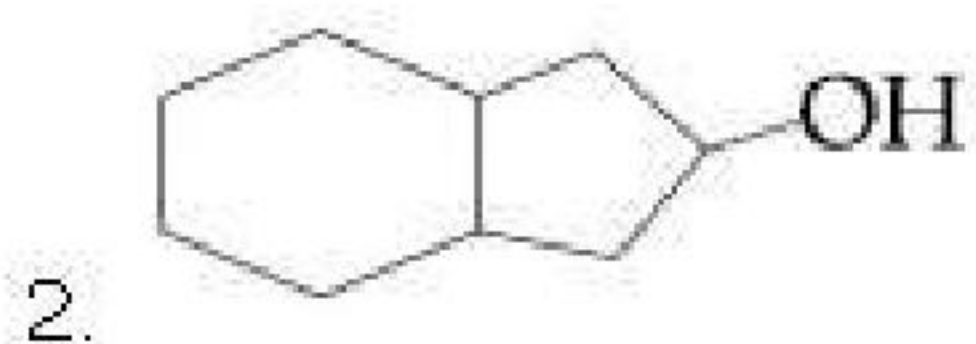
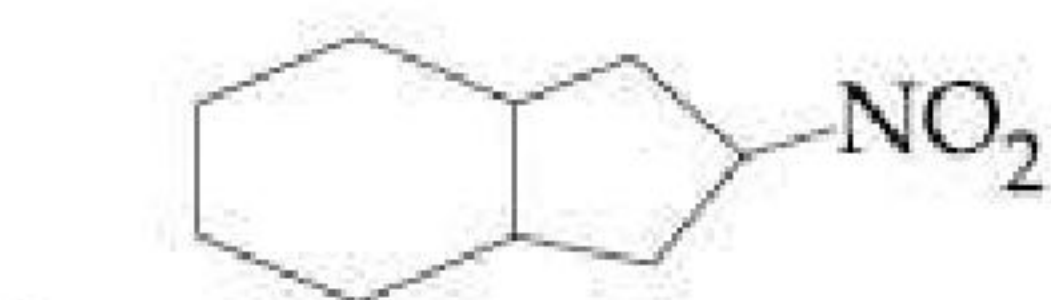
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયામાં મળતી મુખ્ય નીપજ કયું હશે?



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

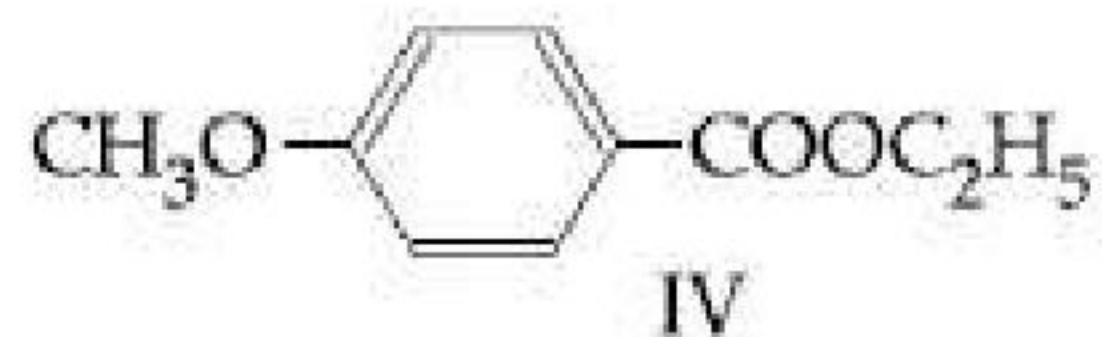
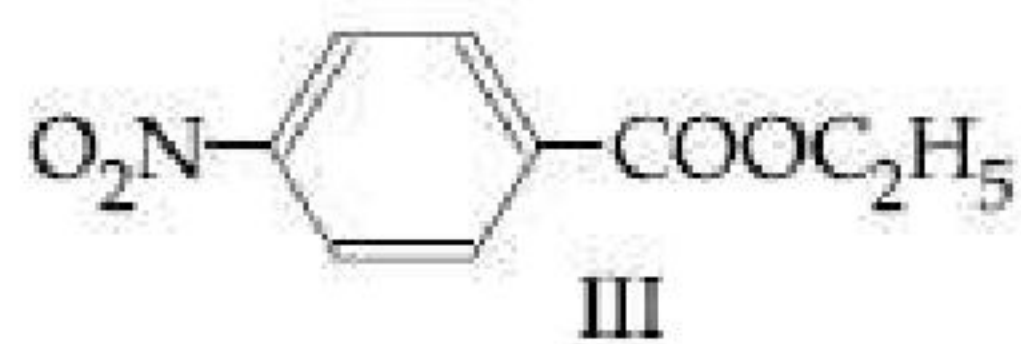
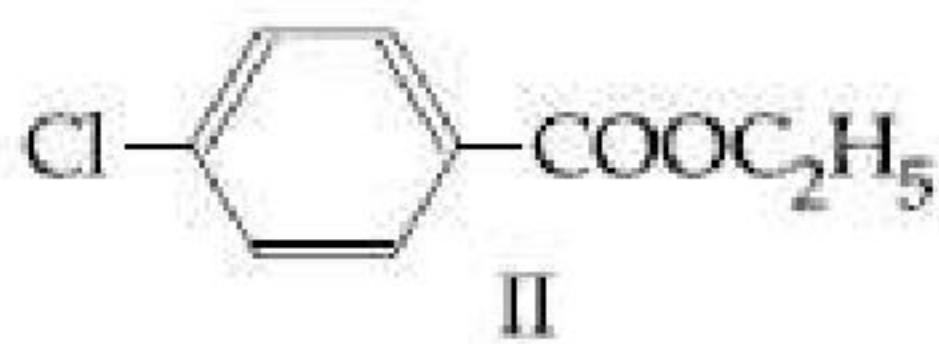
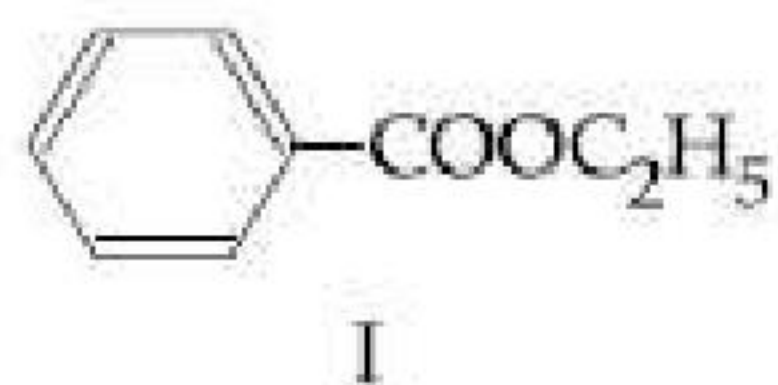
Options :



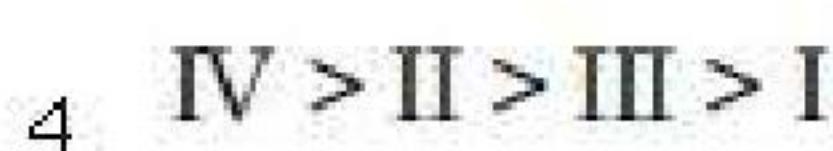
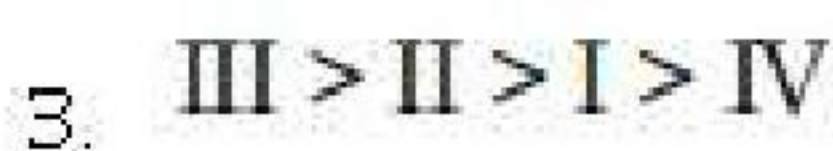
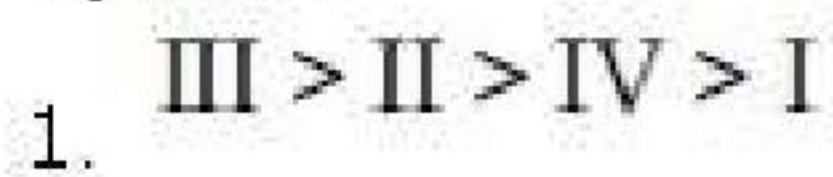
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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



Options :

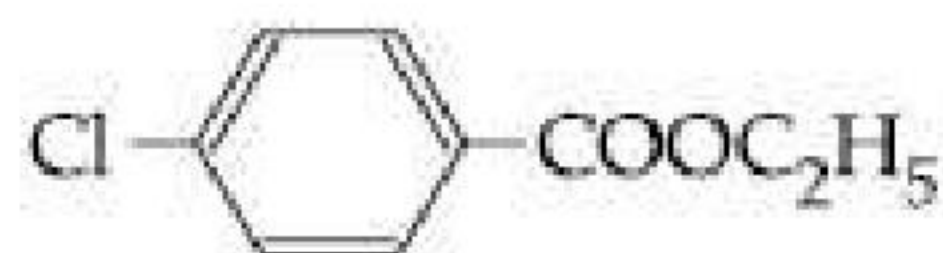


Correct Marks : 4 Wrong Marks : 1

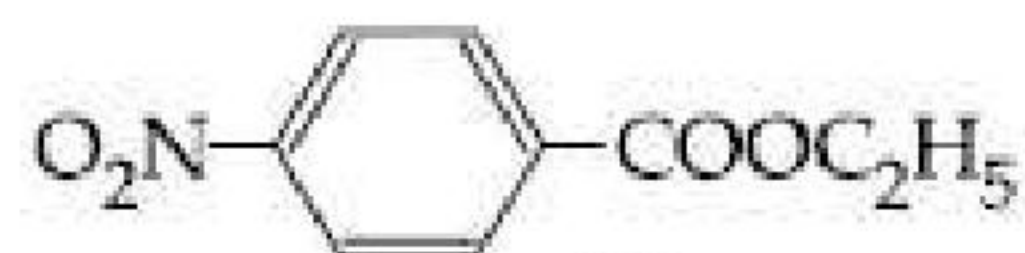
નીચે આપેલા એસ્ટરને બેઝિક જળવિભાજન કરવા માટે પડતી સરળતાનાં ઉત્સરતાક્રમમાં ગોઠવો.



I



II



III



IV

Options :

1. III > II > IV > I
2. II > III > I > IV
3. III > II > I > IV
4. IV > II > III > I

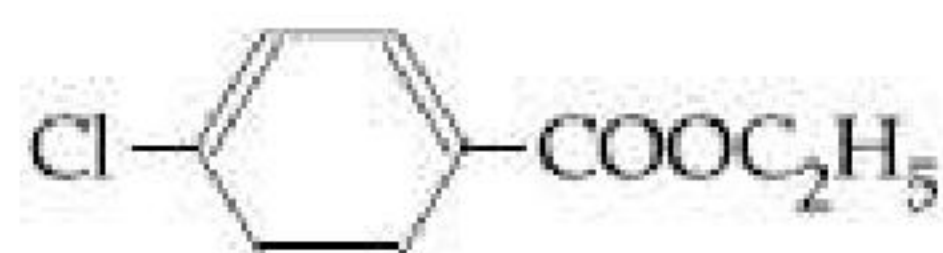
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

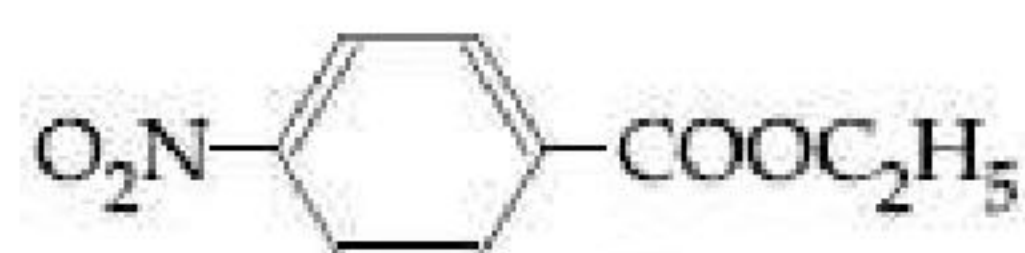
The decreasing order of ease of alkaline hydrolysis for the following esters is



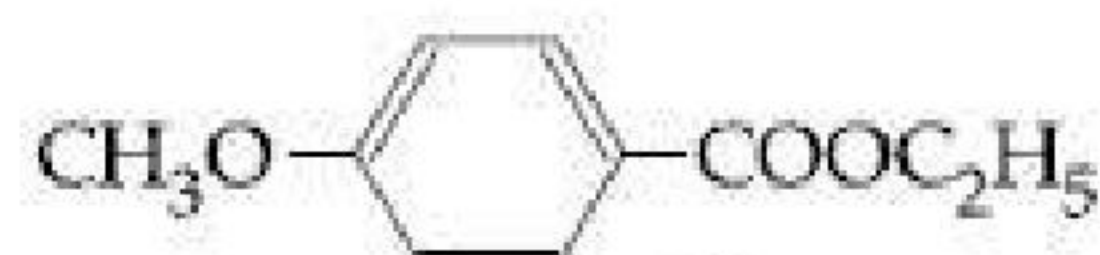
I



II



III



IV

Options :

2. $\text{II} > \text{III} > \text{I} > \text{IV}$

3. $\text{III} > \text{II} > \text{I} > \text{IV}$

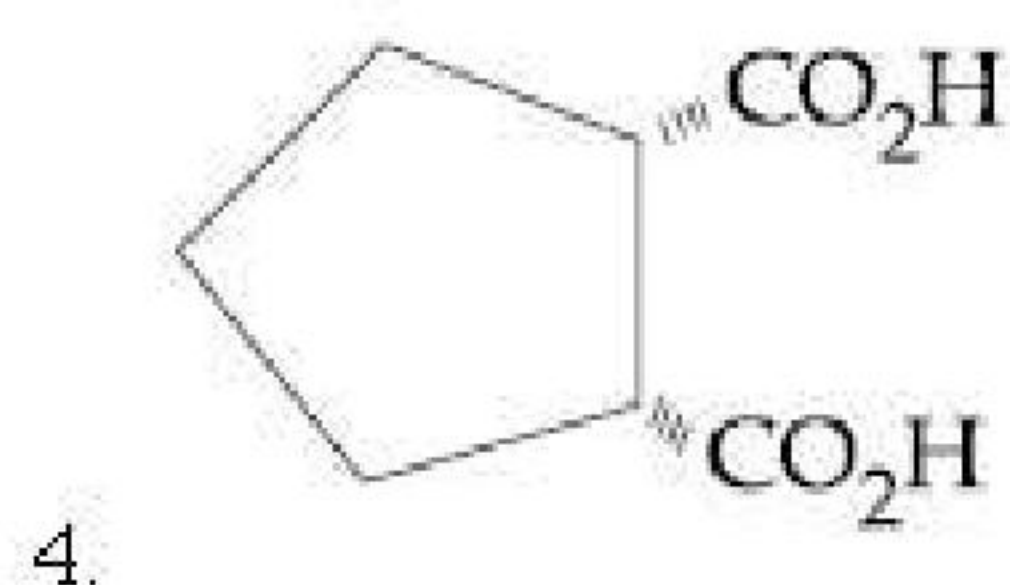
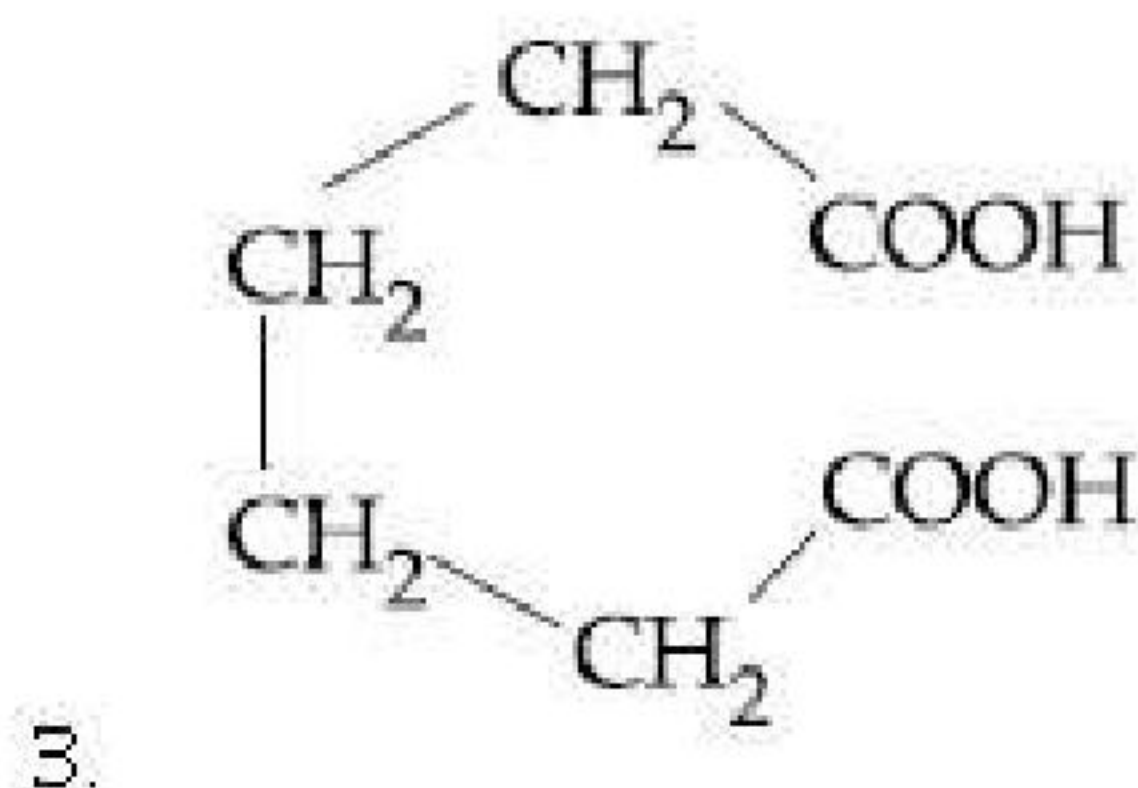
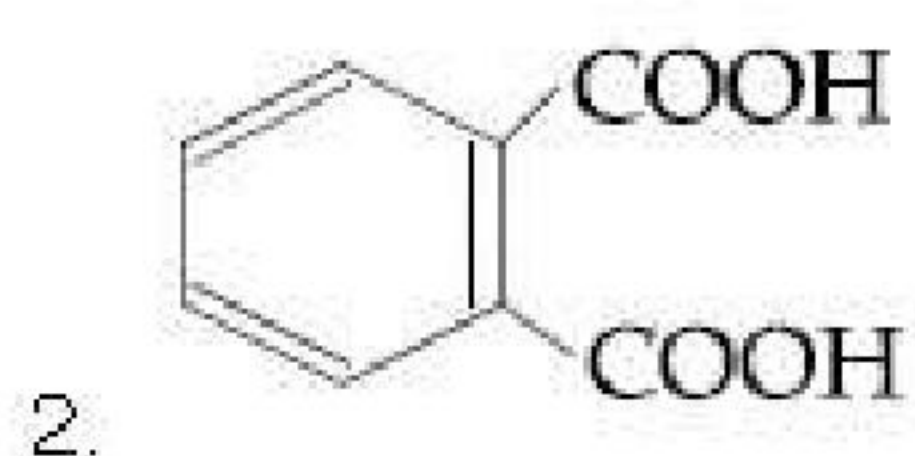
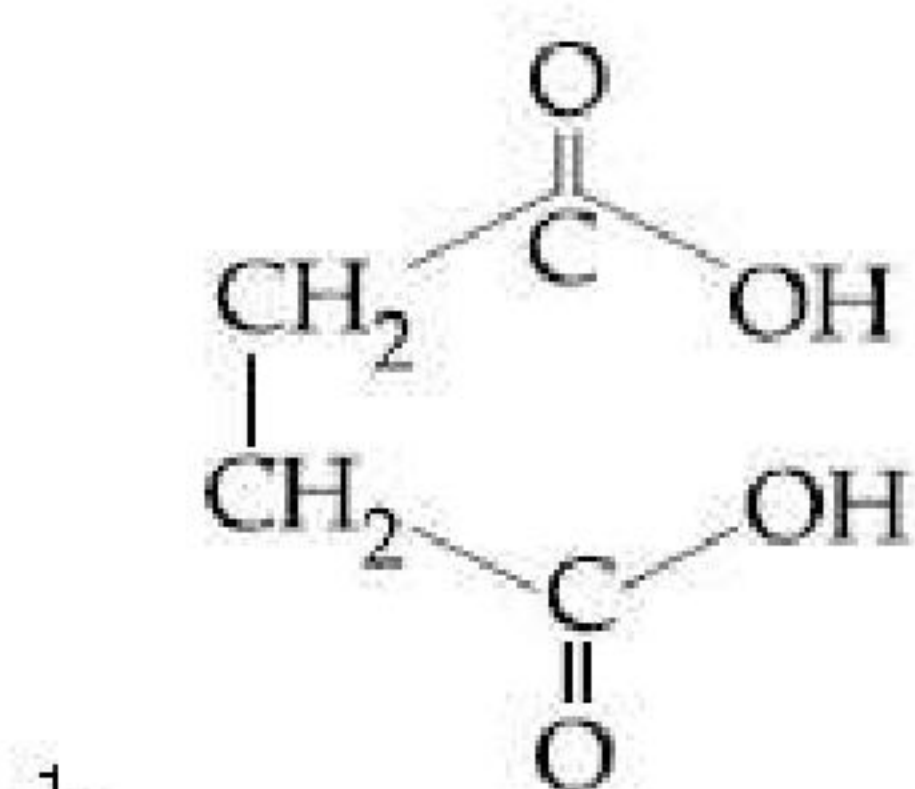
4. $\text{IV} > \text{II} > \text{III} > \text{I}$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

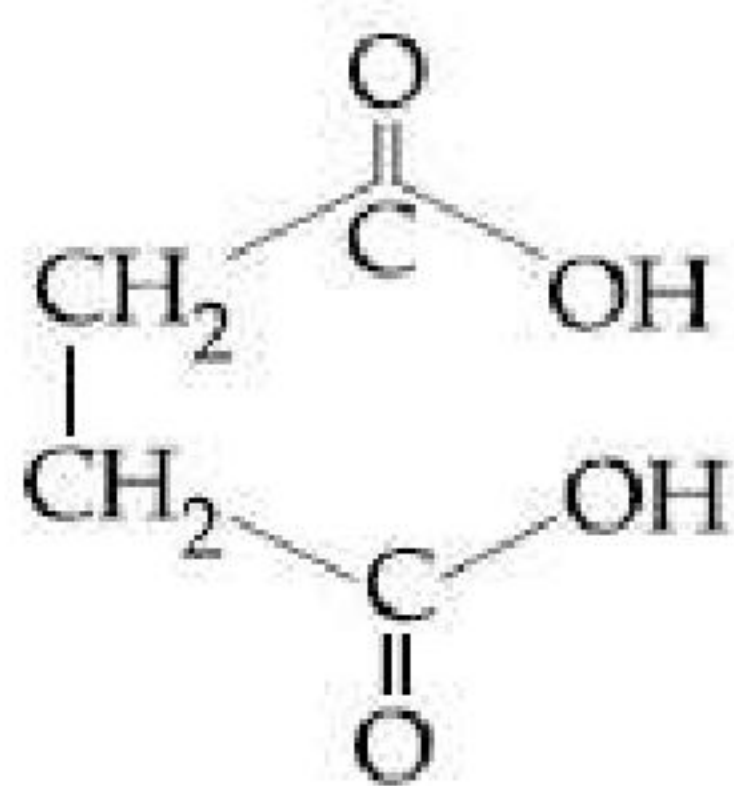


Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

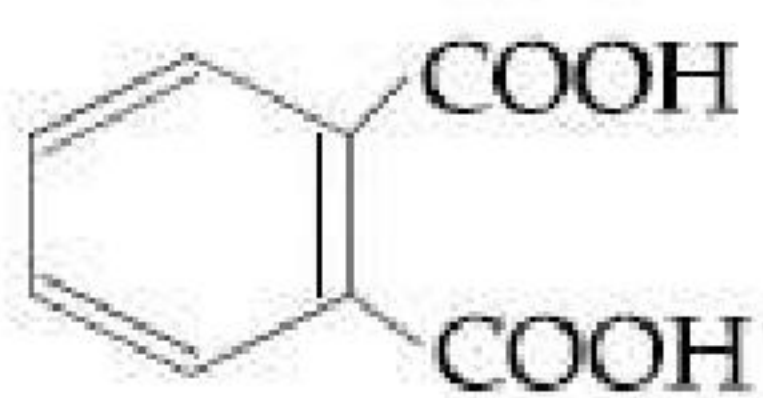
Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन डाइकार्बाक्सिलिक अम्ल निर्जलीकारक की उपस्थिति में एक ऐनहाइडाइड देने के लिए सबसे

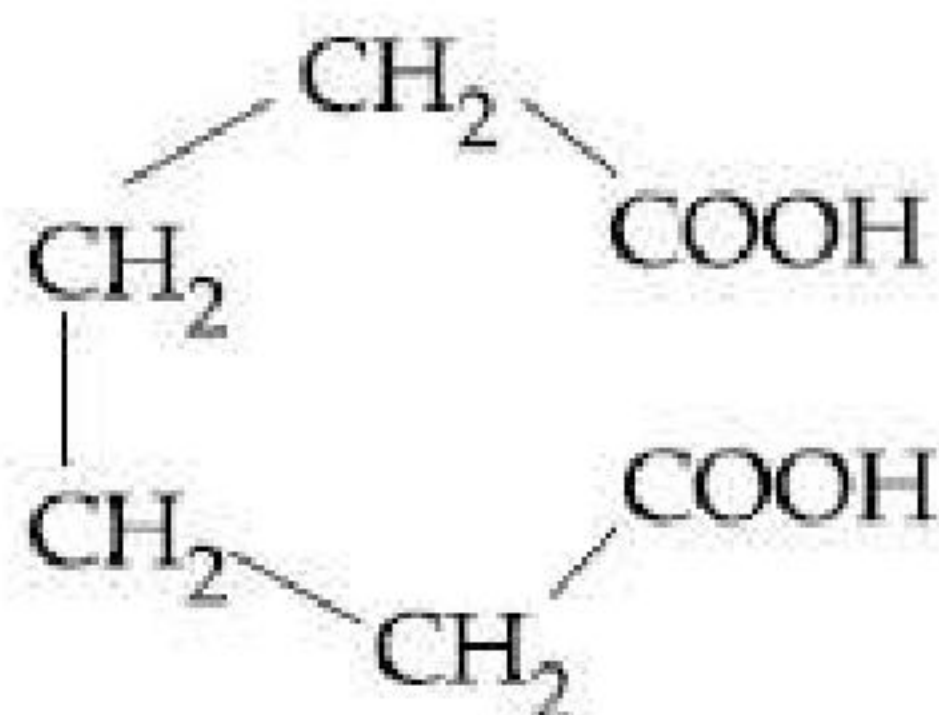
1.



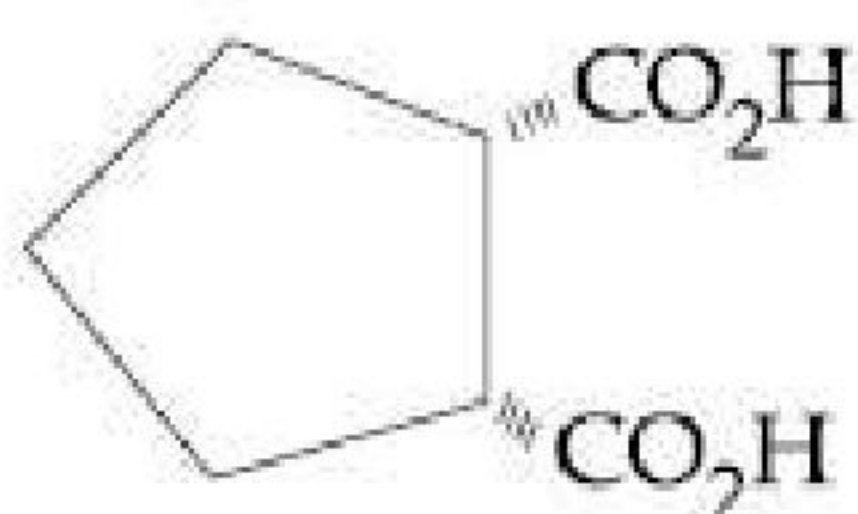
2.



3.



4.



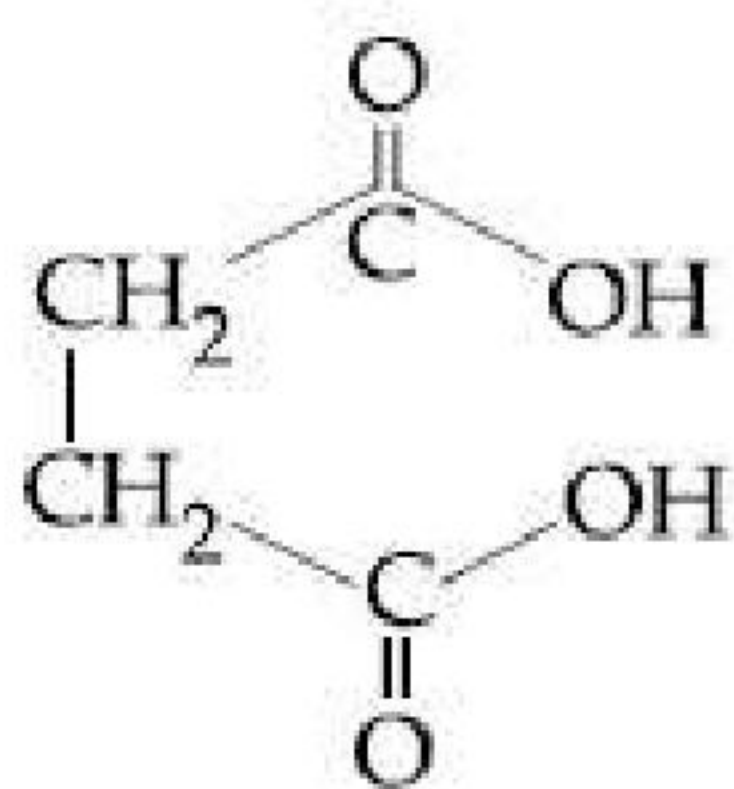
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

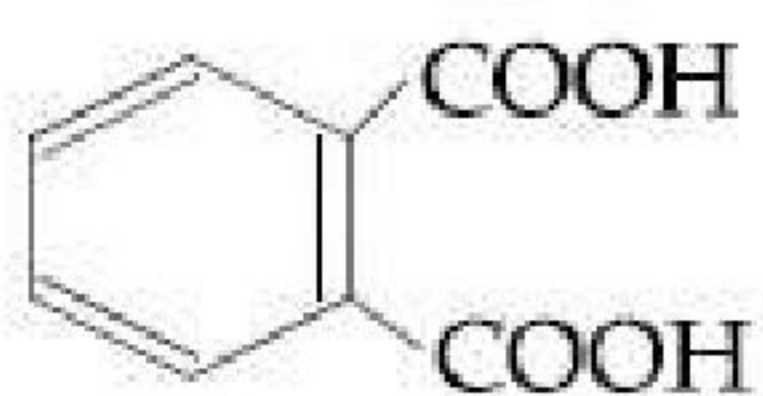
કયો ડાયકાર્બોક્સિલીક એસિડ નિર્જલીકરણ એજન્ટની હાજરીમાં એનહાઇડ્રાઇડ બનાવવા માટે ઓછામાં ઓછો સક્રિય હશે?

Options :

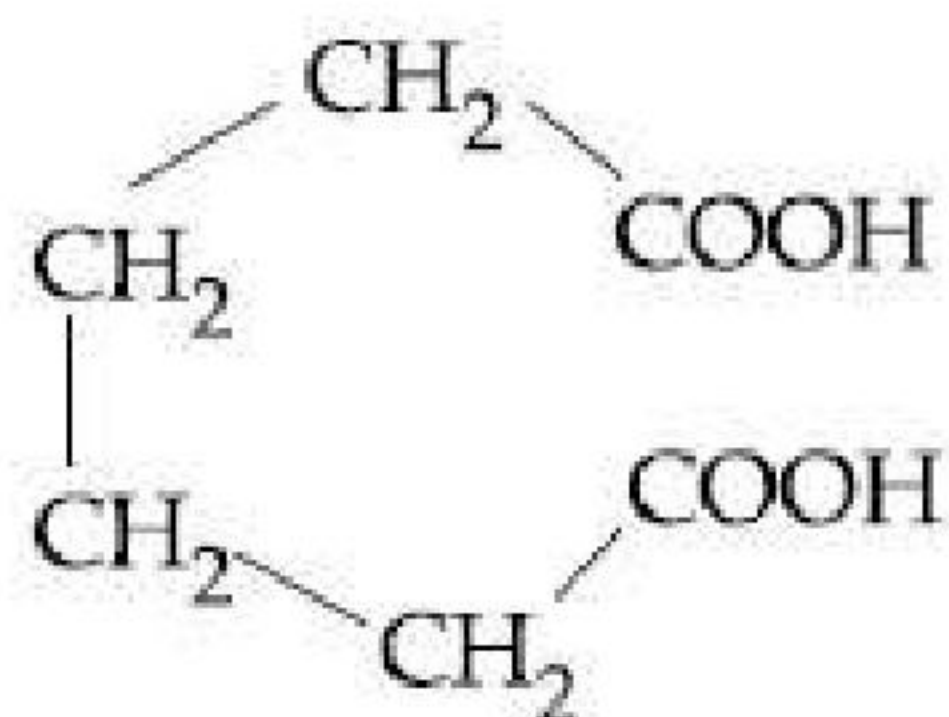
1.



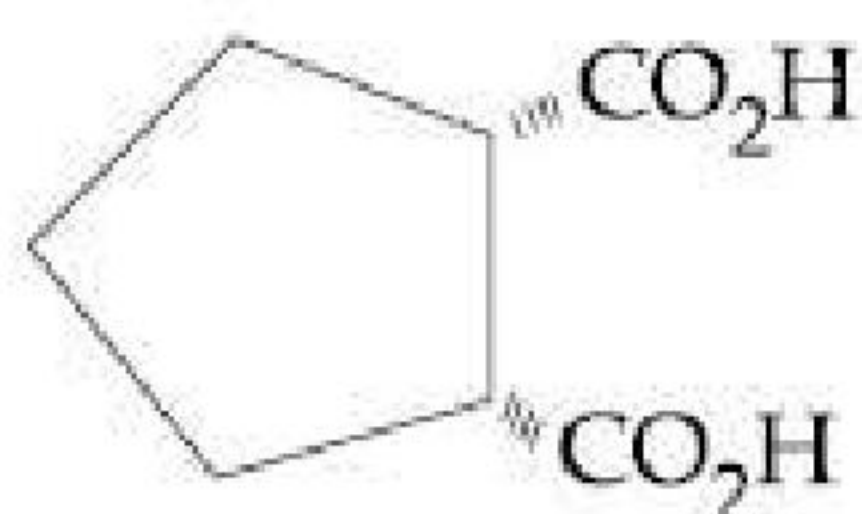
2.



3.



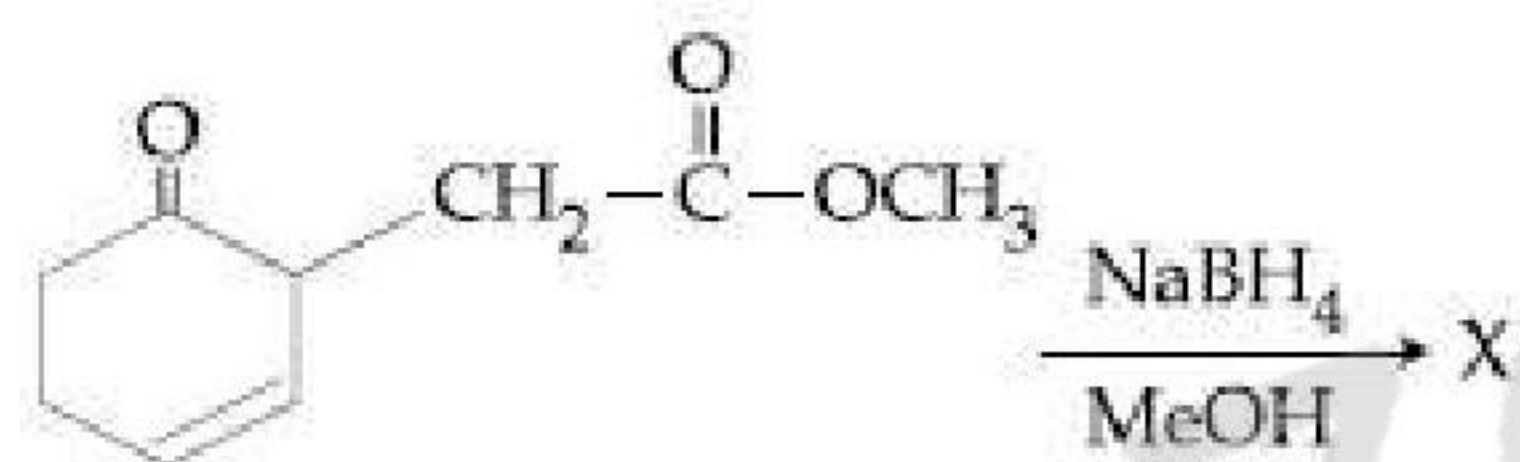
4.



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

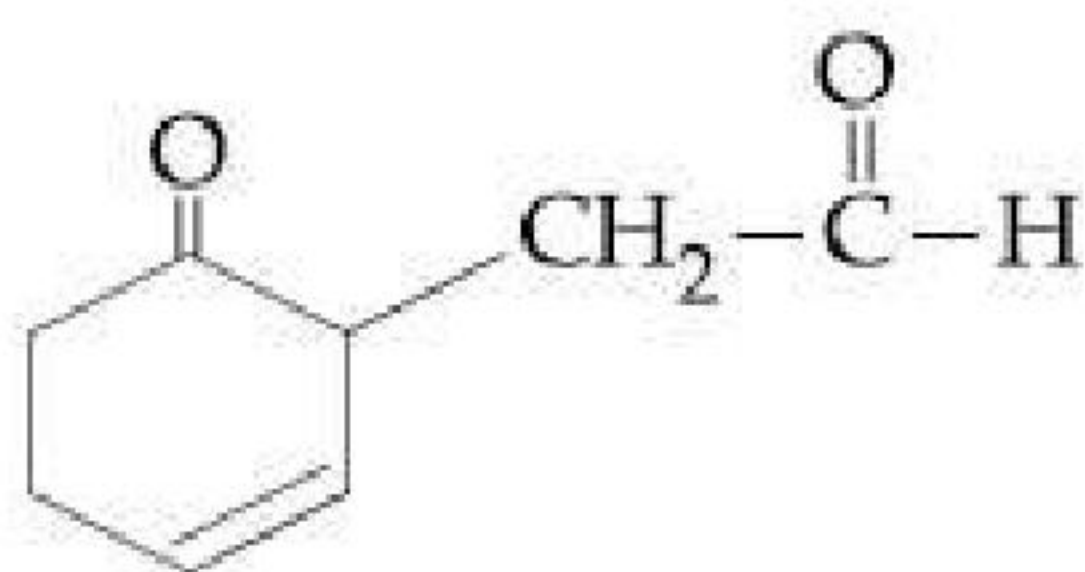
Correct Marks : 4 Wrong Marks : 1

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

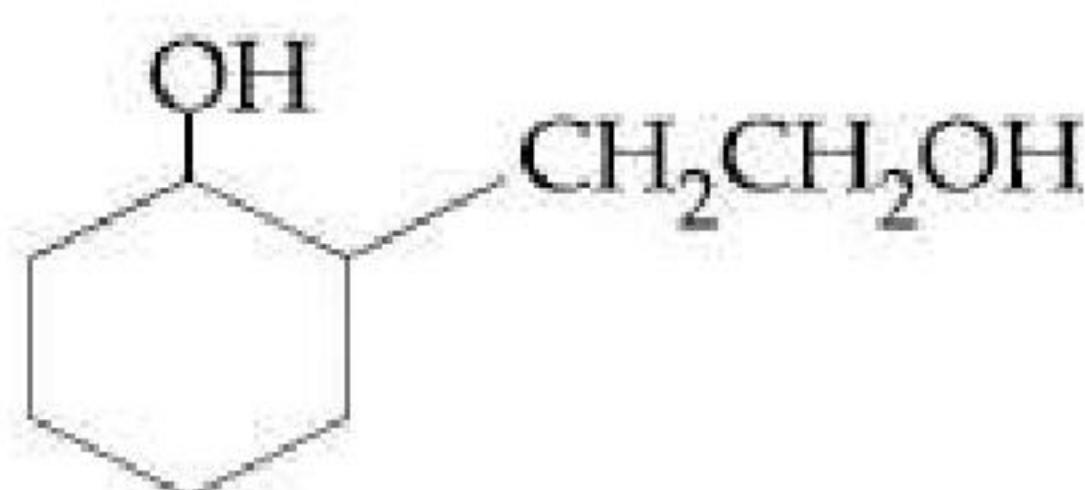


Options :

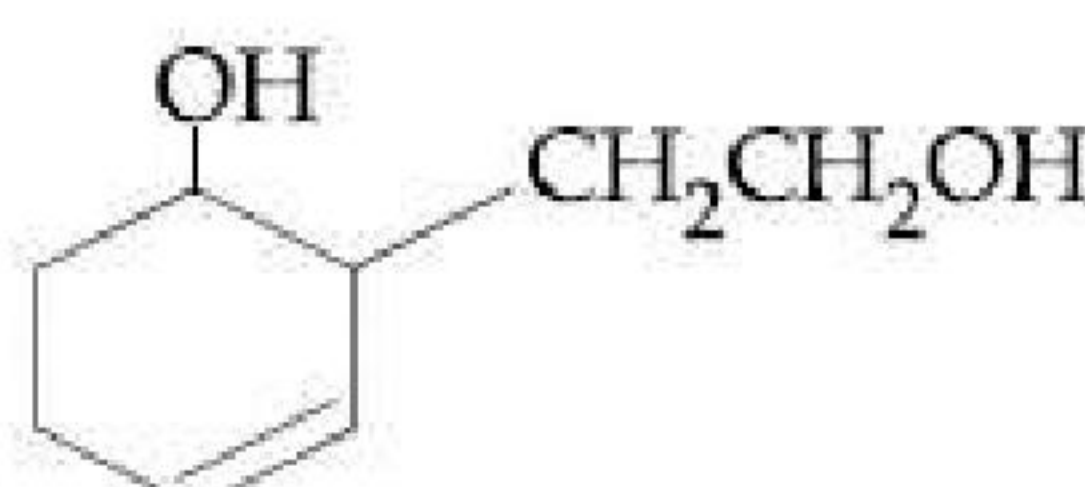
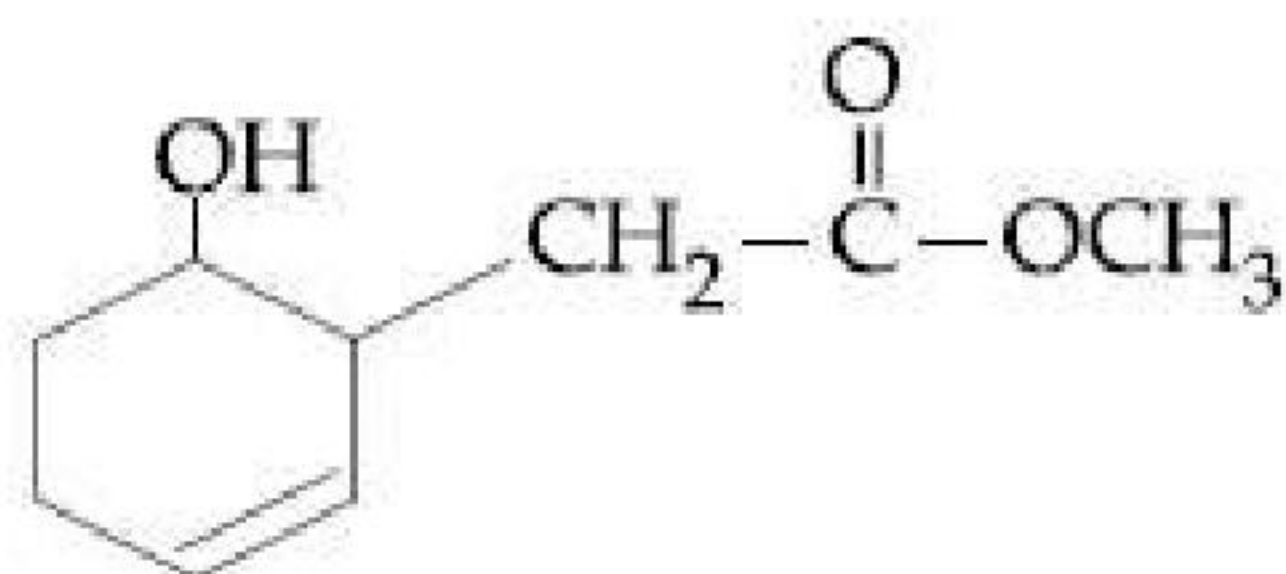
1.



2.



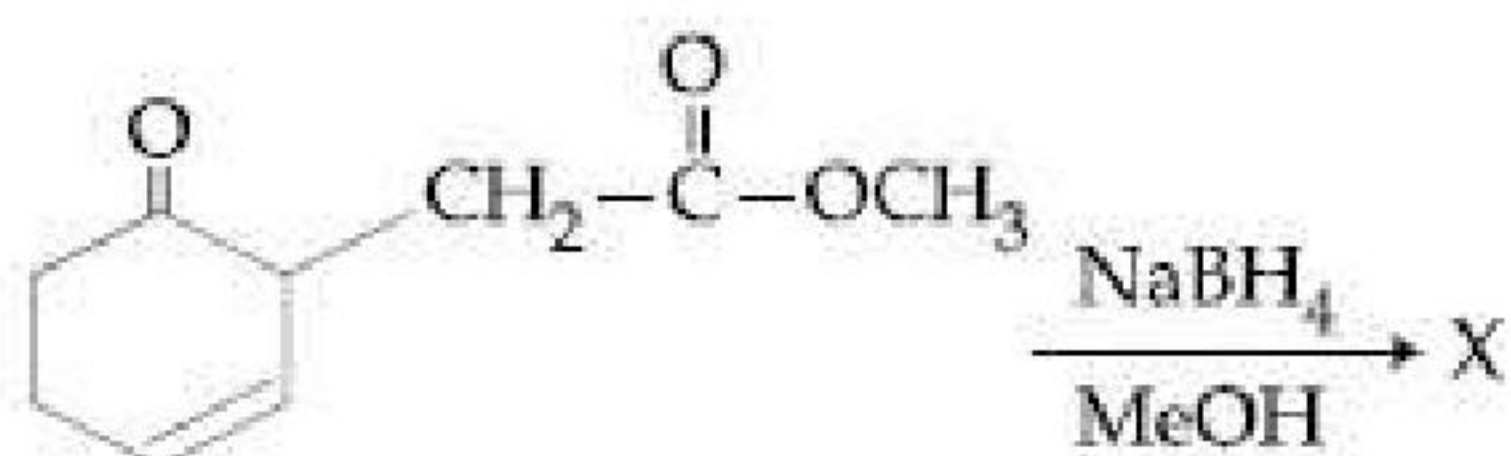
3.



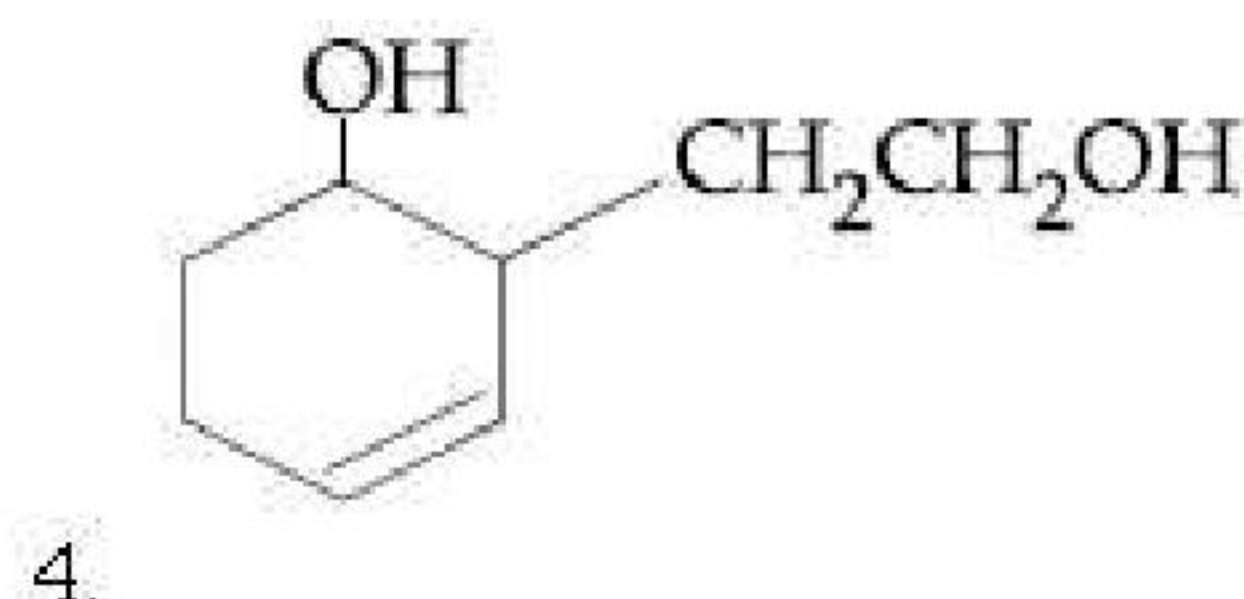
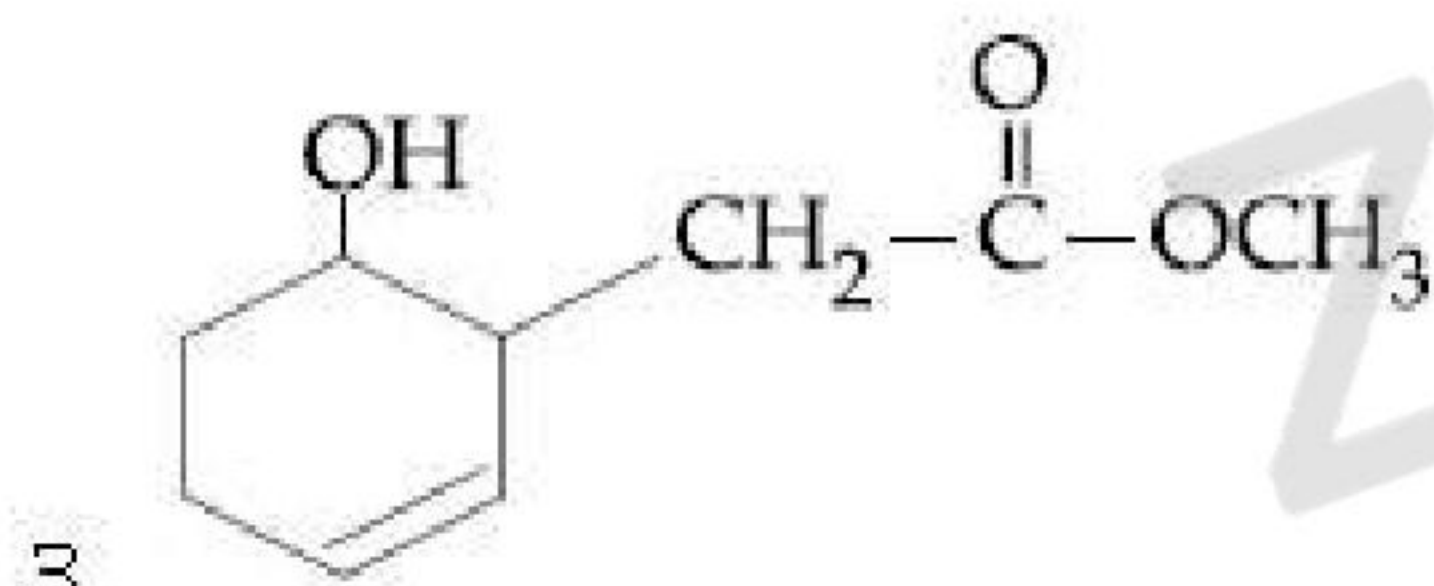
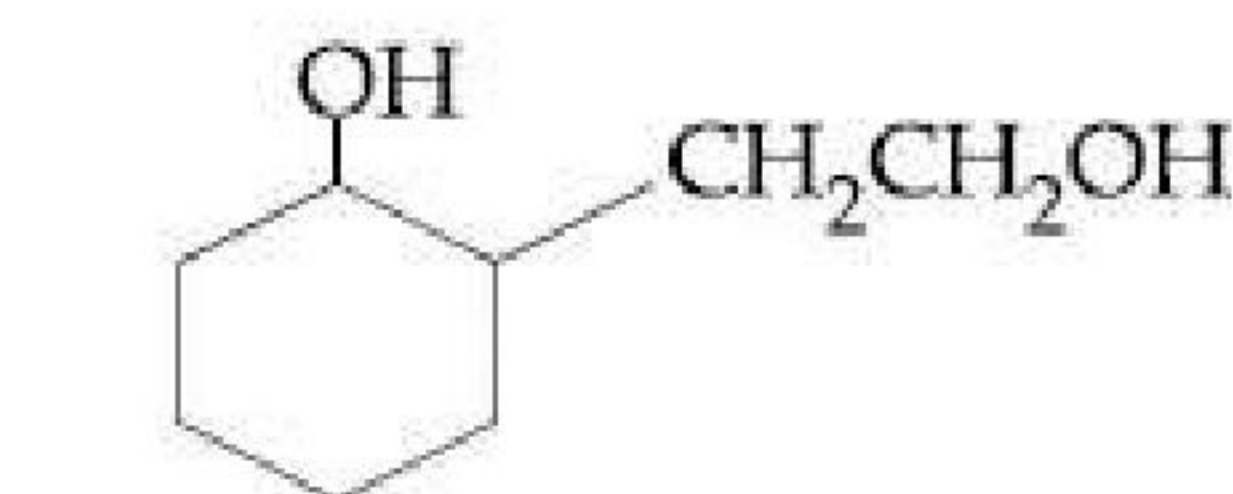
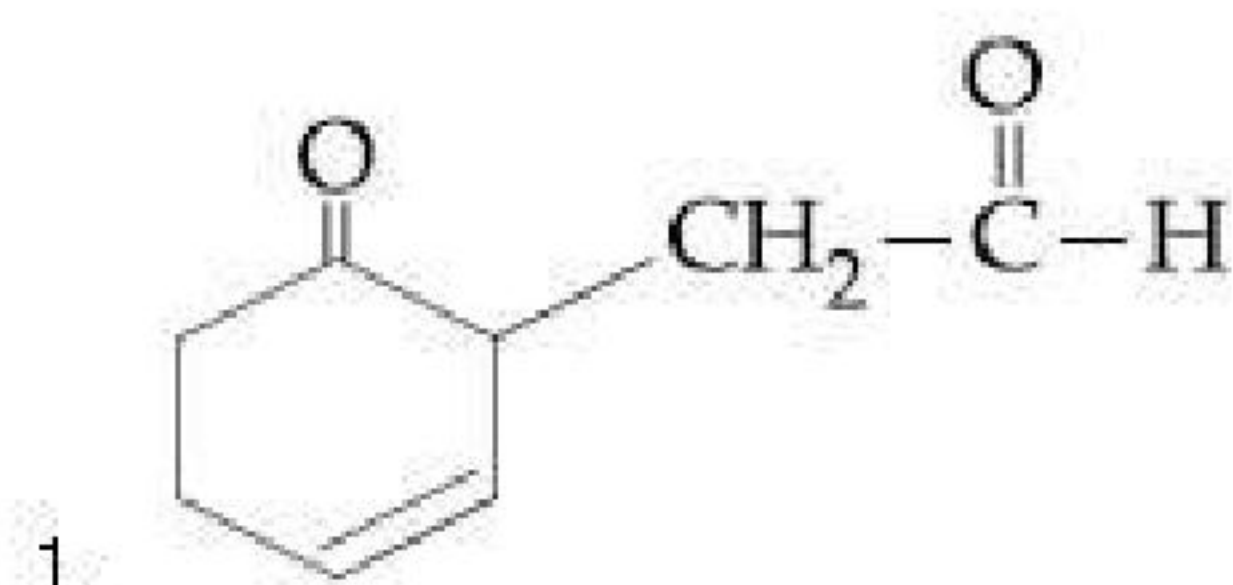
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में बननेवाला मुख्य उत्पाद 'X' है



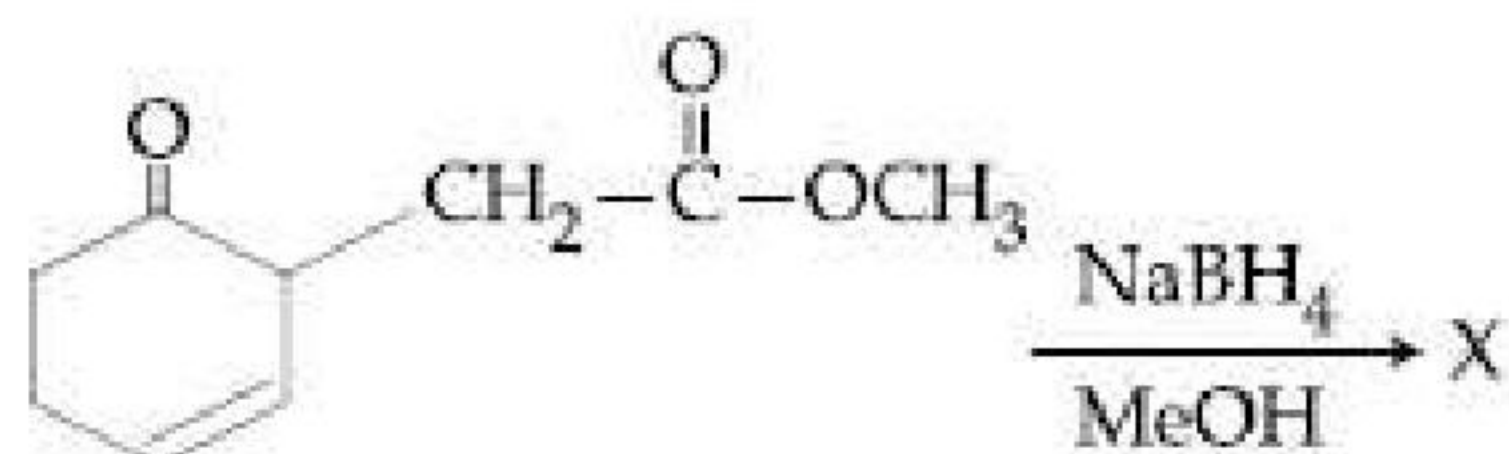
Options :



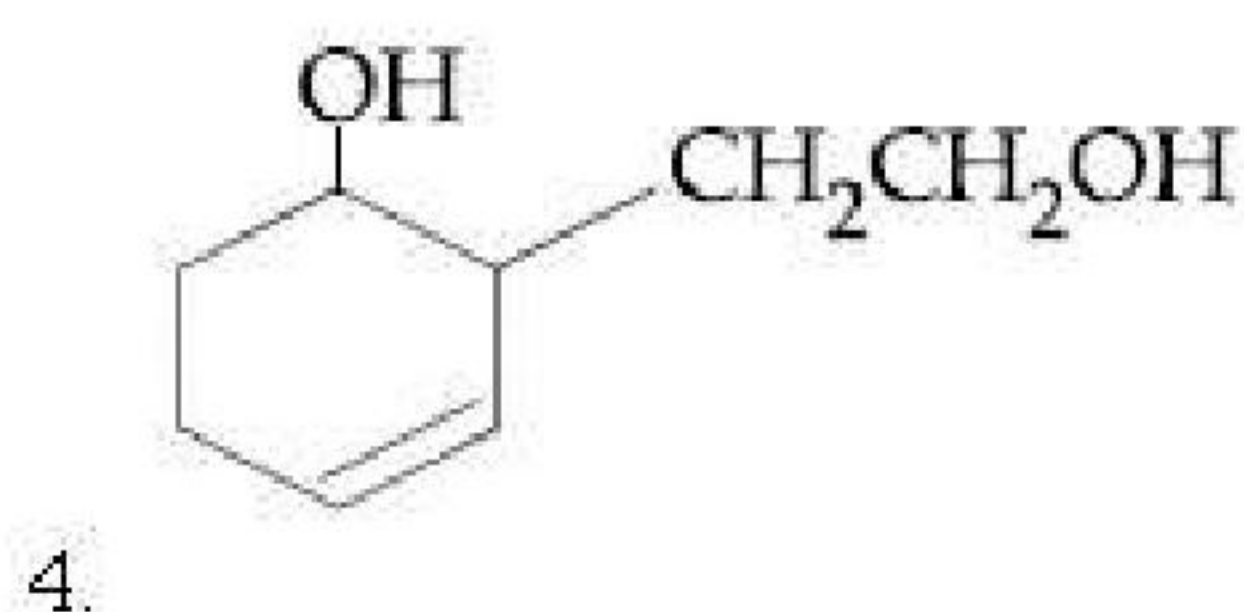
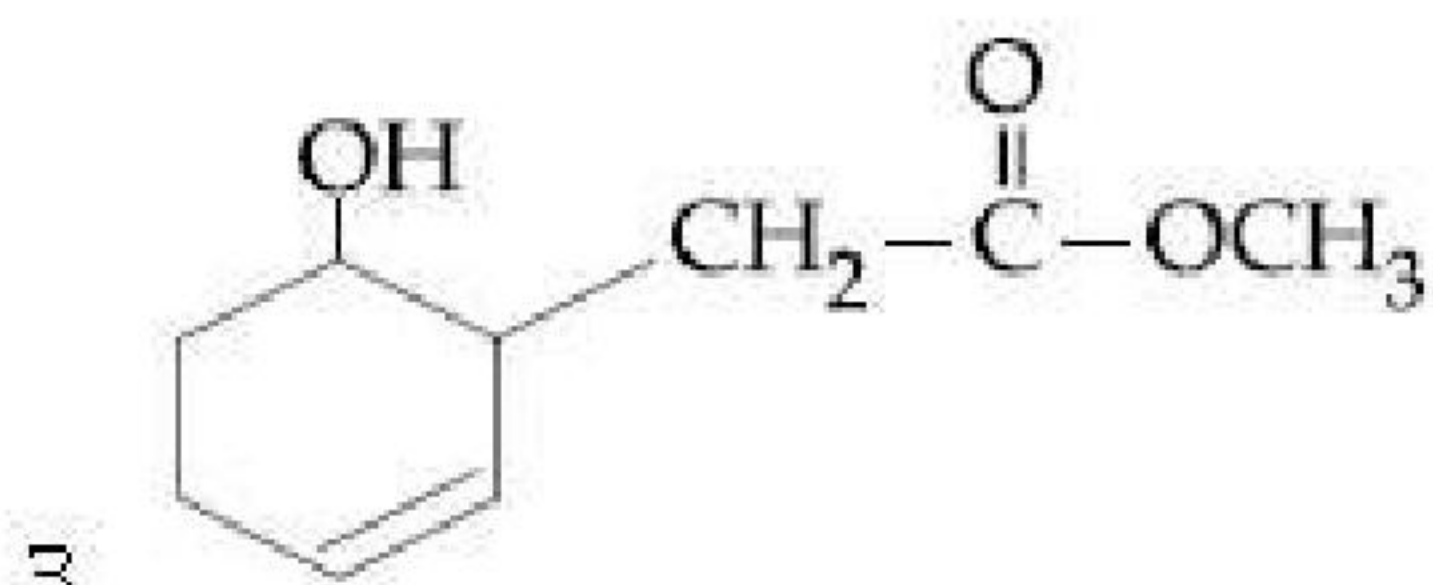
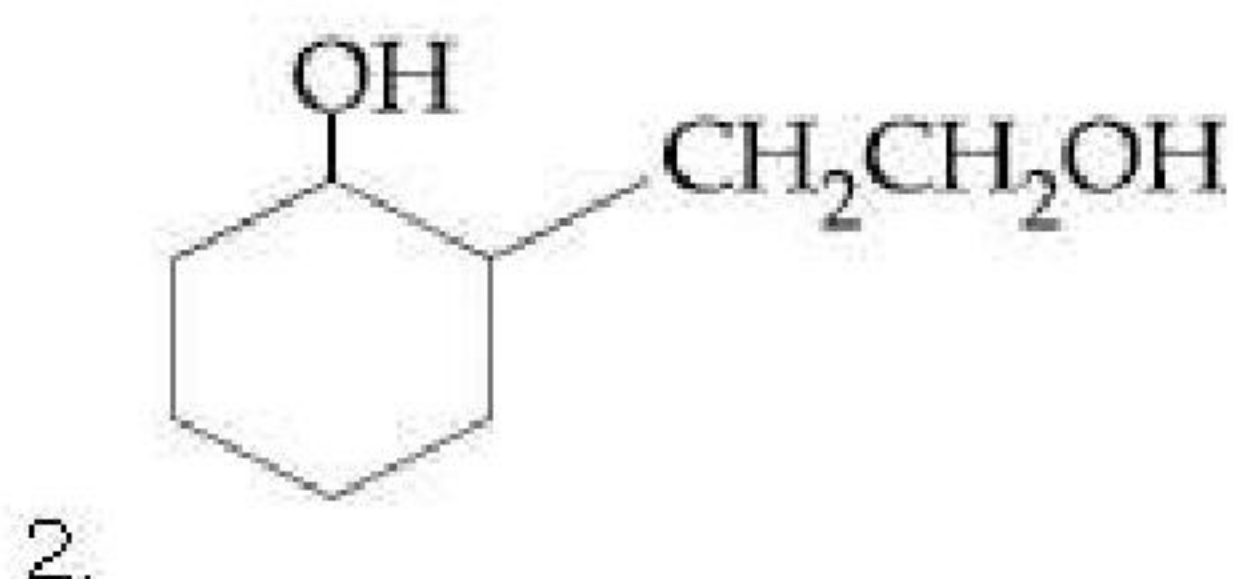
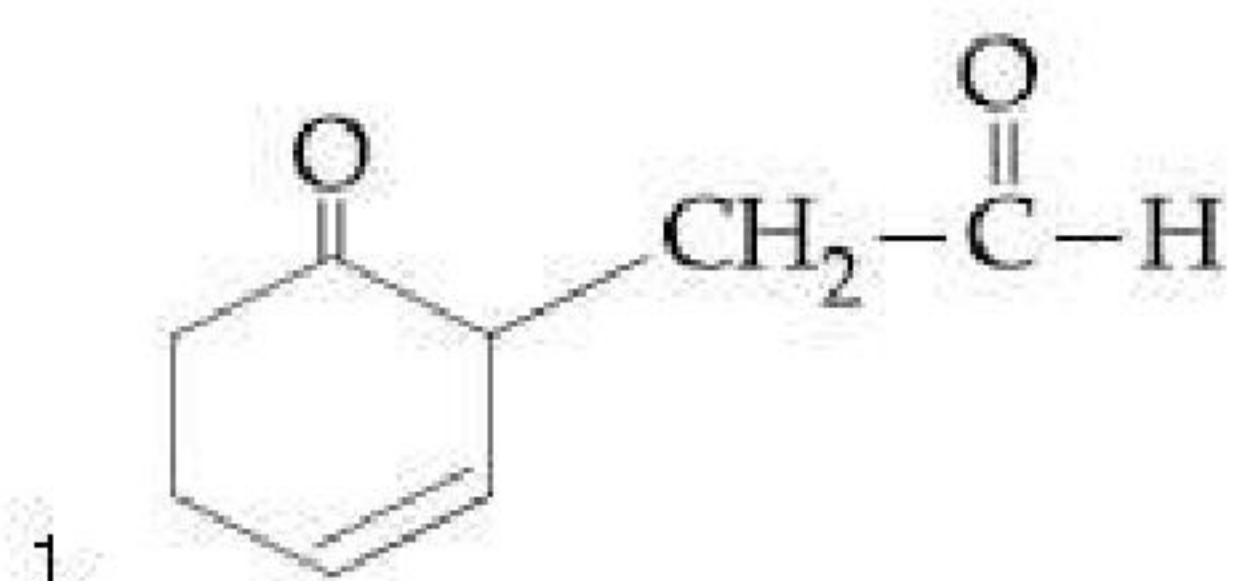
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયામાં બનતી મુખ્ય નીપજ 'X' શોધો.



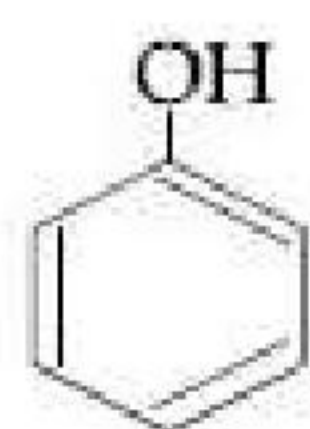
Options :



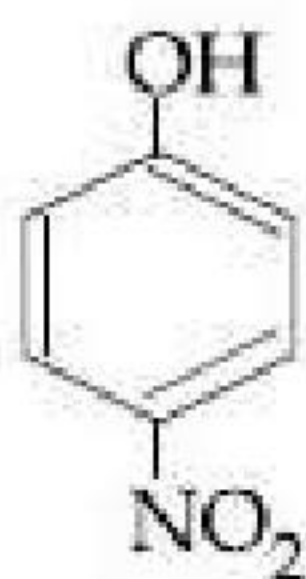
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

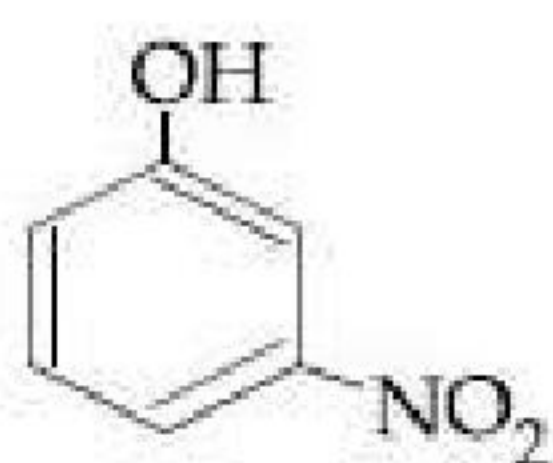
The increasing order of the pKa values of the following compounds is :



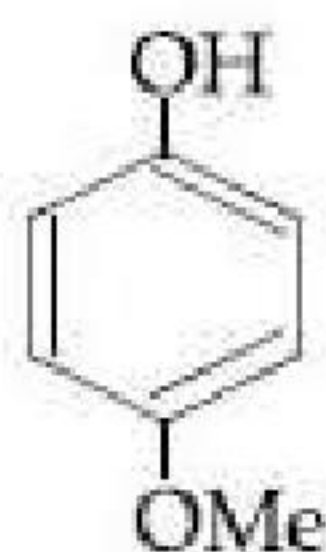
A



B

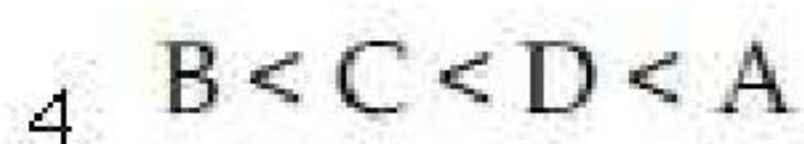
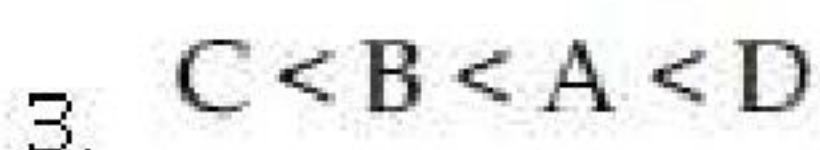
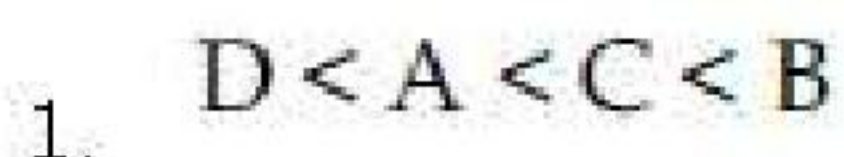


C

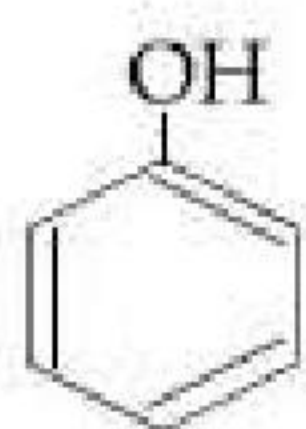


D

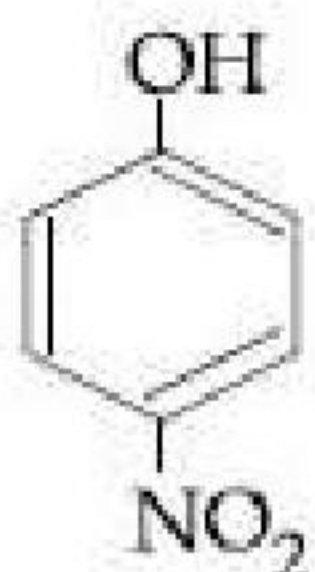
Options :



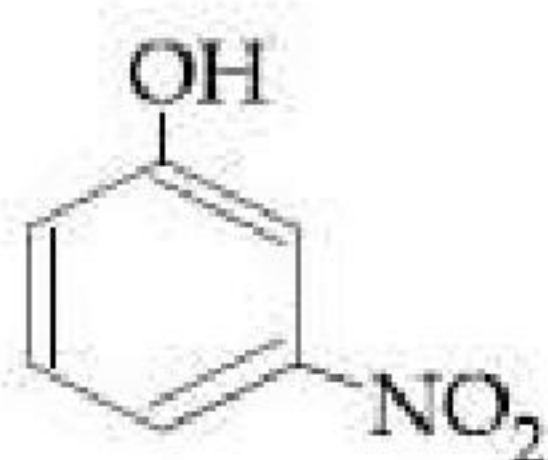
निम्न यौगिकों के pKa का बढ़ता हुआ क्रम है,



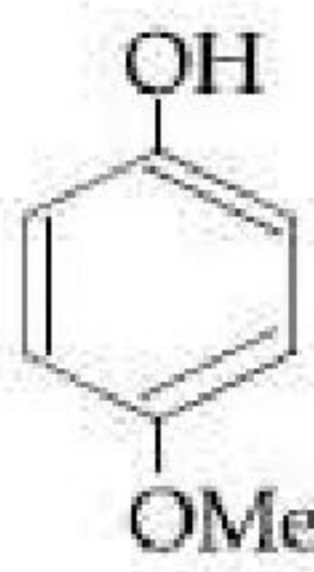
A



B



C



D

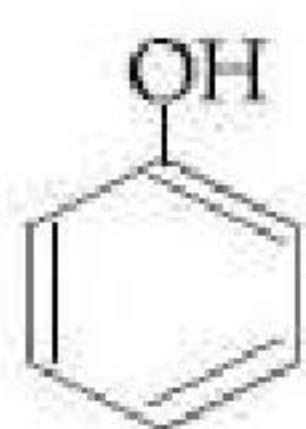
Options :

1. $D < A < C < B$
2. $B < C < A < D$
3. $C < B < A < D$
4. $B < C < D < A$

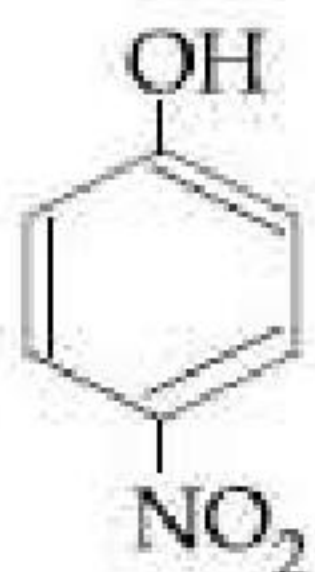
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

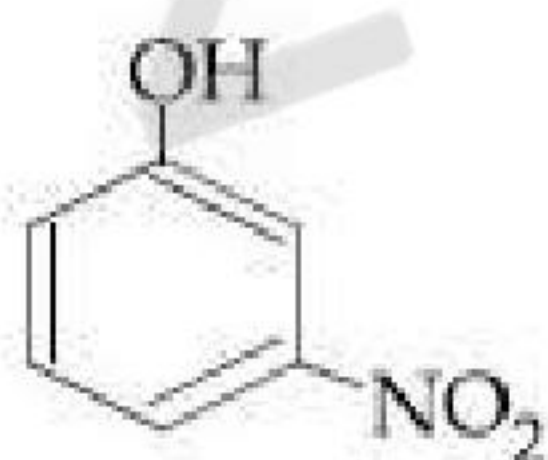
નીચે આપેલા સંયોજનની pKa મૂલ્યની ચઢતો ક્રમ શોધો .



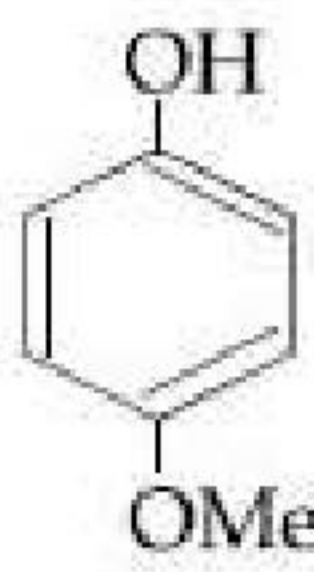
A



B



C



D

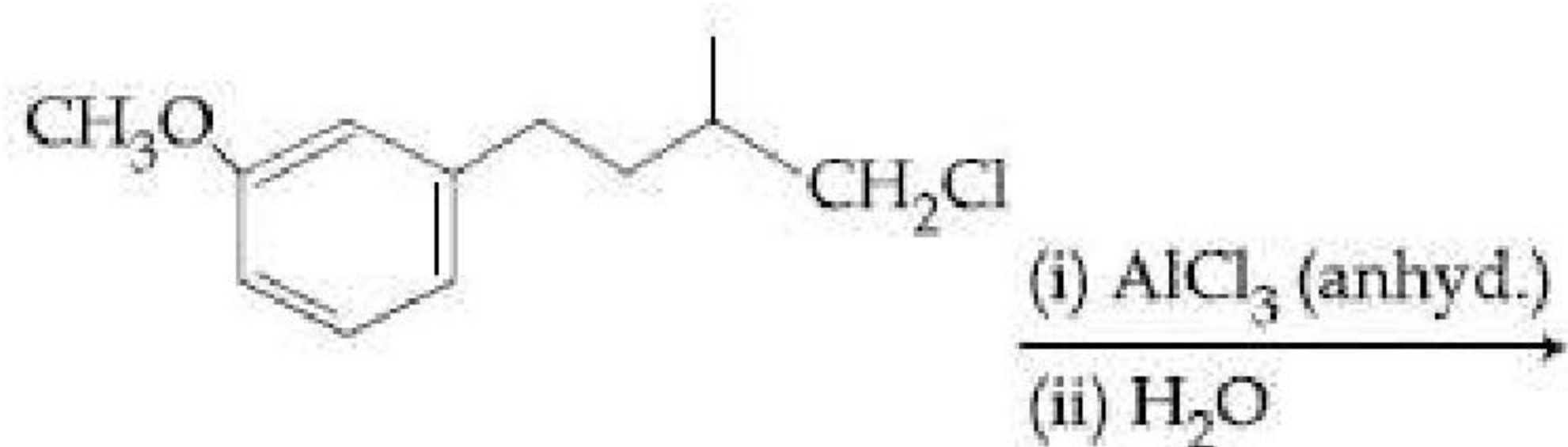
Options :

1. $D < A < C < B$
2. $B < C < A < D$
3. $C < B < A < D$
4. $B < C < D < A$

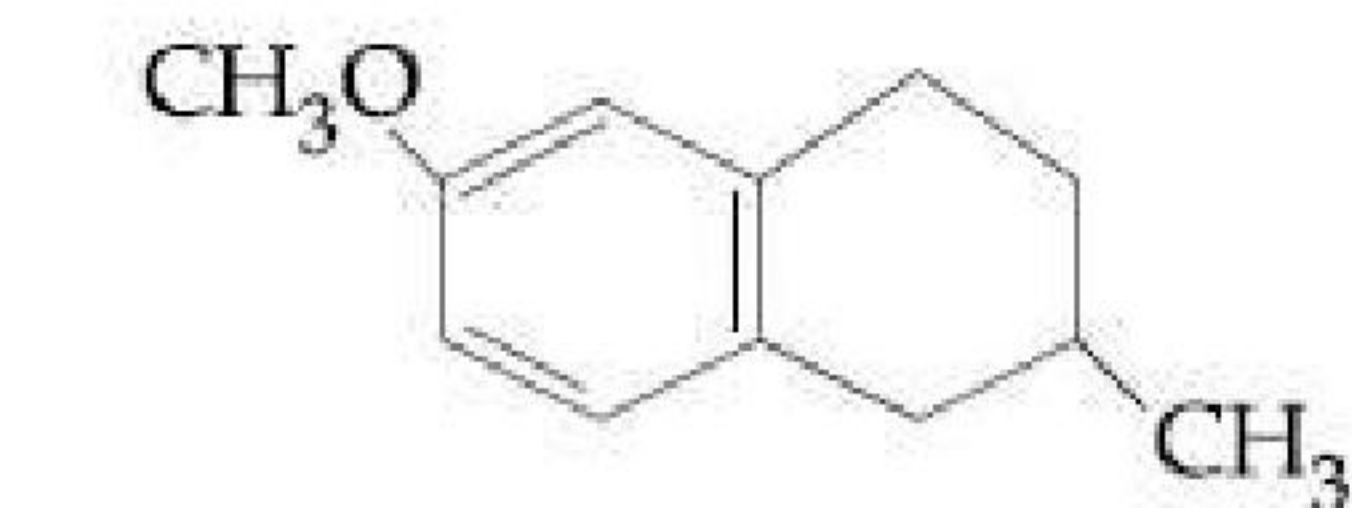
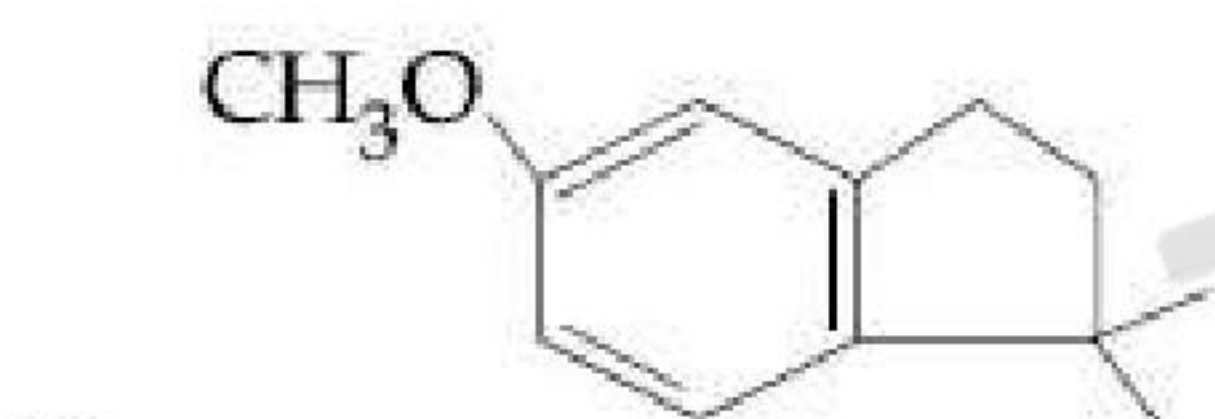
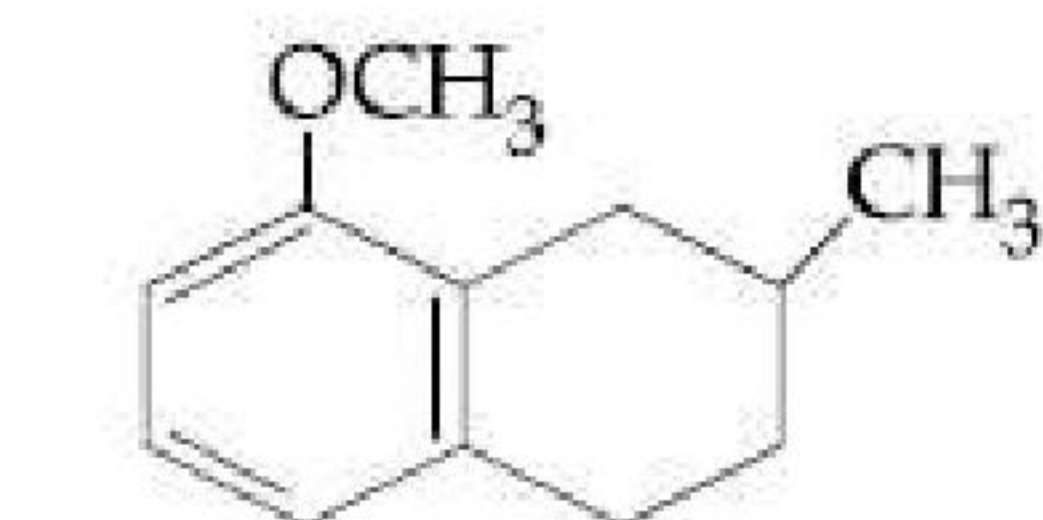
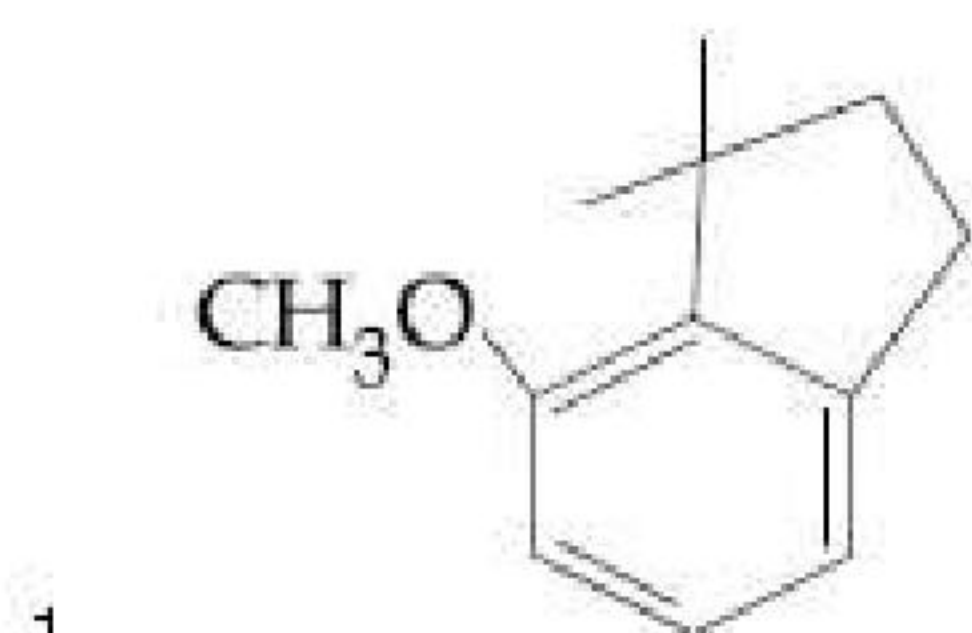
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



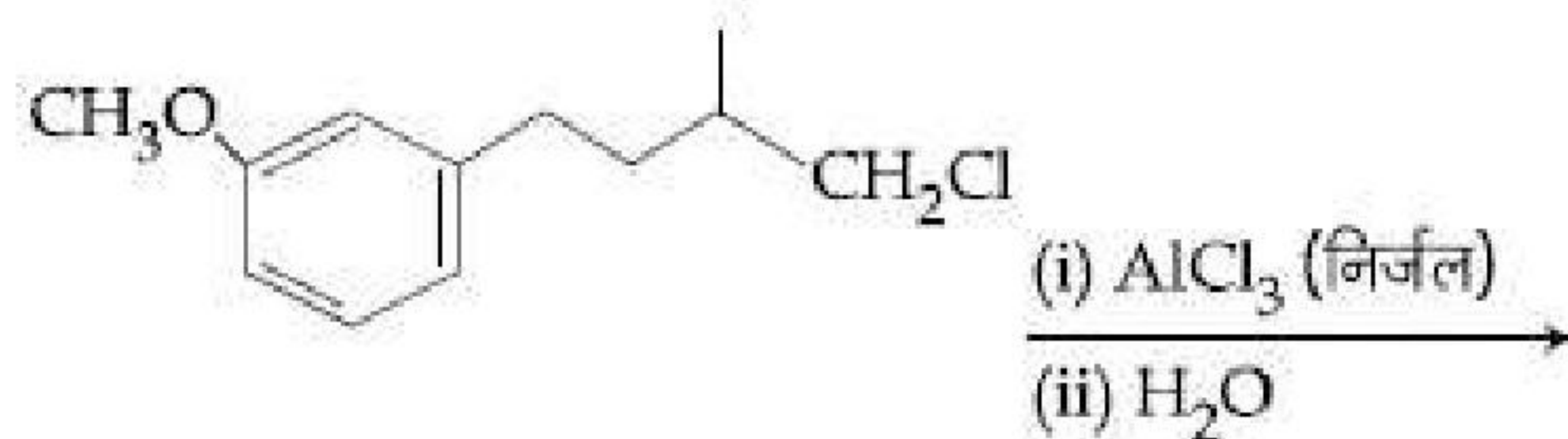
Options :



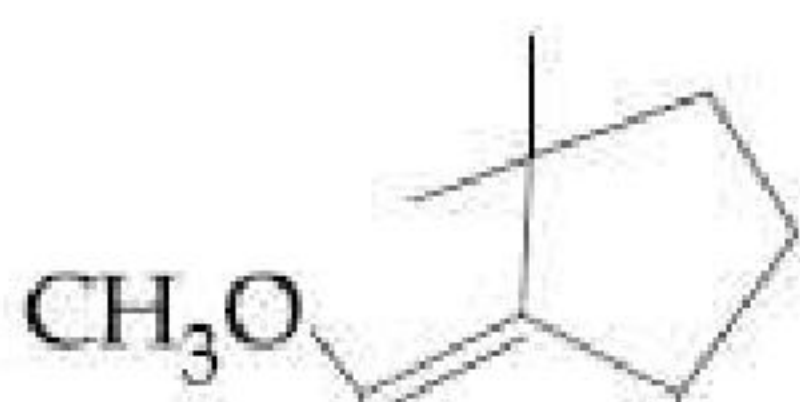
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

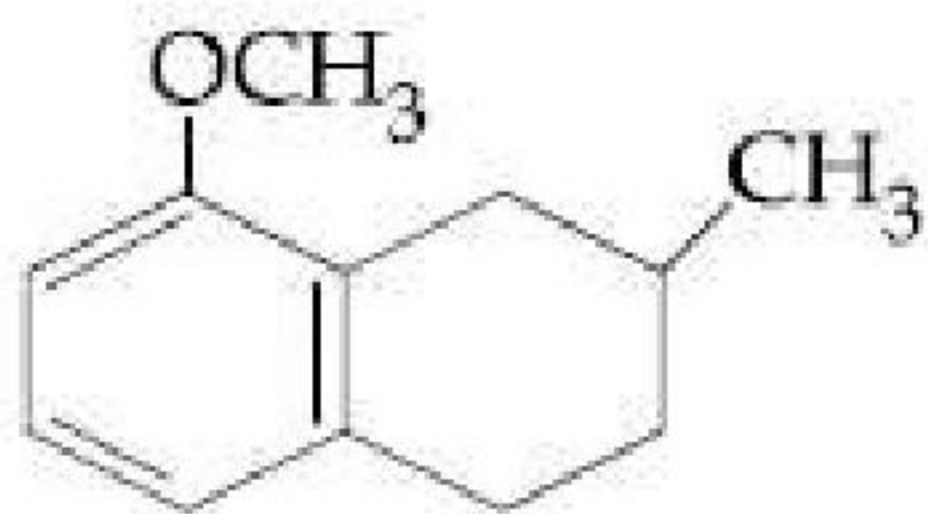
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :

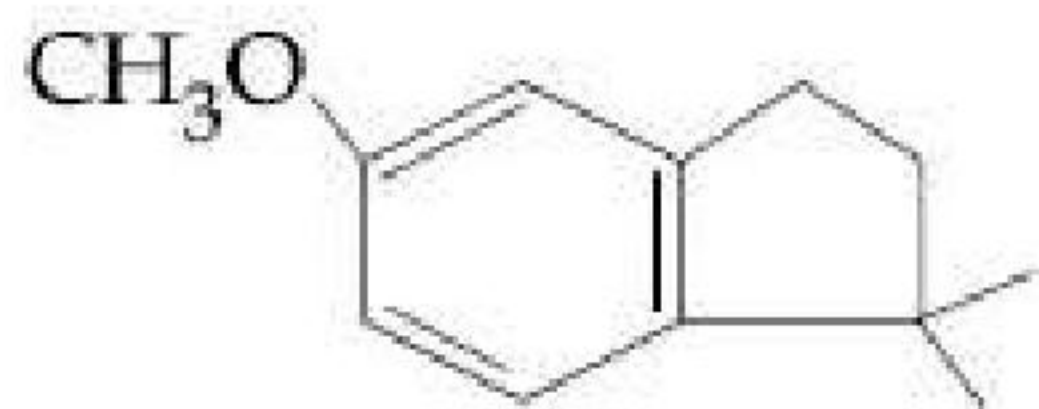


Options :

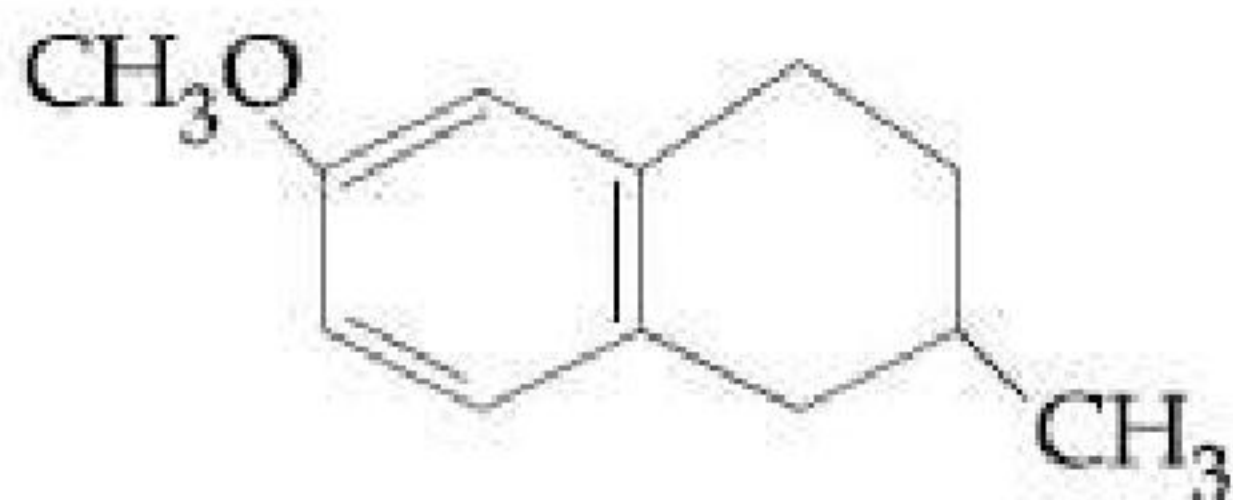




2.



3.

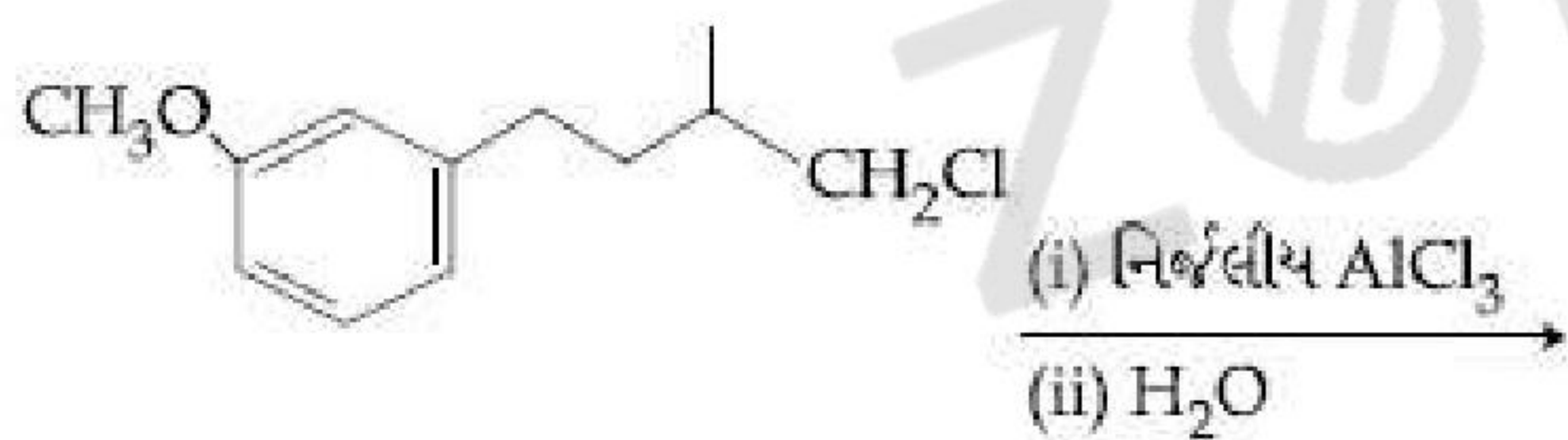


4.

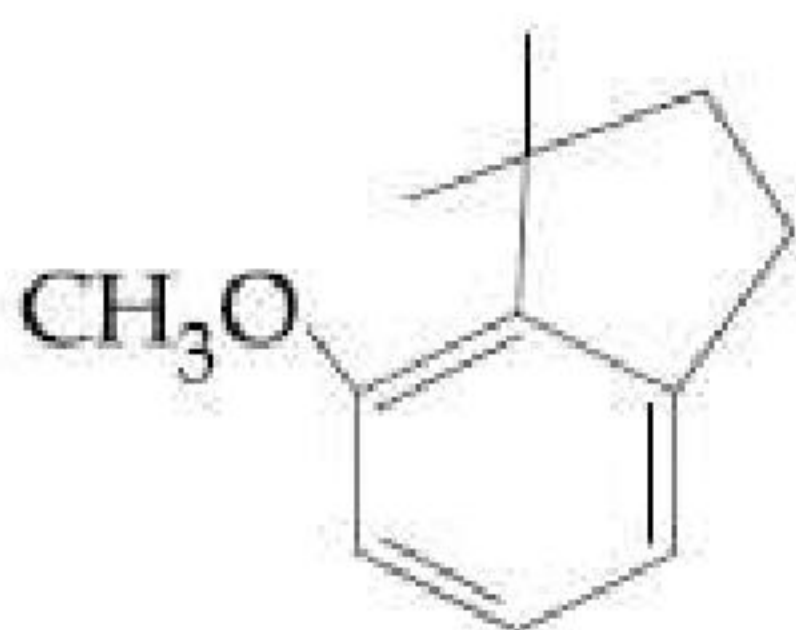
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

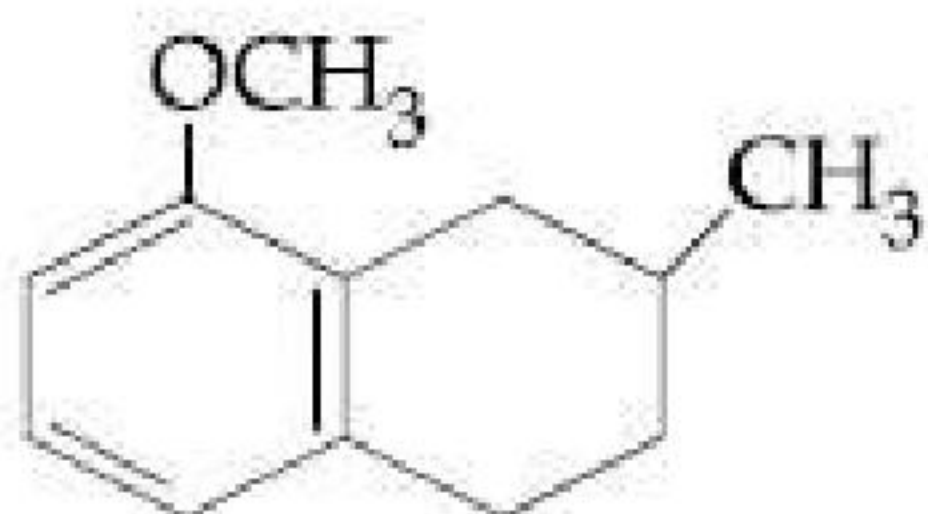
નીચેની પ્રક્રિયા માટેની મુખ્ય નીપજ કયે ?



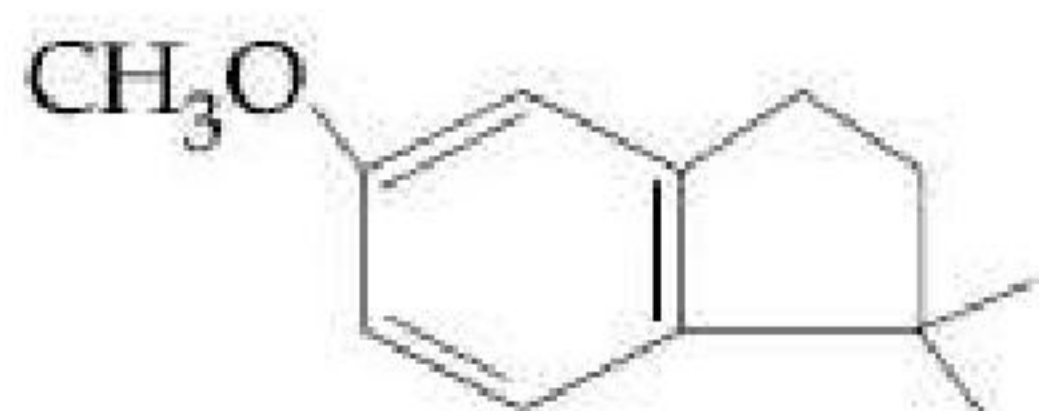
Options :



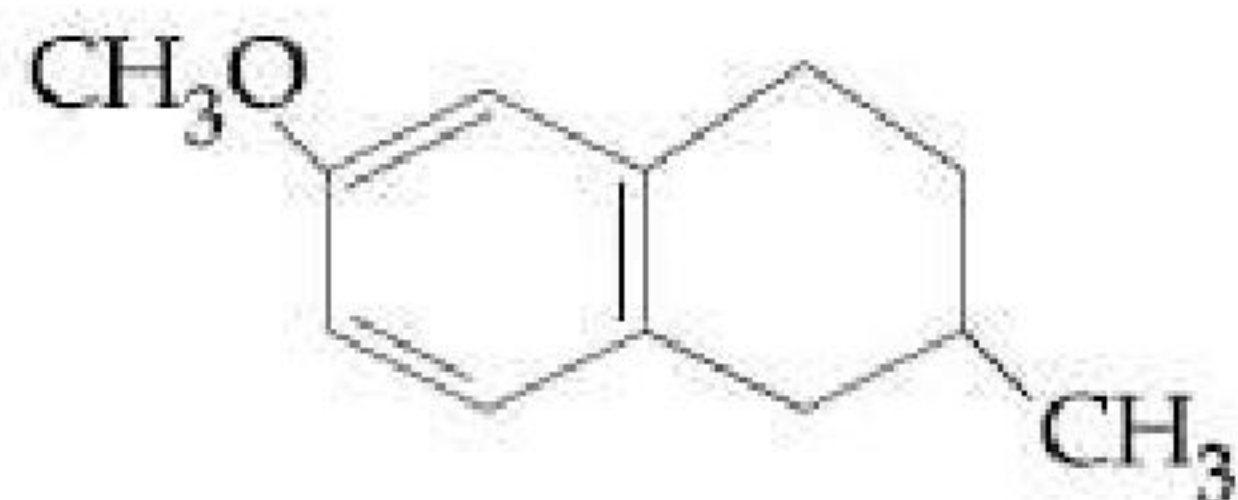
1.



2.



3.

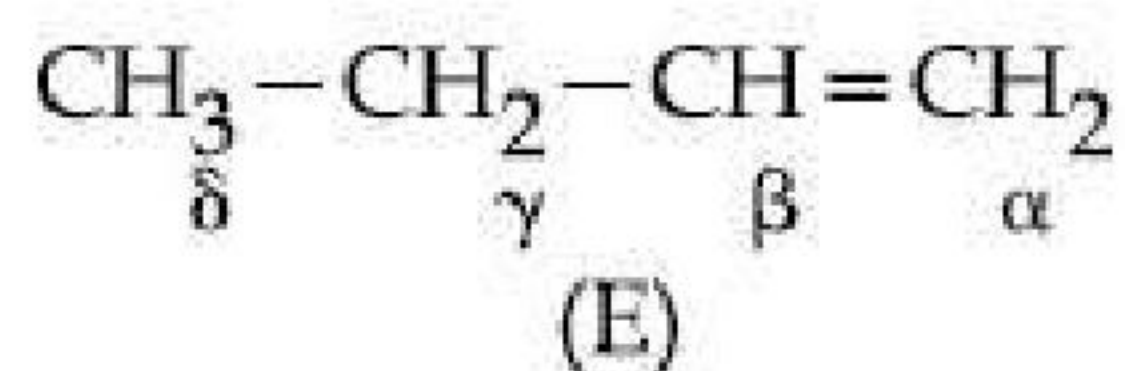


4.

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

Correct Marks : 4 Wrong Marks : 1

Which hydrogen in compound (E) is easily replaceable during bromination reaction in presence of light ?



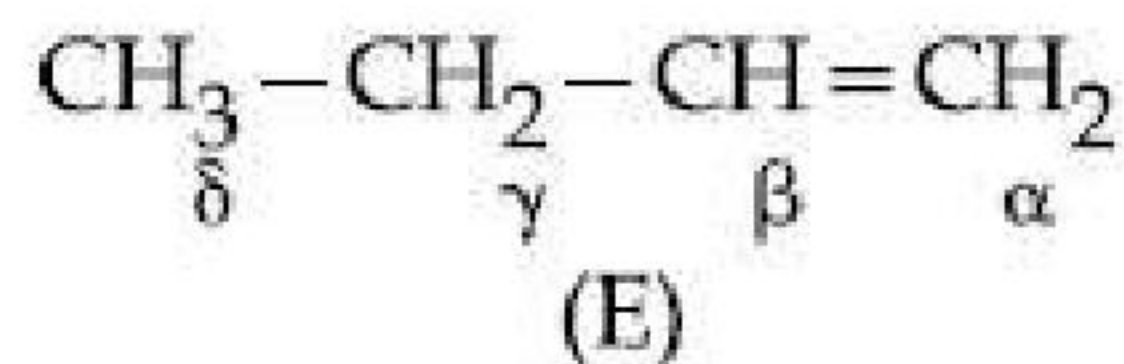
Options :

1. α - hydrogen
2. β - hydrogen
3. γ - hydrogen
4. δ - hydrogen

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

Correct Marks : 4 Wrong Marks : 1

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



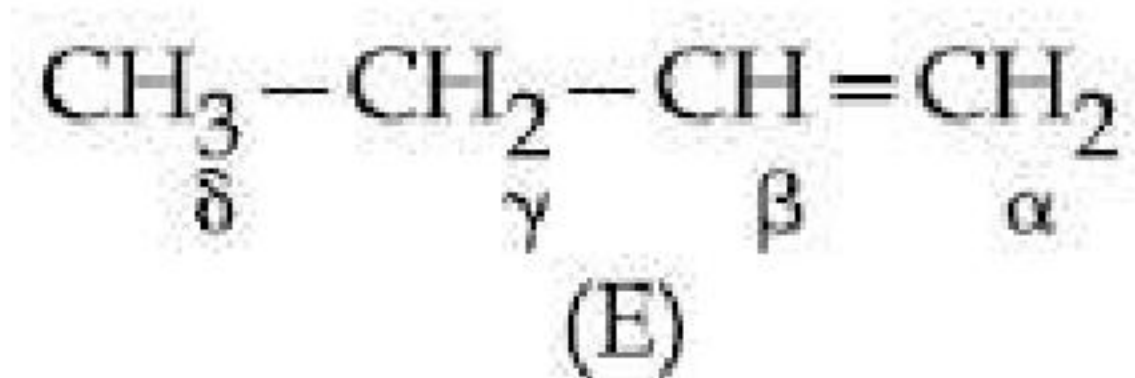
Options :

1. α - हाइड्रोजन
2. β - हाइड्रोजन
3. γ - हाइड्रोजन
4. δ - हाइड्रोजन

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

Correct Marks : 4 Wrong Marks : 1

પ્રકાશની હાજરીમાં સંયોજન (E) માંથી બ્રોમીનેશન પ્રક્રિયા દરમિયાન કયો હાઇડ્રોજન સહેલાયથી વિસ્થાપિત થશે?



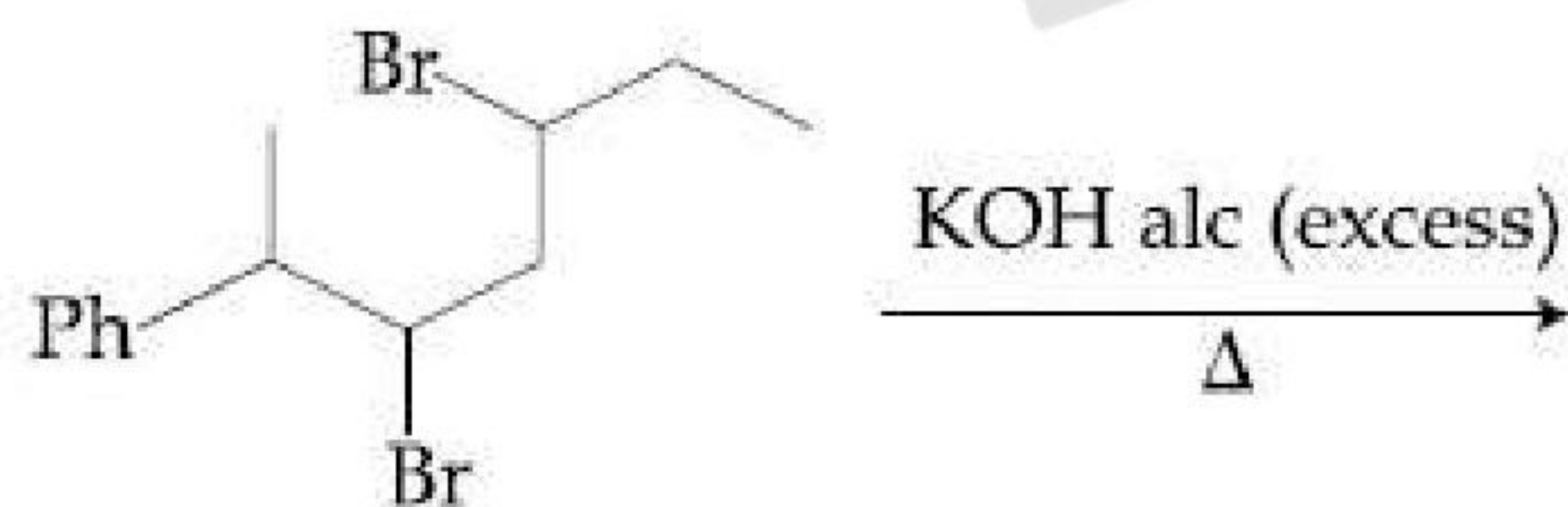
Options :

1. α - હાઇડ્રોજન
2. β - હાઇડ્રોજન
3. γ - હાઇડ્રોજન
4. δ - હાઇડ્રોજન

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

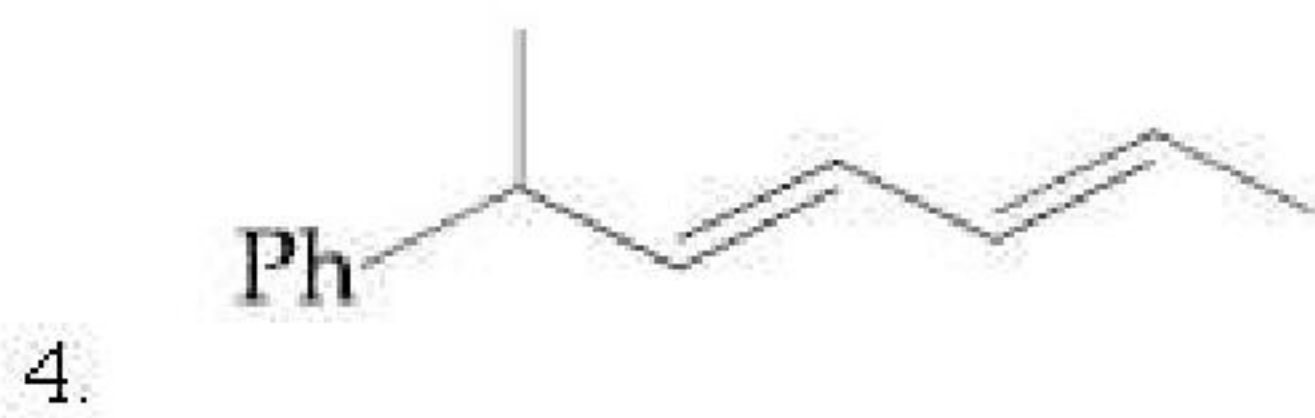
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



Options :

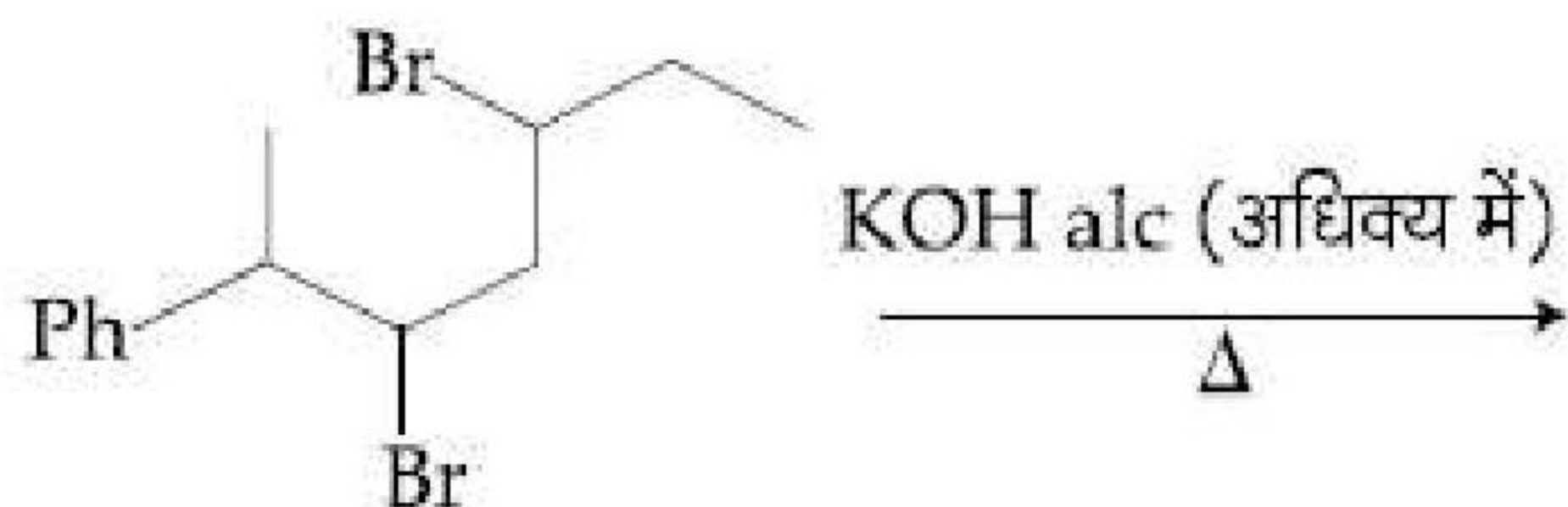
- 1.
- 2.
- 3.



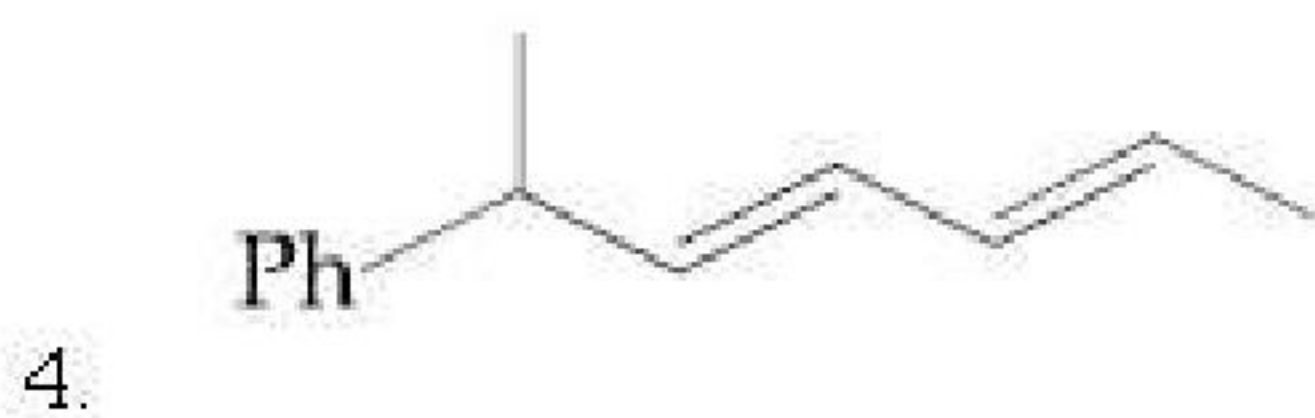
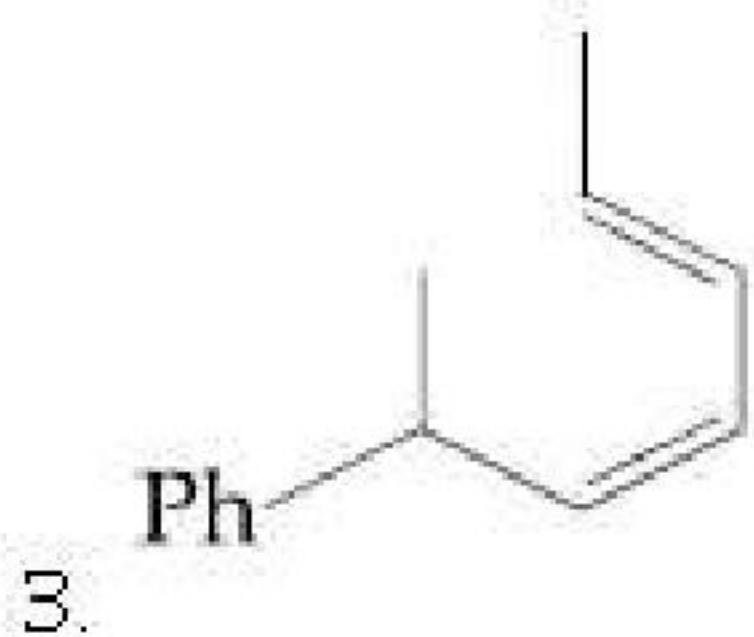
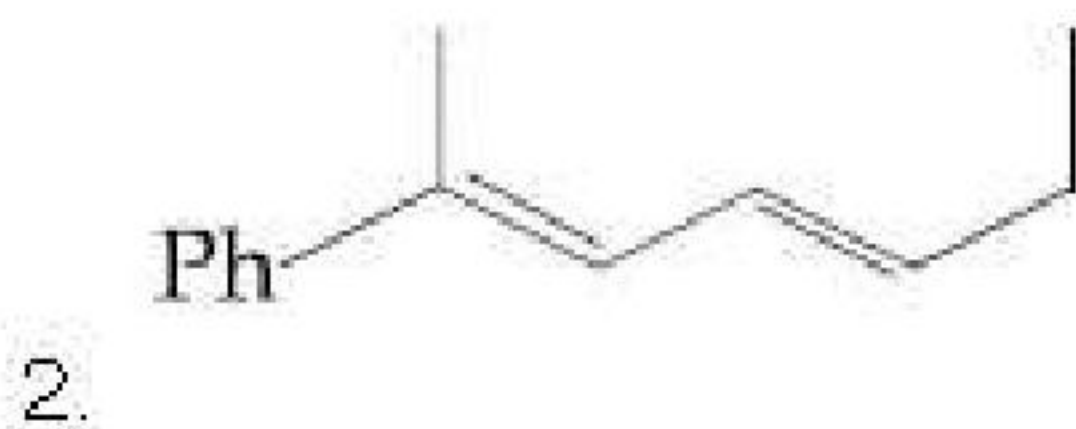
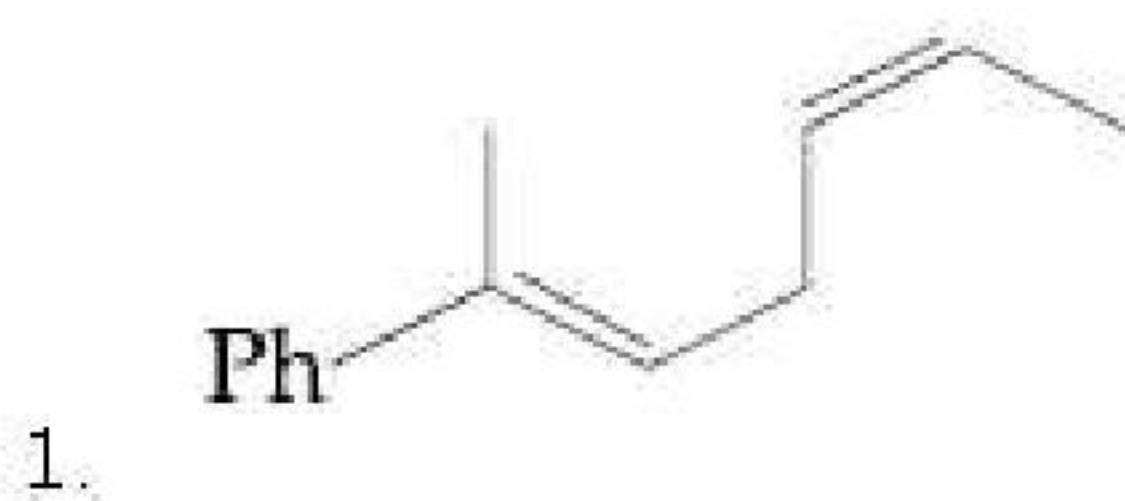
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નિમ્ન અભિક્રિયા કા મુખ્ય ઉત્પાદ છે :



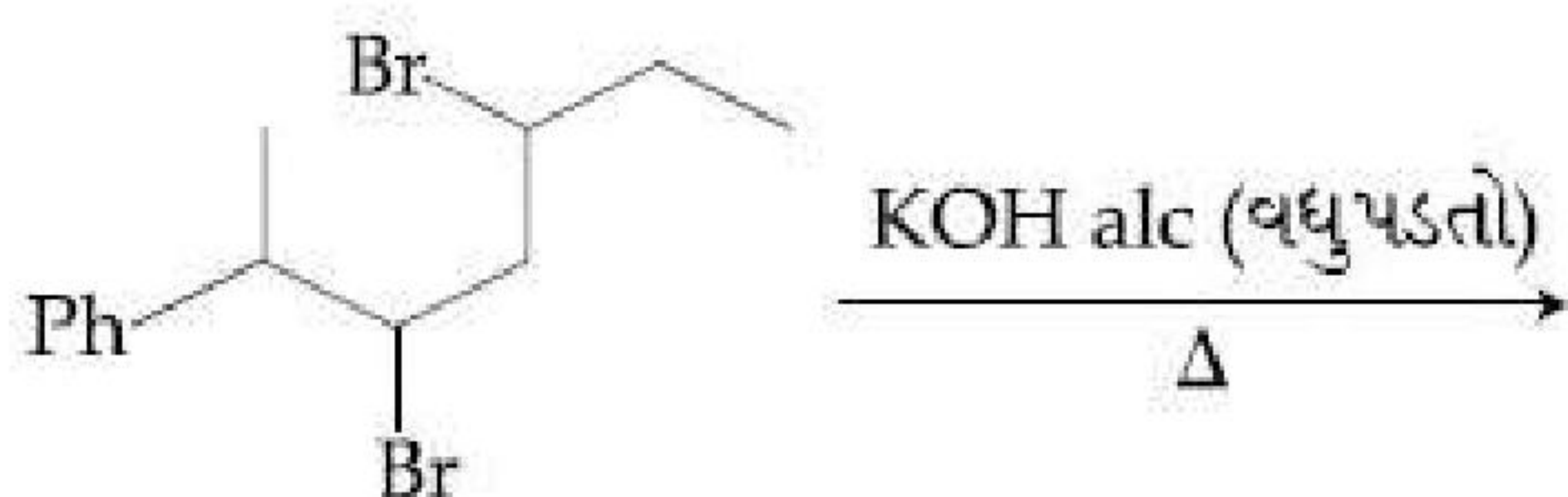
Options :

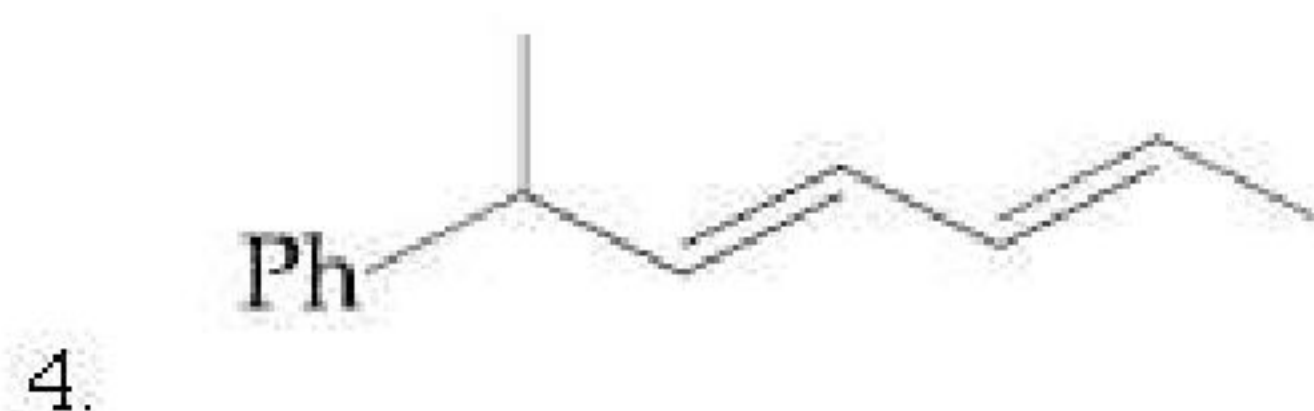
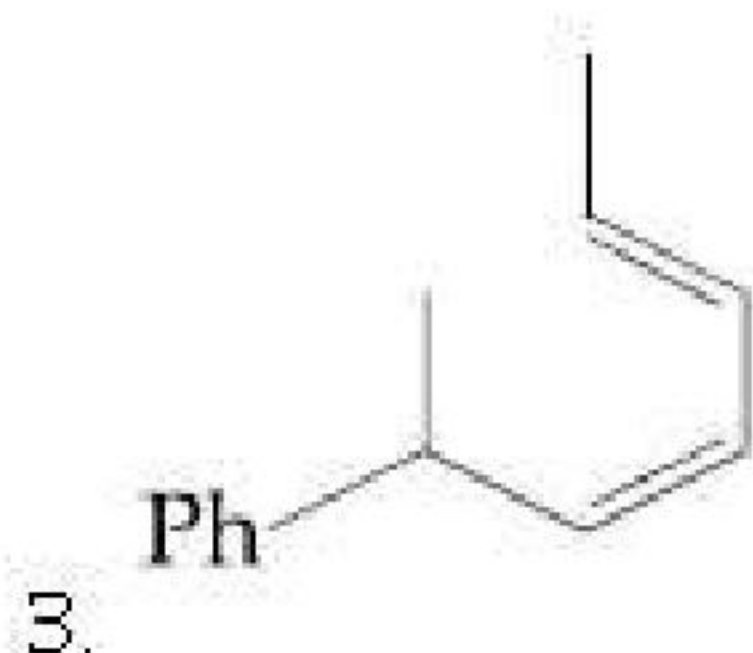
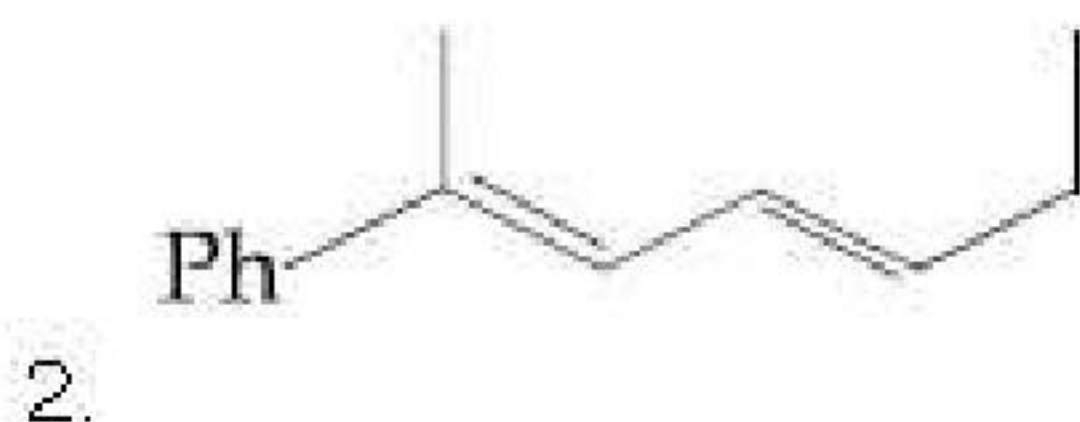
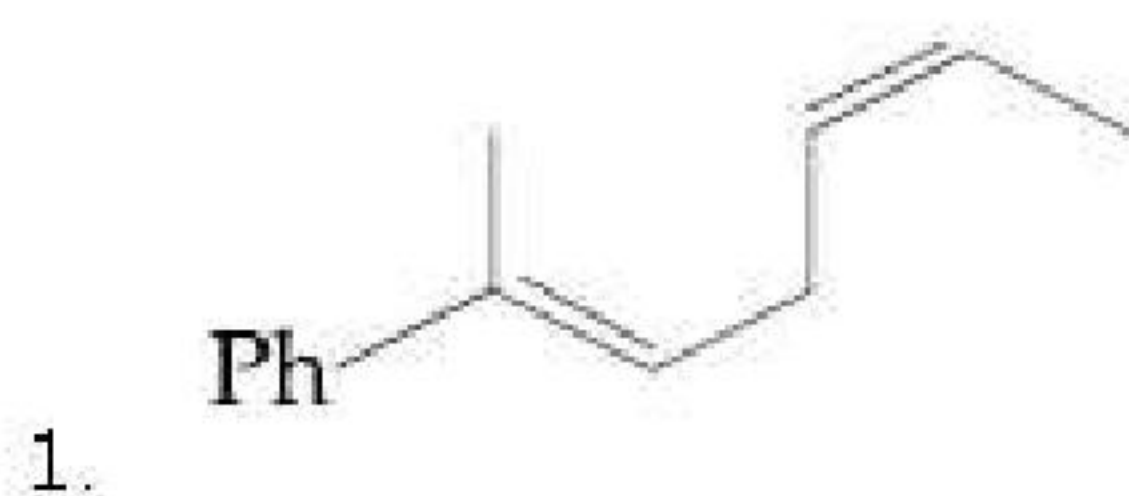


Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયાની મુખ્ય નીપજ કયું છે ?





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

Correct Marks : 4 Wrong Marks : 1

If dichloromethane (DCM) and water (H_2O) are used for differential extraction, which one of the following statements is correct?

Options :

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

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

3. DCM and H_2O will make turbid/colloidal mixture

4. DCM and H_2O will be miscible clearly

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

Correct Marks : 4 Wrong Marks : 1

यदि डाइक्लोरोमेथेन (DCM) तथा जल (H_2O) को अवकल निष्कर्षण में प्रयोग किया जाता है तो निम्न में से कौन सा कथन सही है?

Options :

1. DCM तथा H_2O पृथक्कारी फनेल में क्रमशः ऊपरी तथा निचले भाग में रुकेंगे
2. DCM तथा H_2O पृथक्कारी फनेल में क्रमशः निम्न तथा उच्च सतहों में रुकेंगे
3. DCM तथा H_2O एक आविल/कोलाइडी विलयन बनायेंगे
4. DCM तथा H_2O स्पष्ट रूप से मिश्रणीय होंगे

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

Correct Marks : 4 Wrong Marks : 1

જે ડાઇક્લોરોમીથેન (DCM) અને પાણી (H_2O)નો ઉપયોગ વિકલ નિષ્કર્ષણ (differential extraction)માં કરવામાં આવે તો, નીચેના પૈકી કયું એક વિધાન સાચું છે?

Options :

1. બિન્નકારી ગળતીમાં DCM અને H_2O નું સ્તર અનુક્રમે ઊપર અને નીચે રહેશે.
2. બિન્નકારી ગળતીમાં DCM અને H_2O નું સ્તર અનુક્રમે નીચે અને ઊપર રહેશે.
3. DCM અને H_2O નું મિશ્રણ ડહોળુ/કલિલી બનશે.
4. DCM અને H_2O સંપૂર્ણ મિશ્રણીય રહેશે.

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

Correct Marks : 4 Wrong Marks : 1

1. Lithium
2. Carbon
3. Beryllium
4. Boron

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. लीथियम
2. कार्बन
3. बेरीलियम
4. बोरान

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

Correct Marks : 4 Wrong Marks : 1

એલ્યુમિનિયમની વિદ્યુતઋણતા કોની સમાન છે ?

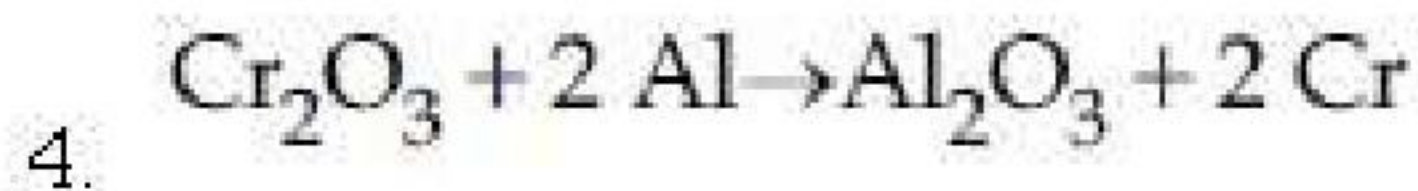
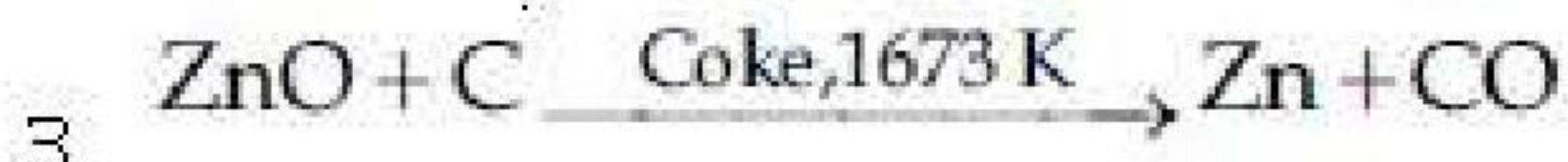
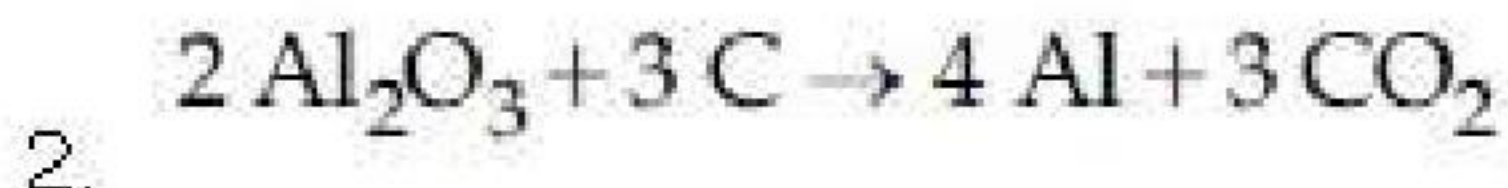
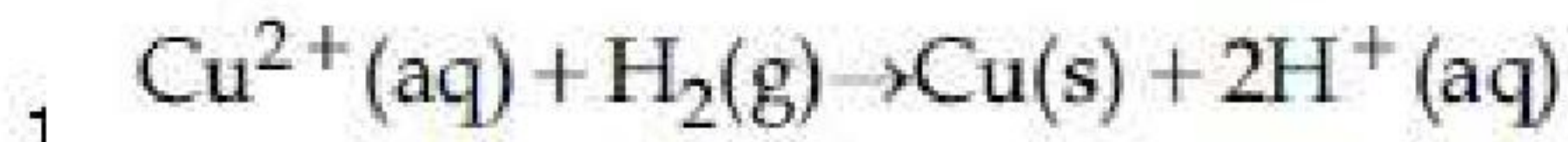
Options :

1. લિથીયમ
2. કાર્બન
3. બેરિલિયમ
4. બોરોન

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

Correct Marks : 4 Wrong Marks : 1

Hall-Heroult's process is given by :

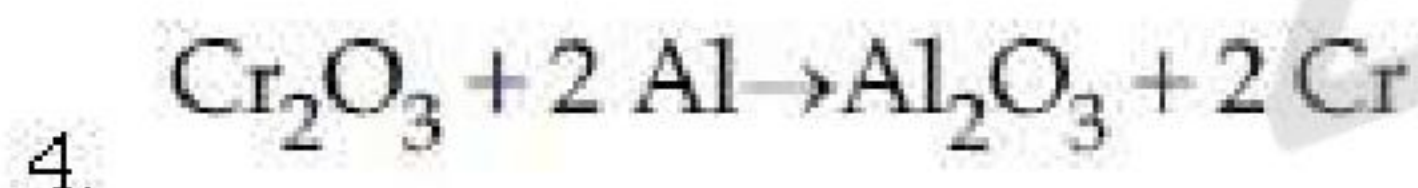
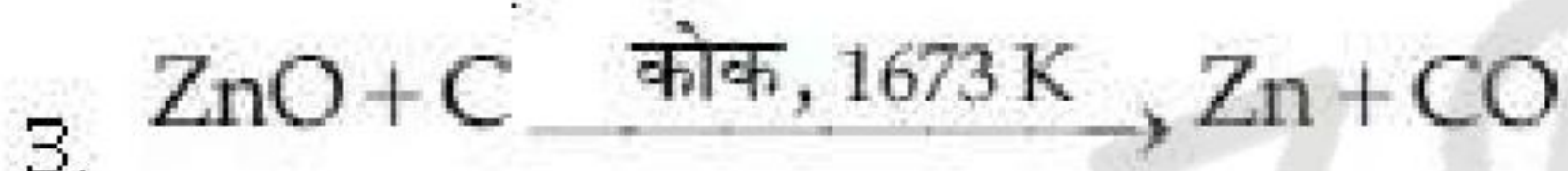
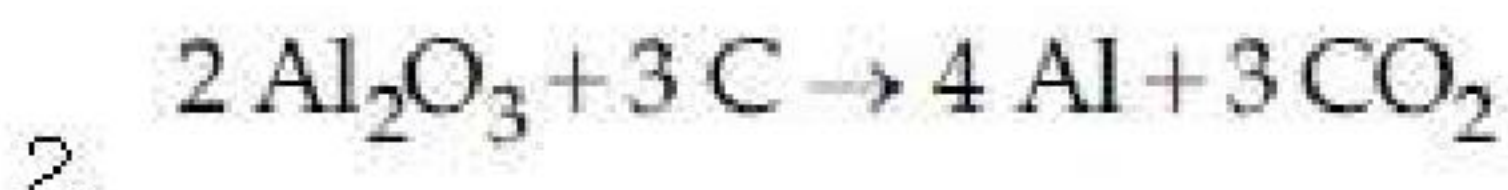
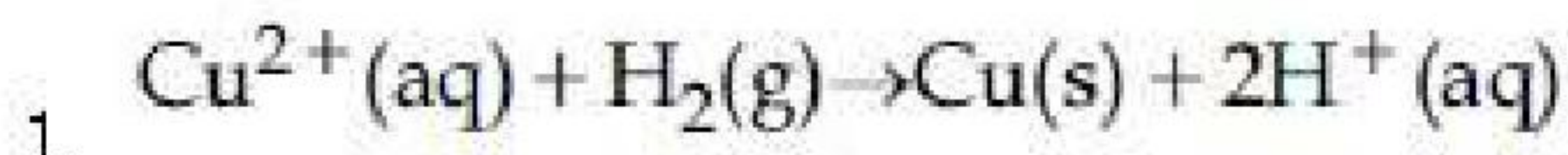


Question Number : 42 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

હાલ-હેરોલ્ટ પ્રક્રમ નિમ્ન કિસકે દ્વારા દિયા જાયેગા ?

Options :

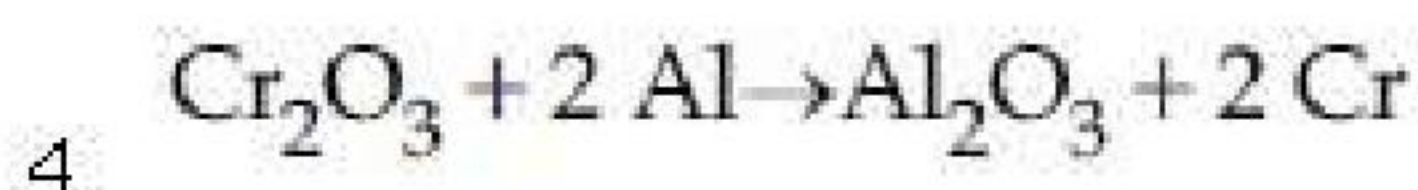
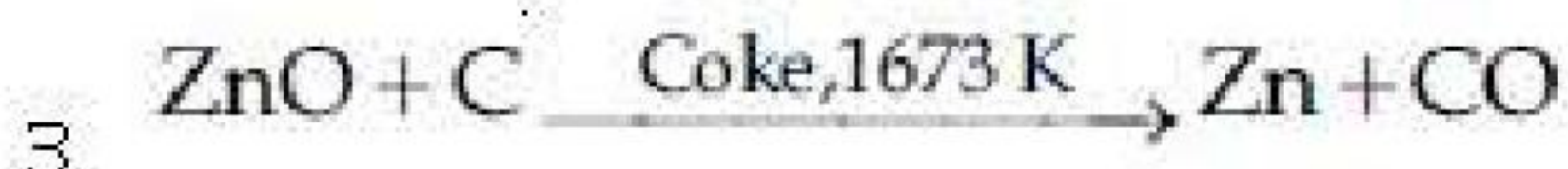
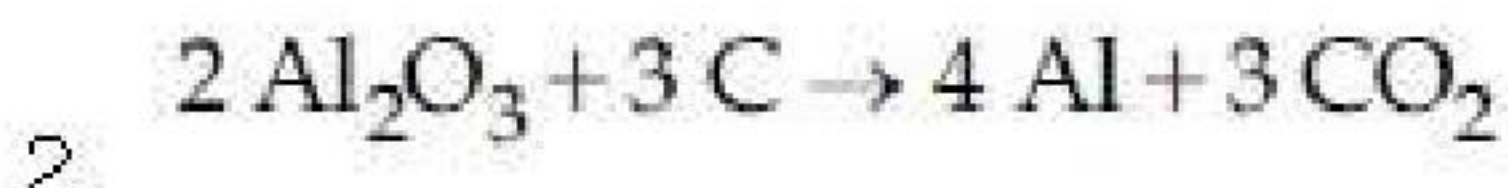
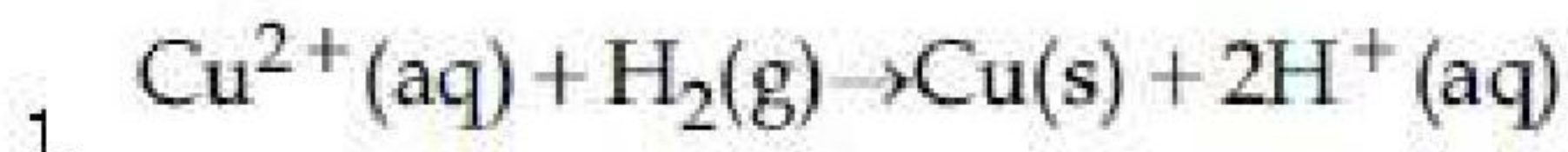


Question Number : 42 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

હોલ-હેરોલ્ટ પ્રક્રમ નીચેનામાંથી કયુ છે ?

Options :



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

Options :

1. Oxidising agent in acidic medium, but not in basic medium.
2. Reducing agent in basic medium, but not in acidic medium.
3. Oxidising and reducing agent in acidic medium, but not in basic medium.
4. Oxidising and reducing agent in both acidic and basic medium.

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

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन पराक्साइड की रासायनिक प्रकृति है :

Options :

1. अम्लीय माध्यम में उपचायक के रूप में, लेकिन क्षारीय माध्यम में नहीं
2. क्षारीय माध्यम में अपचायक के रूप में, लेकिन अम्लीय माध्यम में नहीं
3. अम्लीय माध्यम में उपचायक तथा अपचायक के रूप में, परन्तु क्षारीय माध्यम में नहीं
4. अम्लीय तथा क्षारीय दोनों माध्यमों में उपचायक तथा अपचायक के रूप में

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

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन પેરોક્સાઇડનો રાસાયણિક સ્વભાવ કેવો છે?

Options :

1. એસિડિક માધ્યમમાં ઓક્સીડેશન કર્તા, પરંતુ બેઝિક માધ્યમમાં નહીં.

બેઝિક માધ્યમમાં રીડક્શન કર્તા. પરંતુ એસિડિક

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

4. એસિડિક અને બેઝિક બંને માધ્યમમાં ઓક્સિડેશનકર્તા અને રિડક્શનકર્તા.

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

Correct Marks : 4 Wrong Marks : 1

The total number of isotopes of hydrogen and number of radioactive isotopes among them, respectively, are :

Options :

1. 2 and 1
2. 3 and 1
3. 2 and 0
4. 3 and 2

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 2 तथा 1
2. 3 तथा 1
3. 2 तथा 0
4. 3 तथा 2

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

Correct Marks : 4 Wrong Marks : 1

હાઇડ્રોજનના કુલ સમસ્થાનિકો અને તેમાંના કિરણોત્સર્ગી

1. 2 અને 1

2. 3 અને 1

3. 2 અને 0

4. 3 અને 2

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

Correct Marks : 4 Wrong Marks : 1

The metal used for making X-ray tube window is :

Options :

1. Mg

2. Ca

3. Na

4. Be

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

Correct Marks : 4 Wrong Marks : 1

X-કિરણ નલી કે વાતાયન કો બનાને કે લિએ પ્રયુક્ત ધાતુ હૈ :

Options :

1. Mg

2. Ca

3. Na

4. Be

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

Correct Marks : 4 Wrong Marks : 1

ક્ષ-કિરણ નળની બારી બનવવામાં વપરાતી ધાતુ કઈ?

1. Mg
2. Ca
3. Na
4. Be

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

Correct Marks : 4 Wrong Marks : 1

The type of hybridisation and number of lone pair(s) of electrons of Xe in XeOF_4 , respectively, are :

Options :

1. sp^3d and 1
2. sp^3d and 2
3. sp^3d^2 and 1
4. sp^3d^2 and 2

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. sp^3d तथा 1
2. sp^3d तथा 2
3. sp^3d^2 तथा 1
4. sp^3d^2 तथा 2

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

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

Options :

1. sp^3d અને 1
2. sp^3d અને 2
3. sp^3d^2 અને 1
4. sp^3d^2 અને 2

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

Correct Marks : 4 Wrong Marks : 1

The effect of lanthanoid contraction in the lanthanoid series of elements by and large means :

Options :

1. decrease in both atomic and ionic radii
2. increase in atomic radii and decrease in ionic radii
3. decrease in atomic radii and increase in ionic radii
4. increase in both atomic and ionic radii

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

Correct Marks : 4 Wrong Marks : 1

તત્વોં કે લૅન્થેનાઇડ શ્રંખલા મેં લૅન્થેનાઇડ સંકુચન સામાન્યતયા દર્શાતા હૈ :

Options :

1. પરમાણુક તથા આયનિક ત્રિજ્યાઓં દોનોં કા ઘટના
2. પરમાણુક ત્રિજ્યાઓં કા બઢના તથા આયનિક

3. પરમાણુક ત્રિજ્યાઓં કા ઘટના તથા આયનિક ત્રિજ્યાઓં કા બઢના
4. પરમાણુક તથા આયનિક ત્રિજ્યાઓં દોનોં કા બઢના

Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

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

Options :

1. પરમાણ્વિક અને આયનીય ત્રિજ્યા બન્નેમાં ઘટાડો.
2. પરમાણ્વિક ત્રિજ્યામાં વધારો અને આયનિક ત્રિજ્યામાં ઘટાડો.
3. પરમાણ્વિક ત્રિજ્યામાં ઘટાડો અને આયનીય ત્રિજ્યામાં વધારો.
4. પરમાણ્વિક અને આયનીય ત્રિજ્યા બન્નેમાં વધારો.

Question Number : 48 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Wilkinson catalyst is :

Options :

1. $[(\text{Ph}_3\text{P})_3\text{RhCl}]$ (Et = C_2H_5)
2. $[(\text{Et}_3\text{P})_3\text{RhCl}]$
3. $[(\text{Ph}_3\text{P})_3\text{IrCl}]$
4. $[(\text{Et}_3\text{P})_3\text{IrCl}]$

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

નિચીલ કોષ છે .

1. $[(\text{Ph}_3\text{P})_3\text{RhCl}] \quad (\text{Et} = \text{C}_2\text{H}_5)$
2. $[(\text{Et}_3\text{P})_3\text{RhCl}]$
3. $[(\text{Ph}_3\text{P})_3\text{IrCl}]$
4. $[(\text{Et}_3\text{P})_3\text{IrCl}]$

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

વિલ્ક્રીન્સન ઉદ્દીપક નીચેનામાંથી કયો છે?

Options :

1. $[(\text{Ph}_3\text{P})_3\text{RhCl}] \quad (\text{Et} = \text{C}_2\text{H}_5)$
2. $[(\text{Et}_3\text{P})_3\text{RhCl}]$
3. $[(\text{Ph}_3\text{P})_3\text{IrCl}]$
4. $[(\text{Et}_3\text{P})_3\text{IrCl}]$

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

Correct Marks : 4 Wrong Marks : 1

The total number of isomers for a square planar complex $[\text{M}(\text{F})(\text{Cl})(\text{SCN})(\text{NO}_2)]$ is :

Options :

1. 4
2. 8
3. 12
4. 16

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

Correct Marks : 4 Wrong Marks : 1

વર્ગ સમતલી સંકર $[\text{M}(\text{F})(\text{Cl})(\text{SCN})(\text{NO}_2)]$ કે લિયે સમાવયવિયોં (આઇસોમરોં) કી કલ સંખ્યા

1. 4

2. 8

3. 12

4. 16

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 4

2. 8

3. 12

4. 16

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. B is more polluted than A.

2. A is more polluted than B.

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

4. Both A and B are suitable for drinking.

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

દો ગિલાસોં A તથા B, મેં ભરે હુએ પાની કે BOD કા માન ક્રમશઃ 10 તથા 20 હૈ। સહી કથન કો પહચાનિયે :

Options :

1. B, A કી તુલના મેં જ્યાદા પ્રદૂષિત હૈ।
2. A, B કી તુલના મેં જ્યાદા પ્રદૂષિત હૈ।
3. A પીને કે લિએ ઉપયુક્ત હૈ જબકિ B નહીં હૈ।
4. A તથા B, દોનોં હી પીને કે લિએ ઉપયુક્ત હૈ।

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. B એ A કરતા વધુ પ્રદૂષિત છે.
2. A એ B કરતા વધુ પ્રદૂષિત છે.
3. A એ પીવા યોગ્ય છે, જ્યારે B નથી.
4. A અને B બન્ને પીવા યોગ્ય છે.

Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

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

1. 13.6 g, 0.28 mol L⁻¹
2. 1.9 g, 0.14 mol L⁻¹
3. 13.6 g, 0.14 mol L⁻¹
4. 1.9 g, 0.28 mol L⁻¹

Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

100 m mol Ca(OH)₂ તથા 2 g સોડિયમ સલ્ફેટ
કે એક મિશ્રણ કો જલ મેં ઘોલકર ડસકા આયતન
100 mL તક કિયા ગયા । બને હુએ વિલયન મેં કેલ્શિયમ
સલ્ફેટ કા દ્રવ્યમાન તથા OH⁻ કી સાન્દ્રતા ક્રમશઃ
હેં, (Ca(OH)₂, Na₂SO₄ તથા CaSO₄ કે મોલર
દ્રવ્યમાન હેં ક્રમશઃ 74, 143 તથા 136 g mol⁻¹;
Ca(OH)₂ કા K_{sp} = 5.5 × 10⁻⁶)

Options :

1. 13.6 g, 0.28 mol L⁻¹
2. 1.9 g, 0.14 mol L⁻¹
3. 13.6 g, 0.14 mol L⁻¹
4. 1.9 g, 0.28 mol L⁻¹

Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

100 m mol Ca(OH)₂ અને 2 g સોડિયમ સલ્ફેટને
મિશ્ર કરી, પાણીમાં ઓગાળી બનતા દ્રાવણનું કદ
100 mL સુધી લઈ જવામાં આવ્યું. દ્રાવણમાં બનતા
કેલ્શિયમ સલ્ફેટનું દળ અને પરિણામી દ્રાવણમાં OH⁻ ની
સાંદ્રતા અનુક્રમે શું હશે?

(Ca(OH)₂, Na₂SO₄ અને CaSO₄ ના આણ્વિક દળો
અનુક્રમે 74, 143 અને 136 g mol⁻¹ છે, Ca(OH)₂
નો દ્રાવ્યતા ગુણકાર K_{sp} = 5.5 × 10⁻⁶).

Options :

2. 1.9 g, 0.14 mol L⁻¹
3. 13.6 g, 0.14 mol L⁻¹
4. 1.9 g, 0.28 mol L⁻¹

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

Correct Marks : 4 Wrong Marks : 1

Which primitive unit cell has unequal edge lengths ($a \neq b \neq c$) and all axial angles different from 90° ?

Options :

1. Tetragonal
2. Hexagonal
3. Monoclinic
4. Triclinic

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. द्विसमलम्बाक्ष
2. षटकोणीय
3. एकनताक्ष
4. त्रिनताक्ष

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

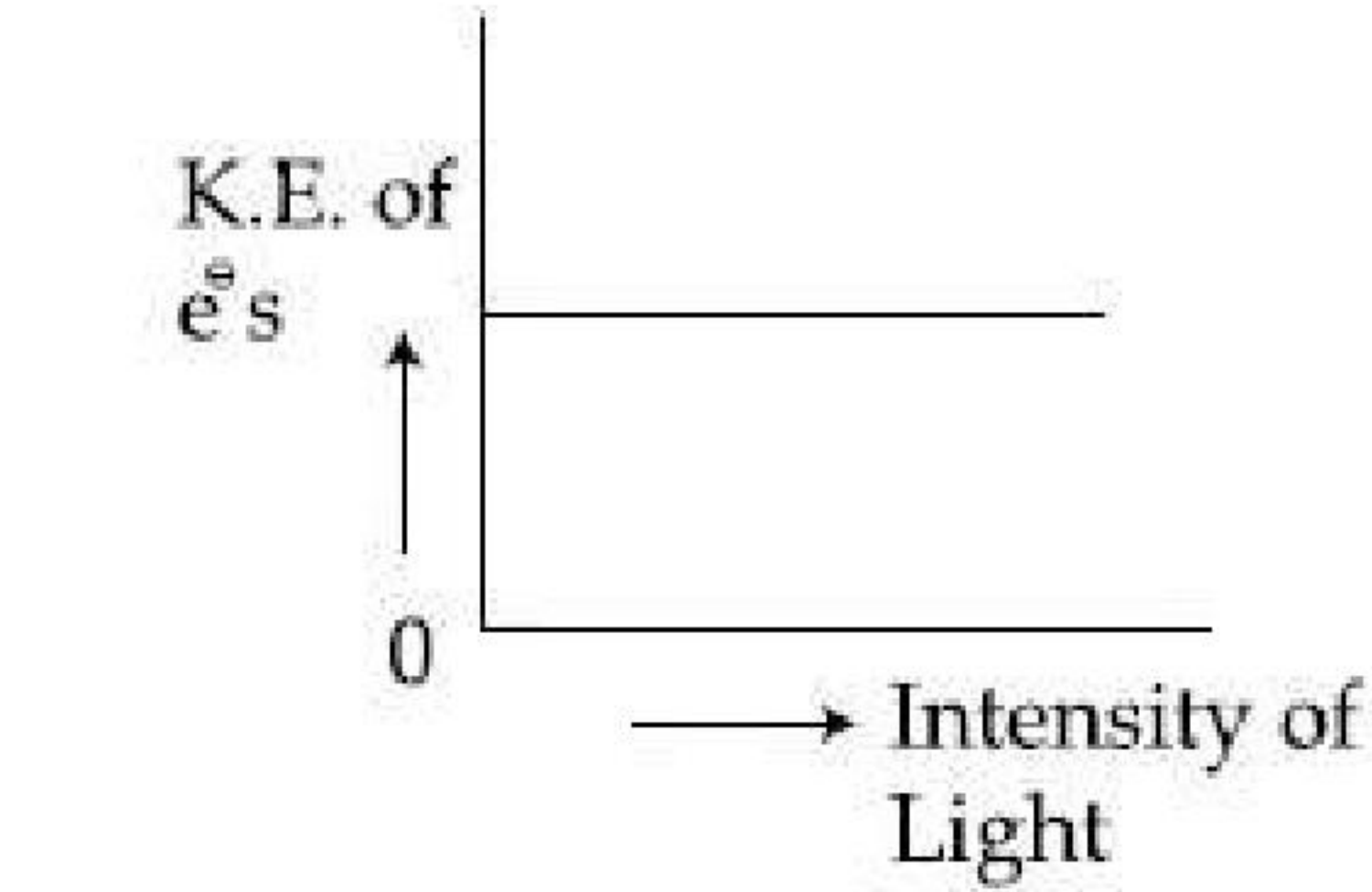
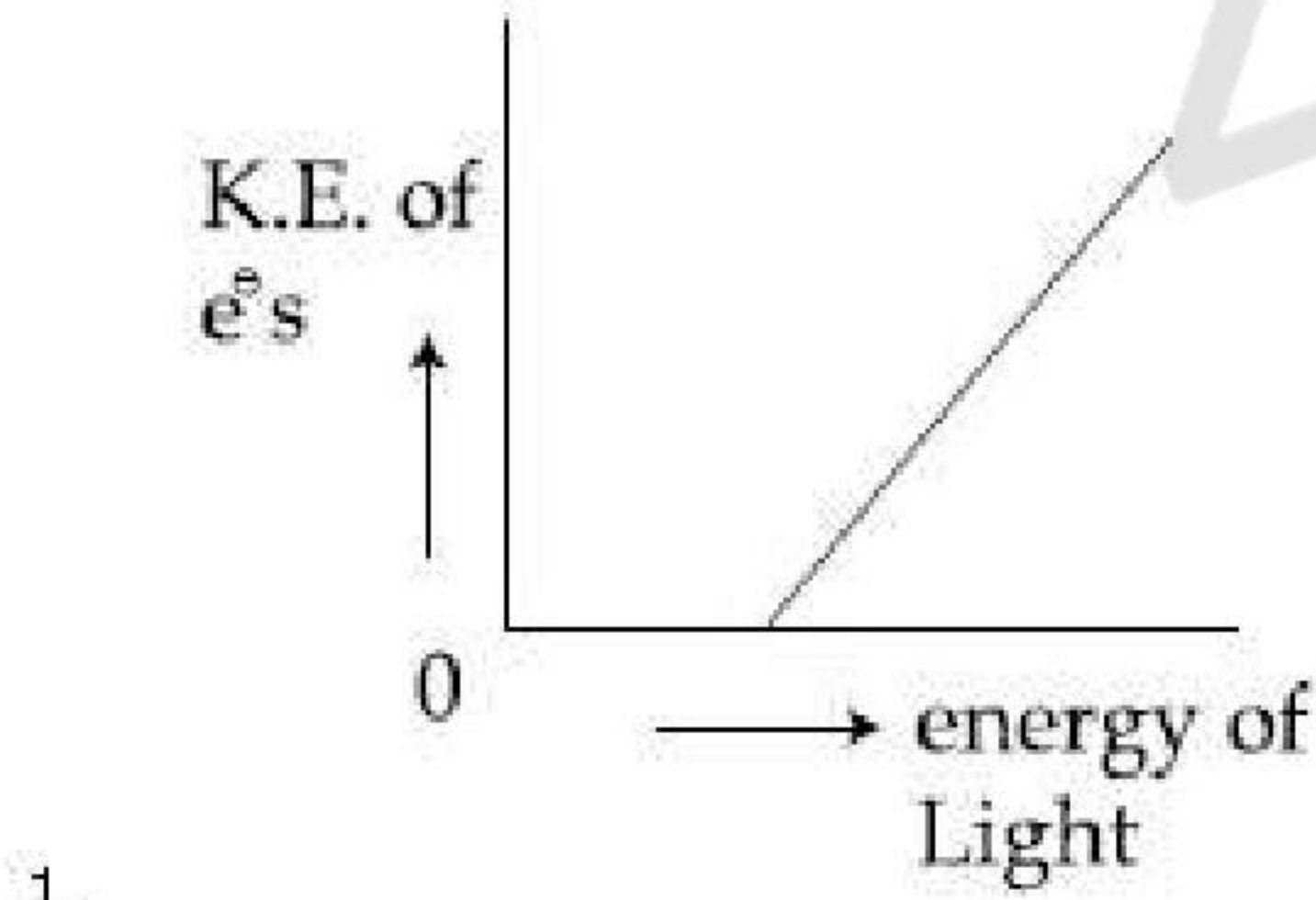
1. ટેટ્રાગોનલ
2. હેક્ઝાગોનલ
3. મોનોક્લિનિક્
4. ટ્રાઈક્લિનિક્

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

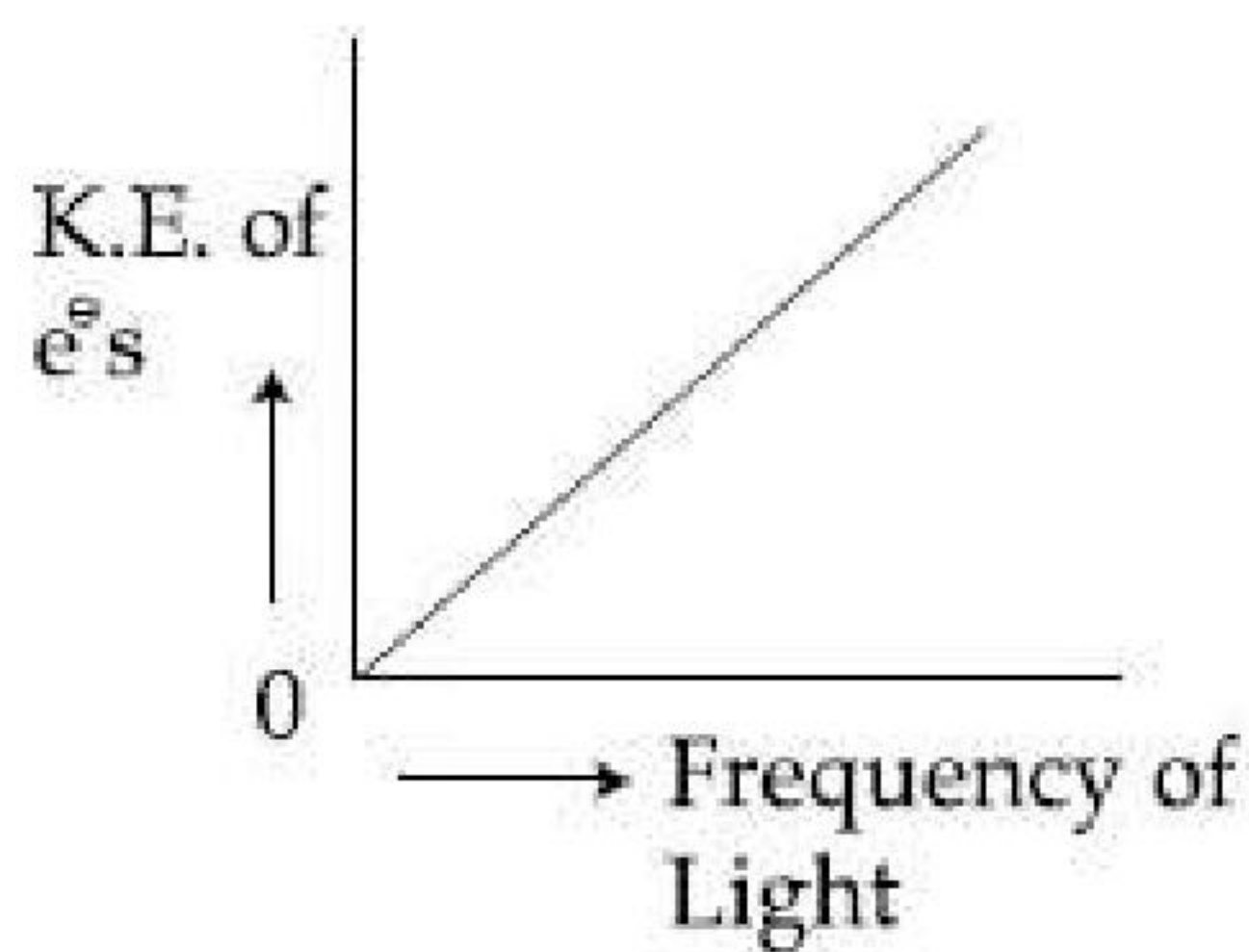
Correct Marks : 4 Wrong Marks : 1

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

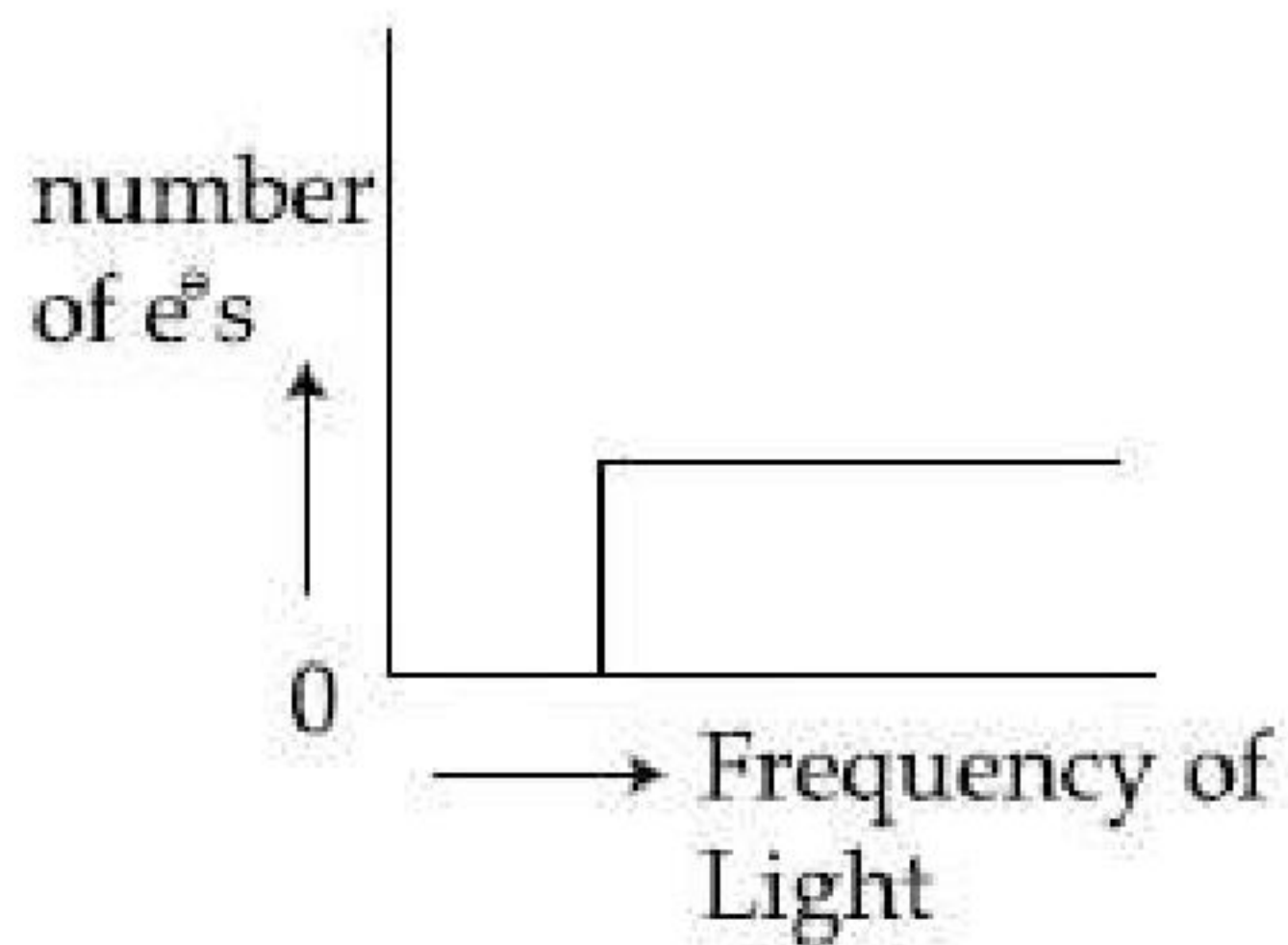
Options :



3.



4.



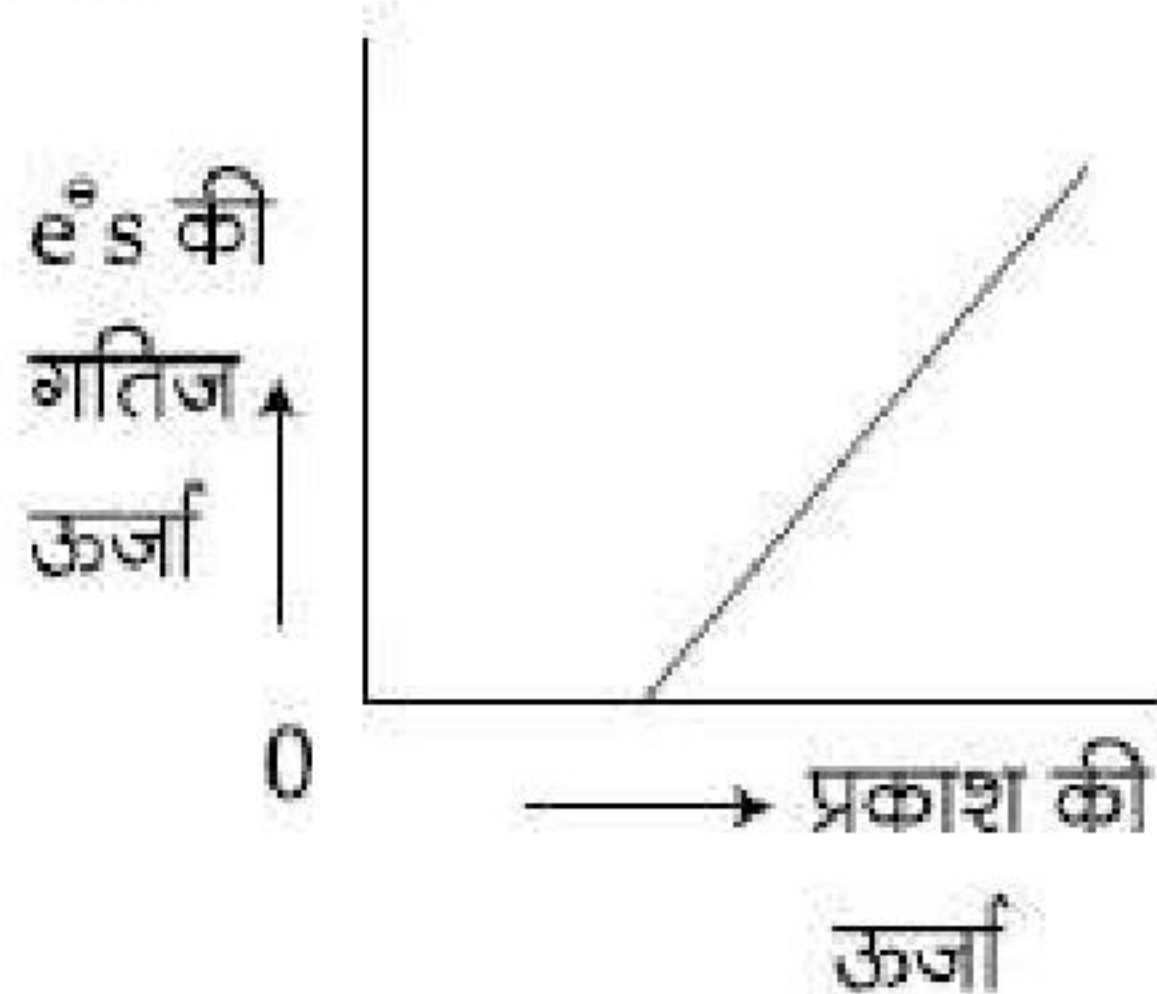
Question Number : 53 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

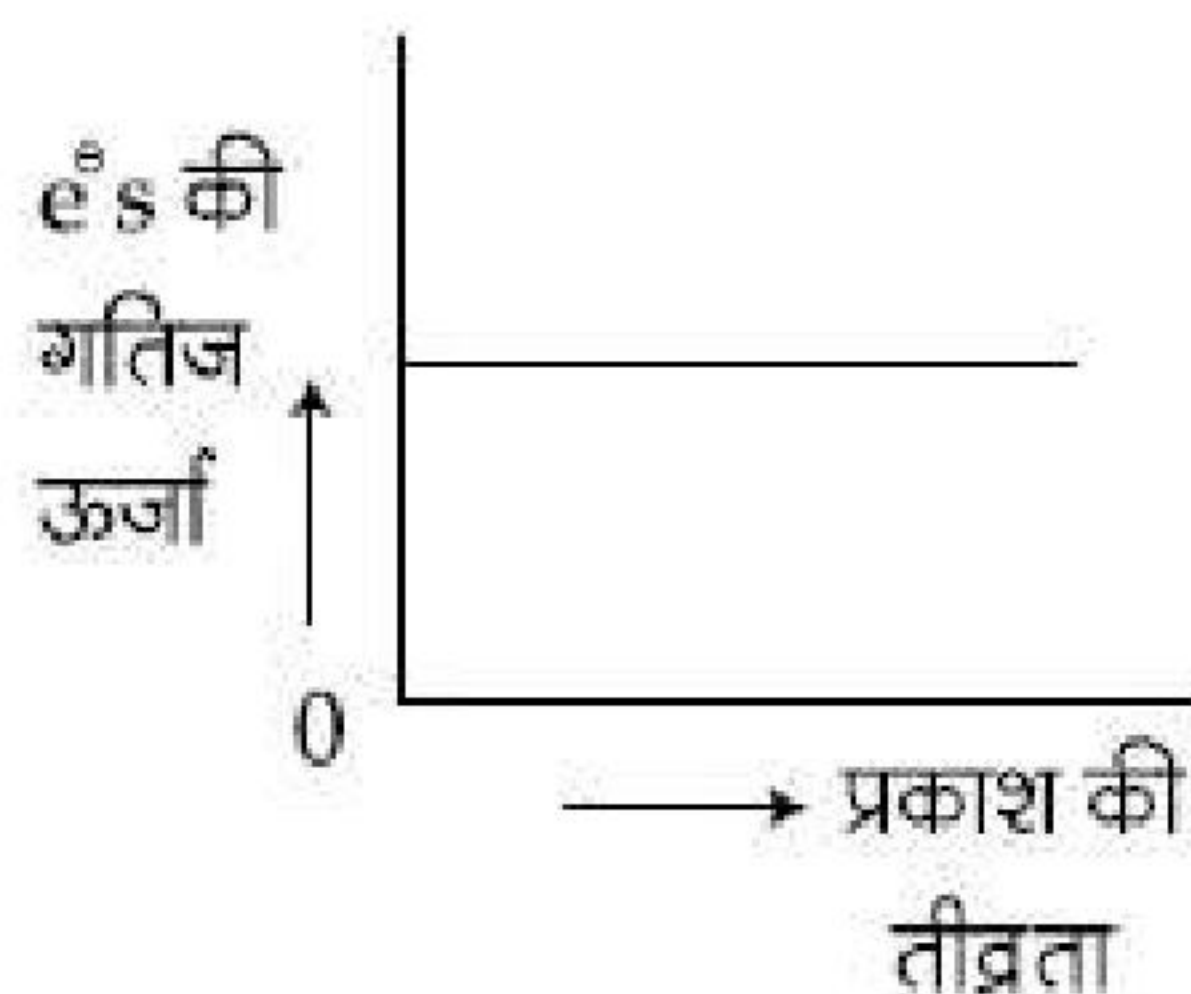
नीचे प्रदर्शित ग्राफ में से कौन-सा आपतित प्रकाश तथा धातु पृष्ठ से निष्कासित इलेक्ट्रॉन के बीच का सम्बन्ध सही ढंग से नहीं अभिव्यक्त करता है?

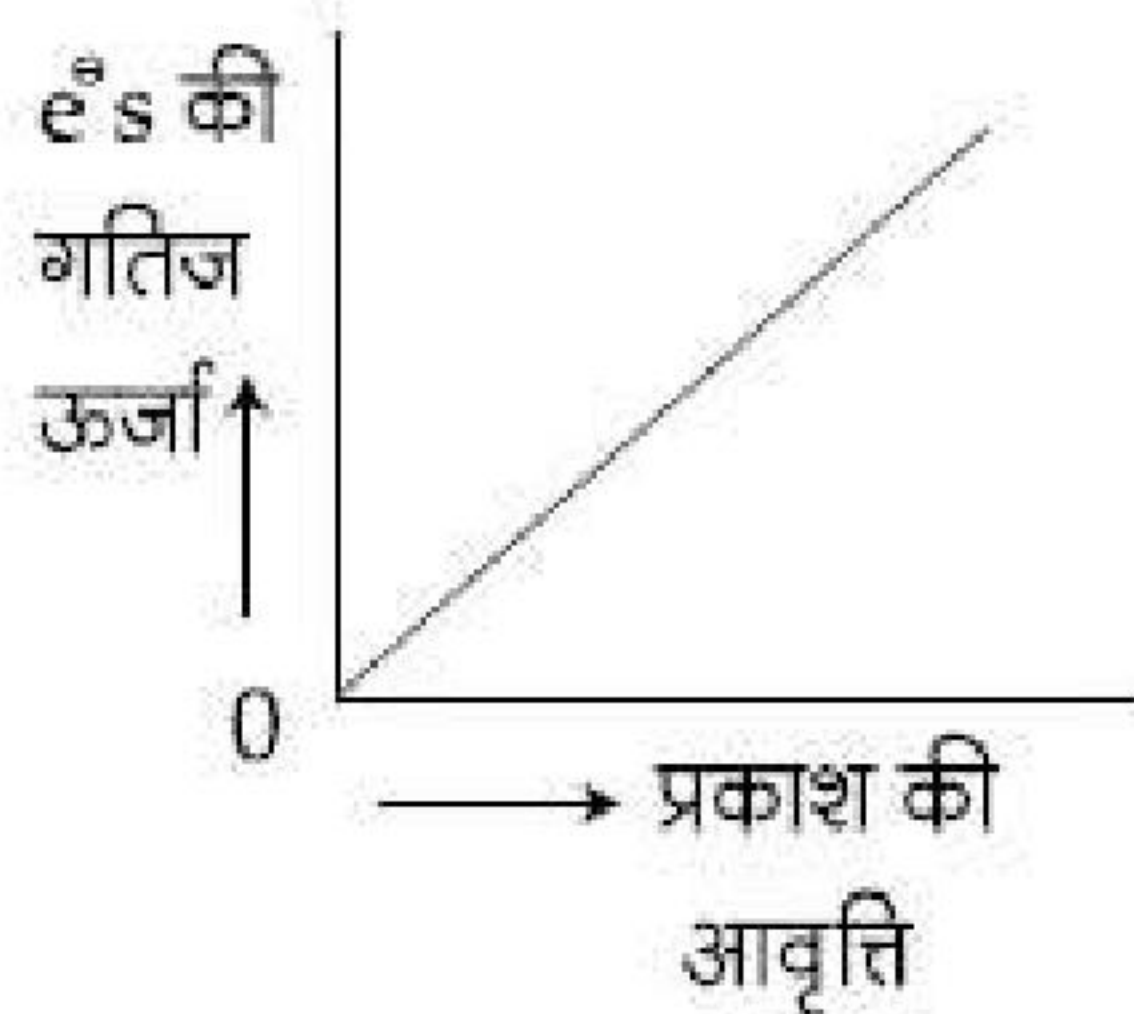
Options :

1.

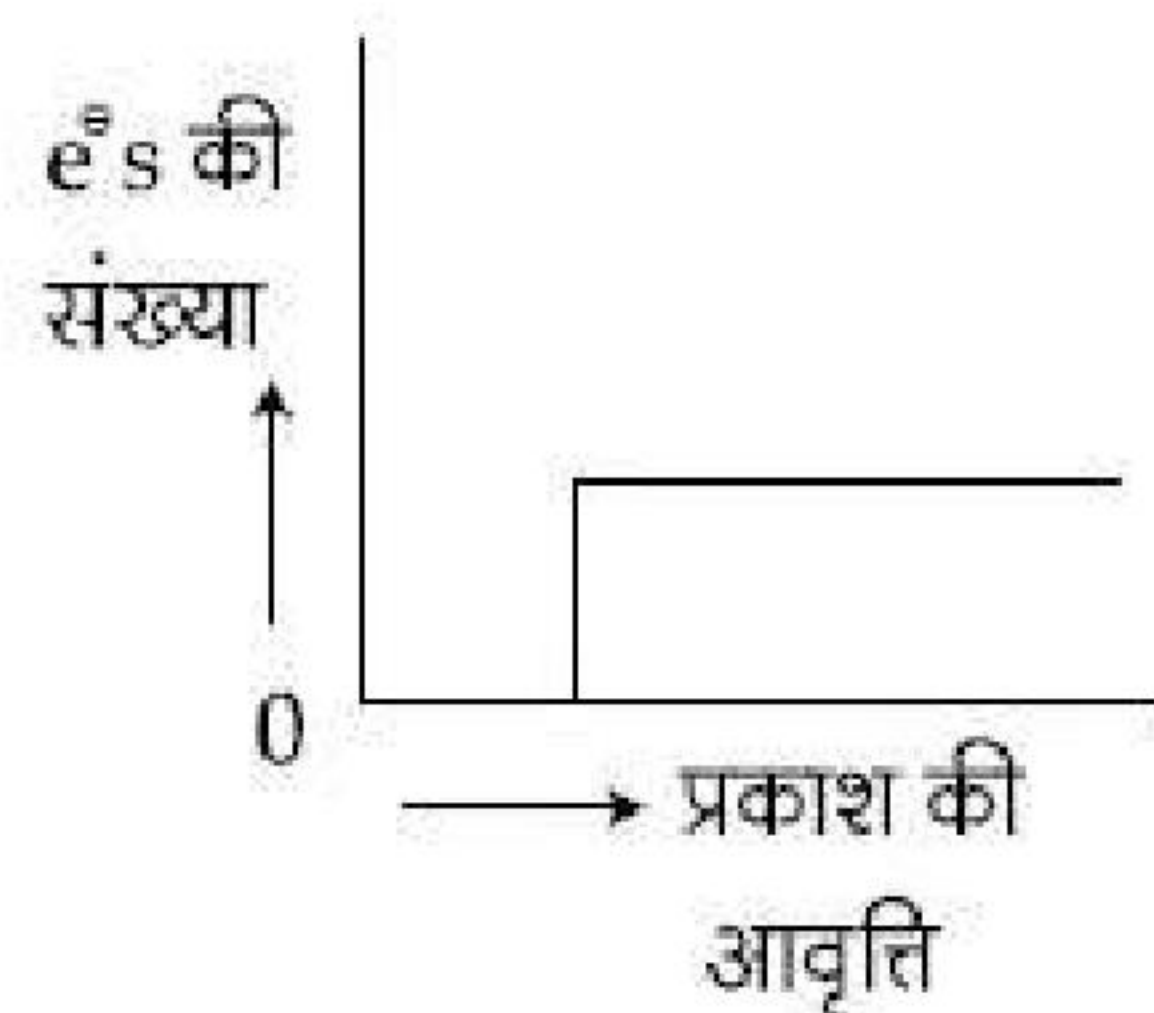


2.





3.



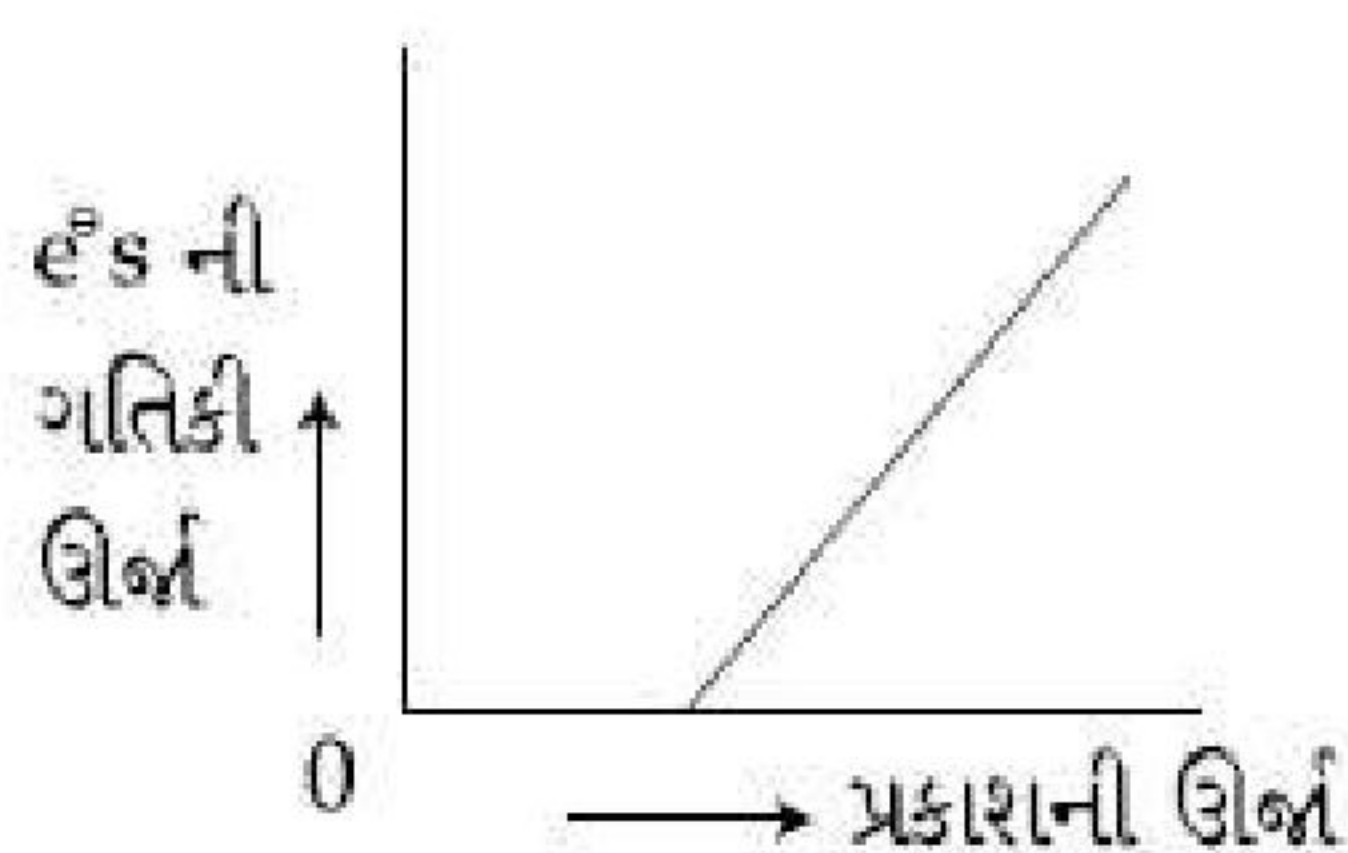
4.

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

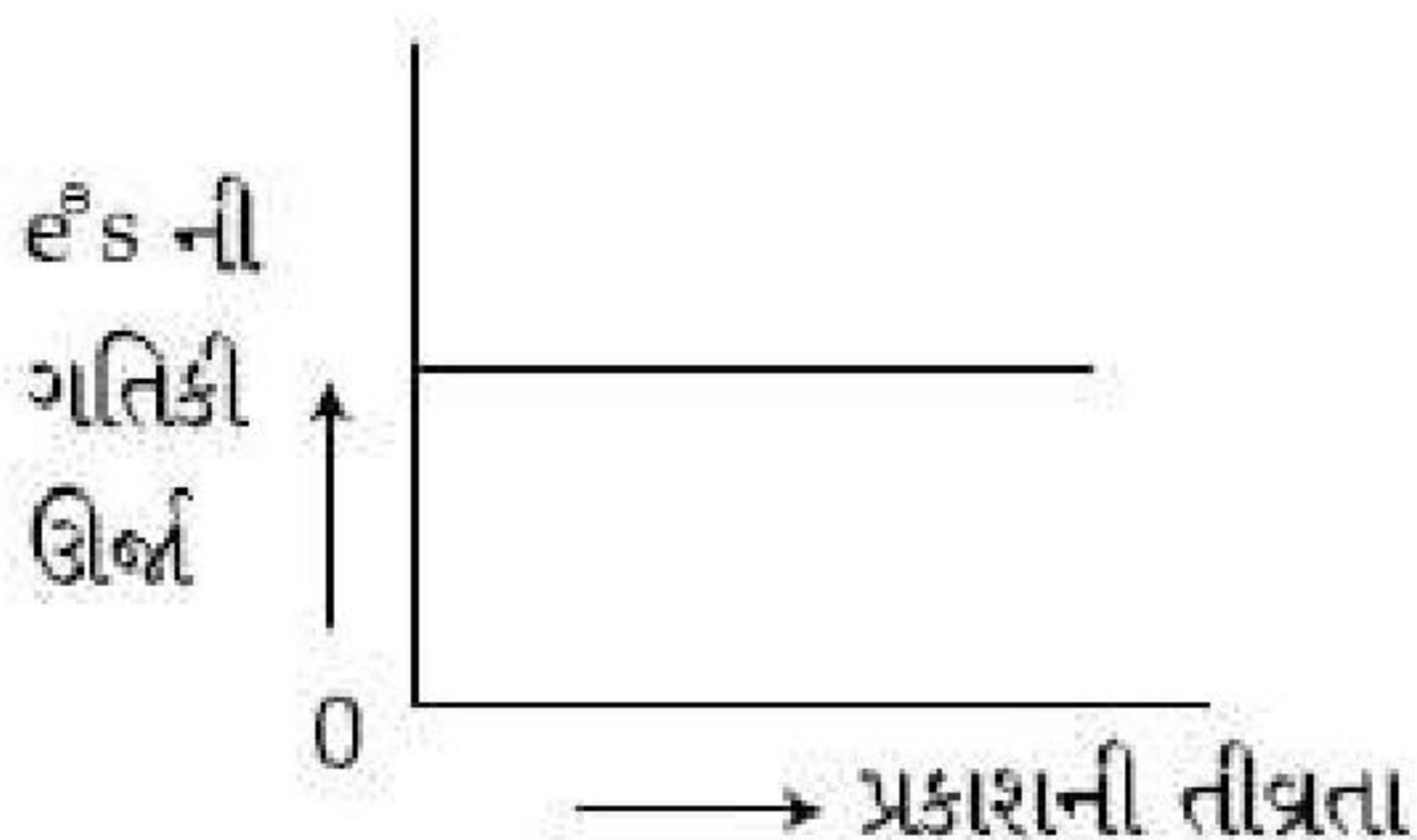
Correct Marks : 4 Wrong Marks : 1

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

Options :

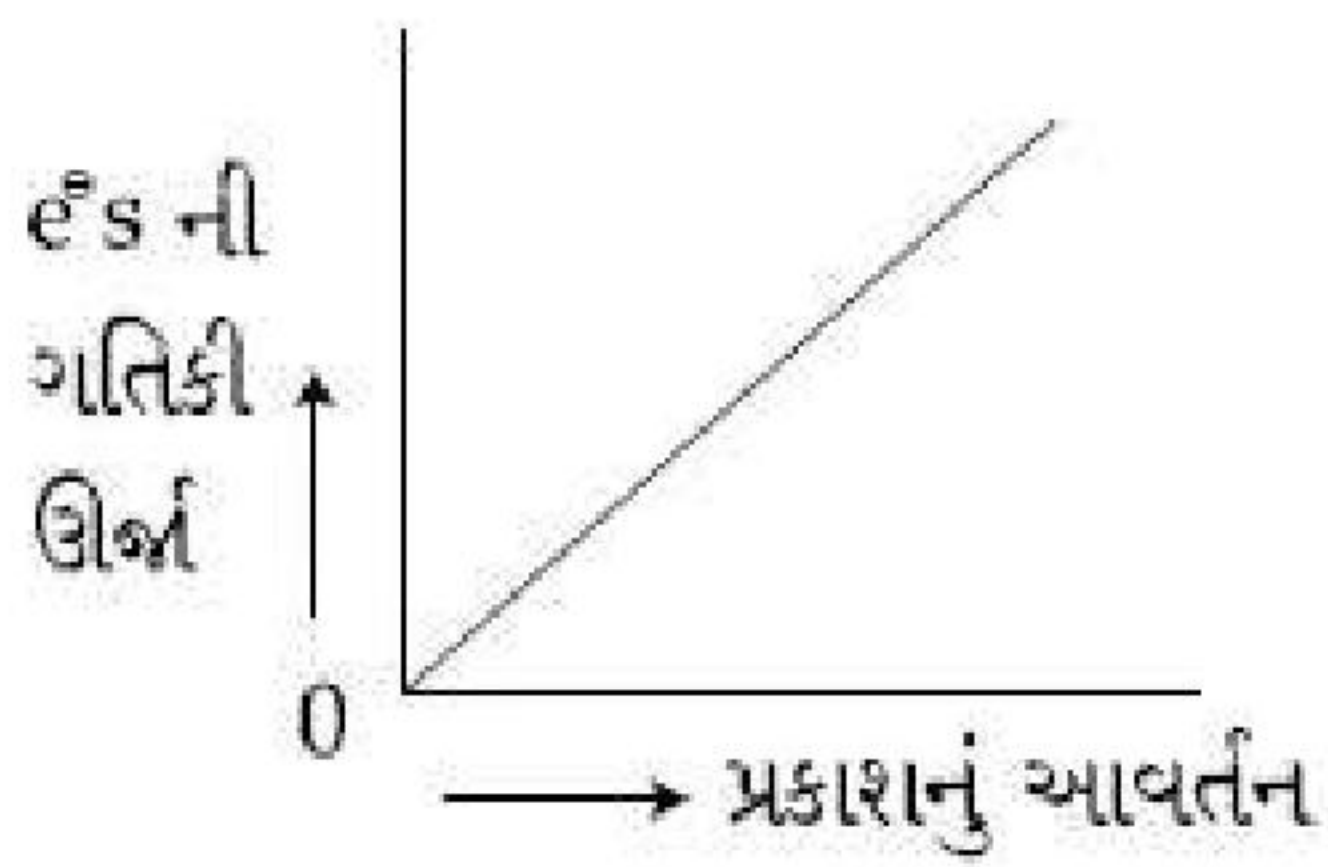


1.

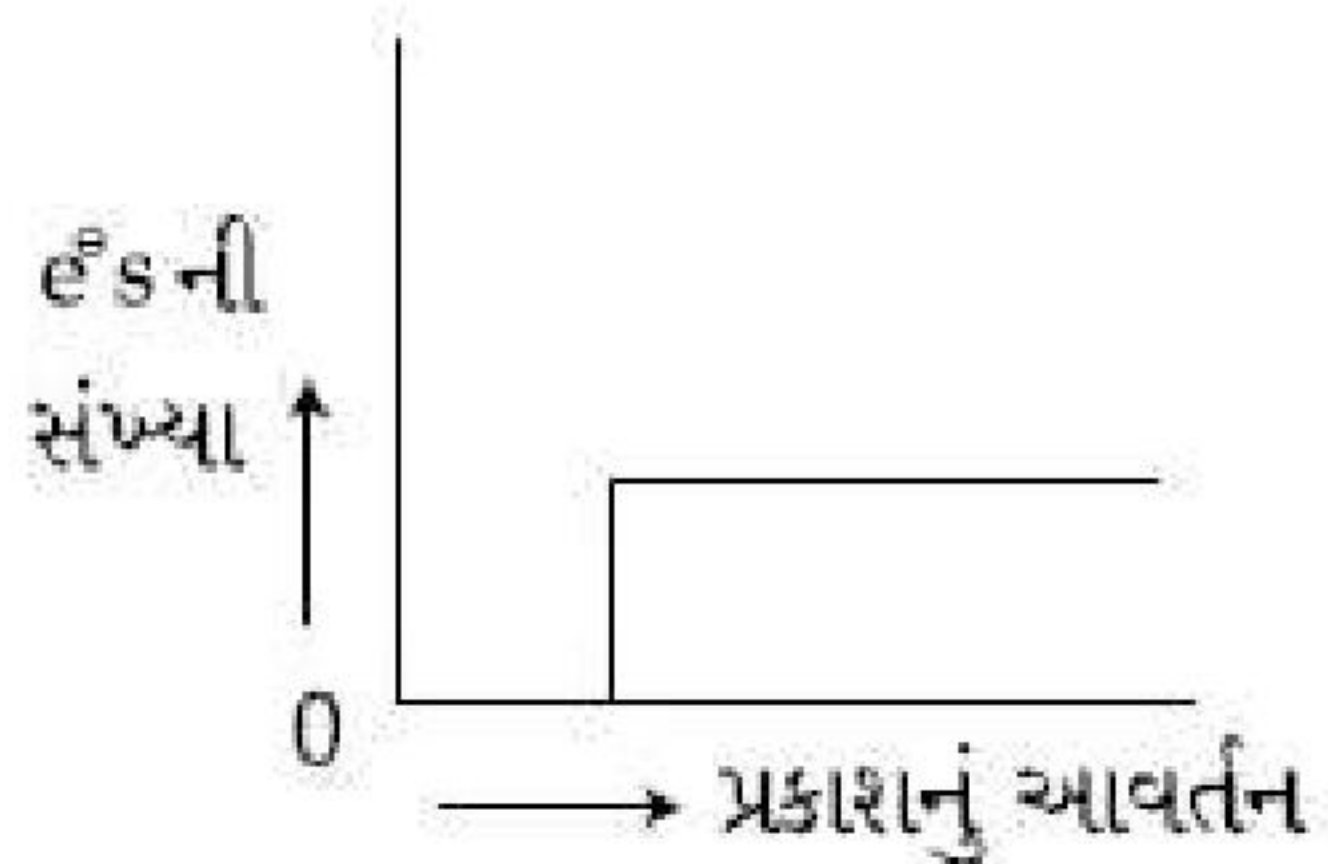


2.

3.



4.



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

Correct Marks : 4 Wrong Marks : 1

Two pi and half sigma bonds are present in :

Options :

1. O_2^+

2. N_2

3. O_2

4. N_2^+

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

Correct Marks : 4 Wrong Marks : 1

દો પાઈ તથા આધા સિગ્મા આબન્ધ નિમ્ન મેં સે કિસમેં ઉપસ્થિત હૈં ?

Options :

1. O_2^+

2. N_2

4. N_2^+

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

Correct Marks : 4 Wrong Marks : 1

નીચેનામાંથી કયામાં બે પાર્ટ અને અડધો સીગ્મા બંધો રહેલા છે?

Options :

1. O_2^+

2. N_2

3. O_2

4. N_2^+

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 12 K

2. 5 K

3. 20 K

4. 4 K

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

Correct Marks : 4 Wrong Marks : 1

एक प्रक्रम में $\Delta H = 200 \text{ Jmol}^{-1}$ तथा $\Delta S = 40 \text{ JK}^{-1}\text{mol}^{-1}$ है। नीचे दिये गये आँकड़ों में से उस निम्नतम ताप का चनाव करिये जिसके ऊपर

1. 12 K
2. 5 K
3. 20 K
4. 4 K

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

Correct Marks : 4 Wrong Marks : 1

એક પ્રક્રિયામાં $\Delta H = 200 \text{ Jmol}^{-1}$ અને $\Delta S = 40 \text{ JK}^{-1}\text{mol}^{-1}$ છે. નીચે આપેલી કિંમતો પૈકી કોઈ ઓછામાં ઓછું તાપમાન પસંદ કરે કે જેનાથી ઉપર પ્રક્રિયા સ્વયંબૂ થશે?

Options :

1. 12 K
2. 5 K
3. 20 K
4. 4 K

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $x_A = 0.76 ; x_B = 0.24$
2. $x_A = 0.4 ; x_B = 0.6$
3. $x_A = 0.37 ; x_B = 0.63$

4. $x_A = 0.28 ; x_B = 0.72$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $x_A = 0.76 ; x_B = 0.24$

2. $x_A = 0.4 ; x_B = 0.6$

3. $x_A = 0.37 ; x_B = 0.63$

4. $x_A = 0.28 ; x_B = 0.72$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

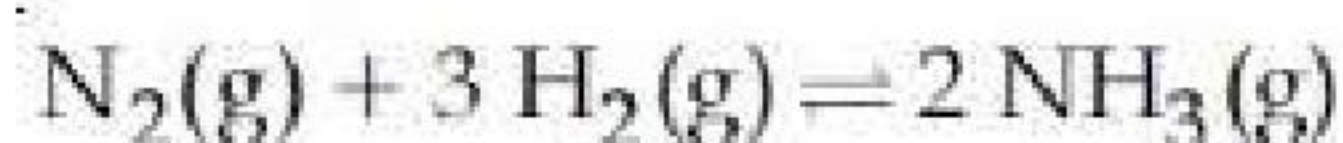
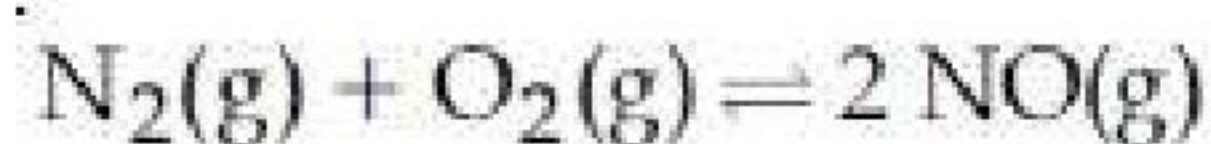
1. $x_A = 0.76 ; x_B = 0.24$

2. $x_A = 0.4 ; x_B = 0.6$

3. $x_A = 0.37 ; x_B = 0.63$

4. $x_A = 0.28 ; x_B = 0.72$

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



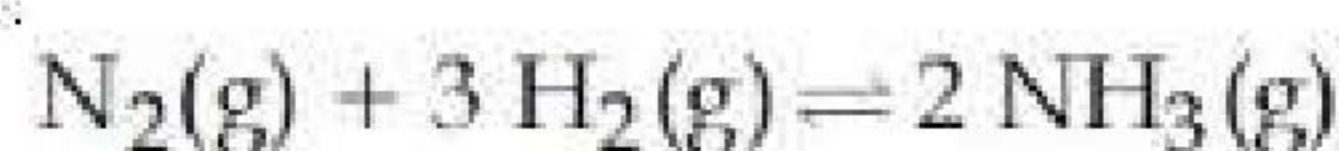
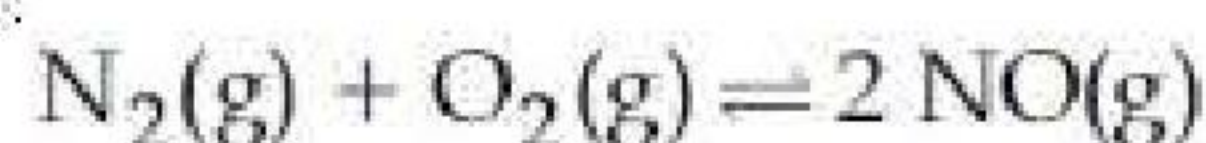
Options :

1. $1, 24.62 \text{ dm}^3 \text{ atm mol}^{-1}, 606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$
2. $24.62 \text{ dm}^3 \text{ atm mol}^{-1}, 606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}, 1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$
3. $1, 24.62 \text{ dm}^3 \text{ atm mol}^{-1}, 1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$
4. $1, 4.1 \times 10^{-2} \text{ dm}^{-3} \text{ atm}^{-1} \text{ mol}, 606 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

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



Options :

1. $1, 24.62 \text{ dm}^3 \text{ atm mol}^{-1}, 606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$
2. $24.62 \text{ dm}^3 \text{ atm mol}^{-1}, 606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}, 1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$
3. $1, 24.62 \text{ dm}^3 \text{ atm mol}^{-1}, 1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$
4. $1, 4.1 \times 10^{-2} \text{ dm}^{-3} \text{ atm}^{-1} \text{ mol}, 606 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

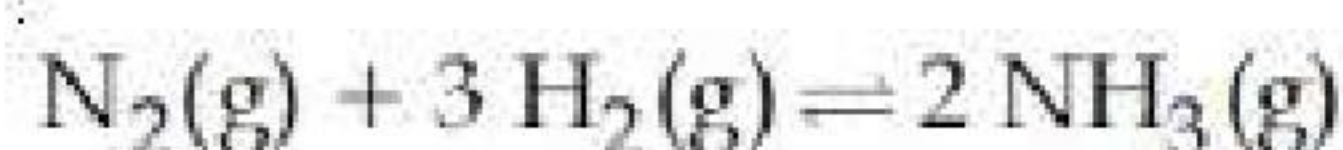
- 1, $4.1 \times 10^{-2} \text{ dm}^{-3} \text{ atm}^{-1} \text{ mol}$,
 4. $606 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

300 K એ નીચેની પ્રક્રિયા માટે K_p/K_c ની કિંમતો અનુક્રમે શોધો ?

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



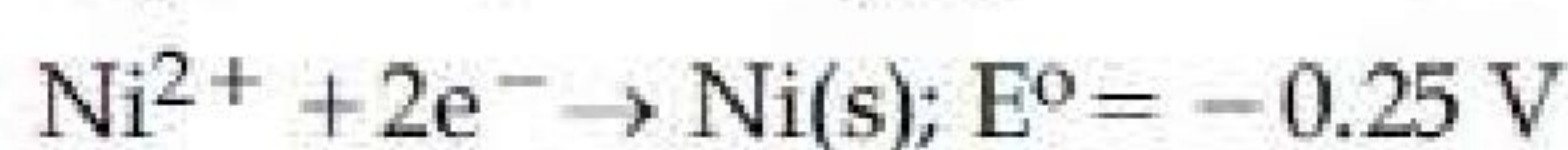
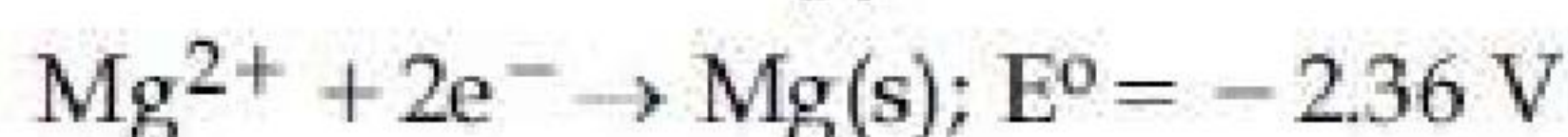
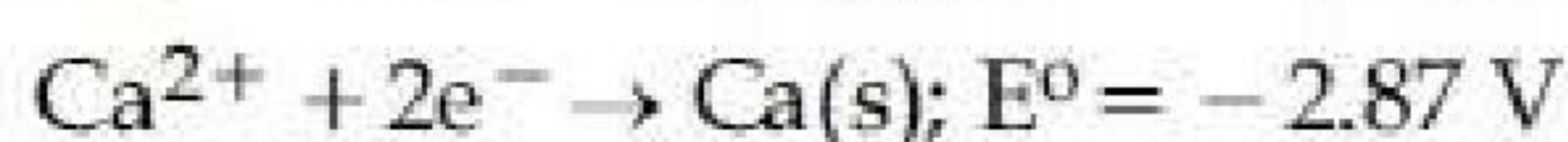
Options :

1. $1, 24.62 \text{ dm}^3 \text{ atm mol}^{-1}$,
 $606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$
2. $24.62 \text{ dm}^3 \text{ atm mol}^{-1}$,
 $606.0 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$,
 $1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$
3. $1, 24.62 \text{ dm}^3 \text{ atm mol}^{-1}$,
 $1.65 \times 10^{-3} \text{ dm}^{-6} \text{ atm}^{-2} \text{ mol}^2$
4. $1, 4.1 \times 10^{-2} \text{ dm}^{-3} \text{ atm}^{-1} \text{ mol}$,
 $606 \text{ dm}^6 \text{ atm}^2 \text{ mol}^{-2}$

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

Correct Marks : 4 Wrong Marks : 1

Consider the following reduction processes :



The reducing power of the metals increases in the order :

Options :

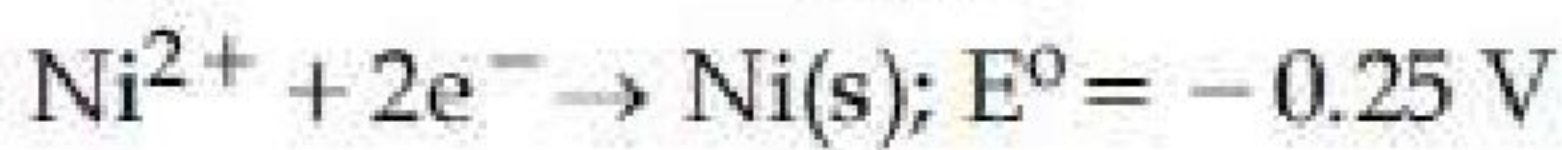
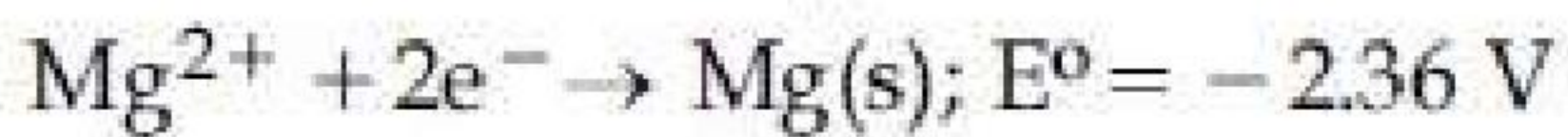
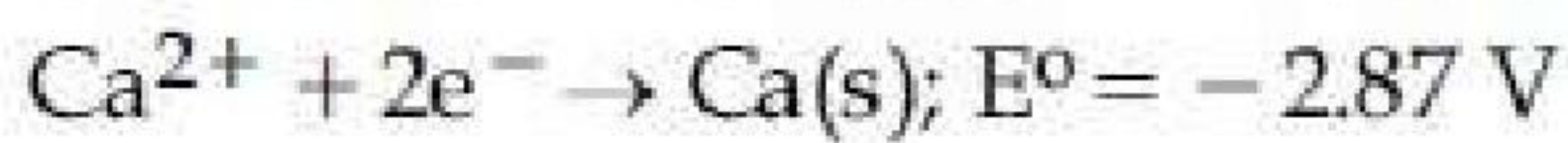
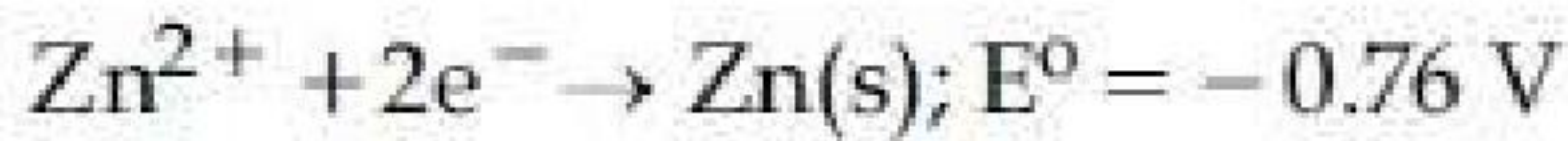
1. $\text{Ca} < \text{Zn} < \text{Mg} < \text{Ni}$

2. $\text{Ca} < \text{Mg} < \text{Zn} < \text{Ni}$
3. $\text{Ni} < \text{Zn} < \text{Mg} < \text{Ca}$
4. $\text{Zn} < \text{Mg} < \text{Ni} < \text{Ca}$

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

Correct Marks : 4 Wrong Marks : 1

નિમ્ન અપચયન પ્રક્રમો પર વિચાર કીજિયે



ધાતુઓ કી અપચાયક સામર્થ્ય ઇસ ક્રમ મેં બઢેગી :

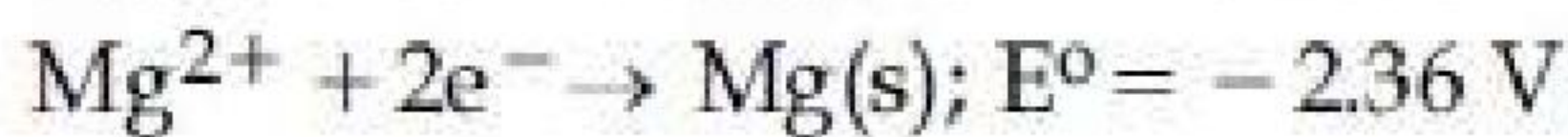
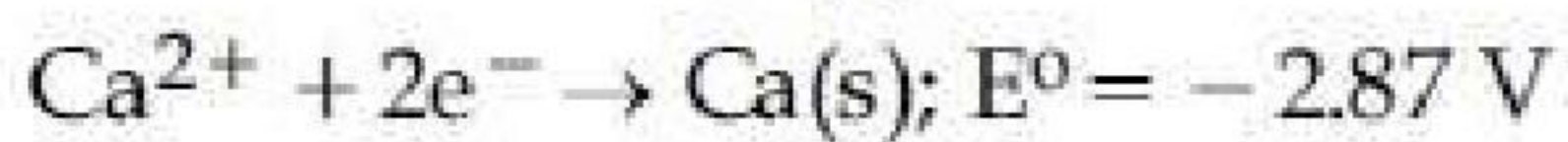
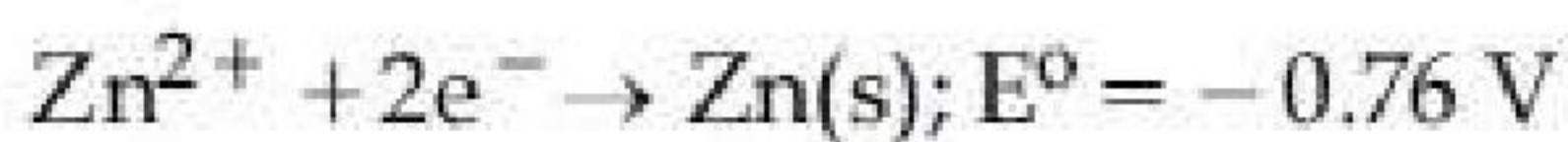
Options :

1. $\text{Ca} < \text{Zn} < \text{Mg} < \text{Ni}$
2. $\text{Ca} < \text{Mg} < \text{Zn} < \text{Ni}$
3. $\text{Ni} < \text{Zn} < \text{Mg} < \text{Ca}$
4. $\text{Zn} < \text{Mg} < \text{Ni} < \text{Ca}$

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

Correct Marks : 4 Wrong Marks : 1

નીચેની રિડક્શન પ્રક્રિયાઓને ધ્યાનમાં લો :



ધાતુઓની રિડક્શનકર્તા શક્તિનો અઢતો ક્રમ :

Options :

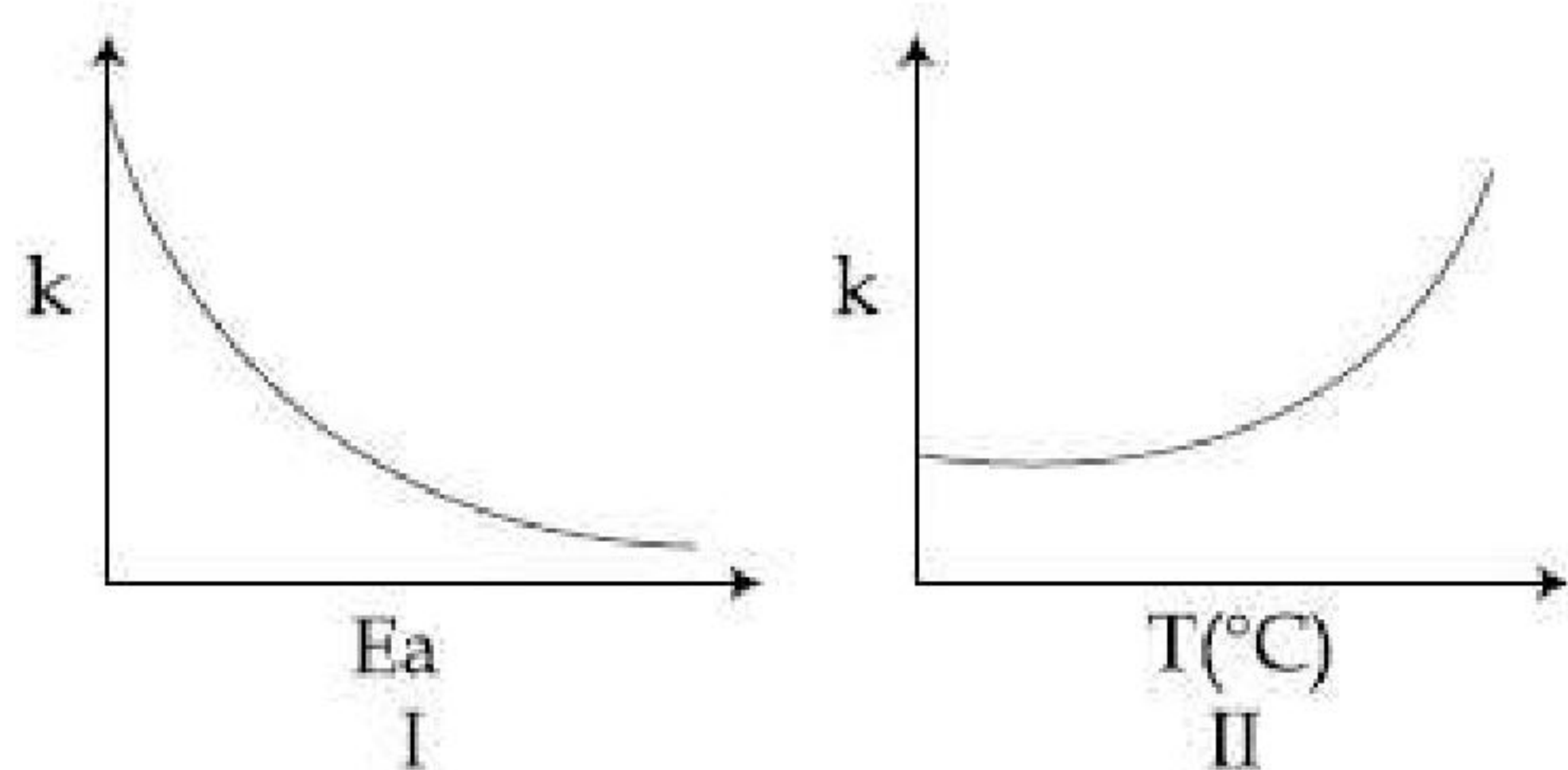
1. $\text{Ca} < \text{Zn} < \text{Mg} < \text{Ni}$
2. $\text{Ca} < \text{Mg} < \text{Zn} < \text{Ni}$

4. $\text{Zn} < \text{Mg} < \text{Ni} < \text{Ca}$

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

Correct Marks : 4 Wrong Marks : 1

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



Choose the correct option :

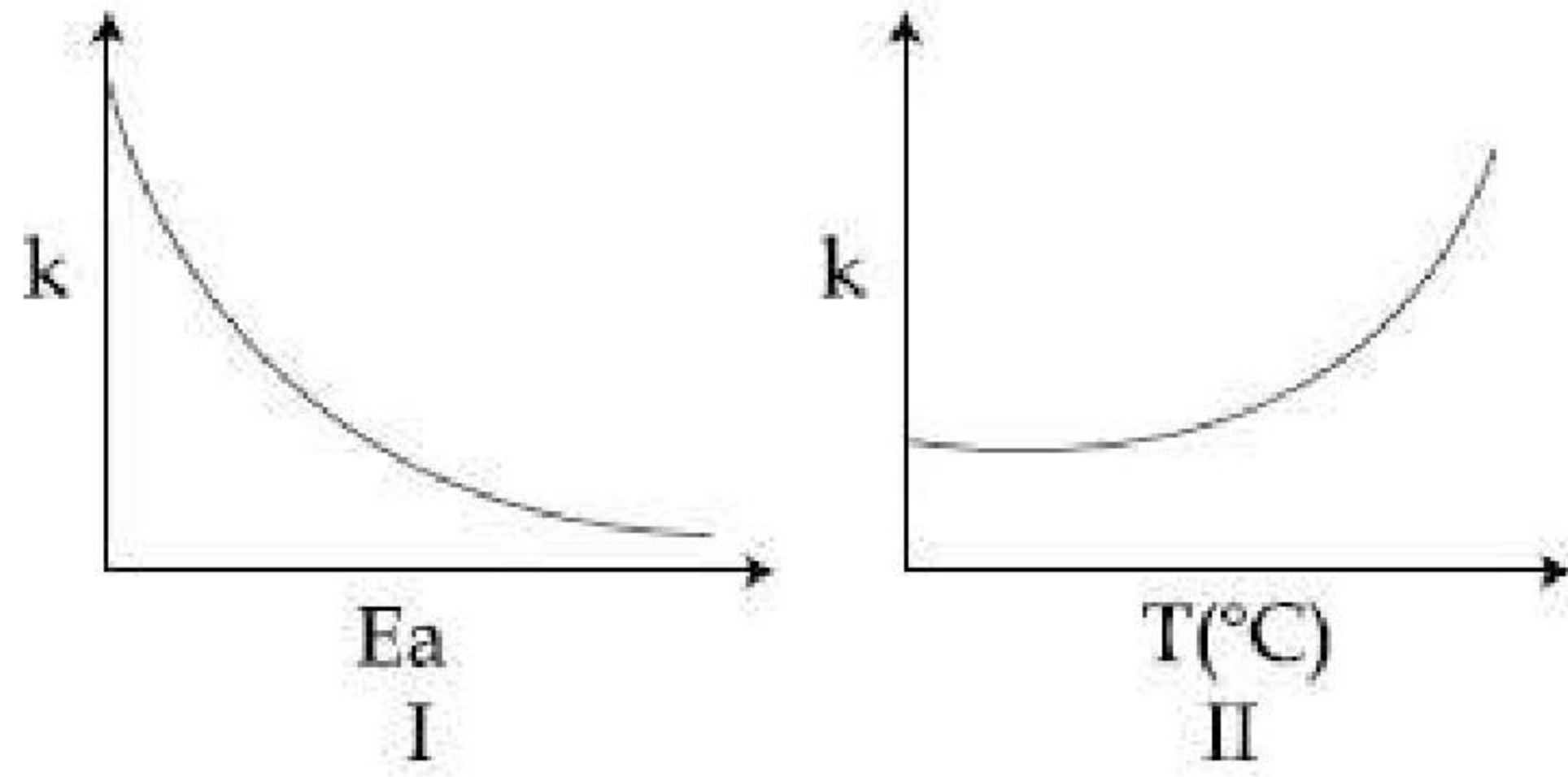
Options :

1. Both I and II are correct
2. Both I and II are wrong
3. I is right but II is wrong
4. I is wrong but II is right

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

Correct Marks : 4 Wrong Marks : 1

આર્હેનિયસ સમીકરણ કો માનને વાલી એક અભિક્રિયા
કે લિએ પ્લાટોં પર વિચાર કીજિએ ($0^{\circ}\text{C} < T < 300^{\circ}\text{C}$),
(k તથા E_a ક્રમશઃ દર નિયતાંક તથા સંક્રમણ ઊર્જા
હૈં)



સહી વિકલ્પ ચુનિયે :

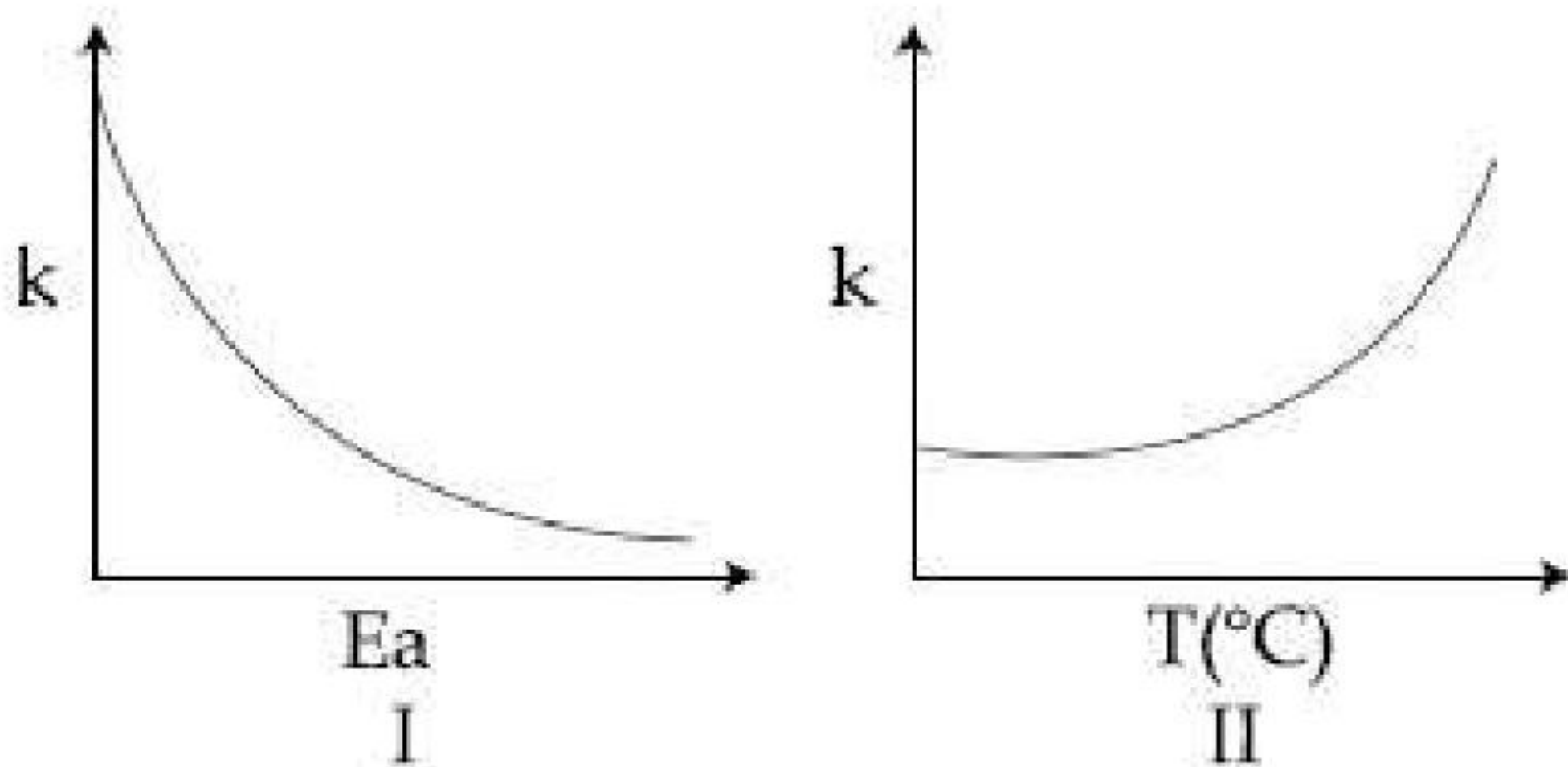
Options :

1. I તથા II દોનોં સહી હૈં
2. I તથા II દોનોં ગલત હૈં
3. I સહી હૈ પરન્તુ II ગલત હૈ
4. I ગલત હૈ પરન્તુ II સહી હૈ

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

Correct Marks : 4 Wrong Marks : 1

આર્હેનિયસના સમીકરણને અનુસરતિ કોઈ એક પ્રક્રિયાના
આલોખો નીચે આપેલા છે ($0^{\circ}\text{C} < T < 300^{\circ}\text{C}$)
(k અને E_a અનુક્રમે પ્રક્રિયા વેગ અને સક્રીયકરણ શક્તિ
છે.)



સાથો વિકલ્પ આપો.

Options :

2. I અને II બન્ને ખોટા છે.
3. I સાચો છે પણ II ખોટો છે.
4. I ખોટો છે પણ II સાચો છે.

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

Correct Marks : 4 Wrong Marks : 1

Which of the following is not an example of heterogeneous catalytic reaction ?

Options :

1. Haber's process
2. Combustion of coal
3. Hydrogenation of vegetable oils
4. Ostwald's process

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. हैबर प्रक्रम
2. कोयले का दहन
3. वनस्पति तेलों का हाइड्रोजनीकरण
4. ओस्टवाल्ड प्रक्रम

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

Correct Marks : 4 Wrong Marks : 1

નીચેનામાંથી કઈ વિસમાંગી ઉદ્દીપકીય પ્રક્રિયાનું ઉદાહરણ

1. હેબર પ્રક્રિયા
2. કોલસાનું દહન
3. વનસ્પતિ તેલનું હાઇડ્રોજનીકરણ
4. ઓસ્વાલ્ડની પ્રક્રિયા

Mathematics

Section Id :	416529138
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529147
Question Shuffling Allowed :	Yes

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 1
2. 102
3. 38
4. 42

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

Correct Marks : 4 Wrong Marks : 1

140 વિદ્યાર્થીયોં, જિનકે ક્રમાંક 1 સે 140 હૈં, કી એક કક્ષા મેં સભી સમ ક્રમાંક કે વિદ્યાર્થીયોં ને ગણિત વિષય ચુના હૈ, उन्होंने जिनके क्रमांक 3 से विभाजित होते हैं भौतिक शास्त्र विषय चुना है तथा उन्होंने जिनके क्रमांक 5 से विभाजित होते हैं, रसायन शास्त्र विषय चुना है। तो उन विद्यार्थियों की संख्या, जिन्होंने इन तीन में से कोई भी विषय नहीं चुना है, हैं :

Options :

1. 1
2. 102
3. 38
4. 42

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 1
2. 102
3. 38
4. 42

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

Correct Marks : 4 Wrong Marks : 1

Let z_1 and z_2 be any two non-zero complex numbers such that $3|z_1| = 4|z_2|$.

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

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

माना z_1 तथा z_2 कोई दो शून्येतर सम्मिश्र संख्याएँ इस प्रकार हैं कि $3|z_1| = 4|z_2|$. यदि

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

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

Options :

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

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

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

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

ધારો કે z_1 અને z_2 એ કોઈ એવી બે શૂન્યેતર સંકર સંખ્યાઓ છે કે જેથી $3|z_1| = 4|z_2|$ થાય. જો

$$z = \frac{3z_1}{2z_2} + \frac{2z_2}{3z_1} \text{ હોય, તો } \underline{\hspace{2cm}}.$$

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 18

2. 12

3. 11

4. 10

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 18
2. 12
3. 11
4. 10

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 18
2. 12
3. 11
4. 10

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

Correct Marks : 4 Wrong Marks : 1

Let $d \in \mathbb{R}$, and

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

Options :

1. -5
2. $2(\sqrt{2} + 2)$
3. -7
4. $2(\sqrt{2} + 1)$

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 $d \in \mathbb{R}$ તથા

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

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

Options :

1. -5
2. $2(\sqrt{2} + 2)$
3. -7
4. $2(\sqrt{2} + 1)$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $d \in \mathbb{R}$ અને

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

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

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

3. -7

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

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

Correct Marks : 4 Wrong Marks : 1

If the system of equations

$$x + y + z = 5$$

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

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

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

Options :

1. 5

2. 18

3. 8

4. 21

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

Correct Marks : 4 Wrong Marks : 1

यदि समीकरण निकाय

$$x + y + z = 5$$

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

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

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

Options :

1. 5

2. 18

3. 8

4. 21

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

Correct Marks : 4 Wrong Marks : 1

જો સમીકરણ સંહિતિ

$$x + y + z = 5$$

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

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

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

Options :

1. 5

2. 18

3. 8

4. 21

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

Correct Marks : 4 Wrong Marks : 1

$$\text{If } \sum_{i=1}^{20} \left(\frac{{}^{20}C_{i-1}}{{}^{20}C_i + {}^{20}C_{i-1}} \right)^3 = \frac{k}{21}, \text{ then } k$$

equals :

Options :

1. 50

2. 100

3. 200

4. 400

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 50
2. 100
3. 200
4. 400

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

Correct Marks : 4 Wrong Marks : 1

यदि $\sum_{i=1}^{20} \left(\frac{{}^{20}C_{i-1}}{{}^{20}C_i + {}^{20}C_{i-1}} \right)^3 = \frac{k}{21}$, तो k बराबर

है :

Options :

1. 50
2. 100
3. 200
4. 400

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

Correct Marks : 4 Wrong Marks : 1

If the third term in the binomial expansion

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

value of x is :

Options :

1. $\frac{1}{8}$
2. $\frac{1}{4}$
3. $2\sqrt{2}$

4. $4\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

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

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

3. $2\sqrt{2}$

4. $4\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

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

2560 હોય, તો x ની કોઈ એક શક્ય કિંમત _____ છે.

Options :

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

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

3. $2\sqrt{2}$

4. $4\sqrt{2}$

If $5, 5r, 5r^2$ are the lengths of the sides of a triangle, then r cannot be equal to :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

यदि एक त्रिभुज की भुजाओं की लम्बाई $5, 5r, 5r^2$ है, तो r निम्न में से किसके बराबर नहीं हो सकता ?

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

3

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 1465

2. 1256

3. 1356

4. 1365

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 1465

2. 1256

3. 1356

4. 1365

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

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

Options :

1. 1465
2. 1256
3. 1356
4. 1365

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

Correct Marks : 4 Wrong Marks : 1

For each $t \in \mathbb{R}$, let $[t]$ be the greatest integer less than or equal to t . Then,

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

Options :

1. equals 0
2. equals 1
3. equals -1
4. does not exist

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

Correct Marks : 4 Wrong Marks : 1

પ્રત્યેક $t \in \mathbb{R}$ કે લિણ, માના $[t]$, t કે સમાન યા ડસસે કમ મહત્તમ પૂર્ણાંક હૈ, તો

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

Options :

1. 0 કે બરાબર હૈ.

2. 1 के बराबर है।
3. -1 के बराबर है।
4. का अस्तित्व नहीं है।

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. બરાબર 0
2. બરાબર 1
3. બરાબર -1
4. નું અસ્તિત્વ નથી

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. is an empty set
2. equals $\{-2, -1, 1, 2\}$
3. equals $\{-2, -1, 0, 1, 2\}$

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

Correct Marks : 4 Wrong Marks : 1

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

માના S , અંતરાલ $(-4, 4)$ કે ઝન બિન્દુઓ, ઝિન પર f અવકલનીય નહીં હૈ, કા સમુચ્ચય હૈ, તો S :

Options :

1. ઁક રિક્ત સમુચ્ચય હૈ.
2. $\{-2, -1, 1, 2\}$ કે બરાબર હૈ.
3. $\{-2, -1, 0, 1, 2\}$ કે બરાબર હૈ.
4. $\{-2, 2\}$ કે બરાબર હૈ.

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

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

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

Options :

1. ખાલી ગણ હૈ
2. બરાબર $\{-2, -1, 1, 2\}$
3. બરાબર $\{-2, -1, 0, 1, 2\}$
4. બરાબર $\{-2, 2\}$

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

Correct Marks : 4 Wrong Marks : 1

Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be a function such that

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

Then $f(2)$ equals :

1. -4
2. 30
3. 8
4. -2

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. -4
2. 30
3. 8
4. -2

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. -4
2. 30
3. 8
4. -2

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

Correct Marks : 4 Wrong Marks : 1

The shortest distance between the point

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

બિંદુ $\left(\frac{3}{2}, 0\right)$ તથા વક્ર $y = \sqrt{x}$, $(x > 0)$ કે બીચ કી ન્યૂનતમ દૂરી હૈ :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

બિંદુ $\left(\frac{3}{2}, 0\right)$ અને વક્ર $y = \sqrt{x}$, $(x > 0)$ વચ્ચેની

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

Let $n \geq 2$ be a natural number and $0 < \theta < \pi/2$.

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

(where C is a constant of integration)

Options :

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

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

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

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

માના $n \geq 2$ એક પ્રાકૃત સંખ્યા છે તથા $0 < \theta < \pi/2$ છે,

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

(જ્યાં C એક સમાકલન અચર છે)

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

(જ્યાં C એ સંકલનનો અચળાંક છે.)

Options :

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

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

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

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

Question Number : 75 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

ધારો કે $I = \int_a^b (x^4 - 2x^2) dx$. જો I ન્યૂનતમ હોય તો
ક્રમયુક્ત જોડ (a, b) એ _____ છે.

Options :

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

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

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

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

Question Number : 75 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Let $I = \int_a^b (x^4 - 2x^2) dx$. If I is minimum
then the ordered pair (a, b) is :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

If the area enclosed between the curves $y = kx^2$ and $x = ky^2$, $(k > 0)$, is 1 square unit. Then k is :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

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

3. $\sqrt{3}$

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

3. $\sqrt{3}$

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

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

Correct Marks : 4 Wrong Marks : 1

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

તથા $y\left(\frac{\pi}{4}\right) = \frac{4}{3}$ હૈ, તો $y\left(-\frac{\pi}{4}\right)$ બરાબર હૈ :

Options :

$-\frac{4}{3}$

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. (4, 3)

2. (2, 2)

3. (3, 4)

4. (4, 4)

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. (4, 3)

2. (2, 2)

3. (3, 4)

4. (4, 4)

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

Options :

1. (4, 3)
2. (2, 2)
3. (3, 4)
4. (4, 4)

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. parallel to x -axis
2. parallel to y -axis
3. with slope $\frac{3}{2}$
4. with slope $\frac{2}{3}$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. जो कि x -अक्ष के समांतर है।

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

4. जिसकी ढाल $\frac{2}{3}$ ।

Question Number : 79 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

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

Options :

1. x -અક્ષને સમાંતર રેખા છે

2. y -અક્ષને સમાંતર રેખા છે

3. $\frac{3}{2}$ ઢાળવાળી રેખા છે

4. $\frac{2}{3}$ ઢાળવાળી રેખા છે

Question Number : 80 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $\sqrt{57}$

2. 4

3. $2\sqrt{5}$

4. 5

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $\sqrt{57}$
2. 4
3. $2\sqrt{5}$
4. 5

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $\sqrt{57}$
2. 4
3. $2\sqrt{5}$
4. 5

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

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

2. $(1, 1, 3)$

3. $(1, 1, 0)$

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

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

2. $(1, 1, 3)$

3. $(1, 1, 0)$

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. $(1, 1, 0)$

2. $(1, 1, 3)$

3. $(1, 1, 0)$

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

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

Correct Marks : 4 Wrong Marks : 1

The equation of a tangent to the hyperbola $4x^2 - 5y^2 = 20$ parallel to the line $x - y = 2$ is :

Options :

1. $x - y + 1 = 0$

2. $x - y + 7 = 0$

3. $x - y - 3 = 0$

4. $x - y + 9 = 0$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $x - y + 1 = 0$

2. $x - y + 7 = 0$

3. $x - y - 3 = 0$

4. $x - y + 9 = 0$

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. $x - y + 1 = 0$

2. $x - y + 7 = 0$

3. $x - y - 3 = 0$

4. $x - y + 9 = 0$

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

Correct Marks : 4 Wrong Marks : 1

The plane passing through the point
(4, -1, 2) and parallel to the lines

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

also passes through the point :

Options :

1. (1, 1, 1)

2. (1, 1, -1)

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

4. (-1, -1, 1)

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

Correct Marks : 4 Wrong Marks : 1

બિંદુ (4, -1, 2) સે હોકર જાને વાલા સમતલ જો રેખાઓ

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

કે સમાંતર છે, નિમ્ન મેં સે જિસ બિંદુ સે બી હોકર જાતા
છે, વહ છે :

Options :

1. (1, 1, 1)

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

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

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

Correct Marks : 4 Wrong Marks : 1

બિંદુ $(4, -1, 2)$ માંથી પસાર થતું તથા રેખાઓ

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

ને સમાંતર હોય તેવું સમતલ _____ બિંદુમાંથી પણ પસાર થાય છે.

Options :

1. $(1, 1, 1)$

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

Let A be a point on the line

$$\vec{r} = (1-3\mu)\hat{i} + (\mu-1)\hat{j} + (2+5\mu)\hat{k} \quad \text{and}$$

B(3, 2, 6) be a point in the space. Then the

value of μ for which the vector $\vec{AB}$ is parallel to the plane $x-4y+3z=1$ is :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

માના A રેખા $\vec{r} = (1-3\mu)\hat{i} + (\mu-1)\hat{j} + (2+5\mu)\hat{k}$ પર સ્થિત એક બિંદુ છે તથા B(3, 2, 6) એક અન્ય બિંદુ છે, તો μ નો વાસ્તવિક મૂલ્ય કે જેના માટે સદિશ $\vec{AB}$ સમતલ $x-4y+3z=1$ ને સમાંતર છે, છે :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે બિંદુ A એ રેખા

$$\vec{r} = (1-3\mu)\hat{i} + (\mu-1)\hat{j} + (2+5\mu)\hat{k}$$

પર આવેલું છે અને B(3, 2, 6) એ અવકાશમાંનું એક બિંદુ છે. તો

સદિશ $\vec{AB}$ એ સમતલ $x-4y+3z=1$ ને સમાંતર થાય તે માટેની μ ની કિંમત _____ છે.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

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

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

Options :

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

2. $(1, 5, 1)$

3. $(1, 3, 1)$

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

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

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

Options :

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

2. $(1, 5, 1)$

3. $(1, 3, 1)$

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

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

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

Options :

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

2. $(1, 5, 1)$

3. $(1, 3, 1)$

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

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

Correct Marks : 4 Wrong Marks : 1

The mean of five observations is 5 and their variance is 9.20. If three of the given five observations are 1, 3 and 8, then a ratio of

1. 10 : 3

2. 4 : 9

3. 5 : 8

4. 6 : 7

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

Correct Marks : 4 Wrong Marks : 1

પાંચ પ્રેક્ષણોં કા માધ્ય 5 હૈ તથા ડનકા પ્રસરણ 9.20 હૈ।
યદિ ડન દિઁ ગઁ પાંચ પ્રેક્ષણોં મેં સે ત્રીન 1, 3 તથા 8 હૈં,
તો અન્ય ડો પ્રેક્ષણોં કા ઁક અનુપાત હૈ :

Options :

1. 10 : 3

2. 4 : 9

3. 5 : 8

4. 6 : 7

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

1. 10 : 3

2. 4 : 9

3. 5 : 8

4. 6 : 7

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

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

Options :

1. π

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

તમામ કિંમતોનો સરવાળો _____ થાય.

Options :

1. π

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

2. $7\sqrt{3}$

3. $2\sqrt{21}$

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

2. $7\sqrt{3}$

3. $2\sqrt{21}$

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

2. $7\sqrt{3}$

3. $2\sqrt{21}$

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

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

Correct Marks : 4 Wrong Marks : 1

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

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

निम्न कथन पर विचार कीजिए

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

1. $P(3)$ तथा $P(5)$ दोनों असत्य हैं।
2. $P(3)$ असत्य है परन्तु $P(5)$ सत्य है।
3. $P(5)$ असत्य है परन्तु $P(3)$ सत्य है।
4. $P(3)$ तथा $P(5)$ दोनों सत्य हैं।

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

Correct Marks : 4 Wrong Marks : 1

વિધાન

“ $P(n) : n^2 - n + 41$ અવિભાજ્ય છે.” નો વિચાર કરો.
તો નીચેના પૈકી કયું સત્ય છે?

Options :

1. $P(3)$ અને $P(5)$ બંને અસત્ય છે.
2. $P(3)$ અસત્ય છે, પણ $P(5)$ સત્ય છે.
3. $P(5)$ અસત્ય છે પણ $P(3)$ સત્ય છે.
4. $P(3)$ અને $P(5)$ બંને સત્ય છે.