

National Testing Agency

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Paper I

Group Number : 1
Group Id : 416529112
Group Maximum Duration : 0
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Physics

Section Id : 416529118
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: 416529127
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

Expression for time in terms of G (universal gravitational constant), h (Planck constant) and c (speed of light) is proportional to :

Options :

$$\sqrt{\frac{Gh}{c^3}}$$

2. $\sqrt{\frac{c^3}{Gh}}$

3. $\sqrt{\frac{Gh}{c^5}}$

4. $\sqrt{\frac{hc^5}{G}}$

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

G (સાર્વત્રિક ગુરુત્વાકર્ષણ નિયતાંક), h (પ્લાંક નિયતાંક) તથા c (પ્રકાશ કી ગતિ) કે રૂપ મેં સમય કા સમતુલ્ય સંબંધ નિમ્ન મેં કિસકે સમાનુપાતી હોગા ?

Options :

1. $\sqrt{\frac{Gh}{c^3}}$

2. $\sqrt{\frac{c^3}{Gh}}$

3. $\sqrt{\frac{Gh}{c^5}}$

4. $\sqrt{\frac{hc^5}{G}}$

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

G (ગુરુત્વાકર્ષણનો સાર્વત્રિક અચળાંક), h (પ્લાંકનો અચળાંક) અને c (પ્રકાશની ઝડપ) ના પદોમાં સમયની અભિવ્યક્તિ _____ ને થલે છે.

Options :

1. $\sqrt{\frac{Gh}{c^3}}$

2. $\sqrt{\frac{c^3}{Gh}}$

3. $\sqrt{\frac{Gh}{c^5}}$

4. $\sqrt{\frac{hc^5}{G}}$

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

In a car race on straight road, car A takes a time t less than car B at the finish and passes finishing point with a speed ' v ' more than that of car B. Both the cars start from rest and travel with constant acceleration a_1 and a_2 respectively. Then ' v ' is equal to :

Options :

1. $\sqrt{2a_1a_2} t$

2. $\sqrt{a_1a_2} t$

3. $\frac{a_1 + a_2}{2} t$

4. $\frac{2a_1a_2}{a_1 + a_2} t$

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

Correct Marks : 4 Wrong Marks : 1

एक सीधी सड़क पर कारों की एक स्पर्धा में, कार 'A' को कार 'B' की अपेक्षा अंत तक पहुँचने में ' t ' समय कम लगता है तथा अन्त बिन्दु पर उसकी गति कार 'B' से v अधिक होती है। दोनों कारें स्थिरावस्था से नियत त्वरण a_1 तथा a_2 से चलती हैं। v का मान होगा :

1. $\sqrt{2a_1a_2} t$

2. $\sqrt{a_1a_2} t$

3. $\frac{a_1 + a_2}{2} t$

4. $\frac{2a_1a_2}{a_1 + a_2} t$

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

સીધા રોડ પરની એક કાર રેસમાં કાર A એ અંતિમ રેખા સુધી t સમય લે છે જે કાર B કરતા ઓછો છે અને અંતિમ બિંદુ પર v ઝડપ ધરાવે છે જે કાર B કરતાં વધુ છે. આ બન્ને કાર સ્થિર સ્થિતિમાંથી શરૂ કરે છે અને ક્રમશઃ a_1 અને a_2 અચળ પ્રવેગથી ગતિ કરે છે તો v બરાબર :

Options :

1. $\sqrt{2a_1a_2} t$

2. $\sqrt{a_1a_2} t$

3. $\frac{a_1 + a_2}{2} t$

4. $\frac{2a_1a_2}{a_1 + a_2} t$

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

Correct Marks : 4 Wrong Marks : 1

The position co-ordinates of a particle moving in a 3-D coordinate system is given by $x = a \cos \omega t$

$$y = a \sin \omega t$$

and $z = a \omega t$

The speed of the particle is :

1. $a\omega$
2. $2a\omega$
3. $\sqrt{2} a\omega$
4. $\sqrt{3} a\omega$

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

Correct Marks : 4 Wrong Marks : 1

एक त्रिविमीय निर्देशांक निकाय में गतिशील एक कण के स्थिति निर्देशांक निम्न हैं :

$$x = a \cos \omega t$$

$$y = a \sin \omega t$$

$$z = a\omega t$$

इस कण की गति का मान होगा :

Options :

1. $a\omega$
2. $2a\omega$
3. $\sqrt{2} a\omega$
4. $\sqrt{3} a\omega$

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

ત્રિપરિમાણીય યામોમાં ગતિ કરતાં એક કણનાં સ્થાન-યામોને

$$x = a \cos \omega t$$

$$y = a \sin \omega t$$

$$z = a\omega t$$

વડે આપવામાં આવે છે. તો આ કણની ઝડપ :

Options :

$$a\omega$$

2. $2a\omega$
3. $\sqrt{2} a\omega$
4. $\sqrt{3} a\omega$

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 mass of 10 kg is suspended vertically by a rope from the roof. When a horizontal force is applied on the rope at some point, the rope deviated at an angle of 45° at the roof point. If the suspended mass is at equilibrium, the magnitude of the force applied is ($g = 10 \text{ ms}^{-2}$)

Options :

1. 100 N
2. 200 N
3. 140 N
4. 70 N

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

10 kg ના દ્રવ્યમાનને છત પરથી દોરડા વડે ઉધ્વદિશામાં લટકાવવામાં આવેલ છે. આ દોરડાના કોઈ એક બિંદુ પર જ્યારે સમક્ષિતિજ બળ લગાડવામાં આવે છે ત્યારે છત પરના બિંદુથી આ દોરડું 45° વિચલન પામે છે. જો લટકાવેલ દ્રવ્યમાન સંતુલનમાં હોય તો આપાત બળનું માન થશે : ($g = 10 \text{ ms}^{-2}$ લો.)

Options :

1. 100 N
2. 200 N

4. 70 N

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

छत से 10 kg के एक द्रव्यमान को एक रस्सी से ऊर्ध्वाधर लटकाया गया है। रस्सी के किसी बिन्दु पर एक क्षैतिज बल लगाने से रस्सी छत वाले बिन्दु पर 45° कोण से विचलित हो जाती है। यदि लटका हुआ द्रव्यमान साम्यावस्था में है तो लगाये गये बल का मान होगा : (दिया है : $g = 10 \text{ ms}^{-2}$)

Options :

1. 100 N
2. 200 N
3. 140 N
4. 70 N

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

Correct Marks : 4 Wrong Marks : 1

A force acts on a 2 kg object so that its position is given as a function of time as $x = 3t^2 + 5$. What is the work done by this force in first 5 seconds ?

Options :

1. 950 J
2. 900 J
3. 875 J
4. 850 J

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

Correct Marks : 4 Wrong Marks : 1

2 kg द्रव्यमान के एक पिण्ड पर एक बल लगाते हैं जिससे उसकी स्थिति का समय के साथ परिवर्तन

Options :

1. 950 J
2. 900 J
3. 875 J
4. 850 J

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

Correct Marks : 4 Wrong Marks : 1

2 kg ના એક પદાર્થપર એક બળ એવી રીતે લગાડવામાં આવે છે કે તેની સ્થિતિને સમય વિધેય $x = 3t^2 + 5$ વડે આપવામાં આવે છે. પ્રથમ 5 s માં આ બળ વડે થતું કાર્ય શું છે?

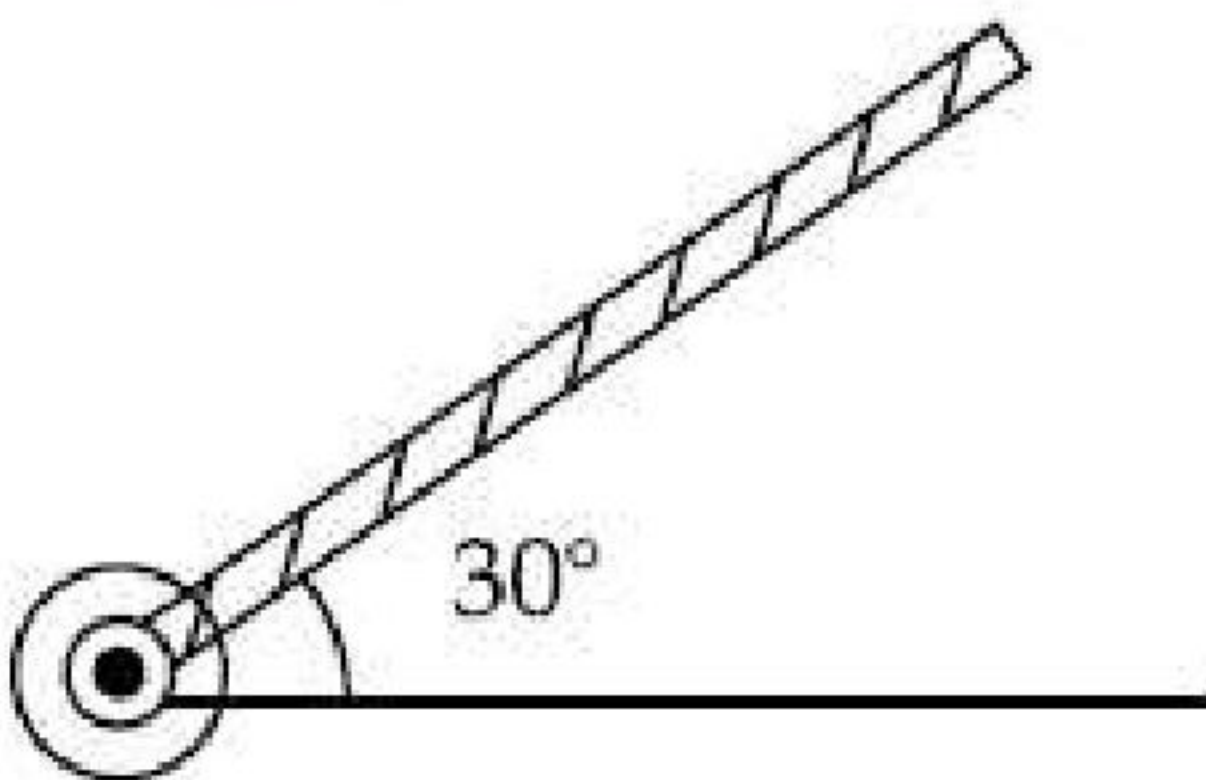
Options :

1. 950 J
2. 900 J
3. 875 J
4. 850 J

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 rod of length 50 cm is pivoted at one end. It is raised such that it makes an angle of 30° from the horizontal as shown and released from rest. Its angular speed when it passes through the horizontal (in rad s^{-1}) will be ($g = 10 \text{ ms}^{-2}$)



Options :

1. $\sqrt{30}$

2. $\sqrt{\frac{30}{2}}$

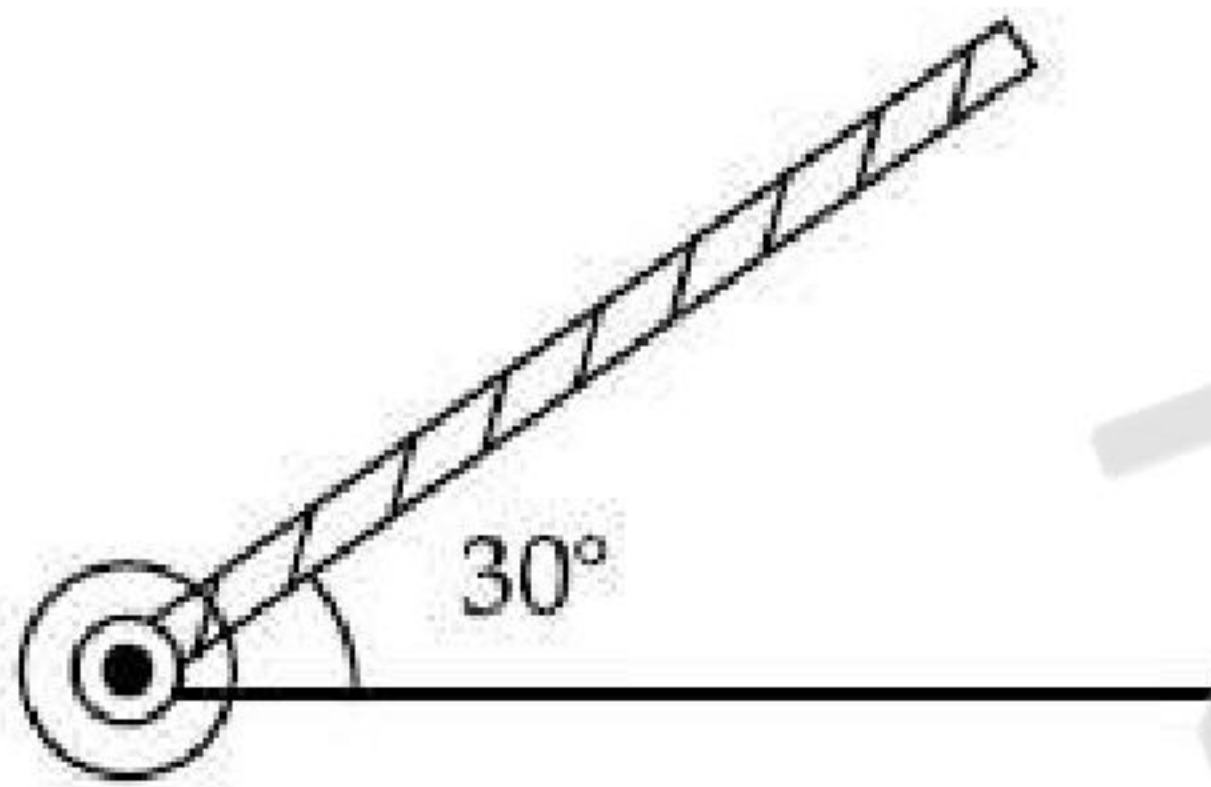
3. $\frac{\sqrt{30}}{2}$

4. $\frac{\sqrt{20}}{3}$

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

50 cm की एक छड़ के एक सिरे को कीलकित किया है। इसको क्षैतिज से 30° कोण पर, चित्रानुसार, उठाकर स्थिरावस्था से छोड़ दिया जाता है। जब यह छड़ क्षैतिज अवस्था से गुजरती है तो इसकी कोणीय चाल का rad s^{-1} में मान होगा : (दिया है : $g = 10 \text{ ms}^{-2}$)



Options :

1. $\sqrt{30}$

2. $\sqrt{\frac{30}{2}}$

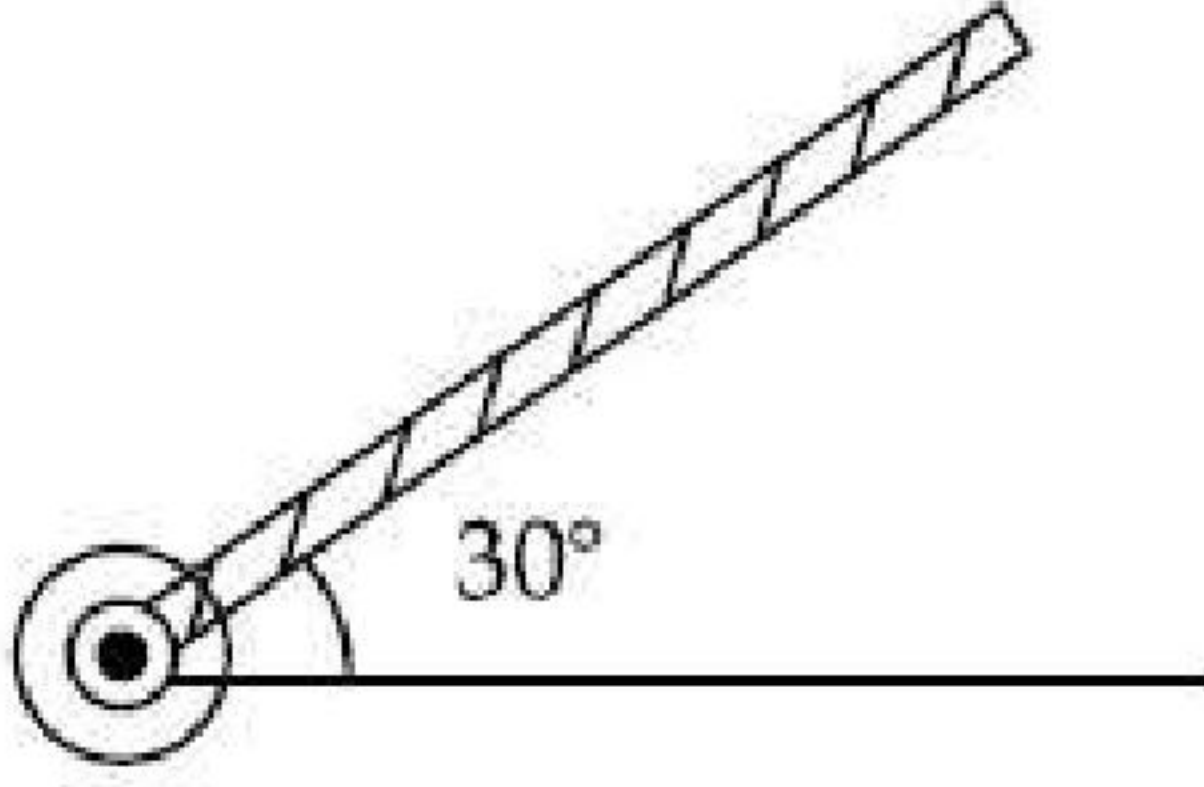
3. $\frac{\sqrt{30}}{2}$

4. $\frac{\sqrt{20}}{3}$

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

50 cm લંબાઈના એક સળીયાને એક છેડાથી જડેલ છે. આ સળીયાને સમક્ષિતિથી 30° ના ખૂણે આકૃતિમાં બતાવ્યા પ્રમાણે ઊંચકીને સ્થિર અવસ્થામાંથી મુક્ત કરવામાં આવે છે. આ સળીયો જ્યારે સમક્ષિતિજને પસાર કરશે ત્યારે તેની કોણીય ઝડપ (rad s^{-1} માં) થશે : ($g = 10 \text{ ms}^{-2}$ લો.)



Options :

1. $\sqrt{30}$
2. $\sqrt{\frac{30}{2}}$
3. $\frac{\sqrt{30}}{2}$
4. $\frac{\sqrt{20}}{3}$

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

A rod of mass 'M' and length '2L' is suspended at its middle by a wire. It exhibits torsional oscillations; If two masses each of 'm' are attached at distance 'L/2' from its centre on both sides, it reduces the oscillation frequency by 20%. The value of ratio m/M is close to :

Options :

1. 0.17
2. 0.77
3. 0.57
4. 0.37

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

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान 'M' तथा लम्बाई '2L' की एक छड़ को उसके मध्यबिन्दु से एक तार द्वारा लटकाया गया है। यह छड़ मरोड़ दोलन करती है। यदि प्रत्येक द्रव्यमान 'm' के दो पिण्डों को छड़ के मध्यबिन्दु से 'L/2' दूरी पर दोनों तरफ जोड़ते हैं, तो दोलन की आवृत्ति 20% घट जाती है। अनुपात m/M का सन्निकट मान होगा :

Options :

1. 0.17
2. 0.77
3. 0.57
4. 0.37

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

'M' દ્રવ્યમાનનાં અને '2L' લંબાઈના એક સળિયાને તેના મધ્યમાંથી લટકાવેલ છે. તે ટોર્સનલ દોલનો કરે છે. 'm' દ્રવ્યમાનના એક એવા બે દ્રવ્યમાનોને સળિયાના મધ્યમાંથી 'L/2' અંતરે બન્ને બાજુ પર જોડવામાં આવતાં તે દોલનોની આવૃત્તિમાં 20% નો ઘટાડો કરે છે. m/M નું મૂલ્ય _____ ની નજીકનું છે.

Options :

1. 0.17
2. 0.77
3. 0.57
4. 0.37

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

The energy required to take a satellite to a height 'h' above Earth surface (radius of Earth = 6.4×10^3 km) is E_1 and kinetic energy required for the satellite to be in a circular orbit at this height is E_2 . The value of h for which E_1 and E_2 are equal, is :

Options :

1. 1.28×10^4 km
2. 6.4×10^3 km
3. 1.6×10^3 km
4. 3.2×10^3 km

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 को पृथ्वी की सतह से ऊँचाई h तक लाने में E_1 ऊर्जा लगती है तथा इस उपग्रह को इस ऊँचाई की वृत्ताकार कक्षा में रखने के लिए E_2 ऊर्जा की आवश्यकता होती है। h का वह मान, जिसके लिए E_1 तथा E_2 बराबर हैं, होगा :

(दिया है : पृथ्वी की त्रिज्या = 6.4×10^3 km)

Options :

1. 1.28×10^4 km
2. 6.4×10^3 km
3. 1.6×10^3 km
4. 3.2×10^3 km

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

પૃથ્વીની સપાટીથી (પૃથ્વીની ત્રિજ્યા 6.4×10^3 km) h ઊંચાઈ પર એક ઉપગ્રહને રાખવામાટેની જરૂરી ઊર્જા E_1 છે અને આ ઉપગ્રહને આ ઊંચાઈ પર વર્તુળાકાર કક્ષામાં રાખવા જરૂરી ગતિ ઊર્જા E_2 છે. E_1 અને E_2

1. 1.28×10^4 km
2. 6.4×10^3 km
3. 1.6×10^3 km
4. 3.2×10^3 km

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

The top of a water tank is open to air and its water level is maintained. It is giving out 0.74 m^3 water per minute through a circular opening of 2 cm radius in its wall. The depth of the centre of the opening from the level of water in the tank is close to :

Options :

1. 4.8 m
2. 9.6 m
3. 2.9 m
4. 6.0 m

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

पानी की एक टंकी ऊपर से खुली हुयी है तथा इसमें पानी का स्तर स्थिर है। इसकी दीवार में उपस्थित एक 2 cm त्रिज्या के वृत्ताकार छेद से पानी $0.74 \text{ m}^3/\text{min.}$ की दर से बह रहा है। इस छेद के केन्द्र की पानी की सतह से गहराई का सन्निकट मान होगा :

Options :

1. 4.8 m
2. 9.6 m
3. 2.9 m

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

એક ઊંચી પાણીની ટાંકીનો ઊપરનો ભાગ હવામાં ખુલ્લો છે અને તેનું પાણીનું સ્તર નગવાઈ રહે છે. તેની દિવાલમાં 2 cm ની ત્રિજ્યાના ગોળાકાર કાણામાંથી બહાર 0.74 m^3 પાણી પ્રતિ મિનટ આપે છે. ટાંકીના પાણીના સ્તરથી આ કાણાના કેન્દ્રની ઊંડાઈ _____ ની નજીકની છે.

Options :

1. 4.8 m
2. 9.6 m
3. 2.9 m
4. 6.0 m

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

Correct Marks : 4 Wrong Marks : 1

Two Carnot engines A and B are operated in series. The first one, A, receives heat at $T_1 (= 600 \text{ K})$ and rejects to a reservoir at temperature T_2 . The second engine B receives heat rejected by the first engine and, in turn, rejects to a heat reservoir at $T_3 (= 400 \text{ K})$. Calculate the temperature T_2 if the work outputs of the two engines are equal :

Options :

1. 300 K
2. 400 K
3. 500 K
4. 600 K

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

દો કાર્નો (Carnot) ઇંજન A તથા B કો શ્રેણીક્રમ મેં ચલાયા જાતા હૈ। પહલા ઇંજન A તાપમાન $T_1 (= 600 \text{ K})$ પર ઝખ્મા લેતા હૈ વ તાપમાન T_2 કે એક ઝખ્મા ભંડાર કો ઝખ્મા દેતા હૈ। દૂસરા ઇંજન B ઇસ પહલે ઇંજન દ્વારા દી હુયી ઝખ્મા કો લેકર તાપમાન $T_3 (= 400 \text{ K})$ કે ઝખ્મા ભંડાર કો ઝખ્મા દેતા હૈ। યદિ દોનોં ઇંજનોં કા કાર્ય ઉત્પાદન બરાબર હૈ તો T_2 કા માન હોગા :

Options :

1. 300 K
2. 400 K
3. 500 K
4. 600 K

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

Correct Marks : 4 Wrong Marks : 1

A અને B એમ બે કાર્નોટ એન્જિન શ્રેણીમાં કાર્યરત છે. પ્રથમ A, એ $T_1 (= 600 \text{ K})$ પર ઊષ્મા પ્રાપ્ત કરે છે અને તાપમાન T_2 સંગ્રાહક (પ્રાપ્તિ સ્થાન) તરફ છોડે છે. બીજું એન્જિન B એ પ્રથમ એન્જિન દ્વારા છોડેલ ઊષ્મા પ્રાપ્ત કરે છે અને $T_3 (= 400 \text{ K})$ પર ઊષ્મા સંગ્રાહક (પ્રાપ્તિ સ્થાન) તરફ છોડે છે. આ બન્ને એન્જિનના કાર્ય આઉટપુટ સરખા હોય ત્યારે તાપમાન T_2 હશે :

Options :

1. 300 K
2. 400 K
3. 500 K
4. 600 K

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

Correct Marks : 4 Wrong Marks : 1

A 15 g mass of nitrogen gas is enclosed in a vessel at a temperature 27°C . Amount of heat transferred to the gas, so that rms velocity of molecules is doubled, is about :
[Take $R = 8.3 \text{ J/K mole}$]

Options :

1. 0.9 kJ
2. 6 kJ
3. 10 kJ
4. 14 kJ

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

નાઇટ્રોજન ગૈસ કી 15 g માત્રા કો એક પાત્ર મેં 27°C પર રખા હૈ। ઝખ્મા કી વહ માત્રા, જિસસે ગૈસ કે અણુઓં કા વર્ગ માધ્ય મૂલ વેગ દો ગુના હો જાયેગા, કા માન હોગા : (દિયા હૈ : $R = 8.3 \text{ J/K mole}$)

Options :

1. 0.9 kJ
2. 6 kJ
3. 10 kJ
4. 14 kJ

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

27°C તાપમાને એક પાત્રમાં 15 g દ્રવ્યમાનના નાઇટ્રોજન વાયુને ભરેલ છે. આ આણુઓની rms ઝડપ બમણી થાય તે માટે આ વાયુમાં તબદિલ ઊષ્માનો જથ્થો લગભગ _____ છે. ($R = 8.3 \text{ J/K mole}$ લો.)

Options :

1. 0.9 kJ
2. 6 kJ

4. 14 kJ

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 musician using an open flute of length 50 cm produces second harmonic sound waves. A person runs towards the musician from another end of a hall at a speed of 10 km/h. If the wave speed is 330 m/s, the frequency heard by the running person shall be close to :

Options :

1. 333 Hz
2. 500 Hz
3. 666 Hz
4. 753 Hz

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

50 cm लम्बाई की खुले सिरे की एक बाँसुरी से एक संगीतज्ञ द्वितीय सन्नादी ध्वनि तरंगें उत्पन्न करता है। एक व्यक्ति कक्ष के दूसरे सिरे से संगीतज्ञ की तरफ 10 km/h की गति से दौड़ता है। यदि ध्वनि की गति 330 m/s है तो दौड़ते हुये व्यक्ति द्वारा सुनी गयी आवृत्ति का सन्निकट मान होगा :

Options :

1. 333 Hz
2. 500 Hz
3. 666 Hz
4. 753 Hz

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

50 cm લંબાઈની એક ખુલ્લી વાંસળીની મદદથી સંગીતકાર દ્વિતીય પ્રસંગાદી ધ્વનિ તરંગો ઉત્પન્ન કરે છે. ખંડના બીજા છેડા થી એક વ્યક્તિ 10 km/h ની ઝડપથી આ સંગીતકાર તરફ દોડે છે. જો તરંગની ઝડપ 330 m/s છે. તો દોડતી વ્યક્તિને સંભળાતી આવૃત્તિ _____ ની નજીકની હશે.

Options :

1. 333 Hz
2. 500 Hz
3. 666 Hz
4. 753 Hz

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

Correct Marks : 4 Wrong Marks : 1

A particle is executing simple harmonic motion (SHM) of amplitude A , along the x -axis, about $x=0$. When its potential Energy (PE) equals kinetic energy (KE), the position of the particle will be :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

एक कण x -अक्ष की दिशा में, $x=0$ के सापेक्ष आयाम A से सरल आवर्त गति कर रहा है। जब इस कण की स्थितिज ऊर्जा तथा गतिज ऊर्जा के मान बराबर हैं तो

1. A

2. $\frac{A}{2}$

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

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

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

Correct Marks : 4 Wrong Marks : 1

એક કણ x -અક્ષ, $x = 0$ કે સાપેક્ષ તરફ A કંપવિસ્તારની સરળ આવર્ત ગતિ (સઆગ) કરે છે. જ્યારે તેની સ્થિતિ ઊર્જા (PE) એ ગતિઊર્જા (KE) ની બરાબર થાય ત્યારે આ કણની સ્થિતિ હશે :

Options :

1. A

2. $\frac{A}{2}$

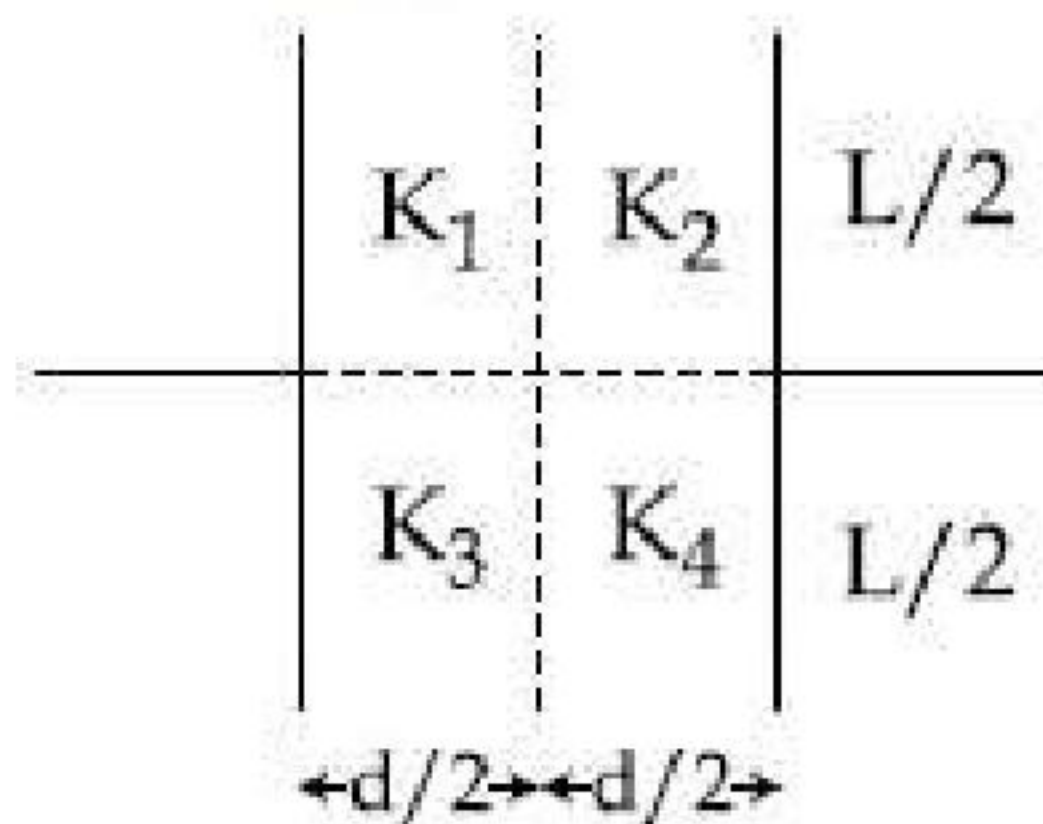
3. $\frac{A}{\sqrt{2}}$

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

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

Correct Marks : 4 Wrong Marks : 1

A parallel plate capacitor with square plates is filled with four dielectrics of dielectric constants K_1, K_2, K_3, K_4 arranged as shown in the figure. The effective dielectric constant K will be :



Options :

1.
$$K = \frac{(K_1 + K_2)(K_3 + K_4)}{K_1 + K_2 + K_3 + K_4}$$

2.
$$K = \frac{(K_1 + K_3)(K_2 + K_4)}{K_1 + K_2 + K_3 + K_4}$$

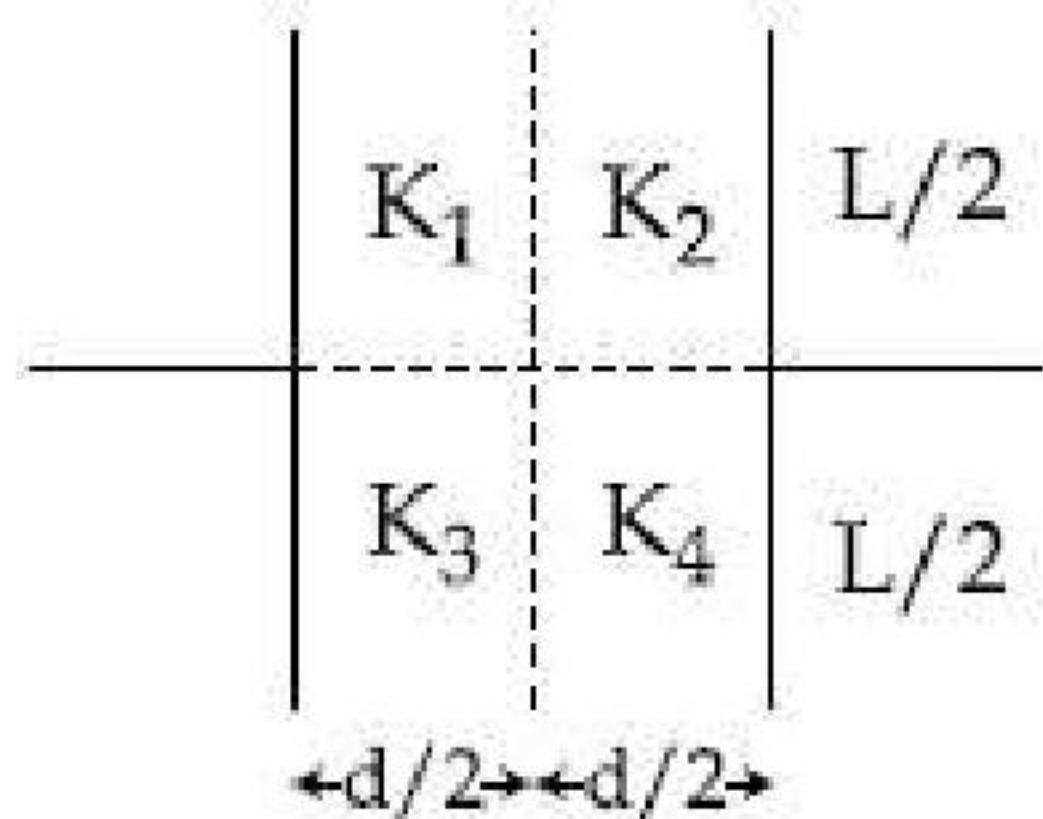
3.
$$K = \frac{(K_1 + K_4)(K_2 + K_3)}{2(K_1 + K_2 + K_3 + K_4)}$$

4.
$$K = \frac{(K_1 + K_2)(K_3 + K_4)}{2(K_1 + K_2 + K_3 + K_4)}$$

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

वर्गाकार प्लेटों वाले एक समान्तर प्लेट संधारित्र को चित्रानुसार चार परावैद्युतों, जिनके परावैद्युतांक K_1, K_2, K_3 तथा K_4 हैं, से भर दिया जाता है तो प्रभावी परावैद्युतांक K का मान होगा :



Options :

1.
$$K = \frac{(K_1 + K_2)(K_3 + K_4)}{K_1 + K_2 + K_3 + K_4}$$

2.
$$K = \frac{(K_1 + K_3)(K_2 + K_4)}{K_1 + K_2 + K_3 + K_4}$$

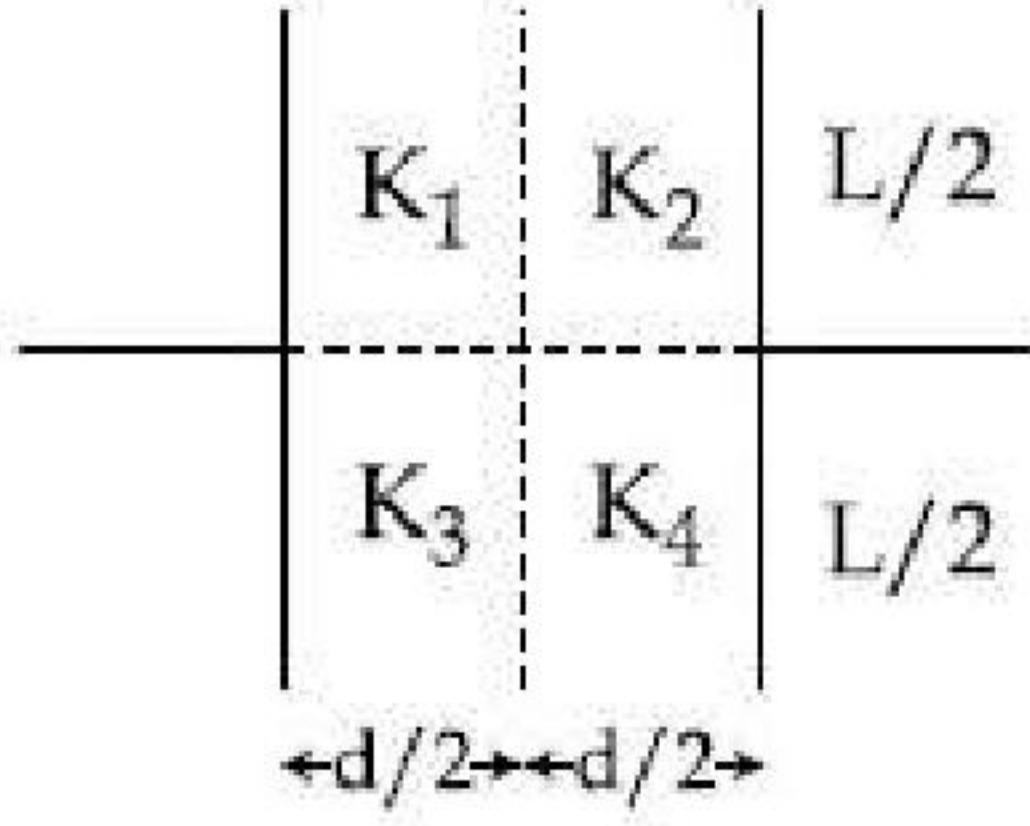
3.
$$K = \frac{(K_1 + K_4)(K_2 + K_3)}{2(K_1 + K_2 + K_3 + K_4)}$$

4.
$$K = \frac{(K_1 + K_2)(K_3 + K_4)}{2(K_1 + K_2 + K_3 + K_4)}$$

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

ચોરસ પ્લેટના એક સમાંતર પ્લેટ કેપેસિટરને ચાર પરાવૈદ્યુત દ્રવ્ય કે જેમના પરાવૈદ્યુતાંક K_1, K_2, K_3, K_4 છે. તેમનાથી આકૃતિમાં દર્શાવ્યા પ્રમાણે ભરેલ છે. અસરકારક પરાવૈદ્યુતાંક K _____ હશે.



Options :

1.
$$K = \frac{(K_1 + K_2)(K_3 + K_4)}{K_1 + K_2 + K_3 + K_4}$$

2.
$$K = \frac{(K_1 + K_3)(K_2 + K_4)}{K_1 + K_2 + K_3 + K_4}$$

3.
$$K = \frac{(K_1 + K_4)(K_2 + K_3)}{2(K_1 + K_2 + K_3 + K_4)}$$

4.
$$K = \frac{(K_1 + K_2)(K_3 + K_4)}{2(K_1 + K_2 + K_3 + K_4)}$$

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

ત્રિજ્યા R કે એક ગોલે પર આવેશ વિતરિત હૈં જિસકા
આયતનિક આવેશ ઘનત્વ $\rho(r) = \frac{A}{r^2} e^{-2r/a}$ સે દિયા જાતા
હૈં, જહાં A તથા a નિયતાંક હૈં। યદિ ઇસ આવેશ
વિતરણ કા કુલ આવેશ Q હૈં, તબ ત્રિજ્યા R કા માન
હૈં :

Options :

1. $\frac{a}{2} \log \left(1 - \frac{Q}{2\pi a A} \right)$

2. $\frac{a}{2} \log \left(\frac{1}{1 - \frac{Q}{2\pi a A}} \right)$

3. $a \log \left(1 - \frac{Q}{2\pi a A} \right)$

4. $a \log \left(\frac{1}{1 - \frac{Q}{2\pi a A}} \right)$

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

$\rho(r) = \frac{A}{r^2} e^{-2r/a}$; જ્યાં A અને a અચળાંકો છે, જેટલી

કદ વિદ્યુતભાર ઘનતા ધરાવતા R ત્રિજ્યાના ગોળામાં વિદ્યુત
ભારનું વિતરણ થયેલ છે. જો Q એ આ વિતરણનો કુલ
વિદ્યુતભાર હોય તો ત્રિજ્યા R હશે :

Options :

1. $\frac{a}{2} \log \left(1 - \frac{Q}{2\pi a A} \right)$

2. $\frac{a}{2} \log \left(\frac{1}{1 - \frac{Q}{2\pi a A}} \right)$

3. $a \log \left(1 - \frac{Q}{2\pi aA} \right)$

4. $a \log \left(\frac{1}{1 - \frac{Q}{2\pi aA}} \right)$

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

Charge is distributed within a sphere of radius R with a volume charge density

$$\rho(r) = \frac{A}{r^2} e^{-2r/a}, \text{ where } A \text{ and } a \text{ are constants.}$$

If Q is the total charge of this charge distribution, the radius R is :

Options :

1. $\frac{a}{2} \log \left(1 - \frac{Q}{2\pi aA} \right)$

2. $\frac{a}{2} \log \left(\frac{1}{1 - \frac{Q}{2\pi aA}} \right)$

3. $a \log \left(1 - \frac{Q}{2\pi aA} \right)$

4. $a \log \left(\frac{1}{1 - \frac{Q}{2\pi aA}} \right)$

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

Correct Marks : 4 Wrong Marks : 1

Two point charges $q_1(\sqrt{10} \mu\text{C})$ and $q_2(-25 \mu\text{C})$ are placed on the x -axis at $x=1 \text{ m}$ and $x=4 \text{ m}$ respectively. The electric field (in V/m) at a point $y=3 \text{ m}$ on y -axis is,

$$\left[\text{take } \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2\text{C}^{-2} \right]$$

Options :

1. $(-63\hat{i} + 27\hat{j}) \times 10^2$

2. $(63\hat{i} - 27\hat{j}) \times 10^2$

3. $(81\hat{i} - 81\hat{j}) \times 10^2$

4. $(-81\hat{i} + 81\hat{j}) \times 10^2$

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

दो बिन्दु आवेशों $q_1(\sqrt{10} \mu\text{C})$ तथा $q_2(-25 \mu\text{C})$ को x -अक्ष पर क्रमशः $x=1 \text{ m}$ तथा $x=4 \text{ m}$ पर रखा गया है। y -अक्ष पर बिन्दु $y=3 \text{ m}$ पर विद्युत क्षेत्र का मान (V/m में) होगा :

$$\left[\text{दिया है: } \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2\text{C}^{-2} \right]$$

Options :

1. $(-63\hat{i} + 27\hat{j}) \times 10^2$

2. $(63\hat{i} - 27\hat{j}) \times 10^2$

3. $(81\hat{i} - 81\hat{j}) \times 10^2$

4. $(-81\hat{i} + 81\hat{j}) \times 10^2$

Correct Marks : 4 Wrong Marks : 1

બે બિંદુવત્ વિજભારો $q_1(\sqrt{10} \mu C)$ અને $q_2(-25 \mu C)$ ને x - અક્ષ પર અનુક્રમે $x=1 \text{ m}$ અને $x=4 \text{ m}$ પર મુકેલ છે. y - અક્ષ પરના $y=3 \text{ m}$ પર વિદ્યુત ક્ષેત્રનું મૂલ્ય (V/m માં) હશે :

$$\left[\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2\text{C}^{-2} \right]$$

Options :

1. $(-63\hat{i} + 27\hat{j}) \times 10^2$

2. $(63\hat{i} - 27\hat{j}) \times 10^2$

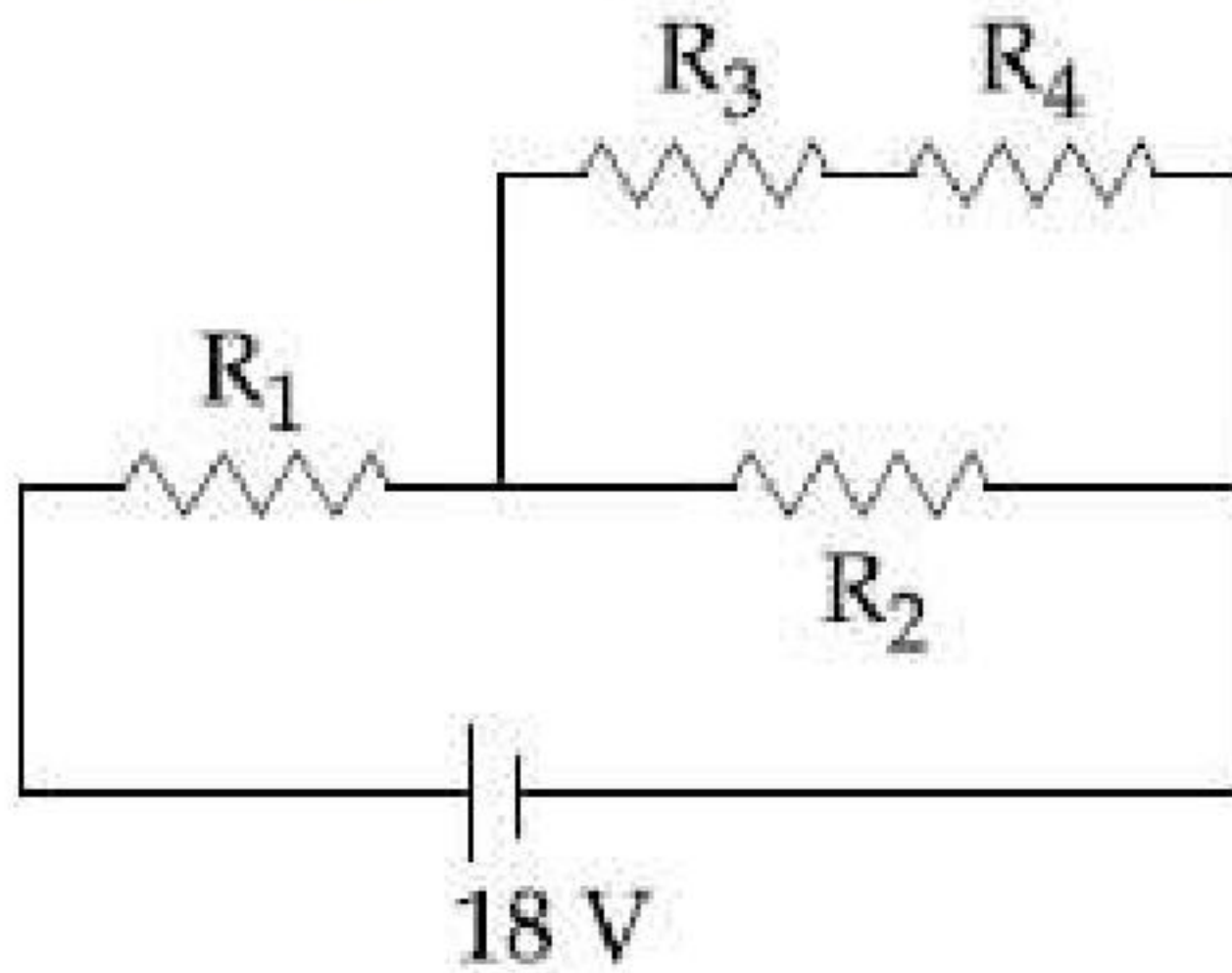
3. $(81\hat{i} - 81\hat{j}) \times 10^2$

4. $(-81\hat{i} + 81\hat{j}) \times 10^2$

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

Correct Marks : 4 Wrong Marks : 1

In the given circuit the internal resistance of the 18 V cell is negligible. If $R_1 = 400 \Omega$, $R_3 = 100 \Omega$ and $R_4 = 500 \Omega$ and the reading of an ideal voltmeter across R_4 is 5 V, then the value of R_2 will be :



Options :

1. 550Ω

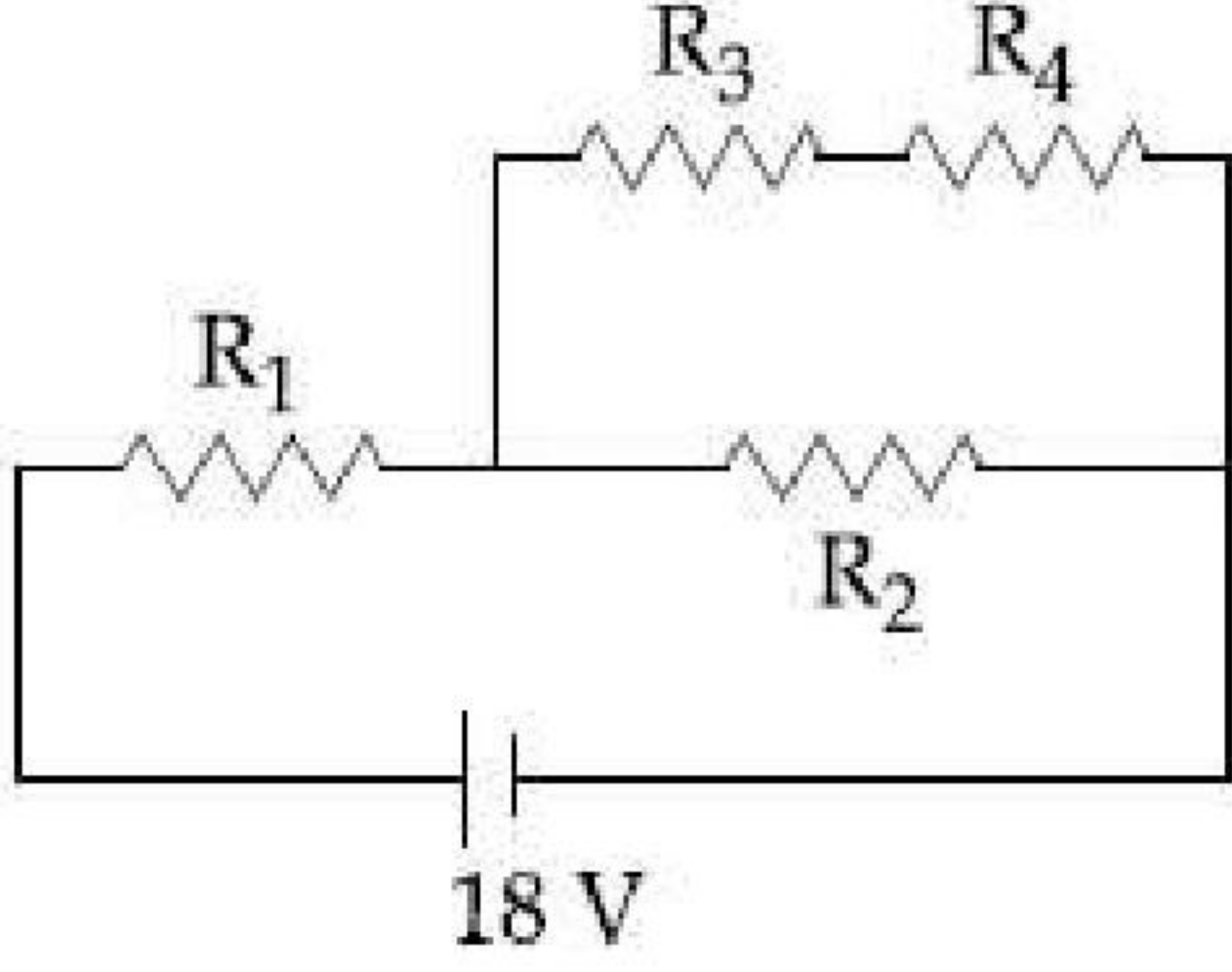
2. 230Ω

3. 450Ω

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

दिये गये परिपथ में 18 V की सेल का आंतरिक प्रतिरोध नगण्य है। यदि $R_1 = 400 \Omega$, $R_3 = 100 \Omega$ तथा $R_4 = 500 \Omega$, हैं और R_4 पर लगे एक आदर्श वोल्टमीटर का पाठ्यांक 5 V है, तो R_2 का मान होगा :



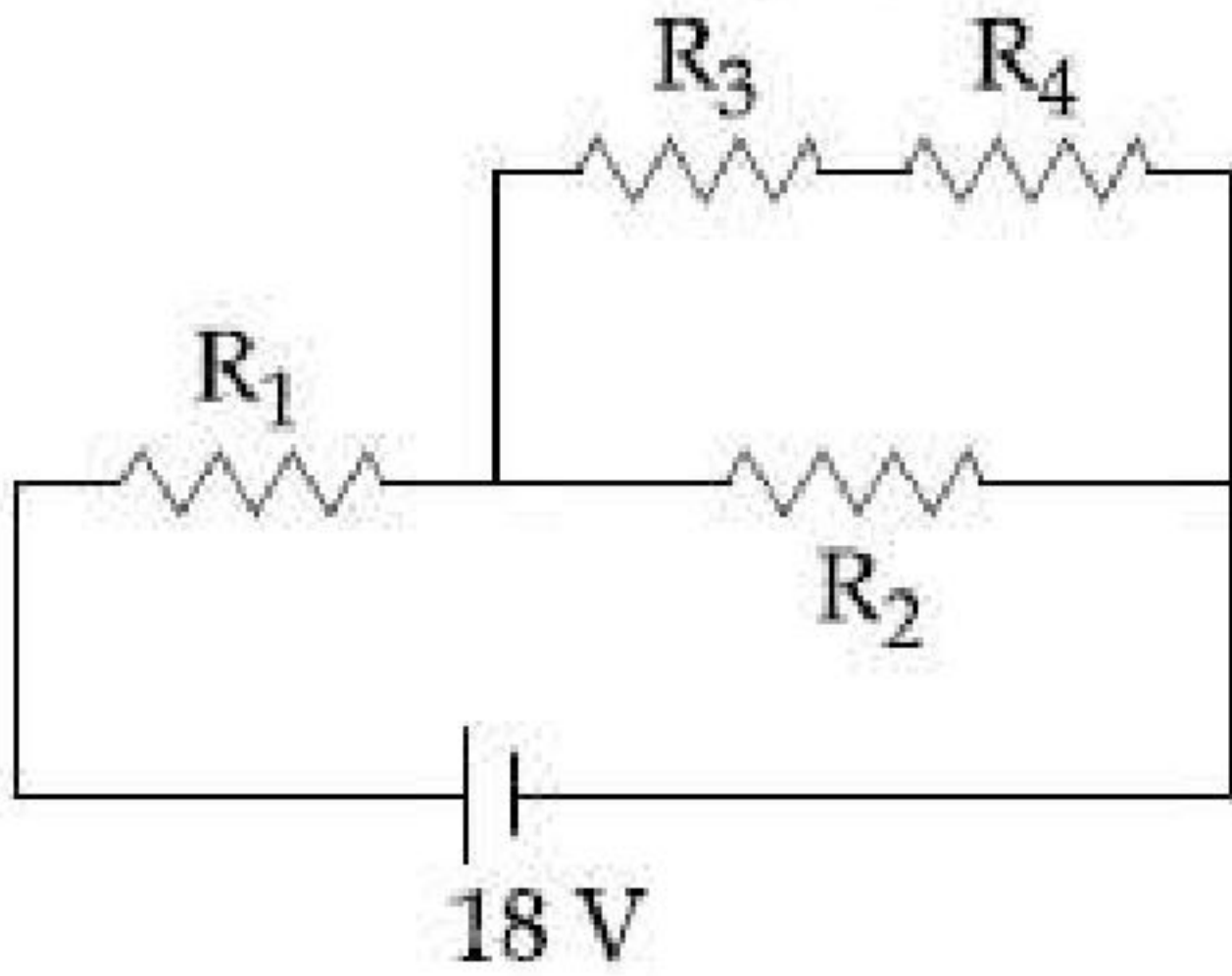
Options :

1. 550Ω
2. 230Ω
3. 450Ω
4. 300Ω

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

આપેલ પરિપથમાં 18 V કોષનો આંતરિક અવરોધ અવગણ્ય છે. જો $R_1 = 400 \Omega$, $R_3 = 100 \Omega$ અને $R_4 = 500 \Omega$, અને જો R_4 ની સાપેક્ષે આદર્શ વોલ્ટમીટરનું વાંચન 5 V છે, તો R_2 નું મૂલ્ય હશે :



Options :

1. 550Ω

230 Ω

3. $450\ \Omega$

4. $300\ \Omega$

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

Correct Marks : 4 Wrong Marks : 1

A series AC circuit containing an inductor (20 mH), a capacitor (120 μ F) and a resistor (60 Ω) is driven by an AC source of 24 V/50 Hz. The energy dissipated in the circuit in 60 s is :

Options :

1. 5.65×10^2 J

2. 2.26×10^3 J

3. 5.17×10^2 J

4. 3.39×10^3 J

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

एक श्रेणीबद्ध प्रत्यावर्ती परिपथ में एक प्रेरक (20 mH), एक संधारित्र (120 μ F) तथा एक प्रतिरोध (60 Ω) लगे हैं और यह एक 24 V/50 Hz के प्रत्यावर्ती स्रोत से चालित है। 60 s समय में क्षयित ऊर्जा का मान होगा :

Options :

1. 5.65×10^2 J

2. 2.26×10^3 J

3. 5.17×10^2 J

4. 3.39×10^3 J

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

એક ઇન્ડક્ટર (20 mH), એક કેપેસિટર (120 μ F) અને અવરોધ (60 Ω) ધરાવતા એક શ્રેણી AC પરિપથ એ એક 24 V/50 Hz ના AC ઉદ્દગમથી ચાલીત છે. આ પરિપથમાં 60 s થતો ઊર્જાનો વ્યય _____ છે.

Options :

1. 5.65×10^2 J
2. 2.26×10^3 J
3. 5.17×10^2 J
4. 3.39×10^3 J

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

લંબાઈ L કે દો એકસમાન ચાલક તારોં મેં સે એક કો વૃત્તાકાર વલય કી આકૃતિ મેં લાયા જાતા હૈ તથા દૂસરે કો N એકસમાન ફેરોં કી વૃત્તાકાર કુંડલી મેં મોડા જાતા હૈ। યદિ દોનોં સે એક હી ધારા પ્રવાહિત કી જાતી હૈ, તો વલય તથા કુંડલી કે કેન્દ્રોં પર ઉપસ્થિત ચુમ્બકીય

ક્ષેત્ર, ક્રમશઃ B_L તથા B_C હોં, તબ અનુપાત $\frac{B_L}{B_C}$

હોગા :

Options :

1. N
2. N^2
3. $\frac{1}{N^2}$
4. $\frac{1}{N}$

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

Correct Marks : 4 Wrong Marks : 1

L જેટલી સમાન લંબાઈના બે વાહક તારમાંથી એકને વાળીને વર્તુળાકાર બંધગાળો બનાવવામાં આવે છે અને બીજાને N સમાન આંટાઓવાળું ગુંચળું બનાવવામાં આવે છે. જો બન્નેમાં સમાન પ્રવાહ પસાર કરાવામાં આવે તો બંધગાળાના કેન્દ્રના ચુંબકીય ક્ષેત્ર (B_L) અને ગુંચળાના કેન્દ્રના ચુંબકીય ક્ષેત્ર (B_C) નો ગુણોત્તર $\frac{B_L}{B_C}$ એ _____ થશે.

Options :

1. N
2. N^2
3. $\frac{1}{N^2}$
4. $\frac{1}{N}$

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

Correct Marks : 4 Wrong Marks : 1

One of the two identical conducting wires of length L is bent in the form of a circular loop and the other one into a circular coil of N identical turns. If the same current is passed in both, the ratio of the magnetic field at the central of the loop (B_L) to that at

the centre of the coil (B_C), i.e. $\frac{B_L}{B_C}$ will be :

Options :

1. N
2. N^2
3. $\frac{1}{N^2}$
4. $\frac{1}{N}$

Correct Marks : 4 Wrong Marks : 1

A particle having the same charge as of electron moves in a circular path of radius 0.5 cm under the influence of a magnetic field of 0.5 T. If an electric field of 100 V/m makes it to move in a straight path, then the mass of the particle is (Given charge of electron = $1.6 \times 10^{-19} \text{C}$)

Options :

1. $9.1 \times 10^{-31} \text{ kg}$
2. $2.0 \times 10^{-24} \text{ kg}$
3. $1.6 \times 10^{-19} \text{ kg}$
4. $1.6 \times 10^{-27} \text{ kg}$

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

Correct Marks : 4 Wrong Marks : 1

एक कण, जिसका आवेश इलेक्ट्रॉन के आवेश के समान है, 0.5 T चुम्बकीय क्षेत्र में एक 0.5 cm त्रिज्या के वृत्ताकार पथ पर चलता है। यदि 100 V/m का विद्युत क्षेत्र लगाने पर यह कण एक सीधी रेखा में चलता है, तो कण का द्रव्यमान होगा :
(दिया है इलेक्ट्रॉन का आवेश = $1.6 \times 10^{-19} \text{C}$)

Options :

1. $9.1 \times 10^{-31} \text{ kg}$
2. $2.0 \times 10^{-24} \text{ kg}$
3. $1.6 \times 10^{-19} \text{ kg}$
4. $1.6 \times 10^{-27} \text{ kg}$

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

ઇલેક્ટ્રોનના જેટલોજ વીજભાર ધરાવતો એક કણ 0.5 cm ત્રિજ્યાના વર્તુળાકાર પથ પર 0.5 T ચુંબકીય ક્ષેત્રની અસર નીચે ગતિ કરે છે. જો 100 V/m નું વિદ્યુત ક્ષેત્ર તેને

Options :

1. $9.1 \times 10^{-31} \text{ kg}$
2. $2.0 \times 10^{-24} \text{ kg}$
3. $1.6 \times 10^{-19} \text{ kg}$
4. $1.6 \times 10^{-27} \text{ kg}$

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 power transmission line feeds input power at 2300 V to a step down transformer with its primary windings having 4000 turns. The output power is delivered at 230 V by the transformer. If the current in the primary of the transformer is 5A and its efficiency is 90%, the output current would be :

Options :

1. 35 A
2. 50 A
3. 45 A
4. 25 A

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

2300 V की एक शक्ति संचरण लाइन एक अपचायी ट्रांसफॉर्मर, जिसके प्राथमिक कुंडली में 4000 फेरें हैं, को शक्ति प्रदान करती है। ट्रांसफॉर्मर 230 V के निर्गत विभव पर शक्ति वितरण करता है। यदि ट्रांसफॉर्मर की प्राथमिक कुंडली में 5A की धारा है तथा इसकी दक्षता 90% है, तो निर्गत धारा का मान होगा :

Options :

1. 35 A

3. 45 A

4. 25 A

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

Correct Marks : 4 Wrong Marks : 1

એક પાવર ટ્રાન્સમીશન લાઇન એ 2300 V નો પાવર એક સ્ટેપ ડાઉન ટ્રાન્સફોર્મર કે જેનું મુખ્ય ગુચળું 4000 આંટાઓ ધરાવે છે તેને આપવામાં આવે છે. આ ટ્રાન્સફોર્મર વડે 230 V પાવર ડિલિવર કરવામાં આવે છે. જો આ ટ્રાન્સફોર્મરનાં મુખ્ય ગુંચળામાં 5A પ્રવાહ અને કાર્યક્ષમતા 90% છે તો આઉટપૂટ પ્રવાહ હશે :

Options :

1. 35 A

2. 50 A

3. 45 A

4. 25 A

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

Correct Marks : 4 Wrong Marks : 1

The energy associated with electric field is (U_E) and with magnetic field is (U_B) for an electromagnetic wave in free space. Then :

Options :

1. $U_E > U_B$

2. $U_E < U_B$

3. $U_E = U_B$

4. $U_E = \frac{U_B}{2}$

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

यदि मुक्त आकाश में एक विद्युत चुम्बकीय तरंग के विद्युत क्षेत्र में निहित ऊर्जा (U_E) तथा चुम्बकीय क्षेत्र में निहित ऊर्जा (U_B) है, तो :

Options :

1. $U_E > U_B$

2. $U_E < U_B$

3. $U_E = U_B$

4. $U_E = \frac{U_B}{2}$

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

Correct Marks : 4 Wrong Marks : 1

મુક્ત અવકાશમાં વિદ્યુતચુંબકીય તરંગમાં U_E અને U_B એ ક્રમશઃ વિદ્યુતક્ષેત્ર અને ચુંબકીય ક્ષેત્ર સાથે સંકળાયેલ ઊર્જા છે, તો :

Options :

1. $U_E > U_B$

2. $U_E < U_B$

3. $U_E = U_B$

4. $U_E = \frac{U_B}{2}$

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

Two plane mirrors are inclined to each other such that a ray of light incident on the first mirror (M_1) and parallel to the second mirror (M_2) is finally reflected from the second mirror (M_2) parallel to the first mirror (M_1). The angle between the two mirrors will be :

Options :

1. 45°

2. 60°
3. 75°
4. 90°

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

દો સમતલ દર્પણો (M_1 તથા M_2) કો પરસ્પર એસે કોણ પર રચા ગયા હૈ જિસસે પ્રકાશ કી ઁક કિરણ જબ M_2 કે સમાંતર જાતી હુયી M_1 પર આપતિત હોતી હૈ તો અંતતઃ વહ M_2 સે M_1 કે સમાંતર પરાવર્તિત હોતી હૈ। દર્પણો કે બીચ કોણ કા માન હોગા :

Options :

1. 45°
2. 60°
3. 75°
4. 90°

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

બે સમતલ અરિસાઓ ઁક બીજાથી ઁવી રીતે ઢળતાં રાખવામાં આવ્યા છે કે જેથી પ્રથમ અરિસા (M_1) પર આપાત થતુ પ્રકાશનું કિરણ કે જે બીજા અરિસા (M_2) ને સમાંતર છે અને અંતે બીજા અરિસા (M_2) થી પરાવર્તિત થાય છે કે જે પ્રથમ અરિસા (M_1) ને સમાંતર છે. આ બે અરિસા વચ્ચેનો ખુણો થશે :

Options :

1. 45°
2. 60°
3. 75°
4. 90°

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, the slits are placed 0.320 mm apart. Light of wavelength $\lambda = 500$ nm is incident on the slits. The total number of bright fringes that are observed in the angular range $-30^\circ \leq \theta \leq 30^\circ$ is :

Options :

1. 320

2. 321

3. 640

4. 641

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

યંગ કે એક દ્વિઝિરી ઉપકરણ મેં ઝિરિયોં કે બીચ દૂરી 0.320 mm હૈ। તરંગદૈર્ઘ્ય $\lambda = 500$ nm કા પ્રકાશ ઝિરિયોં પર પડતા હૈ। કોણીય પરાસ $-30^\circ \leq \theta \leq 30^\circ$ મેં દિખને વાલી દીપ્ત ફ્રિંજોં કી સંખ્યા હોગી :

Options :

1. 320

2. 321

3. 640

4. 641

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

યંગના બે સ્લિટના પ્રયોગમાં સ્લિટને એક બીજાથી 0.320 mm દૂર રાખવામાં આવે છે. આ સ્લિટ્સ પર $\lambda = 500$ nm ની તરંગલંબાઈનો પ્રકાશ આપાત થાય છે. $-30^\circ \leq \theta \leq 30^\circ$ ની કોણીય અવધીમાં જોવા મળતી પ્રકાશિત શલાકઓની કલ સંખ્યા હશે :

1. 320

2. 321

3. 640

4. 641

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

The magnetic field associated with a light wave is given, at the origin, by

$$B = B_0 [\sin(3.14 \times 10^7)ct + \sin(6.28 \times 10^7)ct].$$

If this light falls on a silver plate having a work function of 4.7 eV, what will be the maximum kinetic energy of the photo electrons ?

$$(c = 3 \times 10^8 \text{ ms}^{-1}, h = 6.6 \times 10^{-34} \text{ J-s})$$

Options :

1. 7.72 eV

2. 8.52 eV

3. 12.5 eV

4. 6.82 eV

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

Correct Marks : 4 Wrong Marks : 1

मूलबिंदु पर एक प्रकाशीय तरंग के संगत चुम्बकीय क्षेत्र निम्न है :

$$B = B_0 [\sin(3.14 \times 10^7)ct + \sin(6.28 \times 10^7)ct].$$

यदि यह प्रकाश एक चाँदी की प्लेट, जिसका कार्य फलन 4.7 eV है, पर पड़ता है तो इससे उत्सर्जित फोटोइलैक्ट्रॉनों की अधिकतम गतिज ऊर्जा क्या होगी ?

$$(\text{दिया है : } c = 3 \times 10^8 \text{ ms}^{-1}, h = 6.6 \times 10^{-34} \text{ J-s})$$

Options :

1. 7.72 eV

2. 8.52 eV
3. 12.5 eV
4. 6.82 eV

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

Correct Marks : 4 Wrong Marks : 1

ઉગમબિંદુ એ પ્રકાશ તરંગને સંલગ્ન ચુંબકીય ક્ષેત્રને

$$B = B_0 [\sin(3.14 \times 10^7)ct + \sin(6.28 \times 10^7)ct]$$

પડે આપવામાં આવે છે. જો આ પ્રકાશ કોઈ એક ચાંદીની તકિત કે જેનું કાર્ય વિધેય 4.7 eV હોય તેની પર પડે તો ફોટોઇલેક્ટ્રોનની મહત્તમ ગતિ ઊર્જા કેટલી હશે?

($c = 3 \times 10^8 \text{ ms}^{-1}$, $h = 6.6 \times 10^{-34} \text{ J-s}$ લો.)

Options :

1. 7.72 eV
2. 8.52 eV
3. 12.5 eV
4. 6.82 eV

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

Correct Marks : 4 Wrong Marks : 1

At a given instant, say $t = 0$, two radioactive substances A and B have equal activities.

The ratio $\frac{R_B}{R_A}$ of their activities after

time t itself decays with time t as e^{-3t} .
If the half-life of A is $\ln 2$, the half-life of B is :

Options :

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

4. $4\ln 2$

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

Correct Marks : 4 Wrong Marks : 1

દિયે ગયે એક ક્ષણ, $t=0$ પર દો રેડિયોધર્મી પદાર્થો, A તથા B, કી સક્રિયતા બરાબર હૈ। સમય t કે પશ્ચાત,

इनकी सक्रियता का अनुपात $\frac{R_B}{R_A}$ समय t के साथ

e^{-3t} કે અનુસાર ઘટતા હૈ। યદિ A કી અર્ધઆયુ $\ln 2$ હૈ, તો B કી અર્ધઆયુ હોગી :

Options :

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

2. $\frac{\ln 2}{2}$

3. $2\ln 2$

4. $4\ln 2$

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

Correct Marks : 4 Wrong Marks : 1

આપેલ ક્ષણે, $t=0$, બે રેડિયોએક્ટિવ દ્રવ્યો A અને B ની એક્ટિવિટી સમાન છે. t સમય બાદ તેમની

એક્ટિવિટીઓનો ગુણોત્તર $\frac{R_B}{R_A}$ સમય t સાથે e^{-3t}

વડે ક્ષય પામે છે. જો A નો અર્ધઆયુષ્યકાળ $\ln 2$ છે, તો B નો અર્ધઆયુષ્યકાળ હશે :

Options :

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

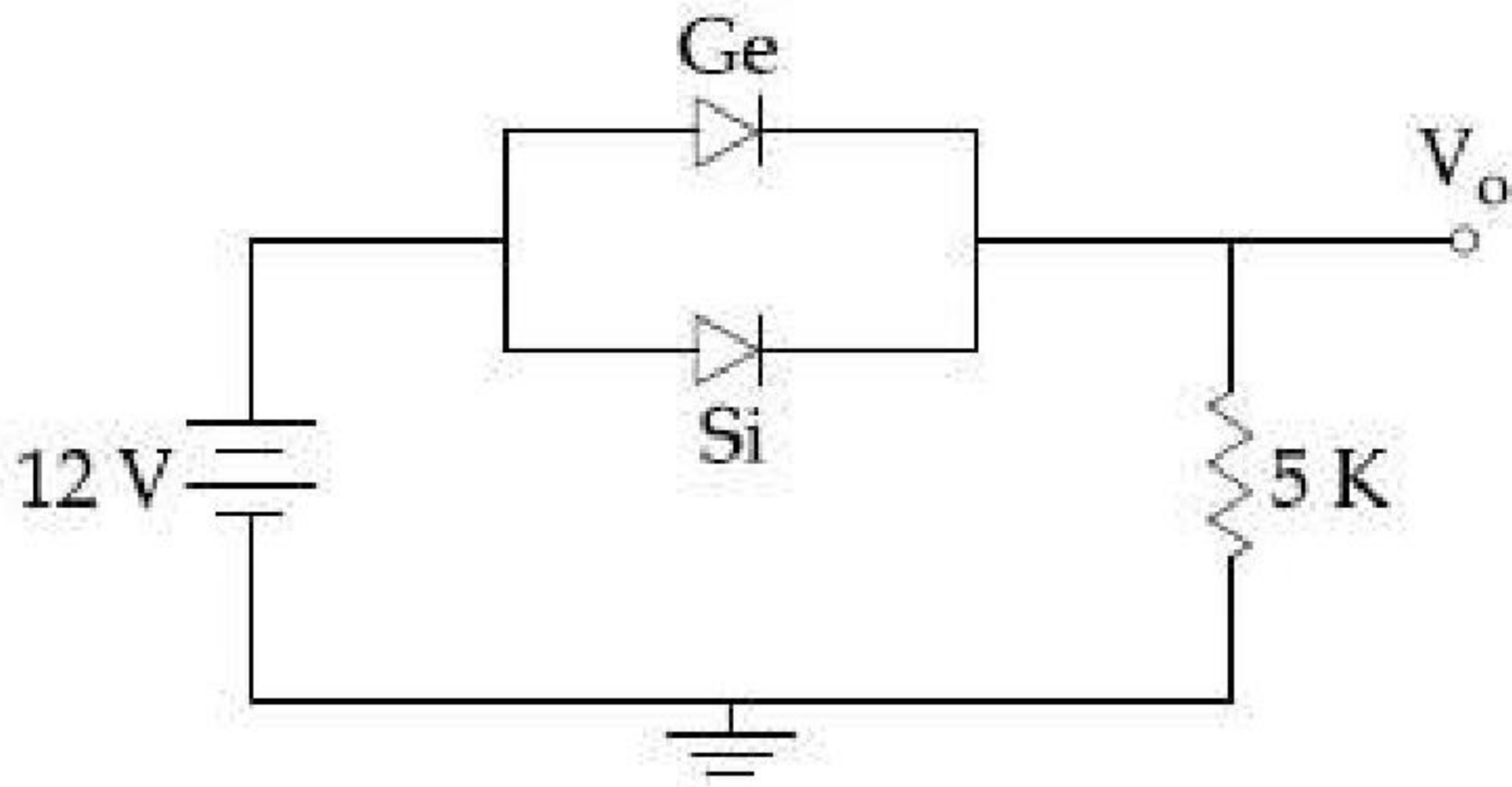
2. $\frac{\ln 2}{2}$

3. $2\ln 2$

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

Correct Marks : 4 Wrong Marks : 1

Ge and Si diodes start conducting at 0.3 V and 0.7 V respectively. In the following figure if Ge diode connection are reversed, the value of V_o changes by : (assume that the Ge diode has large breakdown voltage)



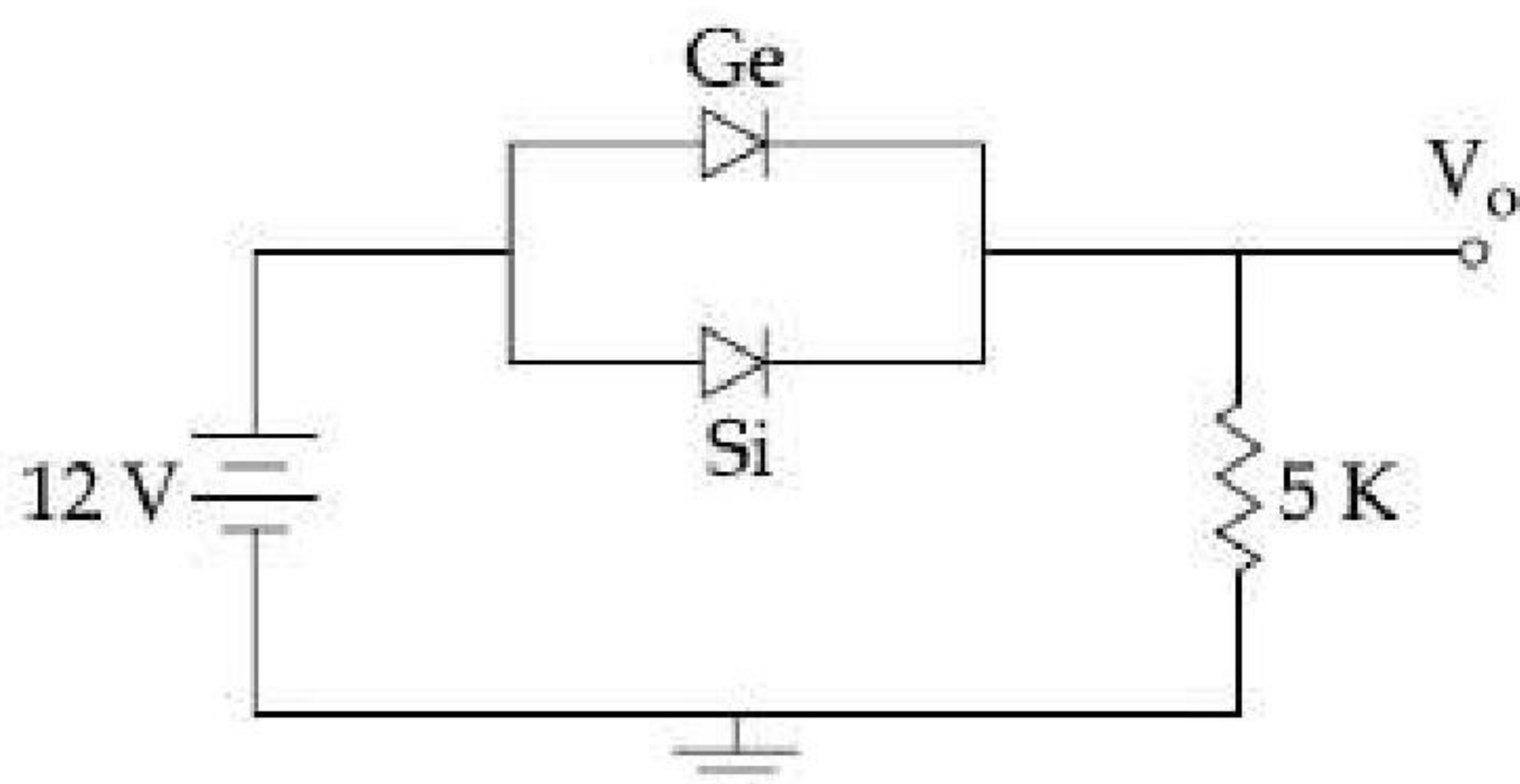
Options :

1. 0.4 V
2. 0.2 V
3. 0.6 V
4. 0.8 V

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

Ge तथा Si के डायोड, क्रमशः 0.3 V तथा 0.7 V पर सुचालक हो जाते हैं। दिय गये चित्र में यदि Ge डायोड के सिरों को पलट दिया जाये तो विभव V_o में परिवर्तन का मान होगा : (मान लें कि Ge डायोड की भंजन वोल्टता अत्यधिक है।)



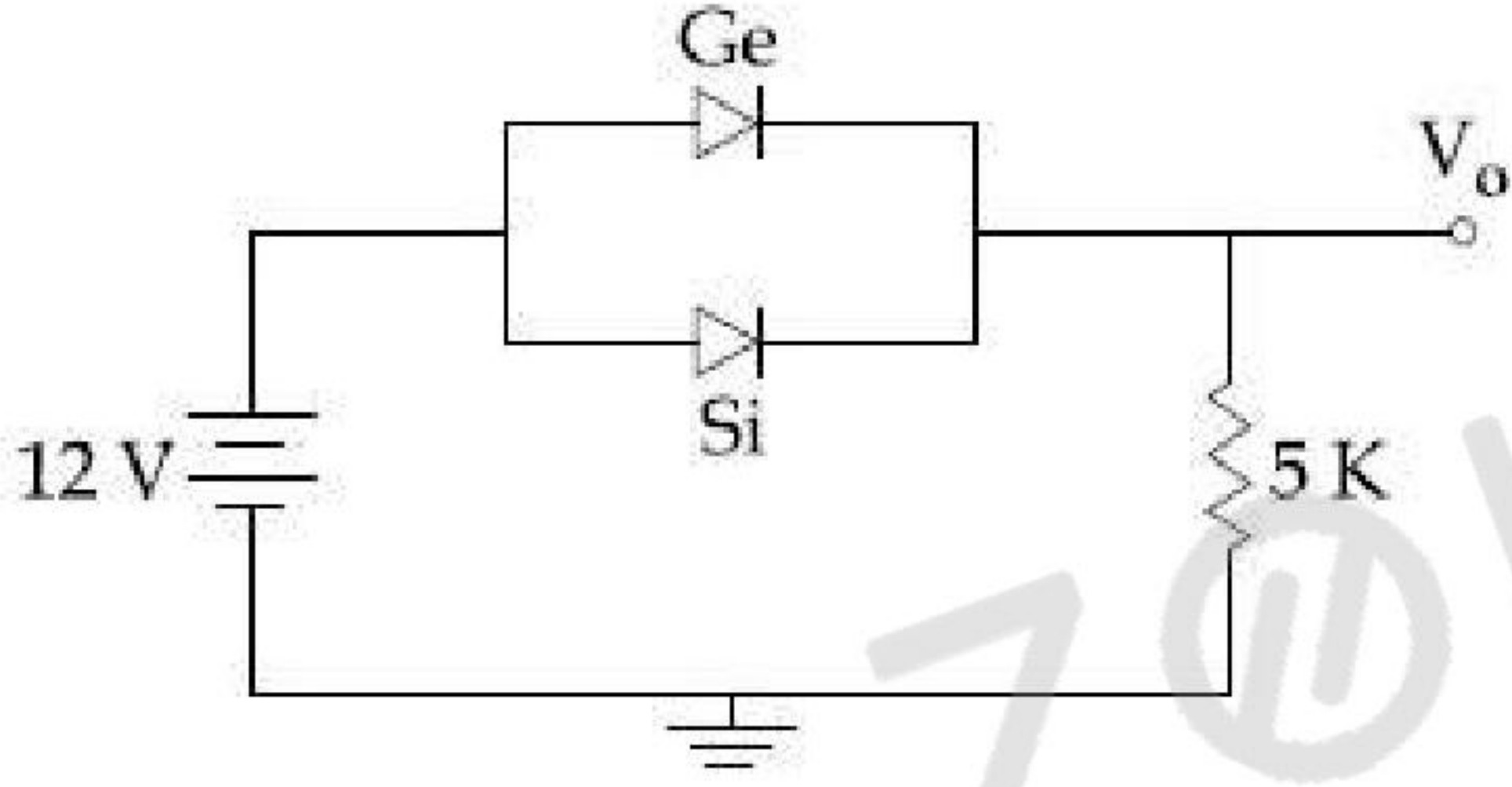
Options :

2. 0.2 V
3. 0.6 V
4. 0.8 V

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

Ge અને Si ડાયોડ ક્રમશઃ 0.3 V અને 0.7 V પર વહન ચાલુ કરે છે. નીચેના પરિપથમાં જો Ge ડાયોડનું જોડાણ ઉલ્ટાવવામાં આવે તો V_o નું મૂલ્ય _____ જેટલું બદલાશે. (ધારો કે Ge ડાયોડ નો બ્રેકડૉન વોલટેજ મોટો છે.)



Options :

1. 0.4 V
2. 0.2 V
3. 0.6 V
4. 0.8 V

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

In a communication system operating at wavelength 800 nm, only one percent of source frequency is available as signal bandwidth. The number of channels accommodated for transmitting TV signals of band width 6 MHz are (Take velocity of light $c = 3 \times 10^8 \text{ m/s}$, $h = 6.6 \times 10^{-34} \text{ J-s}$)

Options :

2. 3.86×10^6

3. 4.87×10^5

4. 3.75×10^6

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

800 nm તરંગદૈર્ઘ્ય પર કાર્ય કરતે હુએ એક સંચાર વ્યવસ્થા મેં સિગ્નલ કી કુલ સ્ત્રોત આવૃત્તિ કા માત્ર એક પ્રતિશત બેંડ ચૌડાઈ કે લિએ ઉપયોગ કર સકતે હૈં। 6 MHz બેંડ ચૌડાઈ કે TV સિગ્નલોં વાલે કિતને ચેનલોં કો ઇસસે સંચારિત કિયા જા સકતા હૈં?

(દિયા હૈં : $c = 3 \times 10^8 \text{ m/s}$, $h = 6.6 \times 10^{-34} \text{ J-s}$)

Options :

1. 6.25×10^5

2. 3.86×10^6

3. 4.87×10^5

4. 3.75×10^6

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

800 nm તરંગલંબાઈ પર કાર્યરત એક સંદેશાવ્યવહાર તંત્રમાં ફક્ત એક ટકા ઉદ્દગમ આવૃત્તિ જ સિગ્નલ બેન્ડવિડથ માટે મળવા પાત્ર છે. 6 MHz ની બેન્ડવિડથના TV સિગ્નલનાં ટ્રાન્સમીશન માટે સમાવિષ્ટ ચેનલોની સંખ્યા હશે :

(પ્રકાશનો વેગ $c = 3 \times 10^8 \text{ m/s}$, $h = 6.6 \times 10^{-34} \text{ J-s}$ લો)

Options :

1. 6.25×10^5

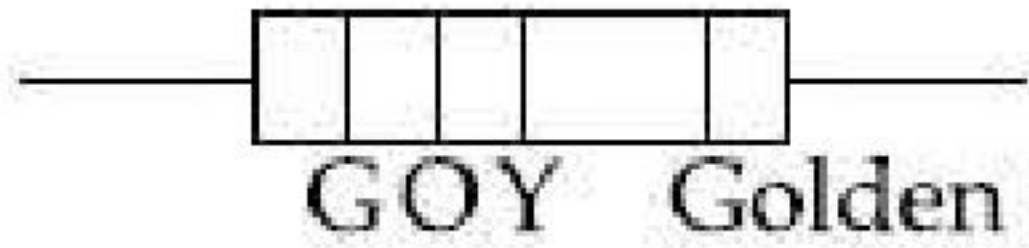
2. 3.86×10^6

4. 3.75×10^6

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

Correct Marks : 4 Wrong Marks : 1

एक कार्बन प्रतिरोध का कलर कोड निम्न है। इसके प्रतिरोध का मान होगा :



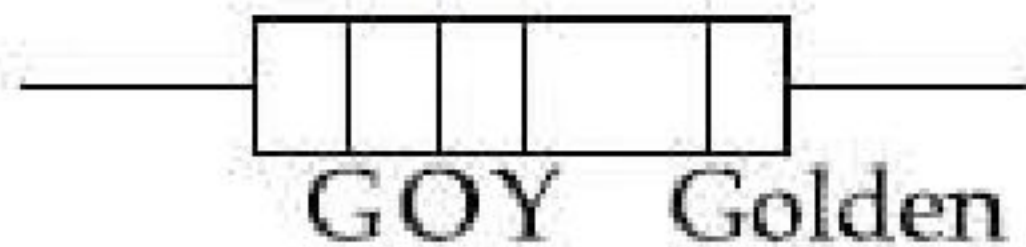
Options :

1. $6.4 \text{ M}\Omega \pm 5\%$
2. $530 \text{ k}\Omega \pm 5\%$
3. $64 \text{ k}\Omega \pm 10\%$
4. $5.3 \text{ M}\Omega \pm 5\%$

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

એક કાર્બન અવરોધ નિમ્ન વર્ણ સંકેતો ધરાવે છે. આ અવરોધનું મૂલ્ય શું છે ?



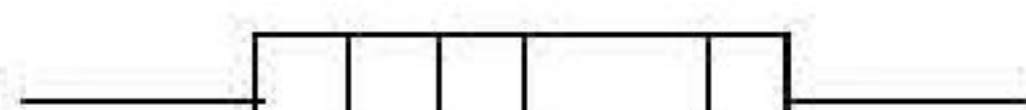
Options :

1. $6.4 \text{ M}\Omega \pm 5\%$
2. $530 \text{ k}\Omega \pm 5\%$
3. $64 \text{ k}\Omega \pm 10\%$
4. $5.3 \text{ M}\Omega \pm 5\%$

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 carbon resistance has a following colour code. What is the value of the resistance ?



1. $6.4 \text{ M}\Omega \pm 5\%$
2. $530 \text{ k}\Omega \pm 5\%$
3. $64 \text{ k}\Omega \pm 10\%$
4. $5.3 \text{ M}\Omega \pm 5\%$

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

The pitch and the number of divisions, on the circular scale, for a given screw gauge are 0.5 mm and 100 respectively. When the screw gauge is fully tightened without any object, the zero of its circular scale lies 3 divisions below the mean line.

The readings of the main scale and the circular scale, for a thin sheet, are 5.5 mm and 48 respectively, the thickness of this sheet is :

Options :

1. 5.725 mm
2. 5.755 mm
3. 5.950 mm
4. 5.740 mm

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

Correct Marks : 4 Wrong Marks : 1

एक पेचमापी की पिच तथा वृत्तीय पैमाने पर भागों की संख्या, क्रमशः 0.5 mm तथा 100 है। जब पेचमापी को बिना किसी वस्तु के पूरी तरह कस दिया जाता है, तो इसके वृत्तीय पैमाने का शून्य मध्य रेखा से तीन भाग नीचे आता है।

एक पतली चढ़र की मोटाई के लिए इस पेचमापी के मुख्य पैमाने तथा वृत्तीय पैमाने का पाठ्यांक, क्रमशः 5.5 mm तथा 48 हैं। तो चढ़र की मोटाई

1. 5.725 mm
2. 5.755 mm
3. 5.950 mm
4. 5.740 mm

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

આપેલ એક સ્ક્રૂગેજમાં વર્તુળાકાર સ્કેલ પર પિચ અને કાપાઓની સંખ્યા અનુક્રમે 0.5 mm અને 100 છે. જ્યારે આ સ્ક્રૂગેજ પૂર્ણતઃ કોઈપણ પદાર્થ વગર બંધ છે, ત્યારે વર્તુળાકાર માપપટ્ટી નું શૂન્ય સરેરાસ રેખાની 3 કાપા નીચે છે. એક પાતળી તકિતમાટે મુખ્ય માપપટ્ટી અને વર્તુળાકાર માપપટ્ટીના વાંચનો અનુક્રમે 5.5 mm અને 48 છે. આ તકિતની જાડાઈ હશે :

Options :

1. 5.725 mm
2. 5.755 mm
3. 5.950 mm
4. 5.740 mm

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

Chemistry

416529119

2

Online

Mandatory

30

30

120

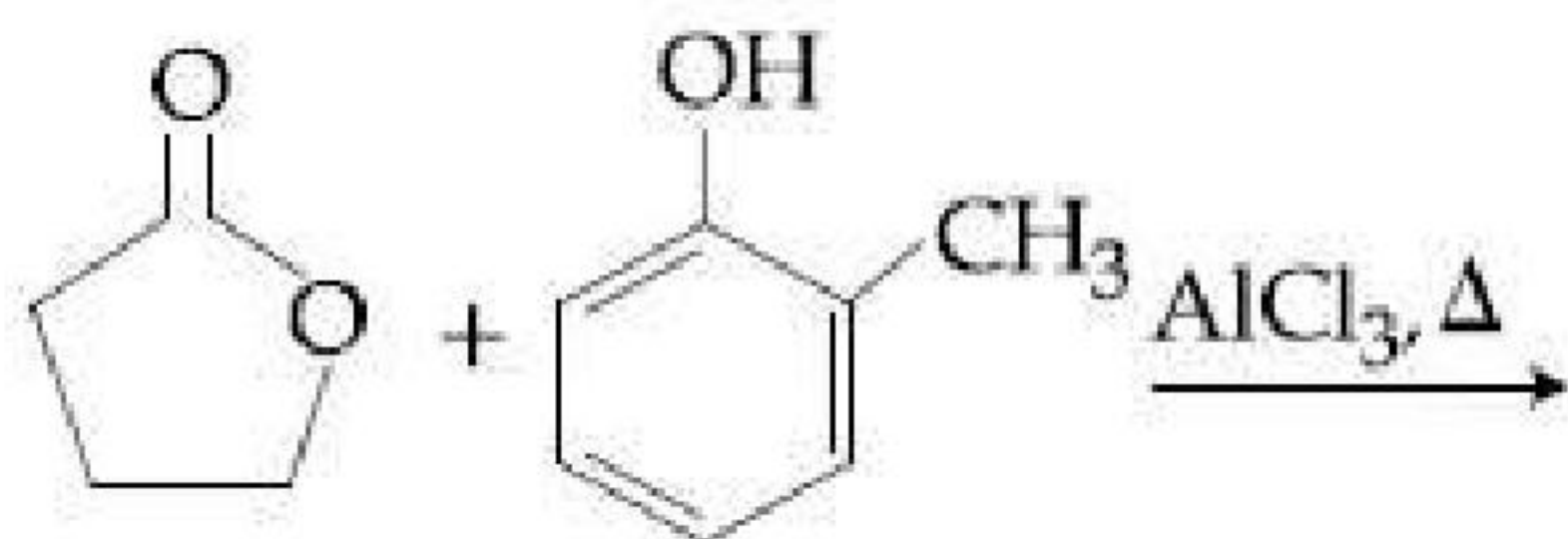
Yes

No

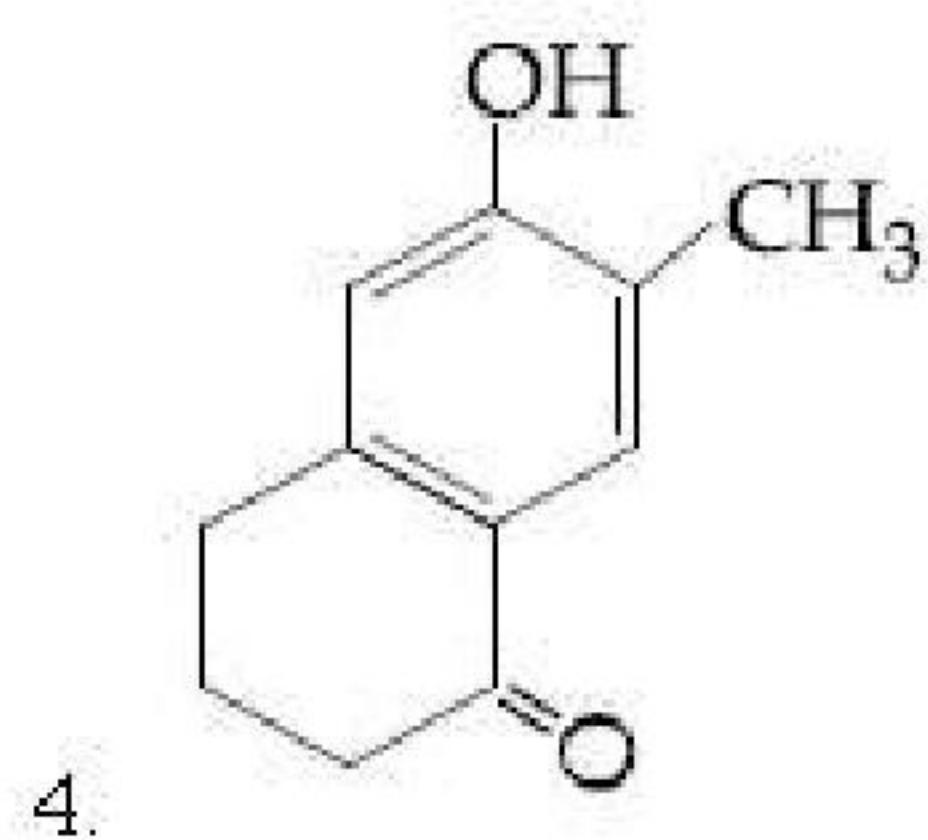
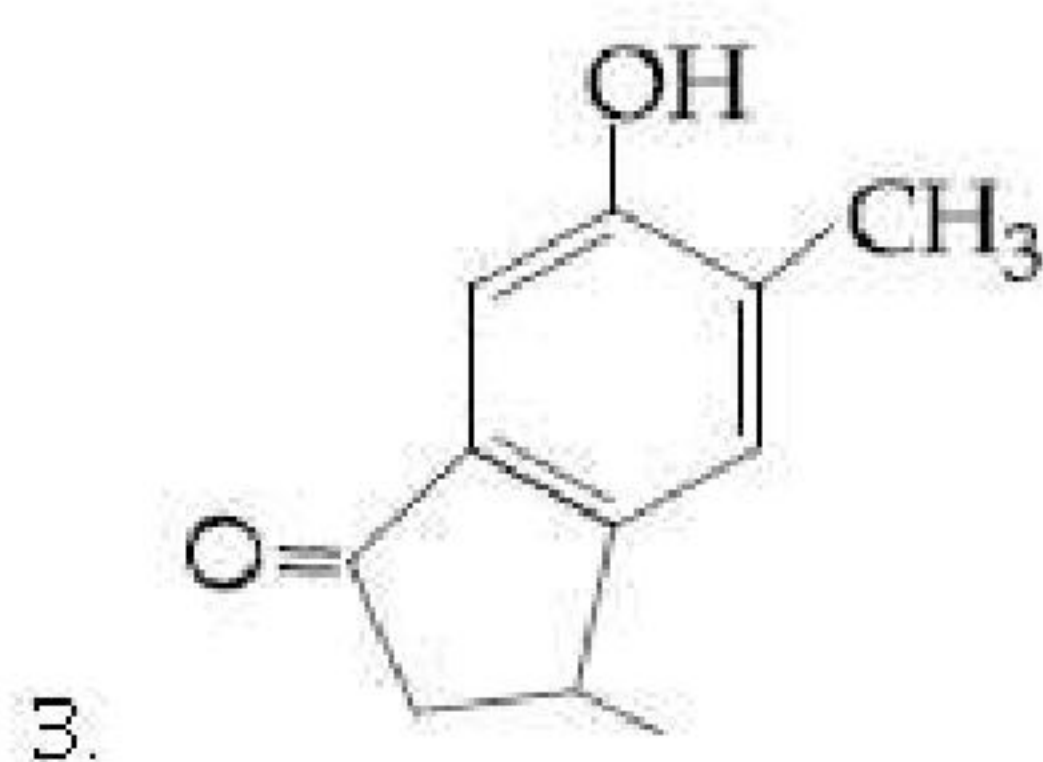
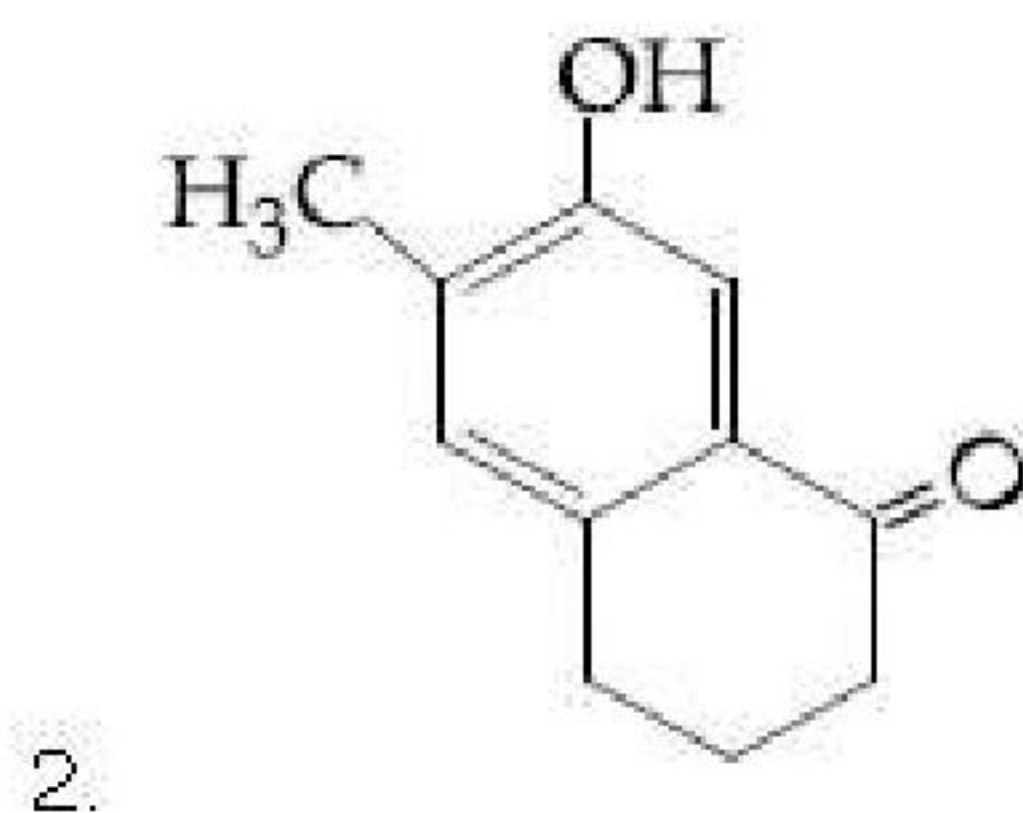
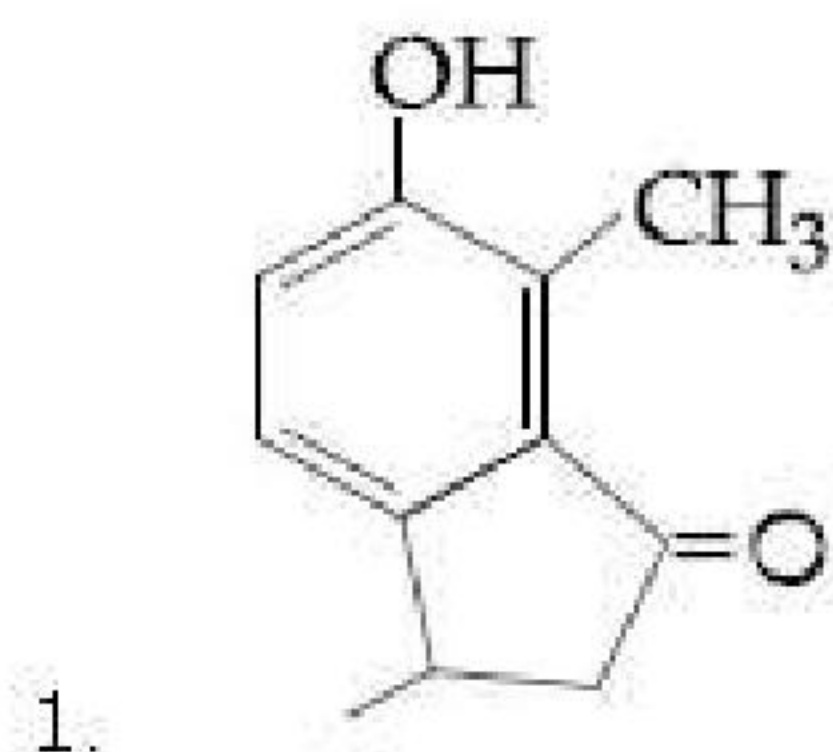
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



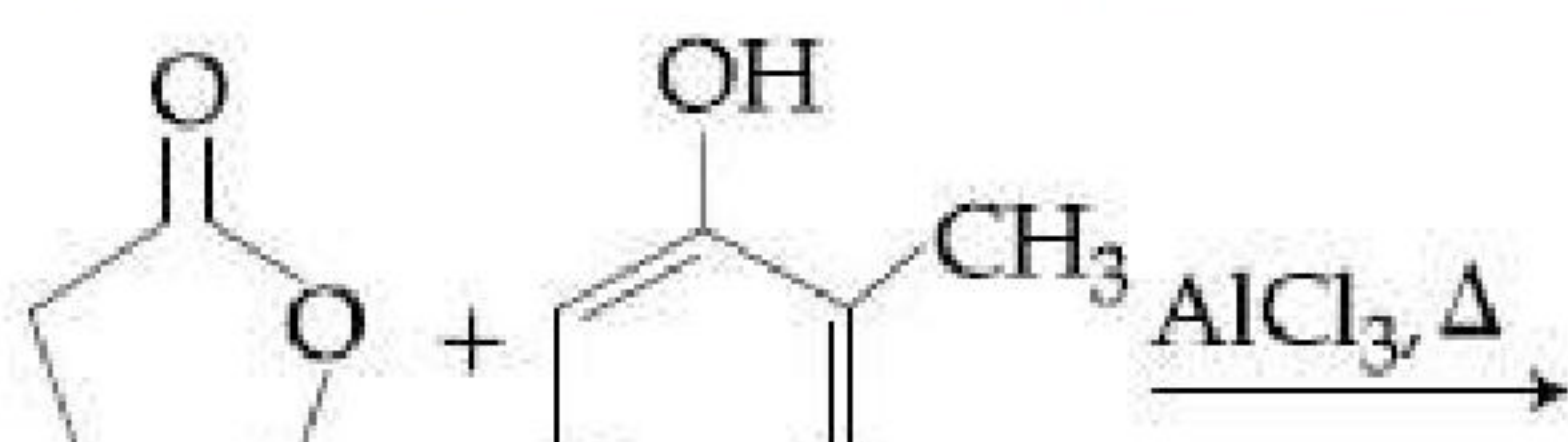
Options :



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

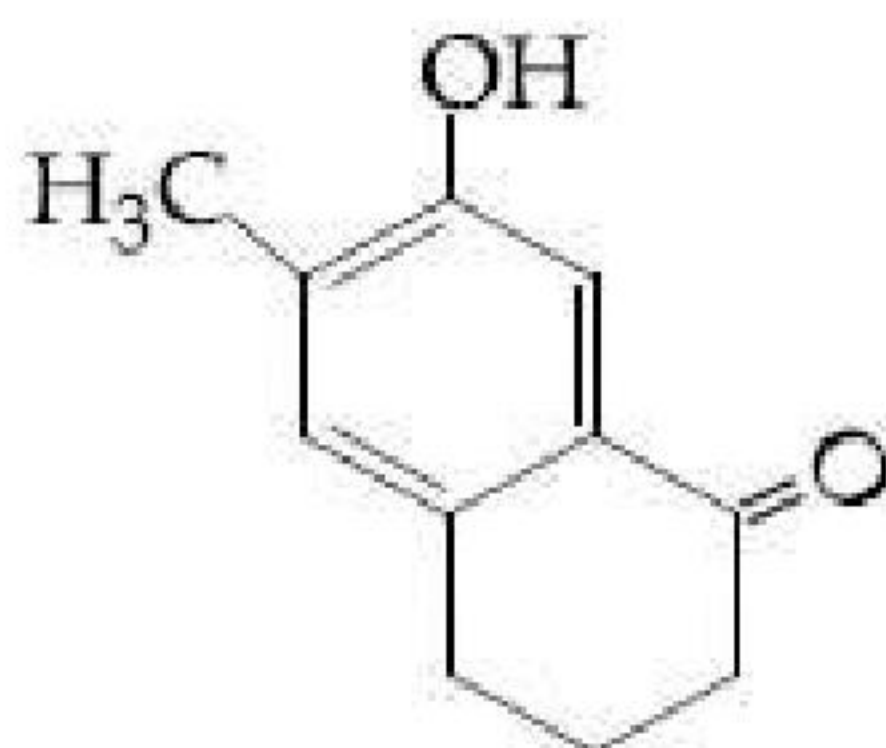
निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



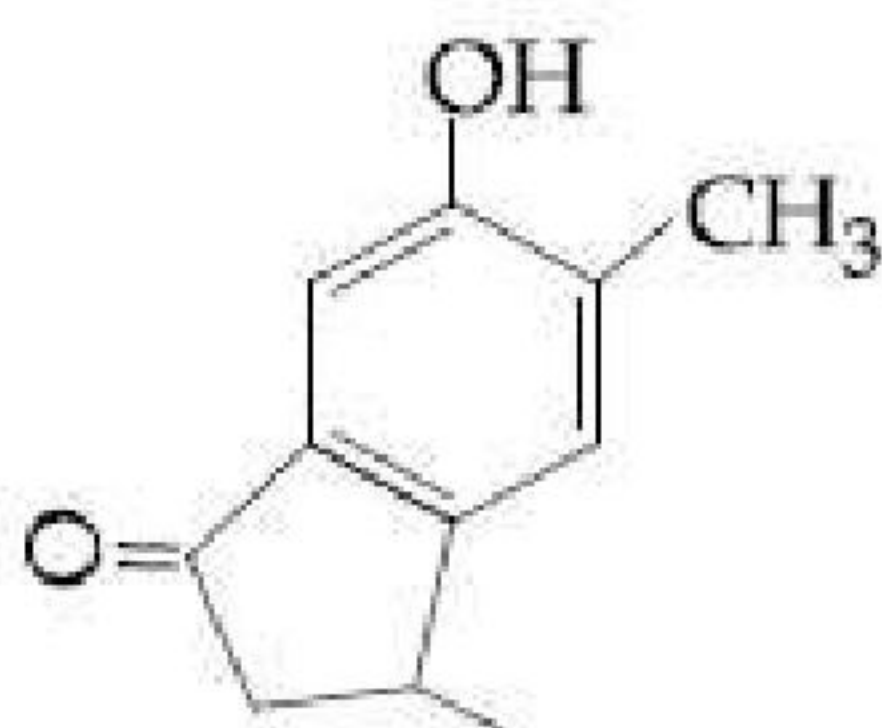
1.



2.



3.



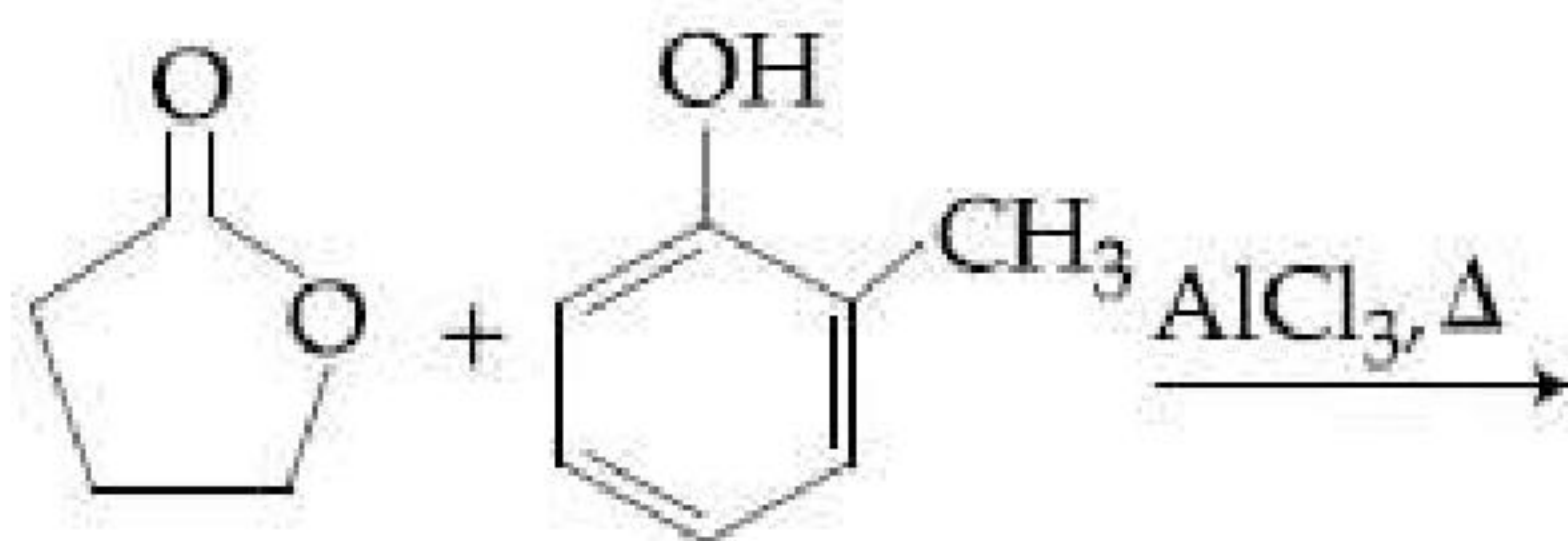
4.



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

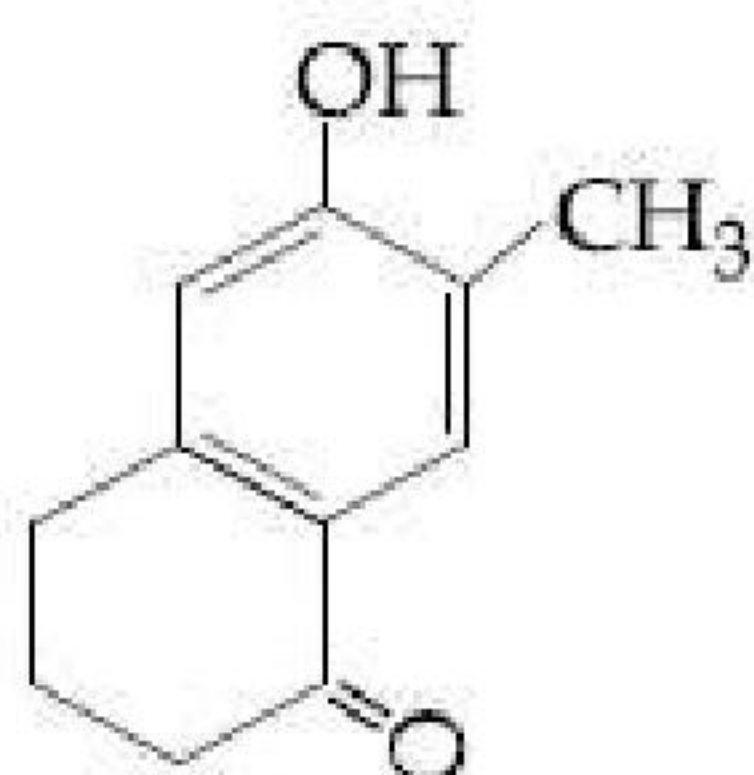
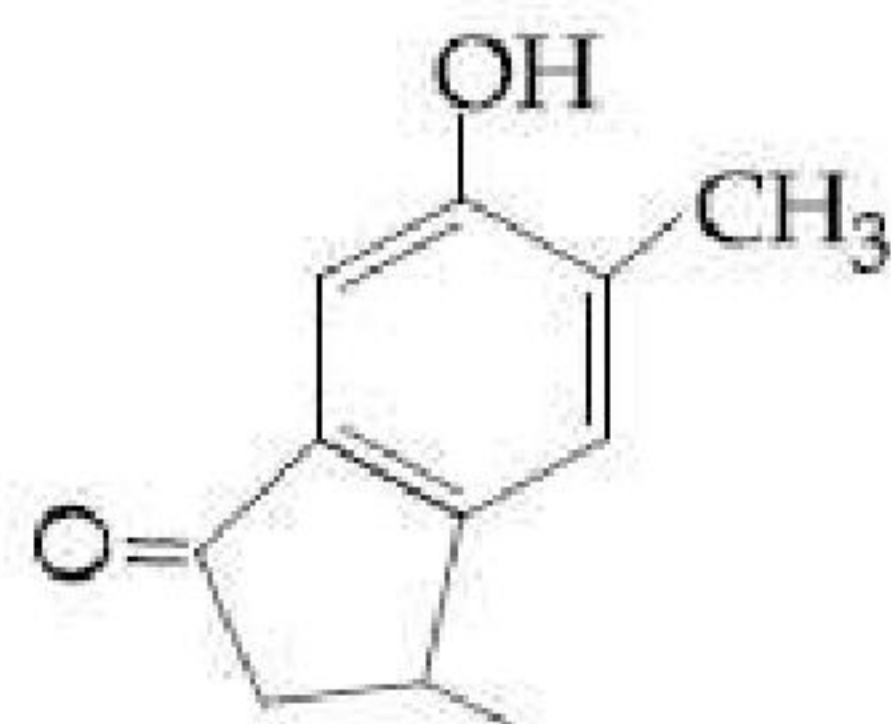
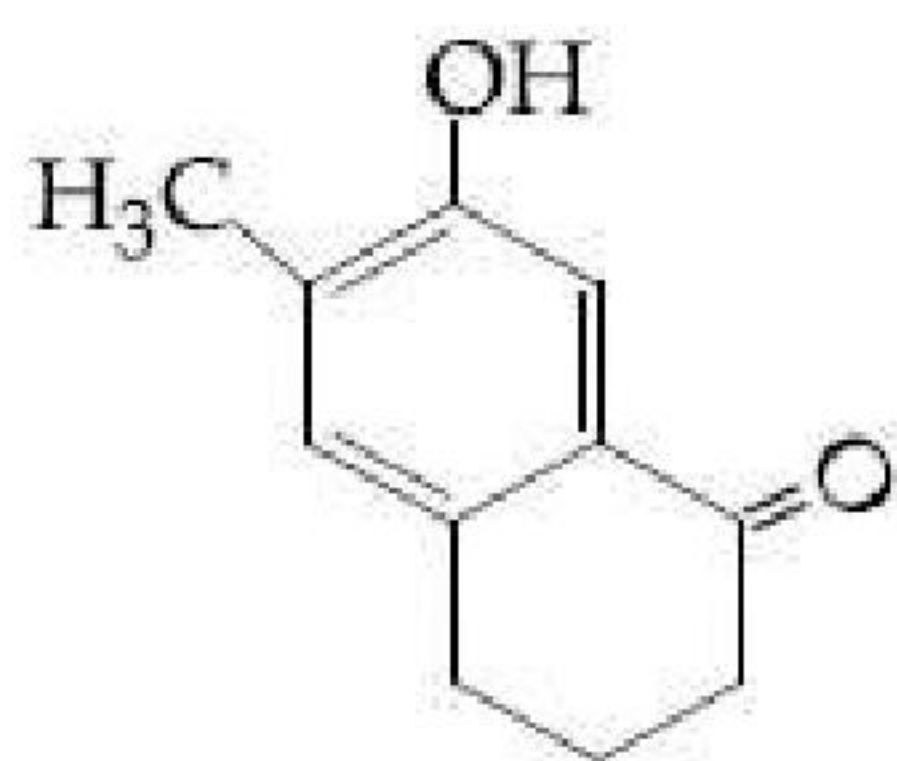
આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?



Options :

1.



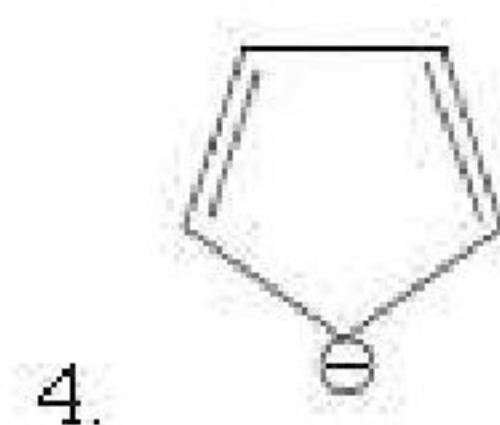
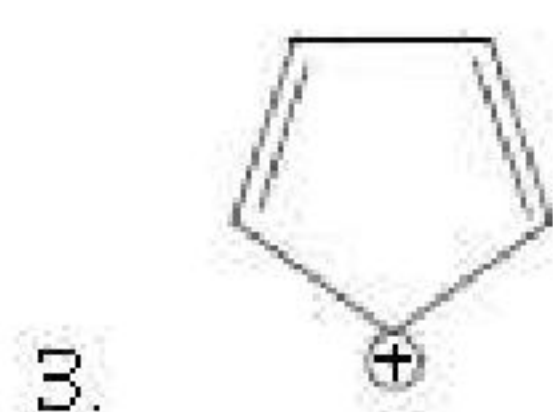
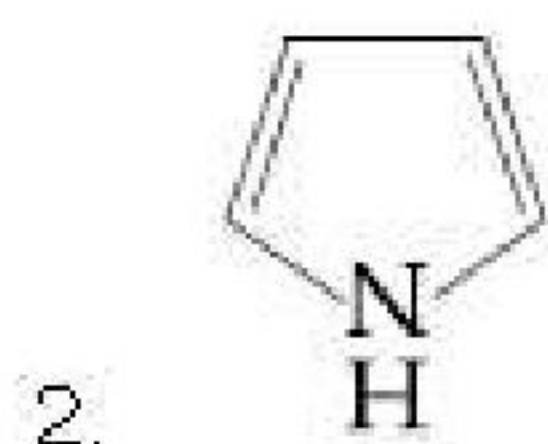
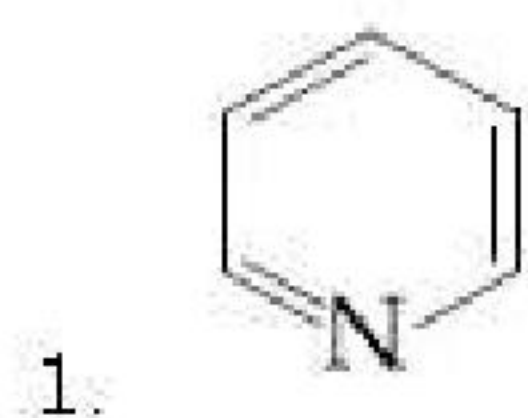


Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

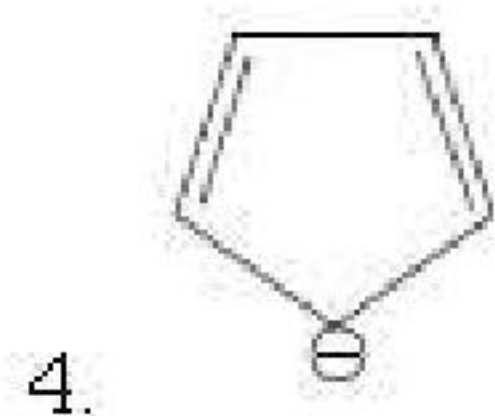
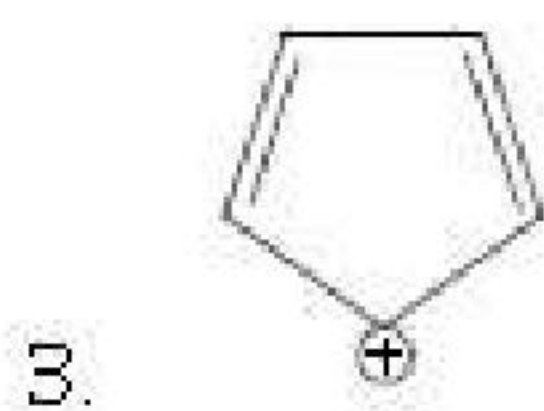
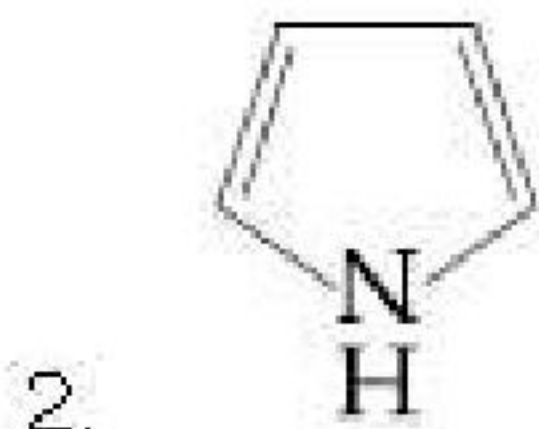
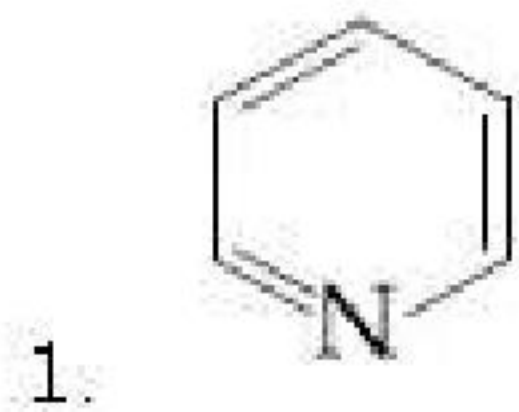
निम्न में से कौन सा यौगिक ऐरोमैटिक नहीं है?

Options :



નીચે આપેલા પૈકી કયો સંયોજન એરોમેટિક નથી?

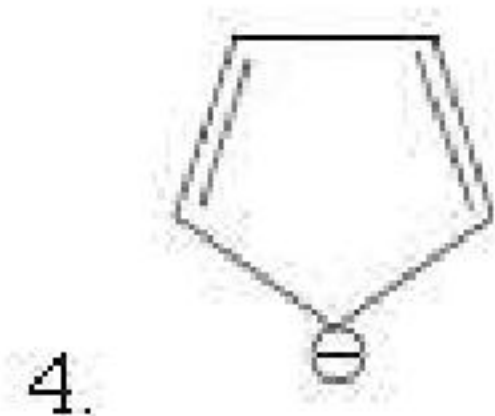
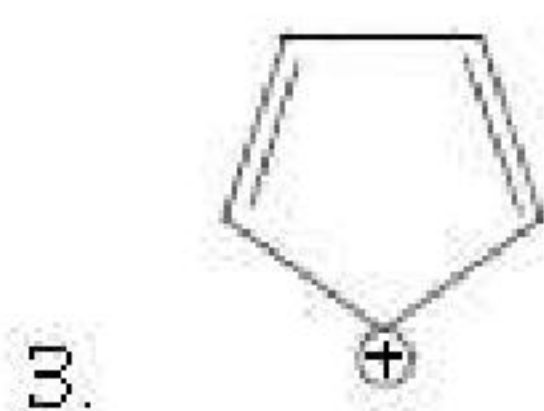
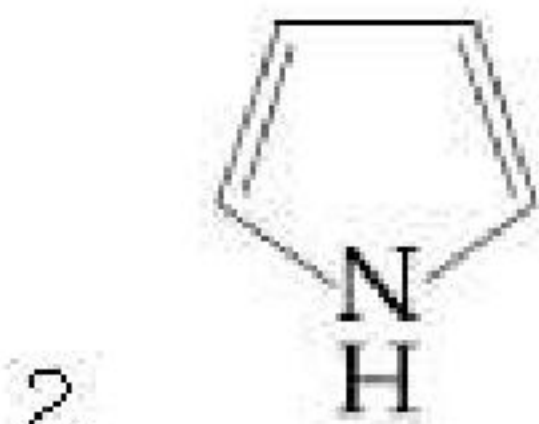
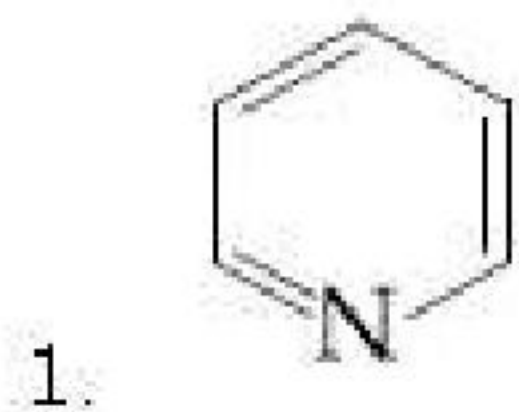
Options :



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

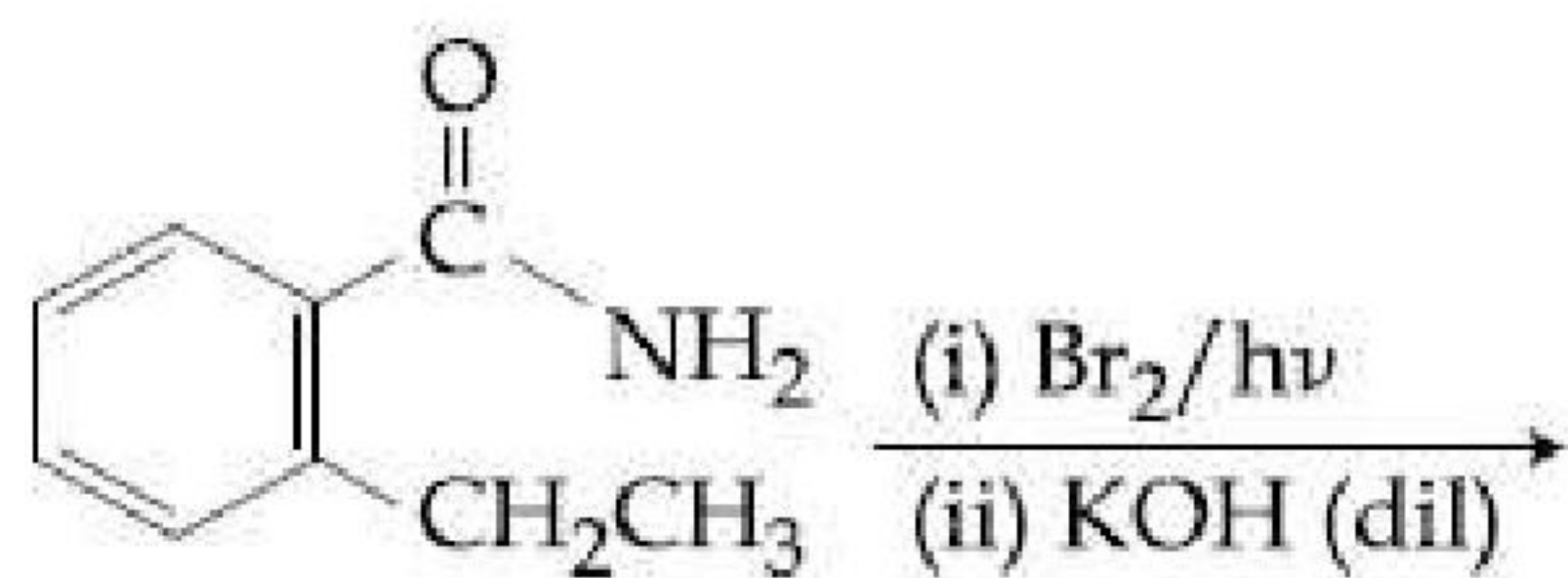
Which of the following compounds is not aromatic ?

Options :

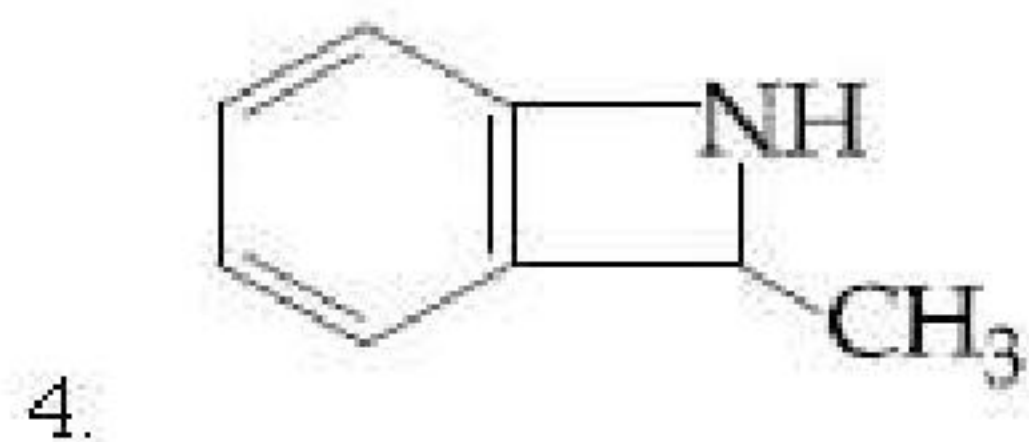
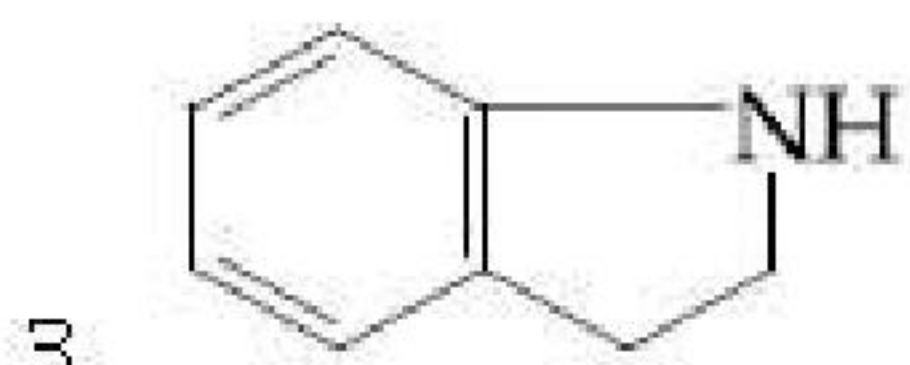
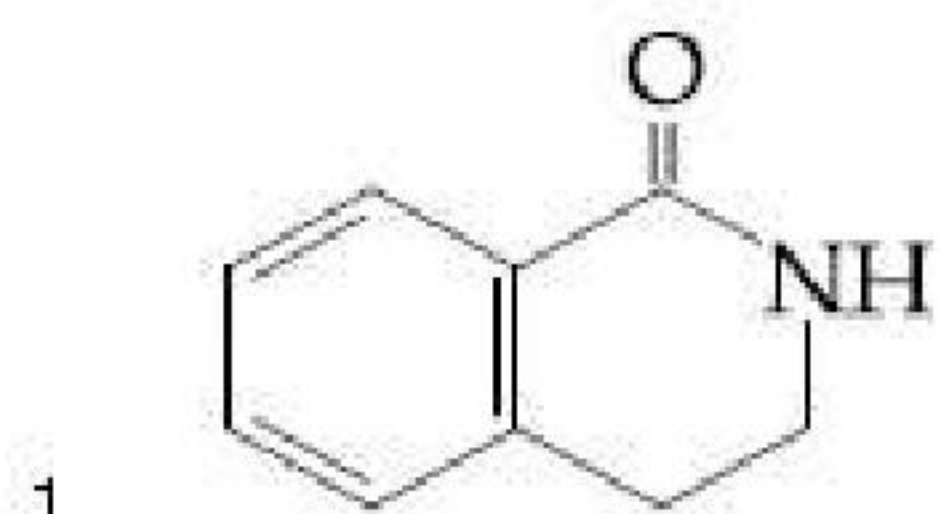


Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number :

The major product of the following reaction is :



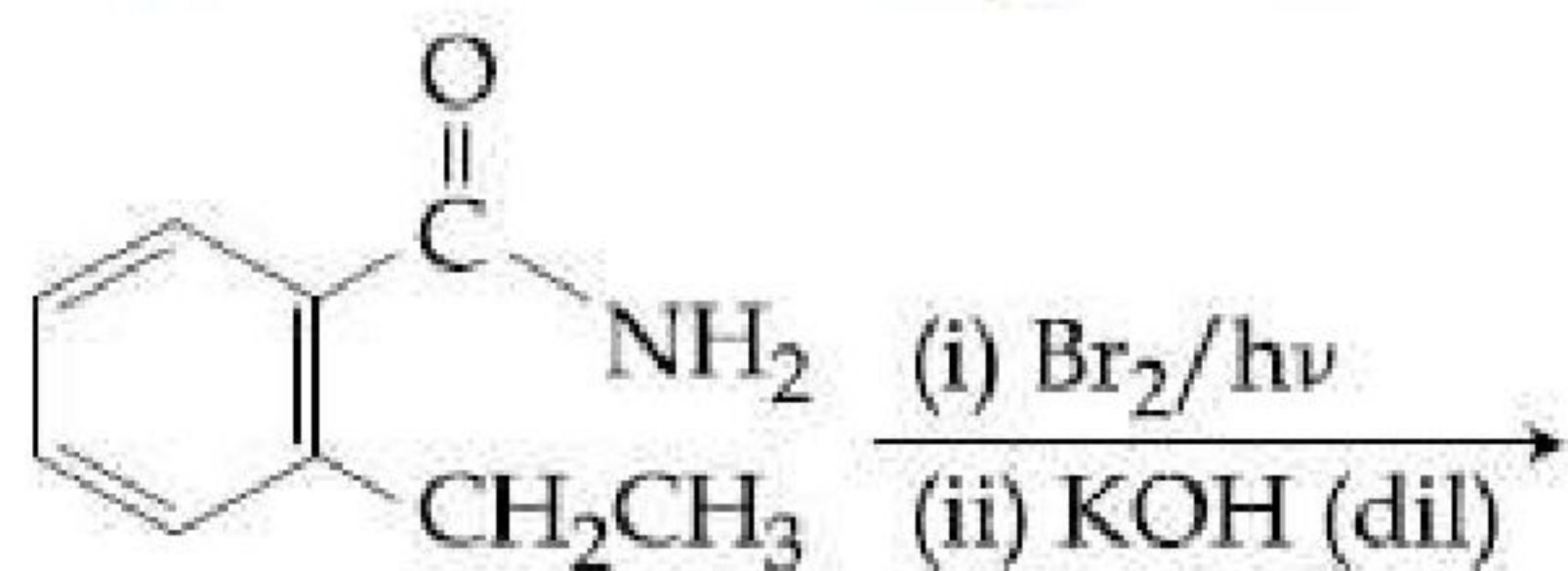
Options :



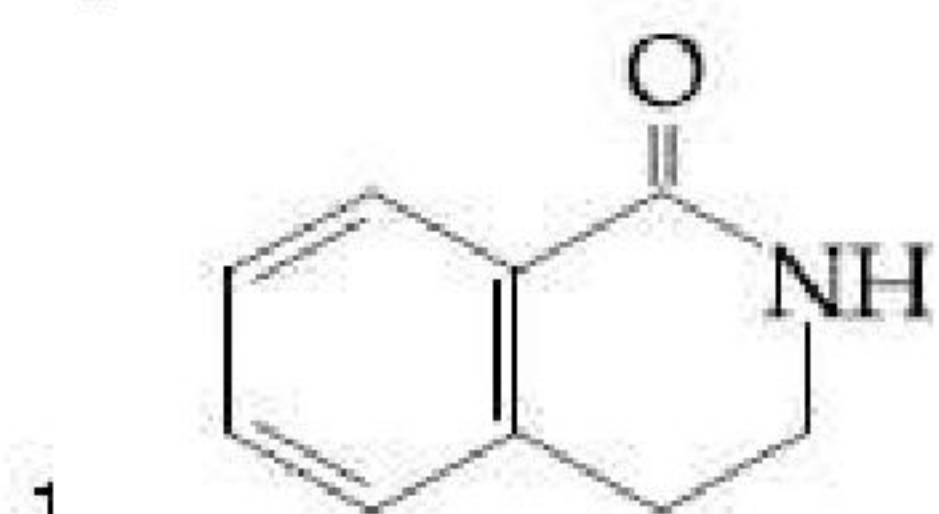
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

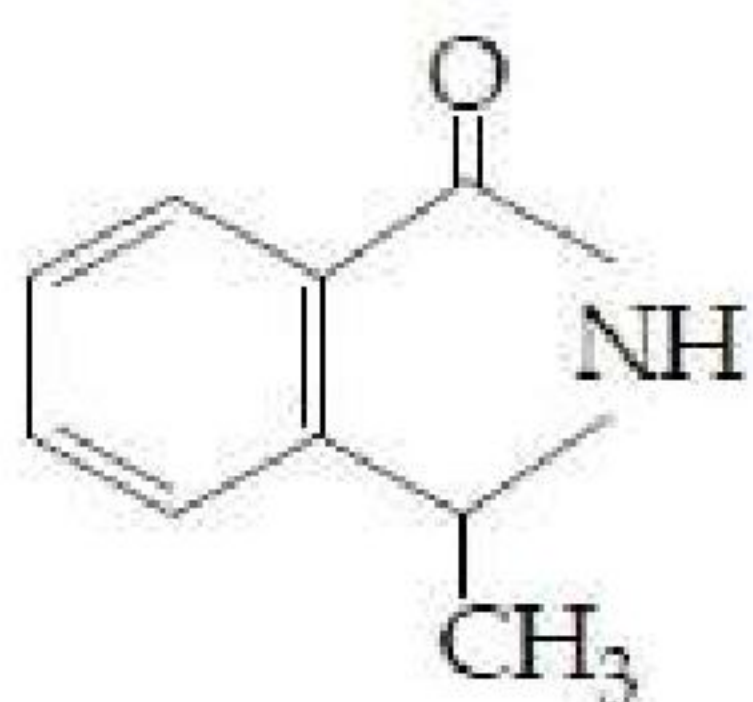
निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



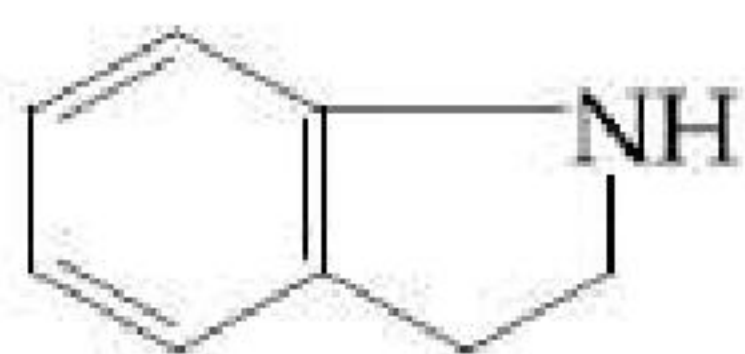
Options :



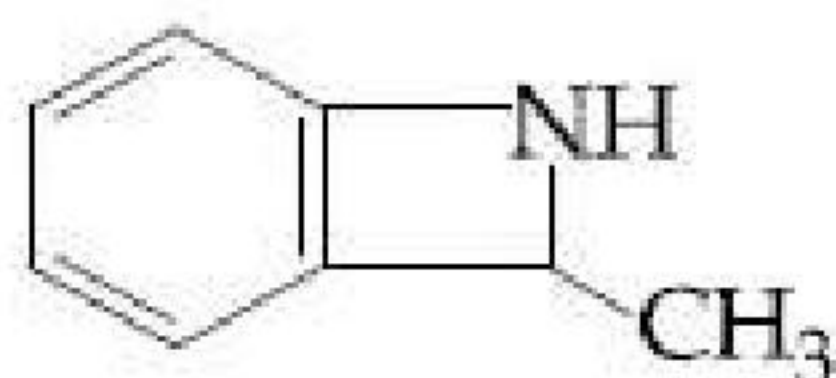
2.



3.



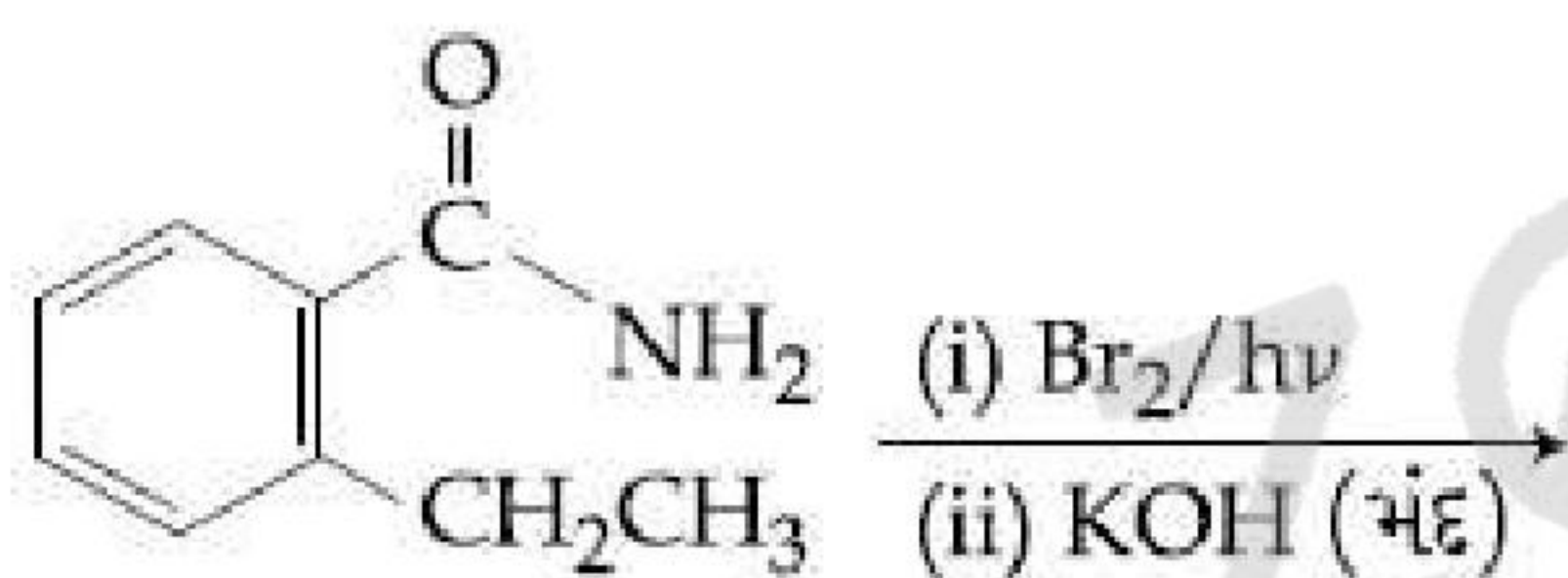
4.



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

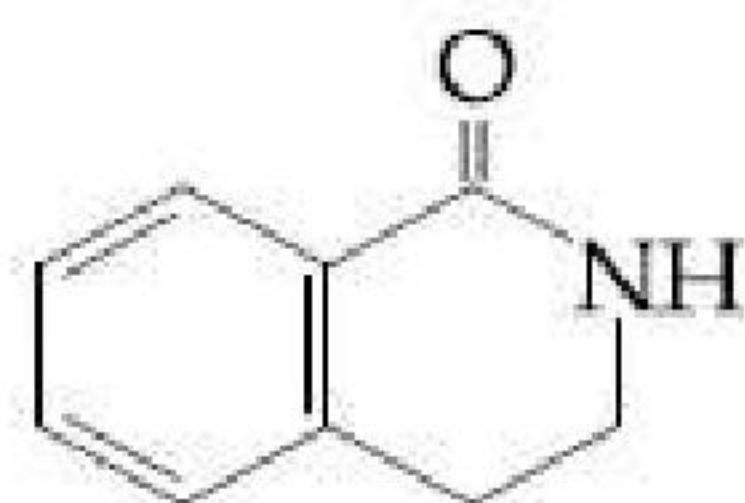
Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયાની મુખ્ય નીપજ શોધો ?

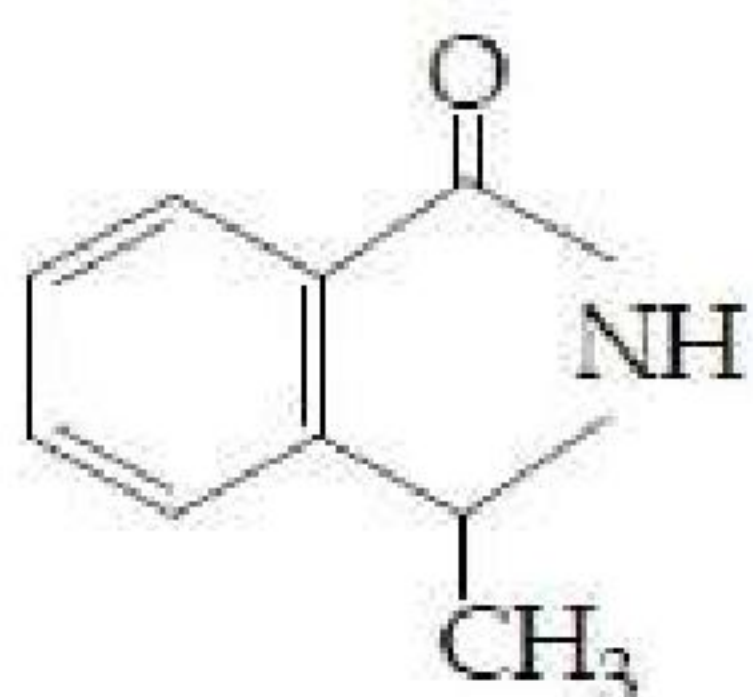


Options :

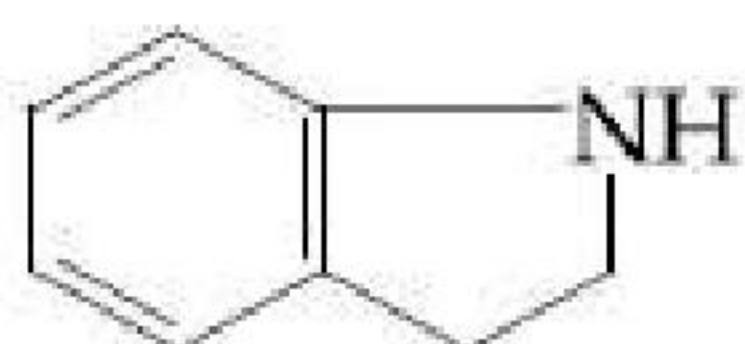
1.



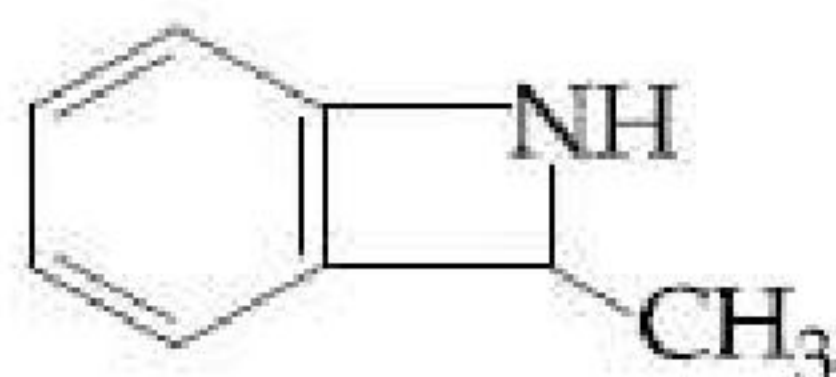
2.



3.

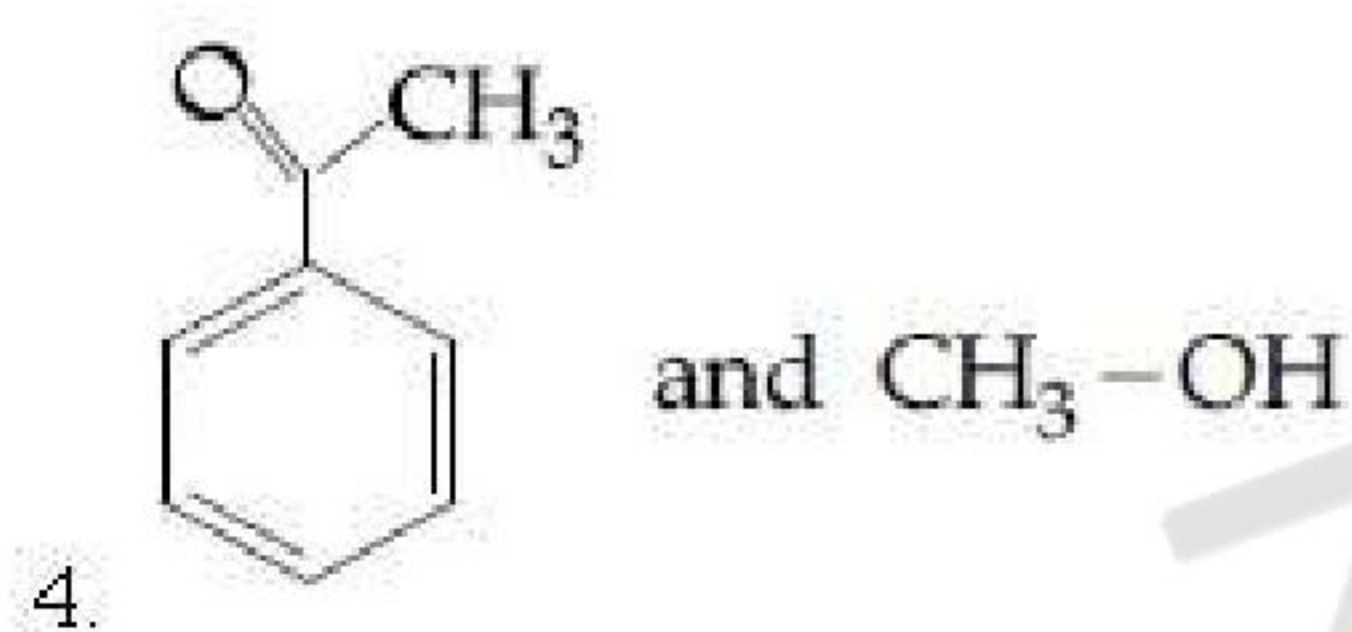
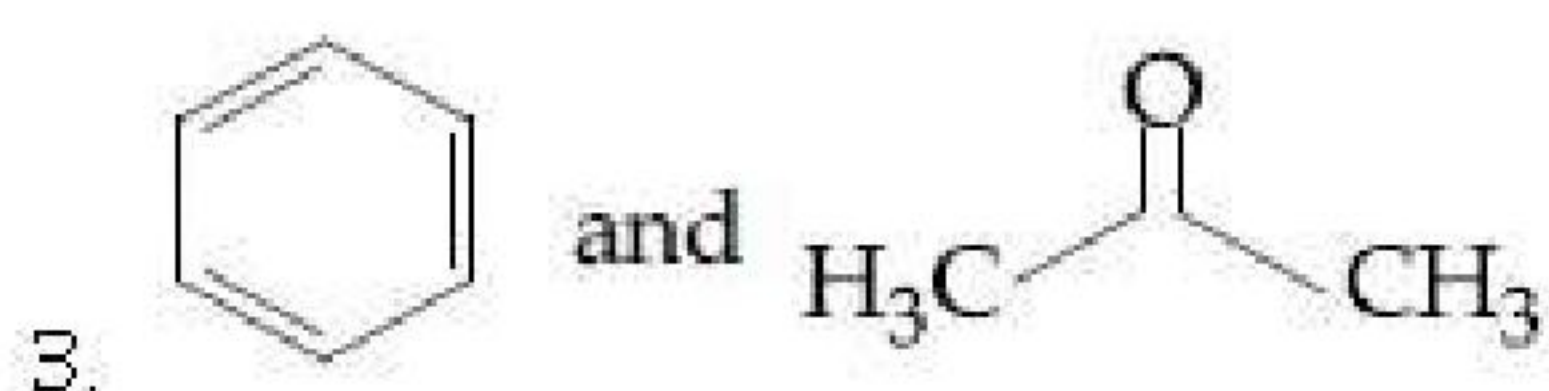
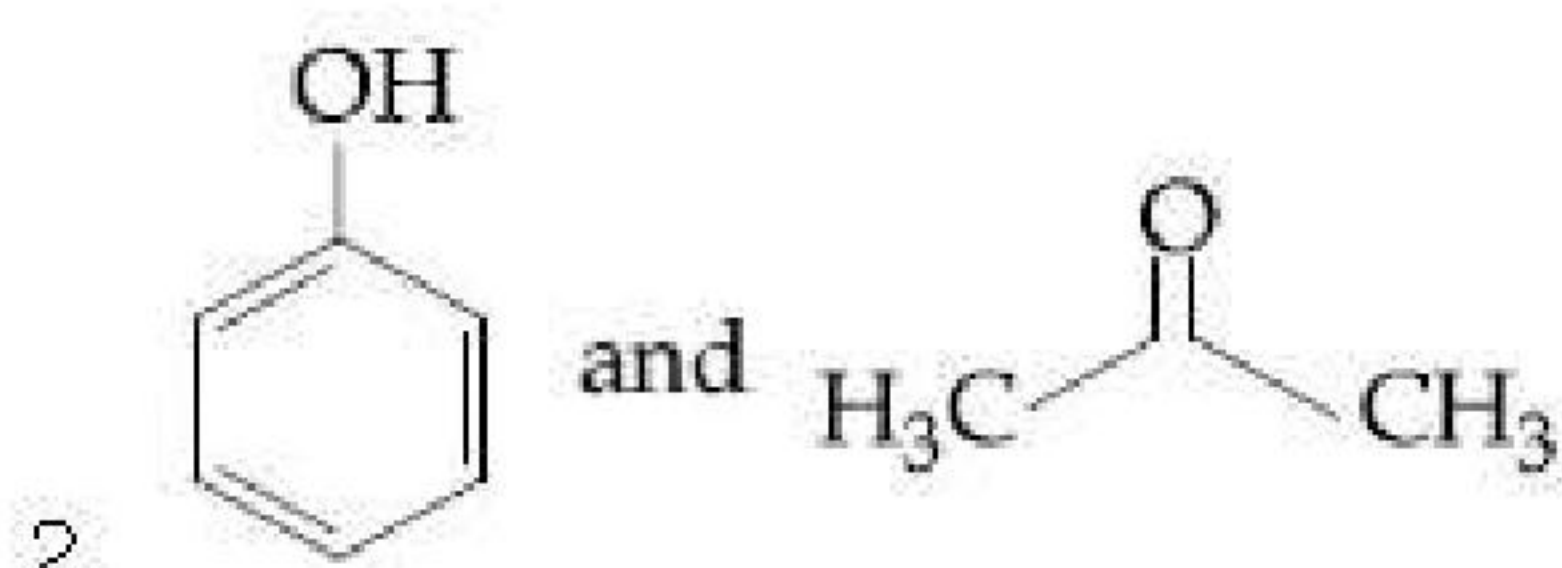
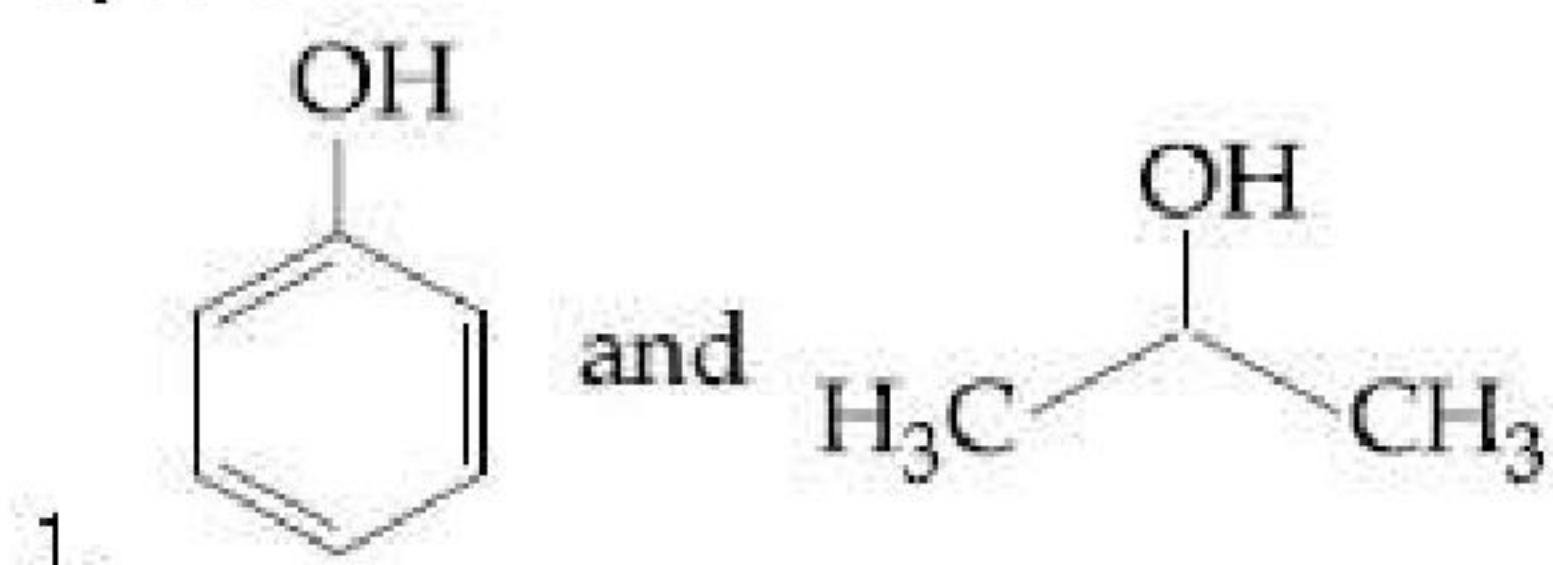


4.



The products formed in the reaction of cumene with O_2 followed by treatment with dil. HCl are :

Options :

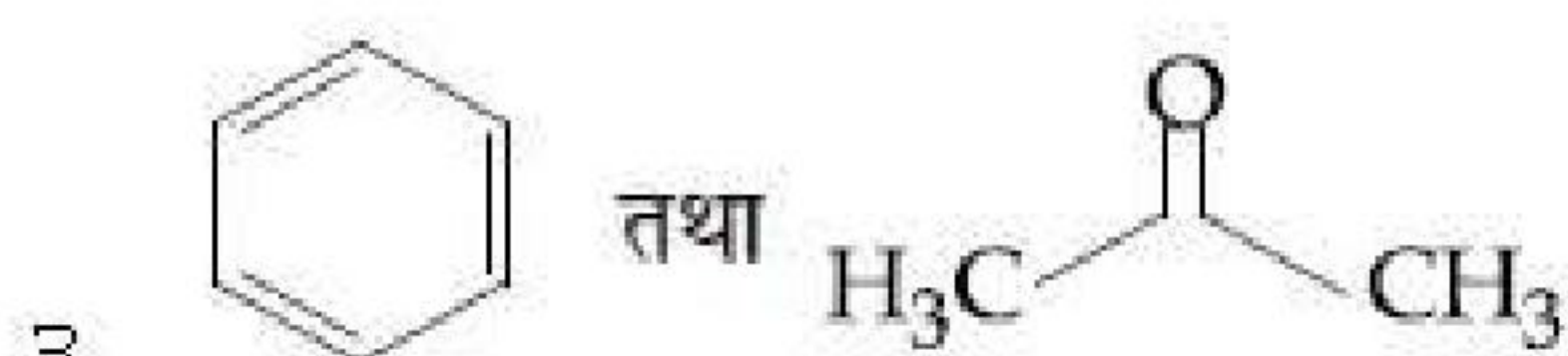
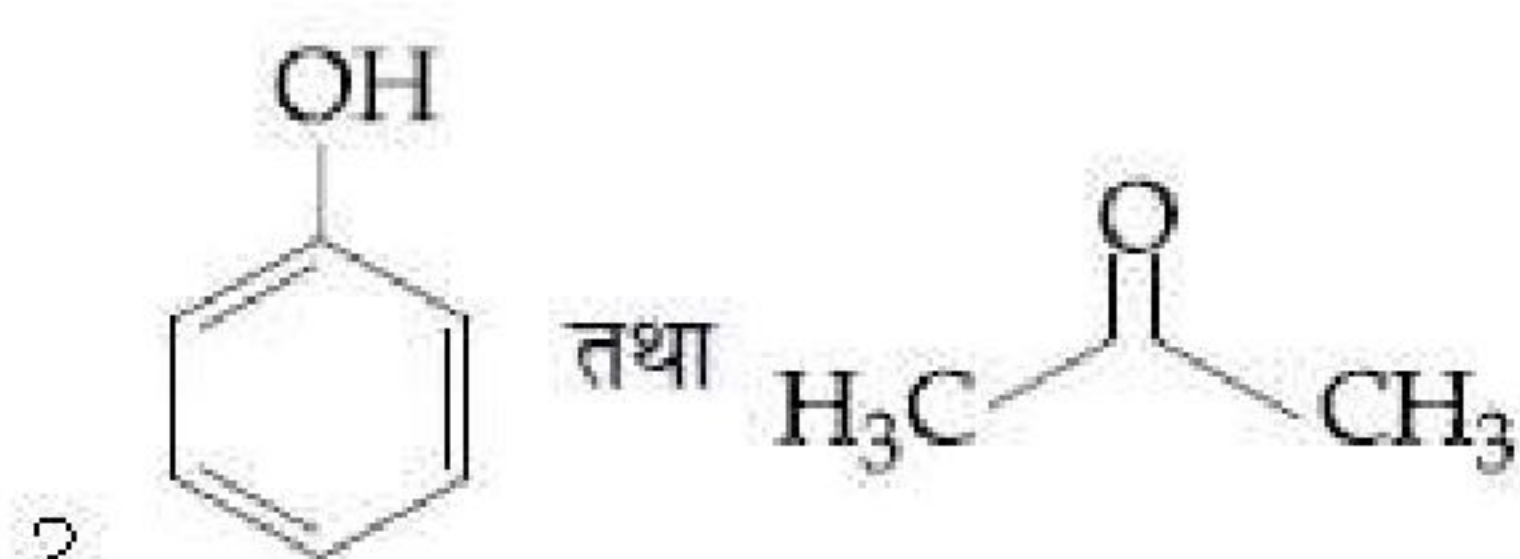
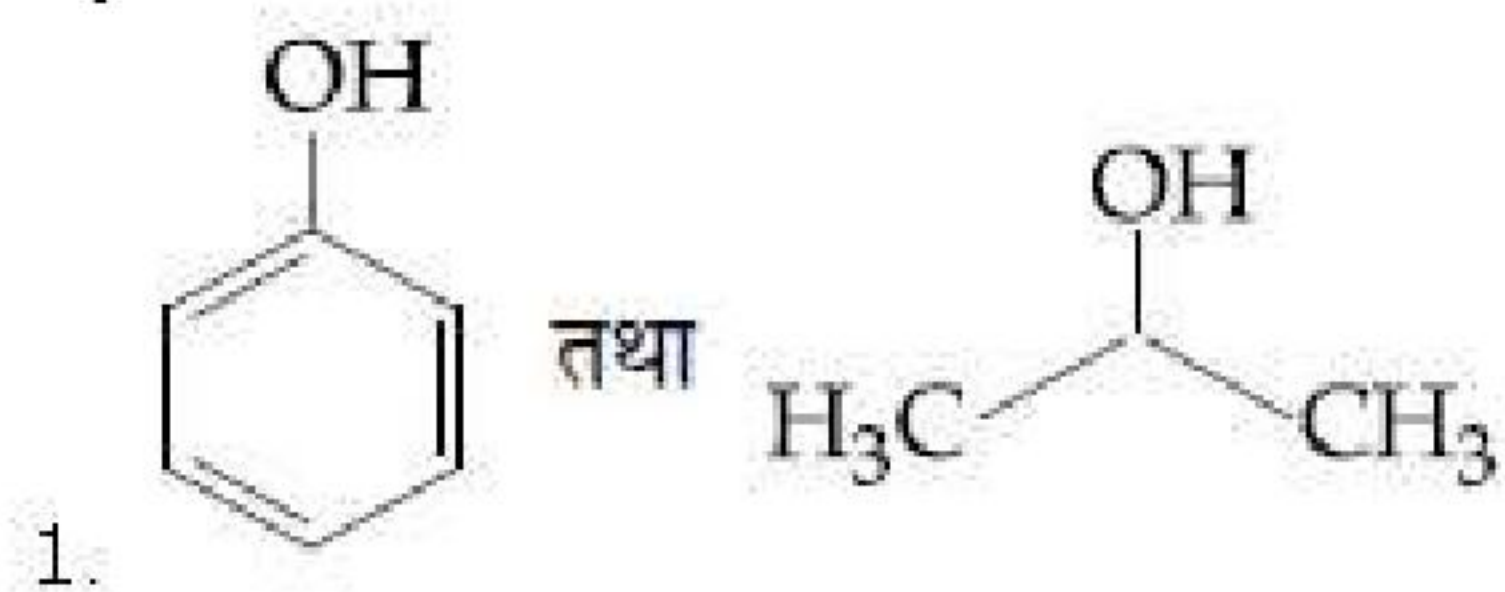


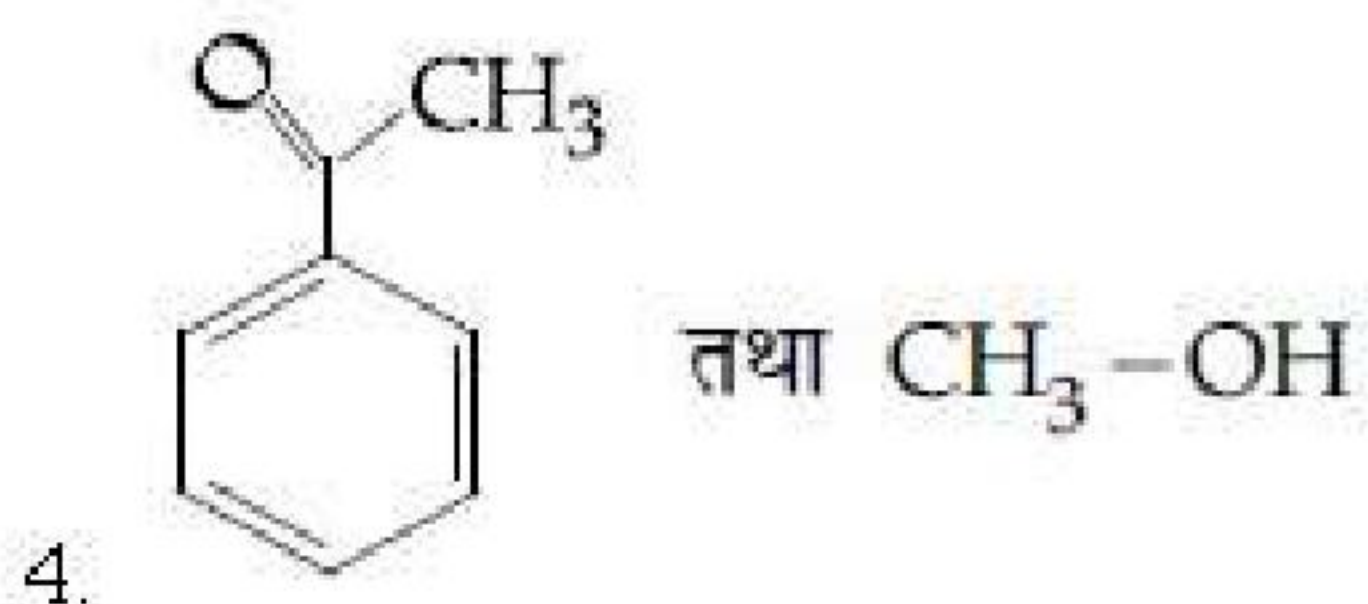
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्यूमीन की O_2 के साथ अभिक्रिया करने के तत्पश्चात् तनु HCl के साथ विवेचन करने पर बनने वाले उत्पाद हैं :

Options :



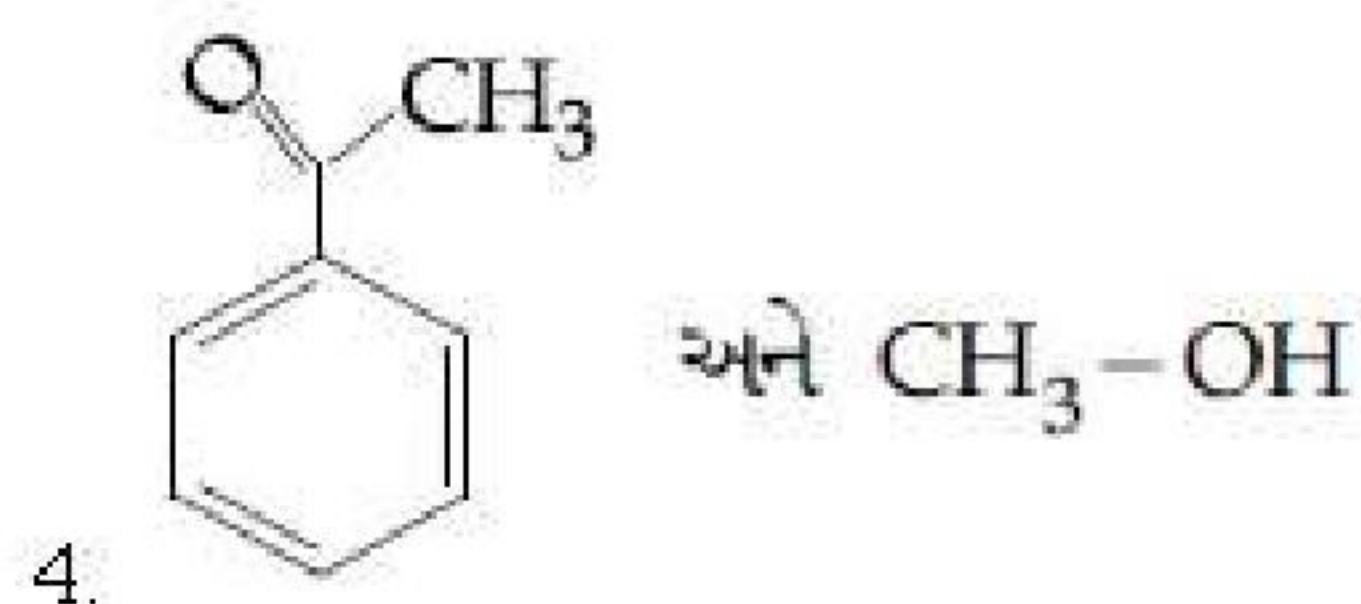
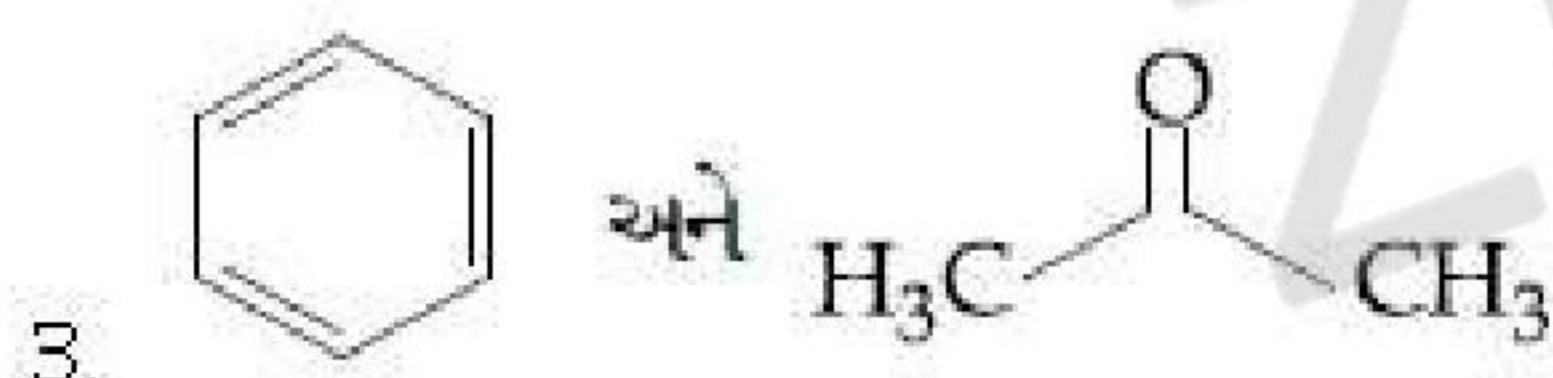
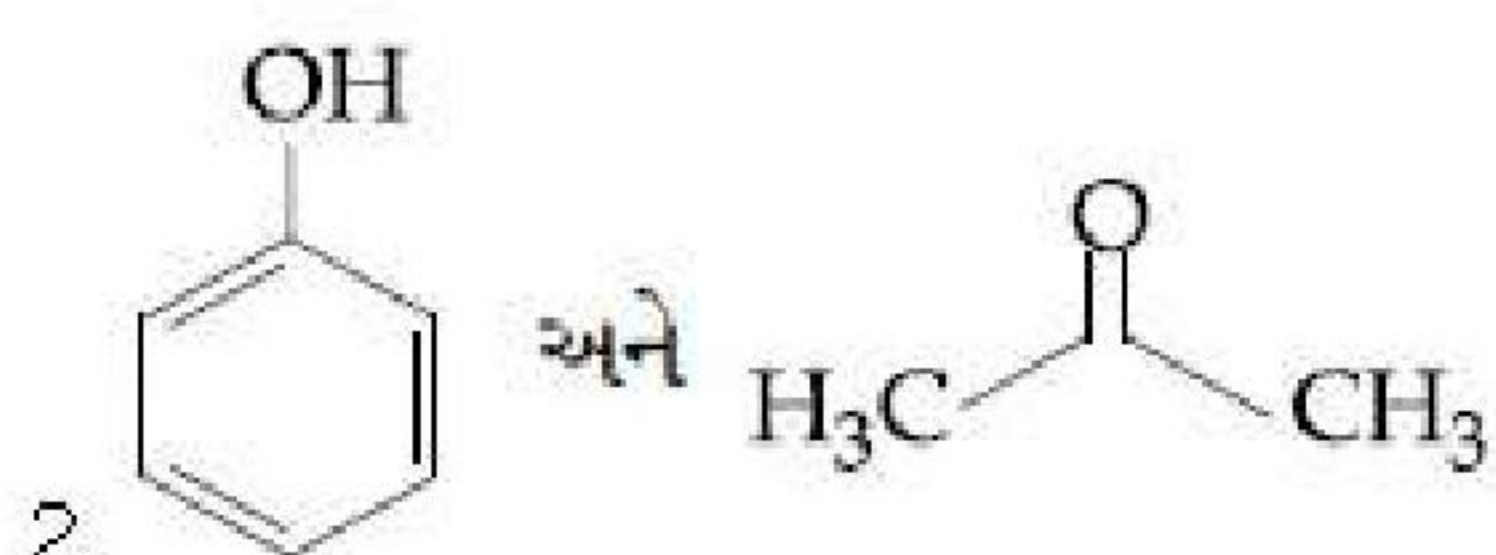
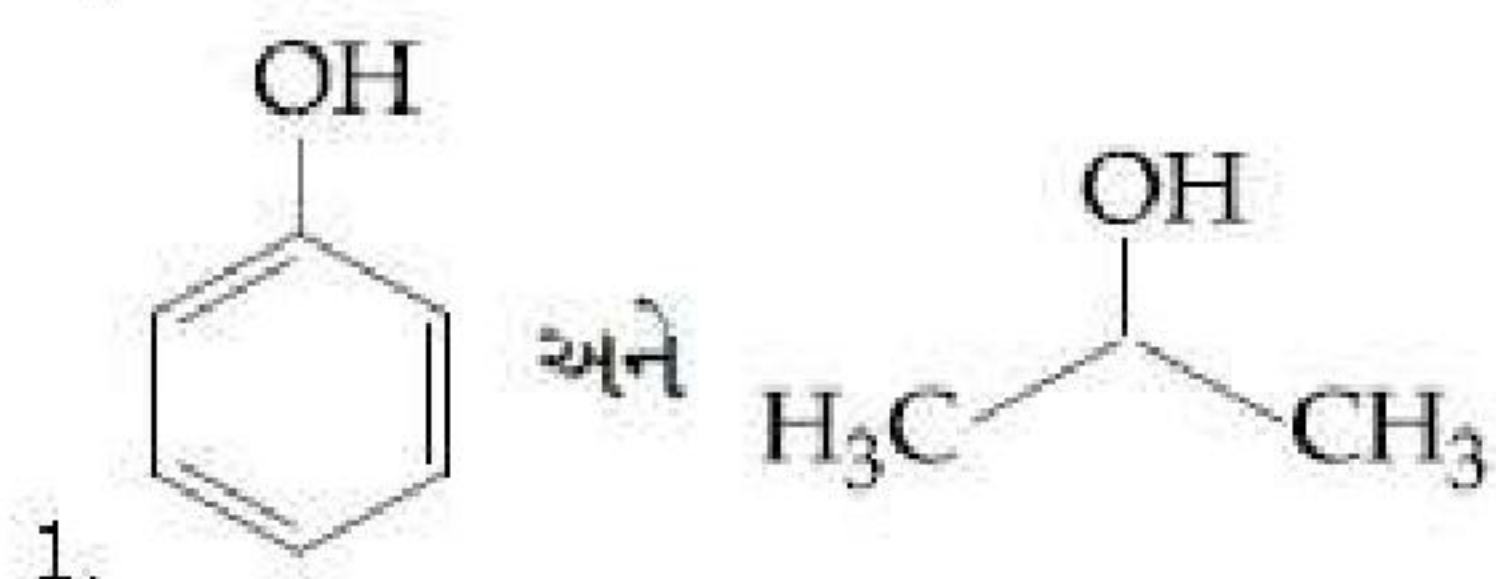


Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ક્યુમિન ની O_2 સાથે પ્રક્રિયા કર્યા બાદ તેની મંદ HCl સાથે પ્રક્રિયા કરતા મળતી નીપજે શોધો?

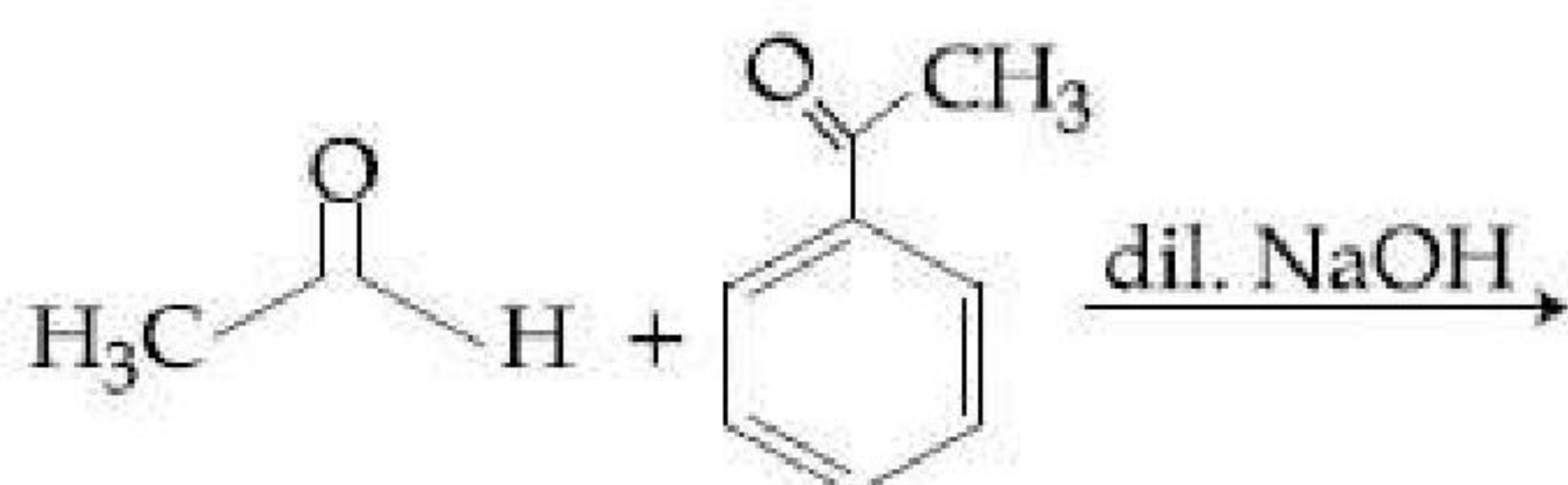
Options :



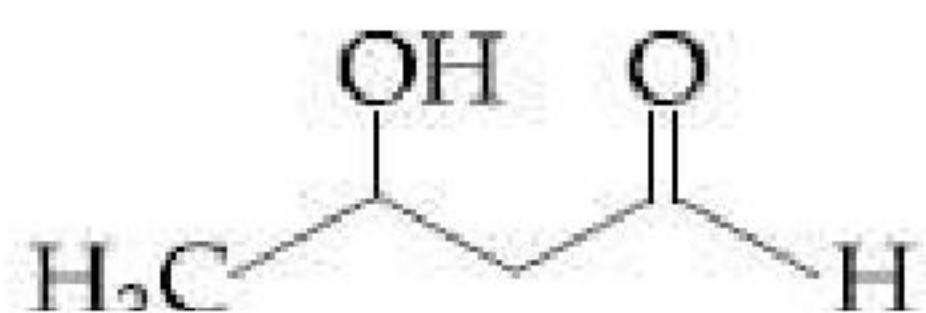
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

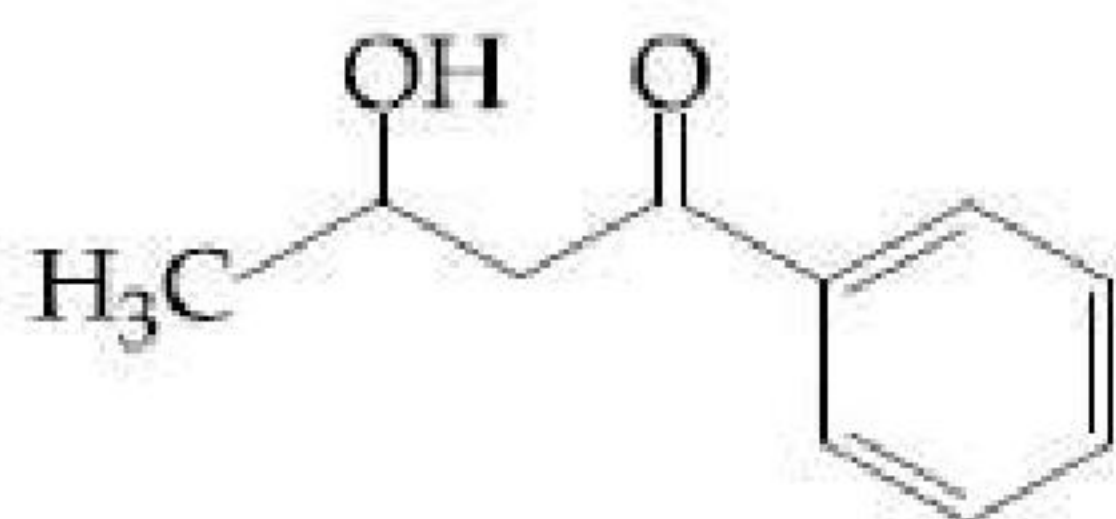
The major product formed in the following reaction is :



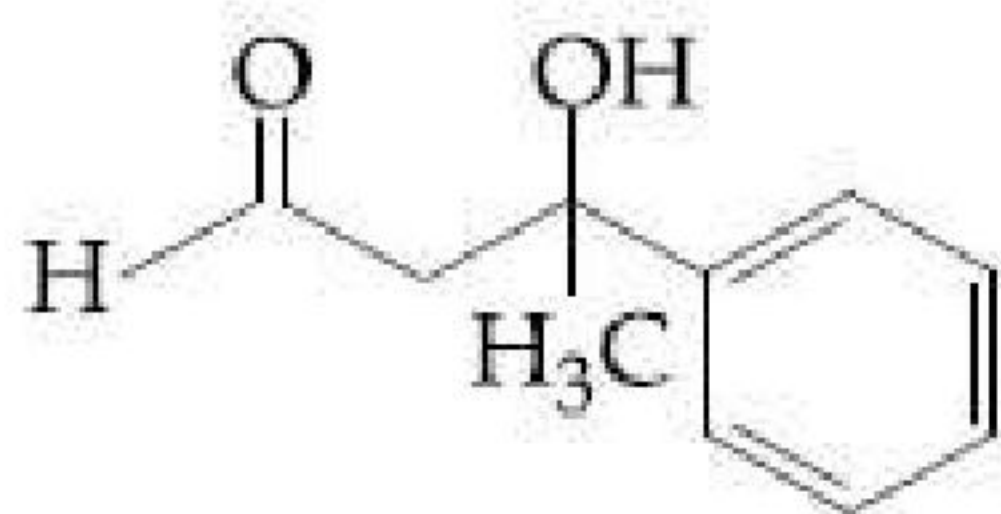
Options :



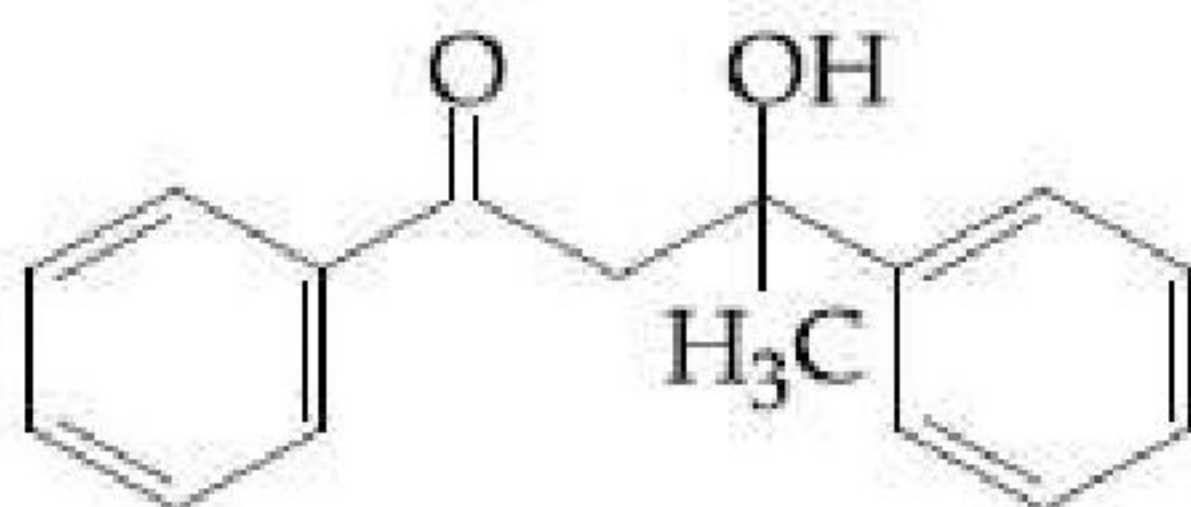
2.



3.



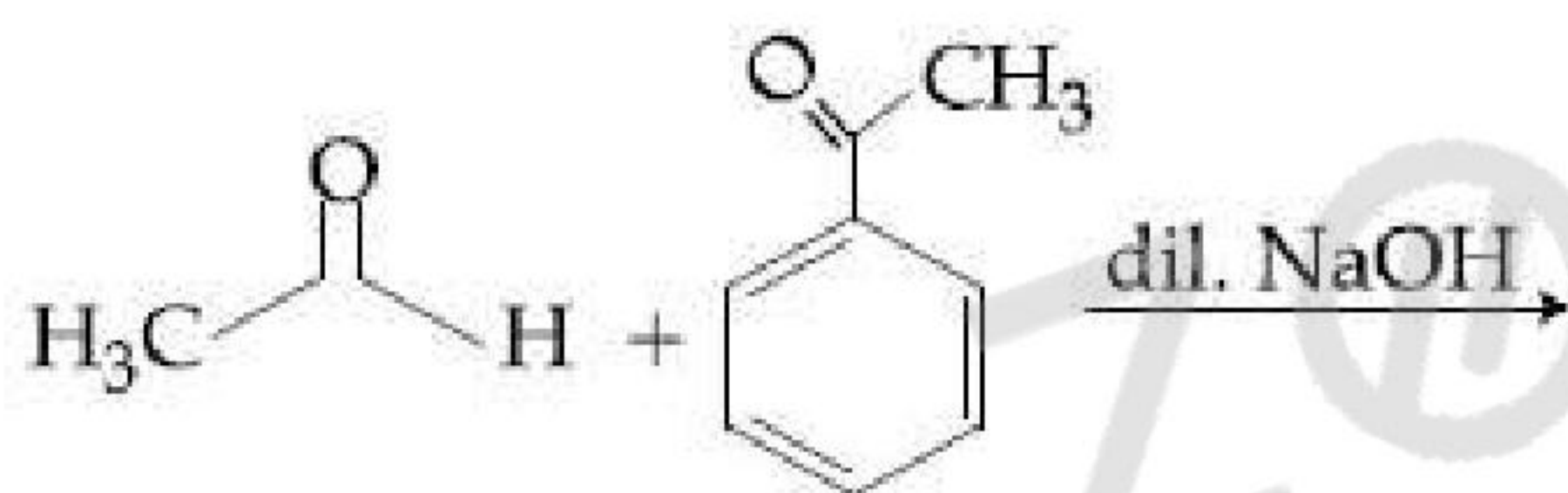
4.



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

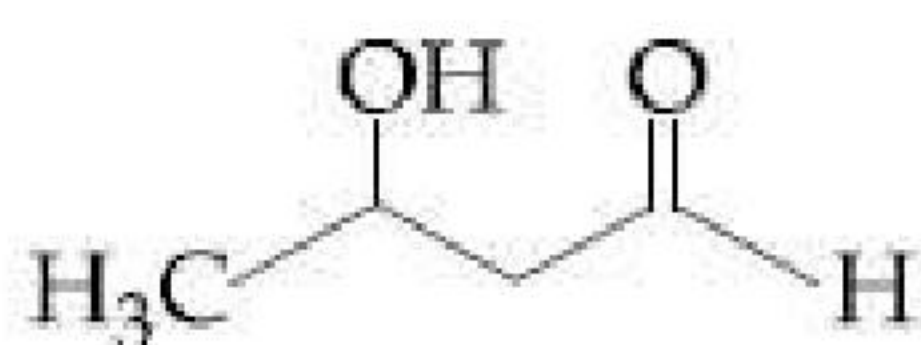
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :

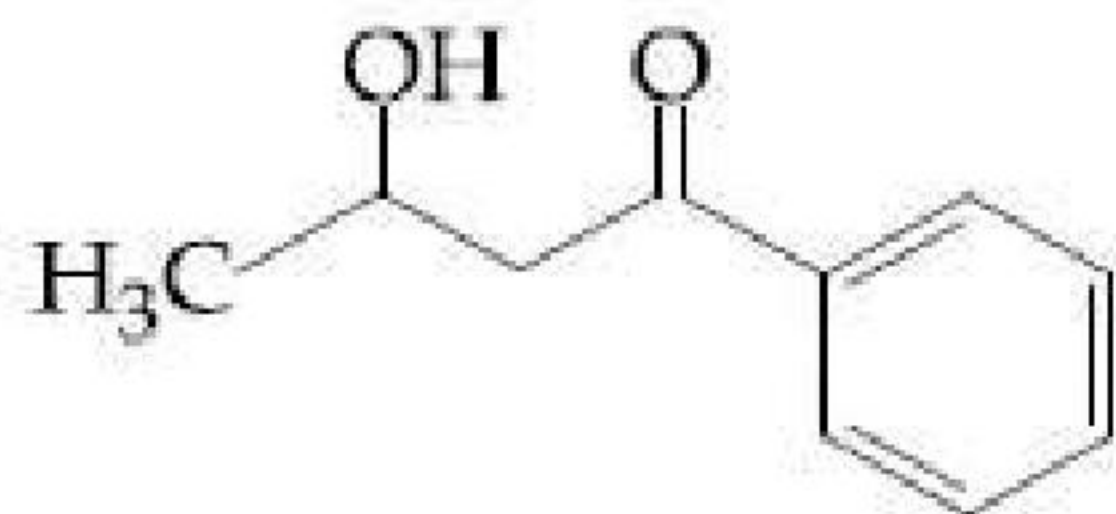


Options :

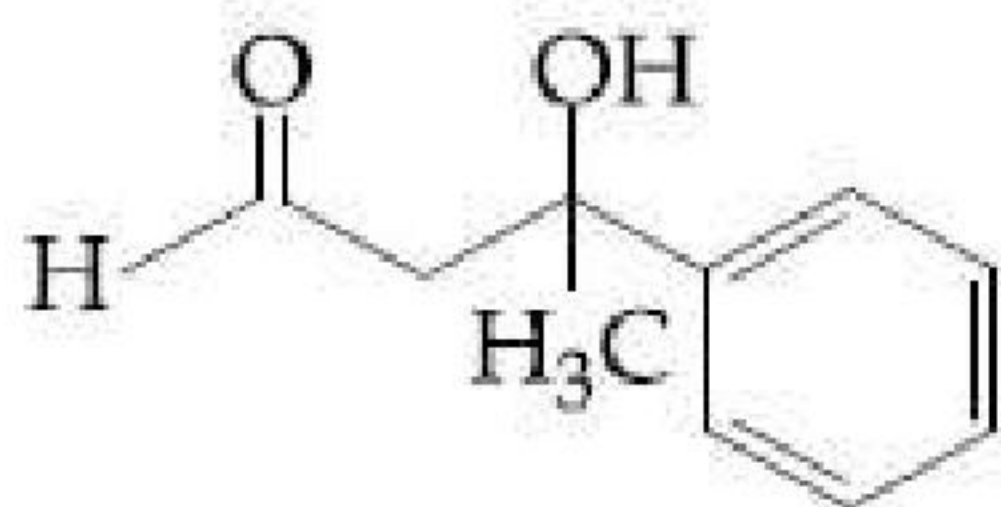
1.



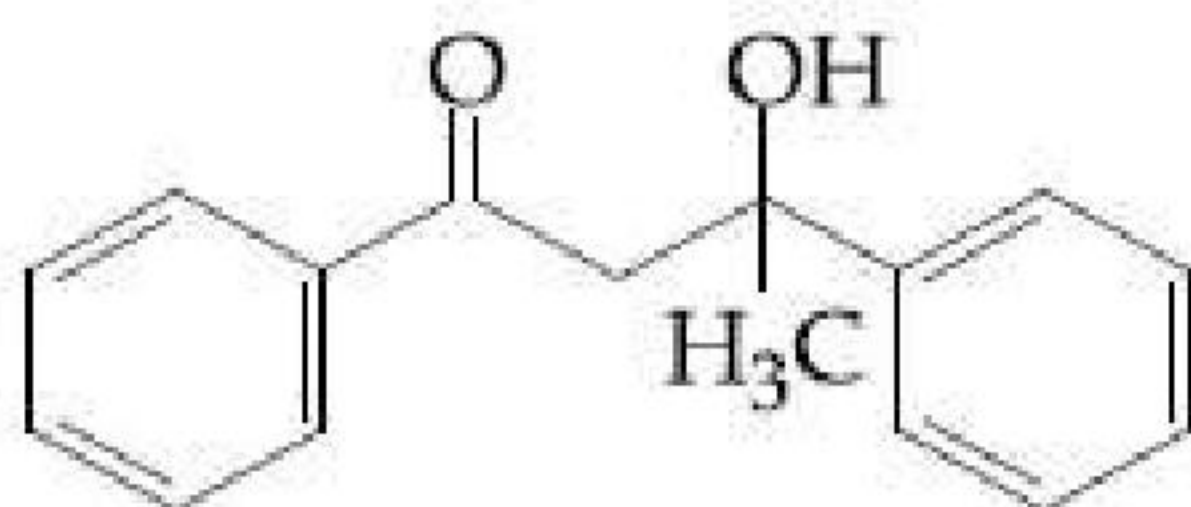
2.



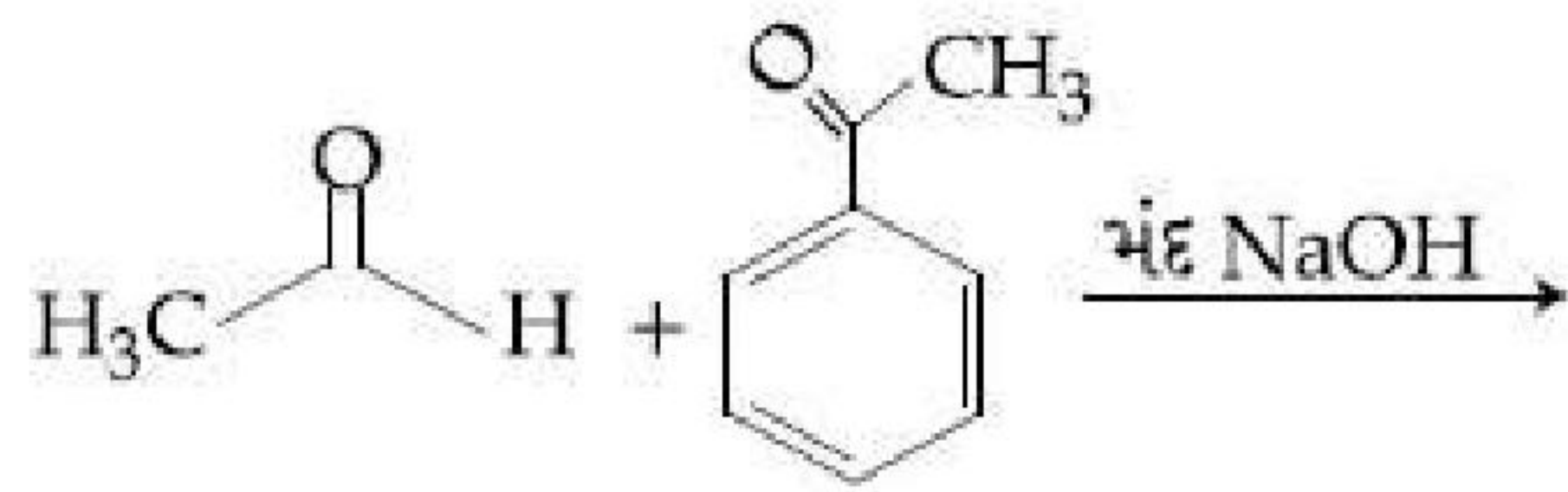
3.



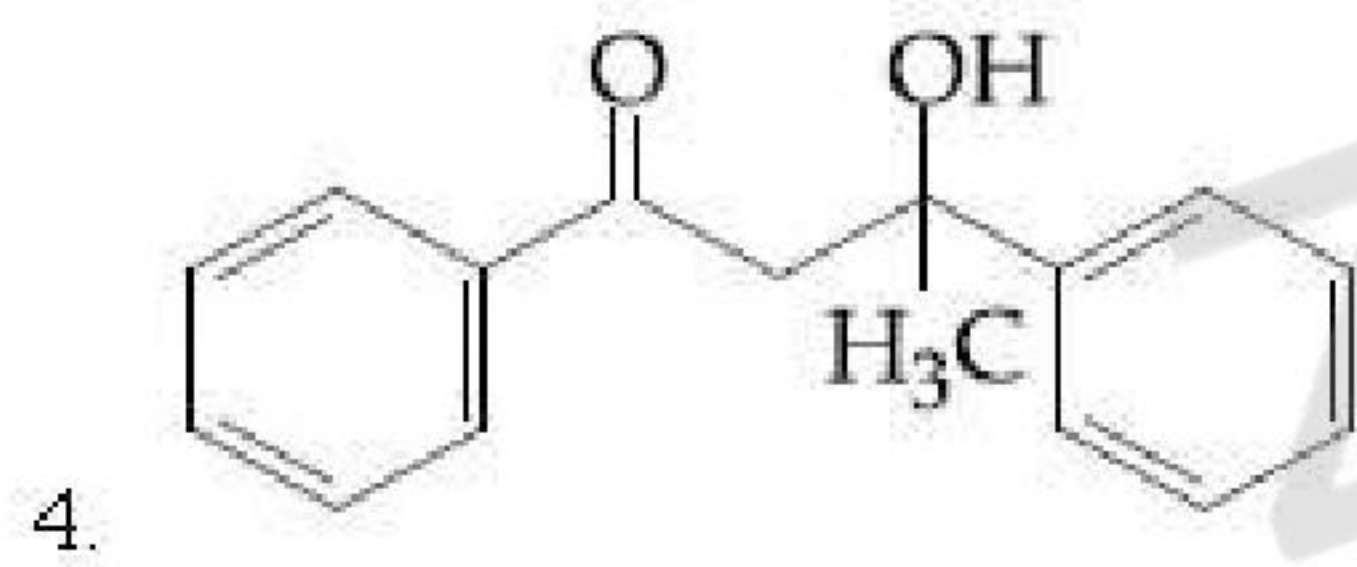
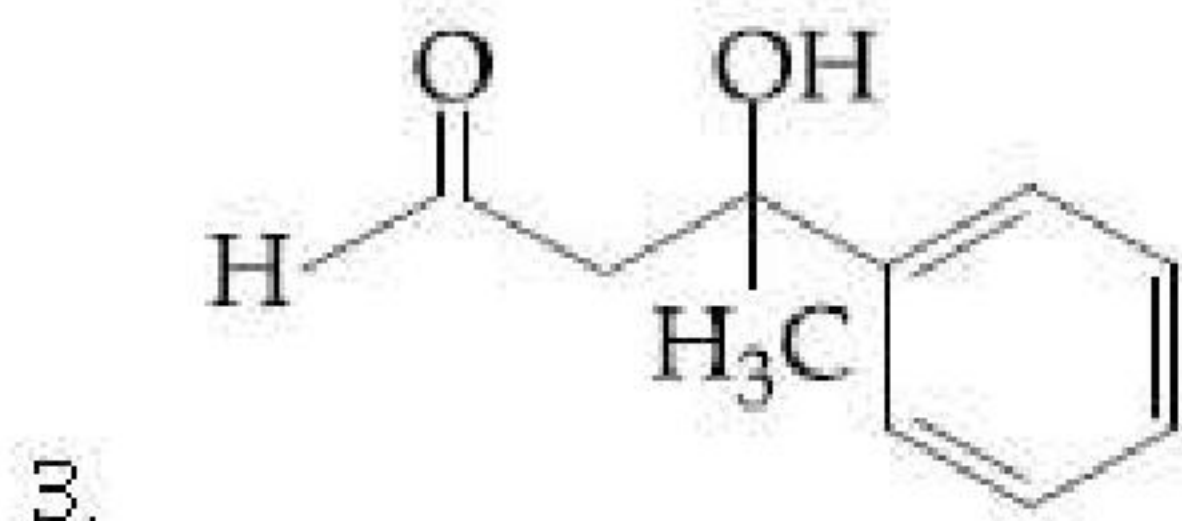
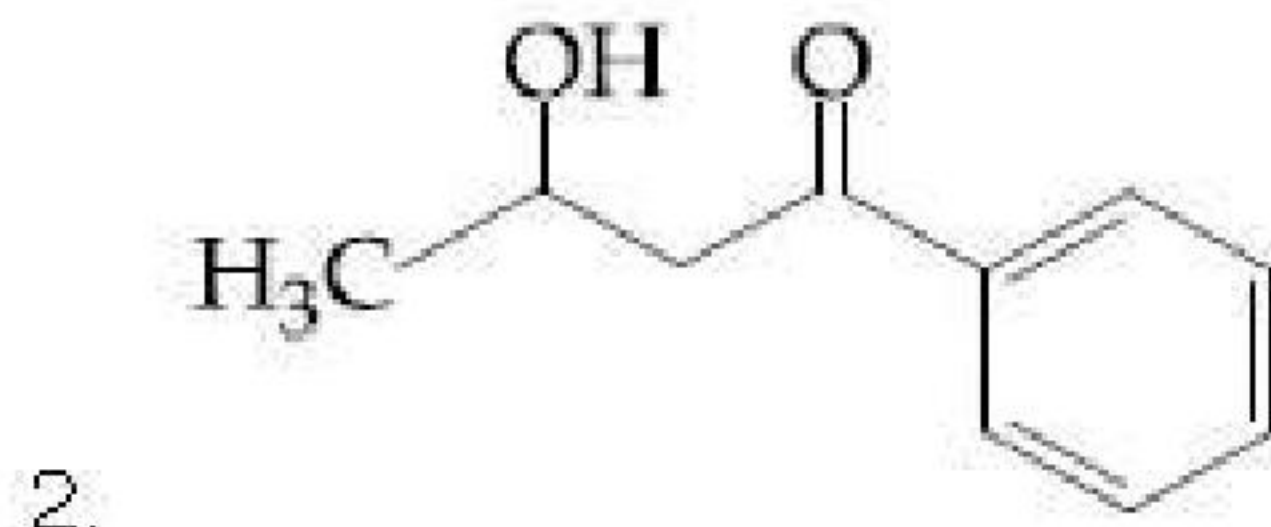
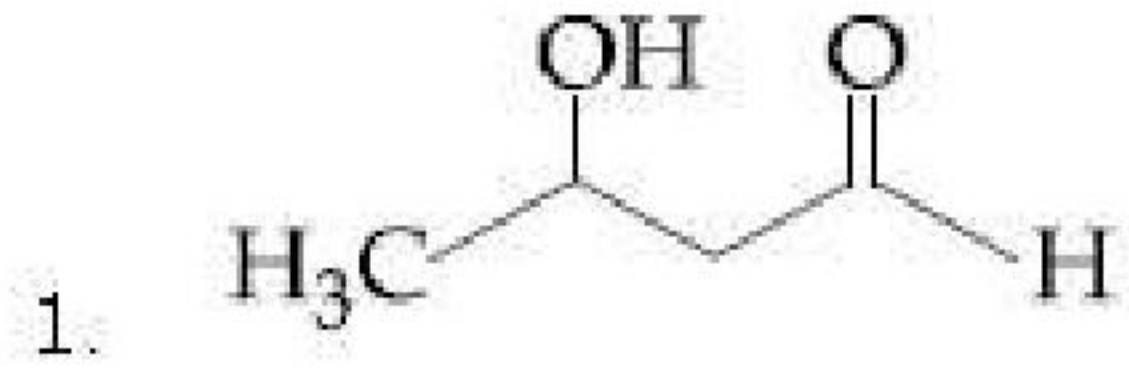
4.



નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?



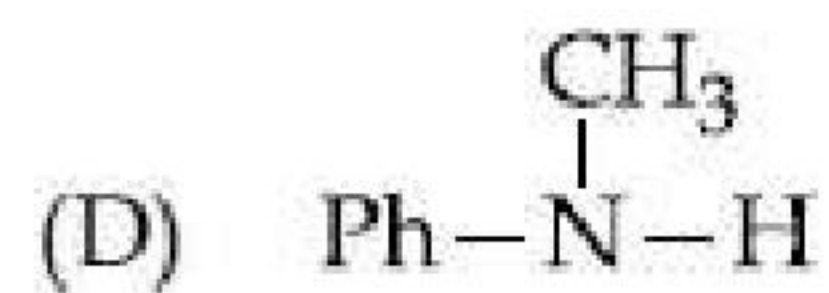
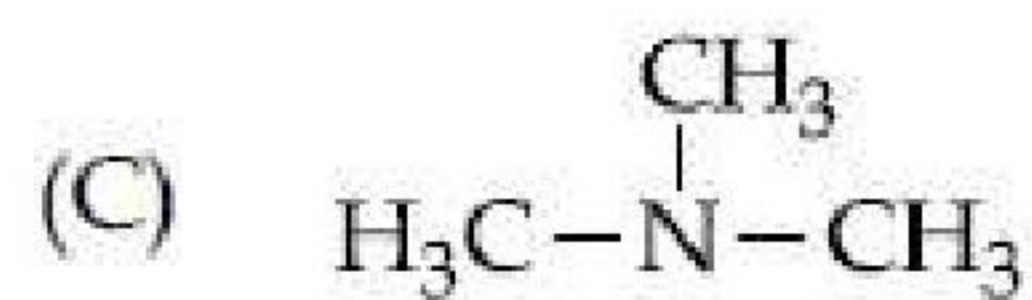
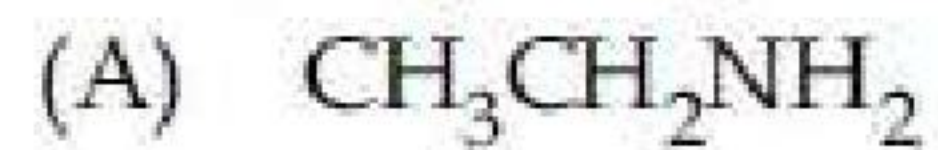
Options :



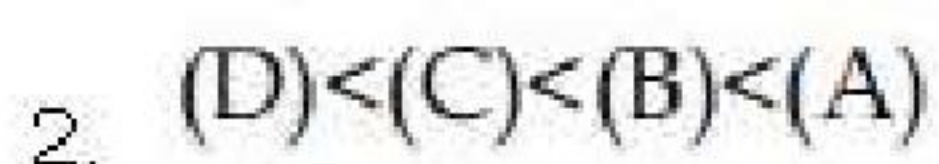
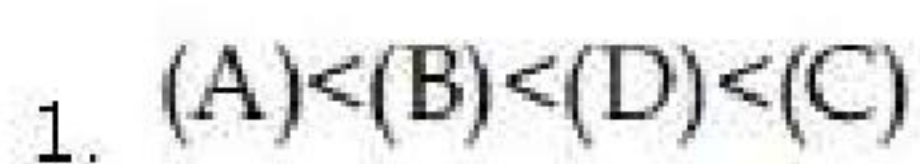
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The increasing basicity order of the following compounds is :



Options :

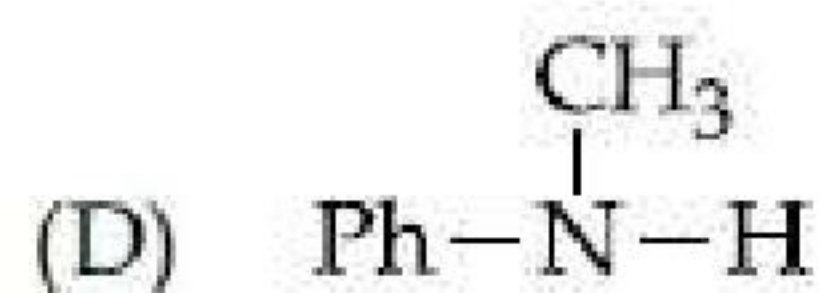
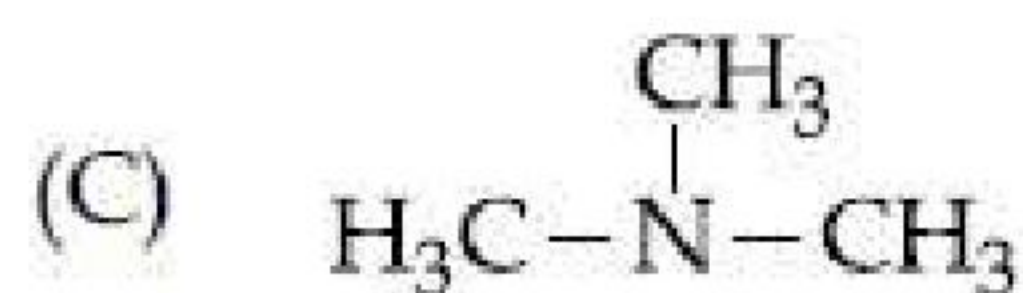
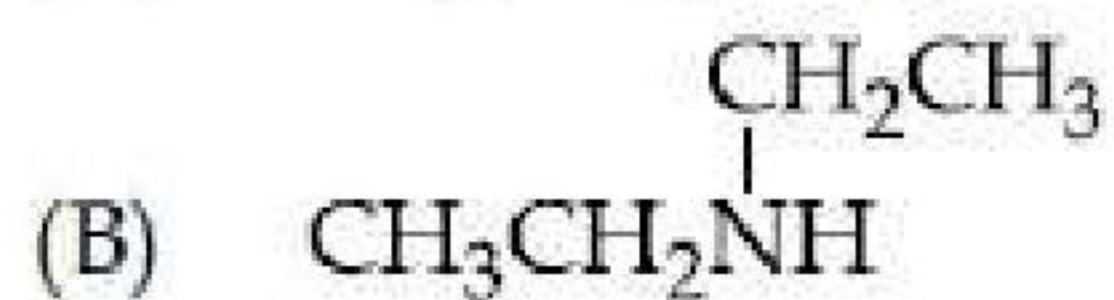
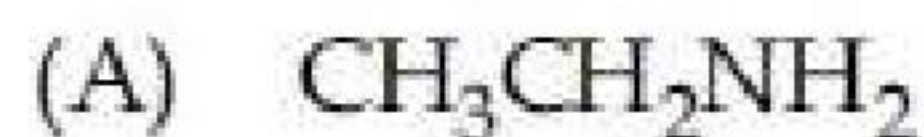


4. (A)<(B)<(C)<(D)

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

નિમ્નલિખિત યૌગિકોં મેં ક્ષારકતા કા બઢતા ક્રમ હૈ :



Options :

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

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

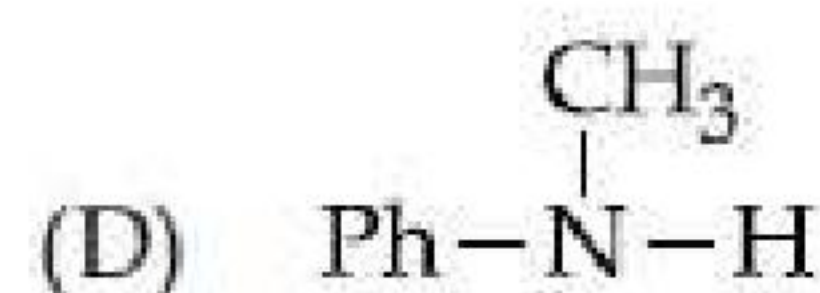
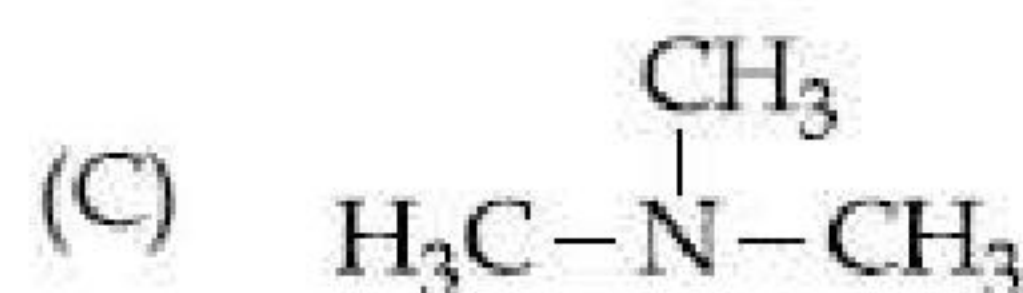
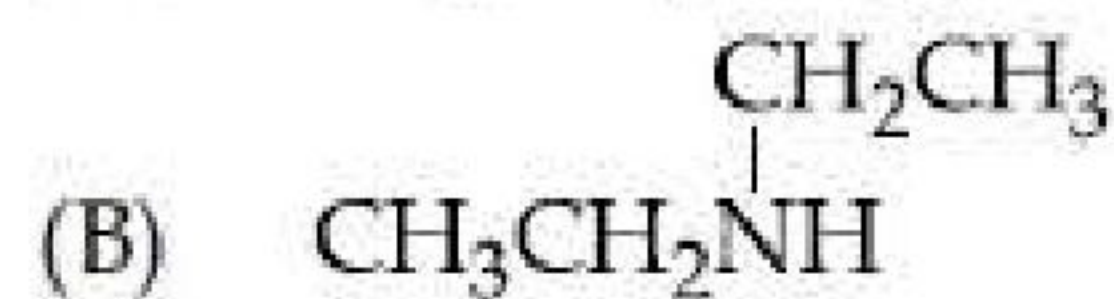
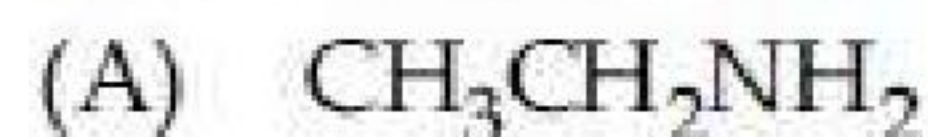
3. (D)<(C)<(A)<(B)

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

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 આપેલ સંયોજનોની બેઝિકતા નો ચઢતો ક્રમ શોધો ?



Options :

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

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

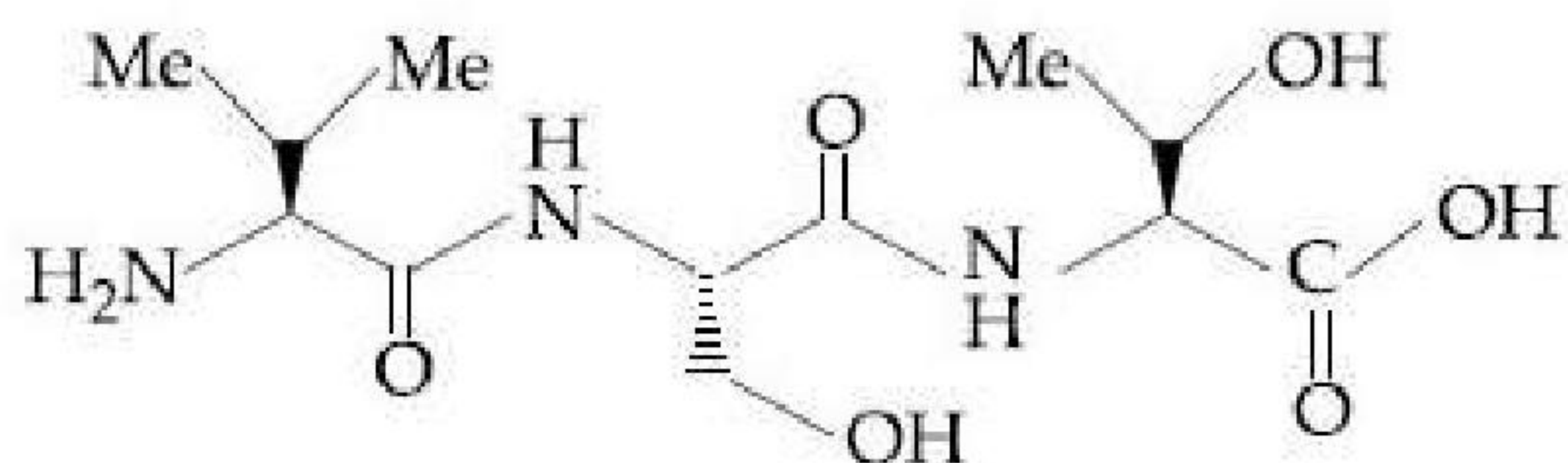
3. (D)<(C)<(A)<(B)

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

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 correct sequence of amino acids present in the tripeptide given below is :



Options :

1. Leu - Ser - Thr

2. Thr - Ser - Leu

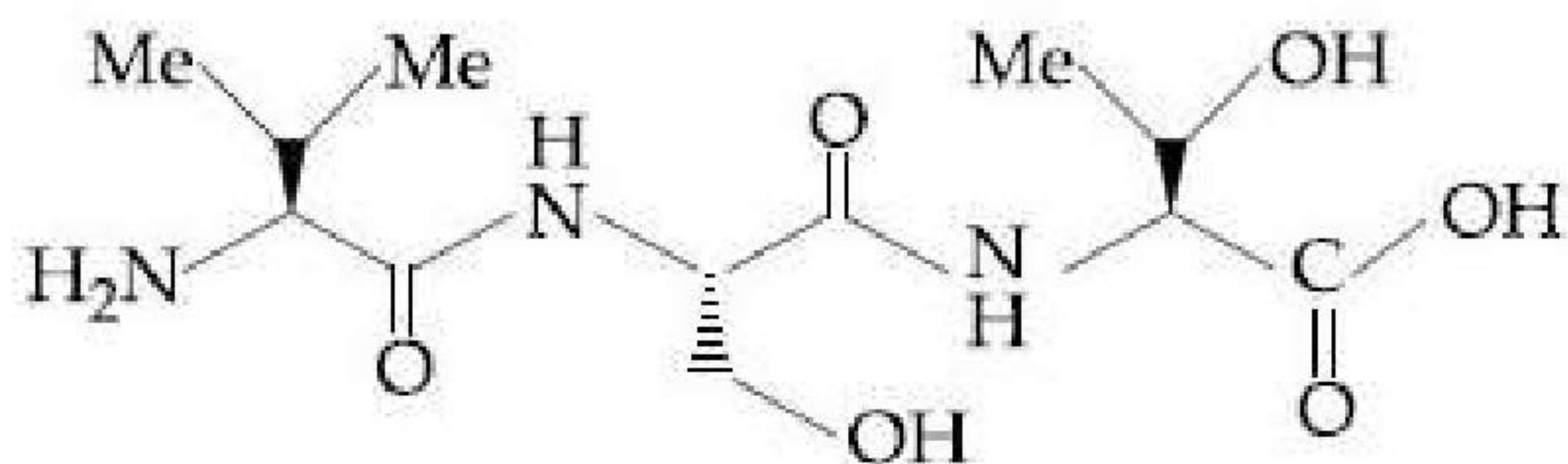
3. Val - Ser - Thr

4. Thr - Ser - Val

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

नीचे दिये ट्राइपेप्टाइड में ऐमीनो अम्लों का सही क्रम है :



Options :

1. Leu - Ser - Thr

2. Thr - Ser - Leu

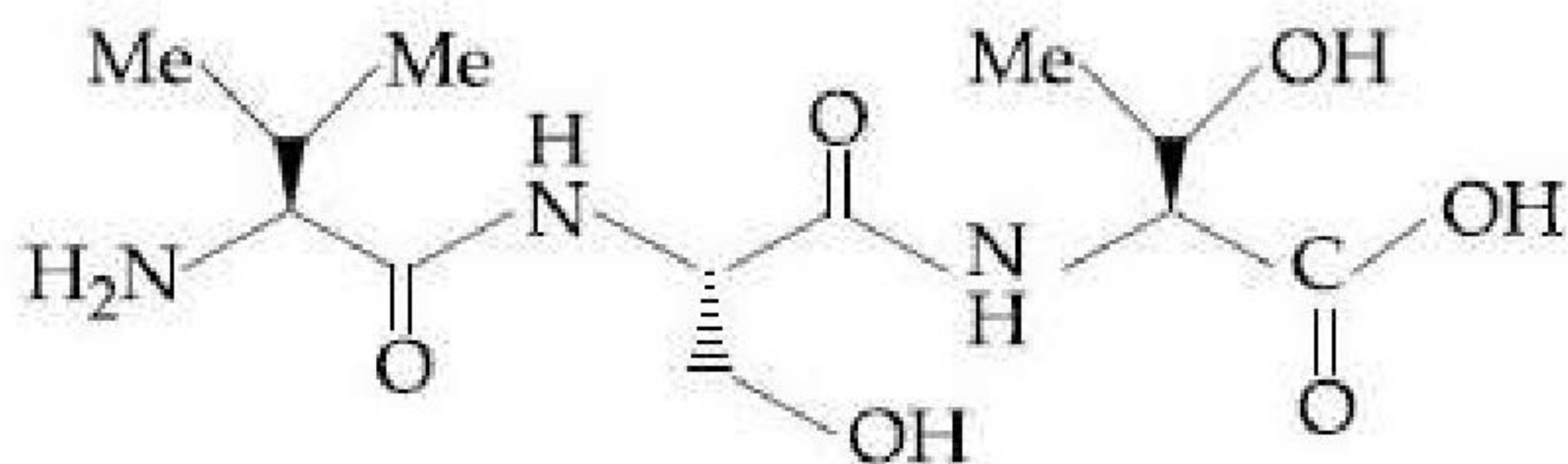
3. Val - Ser - Thr

4. Thr - Ser - Val

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

નીચે આપેલા ટ્રાઇપેપ્ટાઇડ માં રહેલા એમિનો એસિડ નો સાચો ક્રમ શોધો ?



Options :

1. Leu - Ser - Thr
2. Thr - Ser- Leu
3. Val - Ser - Thr
4. Thr - Ser - Val

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

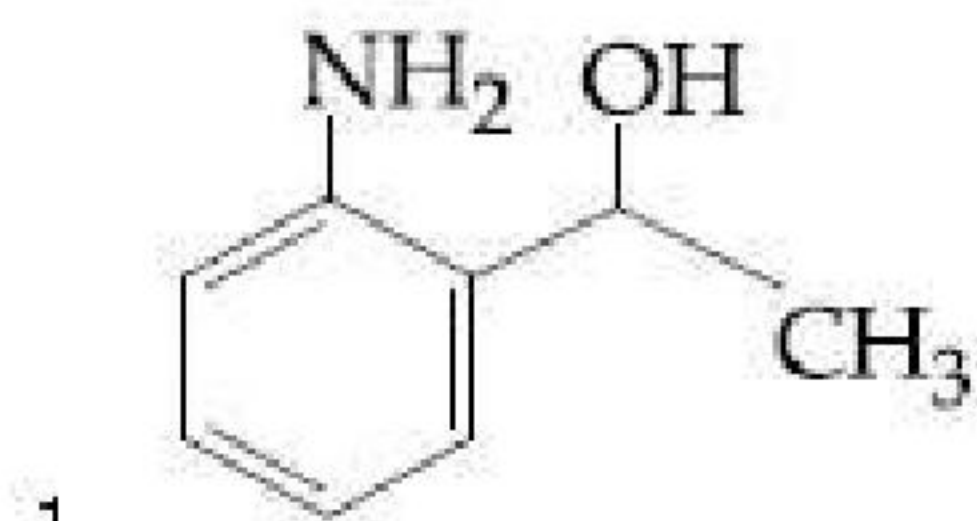
Correct Marks : 4 Wrong Marks : 1

The tests performed on compound X and their inferences are :

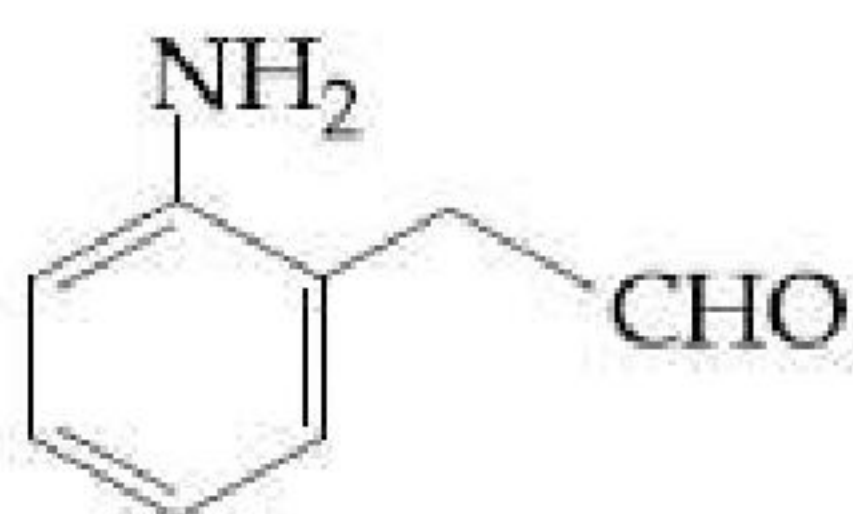
Test	Inference
(a) 2, 4 - DNP test	Coloured precipitate
(b) Iodoform test	Yellow precipitate
(c) Azo-dye test	No dye formation

Compound 'X' is :

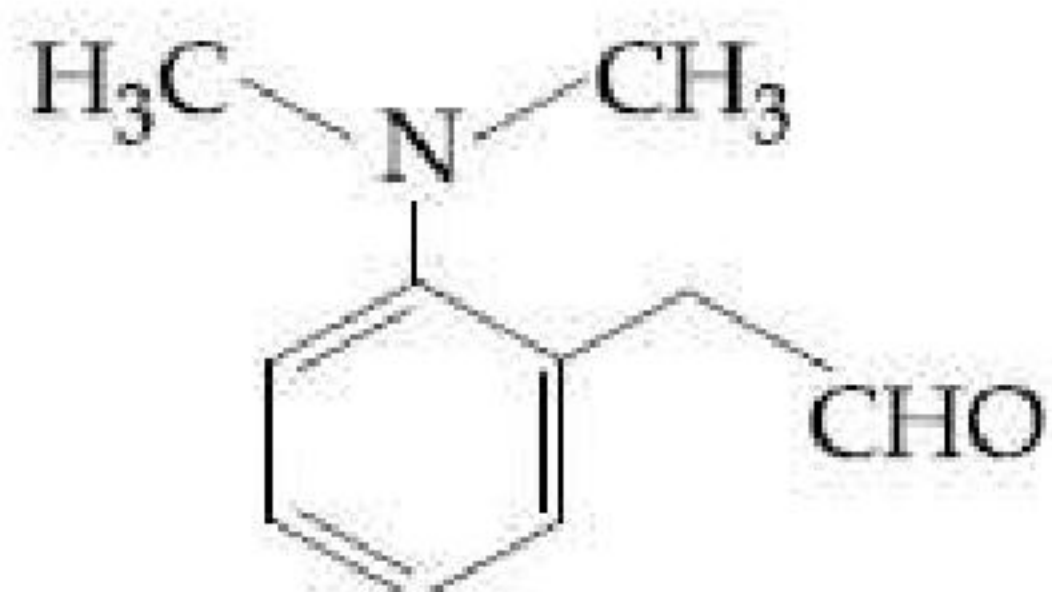
Options :



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

यौगिक X पर किये गये परीक्षण निम्न निष्कर्ष देते हैं :

परीक्षण

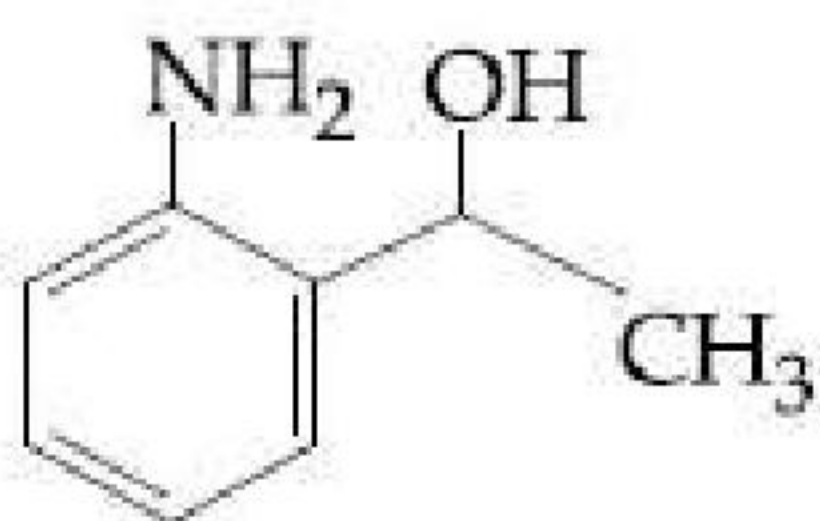
निष्कर्ष

- | | |
|------------------------|-------------------|
| (a) 2, 4 - DNP परीक्षण | रंगीन अवक्षेप |
| (b) आयडोफार्म परीक्षण | पीला अवक्षेप बनना |
| (c) ऐजो-डाई परीक्षण | डाई नहीं बनना |

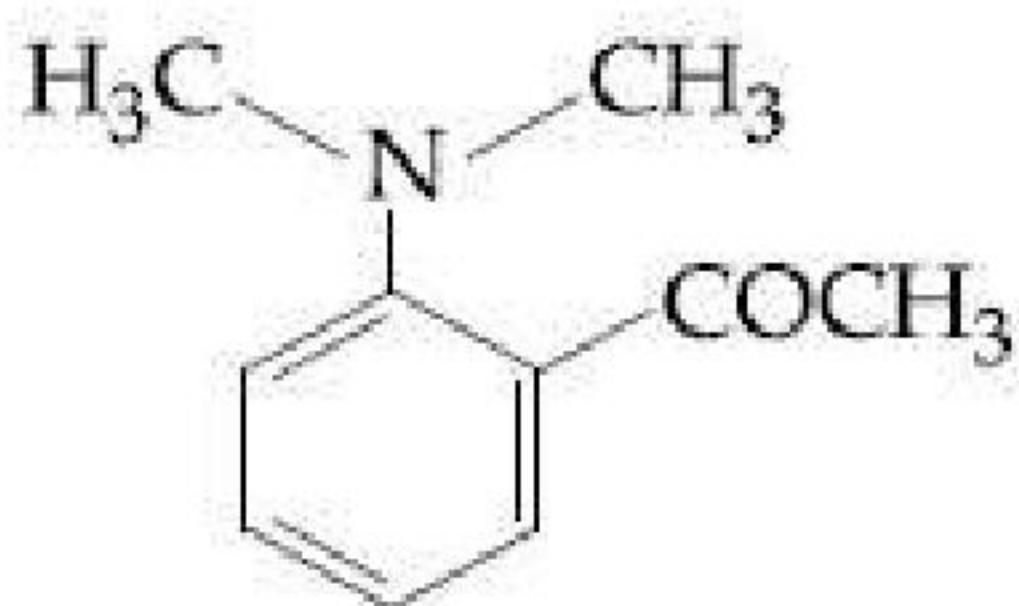
यौगिक 'X' है :

Options :

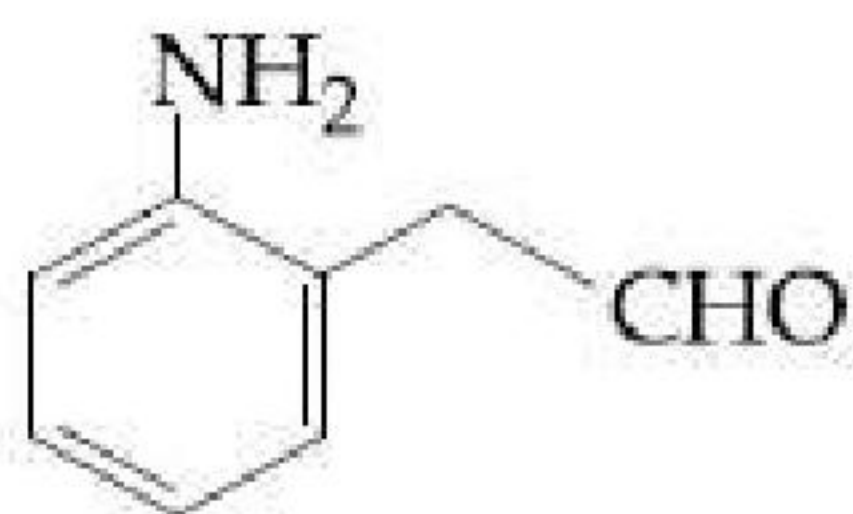
1.



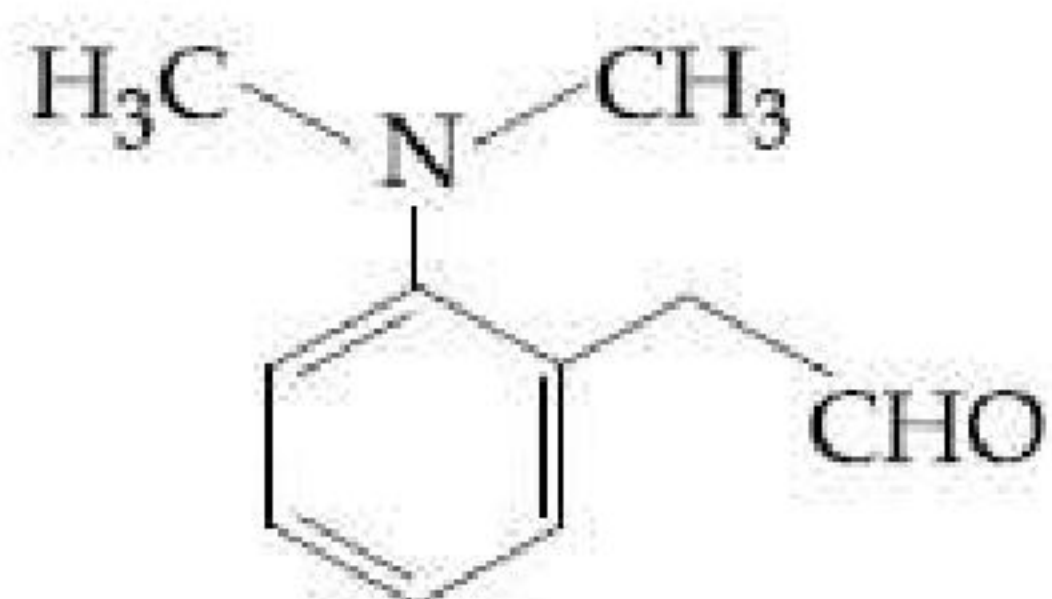
2.



3.



4.



Correct Marks : 4 Wrong Marks : 1

સંયોજન X સાથે કરેલી કસોટી અને તેના અનુમાનો

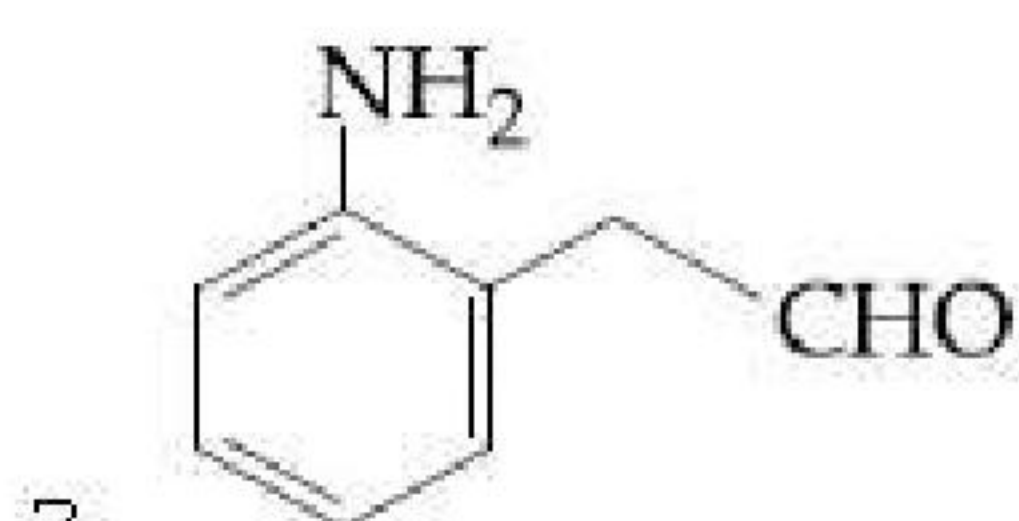
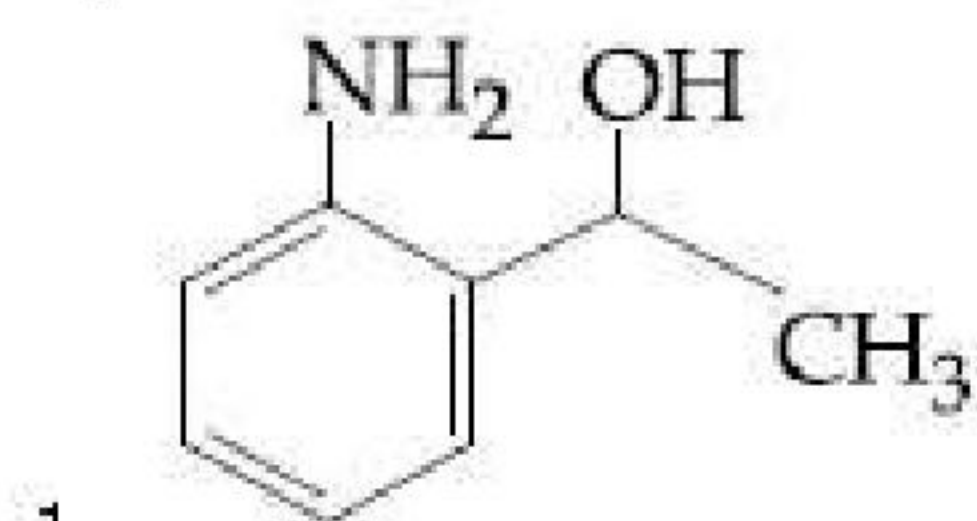
કસોટી

અનુમાન

- | | | |
|-----|------------------|--------------------------|
| (a) | 2, 4 - DNP કસોટી | રંગીન અવક્ષેપ |
| (b) | આયોડોફોર્મ કસોટી | પીળા અવક્ષેપ |
| (c) | એઝો રંગક કસોટી | કોઈ રંગક (dye) બનશે નહીં |

તો સંયોજન X નું બધારકા નીચેનામાંથી શોધો ?

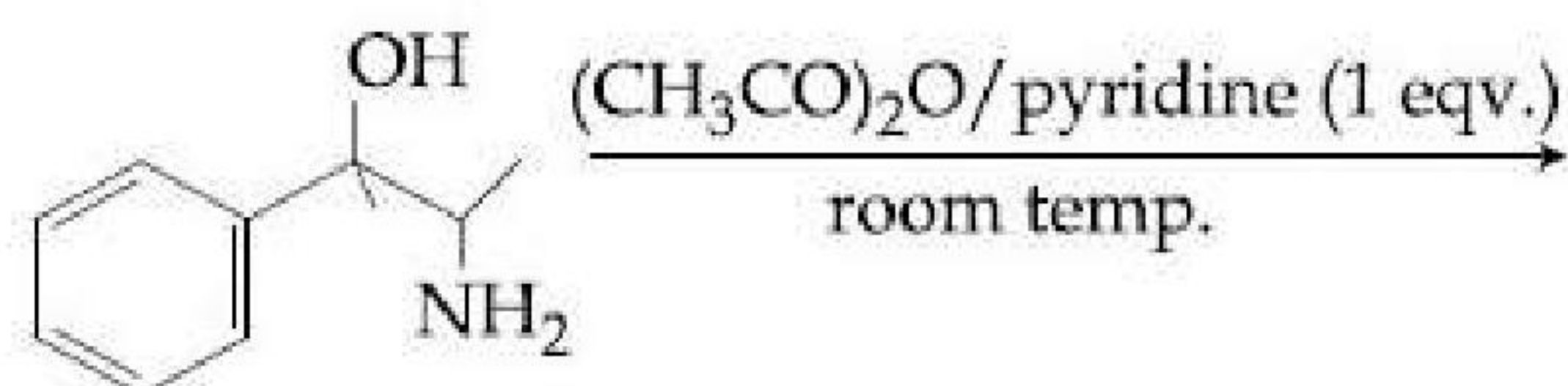
Options :



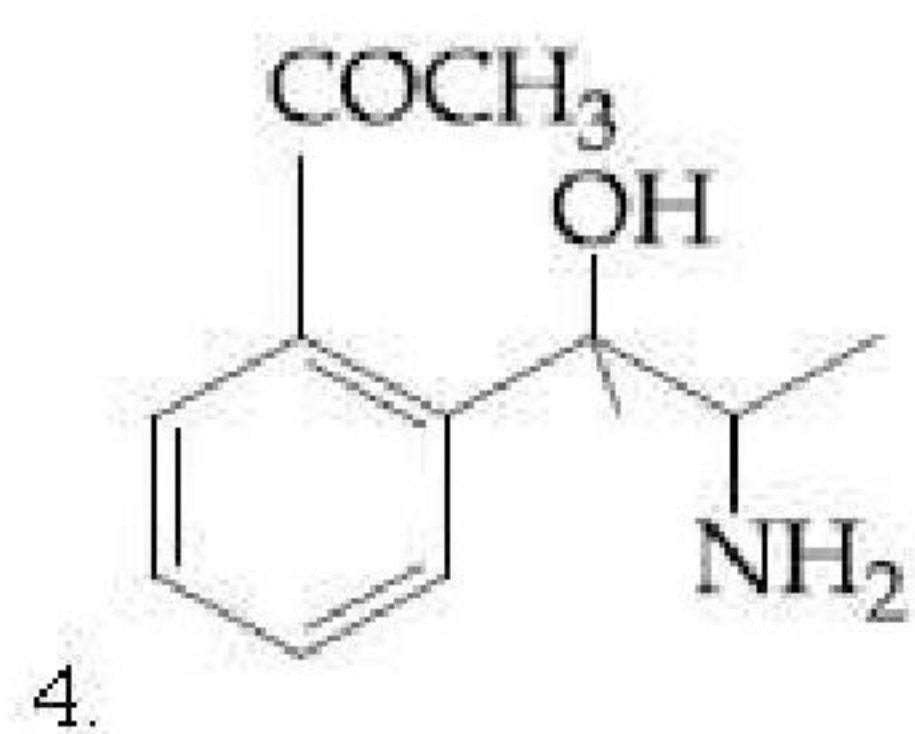
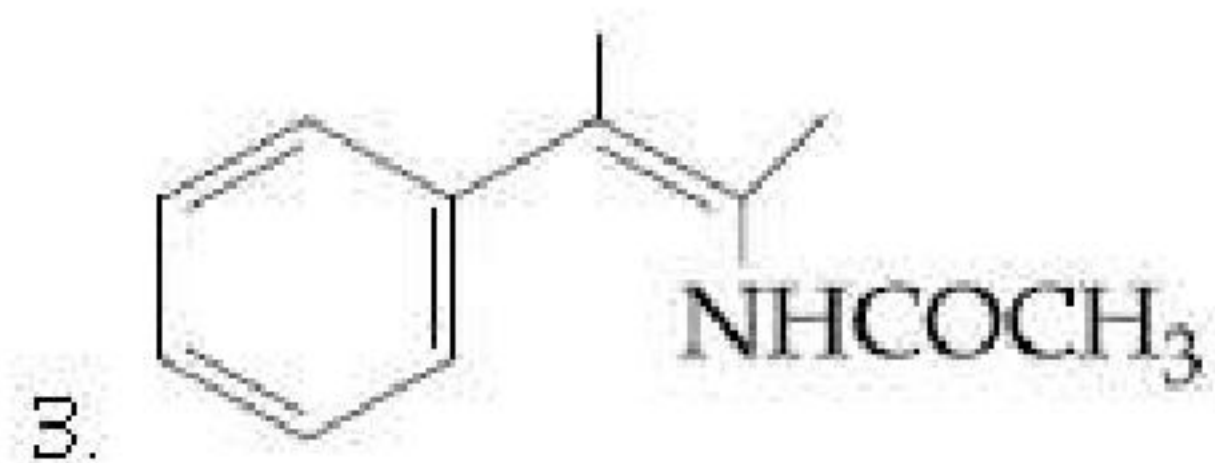
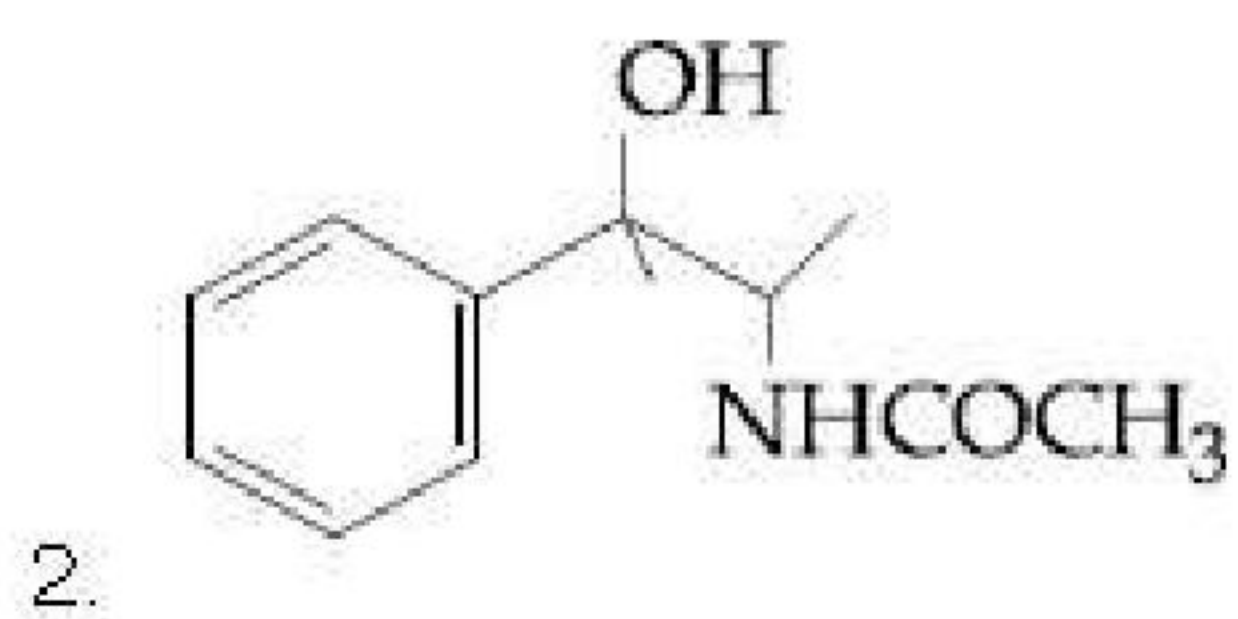
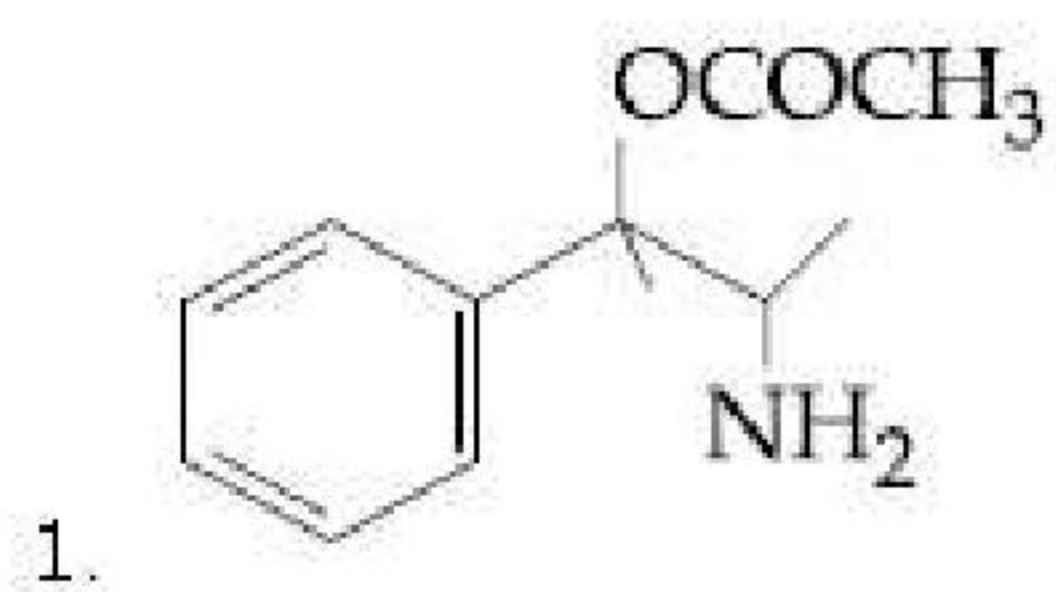
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product obtained in the following reaction is :

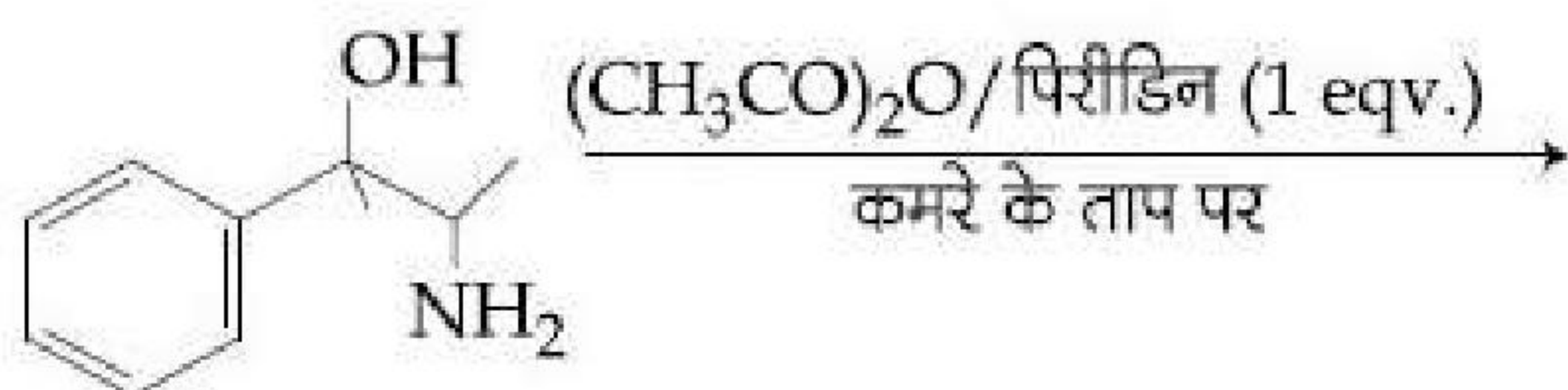


Options :

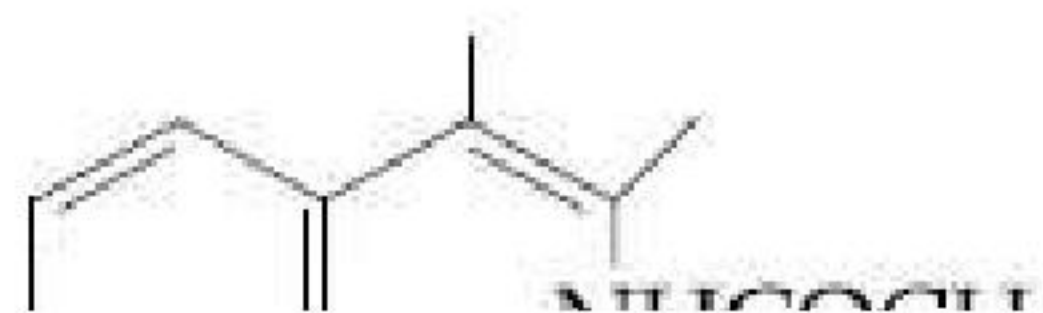
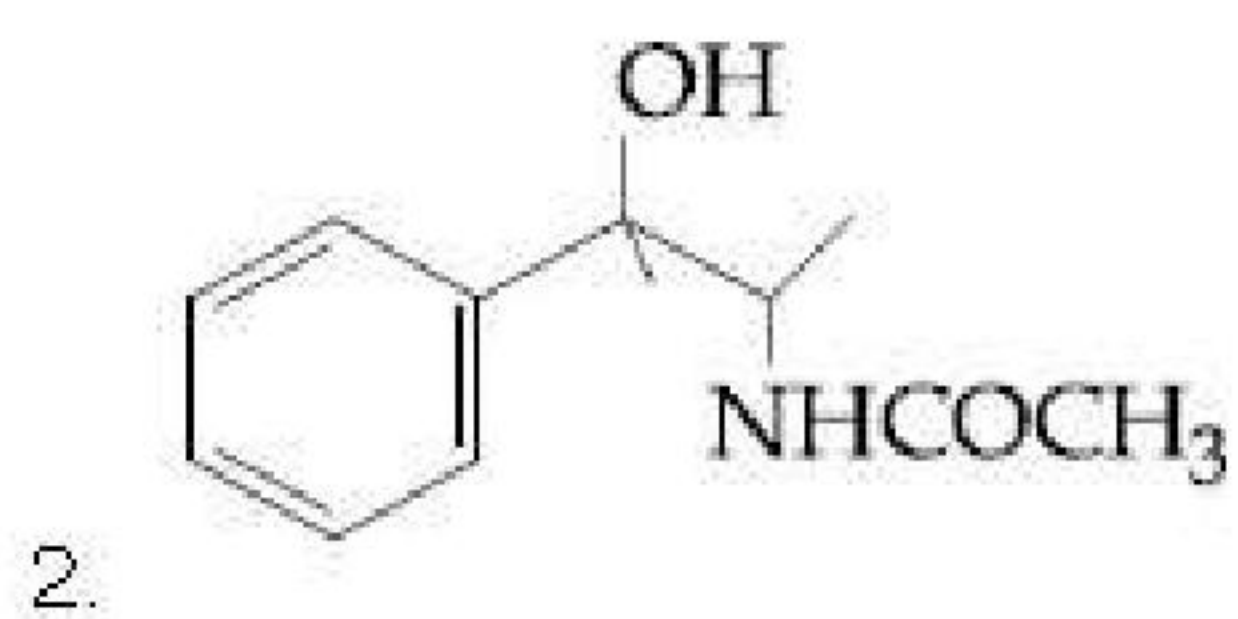
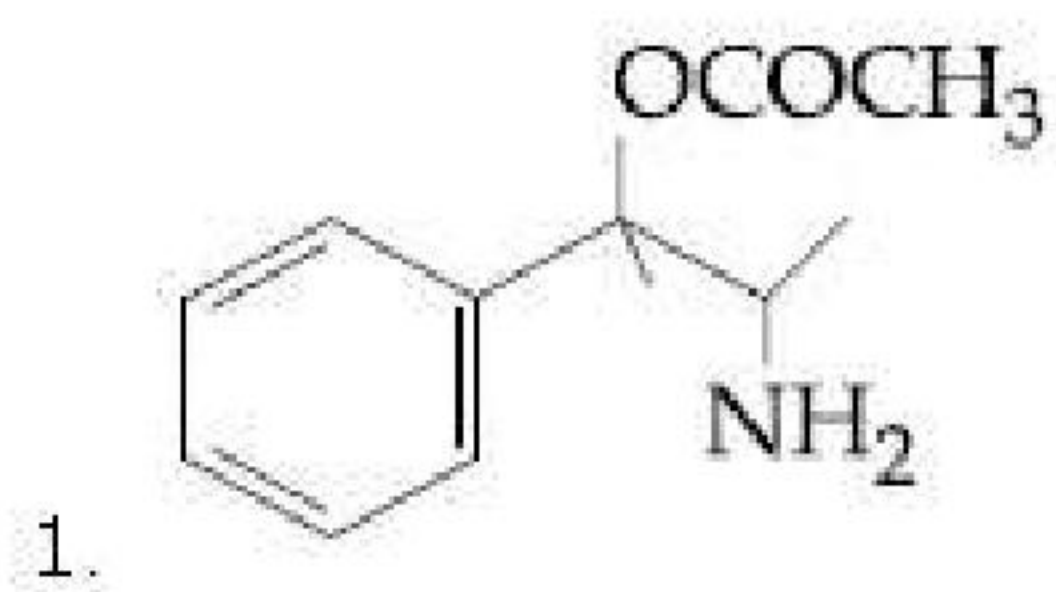


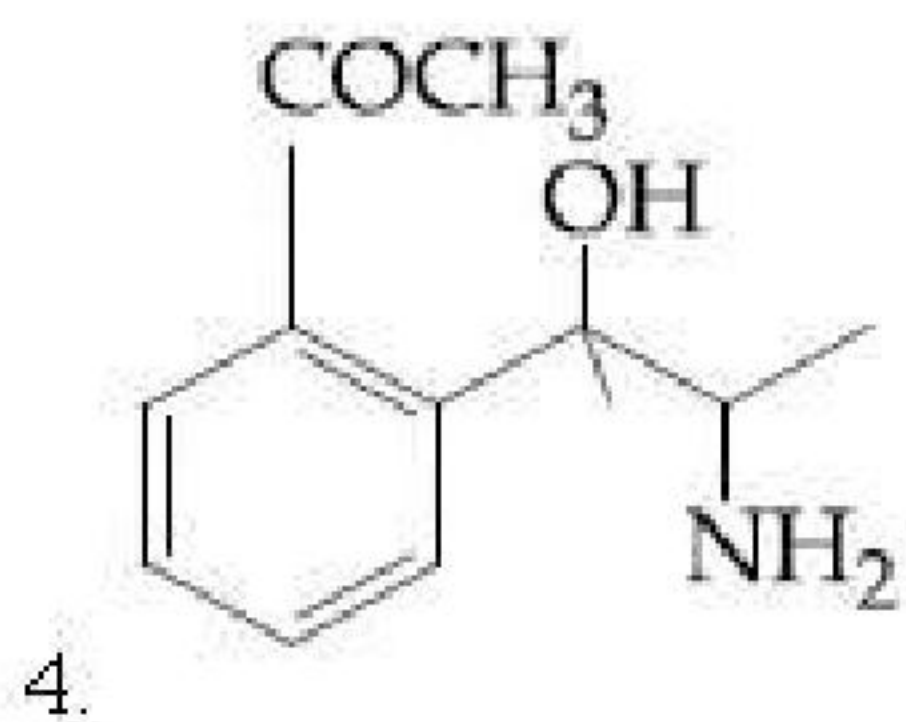
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में प्राप्त होने वाला मुख्य उत्पाद है :



Options :

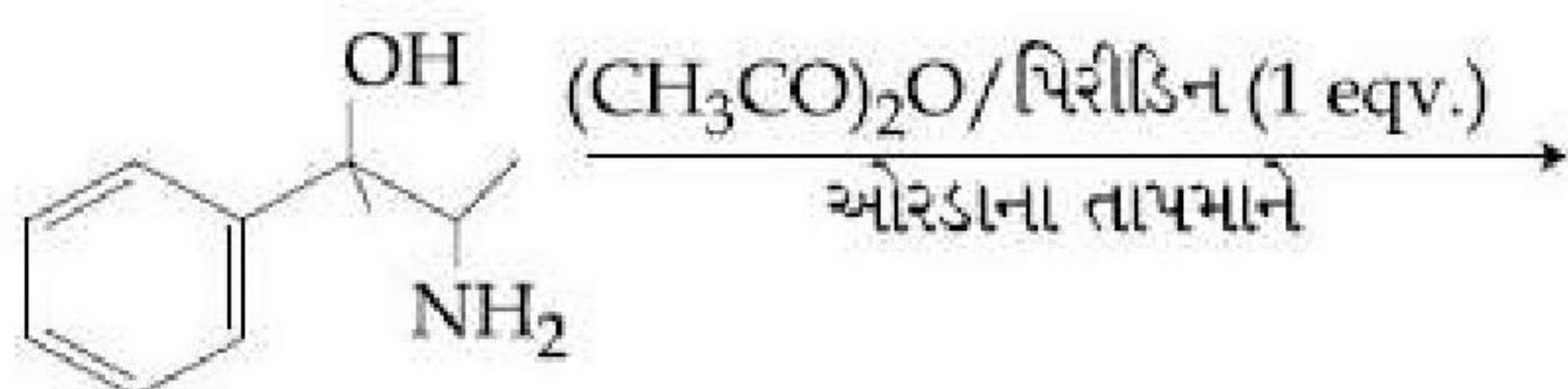




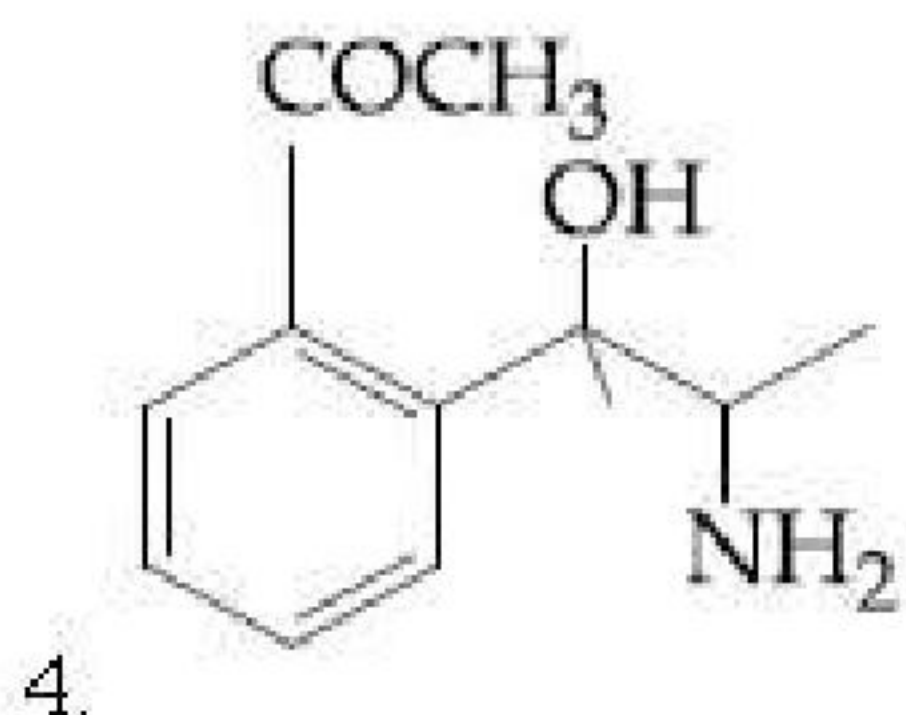
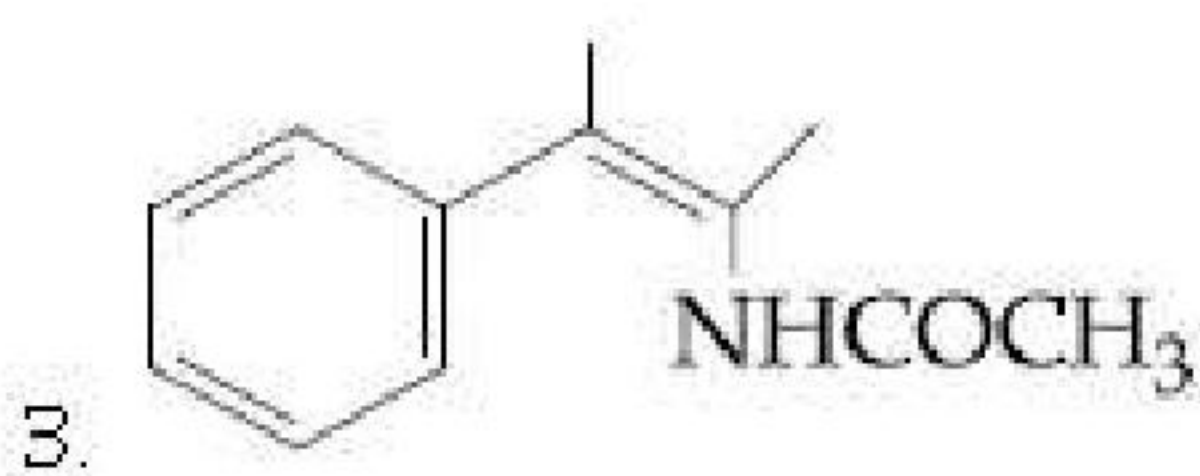
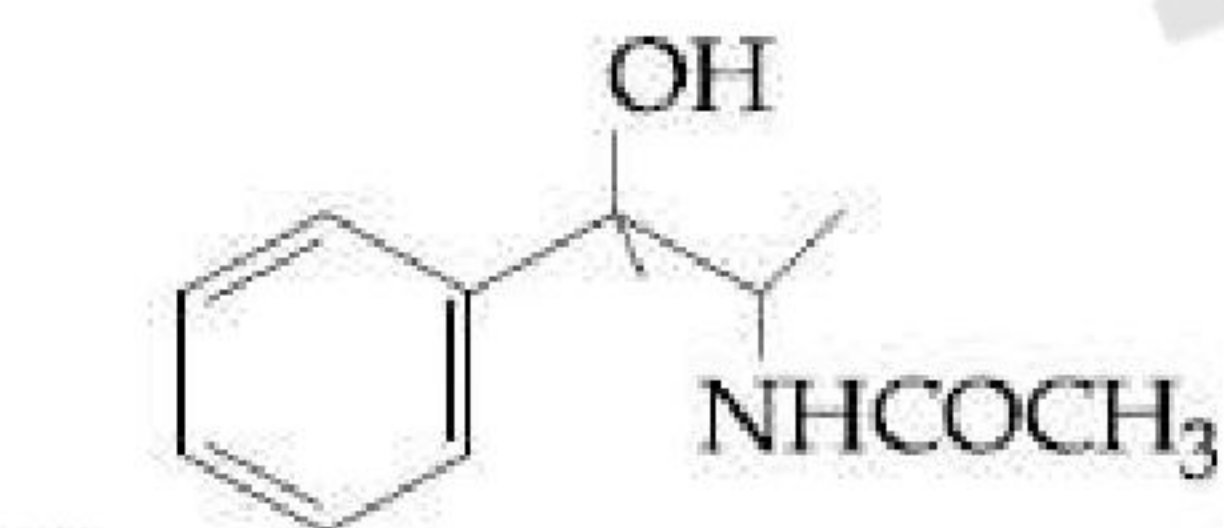
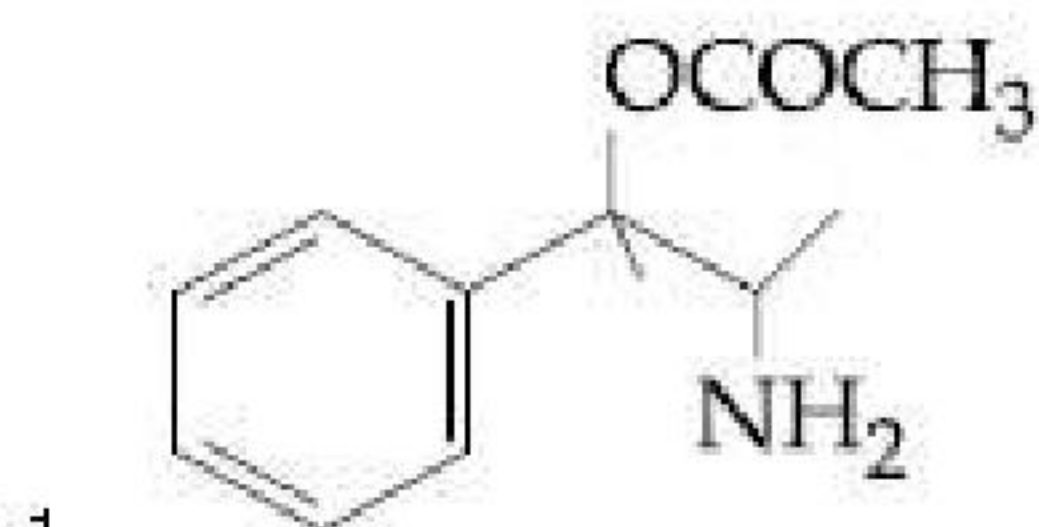
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયા મળતી મુક્ય નીપજ શોધો?



Options :



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

Correct Marks : 4 Wrong Marks : 1

The correct match between Item I and Item II is :

Item I	Item II
(A) Benzaldehyde	(P) Mobile phase
(B) Alumina	(Q) Adsorbent
(C) Acetonitrile	(R) Adsorbate

Options :

1. (A) $\rightarrow$ (P) ; (B) $\rightarrow$ (R) ; (C) $\rightarrow$ (Q)
2. (A) $\rightarrow$ (Q) ; (B) $\rightarrow$ (P) ; (C) $\rightarrow$ (R)
3. (A) $\rightarrow$ (Q) ; (B) $\rightarrow$ (R) ; (C) $\rightarrow$ (P)
4. (A) $\rightarrow$ (R) ; (B) $\rightarrow$ (Q) ; (C) $\rightarrow$ (P)

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

Correct Marks : 4 Wrong Marks : 1

मद I तथा मद II के बीच सही सुमेल है :

मद I	मद II
(A) बेंजाल्डिहाइड	(P) गतिशील प्रावस्था
(B) एल्यूमिना	(Q) अधिशोषक
(C) ऐसिटोनाइट्राइल	(R) अधिशोष्य

Options :

1. (A) $\rightarrow$ (P) ; (B) $\rightarrow$ (R) ; (C) $\rightarrow$ (Q)
2. (A) $\rightarrow$ (Q) ; (B) $\rightarrow$ (P) ; (C) $\rightarrow$ (R)
3. (A) $\rightarrow$ (Q) ; (B) $\rightarrow$ (R) ; (C) $\rightarrow$ (P)
4. (A) $\rightarrow$ (R) ; (B) $\rightarrow$ (Q) ; (C) $\rightarrow$ (P)

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

Correct Marks : 4 Wrong Marks : 1

સૂચિ - I અને સૂચિ - II ને યોગ્ય રીતે જોડો :

સૂચિ - I	સૂચિ - II
(A) બેન્ઝાલ્ડીહાઈડ	(P) ચલિત કલા (Mobile phase)
(B) એલ્યુમિના	(Q) અધિશોષક
(C) એસિટોનાઈટ્રાઈલ	(R) અધિશોષિત

Options :

1. (A) $\rightarrow$ (P) ; (B) $\rightarrow$ (R) ; (C) $\rightarrow$ (Q)
2. (A) $\rightarrow$ (Q) ; (B) $\rightarrow$ (P) ; (C) $\rightarrow$ (R)
3. (A) $\rightarrow$ (Q) ; (B) $\rightarrow$ (R) ; (C) $\rightarrow$ (P)
4. (A) $\rightarrow$ (R) ; (B) $\rightarrow$ (Q) ; (C) $\rightarrow$ (P)

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

Correct Marks : 4 Wrong Marks : 1

When the first electron gain enthalpy ($\Delta_{eg}H$) of oxygen is -141 kJ/mol , its second electron gain enthalpy is :

Options :

1. a positive value
2. a more negative value than the first
3. negative, but less negative than the first
4. almost the same as that of the first

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

यदि आक्सीजन की प्रथम इलेक्ट्रान लब्धि एंथैल्पी ($\Delta_{eg}H$) का मान -141 kJ/mol है, इसके द्वितीय इलेक्ट्रान लब्धि एंथैल्पी का मान है :

Options :

1. धनात्मक

3. ઋણાત્મક લેકિન પહેલે સે કમ ઋણાત્મક

4. પહેલે માન કે લગભગ બરાબર

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

ઓક્સિજનની પ્રથમ ઇલેક્ટ્રોન ગ્રાહ્ય (gain) એન્થાલ્પી ($\Delta_{eg}H$) -141 kJ/mol આપેલ છે. તેની દ્વિતીય ઇલેક્ટ્રોન ગ્રાહ્ય એન્થાલ્પી માટે શું અપેક્ષા છે?

Options :

1. તે ધન હોય શકે.

2. પ્રથમ કરતા વધુ ઋણ હોઈ શકે.

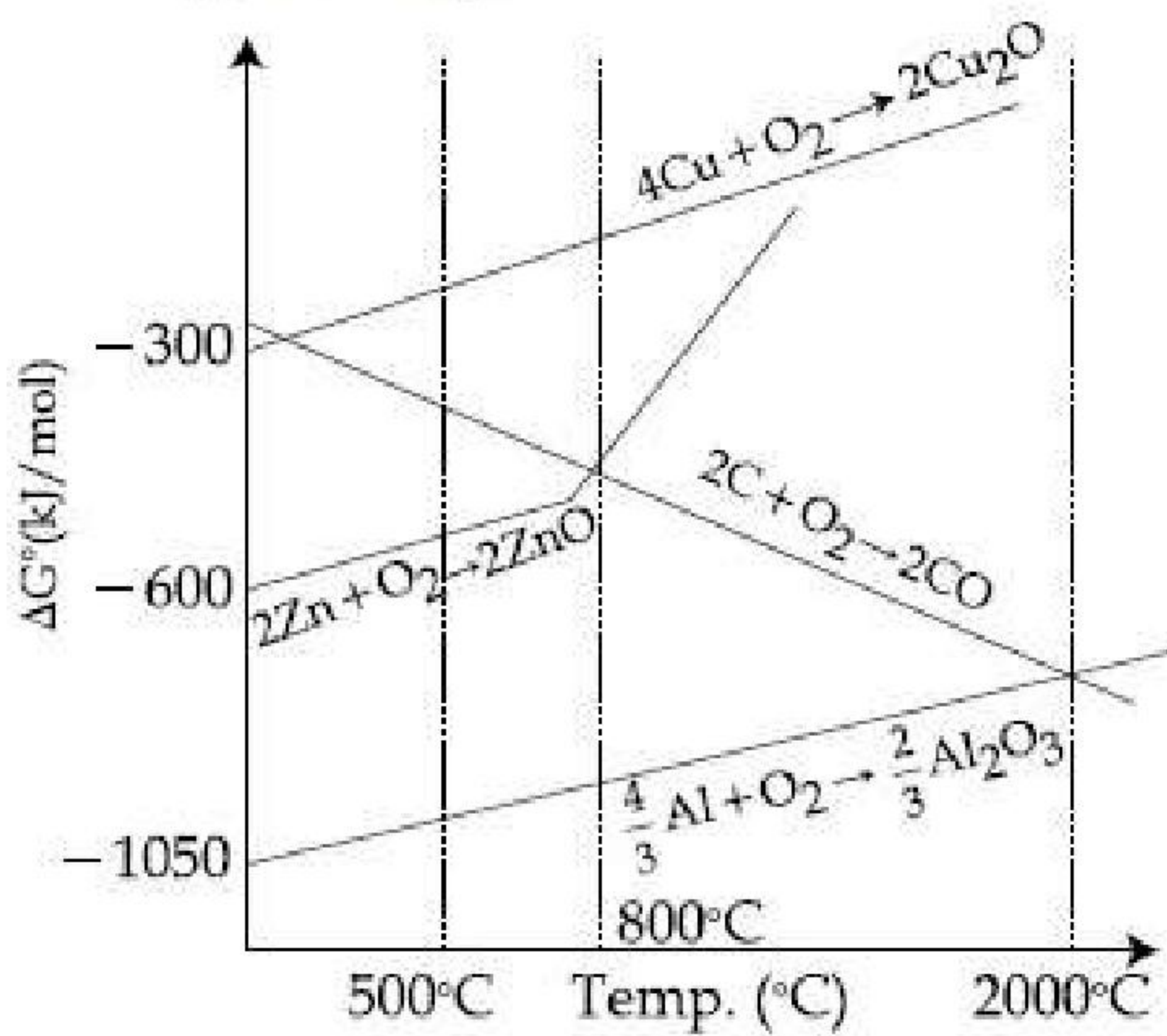
3. ઋણ, પરંતુ, પહેલા કરતા ઓછી ઋણ હોઈ શકે.

4. લગભગ પહેલા જેટલી જ સરખી હોઈ શકે.

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

Correct Marks : 4 Wrong Marks : 1

The correct statement regarding the given Ellingham diagram is :



Options :

1. Coke cannot be used for the extraction of Cu from Cu_2O .

At 1400°C , Al can be used for the

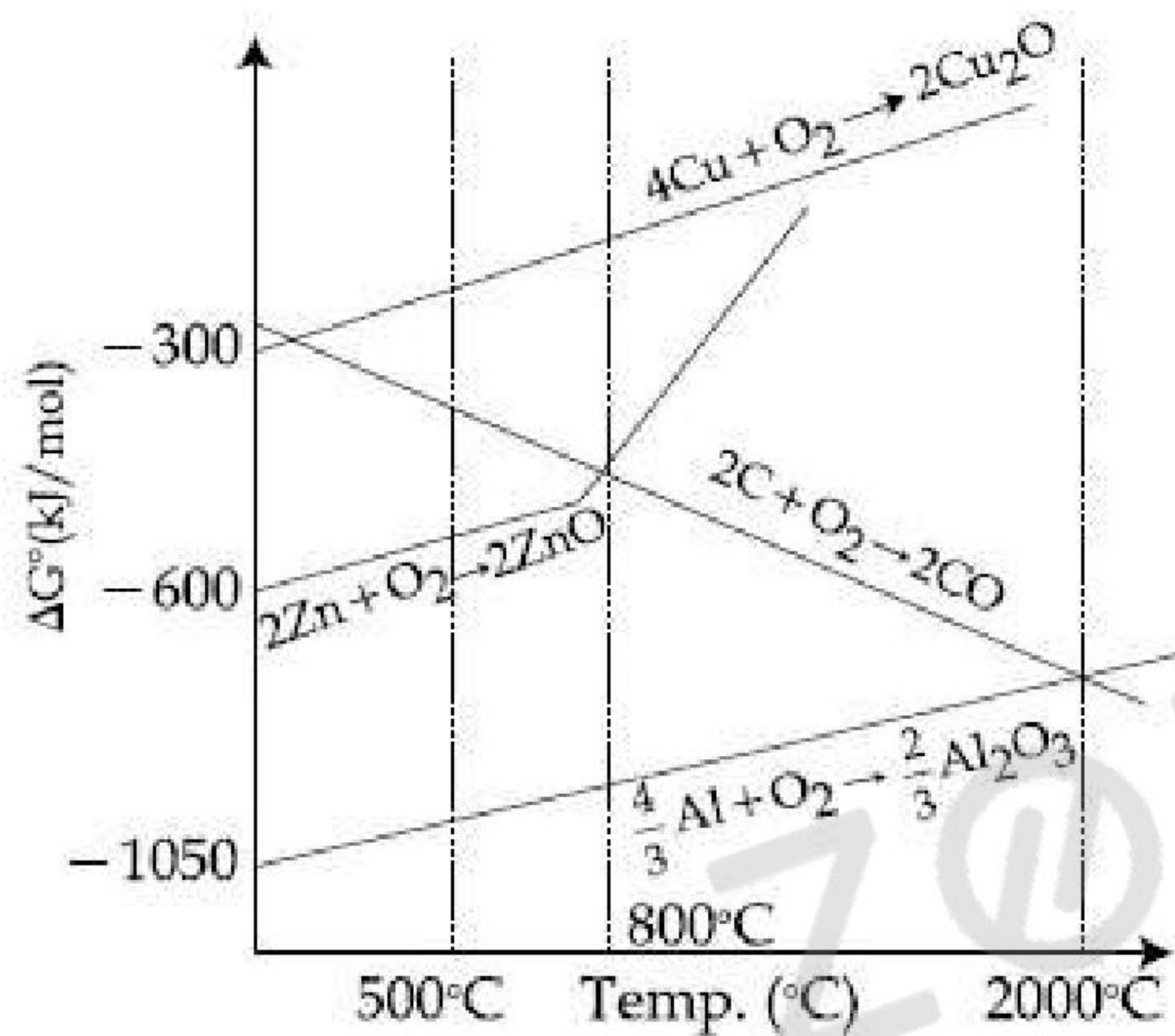
3. At 500°C, coke can be used for the extraction of Zn from ZnO

4. At 800°C, Cu can be used for the extraction of Zn from ZnO.

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

दिए गए आरेखीय एलिंघम आलेख के संबंध में सत्य कथन है :



Options :

1. Cu₂O से Cu का निष्कर्षण कोक का प्रयोग करके नहीं किया जा सकता है।

2. ZnO से Zn का निष्कर्षण 1400°C पर Al का प्रयोग करके किया जा सकता है।

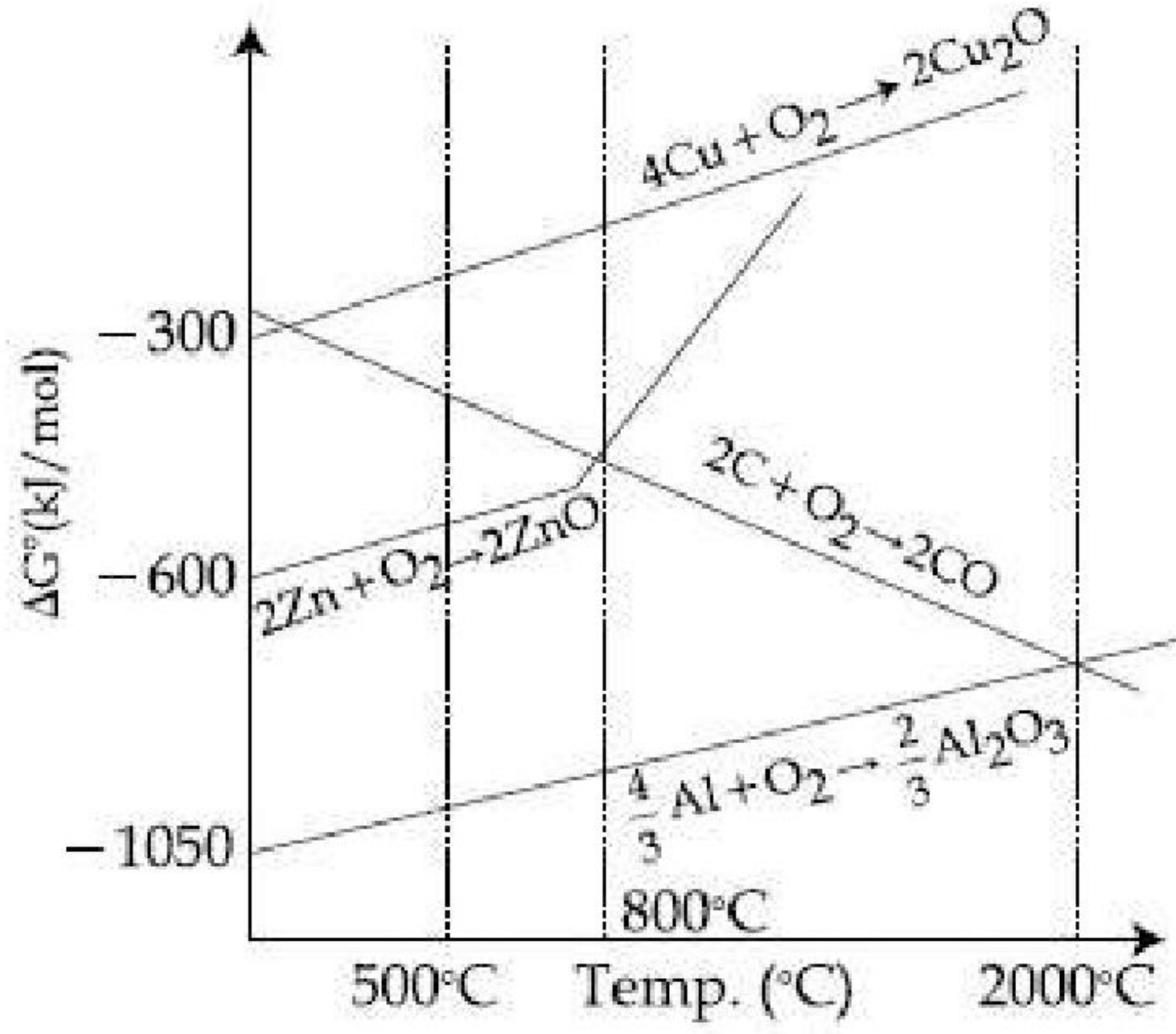
3. ZnO से Zn का निष्कर्षण 500°C पर कोक का प्रयोग करके किया जा सकता है।

4. ZnO से Zn का निष्कर्षण 800°C पर Cu का प्रयोग करके किया जा सकता है।

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

એલિંગહામ (Ellingham) રેખાકૃતિ માટે સાચુ વિધાન શોધો?



Options :

1. Cu_2O માંથી Cu ને નિષ્કર્ષિત કરવા માટે કોક (Coke) નો ઉપયોગ કરી શકાય નહીં.
2. 1400°C એ Al નો ઉપયોગ ZnO માંથી Zn નું નિષ્કર્ષણ કરવા માટે કરી શકાય.
3. 500°C એ Coke નો ઉપયોગ ZnO માંથી Zn ના નિષ્કર્ષણ માટે કરી શકાય.
4. 800°C એ Cu નો ઉપયોગ ZnO માંથી Zn ના નિષ્કર્ષણ માટે કરી શકાય.

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

Correct Marks : 4 Wrong Marks : 1

The temporary hardness of water is due to :

Options :

1. CaCl_2
2. $\text{Ca}(\text{HCO}_3)_2$
3. NaCl
4. Na_2SO_4

पानी की अस्थायी कठोरता का कारण है :

Options :

1. CaCl_2
2. $\text{Ca}(\text{HCO}_3)_2$
3. NaCl
4. Na_2SO_4

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

પાણીની અસ્થાયી કઠીનતા નીચેનામાંથી કયા એકને આભારી છે?

Options :

1. CaCl_2
2. $\text{Ca}(\text{HCO}_3)_2$
3. NaCl
4. Na_2SO_4

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 metal that forms nitride by reacting directly with N_2 of air, is :

Options :

1. K
2. Rb
3. Cs
4. Li

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

Options :

1. K
2. Rb
3. Cs
4. Li

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

નીચે આપેલી ધાતુઓ પૈકી કઈ ધાતુ હવામાંના N_2 સાથે સીધી પ્રક્રિયા કરી નાઇટ્રાઇડ બનાવે છે?

Options :

1. K
2. Rb
3. Cs
4. Li

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

Good reducing nature of H_3PO_2 is attributed to the presence of :

Options :

1. One P – H bond
2. Two P – H bonds
3. One P – OH bond
4. Two P – OH bonds

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

H_2PO_3 की अच्छी अपचायक प्रवृत्ति किनकी उपस्थिति

1. एक P – H आबंध
2. दो P – H आबंध
3. एक P – OH आबंध
4. दो P – OH आबंध

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

H_3PO_2 નો સાચો રીડ્યુસીંગ સ્વભાવ નીચે આપેલા પૈકી કયા એકની હાજરી ને આભારી છે ?

Options :

1. એક P – H બંધ
2. બે P – H બંધ
3. એક P – OH બંધ
4. બે P – OH બંધ

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 transition element that has lowest enthalpy of atomisation, is :

Options :

1. V
2. Cu
3. Zn
4. Fe

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

1. V
2. Cu
3. Zn
4. Fe

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

નીચે આપેલા પૈકી કયા સંક્રાંતિ તત્વની પરમાણ્વીકરણ એન્ટાલ્પી સૌથી સાંછી છે?

Options :

1. V
2. Cu
3. Zn
4. Fe

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 complex that has highest crystal field splitting energy (Δ), is :

Options :

1. $K_2[CoCl_4]$
2. $K_3[Co(CN)_6]$
3. $[Co(NH_3)_5Cl]Cl_2$
4. $[Co(NH_3)_5(H_2O)]Cl_3$

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

Correct Marks : 4 Wrong Marks : 1

અધિકતમ ક્રિસ્ટલ ક્ષેત્ર વિષાટન ઊર્જા (Δ) રાખતો વાલો

_____ છે

1. $K_2[CoCl_4]$
2. $K_3[Co(CN)_6]$
3. $[Co(NH_3)_5Cl]Cl_2$
4. $[Co(NH_3)_5(H_2O)]Cl_3$

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંકિર્ણો પૈકી કયાની સ્ફટિક ક્ષેત્ર વિભાજન ઊર્જા (Δ) સૌથી વધુ છે?

Options :

1. $K_2[CoCl_4]$
2. $K_3[Co(CN)_6]$
3. $[Co(NH_3)_5Cl]Cl_2$
4. $[Co(NH_3)_5(H_2O)]Cl_3$

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

Correct Marks : 4 Wrong Marks : 1

એક ધાતુ આયન ' M^{3+} ' નો હોમોલેપ્ટિક અષ્ટફલકીય સંકિર્ણ તેના ત્રણ એકદંતીય લીગાન્ડ L_1 , L_2 અને L_3 અનુક્રમે લીલા, વાદળી અને લાલ વિસ્તારમાં તરંગલંબાઈ નું શોષણ કરે છે. તો આ લીગાન્ડની પ્રબળતા નો ચઢતો ક્રમ શોધો?

Options :

1. $L_1 < L_2 < L_3$
2. $L_3 < L_2 < L_1$
3. $L_2 < L_1 < L_3$
4. $L_3 < L_1 < L_2$

Homoleptic octahedral complexes of a metal ion ' M^{3+} ' with three monodentate ligands L_1 , L_2 and L_3 absorb wavelengths in the region of green, blue and red respectively. The increasing order of the ligand strength is :

Options :

1. $L_1 < L_2 < L_3$
2. $L_3 < L_2 < L_1$
3. $L_2 < L_1 < L_3$
4. $L_3 < L_1 < L_2$

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

Correct Marks : 4 Wrong Marks : 1

तीन एकदंतुर लिगण्डों L_1 , L_2 तथा L_3 के साथ बने एक धातु आयन ' M^{3+} ' के होमोलेप्टिक अष्टफलक संकुल क्रमशः हरे, नीले एवं लाल क्षेत्र के तरंगदैर्घ्य अवशोषित करते हैं। लिगण्डों की प्रबलता का बढ़ता क्रम है :

Options :

1. $L_1 < L_2 < L_3$
2. $L_3 < L_2 < L_1$
3. $L_2 < L_1 < L_3$
4. $L_3 < L_1 < L_2$

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

Correct Marks : 4 Wrong Marks : 1

Which of the following conditions in drinking water causes methemoglobinemia ?

Options :

1. > 100 ppm of sulphate

3. > 50 ppm of nitrate
4. > 50 ppm of chloride

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

पीने के पानी से मेथेमोग्लोबिनेमिया होने के कारण की शर्त है :

Options :

1. > 100 ppm सल्फेट
2. > 50 ppm लेड
3. > 50 ppm नाइट्रेट
4. > 50 ppm क्लोराइड

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

નીચે આપેલી પીવાના પાણીની કઈ સ્થિતિમાં મિથેમોગ્લોબિનમિયા થાય છે ?

Options :

1. પાણી જેમાં સલ્ફેટ > 100 ppm
2. પાણી જેમાં સીસું (Lead) > 50 ppm
3. પાણી જેમાં નાઇટ્રેટ > 50 ppm
4. પાણી જેમાં ક્લોરાઇડ > 50 ppm

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

Correct Marks : 4 Wrong Marks : 1

The pH of rain water, is approximately :

Options :

1. 7.0

3. 6.5

4. 5.6

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

Correct Marks : 4 Wrong Marks : 1

वर्षा के पानी की pH लगभग है :

Options :

1. 7.0

2. 7.5

3. 6.5

4. 5.6

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

Correct Marks : 4 Wrong Marks : 1

વરસાદના પાણીની અંદાજિત pH શોધો ?

Options :

1. 7.0

2. 7.5

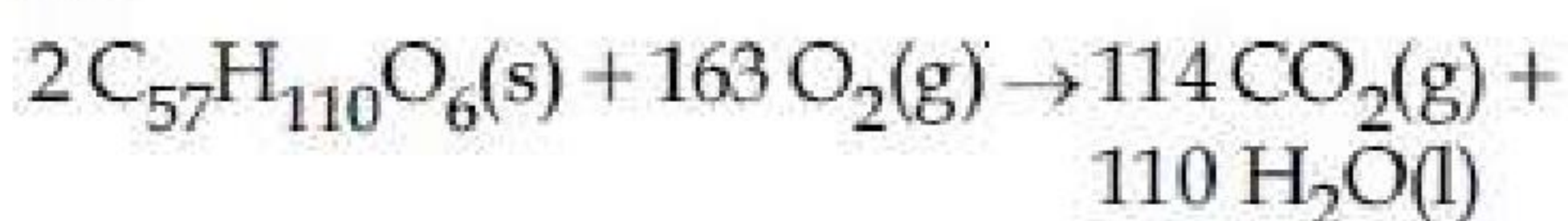
3. 6.5

4. 5.6

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

For the following reaction, the mass of water produced from 445 g of $C_{57}H_{110}O_6$ is :



Options :

1. 445 g

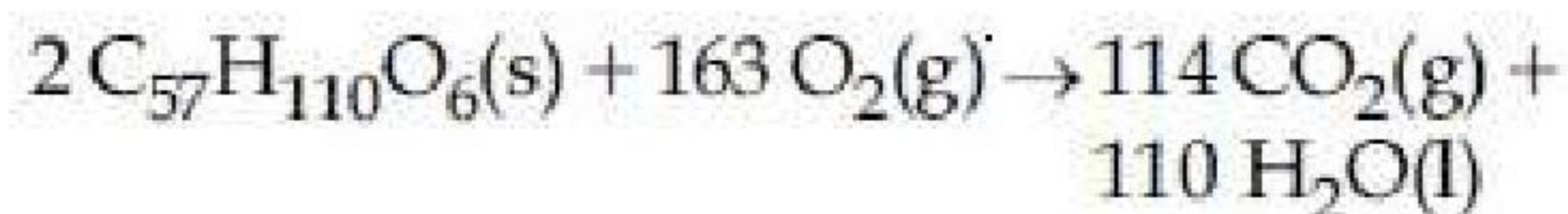
3. 490 g

4. 890 g

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

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया के लिए, 445 g $C_{57}H_{110}O_6$ से
उत्पादित जल का द्रव्यमान है :



Options :

1. 445 g

2. 495 g

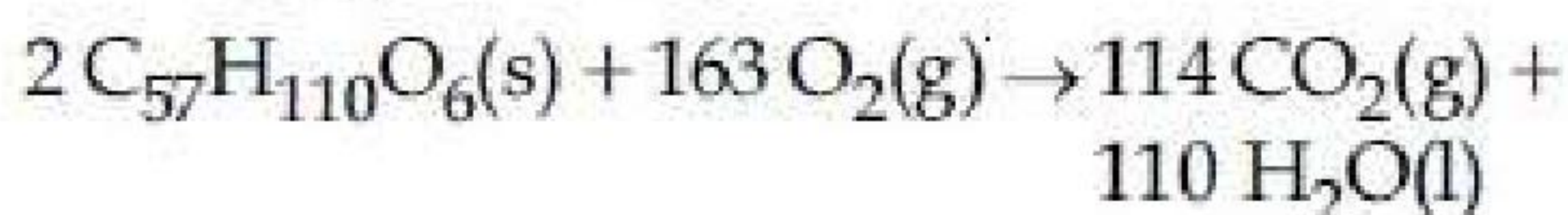
3. 490 g

4. 890 g

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

Correct Marks : 4 Wrong Marks : 1

આપેલ પ્રક્રિયા માટે, 445 g $C_{57}H_{110}O_6$ માંથી ઉત્પન્ન
થતા પાણીનું દળ શોધો ?



Options :

1. 445 g

2. 495 g

3. 490 g

4. 890 g

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

Correct Marks : 4 Wrong Marks : 1

At 100°C , copper (Cu) has FCC unit cell structure with cell edge length of $x \text{ \AA}$. What is the approximate density of Cu (in g cm^{-3}) at this temperature ?

[Atomic Mass of Cu = 63.55 u]

Options :

1. $\frac{105}{x^3}$
2. $\frac{211}{x^3}$
3. $\frac{422}{x^3}$
4. $\frac{205}{x^3}$

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

Correct Marks : 4 Wrong Marks : 1

100°C पर कापर (Cu), $x \text{ \AA}$ कोष्ठिका कोर की लम्बाई वाले FCC एकक कोष्ठिका संरचना रखता है। इस ताप पर Cu का घनत्व (g cm^{-3} में) लगभग होगा :

[Cu का परमाणु भार = 63.55 u]

Options :

1. $\frac{105}{x^3}$
2. $\frac{211}{x^3}$
3. $\frac{422}{x^3}$
4. $\frac{205}{x^3}$

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

100°C એ કોપર (Cu), FCC એકમ કોષ બંધારણ માં છે. તેની કોષ ધાર લંબાઈ $x \text{ \AA}$ છે. તો આ તાપમાને Cu (g cm^{-3} માં) અંદાજિત ઘનતા શોધો?

[Cu નું પરમાણુ દળ = 63.55 u]

Options :

1. $\frac{105}{x^3}$
2. $\frac{211}{x^3}$
3. $\frac{422}{x^3}$
4. $\frac{205}{x^3}$

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 following combination of statements is true regarding the interpretation of the atomic orbitals ?

- (a) An electron in an orbital of high angular momentum stays away from the nucleus than an electron in the orbital of lower angular momentum.
- (b) For a given value of the principal quantum number, the size of the orbit is inversely proportional to the azimuthal quantum number.
- (c) According to wave mechanics, the ground state angular momentum is equal to $\frac{h}{2\pi}$.
- (d) The plot of ψ Vs r for various azimuthal quantum numbers, shows peak shifting towards higher r value.

Options :

1. (a), (b)
2. (a), (c)

3. (b), (c)

4. (a), (d)

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

परमाणु कक्षकों की व्याख्या से संबंधित कौन से संयुक्त कथन सत्य है?

- (a) कम कोणीय संवेग वाले कक्षक के इलेक्ट्रान की तुलना में अधिक कोणीय संवेग वाले कक्षक में इलेक्ट्रान नाभिक से दूर रहता है।
- (b) मुख्य क्वांटम संख्या के एक दिये मान के लिए कक्ष का आमाप बिगंशी क्वांटम संख्या के व्युत्क्रमानुपाती होता है।
- (c) तरंग यांत्रिकी के अनुसार निम्न अवस्था कोणीय संवेग $\frac{h}{2\pi}$ के बराबर होता है।
- (d) विभिन्न बिगंशी क्वांटम संख्याओं के लिए ψ Vs r का प्लॉट अधिक r मान की ओर पीक (शिखर) विस्थापित होना प्रदर्शित करता है।

Options :

1. (a), (b)

2. (a), (c)

3. (b), (c)

4. (a), (d)

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

આણ્વિય કક્ષકો નાં અર્થઘટનના સંદર્ભમાં નીચે આપેલા વિધાનો પૈકી કયા જોડકા વિધાનો સાચા છે?

- (a) ઊંચું કોણીય વેગમાન ધરાવતી કક્ષકમાં રહેલો ઇલેક્ટ્રોન તેના કેન્દ્રથી, નીચું કોણીય વેગમાન ધરાવતી કક્ષકમાં રહેલા ઇલેક્ટ્રોન કરતા દૂર રહે છે.
- (b) આપેલા મુખ્ય ક્વોન્ટમ આંકના મુલ્ય માટે કક્ષકનું કદ તેના કોણીય વેગમાન ક્વોન્ટમ આંકના વ્યસ્ત પ્રમાણમાં ચલે છે.
- (c) ક્વોન્ટમ યાંત્રિકી મુજબ, ધરા અવસ્થા કોણીય વેગમાન $\frac{h}{2\pi}$ ને બરાબર હોય છે.
- (d) જુદા-જુદા કોણીય વેગમાન ક્વોન્ટમ આંક માટે V_s r નો આલેખ, દર્શાવે છે કે ટોચ વધુ r મુલ્ય તરફ ખસે છે.

Options :

- 1. (a), (b)
- 2. (a), (c)
- 3. (b), (c)
- 4. (a), (d)

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

In which of the following processes, the bond order has increased and paramagnetic character has changed to diamagnetic ?

Options :

- 1. $\text{NO} \rightarrow \text{NO}^+$
- 2. $\text{O}_2 \rightarrow \text{O}_2^+$
- 3. $\text{O}_2 \rightarrow \text{O}_2^{2-}$
- 4. $\text{N}_2 \rightarrow \text{N}_2^+$

નીચે દિે ગે કિસ પ્રક્રમ મેં, આબંધ કોટિ બઢ ગયી
ઔર અનુચુંબકીય ગુણ પ્રતિચુંબકીય મેં બદલ ગયા ?

Options :

1. $\text{NO} \rightarrow \text{NO}^+$
2. $\text{O}_2 \rightarrow \text{O}_2^+$
3. $\text{O}_2 \rightarrow \text{O}_2^{2-}$
4. $\text{N}_2 \rightarrow \text{N}_2^+$

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

નીચે આપેલી પ્રક્રિયા પૈકી કઈ એકમાં બંધ ક્રમાંક વધે છે
અને અનુચુંબકીય ગુણધર્મનું પ્રતિચુંબકીય ગુણધર્મ માં
રૂપાંતરીત થાય છે ?

Options :

1. $\text{NO} \rightarrow \text{NO}^+$
2. $\text{O}_2 \rightarrow \text{O}_2^+$
3. $\text{O}_2 \rightarrow \text{O}_2^{2-}$
4. $\text{N}_2 \rightarrow \text{N}_2^+$

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

The entropy change associated with the conversion of 1 kg of ice at 273 K to water vapours at 383 K is :

(Specific heat of water liquid and water vapour are $4.2 \text{ kJ K}^{-1} \text{ kg}^{-1}$ and $2.0 \text{ kJ K}^{-1} \text{ kg}^{-1}$; heat of liquid fusion and vapourisation of water are 334 kJ kg^{-1} and 2491 kJ kg^{-1} , respectively). ($\log 273 = 2.436$, $\log 373 = 2.572$, $\log 383 = 2.583$)

Options :

1. $2.64 \text{ kJ kg}^{-1} \text{ K}^{-1}$

3. $7.90 \text{ kJ kg}^{-1} \text{ K}^{-1}$

4. $9.26 \text{ kJ kg}^{-1} \text{ K}^{-1}$

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

273 K પર 1 kg બર્ફ કો 383 K કે જલ ભાષ મેં
બદલને પર ંટ્રોપી મેં પરિવર્તન હોગા :

(જલ તથા ભાષ કી વિશિષ્ટ ઁષ્મા ક્રમશઃ
4.2 $\text{kJ K}^{-1} \text{kg}^{-1}$ ંવં 2.0 $\text{kJ K}^{-1} \text{kg}^{-1}$ હેં;
સંગલન કી ઁષ્મા તથા પાની કી વાષ્પીકરણ ઁષ્મા
ક્રમશઃ 334 kJ kg^{-1} ંવં 2491 kJ kg^{-1} હેં) ($\log 273 = 2.436$, $\log 373 = 2.572$, $\log 383 = 2.583$)

Options :

1. $2.64 \text{ kJ kg}^{-1} \text{ K}^{-1}$

2. $8.49 \text{ kJ kg}^{-1} \text{ K}^{-1}$

3. $7.90 \text{ kJ kg}^{-1} \text{ K}^{-1}$

4. $9.26 \text{ kJ kg}^{-1} \text{ K}^{-1}$

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

273 K ં 1 kg બરફ ને 383 K ં પાણીની વરાળ
(બાષ્પ) માં રૂપાંતરિત કરવા માટે સંકળાયેલો ંન્ટ્રોપી
નો ફેરફાર શોધો?

(પાણી (પ્રવાહી) ંને પાણીની વરાળ (બાષ્પ) ની વિશિષ્ટ
ઁષ્મા 4.2 $\text{kJ K}^{-1} \text{kg}^{-1}$ ંને 2.0 $\text{kJ K}^{-1} \text{kg}^{-1}$
પાણીની ગલન ઁષ્મા ંને બાષ્પાયન ઁષ્મા ંનુક્રમે
334 kJ kg^{-1} ંને 2491 kJ kg^{-1}) ($\log 273 = 2.436$, $\log 373 = 2.572$, $\log 383 = 2.583$)

Options :

1. $2.64 \text{ kJ kg}^{-1} \text{ K}^{-1}$

2. $8.49 \text{ kJ kg}^{-1} \text{ K}^{-1}$

3. $7.90 \text{ kJ kg}^{-1} \text{ K}^{-1}$

4. $9.26 \text{ kJ kg}^{-1} \text{ K}^{-1}$

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

A solution containing 62 g ethylene glycol in 250 g water is cooled to -10°C . If K_f for water is $1.86 \text{ K kg mol}^{-1}$, the amount of water (in g) separated as ice is :

Options :

1. 16

2. 32

3. 48

4. 64

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

Correct Marks : 4 Wrong Marks : 1

एक विलयन जिसमें 62 g इथिलीन ग्लाइकोल 250 g पानी में है, को -10°C तक ठंडा किया गया। यदि पानी का K_f $1.86 \text{ K kg mol}^{-1}$ हो, तब बर्फ के रूप में अलग हुए पानी की मात्रा (g में) है :

Options :

1. 16

2. 32

3. 48

4. 64

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

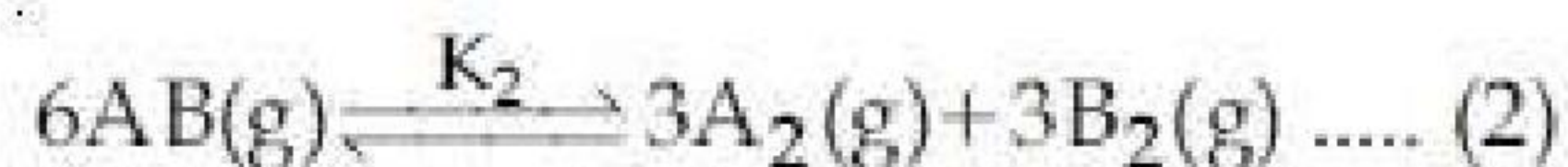
250 g પાણી માં 62 g ઇથીલીન ગ્લાઇકોલ ધરાવતા દ્રાવણ ને -10°C સુધી ઠંડુ કરવામાં આવ્યું. જો પાણીનો K_f $1.86 \text{ K kg mol}^{-1}$ હોય, તો પાણીનો જથ્થો (g) માં જે બરફ સ્વરૂપે છટો પડે છે તે શોધો ?

1. 16
2. 32
3. 48
4. 64

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

Consider the following reversible chemical reactions :



The relation between K_1 and K_2 is :

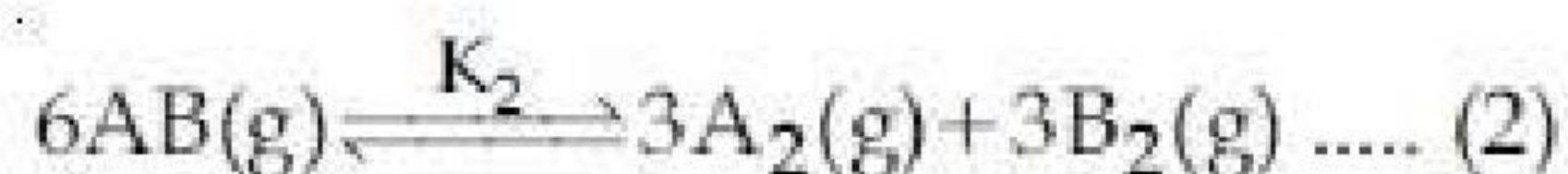
Options :

1. $K_2 = K_1^{-3}$
2. $K_2 = K_1^3$
3. $K_1 K_2 = 3$
4. $K_1 K_2 = \frac{1}{3}$

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

निम्न उत्क्रमणीय अभिक्रियाओं पर विचार करें :



K_1 एवं K_2 के बीच संबंध है :

Options :

1. $K_2 = K_1^{-3}$
2. $K_2 = K_1^3$

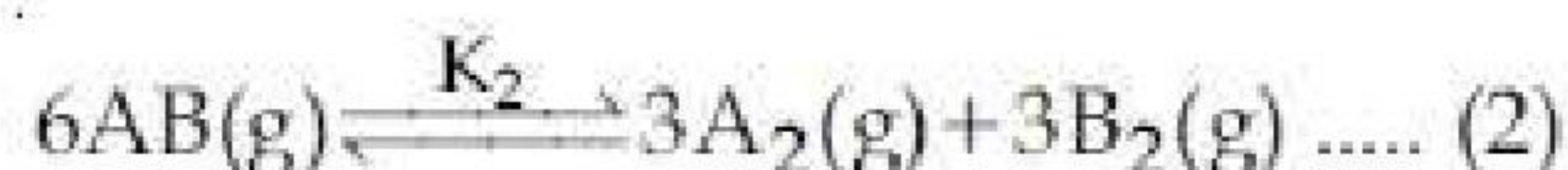
3. $K_1 K_2 = 3$

4. $K_1 K_2 = \frac{1}{3}$

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

નીચે આપેલી પ્રતીઘ્રતી રાસાયણીક પ્રક્રિયા ધ્યાનમાં લો.



તો, K_1 અને K_2 ની વચ્ચેનો સંબંધ શોધો?

Options :

1. $K_2 = K_1^{-3}$

2. $K_2 = K_1^3$

3. $K_1 K_2 = 3$

4. $K_1 K_2 = \frac{1}{3}$

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

If the standard electrode potential for a cell is 2 V at 300 K, the equilibrium constant (K) for the reaction



at 300 K is approximately

($R = 8 \text{ JK}^{-1} \text{ mol}^{-1}$, $F = 96000 \text{ C mol}^{-1}$)

Options :

1. e^{-80}

2. e^{320}

3. e^{-160}

4. e^{160}

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

एक सेल का 300 K पर मानक इलेक्ट्रोड विभव 2 V है। अभिक्रिया

$\text{Zn(s)} + \text{Cu}^{2+}(\text{aq}) \rightleftharpoons \text{Zn}^{2+}(\text{aq}) + \text{Cu(s)}$ के लिए 300 K ताप पर साम्यावस्था स्थिरांक (K) लगभग है :

($R = 8 \text{ JK}^{-1}\text{mol}^{-1}$, $F = 96000 \text{ C mol}^{-1}$)

Options :

1. e^{-80}
2. e^{320}
3. e^{-160}
4. e^{160}

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

300 Kએ એક કોષનો પ્રમાણિત ઇલેક્ટ્રોડ પોટેન્શિયલ (વિભવ) 2 V છે. 300 K એ આપેલ પ્રક્રિયા માટે અંદાજિત સંતુલન અચળાંક (K) નીચેનામાંથી શોધો ?

$\text{Zn(s)} + \text{Cu}^{2+}(\text{aq}) \rightleftharpoons \text{Zn}^{2+}(\text{aq}) + \text{Cu(s)}$

($R = 8 \text{ JK}^{-1}\text{mol}^{-1}$, $F = 96000 \text{ C mol}^{-1}$)

Options :

1. e^{-80}
2. e^{320}
3. e^{-160}
4. e^{160}

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

Correct Marks : 4 Wrong Marks : 1

For the reaction, $2A + B \rightarrow \text{products}$, when the concentrations of A and B both were doubled, the rate of the reaction increased from $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ to $2.4 \text{ mol L}^{-1}\text{s}^{-1}$. When the concentration of A alone is doubled, the rate increased from $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ to $0.6 \text{ mol L}^{-1}\text{s}^{-1}$.

Which one of the following statements is correct?

Options :

- Order of the reaction with respect to B is 2
- Total order of the reaction is 4
- Order of the reaction with respect to A is 2
- Order of the reaction with respect to B is 1

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

अभिक्रिया, $2A + B \rightarrow \text{products}$ के लिए, जब A तथा B दोनों की सांद्रता दोगुनी की गई, तब अभिक्रिया की दर $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ से बढ़कर $2.4 \text{ mol L}^{-1}\text{s}^{-1}$ हो गयी। जब केवल A की सांद्रता दोगुनी की गई तब दर $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ से बढ़कर $0.6 \text{ mol L}^{-1}\text{s}^{-1}$ हो गई।

निम्न में कौन सा कथन सत्य है?

Options :

- अभिक्रिया की कोटि B के सापेक्ष में 2 है।
- कुल अभिक्रिया की कोटि 4 है।
- अभिक्रिया की कोटि A के सापेक्ष में 2 है।
- अभिक्रिया की कोटि B के सापेक्ष में 1 है।

આપેલ પ્રક્રિયા $2A + B \rightarrow$ નીપજો માટે, જ્યારે A અને B બન્નેની સાંદ્રતા બમણી કરવામાં આવે ત્યારે પ્રક્રિયાનો દર $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ થી વધી $2.4 \text{ mol L}^{-1}\text{s}^{-1}$ થાય છે. જ્યારે Aની એકલાની સાંદ્રતા બમણી કરવામાં આવે ત્યારે પ્રક્રિયા દર $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ થી વધી $0.6 \text{ mol L}^{-1}\text{s}^{-1}$ થાય છે.

નીચે આપેલ વિધાના પૈકી કયું વિધાન સાચું છે?

Options :

1. B ના સંદર્ભમાં પ્રક્રિયાનો પ્રક્રિયા દર 2 છે.
2. પ્રક્રિયાનો કુલ પ્રક્રિયા દર 4 છે.
3. A ના સંદર્ભમાં પ્રક્રિયાનો પ્રક્રિયા દર 2 છે.
4. B ના સંદર્ભમાં પ્રક્રિયાનો પ્રક્રિયા દર 1 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

For coagulation of arsenious sulphide sol, which one of the following salt solution will be most effective ?

Options :

1. AlCl_3
2. BaCl_2
3. NaCl
4. Na_3PO_4

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

आर्सेनियस सल्फाइड का स्कंदन निम्न में से किस लवण के घोल से सबसे अधिक प्रभावकारी होगा ?

Options :

1. AlCl_3

3. NaCl

4. Na₃PO₄

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

નીચે આપેલા ક્ષારોના દ્રાવણ પૈકી કયું એક, આર્સેનિકસ સલ્ફાઇટ સોલ નાં સ્કંદન માટે સૌથી અસરકારક રહેશે?

Options :

1. AlCl₃

2. BaCl₂

3. NaCl

4. Na₃PO₄

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Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

Mathematics

416529120

3

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

416529129

Question Shuffling Allowed :

Yes

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

Correct Marks : 4 Wrong Marks : 1

Let $A = \{x \in \mathbb{R} : x \text{ is not a positive integer}\}$.

Define a function $f: A \rightarrow \mathbb{R}$ as $f(x) = \frac{2x}{x-1}$,

then f is :

ZOLLEGE.in

2. injective but not surjective
3. surjective but not injective
4. neither injective nor surjective

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

માના $A = \{x \in \mathbb{R} : x \text{ એક ધન પૂર્ણાંક નહીં છે}\}$ । એક
ફલન $f: A \rightarrow \mathbb{R}$ નિમ્ન પ્રકાર સે પરિભાષિત છે :

$$f(x) = \frac{2x}{x-1}, \text{ તો } f \text{ એક :}$$

Options :

1. એકેકી ફલન નહીં છે ।
2. એકેકી છે, પરંતુ આચ્છાદક ફલન નહીં છે ।
3. આચ્છાદક છે, પરંતુ એકેકી ફલન નહીં છે ।
4. ન એકેકી છે ઓર ન આચ્છાદક ફલન છે ।

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

ધારા કે $A = \{x \in \mathbb{R} : x \text{ સે ધનપૂર્ણાંક નથી}\}$ છે. વિધેય

$$f: A \rightarrow \mathbb{R} \text{ ને } f(x) = \frac{2x}{x-1} \text{ વડે વ્યાખ્યાયિત કરો.}$$

તો f એ _____ .

Options :

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

Correct Marks : 4 Wrong Marks : 1

Let z_0 be a root of the quadratic equation,
 $x^2 + x + 1 = 0$. If $z = 3 + 6iz_0^{81} - 3iz_0^{93}$, then
 $\arg z$ is equal to :

Options :

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

2. $\frac{\pi}{6}$

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

4. 0

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

Correct Marks : 4 Wrong Marks : 1

માના કિ દ્વિઘાતીય સમીકરણ $x^2 + x + 1 = 0$, કા એક
મૂલ z_0 હૈ। યદિ $z = 3 + 6iz_0^{81} - 3iz_0^{93}$ હૈ, તો
કોણાંક z ($\arg z$) બરાબર હૈ :

Options :

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

2. $\frac{\pi}{6}$

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

4. 0

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે z_0 એ દ્વિઘાત સમીકરણ $x^2 + x + 1 = 0$ નું એક
બીજ છે. જો $z = 3 + 6iz_0^{81} - 3iz_0^{93}$ હોય, તો

$\arg z =$

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

2. $\frac{\pi}{6}$

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

4. 0

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

Correct Marks : 4 Wrong Marks : 1

The number of all possible positive integral values of α for which the roots of the quadratic equation, $6x^2 - 11x + \alpha = 0$ are rational numbers is :

Options :

1. 2

2. 3

3. 4

4. 5

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

α के उन सभी संभावित धन पूर्णांक मानों की संख्या जिनके लिए द्विघातीय समीकरण $6x^2 - 11x + \alpha = 0$ के मूल परिमेय संख्याएँ हैं, है :

Options :

1. 2

2. 3

3. 4

4. 5

Correct Marks : 4 Wrong Marks : 1

દ્વિઘાત સમીકરણ $6x^2 - 11x + \alpha = 0$ નાં બીજ સંમેય સંખ્યાઓ થાય તેવી α ની શક્ય તમામ ધનપૂર્ણાંક કિંમતોની સંખ્યા _____ છે.

Options :

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

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

If

$$A = \begin{bmatrix} e^t & e^{-t} \cos t & e^{-t} \sin t \\ e^t & -e^{-t} \cos t - e^{-t} \sin t & -e^{-t} \sin t + e^{-t} \cos t \\ e^t & 2e^{-t} \sin t & -2e^{-t} \cos t \end{bmatrix},$$

then A is :

Options :

1. invertible only if $t = \pi$.
2. invertible only if $t = \frac{\pi}{2}$.
3. invertible for all $t \in \mathbb{R}$.
4. not invertible for any $t \in \mathbb{R}$.

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

यदि

$$A = \begin{bmatrix} e^t & e^{-t} \cos t & e^{-t} \sin t \\ e^t & -e^{-t} \cos t - e^{-t} \sin t & -e^{-t} \sin t + e^{-t} \cos t \\ e^t & 2e^{-t} \sin t & -2e^{-t} \cos t \end{bmatrix}$$

तो A

- વ્યુત્ક્રમણીય (invertible) છે, કેવલ તબ, જબ
1. $t = \pi$ છે।
 2. વ્યુત્ક્રમણીય છે, કેવલ તબ, જબ $t = \frac{\pi}{2}$ છે।
 3. સઘી $t \in \mathbb{R}$ કે લિઁ વ્યુત્ક્રમણીય છે।
 4. કિસી ધી $t \in \mathbb{R}$ કે લિઁ વ્યુત્ક્રમણીય નહીં છે।

Question Number : 64 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

જો

$$A = \begin{bmatrix} e^t & e^{-t} \cos t & e^{-t} \sin t \\ e^t & -e^{-t} \cos t - e^{-t} \sin t & -e^{-t} \sin t + e^{-t} \cos t \\ e^t & 2e^{-t} \sin t & -2e^{-t} \cos t \end{bmatrix}$$

હોય, તો A ને _____.

Options :

1. $t = \pi$ હોય તો જ વ્યસ્ત મળે
2. $t = \frac{\pi}{2}$ હોય તો જ વ્યસ્ત મળે
3. પ્રત્યેક $t \in \mathbb{R}$ માટે વ્યસ્ત મળે
4. કોઈપણ $t \in \mathbb{R}$ માટે વ્યસ્ત ન મળે

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 linear equations

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

$$3y - 5z = h$$

$$-2x + 5y - 9z = k$$

is consistent, then :

Options :

1. $2g + h + k = 0$

3. $g + h + 2k = 0$

4. $g + h + k = 0$

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 रैखिक समीकरण निकाय

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

$$3y - 5z = h$$

$$-2x + 5y - 9z = k$$

संगत (consistent) है, तो :

Options :

1. $2g + h + k = 0$

2. $g + 2h + k = 0$

3. $g + h + 2k = 0$

4. $g + h + k = 0$

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 સુરેખ સમીકરણ સંહિતિ

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

$$3y - 5z = h$$

$$-2x + 5y - 9z = k$$

સુસંગત હોય, તો _____ .

Options :

1. $2g + h + k = 0$

2. $g + 2h + k = 0$

3. $g + h + 2k = 0$

4. $g + h + k = 0$

Correct Marks : 4 Wrong Marks : 1

અંકો 0, 1, 3, 7, 9 કે પ્રયોગ સે (જહાં અંકોં કો દોહરાયા જા સકતા હૈ) બનાઈ જા સકને વાલી પ્રાકૃત સંખ્યાઈં જો 7,000 સે કમ હૈ, કી સંખ્યા હૈ :

Options :

1. 372
2. 375
3. 374
4. 250

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

અંકો 0, 1, 3, 7, 9 નો ઉપયોગ કરી, બનાવેલ 7,000 થી નાની પ્રાકૃતિક સંખ્યાઓની સંખ્યા _____ છે.
(અંકોનું પુનરાવર્તન કરવાની છૂટ છે.)

Options :

1. 372
2. 375
3. 374
4. 250

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

The number of natural numbers less than 7,000 which can be formed by using the digits 0, 1, 3, 7, 9 (repetition of digits allowed) is equal to :

Options :

1. 372
2. 375
3. 374

4. 250

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

Correct Marks : 4 Wrong Marks : 1

The coefficient of t^4 in the expansion of

$$\left(\frac{1-t^6}{1-t} \right)^3 \text{ is :}$$

Options :

1. 12

2. 10

3. 15

4. 14

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

Correct Marks : 4 Wrong Marks : 1

$$\left(\frac{1-t^6}{1-t} \right)^3 \text{ के प्रसार में } t^4 \text{ का गुणांक है :}$$

Options :

1. 12

2. 10

3. 15

4. 14

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

Correct Marks : 4 Wrong Marks : 1

$$\left(\frac{1-t^6}{1-t} \right)^3 \text{ ના વિસ્તરણમાં } t^4 \text{ નો સહગુણક}$$

_____ છે.

Options :

12

2. 10
3. 15
4. 14

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

Correct Marks : 4 Wrong Marks : 1

Let a, b and c be the 7th, 11th and 13th terms respectively of a non-constant A.P. If these are also the three consecutive terms of a

G.P., then $\frac{a}{c}$ is equal to :

Options :

1. 4
2. 2
3. $\frac{7}{13}$
4. $\frac{1}{2}$

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

Correct Marks : 4 Wrong Marks : 1

माना a, b तथा c एक समांतर श्रेढ़ी (जो कि अचर समांतर श्रेढ़ी नहीं है) के क्रमशः 7^{वें}, 11^{वें} तथा 13^{वें} पद हैं। यदि ये एक गुणोत्तर श्रेढ़ी के भी तीन क्रमागत

पद हैं तो $\frac{a}{c}$ बराबर है :

Options :

1. 4
2. 2
3. $\frac{7}{13}$

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

ધારા કે a, b અને c એ એક અચળ ન હોય તેવી સમાંતર શ્રેણી (A.P.) નું અનુક્રમે 7મું, 11મું અને 13મું પદ છે. જો આ પદો એક સમગુણોત્તર શ્રેણી (G.P.) ના ત્રણ

ક્રમિક પદો પણ હોય, તો $\frac{a}{c} = \underline{\hspace{2cm}}$.

Options :

1. 4

2. 2

3. $\frac{7}{13}$

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

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

Correct Marks : 4 Wrong Marks : 1

The sum of the following series

$$1+6+\frac{9(1^2+2^2+3^2)}{7}+\frac{12(1^2+2^2+3^2+4^2)}{9}+\frac{15(1^2+2^2+\dots+5^2)}{11}+\dots \text{ up to 15 terms,}$$

is :

Options :

1. 7510

2. 7820

3. 7830

4. 7520

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

નિમ્ન શ્રેણી

$$1+6+\frac{9(1^2+2^2+3^2)}{7}+\frac{12(1^2+2^2+3^2+4^2)}{9}+\frac{15(1^2+2^2+\dots+5^2)}{11}+\dots$$

કે પ્રથમ 15 પદો કા

યોગ હૈ :

Options :

1. 7510
2. 7820
3. 7830
4. 7520

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

નીચેની શ્રેઢી

$$1+6+\frac{9(1^2+2^2+3^2)}{7}+\frac{12(1^2+2^2+3^2+4^2)}{9}+\frac{15(1^2+2^2+\dots+5^2)}{11}+\dots$$

ના 15 પદો સુધીનો

સરવાળો _____ છે.

Options :

1. 7510
2. 7820
3. 7830
4. 7520

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

Options :

1. $\sin 1$
2. 0
3. $-\sin 1$
4. 1

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

સર્વો $x \in \mathbb{R}$ કે લિએ, મના $[x]$, ઁક મહત્તમ પૂર્ણાંક હૈ
જો x કે સમાન અથવા ઁસસે કમ હૈ, તો

$\lim_{x \rightarrow 0^-} \frac{x([x] + |x|) \sin [x]}{|x|}$ બરાબર હૈ :

Options :

1. $\sin 1$
2. 0
3. $-\sin 1$
4. 1

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 $x \in \mathbb{R}$ મોટે ધારેકે $[x]$ ઁ x થી નાના અથવા x ને
સમાન તમામ પૂર્ણાંકોમાં સૌથી મોટો પૂર્ણાંક છે. તો

$\lim_{x \rightarrow 0^-} \frac{x([x] + |x|) \sin [x]}{|x|} = \underline{\hspace{2cm}}$

Options :

1. $\sin 1$
2. 0
3. $-\sin 1$
4. 1

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

Correct Marks : 4 Wrong Marks : 1

If $x = 3 \tan t$ and $y = 3 \sec t$, then the value

of $\frac{d^2 y}{dx^2}$ at $t = \frac{\pi}{4}$, is :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

यदि $x = 3 \tan t$ तथा $y = 3 \sec t$ है, तो $t = \frac{\pi}{4}$ पर

$\frac{d^2 y}{dx^2}$ का मान है :

Options :

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

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

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

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

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

જો $x = 3 \tan t$ અને $y = 3 \sec t$ હોય, તો $t = \frac{\pi}{4}$

આગળ $\frac{d^2 y}{dx^2}$ ની કિંમત _____ છે.

Options :

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

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

If both the roots of the quadratic equation $x^2 - mx + 4 = 0$ are real and distinct and they lie in the interval $[1, 5]$, then m lies in the interval :

Options :

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

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

यदि द्विघात समीकरण $x^2 - mx + 4 = 0$ के दोनों मूल वास्तविक तथा भिन्न हैं और वे अंतराल $[1, 5]$ में स्थित हैं, तो m जिस अंतराल में स्थित है, वह है :

Options :

1. $(-5, -4)$

2. (3, 4)

3. (4, 5)

4. (5, 6)

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

Correct Marks : 4 Wrong Marks : 1

જો દ્વિઘાત સમીકરણ $x^2 - mx + 4 = 0$ નાં બંને બીજ વાસ્તવિક અને ભિન્ન હોય તથા તેઓ અંતરાલ $[1, 5]$ માં આવેલા હોય, તો m એ _____ અંતરાલમાં છે.

Options :

1. $(-5, -4)$

2. (3, 4)

3. (4, 5)

4. (5, 6)

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

Let f be a differentiable function from

$\mathbf{R}$ to $\mathbf{R}$ such that $|f(x) - f(y)| \leq 2|x - y|^{3/2}$, for

all $x, y \in \mathbf{R}$. If $f(0) = 1$ then $\int_0^1 f^2(x) dx$ is

equal to :

Options :

1. 0

2. 1

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

4. 2

Correct Marks : 4 Wrong Marks : 1

माना $f: \mathbb{R} \rightarrow \mathbb{R}$ एक ऐसा अवकलनीय फलन है, कि सभी $x, y \in \mathbb{R}$ के लिए $|f(x) - f(y)| \leq 2|x - y|^{3/2}$ है। यदि $f(0) = 1$ है, तो $\int_0^1 f^2(x) dx$ बराबर है :

Options :

1. 0
2. 1
3. $\frac{1}{2}$
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

ધારો કે f એ $\mathbb{R}$ થી $\mathbb{R}$ નું એવું વિકલનીય વિધેય છે કે જેથી પ્રત્યેક $x, y \in \mathbb{R}$ માટે $|f(x) - f(y)| \leq 2|x - y|^{3/2}$ થાય. જો $f(0) = 1$ હોય, તો $\int_0^1 f^2(x) dx =$ _____ .

Options :

1. 0
2. 1
3. $\frac{1}{2}$
4. 2

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

Correct Marks : 4 Wrong Marks : 1

If $f(x) = \int \frac{5x^8 + 7x^6}{(x^2 + 1 + 2x^7)^2} dx, (x \geq 0)$, and

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

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

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

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

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

यदि $f(x) = \int \frac{5x^8 + 7x^6}{(x^2 + 1 + 2x^7)^2} dx, (x \geq 0)$ तथा

$f(0) = 0$ है, तो $f(1)$ का मान है :

Options :

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

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

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

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

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

જો $f(x) = \int \frac{5x^8 + 7x^6}{(x^2 + 1 + 2x^7)^2} dx, (x \geq 0)$ અને

$f(0) = 0$ હોય, તો $f(1)$ ની કિંમત _____ છે.

Options :

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

If $\int_0^{\pi/3} \frac{\tan \theta}{\sqrt{2k \sec \theta}} d\theta = 1 - \frac{1}{\sqrt{2}}$, ($k > 0$), then the value of k is :

Options :

1. 2

2. 1

3. 4

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

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

Correct Marks : 4 Wrong Marks : 1

यदि $\int_0^{\pi/3} \frac{\tan \theta}{\sqrt{2k \sec \theta}} d\theta = 1 - \frac{1}{\sqrt{2}}$, ($k > 0$) है, तो k का मान है :

Options :

1. 2

2. 1

3. 4

4. 1

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

Correct Marks : 4 Wrong Marks : 1

જો $\int_0^{\pi/3} \frac{\tan \theta}{\sqrt{2k \sec \theta}} d\theta = 1 - \frac{1}{\sqrt{2}}, (k > 0)$ હોય, તો k

ની કિંમત _____ છે.

Options :

1. 2

2. 1

3. 4

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

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

Correct Marks : 4 Wrong Marks : 1

The area of the region

$A = \{(x, y) : 0 \leq y \leq x|x| + 1 \text{ and } -1 \leq x \leq 1\}$ in sq. units, is :

Options :

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

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

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

4. 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

क्षेत्र $A = \{(x, y) : 0 \leq y \leq x|x| + 1 \text{ तथा } -1 \leq x \leq 1\}$

का वर्ग इकाईयों में क्षेत्रफल है :

Options :

$\frac{2}{3}$

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

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

4. 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

પ્રદેશ $A = \{(x, y) : 0 \leq y \leq x|x| + 1 \text{ અને } -1 \leq x \leq 1\}$
નું ક્ષેત્રફળ ચો. એકમમાં _____ છે.

Options :

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

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

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

4. 2

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

Let $f: [0, 1] \rightarrow \mathbb{R}$ be such that $f(xy) = f(x) \cdot f(y)$,
for all $x, y \in [0, 1]$, and $f(0) \neq 0$. If $y = y(x)$
satisfies the differential equation,
 $\frac{dy}{dx} = f(x)$ with $y(0) = 1$, then $y\left(\frac{1}{4}\right) + y\left(\frac{3}{4}\right)$
is equal to :

Options :

1. 2

2. 3

3. 4

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

Correct Marks : 4 Wrong Marks : 1

माना $f : [0, 1] \rightarrow \mathbb{R}$ इस प्रकार है कि सभी $x, y \in [0, 1]$ के लिए $f(xy) = f(x) \cdot f(y)$ है तथा $f(0) \neq 0$

है। यदि $y = y(x)$ अवकल समीकरण $\frac{dy}{dx} = f(x)$

को संतुष्ट करता है और $y(0) = 1$ है, तो

$y\left(\frac{1}{4}\right) + y\left(\frac{3}{4}\right)$ बराबर है :

Options :

1. 2

2. 3

3. 4

4. 5

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

ધારોકે $f : [0, 1] \rightarrow \mathbb{R}$ એવું છે કે જેથી પ્રત્યેક $x, y \in [0, 1]$ માટે $f(xy) = f(x) \cdot f(y)$ અને $f(0) \neq 0$

થાય. જો $y = y(x)$ એ વિકલ સમીકરણ $\frac{dy}{dx} = f(x)$

ને સંતોષે, જ્યાં $y(0) = 1$ હોય, તો

$y\left(\frac{1}{4}\right) + y\left(\frac{3}{4}\right) = \underline{\hspace{2cm}}$

Options :

1. 2

2. 3

3. 4

4. 5

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

Correct Marks : 4 Wrong Marks : 1

Let S be the set of all triangles in the xy -plane, each having one vertex at the origin and the other two vertices lie on coordinate axes with integral coordinates. If each triangle in S has area 50 sq. units, then the number of elements in the set S is :

Options :

1. 9
2. 18
3. 36
4. 32

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

માના S , xy -તલ મેં સ્થિત એસી સઘી ત્રિભુજોં કા સમુચ્ચય હૈ જિનકા એક શીર્ષ મૂલ બિંદુ પર હૈ તથા દૂસરે દો શીર્ષ નિર્દેશાંક અક્ષોં પર હૈ તથા જિનકે નિર્દેશાંક પૂર્ણાંકીય હૈ. યદિ S કી પ્રત્યેક ત્રિભુજ કા ક્ષેત્રફલ 50 વર્ગ ઇકાઈ હૈ, તો સમુચ્ચય S કે અવયવોં કી સંખ્યા હૈ :

Options :

1. 9
2. 18
3. 36
4. 32

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

જેનું એક શિરોબિંદુ ઉગમબિંદુ અને બીજા બે પૂર્ણાંક યામોવાળા શિરોબિંદુઓ યામાક્ષો પર આવેલા હોય તેવા xy -સમતલમાં આવેલા તમામ ત્રિકોણોનો ગણ ધારો કે S છે. જો S માંના પ્રત્યેક ત્રિકોણનું ક્ષેત્રફળ 50 ચો. એકમ હોય, તો ગણ S ના સભ્યોની સંખ્યા _____ છે.

2. 18

3. 36

4. 32

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

Let the equations of two sides of a triangle be $3x - 2y + 6 = 0$ and $4x + 5y - 20 = 0$. If the orthocentre of this triangle is at $(1, 1)$, then the equation of its third side is :

Options :

1. $122y - 26x - 1675 = 0$

2. $26x - 122y - 1675 = 0$

3. $26x + 61y + 1675 = 0$

4. $122y + 26x + 1675 = 0$

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

माना एक त्रिभुज की दो भुजाओं के समीकरण $3x - 2y + 6 = 0$ तथा $4x + 5y - 20 = 0$ हैं। यदि इस त्रिभुज का लंबकेंद्र $(1, 1)$ पर है, तो इसकी तीसरी भुजा का समीकरण है :

Options :

1. $122y - 26x - 1675 = 0$

2. $26x - 122y - 1675 = 0$

3. $26x + 61y + 1675 = 0$

4. $122y + 26x + 1675 = 0$

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

ધારોકે એક ત્રિકોણની બે બાજુઓનાં સમીકરણ
 $3x - 2y + 6 = 0$ અને $4x + 5y - 20 = 0$ છે. જો આ
ત્રિકોણનું લંબકેન્દ્ર $(1, 1)$ હોય, તો તેની ત્રીજી બાજુનું
સમીકરણ _____ છે.

Options :

1. $122y - 26x - 1675 = 0$
2. $26x - 122y - 1675 = 0$
3. $26x + 61y + 1675 = 0$
4. $122y + 26x + 1675 = 0$

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

Correct Marks : 4 Wrong Marks : 1

If the circles $x^2 + y^2 - 16x - 20y + 164 = r^2$
and $(x - 4)^2 + (y - 7)^2 = 36$ intersect at two
distinct points, then :

Options :

1. $1 < r < 11$
2. $0 < r < 1$
3. $r = 11$
4. $r > 11$

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

यदि वृत्त $x^2 + y^2 - 16x - 20y + 164 = r^2$ तथा
 $(x - 4)^2 + (y - 7)^2 = 36$, दो भिन्न बिंदुओं पर काटते
हैं, तो :

Options :

1. $1 < r < 11$
2. $0 < r < 1$
3. $r = 11$

4. $r > 11$

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

Correct Marks : 4 Wrong Marks : 1

જો વર્તુળ $x^2 + y^2 - 16x - 20y + 164 = r^2$ અને $(x-4)^2 + (y-7)^2 = 36$ બે ભિન્ન બિંદુઓ એ છેદે તો

Options :

1. $1 < r < 11$

2. $0 < r < 1$

3. $r = 11$

4. $r > 11$

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

Correct Marks : 4 Wrong Marks : 1

Let A(4, -4) and B(9, 6) be points on the parabola, $y^2 = 4x$. Let C be chosen on the arc AOB of the parabola, where O is the origin, such that the area of ΔACB is maximum. Then, the area (in sq.units) of ΔACB , is :

Options :

1. $31\frac{1}{4}$

2. $30\frac{1}{2}$

3. 32

4. $31\frac{3}{4}$

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

माना $A(4, -4)$ तथा $B(9, 6)$ एक परवलय $y^2 = 4x$ पर स्थित दो बिंदु हैं। माना परवलय के चाप AOB (जहाँ O मूल बिंदु है) पर स्थित एक बिंदु C इस प्रकार चुना गया कि $\triangle ACB$ का क्षेत्रफल अधिकतम है, तो $\triangle ACB$ का क्षेत्रफल (वर्ग इकाईयों में) है :

Options :

1. $31\frac{1}{4}$

2. $30\frac{1}{2}$

3. 32

4. $31\frac{3}{4}$

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

ધારોકે $A(4, -4)$ અને $B(9, 6)$ એ પરવલય $y^2 = 4x$ પરના બિંદુઓ છે. ચાપ AOB પર બિંદુ C એવી રીતે પસંદ કરવામાં આવે છે કે જેથી $\triangle ACB$ નું ક્ષેત્રફળ મહત્તમ થાય, જ્યાં O ઉગમબિંદુ છે. તો $\triangle ACB$ નું ક્ષેત્રફળ (ચો.એકમમાં) _____ છે.

Options :

1. $31\frac{1}{4}$

2. $30\frac{1}{2}$

3. 32

4. $31\frac{3}{4}$

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

A hyperbola has its centre at the origin, passes through the point (4, 2) and has transverse axis of length 4 along the x -axis. Then the eccentricity of the hyperbola is :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

एक अतिपरवलय का केंद्र मूल बिंदु पर है, तथा यह बिंदु (4, 2) से होकर जाता है और इसका अनुप्रस्थ (transverse) अक्ष, x -अक्ष के अनुदिश है जिसकी लंबाई 4 है। तो इस अतिपरवलय की उत्केंद्रता (eccentricity) है :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

એક અતિવલયનું કેન્દ્ર ઉગમબિંદુ છે, તે બિંદુ (4, 2) માંથી પસાર થાય છે અને x -અક્ષ પરની તેના મુખ્ય અક્ષની લંબાઈ 4 છે. તો આ અતિવલયનની ઉત્કેન્દ્રતા

1. $\sqrt{3}$

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

3. 2

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

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

Correct Marks : 4 Wrong Marks : 1

If the lines $x = ay + b$, $z = cy + d$ and $x = a'z + b'$, $y = c'z + d'$ are perpendicular, then :

Options :

1. $ab' + bc' + 1 = 0$

2. $bb' + cc' + 1 = 0$

3. $aa' + c + c' = 0$

4. $cc' + a + a' = 0$

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

यदि रेखाएँ $x = ay + b$, $z = cy + d$ तथा $x = a'z + b'$, $y = c'z + d'$ लंबवत हैं, तो :

Options :

1. $ab' + bc' + 1 = 0$

2. $bb' + cc' + 1 = 0$

3. $aa' + c + c' = 0$

4. $cc' + a + a' = 0$

Question Number : 83 Question Type : MCQ Option Shuffling : Yes Display Question Number

જો રેખાઓ $x = ay + b, z = cy + d$ અને $x = a'z + b', y = c'z + d'$ સંબંધિત હોય, તો _____ .

Options :

1. $ab' + bc' + 1 = 0$
2. $bb' + cc' + 1 = 0$
3. $aa' + c + c' = 0$
4. $cc' + a + a' = 0$

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

Correct Marks : 4 Wrong Marks : 1

The equation of the plane containing the straight line $\frac{x}{2} = \frac{y}{3} = \frac{z}{4}$ and perpendicular to the plane containing the straight lines

$\frac{x}{3} = \frac{y}{4} = \frac{z}{2}$ and $\frac{x}{4} = \frac{y}{2} = \frac{z}{3}$ is :

Options :

1. $x + 2y - 2z = 0$
2. $3x + 2y - 3z = 0$
3. $x - 2y + z = 0$
4. $5x + 2y - 4z = 0$

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

एक ऐसे समतल का समीकरण, जिस पर रेखा

$\frac{x}{2} = \frac{y}{3} = \frac{z}{4}$ स्थित है तथा जो एक अन्य समतल

जिसमें रेखाएँ $\frac{x}{3} = \frac{y}{4} = \frac{z}{2}$ तथा $\frac{x}{4} = \frac{y}{2} = \frac{z}{3}$ स्थित

हैं, के लंबवत है, है :

Options :

1. $x + 2y - 2z = 0$

3. $x - 2y + z = 0$

4. $5x + 2y - 4z = 0$

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

Correct Marks : 4 Wrong Marks : 1

રેખા $\frac{x}{2} = \frac{y}{3} = \frac{z}{4}$ ને સમાવતા તથા રેખાઓ

$\frac{x}{3} = \frac{y}{4} = \frac{z}{2}$ અને $\frac{x}{4} = \frac{y}{2} = \frac{z}{3}$ ને સમાવતા

સમતલને લંબ હોય તેવા સમતલનું સમીકરણ _____ છે.

Options :

1. $x + 2y - 2z = 0$

2. $3x + 2y - 3z = 0$

3. $x - 2y + z = 0$

4. $5x + 2y - 4z = 0$

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 $\vec{a} = \hat{i} + \hat{j} + \sqrt{2}\hat{k}$, $\vec{b} = b_1\hat{i} + b_2\hat{j} + \sqrt{2}\hat{k}$

and $\vec{c} = 5\hat{i} + \hat{j} + \sqrt{2}\hat{k}$ be three vectors such

that the projection vector of $\vec{b}$ on $\vec{a}$ is $\vec{a}$.

If $\vec{a} + \vec{b}$ is perpendicular to $\vec{c}$, then $|\vec{b}|$ is equal to :

Options :

1. 6

2. 4

3. $\sqrt{22}$

4. $\sqrt{18}$

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

માના $\vec{a} = \hat{i} + \hat{j} + \sqrt{2}\hat{k}$, $\vec{b} = b_1\hat{i} + b_2\hat{j} + \sqrt{2}\hat{k}$

તથા $\vec{c} = 5\hat{i} + \hat{j} + \sqrt{2}\hat{k}$ ત્રીણ એસે સદિશ હૈ કિ

$\vec{b}$ કા $\vec{a}$ પર પ્રક્ષેપ સદિશ, $\vec{a}$ હૈ। યદિ $\vec{a} + \vec{b}$,

સદિશ $\vec{c}$ કે લંબવત હૈ, તો $|\vec{b}|$ બરાબર હૈ :

Options :

1. 6
2. 4
3. $\sqrt{22}$
4. $\sqrt{32}$

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 $\vec{a} = \hat{i} + \hat{j} + \sqrt{2}\hat{k}$,

$\vec{b} = b_1\hat{i} + b_2\hat{j} + \sqrt{2}\hat{k}$ અને

$\vec{c} = 5\hat{i} + \hat{j} + \sqrt{2}\hat{k}$ એ ત્રણ એવા સદિશો છે કે જેથી

$\vec{b}$ નો $\vec{a}$ પરનો પ્રક્ષેપ સદિશ $\vec{a}$ છે. જો $\vec{a} + \vec{b}$ એ

$\vec{c}$ ને લંબ હોય, તો $|\vec{b}| = \underline{\hspace{2cm}}$.

Options :

1. 6
2. 4
3. $\sqrt{22}$
4. $\sqrt{32}$

A data consists of n observations :

$x_1, x_2, \dots, x_n$. If $\sum_{i=1}^n (x_i + 1)^2 = 9n$ and

$\sum_{i=1}^n (x_i - 1)^2 = 5n$, then the standard

deviation of this data is :

Options :

1. $\sqrt{7}$

2. $\sqrt{5}$

3. 5

4. 2

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

Correct Marks : 4 Wrong Marks : 1

आँकड़ों के एक समूह में n प्रेक्षण $x_1, x_2, \dots, x_n$ हैं।

यदि $\sum_{i=1}^n (x_i + 1)^2 = 9n$ तथा $\sum_{i=1}^n (x_i - 1)^2 = 5n$

है, तो इन आँकड़ों का मानक विचलन है :

Options :

1. $\sqrt{7}$

2. $\sqrt{5}$

3. 5

4. 2

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

Correct Marks : 4 Wrong Marks : 1

એક માહિતીનાં n અવલોકનો $x_1, x_2, \dots, x_n$ છે. જો

$$\sum_{i=1}^n (x_i + 1)^2 = 9n \text{ અને } \sum_{i=1}^n (x_i - 1)^2 = 5n \text{ હોય,}$$

તો આ માહિતીનું પ્રમાણિત વિચલન _____ છે.

Options :

1. $\sqrt{7}$

2. $\sqrt{5}$

3. 5

4. 2

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 कलश में 5 लाल तथा 2 हरी गेंदें हैं। इस कलश में से यादृच्छया एक गेंद निकाली गई। यदि निकाली गई गेंद हरी है, तो कलश में एक लाल गेंद डाली जाती है तथा यदि निकाली गई गेंद लाल है, तो कलश में एक हरी गेंद डाली जाती है, जबकि निकाली गई गेंद वापिस नहीं डाली जाती। अब इसमें से यादृच्छया एक दूसरी गेंद निकाली गई, तो इस दूसरी गेंद के लाल होने की प्रायिकता है :

Options :

1. $\frac{27}{49}$

2. $\frac{21}{49}$

3. $\frac{26}{49}$

4. $\frac{32}{49}$

એક પાત્રમાં 5 લાલ અને 2 લીલા દડા છે. પાત્ર માંથી એક દડો યાદચ્છિક રીતે પસંદ કરવામાં આવે છે. જો પસંદ થયેલ દડો લીલો હોય, તો પાત્રમાં એક લાલ દડો ઉમેરવામાં આવે છે અને જો પસંદ થયેલ દડો લાલ હોય, તો પાત્રમાં એક લીલો દડો ઉમેરવામાં આવે છે; મૂળ દડો પાત્રમાં પાછો મૂકવામાં આવતો નથી. ત્યાર બાદ તેમાંથી એક એક બીજો દડો યાદચ્છિક રીતે પસંદ કરવામાં આવે છે. બીજો દડો લાલ હોય તેની સંભાવના _____ છે.

Options :

1. $\frac{27}{49}$

2. $\frac{21}{49}$

3. $\frac{26}{49}$

4. $\frac{32}{49}$

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

Correct Marks : 4 Wrong Marks : 1

An urn contains 5 red and 2 green balls. A ball is drawn at random from the urn. If the drawn ball is green, then a red ball is added to the urn and if the drawn ball is red, then a green ball is added to the urn ; the original ball is not returned to the urn. Now, a second ball is drawn at random from it. The probability that the second ball is red, is :

Options :

1. $\frac{27}{49}$

2. $\frac{21}{49}$

4. $\frac{32}{49}$

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

If $0 \leq x < \frac{\pi}{2}$, then the number of values of x for which $\sin x - \sin 2x + \sin 3x = 0$, is :

Options :

1. 3

2. 4

3. 2

4. 1

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

Correct Marks : 4 Wrong Marks : 1

यदि $0 \leq x < \frac{\pi}{2}$ है, तो x के उन मानों की संख्या जिनके लिए $\sin x - \sin 2x + \sin 3x = 0$ है, है :

Options :

1. 3

2. 4

3. 2

4. 1

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

જો $0 \leq x < \frac{\pi}{2}$ હોય, તો $\sin x - \sin 2x + \sin 3x = 0$ થાય તેવી x ની કિંમતોની સંખ્યા _____ છે.

Options :

1. 3

3. 2

4. 1

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

Correct Marks : 4 Wrong Marks : 1

If $x = \sin^{-1}(\sin 10)$ and $y = \cos^{-1}(\cos 10)$,
then $y - x$ is equal to :

Options :

1. 0

2. π

3. 10

4. 7π

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

यदि $x = \sin^{-1}(\sin 10)$ तथा $y = \cos^{-1}(\cos 10)$ है,
तो $y - x$ बराबर है :

Options :

1. 0

2. π

3. 10

4. 7π

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

Correct Marks : 4 Wrong Marks : 1

જો $x = \sin^{-1}(\sin 10)$ અને $y = \cos^{-1}(\cos 10)$ હોય,
તો $y - x =$ _____ .

Options :

1. 0

2. π

3. 10

4. 7π

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

The logical statement

$[\sim(\sim p \vee q) \vee (p \wedge r)] \wedge (\sim q \wedge r)$
is equivalent to :

Options :

1. $\sim p \vee r$

2. $(p \wedge r) \wedge \sim q$

3. $(p \wedge \sim q) \vee r$

4. $(\sim p \wedge \sim q) \wedge r$

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

Correct Marks : 4 Wrong Marks : 1

તર્કસંગત કથન

$[\sim(\sim p \vee q) \vee (p \wedge r)] \wedge (\sim q \wedge r)$

નિમ્ન મેં સે કિસકે સમતુલ્ય છે?

Options :

1. $\sim p \vee r$

2. $(p \wedge r) \wedge \sim q$

3. $(p \wedge \sim q) \vee r$

4. $(\sim p \wedge \sim q) \wedge r$

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

Correct Marks : 4 Wrong Marks : 1

તાર્કિક વિધાન

$[\sim(\sim p \vee q) \vee (p \wedge r)] \wedge (\sim q \wedge r)$

એ _____ ને સમકક્ષ છે.

Options :

2. $(p \wedge r) \wedge \sim q$

3. $(p \wedge \sim q) \vee r$

4. $(\sim p \wedge \sim q) \wedge r$

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