

National Testing Agency

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Paper I

Group Number : 1
Group Id : 416529171
Group Maximum Duration : 0
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Revisit allowed for edit? : No
Break time: 0
Group Marks: 360

Physics

Section Id : 416529307
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: 416529447
Question Shuffling Allowed : Yes

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

Correct Marks : 4 Wrong Marks : 1

In the formula $X = 5YZ^2$, X and Z have dimensions of capacitance and magnetic field, respectively. What are the dimensions of Y in SI units ?

Options :

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

2. $[M^{-3} L^{-2} T^8 A^4]$

3. $[M^{-2} L^{-2} T^6 A^3]$

4. $[M^{-2} L^0 T^{-4} A^{-2}]$

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

Correct Marks : 4 Wrong Marks : 1

सूत्र $X = 5YZ^2$ में X तथा Z की विमायें, क्रमशः, धारिता तथा चुम्बकीय क्षेत्र हैं। SI इकाई में Y की विमा क्या होगी ?

Options :

1. $[M^{-1} L^{-2} T^4 A^2]$

2. $[M^{-3} L^{-2} T^8 A^4]$

3. $[M^{-2} L^{-2} T^6 A^3]$

4. $[M^{-2} L^0 T^{-4} A^{-2}]$

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

Correct Marks : 4 Wrong Marks : 1

સૂત્ર $X = 5 YZ^2$, માં X અને Z ને અનુક્રમે સંઘારકતાના અને ચુંબકીય ક્ષેત્રના પરિમાણ છે. તો Y નું SI એકમ પદ્ધતિમાં પરિમાણ શું હશે?

Options :

1. $[M^{-1} L^{-2} T^4 A^2]$

2. $[M^{-3} L^{-2} T^8 A^4]$

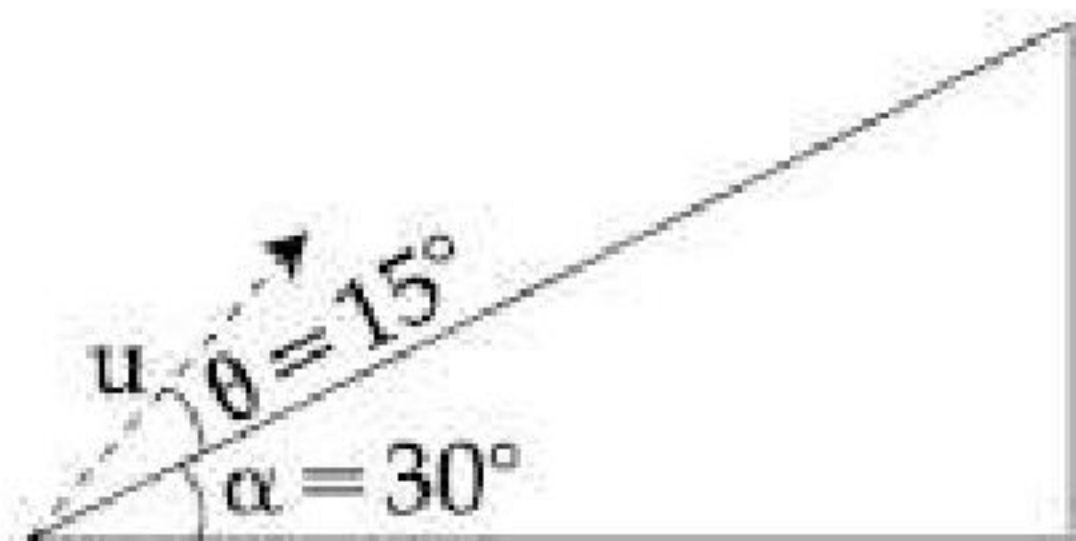
3. $[M^{-2} L^{-2} T^6 A^3]$

4. $[M^{-2} L^0 T^{-4} A^{-2}]$

Question Number : 2 Question Type : MCO Option Shuffling : Yes Display Question Number :

A plane is inclined at an angle $\alpha = 30^\circ$ with respect to the horizontal. A particle is projected with a speed $u = 2 \text{ ms}^{-1}$, from the base of the plane, making an angle $\theta = 15^\circ$ with respect to the plane as shown in the figure. The distance from the base, at which the particle hits the plane is close to :

(Take $g = 10 \text{ ms}^{-2}$)



Options :

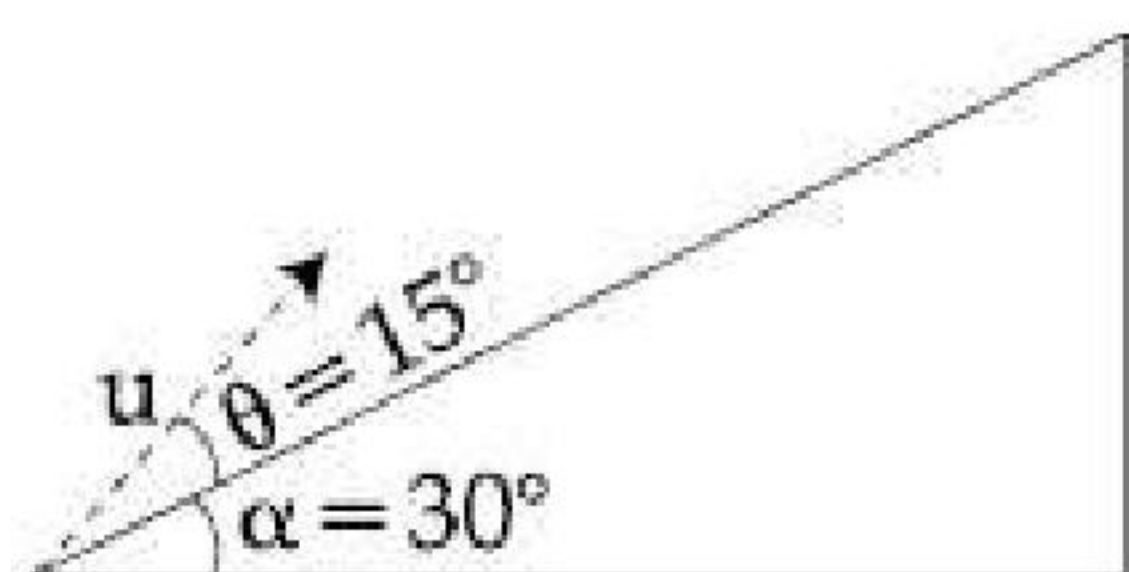
1. 14 cm
2. 18 cm
3. 20 cm
4. 26 cm

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 समतल क्षैतिज से $\alpha = 30^\circ$ का कोण बनाता है। एक कण को इस समतल के आधार से गति $u = 2 \text{ ms}^{-1}$ से समतल से $\theta = 15^\circ$ के कोण पर चित्रानुसार प्रक्षेपित किया जाता है। उस बिन्दु, जहाँ कण समतल पर गिरता है, की आधार से दूरी का सन्निकट मान होगा :

($g = 10 \text{ ms}^{-2}$ लीजिए)



Options :

1. 14 cm

3. 20 cm

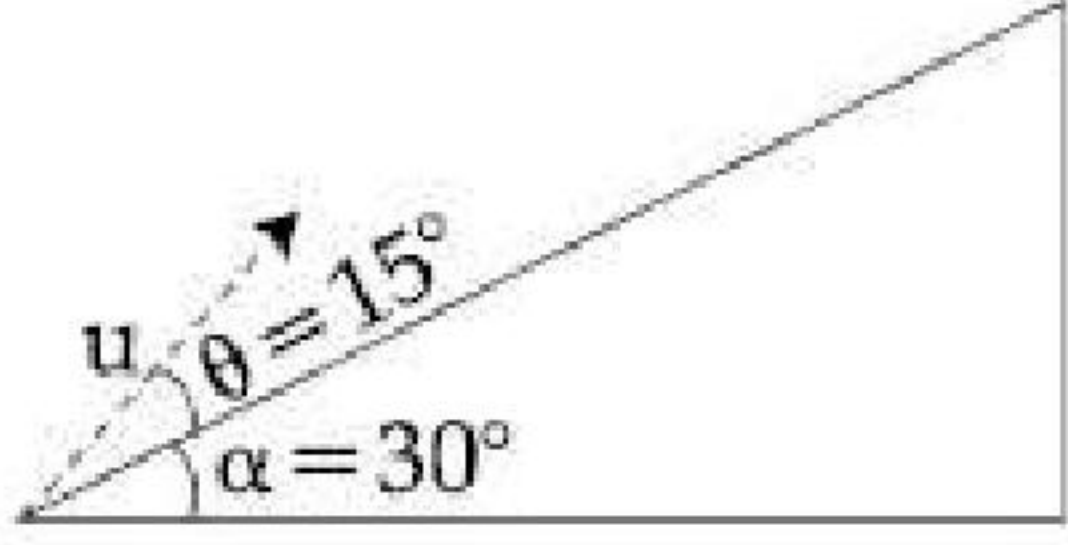
4. 26 cm

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

Correct Marks : 4 Wrong Marks : 1

એક સમતલ સમક્ષિતિજને સાપેક્ષે $\alpha = 30^\circ$ ના કોણે ઢળેલું છે. એક કણ $u = 2 \text{ ms}^{-1}$ ઝડપ સાથે આકૃતિમાં દર્શાવ્યા અનુસાર ઢોળાવના તળિયેથી ઢોળાવને સાપેક્ષે $\theta = 15^\circ$ કોણે પ્રક્ષિપ્ત કરવામાં આવે છે. ઢોળાવના તળિયેથી કણ સમતલ/ઢોળાવને જ્યાં અથડાશે તેનું અંતર _____ ની નજીકનું હશે.

($g = 10 \text{ ms}^{-2}$ લો)



Options :

1. 14 cm

2. 18 cm

3. 20 cm

4. 26 cm

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 time dependence of the position of a particle of mass $m = 2$ is given by

$\vec{r}(t) = 2t \hat{i} - 3t^2 \hat{j}$. Its angular momentum,

with respect to the origin, at time $t = 2$ is :

Options :

1. $36 \hat{k}$

2. $-48 \hat{k}$

3. $-34 (\hat{k} - \hat{i})$

4. $48 (\hat{i} + \hat{j})$

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

Correct Marks : 4 Wrong Marks : 1

દ્રવ્યમાન $m = 2$ કે એક કણ કી સ્થિતિ, સમય (t) કે

અનુસાર, $\vec{r}(t) = 2t\hat{i} - 3t^2\hat{j}$ હૈ। ઇસ કણ કા મૂલબિન્દુ કે સાપેક્ષ $t = 2$ પર કોણીય સંવેગ હોગા :

Options :

1. $36 \hat{k}$

2. $-48 \hat{k}$

3. $-34 (\hat{k} - \hat{i})$

4. $48 (\hat{i} + \hat{j})$

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

Correct Marks : 4 Wrong Marks : 1

$m = 2$ દળ ધરાવતા કણનું સમય આધારિત સ્થાન

$\vec{r}(t) = 2t\hat{i} - 3t^2\hat{j}$ વિધેય દ્વારા આપવામાં આવે છે.

$t = 2$ સમયે ઉગમબિંદુની સાપેક્ષે તેનું કોણીય વેગમાન :

Options :

1. $36 \hat{k}$

2. $-48 \hat{k}$

3. $-34 (\hat{k} - \hat{i})$

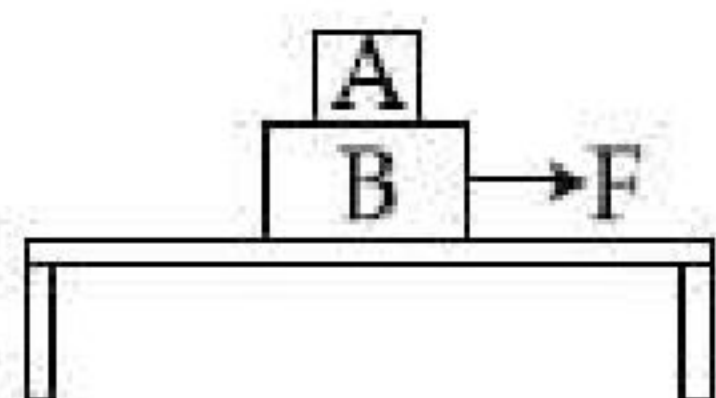
4. $48 (\hat{i} + \hat{j})$

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

Correct Marks : 4 Wrong Marks : 1

Two blocks A and B of masses $m_A = 1 \text{ kg}$ and $m_B = 3 \text{ kg}$ are kept on the table as shown in figure. The coefficient of friction between A and B is 0.2 and between B and the surface of the table is also 0.2. The maximum force F that can be applied on B horizontally, so that the block A does not slide over the block B is :

[Take $g = 10 \text{ m/s}^2$]



Options :

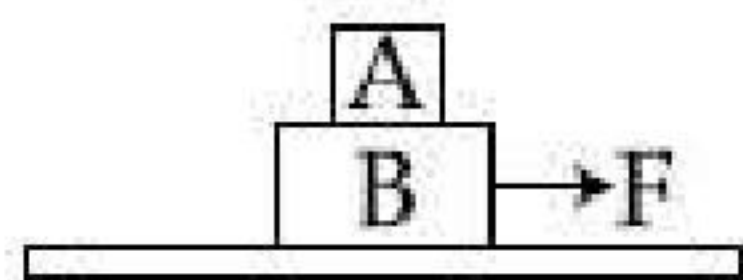
1. 8 N
2. 12 N
3. 16 N
4. 40 N

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

द्रव्यमान $m_A = 1 \text{ kg}$ तथा $m_B = 3 \text{ kg}$ के दो गुटकों, A तथा B, को चित्रानुसार एक मेज पर रखा गया है। A तथा B के बीच घर्षण गुणांक 0.2 एवं B तथा मेज के बीच भी घर्षण गुणांक 0.2 है। गुटके B पर लगाये गये क्षैतिज बल F का अधिकतम मान, जिससे गुटका A गुटका B के ऊपर नहीं फिसले, होगा :

[दिया है, $g = 10 \text{ m/s}^2$]



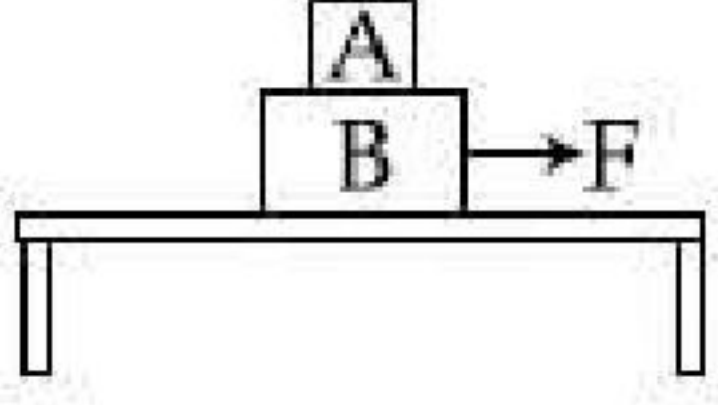
1. 8 N
2. 12 N
3. 16 N
4. 40 N

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

આકૃતિમાં દર્શાવ્યા અનુસાર $m_A = 1 \text{ kg}$ અને $m_B = 3 \text{ kg}$ દળ ધરાવતા બે ચોસલાઓને ટેબલ ઉપર મૂકવામાં આવ્યા છે. ચોસલાઓ A અને B વચ્ચે ઘર્ષણાંક 0.2 અને બ્લોક B અને ટેબલની સપાટી વચ્ચે પણ 0.2 છે. બ્લોક A એ બ્લોક B ઉપર સરકે નહીં તે રીતે બ્લોક B પર લગાડી શકાતું મહત્તમ બળ F _____ છે.

[$g = 10 \text{ m/s}^2$ લો]



Options :

1. 8 N
2. 12 N
3. 16 N
4. 40 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 bullet of mass 20 g has an initial speed of 1 ms^{-1} , just before it starts penetrating a mud wall of thickness 20 cm. If the wall offers a mean resistance of $2.5 \times 10^{-2} \text{ N}$, the speed of the bullet after emerging from the other side of the wall is close to :

1. 0.7 ms^{-1}
2. 0.3 ms^{-1}
3. 0.4 ms^{-1}
4. 0.1 ms^{-1}

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

20 cm મોટાઈ કી મિટ્રી કી દીવાર ભેદને સે ઠીક પહેલે 20 g દ્રવ્યમાન કી એક ગોલી કી ચાલ 1 ms^{-1} હૈ। યદિ દીવાર $2.5 \times 10^{-2} \text{ N}$ કા ઔસત અવરોધ લગાતી હૈ તો દીવાર કે દૂસરે તરફ સે નિર્ગત ગોલી કી ચાલ કા સન્નિકટ માન હોગા :

Options :

1. 0.7 ms^{-1}
2. 0.3 ms^{-1}
3. 0.4 ms^{-1}
4. 0.1 ms^{-1}

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

20 cm કાદવની બનેલી દિવાલને છેદવાનું ચાલુ કરે તે જ વખતે 20 g દળ ધરાવતી ગોળીની પ્રારંભિક ઝડપ 1 ms^{-1} છે. જો દિવાલ દ્વારા લાગુ પડતો સરેરાશ અવરોધ $2.5 \times 10^{-2} \text{ N}$ હોય તો દિવાલની બીજી બાજુ નિર્ગમન પામતી ગોળીની ઝડપ _____ ની નજીકની હશે.

Options :

1. 0.7 ms^{-1}
2. 0.3 ms^{-1}

4. 0.1 ms^{-1}

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 solid sphere of mass M and radius R is divided into two unequal parts. The first part has a mass of $\frac{7M}{8}$ and is converted into a uniform disc of radius $2R$. The second part is converted into a uniform solid sphere. Let I_1 be the moment of inertia of the disc about its axis and I_2 be the moment of inertia of the new sphere about its axis. The ratio I_1/I_2 is given by :

Options :

1. 140
2. 65
3. 285
4. 185

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

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M तथा त्रिज्या R के एक ठोस गोले को दो असमान हिस्सों में बाँटा जाता है। $\frac{7M}{8}$ द्रव्यमान के पहले हिस्से को एक $2R$ त्रिज्या की एकसमान डिस्क में बदला जाता है। बचे हुये हिस्से से एक एकसमान ठोस गोला बनाया जाता है। मानाकि I_1 डिस्क का उसकी अक्ष के परितः जड़त्व आघूर्ण है तथा I_2 नये गोले का उसके अक्ष के परितः जड़त्व आघूर्ण है। अनुपात I_1/I_2 होगा :

Options :

1. 140

3. 285

4. 185

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

M દળ ધરાવતો અને R ત્રિજ્યા ધરાવતો એક ઘન ગોળો બે અનિયમિત ભાગમાં કાપવામાં આવે છે. પહેલા ભાગ કે જેનું દળ $\frac{7M}{8}$ છે તેને $2R$ ત્રિજ્યા ધરાવતી સમાંગ પાતળી તક્તી સાથે જોડવામાં આવે છે. બીજા ભાગને સમાંગ ઘન ગોળામાં જોડવામાં આવે છે. જો તક્તીની પોતાની અક્ષને અનુલક્ષીને જડત્વની ચાકમાત્રા I_1 હોય અને નવા ગોળાની અક્ષને અનુલક્ષીને જડત્વની ચાકમાત્રા I_2 હોય તો I_1/I_2 ગુણોત્તર _____ વડે આપી શકાય.

Options :

1. 140

2. 65

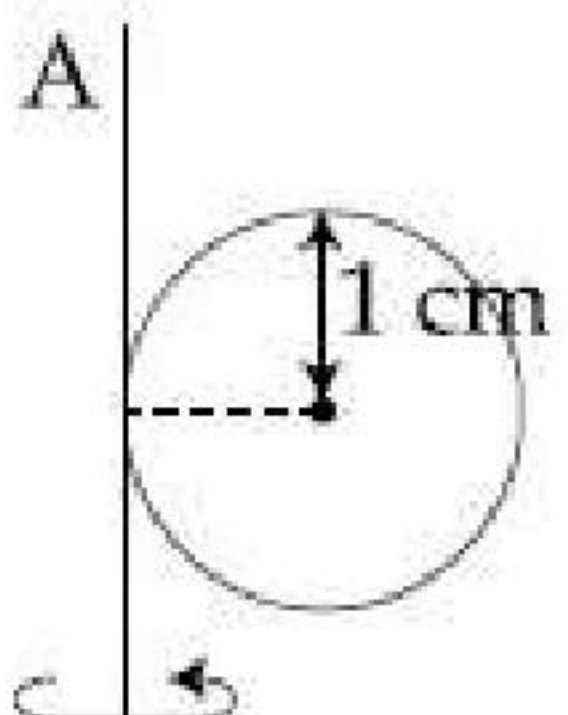
3. 285

4. 185

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 metal coin of mass 5 g and radius 1 cm is fixed to a thin stick AB of negligible mass as shown in the figure. The system is initially at rest. The constant torque, that will make the system rotate about AB at 25 rotations per second in 5 s, is close to :

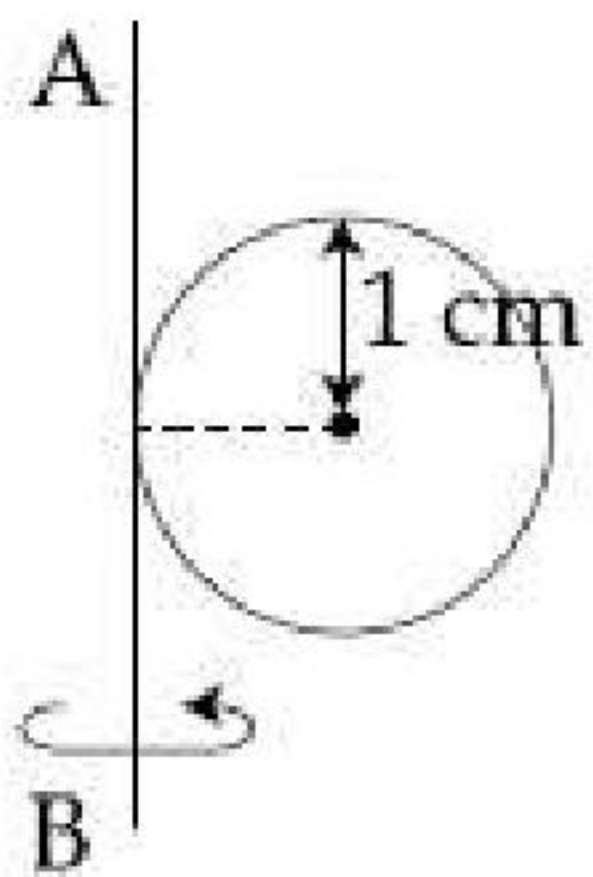


1. $4.0 \times 10^{-6} \text{ Nm}$
2. $7.9 \times 10^{-6} \text{ Nm}$
3. $1.6 \times 10^{-5} \text{ Nm}$
4. $2.0 \times 10^{-5} \text{ Nm}$

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

5 g द्रव्यमान तथा 1 cm त्रिज्या के धातु के एक सिक्के को एक पतली नगण्य द्रव्यमान की छड़ AB से चित्रानुसार जोड़ा जाता है। यह निकाय आरम्भ में स्थिरावस्था में है। इसे AB के परितः 5 s तक 25 चक्कर प्रति सेकण्ड की गति से घुमाने के लिये नियत बल आघूर्ण का सन्निकट मान होगा :



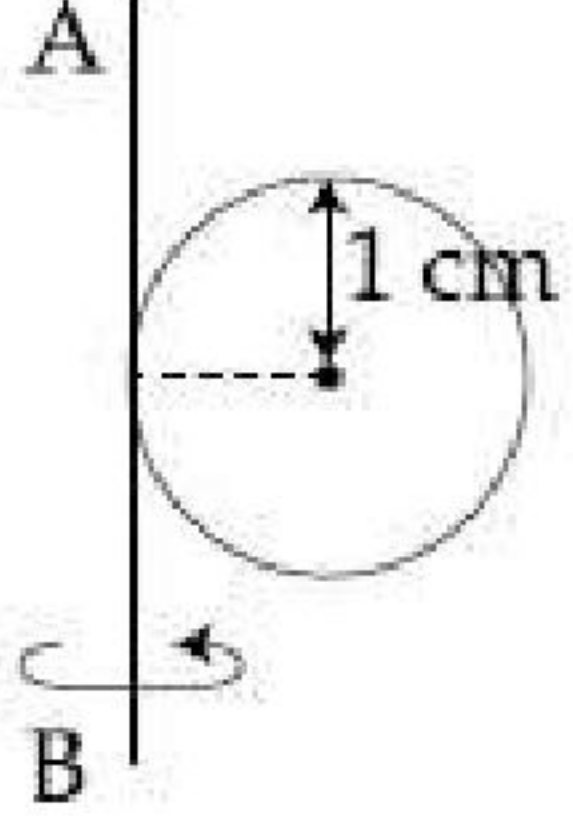
Options :

1. $4.0 \times 10^{-6} \text{ Nm}$
2. $7.9 \times 10^{-6} \text{ Nm}$
3. $1.6 \times 10^{-5} \text{ Nm}$
4. $2.0 \times 10^{-5} \text{ Nm}$

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

આકૃતિમાં દર્શાવ્યા અનુસાર, 5 g દળ ધરાવતા અને 1 cm ત્રિજ્યા ધરાવતા એક ધાતુના સિક્કાને અવગણ્ય દળ ધરાવતી પાતળી AB સ્ટીક (લાકડી) સાથે જોડવામાં આવે છે. આ તંત્ર પ્રારંભમાં સ્થિર છે. સ્થિર સ્થિતિમાંથી 5 s ની અંદર આ તંત્ર AB ને ફરતે પ્રતિ સેકન્ડ 25 ભ્રમણ કરે તેમાટે નું જરૂરી અચળ ટોર્ક _____ ની નજીકનું છે.



Options :

1. $4.0 \times 10^{-6} \text{ Nm}$
2. $7.9 \times 10^{-6} \text{ Nm}$
3. $1.6 \times 10^{-5} \text{ Nm}$
4. $2.0 \times 10^{-5} \text{ Nm}$

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

Correct Marks : 4 Wrong Marks : 1

A spaceship orbits around a planet at a height of 20 km from its surface. Assuming that only gravitational field of the planet acts on the spaceship, what will be the number of complete revolutions made by the spaceship in 24 hours around the planet ?

[Given : Mass of planet = $8 \times 10^{22} \text{ kg}$,

Radius of planet = $2 \times 10^6 \text{ m}$,

Gravitational constant $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$]

Options :

1. 13

3. 9

4. 11

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 ग्रह की सतह से 20 km ऊँचाई पर एक अंतरिक्षयान ग्रह के परितः कक्षा में घूम रहा है। यदि यान पर सिर्फ ग्रह का गुरुत्वीय क्षेत्र प्रभावी है तो यान द्वारा 24 hrs में लगाये गये पूरे चक्करों की संख्या का मान होगा :

[दिया है, ग्रह का द्रव्यमान $= 8 \times 10^{22}$ kg,

ग्रह की त्रिज्या $= 2 \times 10^6$ m,

गुरुत्वीय नियतांक $G = 6.67 \times 10^{-11}$ Nm²/kg²]

Options :

1. 13

2. 17

3. 9

4. 11

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

Correct Marks : 4 Wrong Marks : 1

એક વિમાન એક ગ્રહની ફરતે તેની સપાટીથી 20 km ઉંચાઈએ પરિભ્રમણ કરે છે. વિમાન ઉપર ગ્રહનો ફક્ત ગુરુત્વાકર્ષી બળ અસર કરે છે તેમ ધારીએ તો વિમાન 24 કલાકમાં ગ્રહની પરતે કેટલા પરિભ્રમણો કરશે?

[ગ્રહનું દળ $= 8 \times 10^{22}$ kg,

ગ્રહની ત્રિજ્યા $= 2 \times 10^6$ m,

ગુરુત્વાકર્ષી અચળાંક $G = 6.67 \times 10^{-11}$ Nm²/kg²]

Options :

1. 13

2. 17

4. 11

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 elastic limit of brass is 379 MPa. What should be the minimum diameter of a brass rod if it is to support a 400 N load without exceeding its elastic limit ?

Options :

1. 1.00 mm
2. 0.90 mm
3. 1.16 mm
4. 1.36 mm

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

પીતલ કી પ્રત્યાસ્થતા સીમા 379 MPa છે. 400 N બલ કો બિના પ્રત્યાસ્થતા સીમા પાર કિયે સહ સકને વાલી પીતલ કી છઢ્ઢ કા ન્યૂનતમ વ્યાસ ક્યા હોગા ?

Options :

1. 1.00 mm
2. 0.90 mm
3. 1.16 mm
4. 1.36 mm

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

જો પીતલના સળીયાને 400 N ના ભારને તેની સ્થિતિસ્થાપકતાની (હદ) મર્યાદામાં રહીને ઊંચકવો હોય તો તેનો લઘુત્તમ વ્યાસ કેટલો થશે? સ્થિતિસ્થાપક હદને અનુરૂપ પ્રતિબળ 379 MPa છે.

1. 1.00 mm
2. 0.90 mm
3. 1.16 mm
4. 1.36 mm

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

Water from a tap emerges vertically downwards with an initial speed of 1.0 ms^{-1} . The cross-sectional area of the tap is 10^{-4} m^2 . Assume that the pressure is constant throughout the stream of water and that the flow is streamlined. The cross-sectional area of the stream, 0.15 m below the tap would be :

(Take $g = 10 \text{ ms}^{-2}$)

Options :

1. $1 \times 10^{-5} \text{ m}^2$
2. $2 \times 10^{-5} \text{ m}^2$
3. $5 \times 10^{-4} \text{ m}^2$
4. $5 \times 10^{-5} \text{ m}^2$

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

एक नल से पानी ऊर्ध्वाधर नीचे की ओर 1.0 ms^{-1} की आरम्भिक गति से निकलता है। नल के अनुप्रस्थ काट का क्षेत्रफल 10^{-4} m^2 है। पानी की धारा में दाब को नियत तथा बहाव को धारारेखीय मानिये। नल से 0.15 m नीचे धारा का अनुप्रस्थ काट का क्षेत्रफल होगा :

($g = 10 \text{ ms}^{-2}$ लीजिए)

2. $2 \times 10^{-5} \text{ m}^2$

3. $5 \times 10^{-4} \text{ m}^2$

4. $5 \times 10^{-5} \text{ m}^2$

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

નળમાંથી પાણી 1.0 ms^{-1} જેટલી પ્રારંભિક ઝડપસાથે ઉપરથી નીચે તરફ વહેતું દેખાય છે. નળના આડછેદનું ક્ષેત્રફળ 10^{-4} m^2 છે. આ સમગ્ર પાણી ધારા દરમ્યાન જો દબાણ અચળ રહેતું હોય અને જો પ્રવાહ ધારારેખીય હોય તો નળની નીચે 0.15 m અંતરે આ ધારાના આડછેદનું ક્ષેત્રફળ _____ થશે.

($g = 10 \text{ ms}^{-2}$ લો)

Options :

1. $1 \times 10^{-5} \text{ m}^2$

2. $2 \times 10^{-5} \text{ m}^2$

3. $5 \times 10^{-4} \text{ m}^2$

4. $5 \times 10^{-5} \text{ m}^2$

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

Correct Marks : 4 Wrong Marks : 1

One mole of an ideal gas passes through a process where pressure and volume obey

the relation $P = P_0 \left[1 - \frac{1}{2} \left(\frac{V_0}{V} \right)^2 \right]$. Here P_0

and V_0 are constants. Calculate the change in the temperature of the gas if its volume changes from V_0 to $2V_0$.

Options :

1. $\frac{1}{2} \frac{P_0 V_0}{R}$

2. $\frac{1}{4} \frac{P_0 V_0}{R}$

3. $\frac{3}{4} \frac{P_0 V_0}{R}$

4. $\frac{5}{4} \frac{P_0 V_0}{R}$

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

एक आदर्श गैस का एक मोल एक ऐसे प्रक्रम से गुजरता है जिसमें दाब तथा आयतन सूत्र

$$P = P_0 \left[1 - \frac{1}{2} \left(\frac{V_0}{V} \right)^2 \right] \text{ से सम्बन्धित हैं। यहाँ}$$

P_0 तथा V_0 नियतांक हैं। यदि गैस का आयतन V_0 से $2V_0$ होता है तो इसके तापमान का बदलाव होगा :

Options :

1. $\frac{1}{2} \frac{P_0 V_0}{R}$

2. $\frac{1}{4} \frac{P_0 V_0}{R}$

3. $\frac{3}{4} \frac{P_0 V_0}{R}$

4. $\frac{5}{4} \frac{P_0 V_0}{R}$

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

એક મોલ આદર્શ વાયુ એવી પ્રક્રિયામાંથી પસાર થાય છે

$$\text{કે જેમાં દબાણ અને કદ વચ્ચે } P = P_0 \left[1 - \frac{1}{2} \left(\frac{V_0}{V} \right)^2 \right]$$

સંબંધ પળાય છે. અહીં P_0 અને V_0 અચળાંકો છે. વાયુનું દબાણ V_0 થી $2V_0$ જેટલું બદલવામાં આવે ત્યારે તાપમાનમાં થતો ફેરફાર ગણો.

$$1. \frac{1}{2} \frac{P_0 V_0}{R}$$

$$2. \frac{1}{4} \frac{P_0 V_0}{R}$$

$$3. \frac{3}{4} \frac{P_0 V_0}{R}$$

$$4. \frac{5}{4} \frac{P_0 V_0}{R}$$

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

When heat Q is supplied to a diatomic gas of rigid molecules, at constant volume its temperature increases by ΔT . The heat required to produce the same change in temperature, at a constant pressure is :

Options :

$$1. \frac{5}{3}Q$$

$$2. \frac{7}{5}Q$$

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

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

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

दृढ़ अणुओं वाली एक द्विपरमाणुक गैस को जब Q ऊष्मा नियत आयतन पर दी जाती है तो उसके तापमान में ΔT की वृद्धि होती है। इसी तापमान वृद्धि को नियत दाब पर सुनिश्चित करने के लिये आवश्यक ऊष्मा होगी :

1. $\frac{5}{3}Q$

2. $\frac{7}{5}Q$

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

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

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

દઢ પરમાણુઓના બનેલા દ્વિપરમાણુક વાયુને Q જેટલી ઊષ્મા અચળ કદે આપવામાં આવે છે ત્યારે તેનું તાપમાન ΔT જેટલું વધે છે. અચળ દબાણે, તાપમાનમાં આટલો જ ફેરફાર કરવા આપવી પડતી ઊષ્મા _____ છે.

Options :

1. $\frac{5}{3}Q$

2. $\frac{7}{5}Q$

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

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

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 submarine experiences a pressure of 5.05×10^6 Pa at a depth of d_1 in a sea. When it goes further to a depth of d_2 , it experiences a pressure of 8.08×10^6 Pa. Then $d_2 - d_1$ is approximately (density of water $= 10^3 \text{ kg/m}^3$ and acceleration due to

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

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

સમુદ્ર મેં d_1 ગહરાઈ પર એક પનડુબ્બી 5.05×10^6 Pa કા દાબ અનુભવ કરતી હૈ। જબ યહ પનડુબ્બી ઔર ગહરાઈ d_2 પર જાતી હૈ તો 8.08×10^6 Pa કા દાબ અનુભવ કરતી હૈ। તબ $d_2 - d_1$ કા નિકટતમ માન હોગા (દિયા હૈ : પાની કા ઘનત્વ $= 10^3 \text{ kg/m}^3$ તથા ગુરુત્વીય ત્વરણ $= 10 \text{ ms}^{-2}$) :

Options :

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

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 સબમરીન દરિયામાં d_1 ઊંડાઈએ 5.05×10^6 Pa જેટલું દબાણ અનુભવે છે. તે જ્યારે વધારે ઊંડાઈ d_2 એ જાય છે ત્યારે 8.08×10^6 Pa જેટલું દબાણ અનુભવે છે. તો $d_2 - d_1$ નું લગભગ મૂલ્ય _____ થશે.
(પાણીની ઘનતા $= 10^3 \text{ kg/m}^3$, ગુરુત્વાકર્ષી પ્રવેગ $= 10 \text{ ms}^{-2}$)

Options :

1. 300 m
2. 600 m

3. 500 m
4. 400 m

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 source of sound S is moving with a velocity of 50 m/s towards a stationary observer. The observer measures the frequency of the source as 1000 Hz. What will be the apparent frequency of the source when it is moving away from the observer after crossing him? (Take velocity of sound in air is 350 m/s)

Options :

1. 857 Hz
2. 1143 Hz
3. 750 Hz
4. 807 Hz

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

Correct Marks : 4 Wrong Marks : 1

एक ध्वनि स्रोत S 50 m/s की गति से एक स्थिर श्रोता की तरफ बढ़ रहा है। श्रोता को ध्वनि की आवृत्ति 1000 Hz सुनाई देती है। जब स्रोत उसी गति से श्रोता को पार करके उससे दूर जाता है तो श्रोता द्वारा सुनी गयी ध्वनि की आवृत्ति का मान होगा : [मानो वायु में ध्वनि की गति = 350 m/s]

Options :

1. 857 Hz
2. 1143 Hz
3. 750 Hz

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

Correct Marks : 4 Wrong Marks : 1

એક ધ્વનિ ઉદ્ગમ S, 50 m/s જેટલા વેગથી સ્થિર અવલોકનકાર તરફ ગતિ કરે છે. અવલોકનકાર ઉદ્ગમની આવૃત્તિ 1000 Hz જેટલી નોંધે છે. જ્યારે ઉદ્ગમ અવલોકનકારને પસાર કરી તેનાથી દૂર જતું હોય તે વખતે ઉદ્ગમની દેખીતી આવૃત્તિ કેટલી હશે?
[હવામાં ધ્વનિનો વેગ 350 m/s છે.]

Options :

1. 857 Hz
2. 1143 Hz
3. 750 Hz
4. 807 Hz

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

Correct Marks : 4 Wrong Marks : 1

In free space, a particle A of charge $1 \mu\text{C}$ is held fixed at a point P. Another particle B of the same charge and mass $4 \mu\text{g}$ is kept at a distance of 1 mm from P. If B is released, then its velocity at a distance of 9 mm from P is :

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

Options :

1. $3.0 \times 10^4 \text{ m/s}$
2. $2.0 \times 10^3 \text{ m/s}$
3. $1.5 \times 10^2 \text{ m/s}$
4. 1.0 m/s

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

निर्वात में एक $1 \mu\text{C}$ आवेश के एक कण A को बिन्दु P पर दृढ़ रखा है। उसी आवेश तथा $4 \mu\text{g}$ द्रव्यमान के दूसरे कण B को P से 1 mm दूरी पर रखा है। B को छोड़ने पर P से 9 mm दूरी पर उसकी गति का मान

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

Options :

1. $3.0 \times 10^4 \text{ m/s}$
2. $2.0 \times 10^3 \text{ m/s}$
3. $1.5 \times 10^2 \text{ m/s}$
4. 1.0 m/s

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

મુક્ત આવકાશમાં, $1 \mu\text{C}$ વિદ્યુતભાર ધરાવતો એક કણ A બિંદુ P આગળ જડીત કરવામાં આવેલ છે. બીજો સમાન વીજભાર ધરાવતો અને $4 \mu\text{g}$ દળ ધરાવતો બીજો કણ B, P થી 1 mm અંતરે રાખવામાં આવેલ છે. હવે જો B ને મુક્ત કરવામાં આવે તો P થી 9 mm અંતરે તેનો વેગ :

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

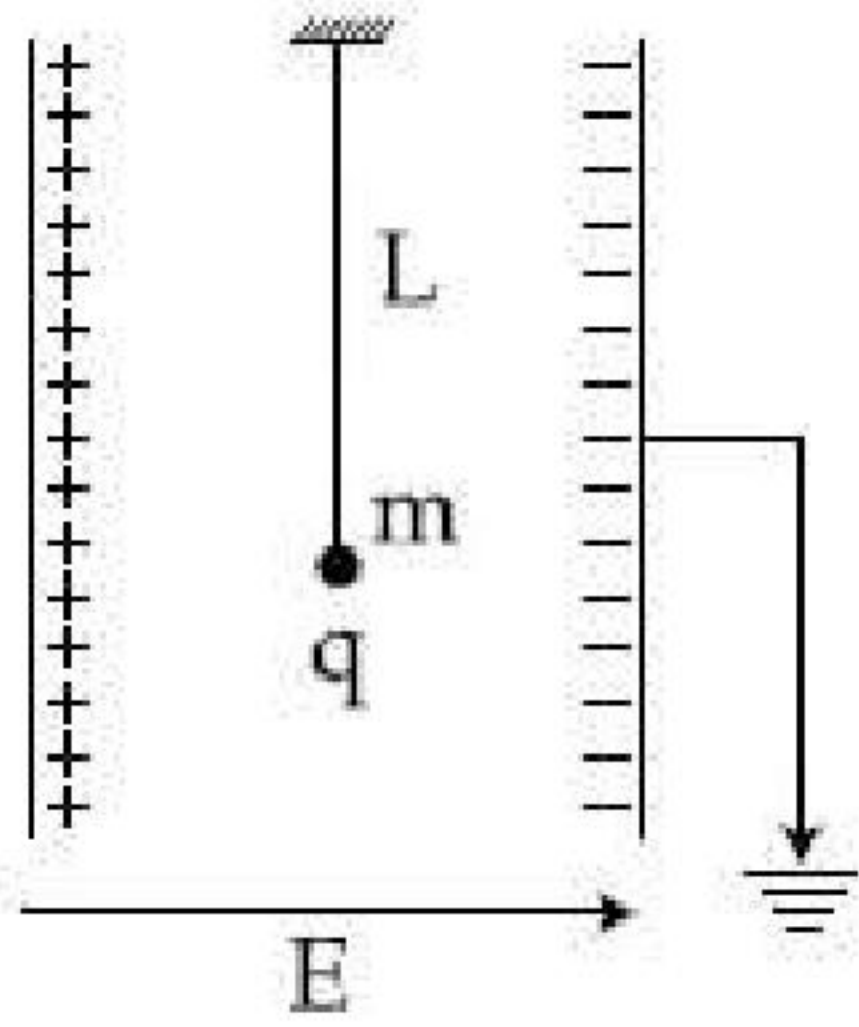
Options :

1. $3.0 \times 10^4 \text{ m/s}$
2. $2.0 \times 10^3 \text{ m/s}$
3. $1.5 \times 10^2 \text{ m/s}$
4. 1.0 m/s

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

Correct Marks : 4 Wrong Marks : 1

A simple pendulum of length L is placed between the plates of a parallel plate capacitor having electric field E , as shown in figure. Its bob has mass m and charge q . The time period of the pendulum is given by :



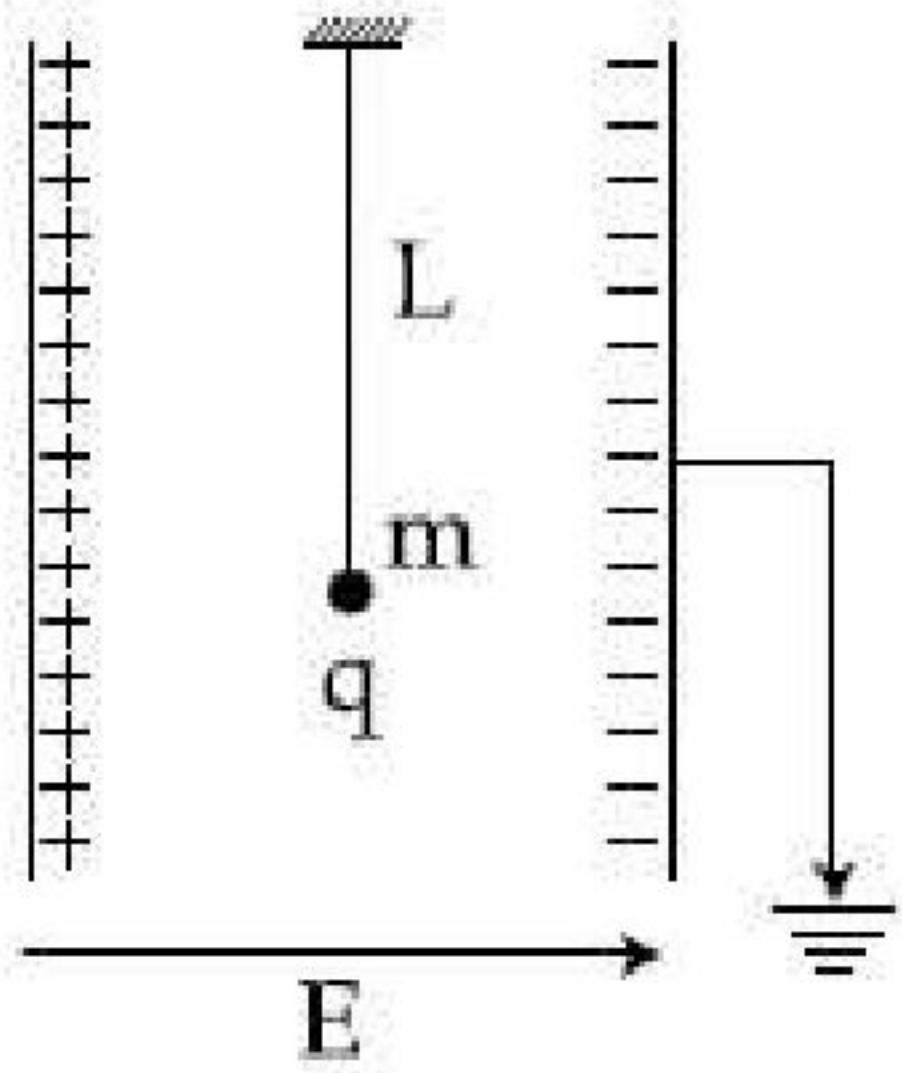
Options :

1. $2\pi \sqrt{\frac{L}{\left(g + \frac{qE}{m}\right)}}$
2. $2\pi \sqrt{\frac{L}{\left(g - \frac{qE}{m}\right)}}$
3. $2\pi \sqrt{\frac{L}{\sqrt{g^2 + \left(\frac{qE}{m}\right)^2}}}$
4. $2\pi \sqrt{\frac{L}{\sqrt{g^2 - \frac{q^2 E^2}{m^2}}}}$

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

L लम्बाई के एक सरल दोलक को चित्रानुसार एक समांतर प्लेट संधारित्र के मध्य, जिसमें विद्युत क्षेत्र E है, में रखा है। इसके लोलक का द्रव्यमान m तथा आवेश q है। इस दोलक का आवर्तकाल होगा :

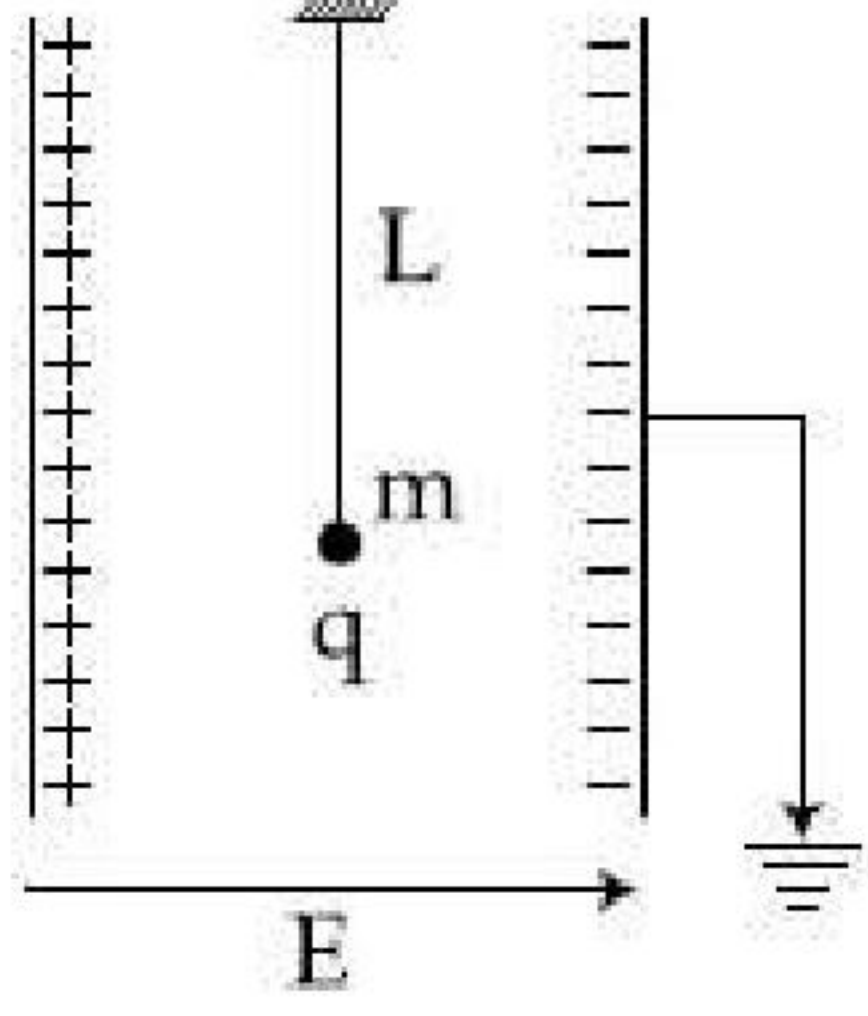


Options :

1. $2\pi \sqrt{\frac{L}{\left(g + \frac{qE}{m}\right)}}$
2. $2\pi \sqrt{\frac{L}{\left(g - \frac{qE}{m}\right)}}$
3. $2\pi \sqrt{\frac{L}{\sqrt{g^2 + \left(\frac{qE}{m}\right)^2}}}$
4. $2\pi \sqrt{\frac{L}{\sqrt{g^2 - \frac{q^2 E^2}{m^2}}}}$

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

આકૃતિમાં દર્શાવ્યા પ્રમાણે, L લંબાઈનું એક સાદુ લોલક સમાંતર પ્લેટ કેપેસીટરની વચ્ચે E જેટલા વિદ્યુતક્ષેત્રમાં રાખવામાં આવે છે. તેના લોલક (ગોળા) નું દળ m અને તેના પર વિદ્યુતભાર q છે. લોલકનો આવર્તકાળ _____ ની મદદથી આપી શકાય.



Options :

1. $2\pi \sqrt{\frac{L}{\left(g + \frac{qE}{m}\right)}}$
2. $2\pi \sqrt{\frac{L}{\left(g - \frac{qE}{m}\right)}}$
3. $2\pi \sqrt{\frac{L}{\sqrt{g^2 + \left(\frac{qE}{m}\right)^2}}}$
4. $2\pi \sqrt{\frac{L}{\sqrt{g^2 - \frac{q^2 E^2}{m^2}}}}$

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

Space between two concentric conducting spheres of radii a and b ($b > a$) is filled with a medium of resistivity ρ . The resistance between the two spheres will be :

Options :

2. $\frac{\rho}{4\pi} \left(\frac{1}{a} - \frac{1}{b} \right)$

3. $\frac{\rho}{2\pi} \left(\frac{1}{a} + \frac{1}{b} \right)$

4. $\frac{\rho}{2\pi} \left(\frac{1}{a} - \frac{1}{b} \right)$

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

Correct Marks : 4 Wrong Marks : 1

ત્રિજ્યાઓ a તથા b ($b > a$) કે દો સમકેન્દ્રીય ચાલક ગોળોં કે બીચ એક ρ પ્રતિરોધકતા કા પદાર્થ ભર દિયા જાતા હૈ। ઇન ગોળોં કે બીચ પ્રતિરોધ કા માન હોગા :

Options :

1. $\frac{\rho}{4\pi} \left(\frac{1}{a} + \frac{1}{b} \right)$

2. $\frac{\rho}{4\pi} \left(\frac{1}{a} - \frac{1}{b} \right)$

3. $\frac{\rho}{2\pi} \left(\frac{1}{a} + \frac{1}{b} \right)$

4. $\frac{\rho}{2\pi} \left(\frac{1}{a} - \frac{1}{b} \right)$

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

Correct Marks : 4 Wrong Marks : 1

ત્રિજ્યાઓ a અને b ($b > a$) ધરાવતા બે સમકેન્દ્રીય ગોળાઓની વચ્ચેની જગ્યામાં ρ અવરોધકતા ધરાવતું માધ્યમ ભરવામાં આવેલ છે. બે ગોળાઓ વચ્ચેનો અવરોધ _____ હશે.

Options :

1. $\frac{\rho}{4\pi} \left(\frac{1}{a} + \frac{1}{b} \right)$

2. $\frac{\rho}{4\pi} \left(\frac{1}{a} - \frac{1}{b} \right)$

3. $\frac{\rho}{2\pi} \left(\frac{1}{a} + \frac{1}{b} \right)$

4. $\frac{\rho}{2\pi} \left(\frac{1}{a} - \frac{1}{b} \right)$

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

Correct Marks : 4 Wrong Marks : 1

The magnitude of the magnetic field at the center of an equilateral triangular loop of side 1 m which is carrying a current of 10 A is :

[Take $\mu_0 = 4\pi \times 10^{-7} \text{ NA}^{-2}$]

Options :

1. $1 \mu\text{T}$

2. $3 \mu\text{T}$

3. $9 \mu\text{T}$

4. $18 \mu\text{T}$

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

1 m भुजा वाले एक समबाहु त्रिभुजाकार वलय में 10 A धारा प्रवाहित होती है। इसके केन्द्र पर चुम्बकीय क्षेत्र के परिमाण का मान होगा :

[$\mu_0 = 4\pi \times 10^{-7} \text{ NA}^{-2}$ लीजिए]

Options :

1. $1 \mu\text{T}$

2. $3 \mu\text{T}$

3. $9 \mu\text{T}$

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

1 m બાજુવાળા અને 10 A પ્રવાહ ધરાવતા સમબાજુ ત્રિકોણાકાર (વલય) ગાળાના કેન્દ્ર આગળ ચુંબકીયક્ષેત્રનું મૂલ્ય _____ હશે.

$[\mu_0 = 4\pi \times 10^{-7} \text{ NA}^{-2} \text{ લો}]$

Options :

1. $1 \mu\text{T}$
2. $3 \mu\text{T}$
3. $9 \mu\text{T}$
4. $18 \mu\text{T}$

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

Correct Marks : 4 Wrong Marks : 1

A square loop is carrying a steady current I and the magnitude of its magnetic dipole moment is m . If this square loop is changed to a circular loop and it carries the same current, the magnitude of the magnetic dipole moment of circular loop will be :

Options :

1. $\frac{m}{\pi}$
2. $\frac{2m}{\pi}$
3. $\frac{3m}{\pi}$
4. $\frac{4m}{\pi}$

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

Correct Marks : 4 Wrong Marks : 1

एक वर्गाकार वलय में धारा I प्रवाहित करने पर इसके चुम्बकीय द्विध्रुव आघूर्ण का परिमाण m होता है। यदि इस वर्गाकार वलय को मोड़कर एक वृत्ताकार वलय में परिवर्तित किया जाये और उसमें वही धारा प्रवाहित की जाए तो इस वृत्ताकार वलय के चुम्बकीय द्विध्रुव आघूर्ण का परिमाण होगा :

Options :

1. $\frac{m}{\pi}$
2. $\frac{2m}{\pi}$
3. $\frac{3m}{\pi}$
4. $\frac{4m}{\pi}$

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

Correct Marks : 4 Wrong Marks : 1

એક ચોરસ ગાળામાંથી I જેટલો સ્થિત વિદ્યુતપ્રવાહ પસાર થાય છે અને તેની ચુંબકીય દ્વિધ્રુવીય ચાકમાત્રાનું મૂલ્ય m છે. જો આ ચોરસ ગાળો બદલાઈને વર્તુળાકાર ગાળો બને અને તેમાંથી સમાન પ્રવાહ જ પસાર થતો હોય તો વર્તુળાકાર ગાળામાં ની ચુંબકીય દ્વિધ્રુવી ચાકમાત્રા _____ થશે.

Options :

1. $\frac{m}{\pi}$
2. $\frac{2m}{\pi}$
3. $\frac{3m}{\pi}$
4. $\frac{4m}{\pi}$

Correct Marks : 4 Wrong Marks : 1

A coil of self inductance 10 mH and resistance $0.1\ \Omega$ is connected through a switch to a battery of internal resistance $0.9\ \Omega$. After the switch is closed, the time taken for the current to attain 80% of the saturation value is : [take $\ln 5 = 1.6$]

Options :

1. 0.016 s
2. 0.002 s
3. 0.103 s
4. 0.324 s

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

10 mH स्वप्रेरकत्व एवं 0.1Ω प्रतिरोध की एक कुंडली को एक कुंजी के साथ एक 0.9Ω आंतरिक प्रतिरोध के सेल से जोड़ते हैं। कुंजी को बंद करने के पश्चात इस परिपथ में धारा का मान संतृप्त धारा के 80% होने में लगा समय होगा :

[दिया है : $\ln 5 = 1.6$]

Options :

1. 0.016 s
2. 0.002 s
3. 0.103 s
4. 0.324 s

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

10 mH જેટલું આત્મપ્રેરણ અને 0.1Ω નો અવરોધ ધરાવતા ગૂંચળાને કળની મદદથી 0.9Ω જેટલો આતંરિક અવરોધ ધરાવતી બેટરી સાથે જોડેલું છે. કળ બંધ કર્યાબાદ

Options :

1. 0.016 s
2. 0.002 s
3. 0.103 s
4. 0.324 s

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

Light is incident normally on a completely absorbing surface with an energy flux of 25 Wcm^{-2} . If the surface has an area of 25 cm^2 , the momentum transferred to the surface in 40 min time duration will be :

Options :

1. $1.4 \times 10^{-6} \text{ Ns}$
2. $3.5 \times 10^{-6} \text{ Ns}$
3. $5.0 \times 10^{-3} \text{ Ns}$
4. $6.3 \times 10^{-4} \text{ Ns}$

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

Correct Marks : 4 Wrong Marks : 1

एक सम्पूर्ण अवशोषक पृष्ठ पर 25 Wcm^{-2} ऊर्जा प्रवाह (flux) का प्रकाश लम्बवत् आपतित होता है। यदि पृष्ठ का क्षेत्रफल 25 cm^2 है तो 40 min समयान्तराल में उस पर हुआ संवेग अंतरण (transfer) होगा :

Options :

1. $1.4 \times 10^{-6} \text{ Ns}$
2. $3.5 \times 10^{-6} \text{ Ns}$

$5.0 \times 10^{-3} \text{ Ns}$

4. $6.3 \times 10^{-4} \text{ N s}$

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

25 W cm^{-2} જેટલું ઉર્જા ફ્લક્સ ધરાવતો પ્રકાશ એક સંપૂર્ણ શોષક સપાટી ઉપર લંબરૂપે આપતા થાય છે. જો સપાટીનું ક્ષેત્રફળ 25 cm^2 હોય તો સપાટીને 40 મીનીટ ના સમય ગાળા દરમિયાન રૂપાંતર થતું વેગમાન _____ હશે.

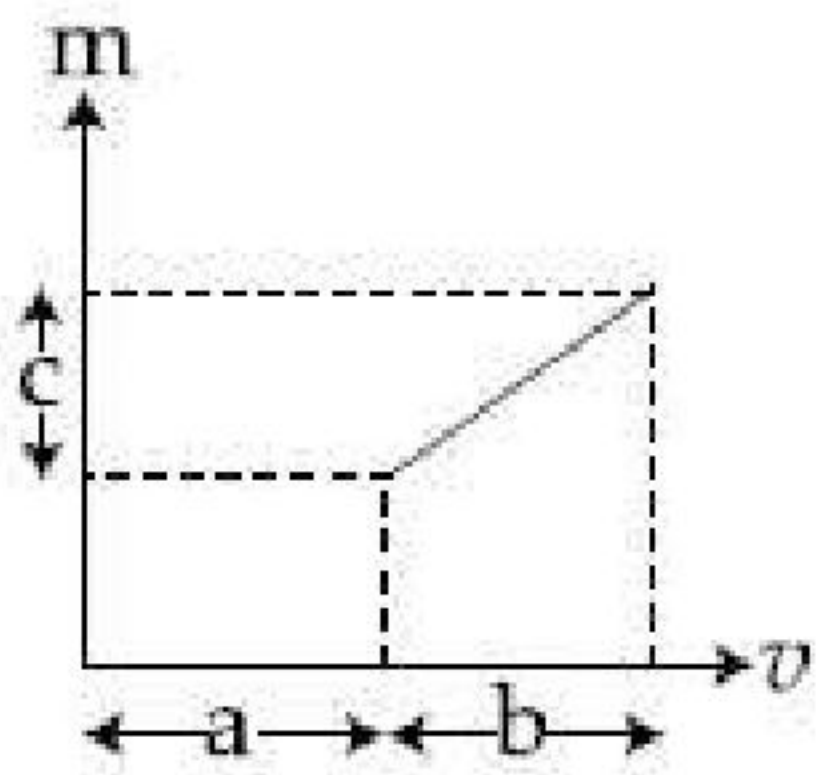
Options :

1. $1.4 \times 10^{-6} \text{ N s}$
2. $3.5 \times 10^{-6} \text{ N s}$
3. $5.0 \times 10^{-3} \text{ N s}$
4. $6.3 \times 10^{-4} \text{ N s}$

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 graph shows how the magnification m produced by a thin lens varies with image distance v . What is the focal length of the lens used ?



Options :

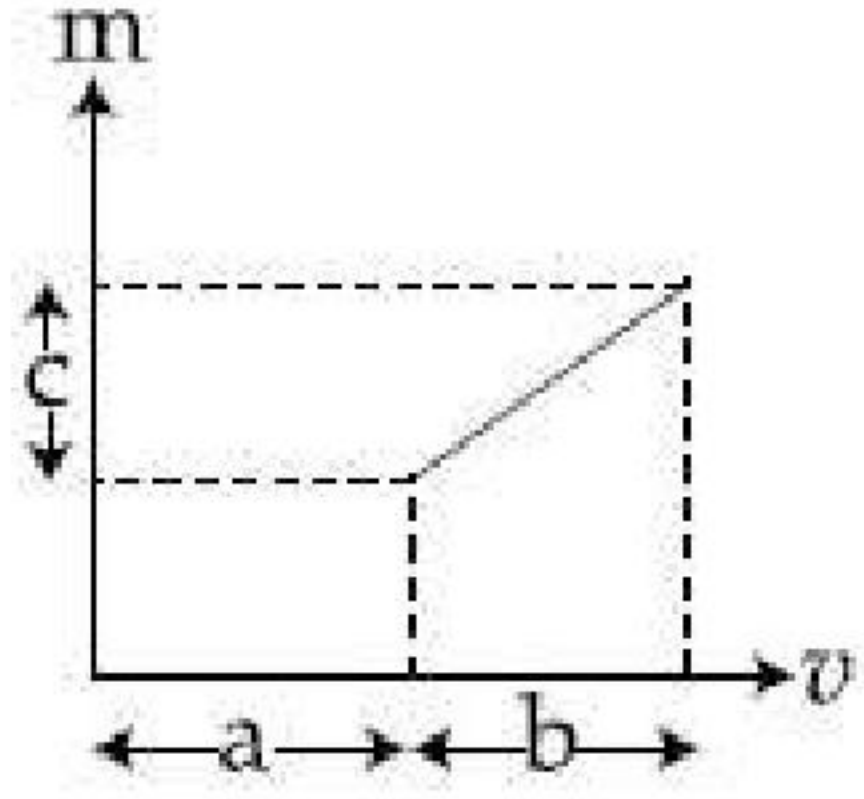
1. $\frac{b^2}{ac}$
2. $\frac{a}{c}$
3. $\frac{b^2}{c}$

4. $\frac{b}{c}$

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

Correct Marks : 4 Wrong Marks : 1

દિયે ગયે ગ્રાફ મેં એક પતલે લેંસ કે આવર્ધન m કો પ્રતિબિમ્બ કી દૂરી v કે સાથ દર્શાયા ગયા હૈ। ઇસ લેંસ કી ફોકસ દૂરી ક્યા હોગી ?



Options :

1. $\frac{b^2}{ac}$

2. $\frac{a}{c}$

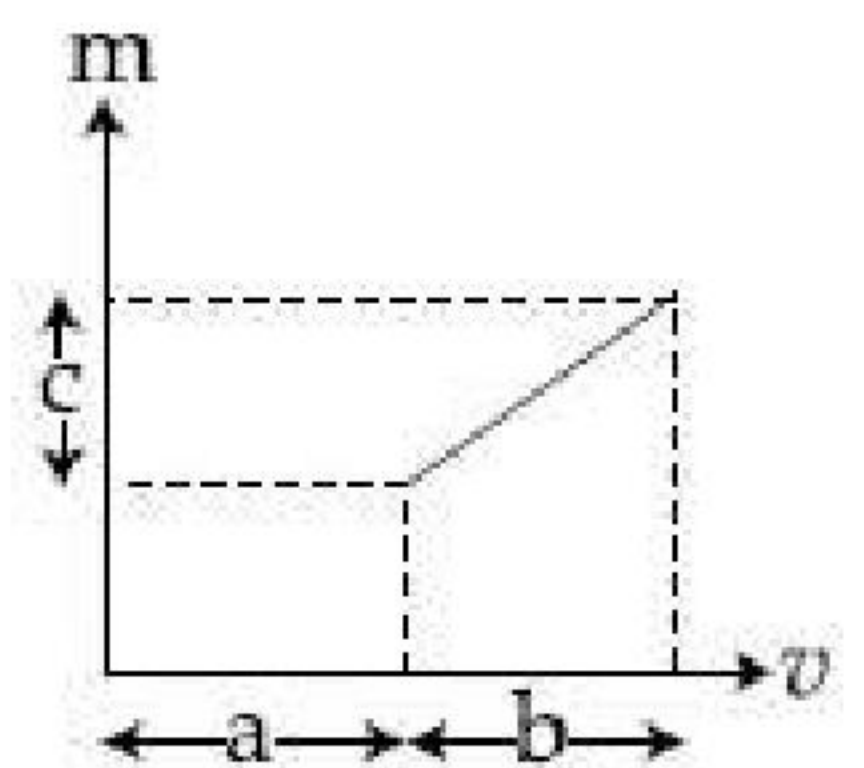
3. $\frac{b^2c}{a}$

4. $\frac{b}{c}$

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

Correct Marks : 4 Wrong Marks : 1

એક પાતળા લેન્સમાટે મોટવાણી m પ્રતિબિંબ અંતર v સાથે કેવી રીતે બદલાય છે તે આલેખમાં દર્શાવેલ છે. વપરાયેલ લેન્સની કેન્દ્રલંબાઈ કેટલી હશે?



1. $\frac{b^2}{ac}$

2. $\frac{a}{c}$

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

4. $\frac{b}{c}$

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

Correct Marks : 4 Wrong Marks : 1

In a Young's double slit experiment, the ratio of the slit's width is 4 : 1. The ratio of the intensity of maxima to minima, close to the central fringe on the screen, will be :

Options :

1. 4 : 1

2. 9 : 1

3. $(\sqrt{3}+1)^4 : 16$

4. 25 : 9

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

यंग के एक द्विझिरी प्रयोग में स्लिट की चौड़ाइयों का अनुपात 4 : 1 है। स्क्रीन पर केन्द्रीय फ्रिंज के निकट देखी गयी उच्चतम तथा न्यूनतम प्रकाश तीव्रता का अनुपात होगा :

Options :

1. 4 : 1

2. 9 : 1

4. 25 : 9

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

ચંગના બે સ્લિટનાં પ્રયોગમાં, સ્લિટની પહોળાઈઓનો ગુણોત્તર 4 : 1 છે. પડદા પર મધ્યસ્થ શાલાકાની નજીક રહેલ મહત્તમ અને ન્યૂનતમની તીવ્રતાઓનો ગુણોત્તર _____ થશે.

Options :

1. 4 : 1
2. 9 : 1
3. $(\sqrt{3}+1)^4 : 16$
4. 25 : 9

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

A 2 mW laser operates at a wavelength of 500 nm. The number of photons that will be emitted per second is :

[Given Planck's constant $h = 6.6 \times 10^{-34}$ Js, speed of light $c = 3.0 \times 10^8$ m/s]

Options :

1. 5×10^{15}
2. 1×10^{16}
3. 1.5×10^{16}
4. 2×10^{16}

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

Correct Marks : 4 Wrong Marks : 1

एक 2 mW लेजर की तरंगदैर्घ्य 500 nm है। इससे निकलने वाले प्रति सेकण्ड फोटॉनों की संख्या होगी :
[दिया है, प्लांक नियतांक $h = 6.6 \times 10^{-34}$ Js,
प्रकाश की चाल $c = 3.0 \times 10^8$ m/s]

Options :

1. 5×10^{15}
2. 1×10^{16}
3. 1.5×10^{16}
4. 2×10^{16}

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

Correct Marks : 4 Wrong Marks : 1

એક લેઝર 2 mW પાવરે 500 nm તરંગલંબાઈએ કાર્ય કરે છે. આ દરમિયાન પ્રતિ સેકન્ડે ઉત્સર્જિત થતા ફોટોનની સંખ્યા _____ હશે.

[પ્લાંકનો અચળાંક $h = 6.6 \times 10^{-34}$ Js,
પ્રકાશની ઝડપ $c = 3.0 \times 10^8$ m/s આપેલ છે.]

Options :

1. 5×10^{15}
2. 1×10^{16}
3. 1.5×10^{16}
4. 2×10^{16}

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

Correct Marks : 4 Wrong Marks : 1

In Li^{++} , electron in first Bohr orbit is excited to a level by a radiation of wavelength λ . When the ion gets deexcited to the ground state in all possible ways (including intermediate emissions), a total of six spectral lines are observed. What is the value of λ ?

(Given : $h = 6.63 \times 10^{-34} \text{ Js}$;

$c = 3 \times 10^8 \text{ ms}^{-1}$)

Options :

1. 9.4 nm
2. 10.8 nm
3. 11.4 nm
4. 12.3 nm

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

Correct Marks : 4 Wrong Marks : 1

Li^{++} आयन में इलेक्ट्रॉन को उसकी प्रथम बोहर कक्षा से λ तरंगदैर्घ्य के विकिरण से एक ऊँची कक्षा में उत्तेजित कर दिया जाता है। जब यह आयन अपनी न्यूनतम ऊर्जा अवस्था में सभी संभव तरीकों (मध्यवर्ती उत्सर्जनों को मिलाकर) से आता है तो कुल 6 स्पेक्ट्रल लाइनें पायी जाती हैं। λ का मान क्या होगा?

(दिया है : $h = 6.63 \times 10^{-34} \text{ Js}$;

$c = 3 \times 10^8 \text{ ms}^{-1}$)

Options :

1. 9.4 nm
2. 10.8 nm
3. 11.4 nm
4. 12.3 nm

Li^+ માં પ્રથમ બોહ્ર કક્ષામાં રહેલો ઇલેક્ટ્રોન λ જેટલી તરંગલંબાઈ ધરાવતા વિકિરણની મદદથી ઉત્તેજિત કક્ષામાં જાય છે. જ્યારે આ આયન બધી જ રીતે (વચ્ચે થતી ઉત્સર્જનો દ્વારા ઓ પણ) જ્યારે અનુત્તેજિત થાય છે ત્યારે કુલ 6 વર્ણપટ રેખાઓ જોવા મળે છે. λ ની કિંમત કેટલી હશે?

($h = 6.63 \times 10^{-34} \text{ Js}$; $c = 3 \times 10^8 \text{ ms}^{-1}$ આપેલ છે.)

Options :

1. 9.4 nm
2. 10.8 nm
3. 11.4 nm
4. 12.3 nm

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

Correct Marks : 4 Wrong Marks : 1

Two radioactive substances A and B have decay constants 5λ and λ respectively. At $t=0$, a sample has the same number of the two nuclei. The time taken for the ratio of

the number of nuclei to become $\left(\frac{1}{e}\right)^2$ will

be :

Options :

1. $1/\lambda$
2. $2/\lambda$
3. $1/2\lambda$
4. $1/4\lambda$

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

દો રેડિયોધર્મી પદાર્થો A તથા B કે ક્ષય નિયતાંક, ક્રમશઃ, 5λ તથા λ હૈં। $t=0$ પર ઇક નમૂને મેં ઇન દો નાભિકોં કી બરાબર સંખ્યા હૈ। નાભિકોં કી સંખ્યા કા અનુપાત

$\left(\frac{1}{e}\right)^2$ હોને મેં લગે સમય કા માન હોગા :

Options :

1. $1/\lambda$
2. $2/\lambda$
3. $1/2\lambda$
4. $1/4\lambda$

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

Correct Marks : 4 Wrong Marks : 1

બે રેડિયોએક્ટિવ પદાર્થો A અને B નાં ક્ષયનિયતાંકો અનુક્રમે 5λ અને λ છે. $t=0$ સમયે નમૂના પાસે સરખા ન્યૂક્લિયસોની સંખ્યા છે. ન્યૂક્લિયસોની સંખ્યાઓના

ગુણોત્તરનું મૂલ્ય $\left(\frac{1}{e}\right)^2$ થાય તે માટે લાગતો સમય _____ હશે.

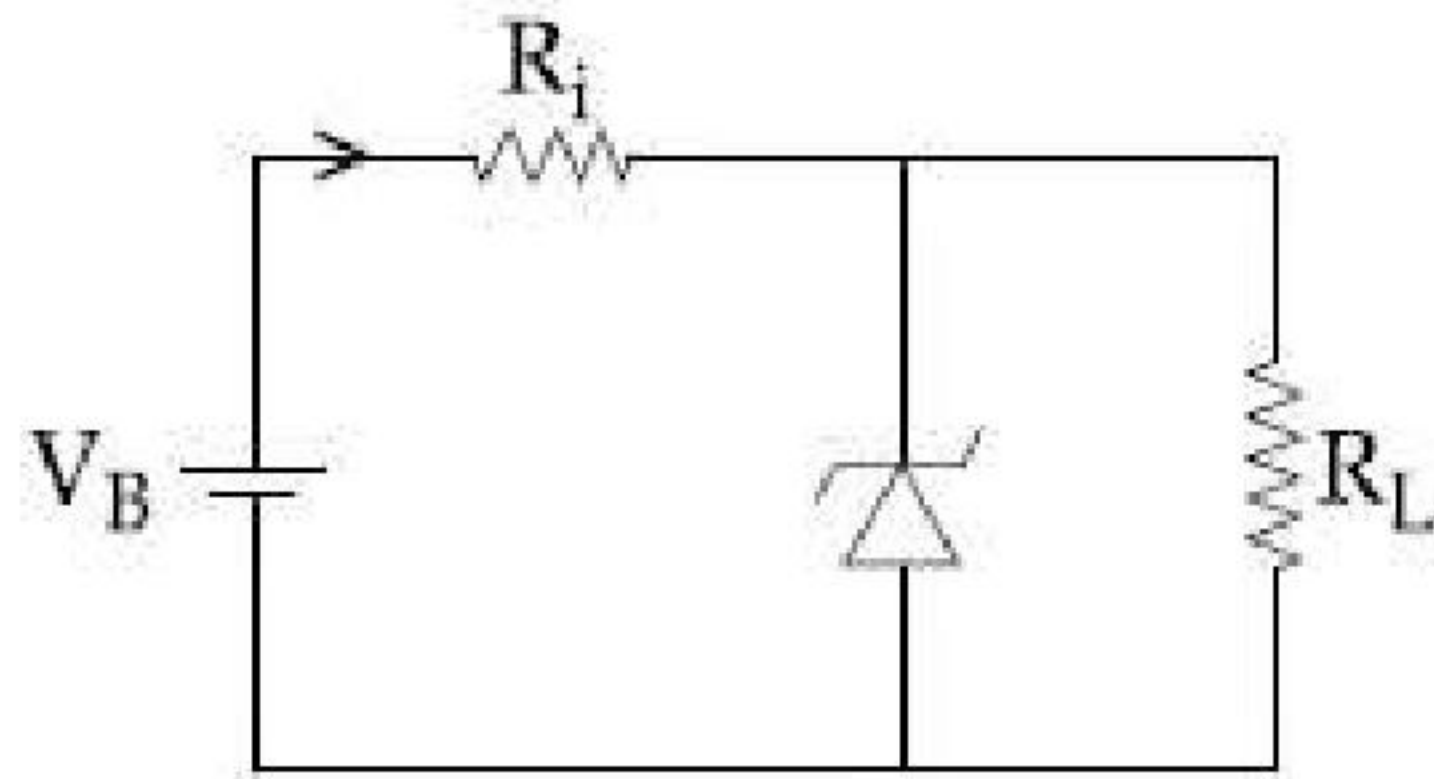
Options :

1. $1/\lambda$
2. $2/\lambda$
3. $1/2\lambda$
4. $1/4\lambda$

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

Correct Marks : 4 Wrong Marks : 1

The figure represents a voltage regulator circuit using a Zener diode. The breakdown voltage of the Zener diode is 6 V and the load resistance is, $R_L = 4 \text{ k}\Omega$. The series resistance of the circuit is $R_i = 1 \text{ k}\Omega$. If the battery voltage V_B varies from 8 V to 16 V, what are the minimum and maximum values of the current through Zener diode ?



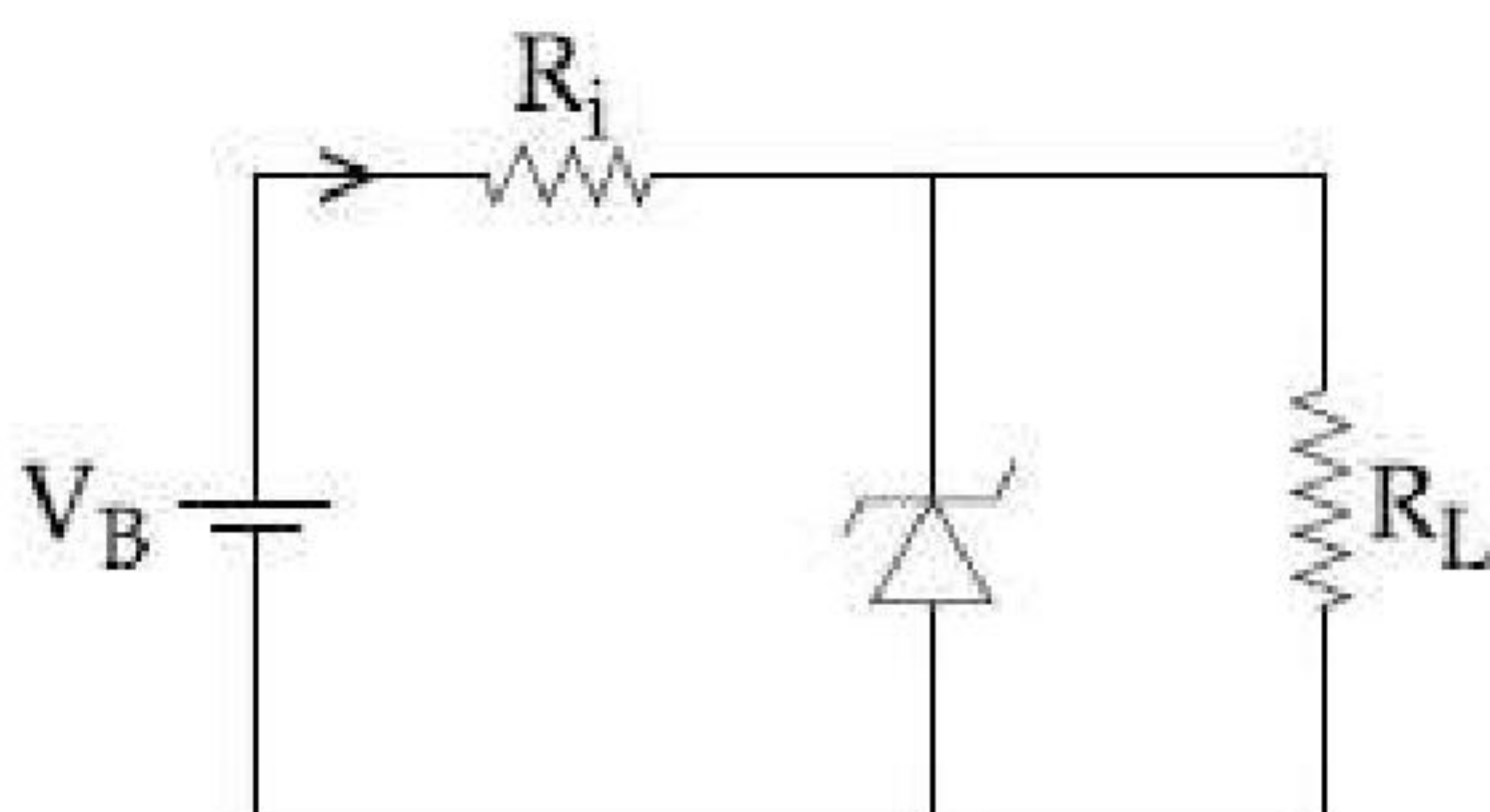
Options :

1. 0.5 mA; 6 mA
2. 1.5 mA; 8.5 mA
3. 0.5 mA; 8.5 mA
4. 1 mA; 8.5 mA

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

Correct Marks : 4 Wrong Marks : 1

चित्र में जेनर डायोड से बनाया हुआ वोल्टेज नियंत्रण परिपथ दिखाया गया है। जेनर डायोड की भंजन वोल्टता 6 V तथा लोड प्रतिरोध $R_L = 4 \text{ k}\Omega$ है। श्रेणी प्रतिरोध $R_i = 1 \text{ k}\Omega$ है। यदि सेल का विभव V_B , 8 V से 16 V के बीच बदलता है तो जेनर डायोड की धारा के न्यूनतम तथा अधिकतम मान क्या होंगे ?

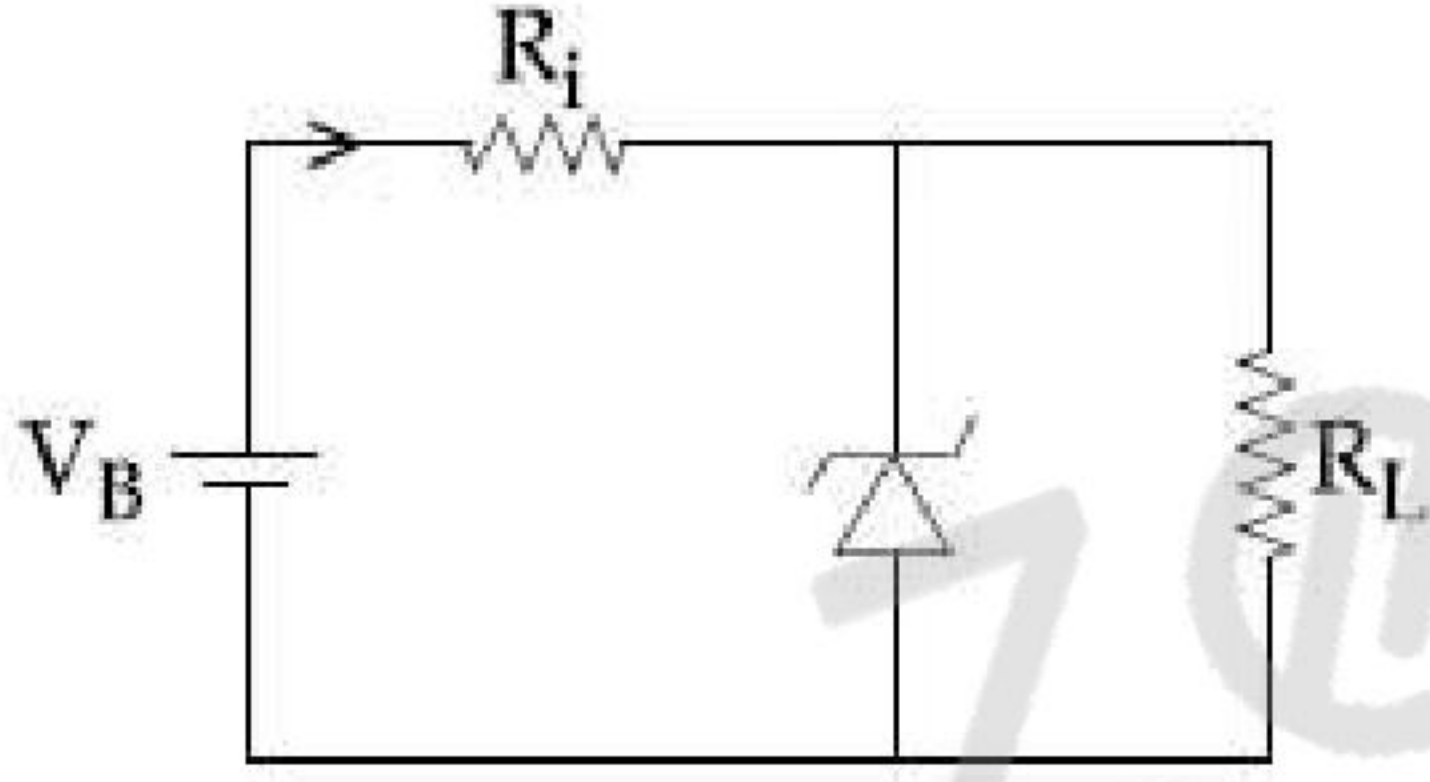


2. 1.5 mA; 8.5 mA
3. 0.5 mA; 8.5 mA
4. 1 mA; 8.5 mA

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

Correct Marks : 4 Wrong Marks : 1

આકૃતિ એક ઝેનર ડાયોડથી બનેલ વોલ્ટેજ રેગ્યુલેટર પરિપથ દર્શાવે છે. ઝેનર ડાયોડનો બ્રેકડાઉન વોલ્ટેજ 6 V અને ભાર અવરોધ $R_L = 4 \text{ k}\Omega$ છે. પરિપથનો શ્રેણી અવરોધ $R_i = 1 \text{ k}\Omega$ છે. જો બેટરીનો વોલ્ટેજ V_B ને 8 V થી 16 V બદલવામાં આવે તો ઝેનર ડાયોડ પ્રવાહનું ન્યૂનતમ અને મહત્તમ મૂલ્ય કેટલું મળે ?



Options :

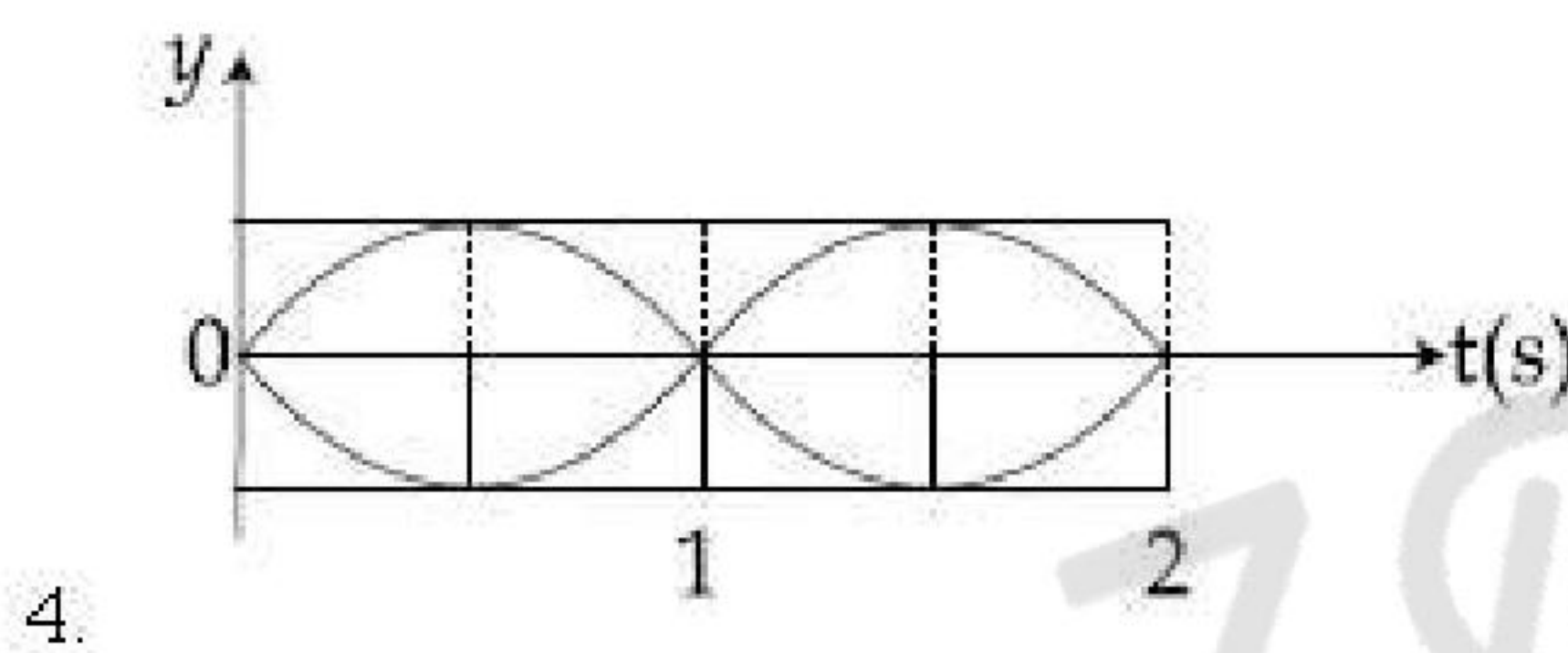
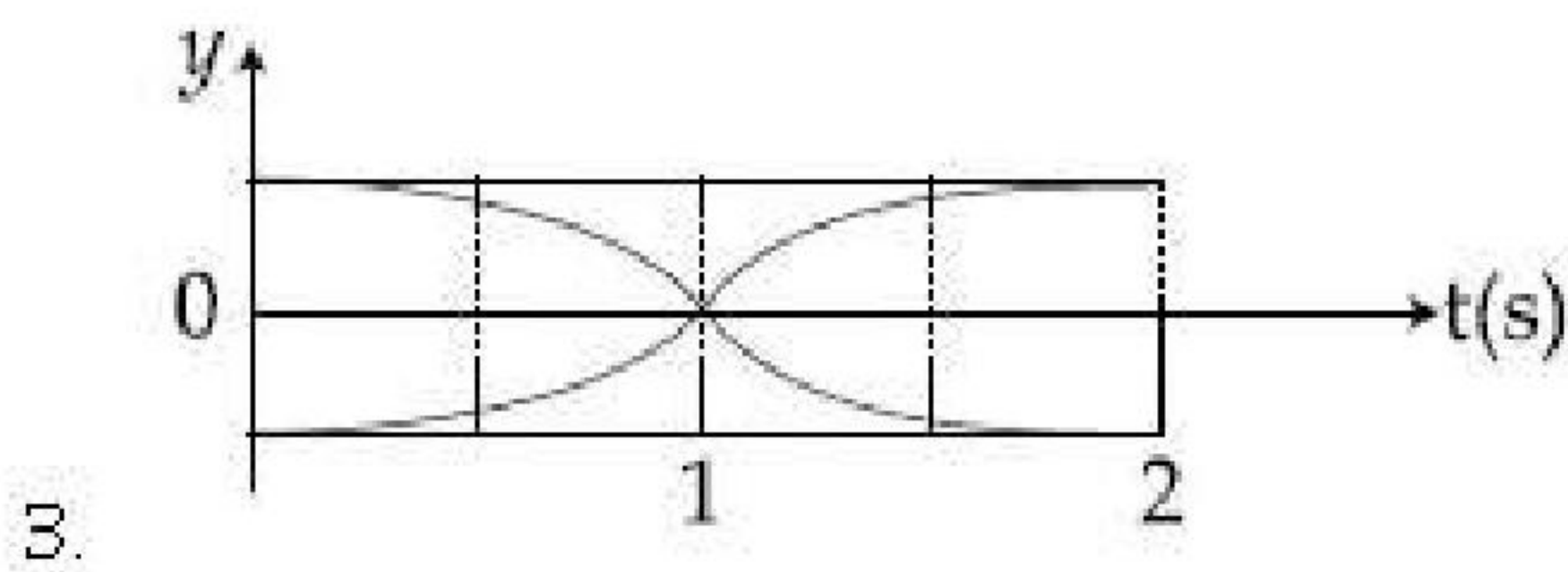
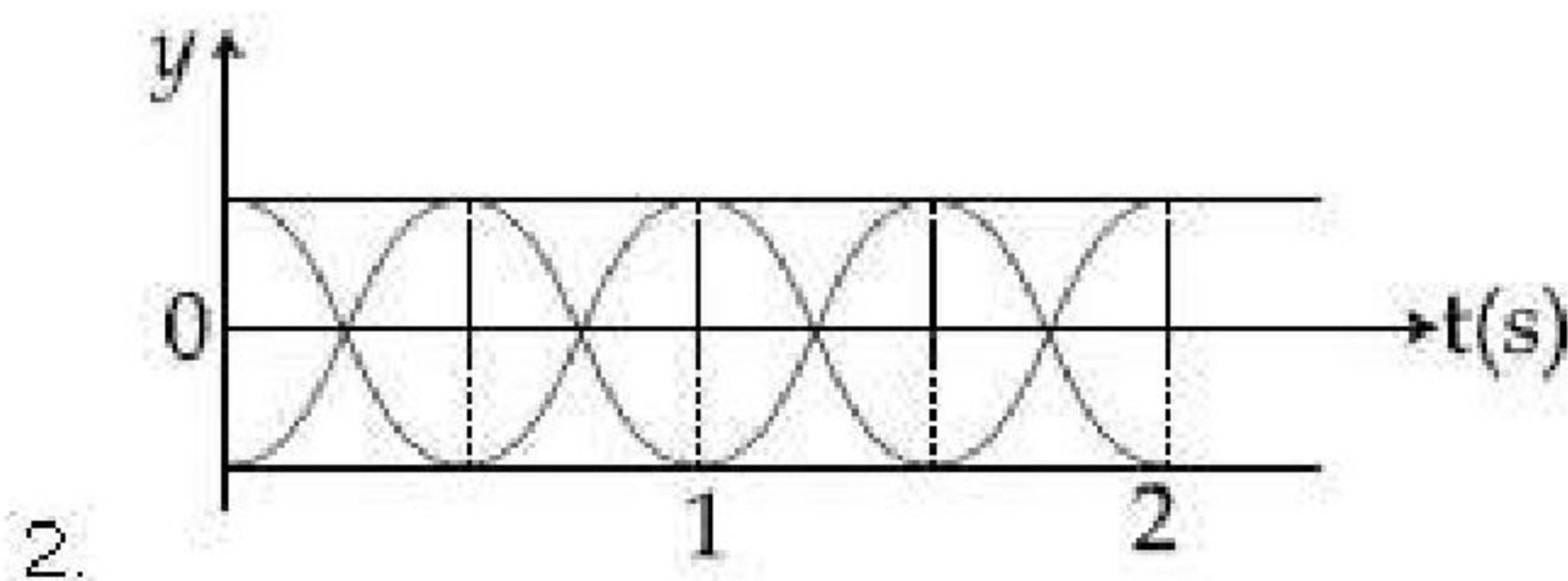
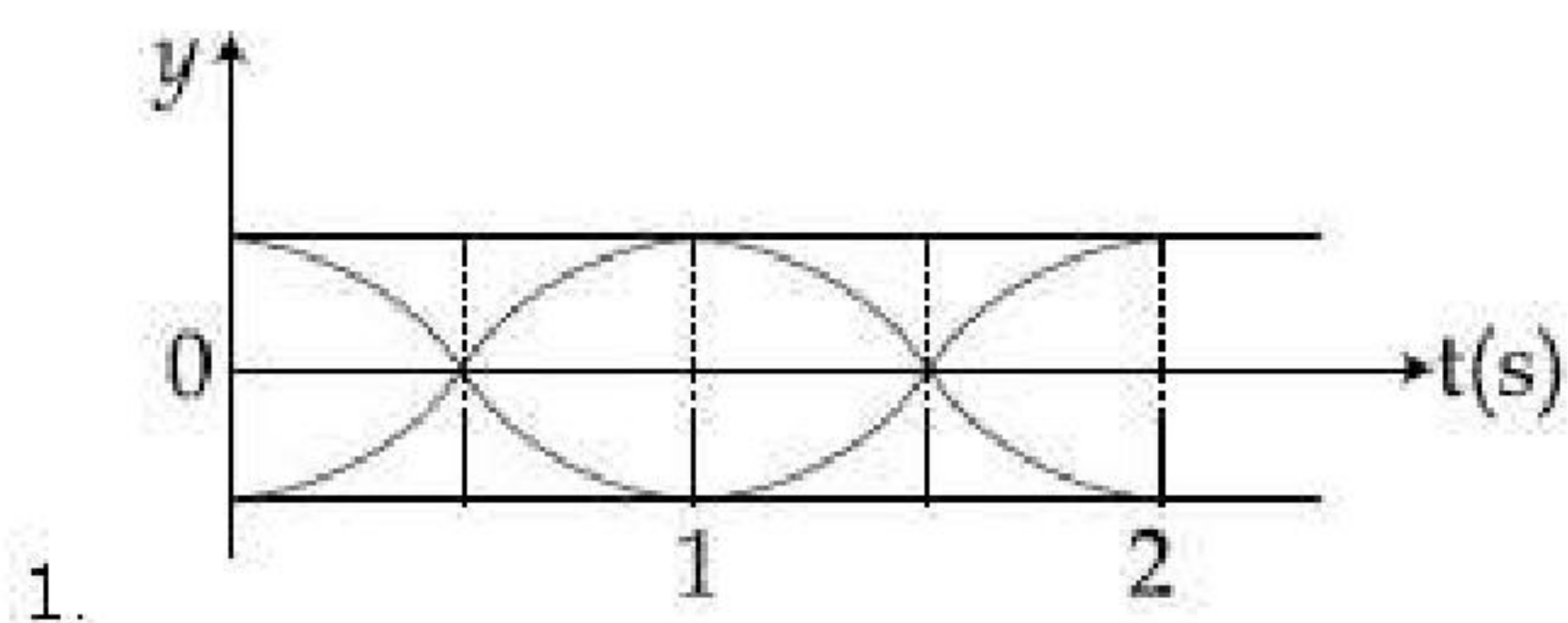
1. 0.5 mA; 6 mA
2. 1.5 mA; 8.5 mA
3. 0.5 mA; 8.5 mA
4. 1 mA; 8.5 mA

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

Correct Marks : 4 Wrong Marks : 1

The correct figure that shows, schematically, the wave pattern produced by superposition of two waves of frequencies 9 Hz and 11 Hz, is :

Options :

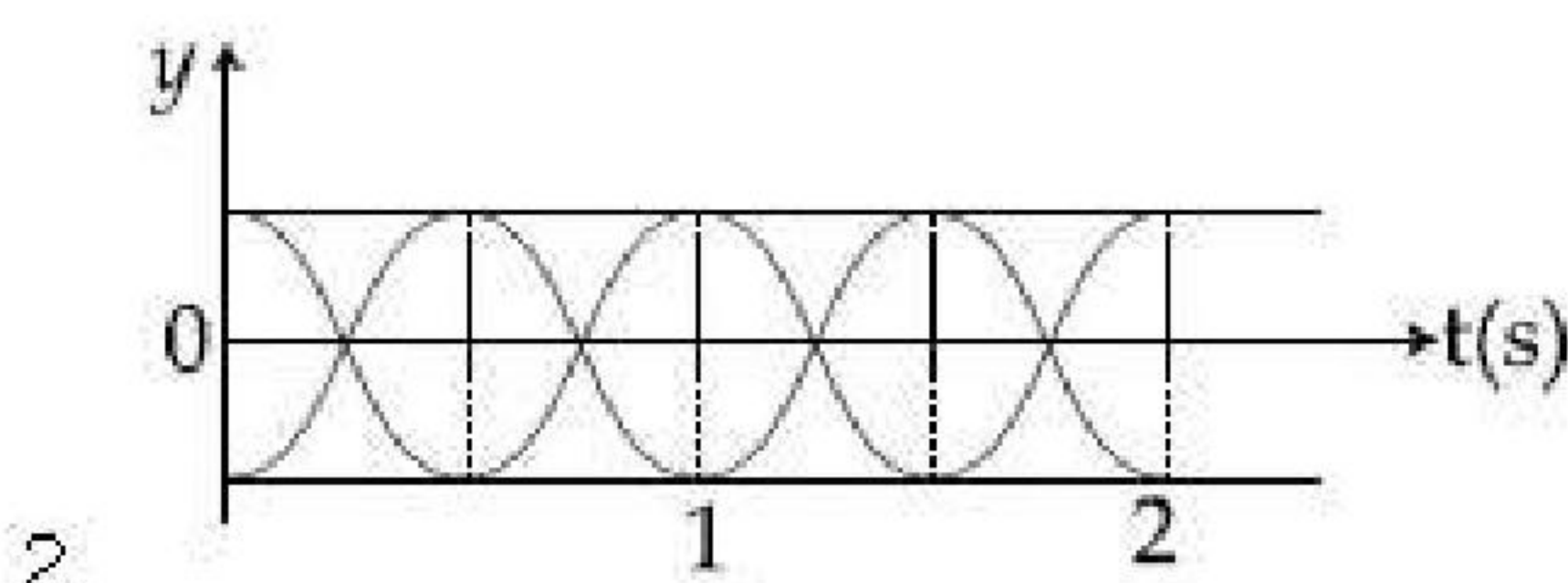
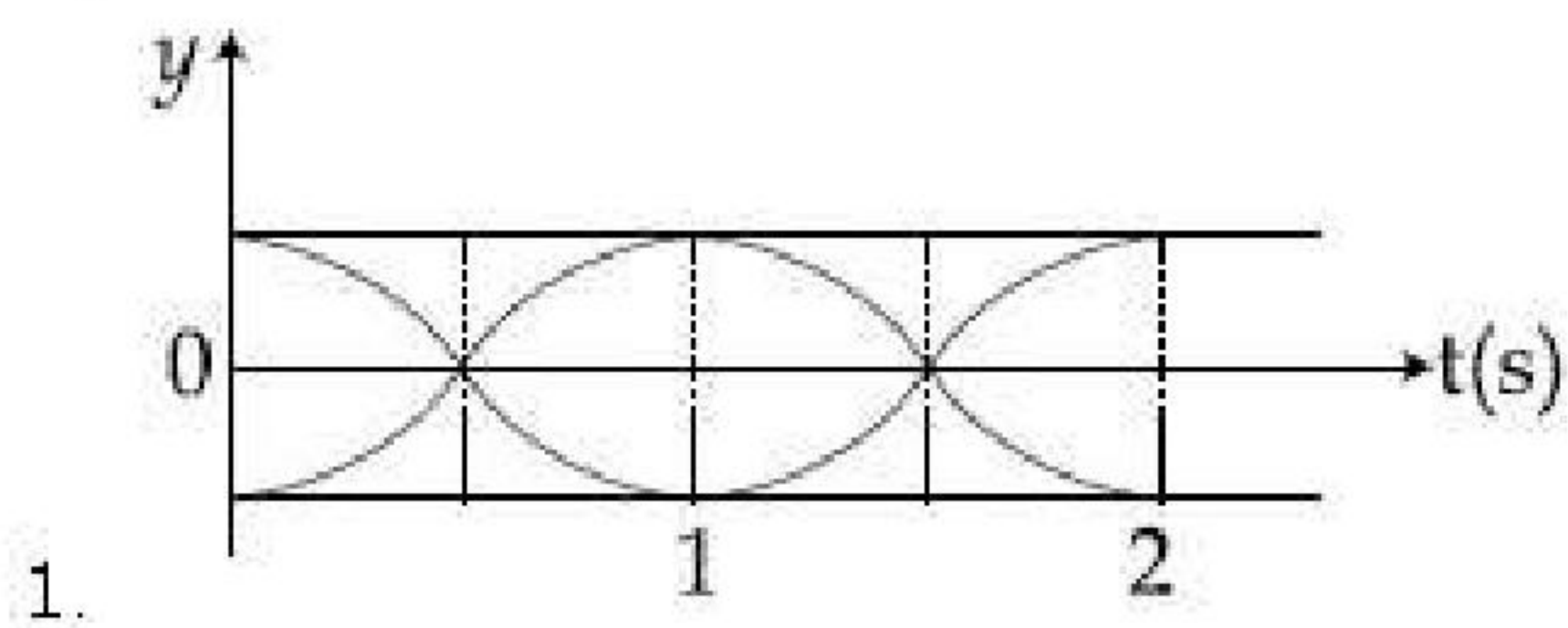


Question Number : 28 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

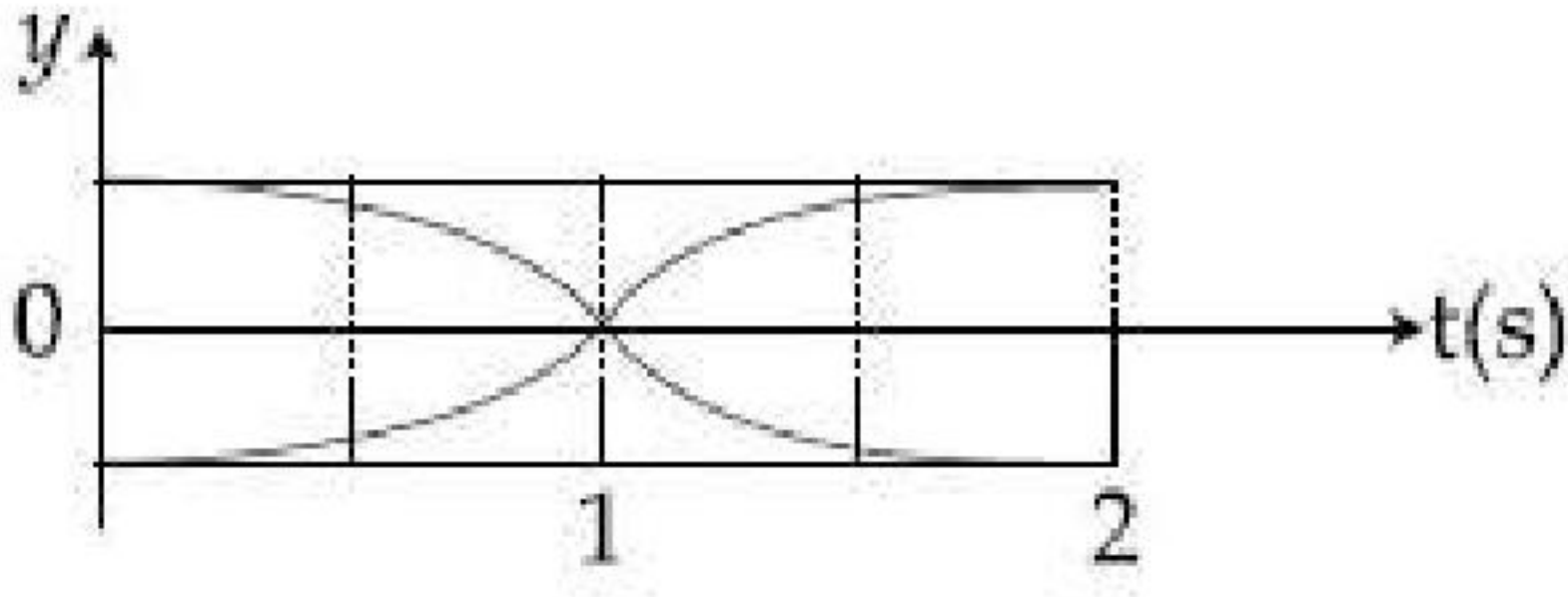
Correct Marks : 4 Wrong Marks : 1

11 Hz तथा 9 Hz आवृत्ति की दो तरंगों के अध्यारोपण को निम्न में कौन चित्र योजनाबद्ध तरीके से सही दर्शाता है?

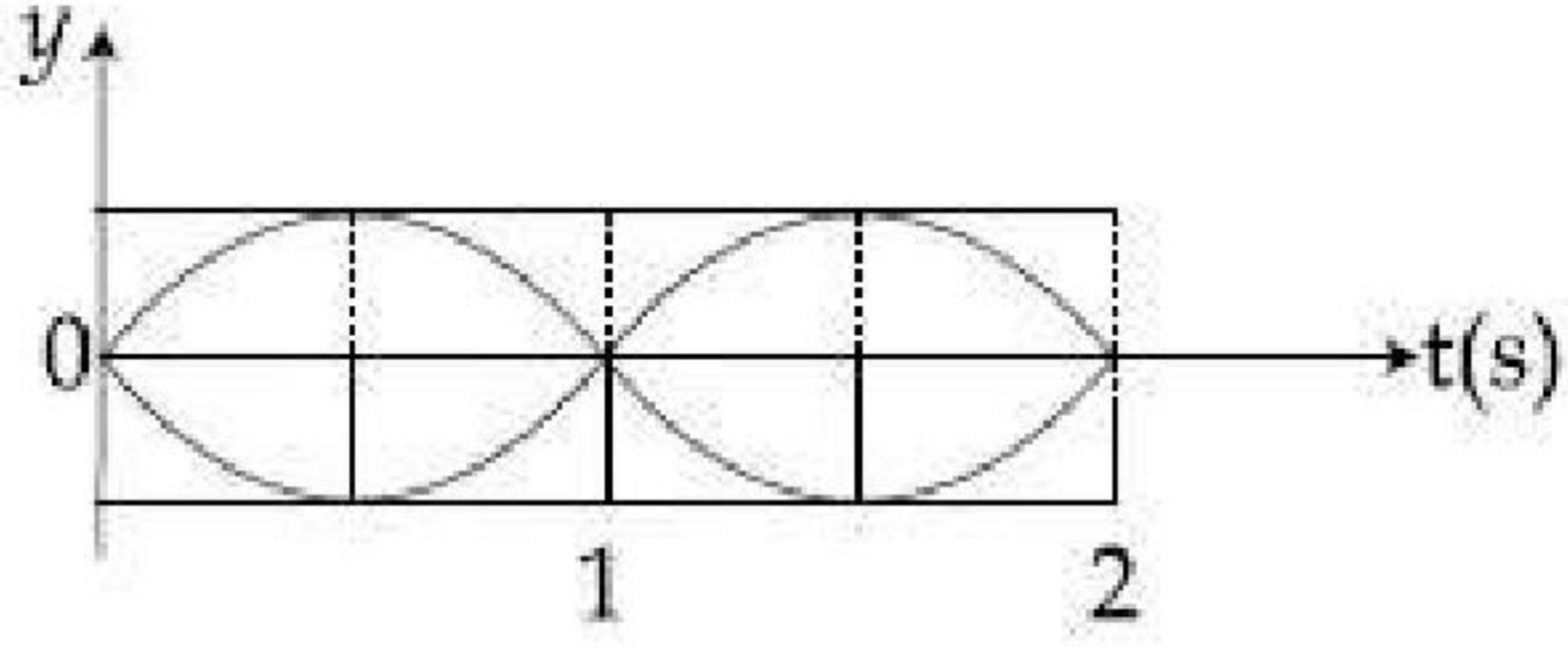
Options :



3.



4.



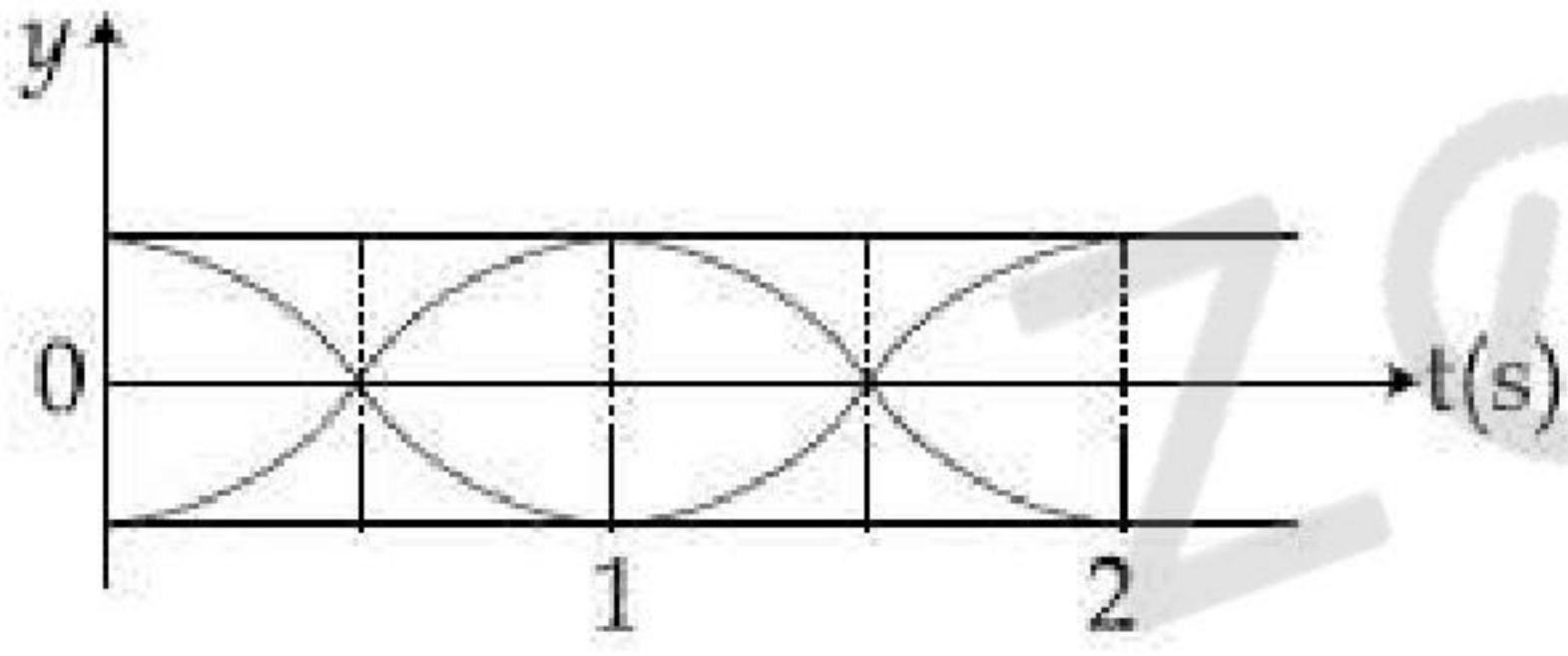
Question Number : 28 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

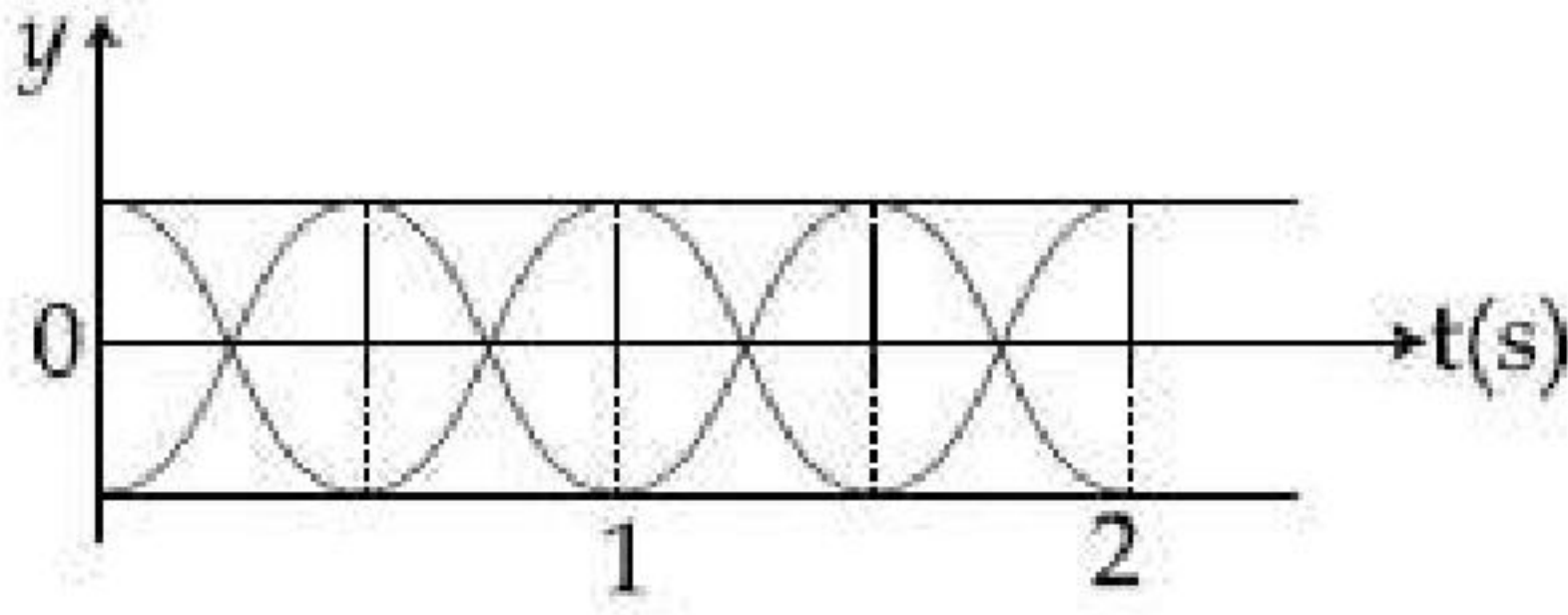
11 Hz અને 9 Hz આવૃત્તિ ધરાવતા બે તરંગોના સંપાતીકરણ દ્વારા મળતી તરંગ-ભાતની રેખાકૃતિ દર્શાવતી સાચી આકૃતિ _____ છે.

Options :

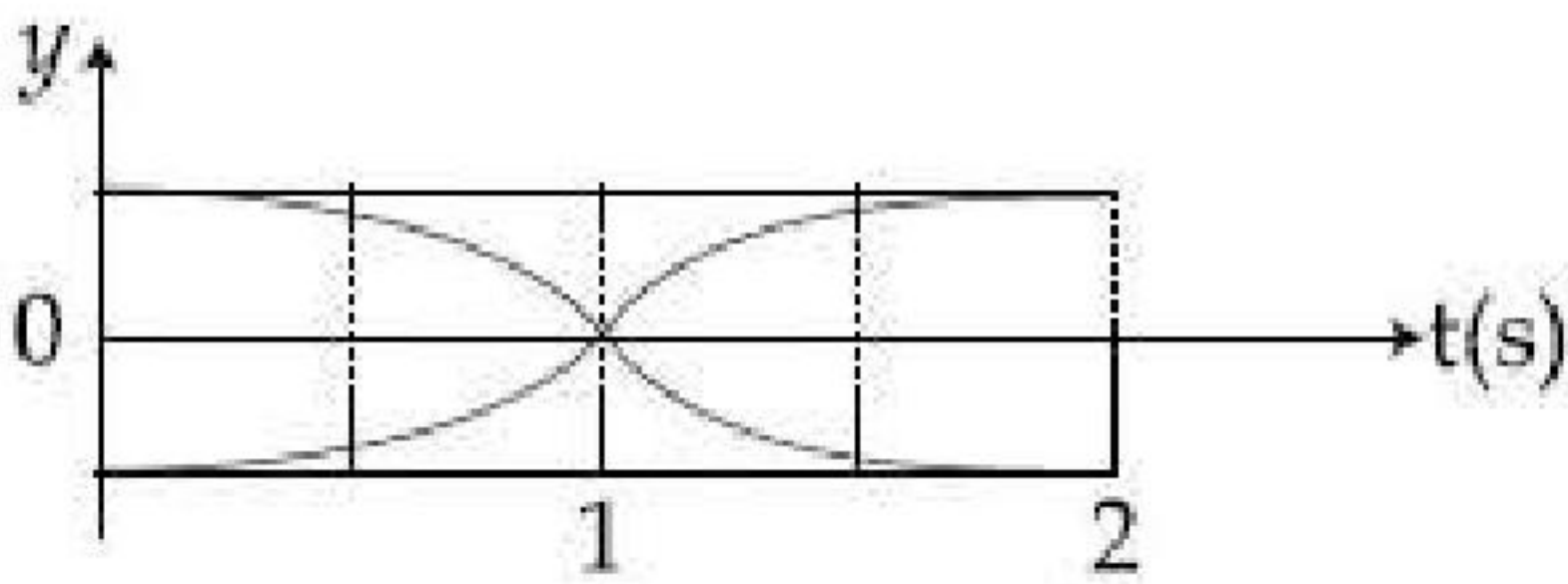
1.



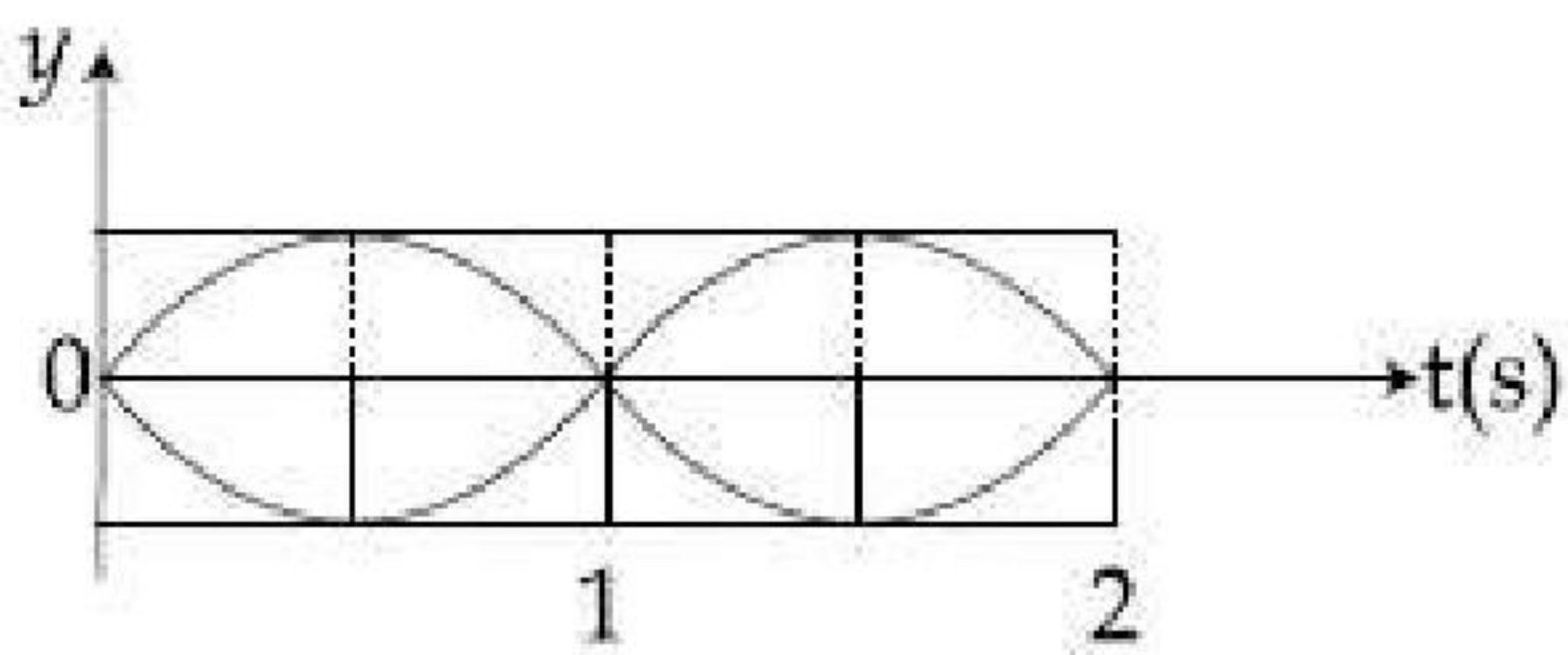
2.



3.



4.



In an experiment, brass and steel wires of length 1 m each with areas of cross section 1 mm^2 are used. The wires are connected in series and one end of the combined wire is connected to a rigid support and other end is subjected to elongation. The stress required to produce a net elongation of 0.2 mm is,

[Given, the Young's Modulus for steel and brass are, respectively, $120 \times 10^9 \text{ N/m}^2$ and $60 \times 10^9 \text{ N/m}^2$]

Options :

1. $0.2 \times 10^6 \text{ N/m}^2$
2. $4.0 \times 10^6 \text{ N/m}^2$
3. $1.2 \times 10^6 \text{ N/m}^2$
4. $1.8 \times 10^6 \text{ N/m}^2$

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 प्रयोग में, पीतल तथा स्टील के दो तारों का प्रयोग किया गया है जिनमें प्रत्येक की लम्बाई 1 m तथा अनुप्रस्थ काट का क्षेत्रफल 1 mm^2 हैं। इन तारों को श्रेणीक्रम में जोड़ते हैं तथा संयुक्त तार के एक सिरे को दृढ़ स्तम्भ से जोड़ते हैं एवं दूसरे सिरे को खींचा जाता है। 0.2 mm की कुल वृद्धि के लिये प्रतिबल का मान होगा :

(दिया है, स्टील तथा पीतल के यंग प्रत्यास्थता गुणांक, क्रमशः, $120 \times 10^9 \text{ N/m}^2$ तथा $60 \times 10^9 \text{ N/m}^2$ हैं)

Options :

1. $0.2 \times 10^6 \text{ N/m}^2$
2. $4.0 \times 10^6 \text{ N/m}^2$
3. $1.2 \times 10^6 \text{ N/m}^2$

4. $1.8 \times 10^6 \text{ N/m}^2$

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 પ્રયોગમાં, દરેક 1 m લંબાઈના અને 1 mm^2 જેટલા આડછેદનું ક્ષેત્રફળ ધરાવતા પીત્તળ અને સ્ટિલના તારનો ઉપયોગ કરવામાં આવે છે. આ તારોને શ્રેણીમાં જોડવામાં આવે છે અને તેમના જોડેલા છેડાને દૃઢ આધારસાથે જોડવામાં આવે છે જ્યારે બીજા છેડાઓ પર ખેંચાણ લગાવવામાં આવે છે. કુલ 0.2 mm જેટલી લંબાઈમાં વધારો કરવા જરૂરી પ્રતિબળ _____ છે.

(સ્ટિલ અને પીત્તળનો યંગ મોડ્યુલસ અનુક્રમે $120 \times 10^9 \text{ N/m}^2$ અને $60 \times 10^9 \text{ N/m}^2$ આપેલા છે.)

Options :

1. $0.2 \times 10^6 \text{ N/m}^2$
2. $4.0 \times 10^6 \text{ N/m}^2$
3. $1.2 \times 10^6 \text{ N/m}^2$
4. $1.8 \times 10^6 \text{ N/m}^2$

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

Correct Marks : 4 Wrong Marks : 1

A cubical block of side 0.5 m floats on water with 30% of its volume under water. What is the maximum weight that can be put on the block without fully submerging it under water ?

[Take, density of water = 10^3 kg/m^3]

Options :

1. 30.1 kg
2. 87.5 kg
3. 46.3 kg

4. 65.4 kg

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

0.5 m भुजा लम्बाई का एक घनाकार गुटका पानी में तैरता है जिससे उसका 30% आयतन पानी में डूबा है। इस गुटके के ऊपर अधिकतम कितना भार, गुटके को बिना पूरी तरह डुबाये, रखा जा सकता है?
[दिया है : पानी का घनत्व = 10^3 kg/m^3]

Options :

1. 30.1 kg

2. 87.5 kg

3. 46.3 kg

4. 65.4 kg

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

0.5 m જોટલી બાજુ ધરાવતો સમઘન ચોસલો તેનું 30% કદ પાણીની અંદર રહે તેમ પાણી પર તરે છે. ચોસલા પર કેટલું મહત્તમ વજન મૂકી શકાય કે જેથી તે પાણીની અંદર પૂર્ણરિતે જતો ના રહે?
[પાણીની ઘનતા = 10^3 kg/m^3 લો]

Options :

1. 30.1 kg

2. 87.5 kg

3. 46.3 kg

4. 65.4 kg

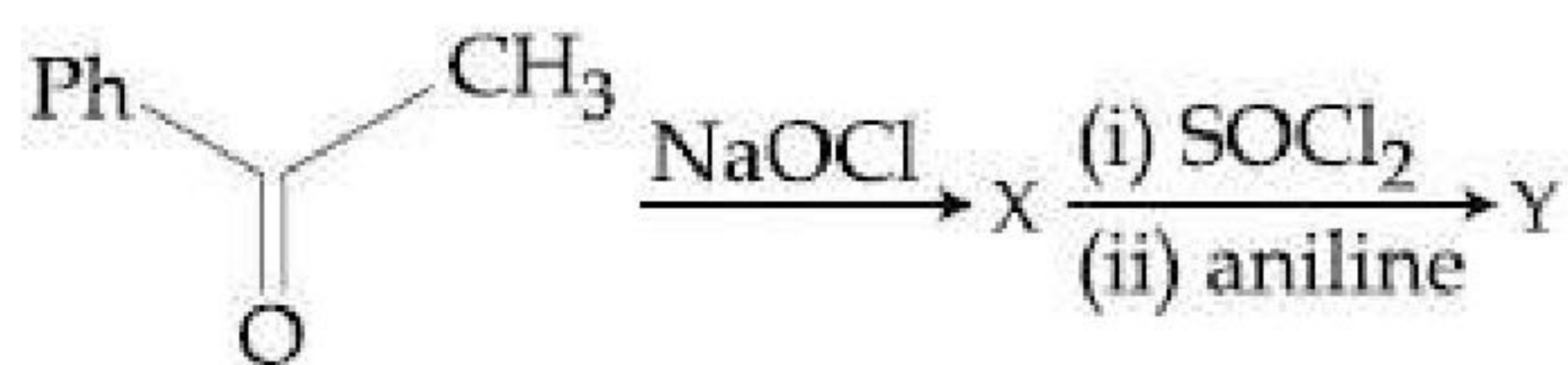
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529448
Question Shuffling Allowed :	Yes

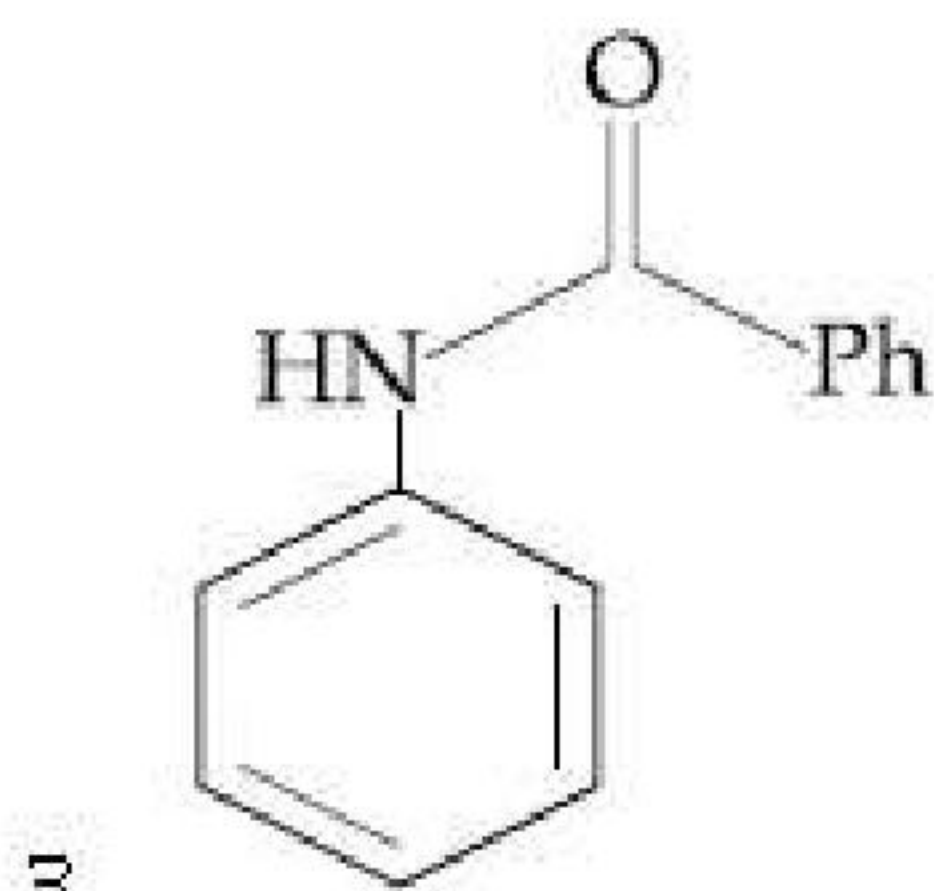
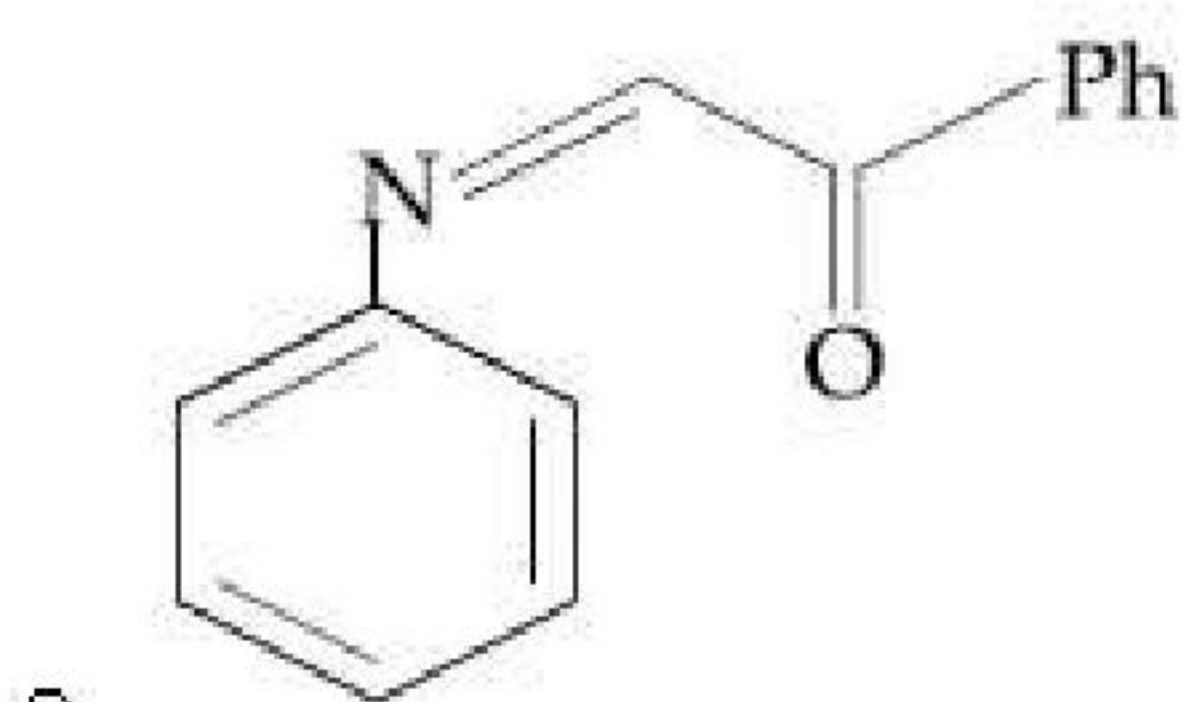
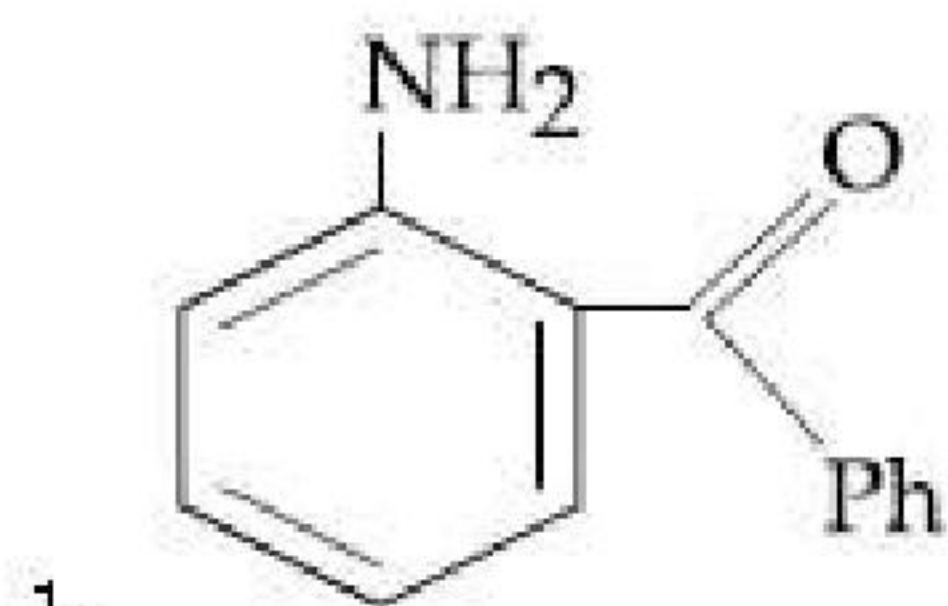
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

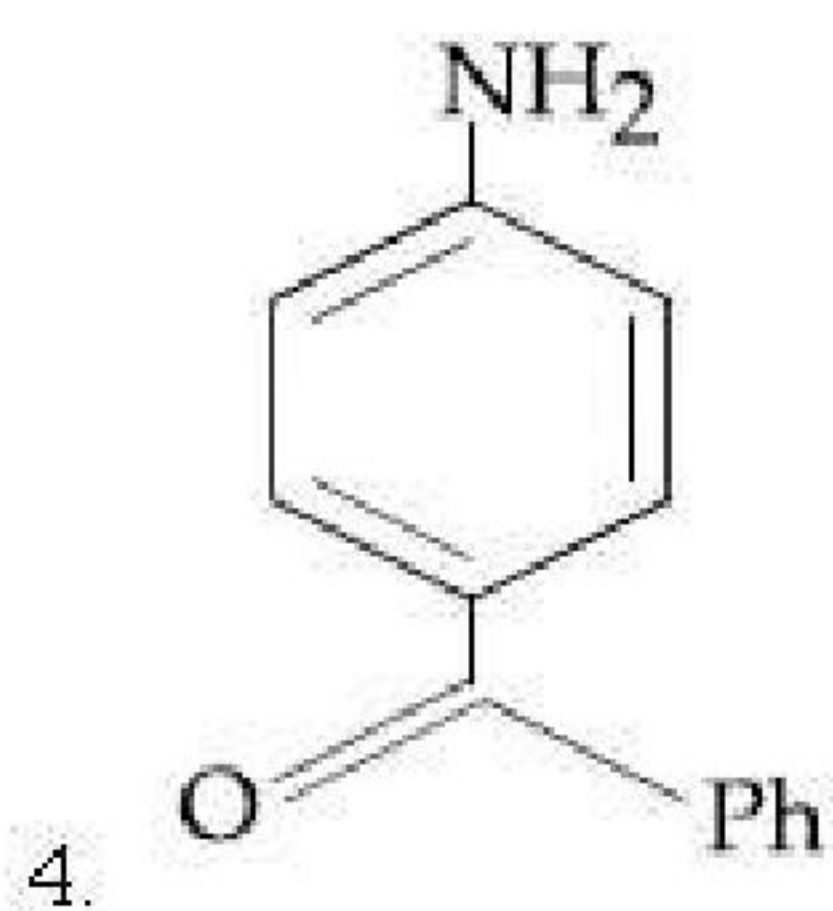
Correct Marks : 4 Wrong Marks : 1

The major product 'Y' in the following reaction is :



Options :

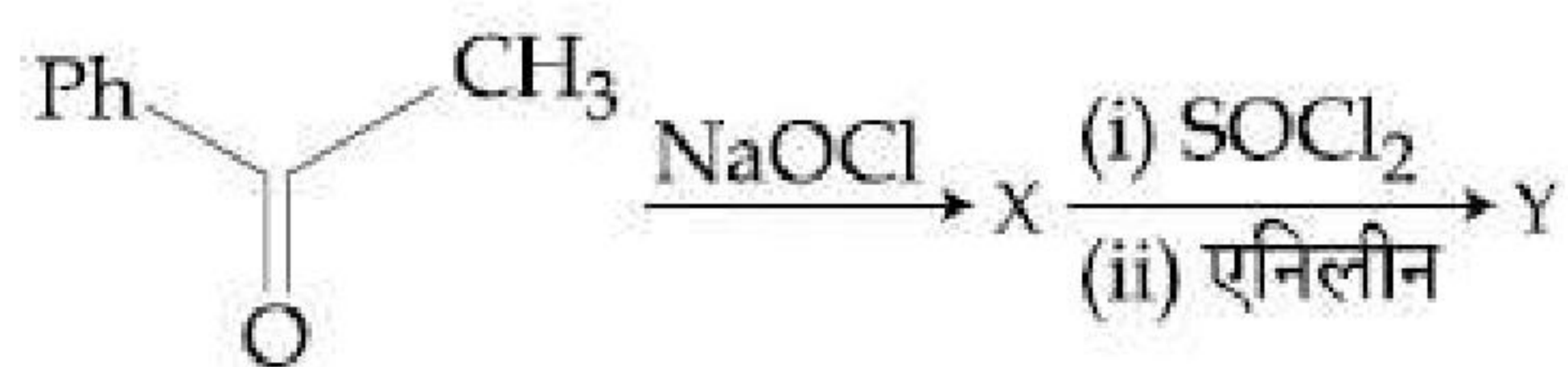




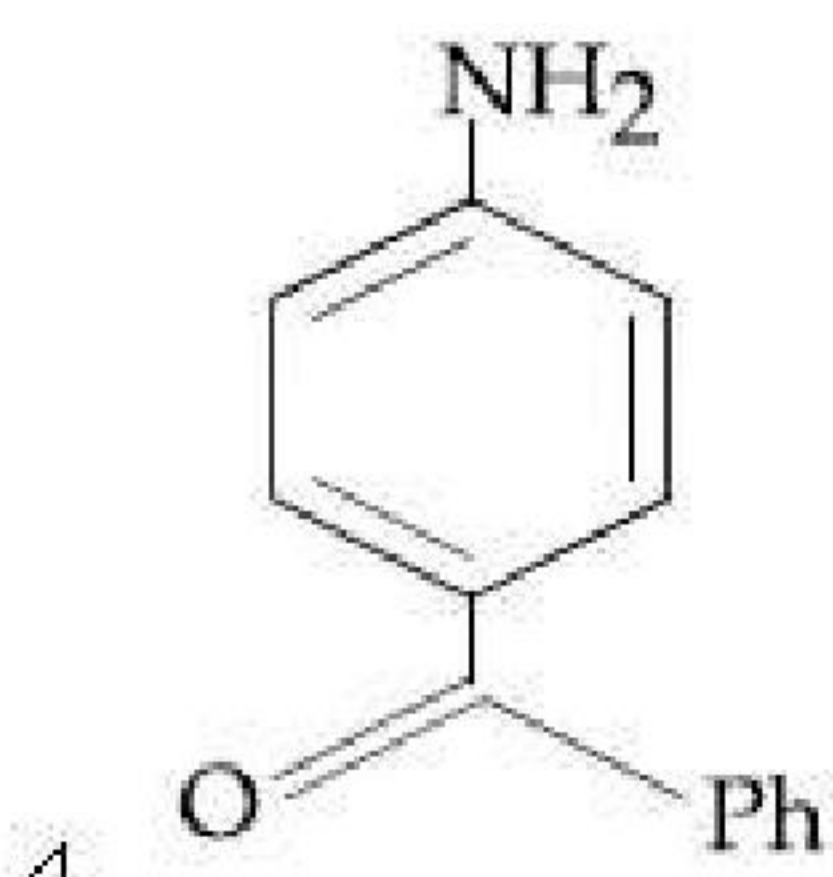
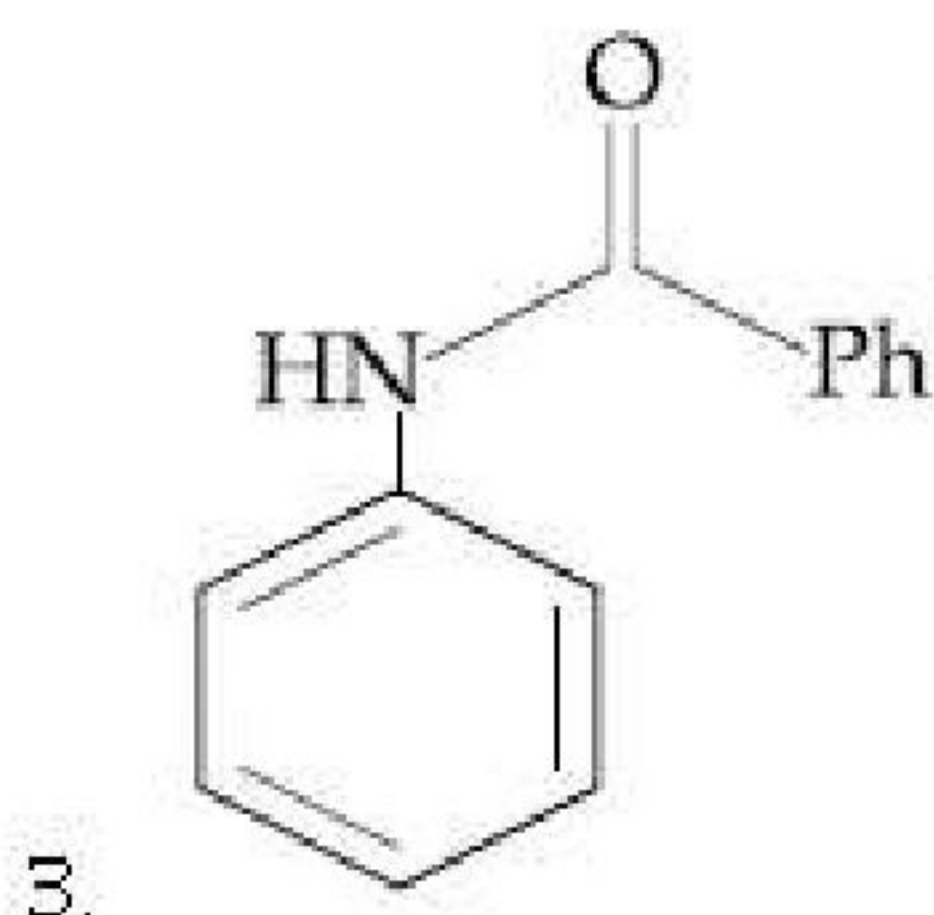
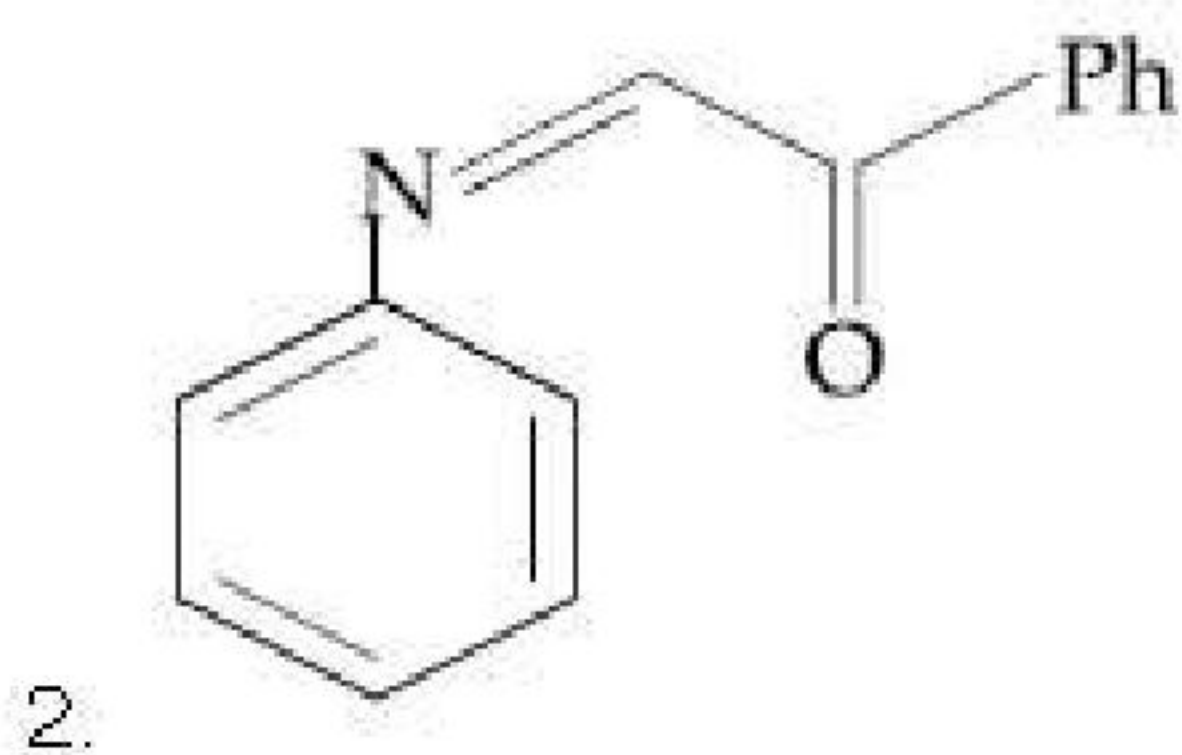
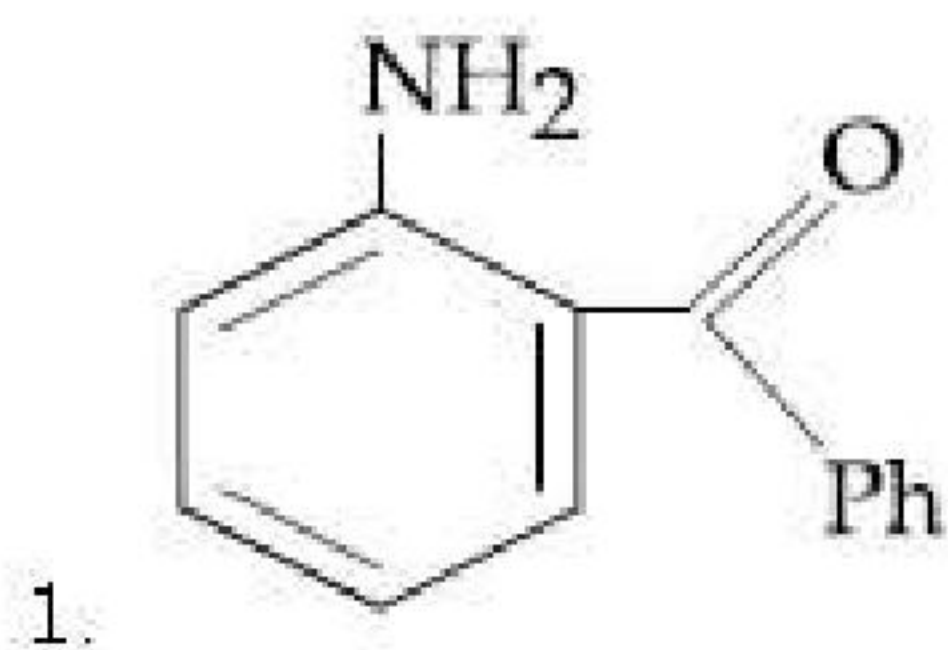
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में मुख्य उत्पाद 'Y' है :



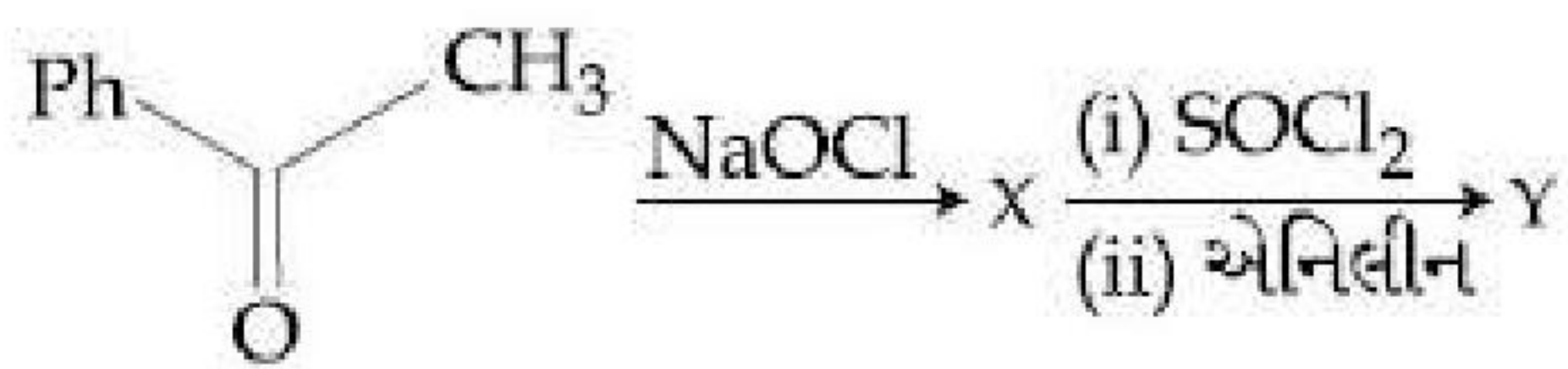
Options :



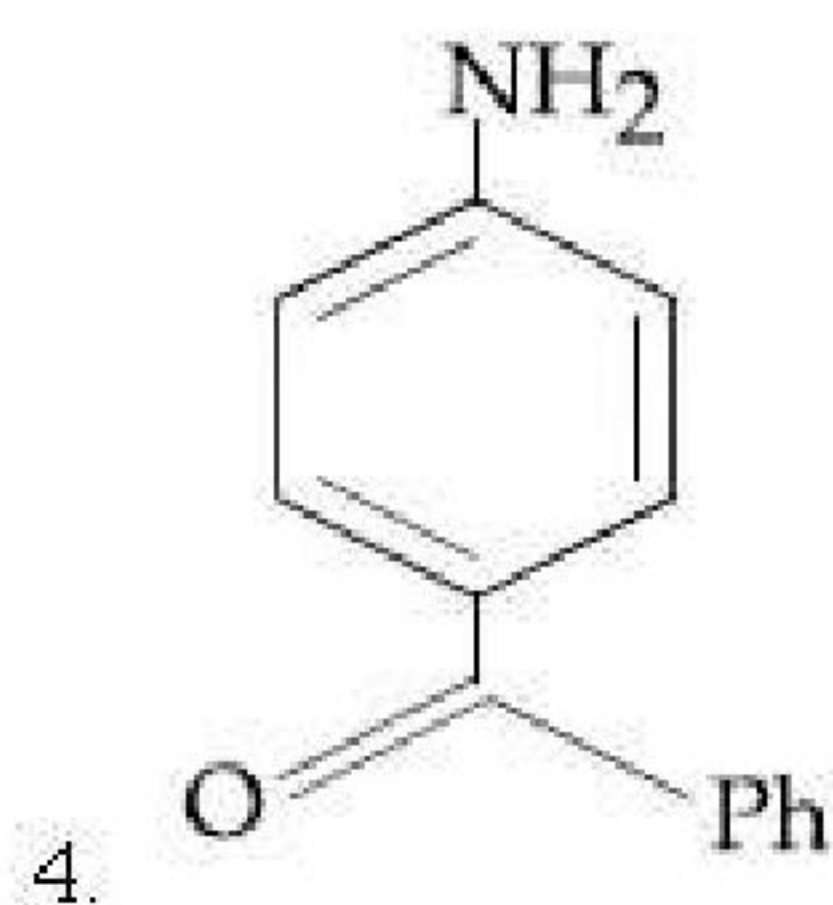
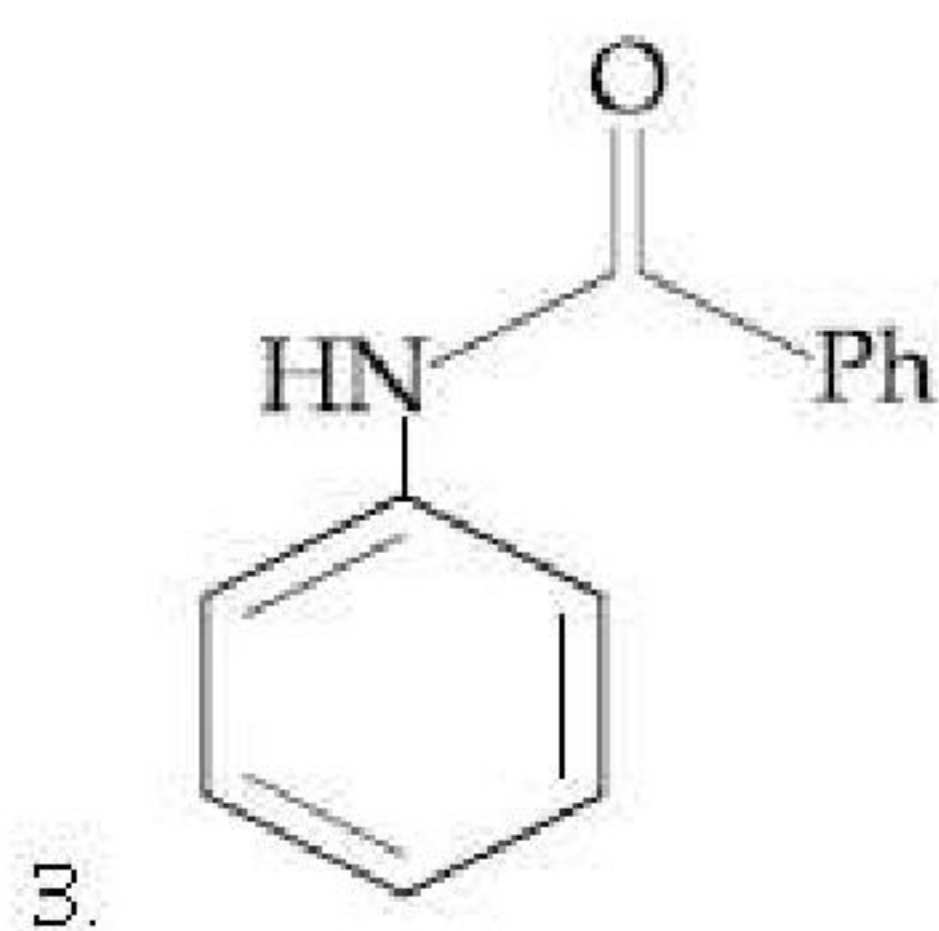
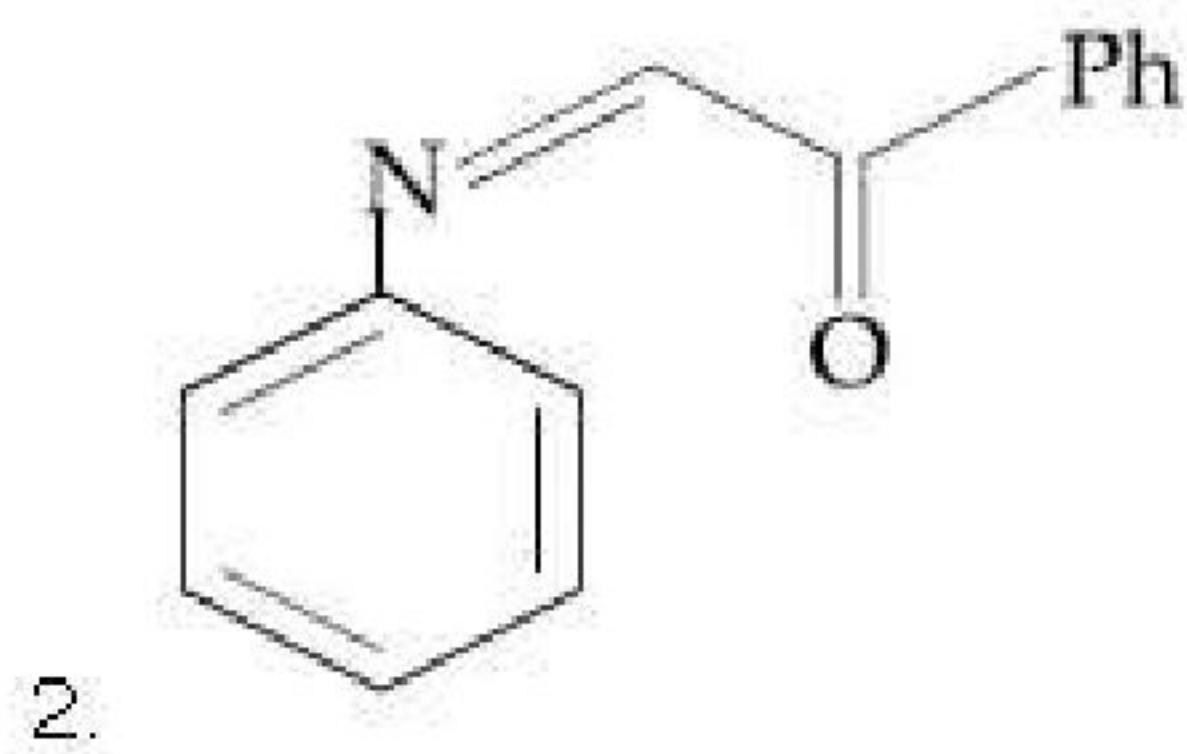
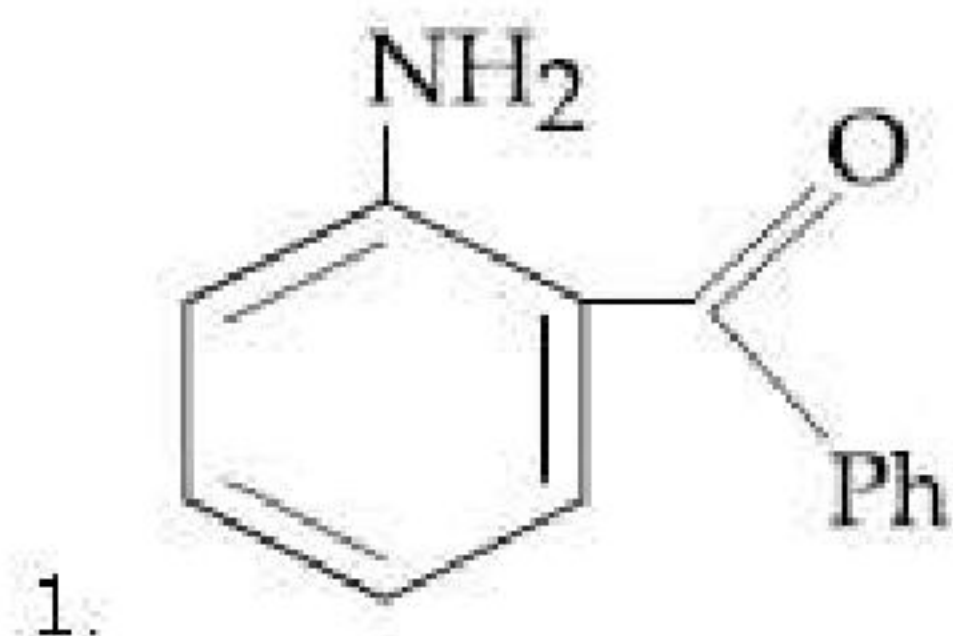
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયામાં મુખ્ય નીપજ 'Y' છે :



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 these factors does not govern the stability of a conformation in acyclic compounds ?

Options :

2. Angle strain
3. Torsional strain
4. Electrostatic forces of interaction

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

अचक्रिय यौगिकों में इनमें कौन सा कारक संरूपणों के स्थायित्व के लिये नहीं लागू होगा ?

Options :

1. त्रिविमी अन्योन्यक्रिया
2. कोणीय विकृति
3. मरोड़ी विकृति
4. अन्योन्यक्रिया का स्थिर वैद्युत बल

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા પરીબળો પૈકી કયો એક અચક્રીય સંયોજનોમાં સંરૂપોની સ્થિરતા માટે જવાબદાર નથી?

Options :

1. ત્રિવિમ વિન્યાસી વિનિમય
2. કોણીય વિકૃતિ
3. ટોરશિયોનલ વિકૃતિ
4. સ્થિરવૈદ્યુત બળો ની ક્રિયા પ્રતિક્રિયા

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

In chromatography, which of the following

1. Higher R_f value means higher adsorption.
2. R_f value depends on the type of chromatography.
3. The value of R_f can not be more than one.
4. R_f value is dependent on the mobile phase.

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

ક્રોમેટોગ્રાફી મેં, R_f કે લિયે નિમ્ન કથનોં મેં સે કૌન સા ગલત હૈ?

Options :

1. ઉચ્ચતર R_f માન કા અર્થ હૈ ઉચ્ચતર અધિશોષણ ।
2. R_f કા માન ક્રોમેટોગ્રાફી કે પ્રકાર પર નિર્ભર કરતા હૈ ।
3. R_f કા માન 1 સે અધિક નહીં હો સકતા હૈ ।
4. R_f કા માન ગતિશીલ પ્રાવસ્થા પર નિર્ભર કરતા હૈ ।

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

ક્રોમેટોગ્રાફીમાં નીચે આપેલા વિધાનો પૈકી R_f ના સંદર્ભમાં કયું વિધાન સાચું નથી?

Options :

1. ઊંચી R_f મૂલ્યનો મતલબ વધુ અધિશોષણ
2. R_f નું મૂલ્ય ક્રોમેટોગ્રાફીના પ્રકાર ઉપર નિર્ભર હોય છે.

3. R_f નું મુલ્ય 1 થી વધુ હોય શકે નહીં

4. R_f નું મુલ્ય ચલિત ક્ષેત્ર ઉપર નિર્ભર હોય છે.

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

Number of stereo centers present in linear and cyclic structures of glucose are respectively :

Options :

1. 4 & 4

2. 4 & 5

3. 5 & 4

4. 5 & 5

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

ગ્લુકોઝ કે રૈખિક તથા ચક્રીય સંરચનાઓં મેં ઉપસ્થિત ત્રિવિમ કેન્દ્રોં કી સંખ્યા ક્રમશઃ હોગી :

Options :

1. 4 તથા 4

2. 4 તથા 5

3. 5 તથા 4

4. 5 તથા 5

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

ગ્લુકોઝના રેખીય અને ચક્રીય બંધારણ માં રહેલા ત્રિપરીમાણી કેન્દ્રોંની સંખ્યા અનુક્રમે શોધો :

Options :

2. 4 અને 5

3. 5 અને 4

4. 5 અને 5

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 correct match between Item - I and Item - II is :

	Item - I		Item - II
(a)	High density polythene	(I)	Peroxide catalyst
(b)	Polyacrylonitrile	(II)	Condensation at high temperature & pressure
(c)	Novolac	(III)	Ziegler-Natta Catalyst
(d)	Nylon 6	(IV)	Acid or base catalyst

Options :

1. (a) $\rightarrow$ (IV), (b) $\rightarrow$ (II), (c) $\rightarrow$ (I),
(d) $\rightarrow$ (III)

2. (a) $\rightarrow$ (II), (b) $\rightarrow$ (IV), (c) $\rightarrow$ (I),
(d) $\rightarrow$ (III)

3. (a) $\rightarrow$ (III), (b) $\rightarrow$ (I), (c) $\rightarrow$ (II),
(d) $\rightarrow$ (IV)

4. (a) $\rightarrow$ (III), (b) $\rightarrow$ (I), (c) $\rightarrow$ (IV),
(d) $\rightarrow$ (II)

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

મદ - I તથા મદ - II કે બીચ સહી સુમેલ હૈ :

	મદ - I		મદ - II
(a)	ઉચ્ચ ઘનત્વ પાલીથીન	(I)	પરાક્સાઇડ ઉત્પ્રેરક
(b)	પાલીએક્રિલોનાઇટ્રાઇલ	(II)	ઉચ્ચ તાપ તથા દાબ પર સંઘનન
(c)	નોબોલેક	(III)	ઝિગલર-નાટા ઉત્પ્રેરક
(d)	નાયલોન 6	(IV)	અમ્લ અથવા ક્ષારક ઉત્પ્રેરક

Options :

1. (a) $\rightarrow$ (IV), (b) $\rightarrow$ (II), (c) $\rightarrow$ (I),
(d) $\rightarrow$ (III)

2. (a) $\rightarrow$ (II), (b) $\rightarrow$ (IV), (c) $\rightarrow$ (I),
(d) $\rightarrow$ (III)

3. (a) $\rightarrow$ (III), (b) $\rightarrow$ (I), (c) $\rightarrow$ (II),
(d) $\rightarrow$ (IV)

4. (a) $\rightarrow$ (III), (b) $\rightarrow$ (I), (c) $\rightarrow$ (IV),
(d) $\rightarrow$ (II)

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

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

	સુચી - I		સુચી - II
(a)	વધુ ઘનતા વાળો પોલીથીન	(I)	પેરોક્સાઇડ ઉદ્દીપક
(b)	પોલીએક્રિલોનાઇટ્રાઇલ	(II)	ઉચ્ચ તાપમાને અને દબાણે સંઘનન
(c)	નોબોલેક	(III)	ઝિગલર નાઇટા ઉદ્દીપક
(d)	નાયલોન 6	(IV)	એસિડ અથવા બેઇઝ ઉદ્દીપક

Options :

1. (a) $\rightarrow$ (IV), (b) $\rightarrow$ (II), (c) $\rightarrow$ (I),
(d) $\rightarrow$ (III)

2. (a) $\rightarrow$ (II), (b) $\rightarrow$ (IV), (c) $\rightarrow$ (I),
(d) $\rightarrow$ (III)

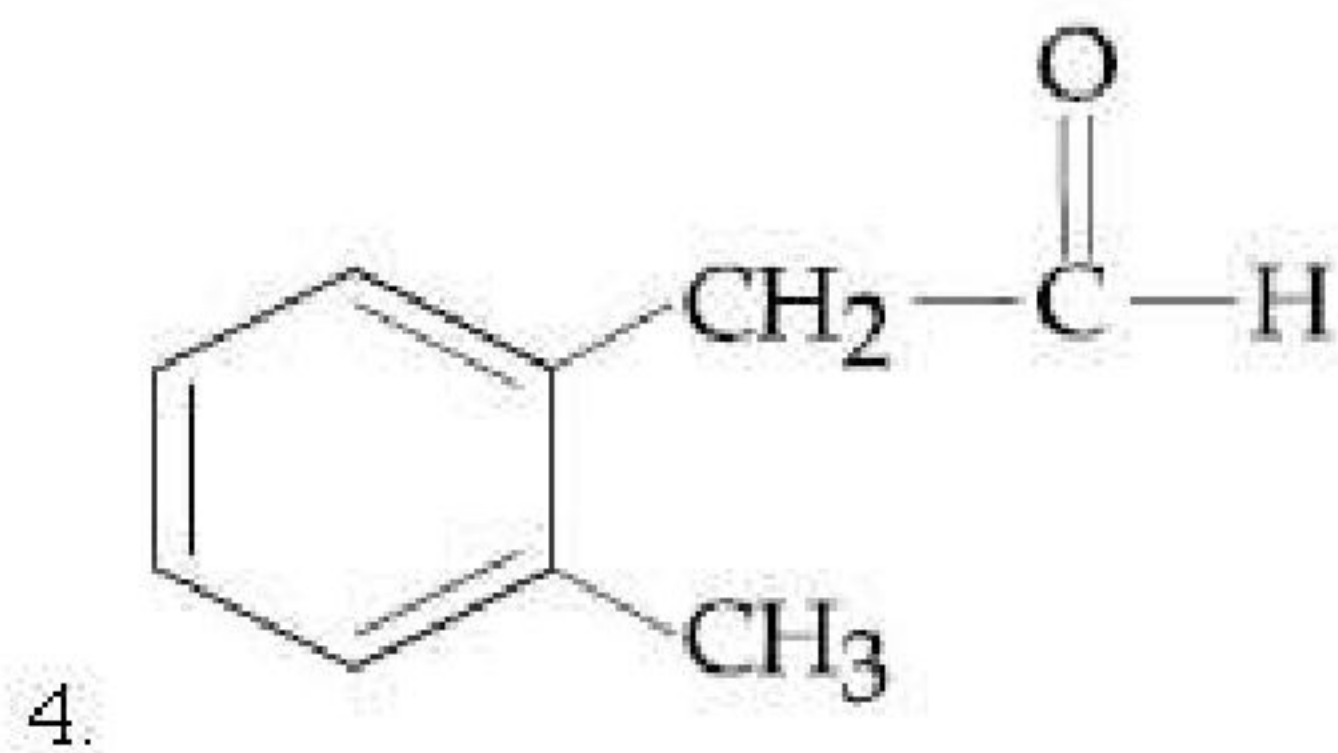
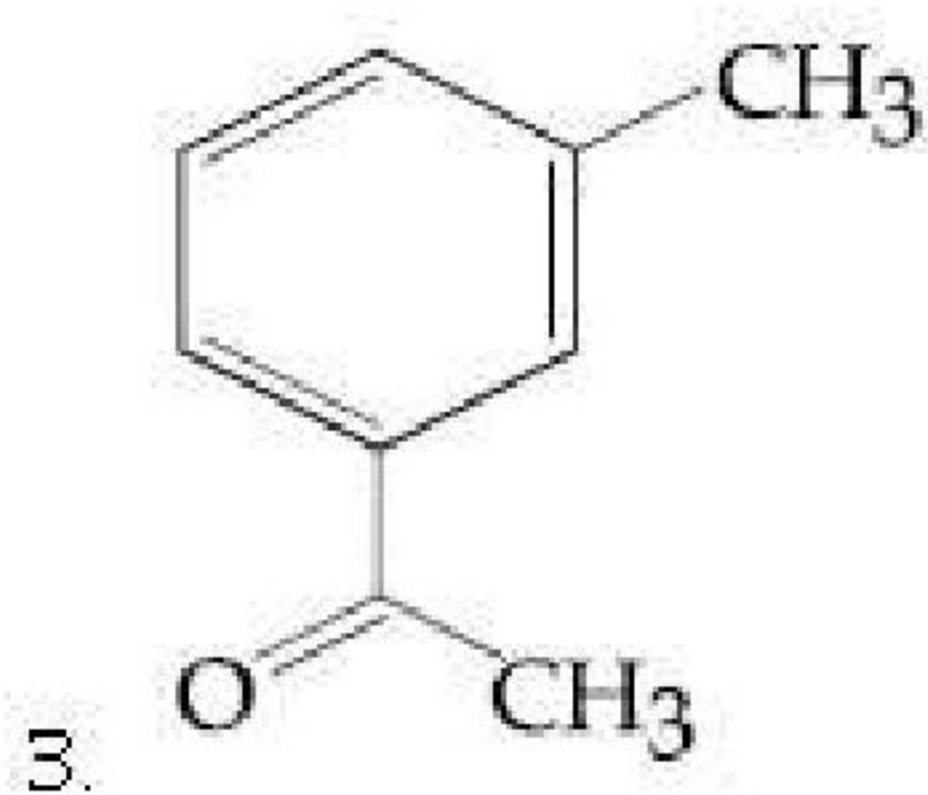
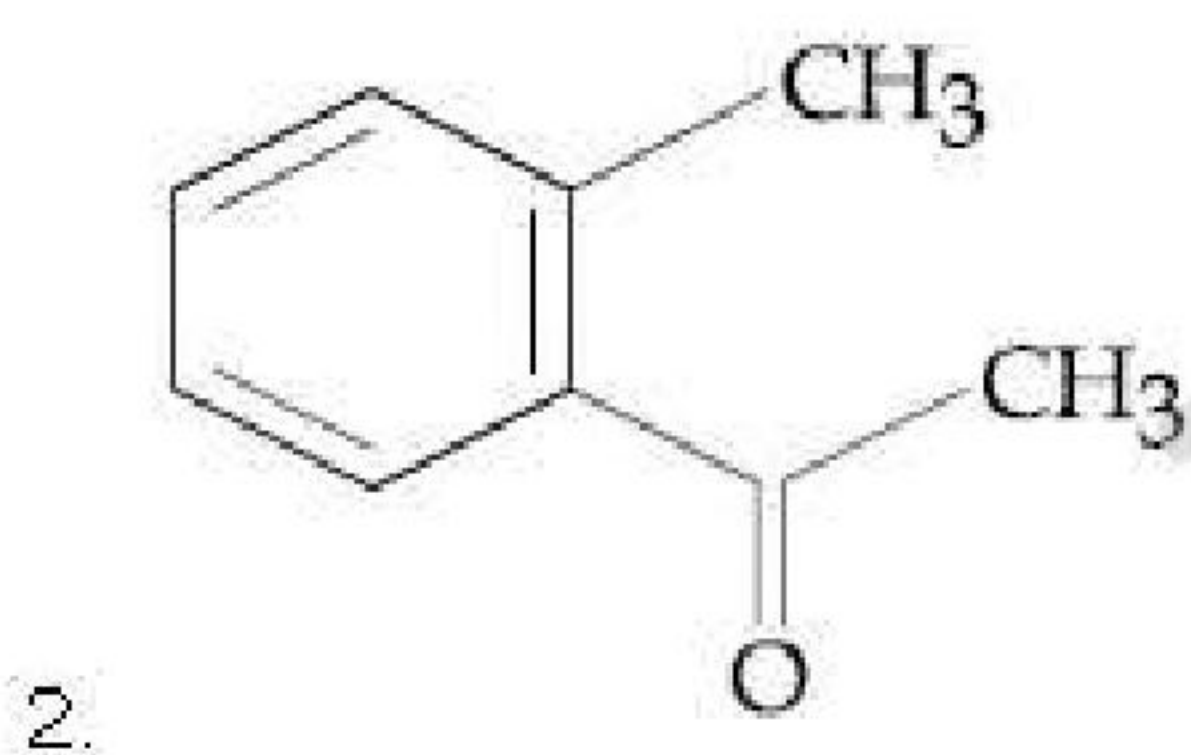
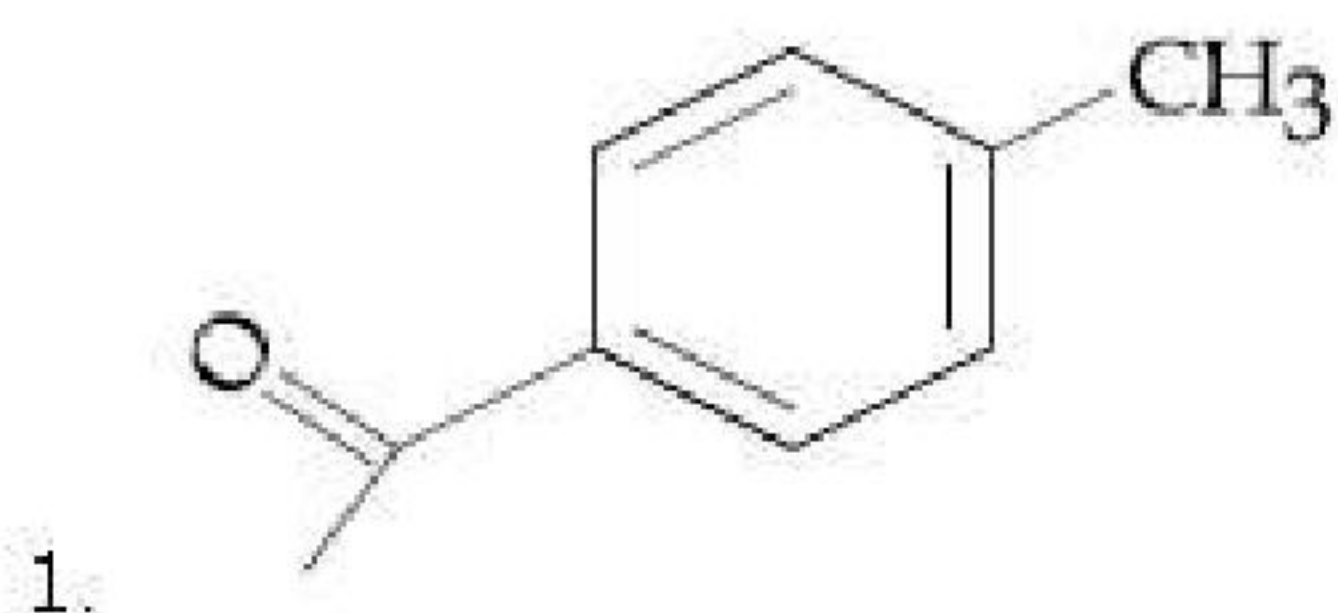
- (a) $\rightarrow$ (III), (b) $\rightarrow$ (I), (c) $\rightarrow$ (IV),
4. (d) $\rightarrow$ (II)

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

Compound A ($C_9H_{10}O$) shows positive iodoform test. Oxidation of A with $KMnO_4/KOH$ gives acid B ($C_8H_6O_4$). Anhydride of B is used for the preparation of phenolphthalein. Compound A is :

Options :

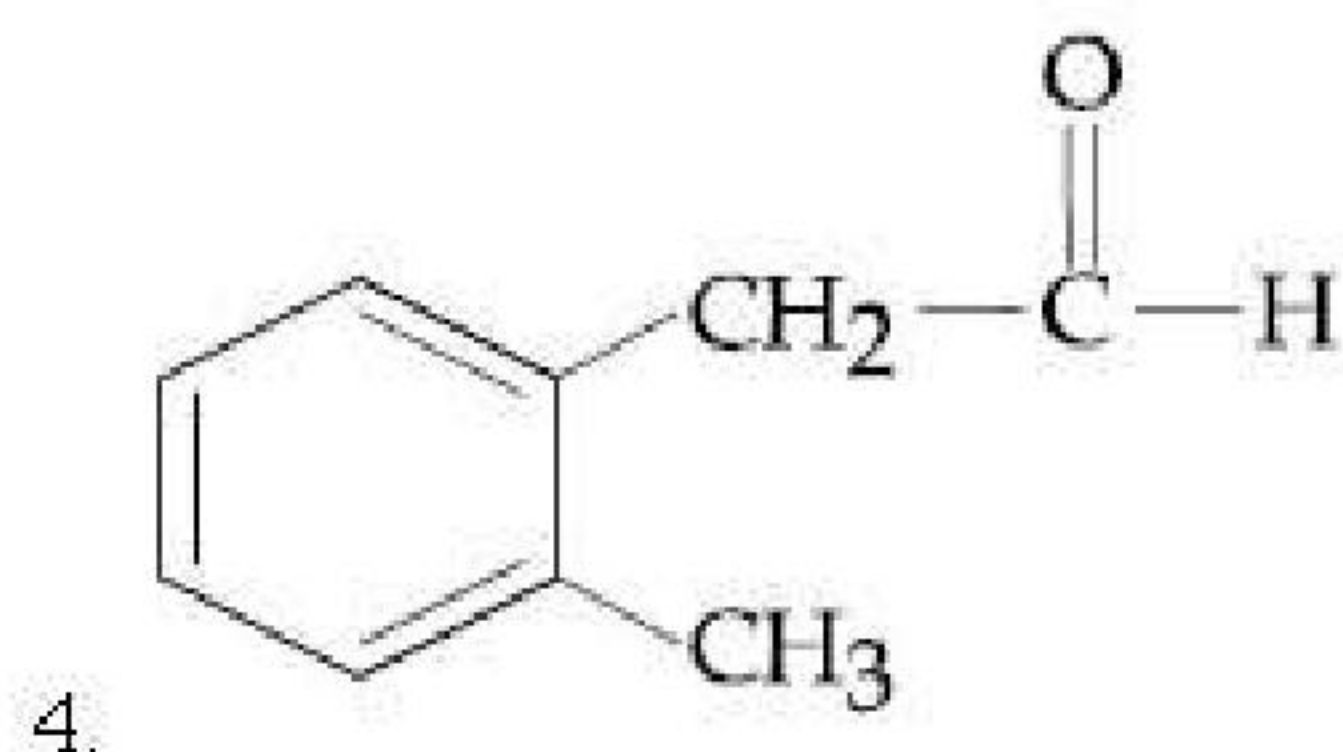
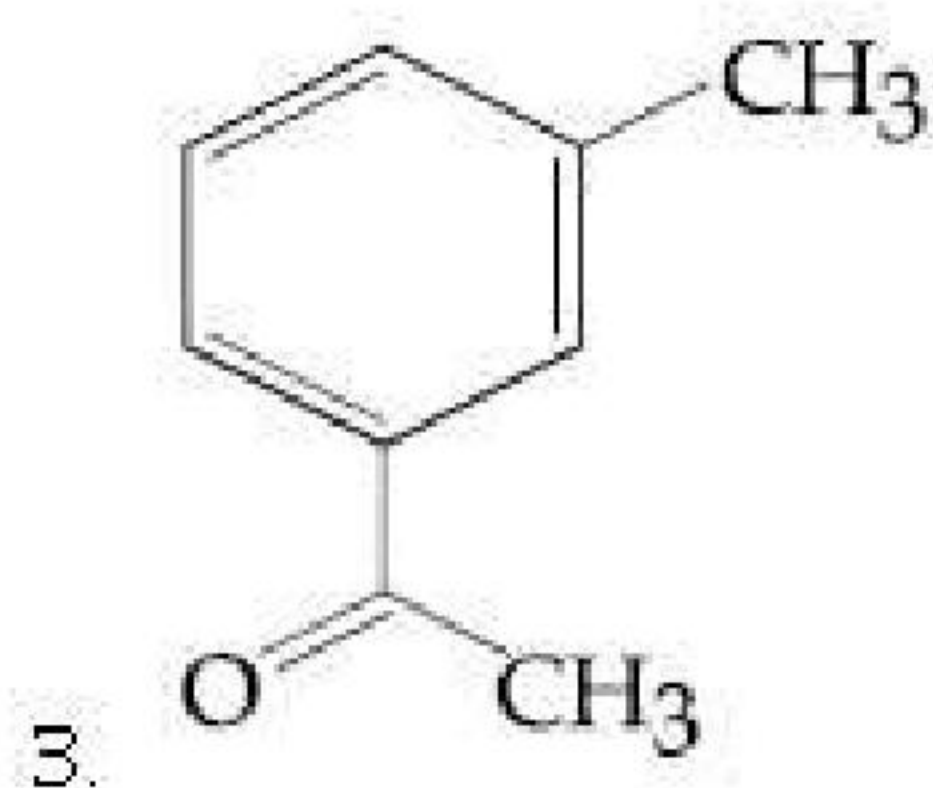
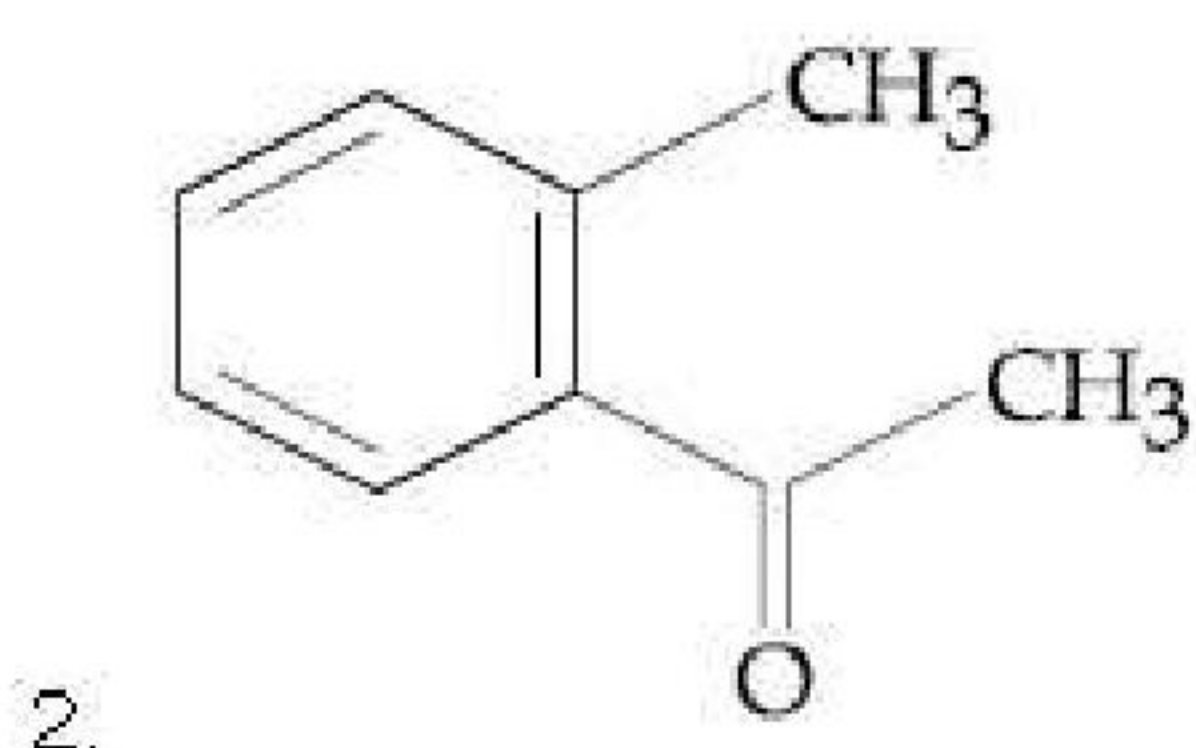
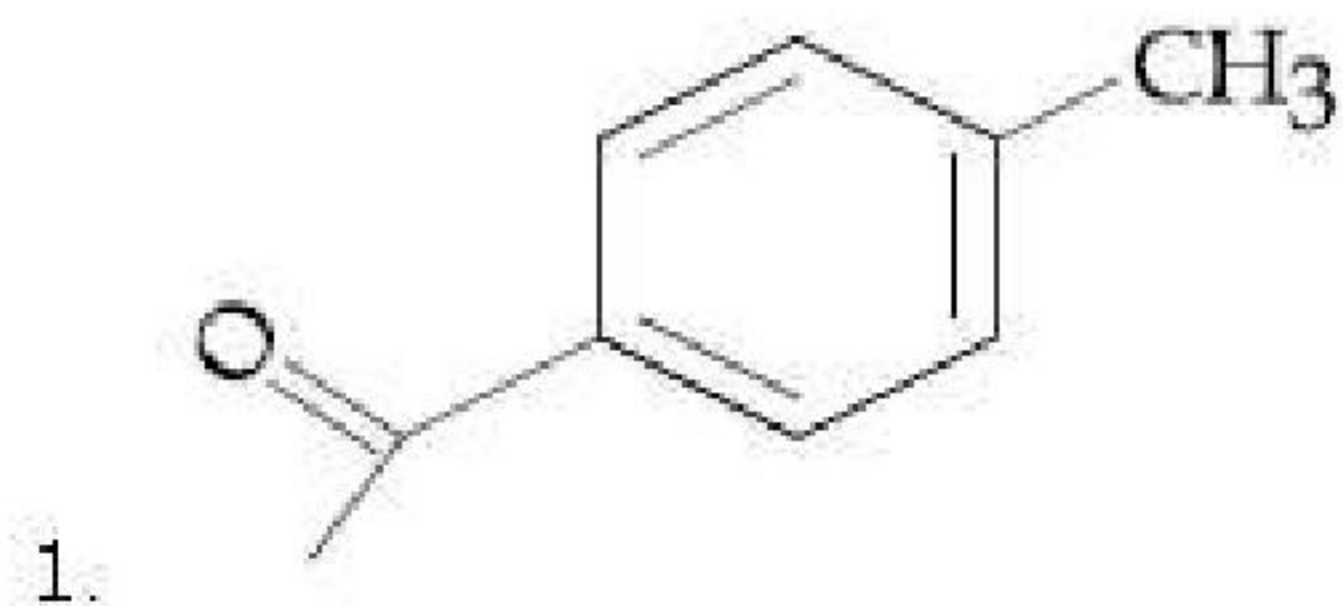


Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

યૌગિક A($C_9H_{10}O$) સકારાત્મક આયડોફર્મ પરીક્ષણ પ્રદર્શિત કરતા હૈ। $KMnO_4/KOH$ કે સાથ A કા આક્સીકરણ ઁક અમ્લ B($C_8H_6O_4$) દેતા હૈ। B કે ઁનહાઇડ્રાઇડ કો ફેનાલ્ફથૈલીન કો બનાને કે લિફ પ્રયોગ કરતે હૈ। યૌગિક A હૈ :

Options :



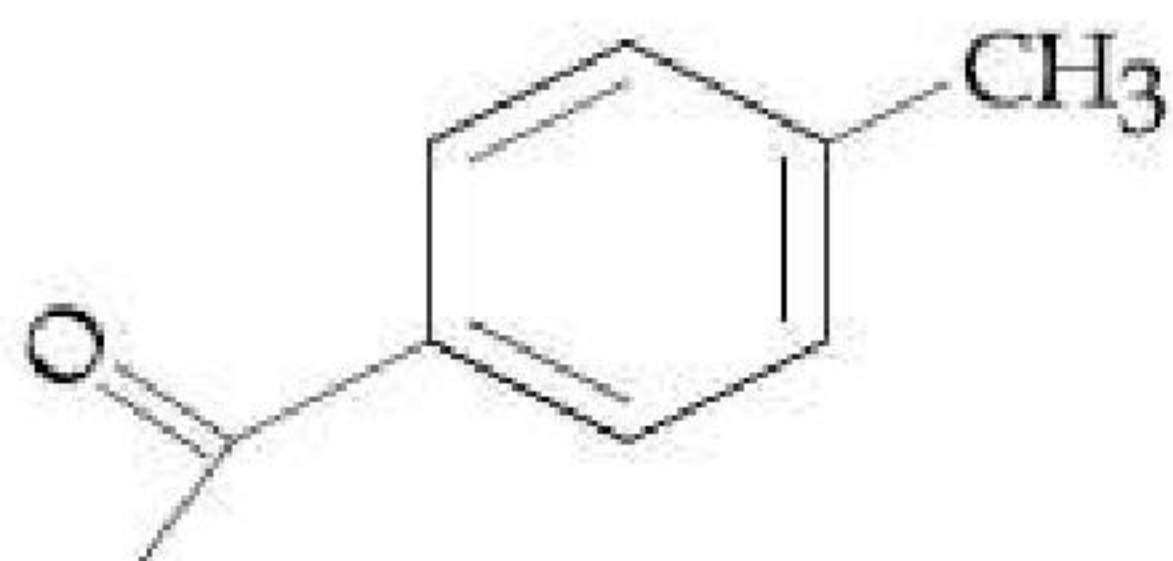
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

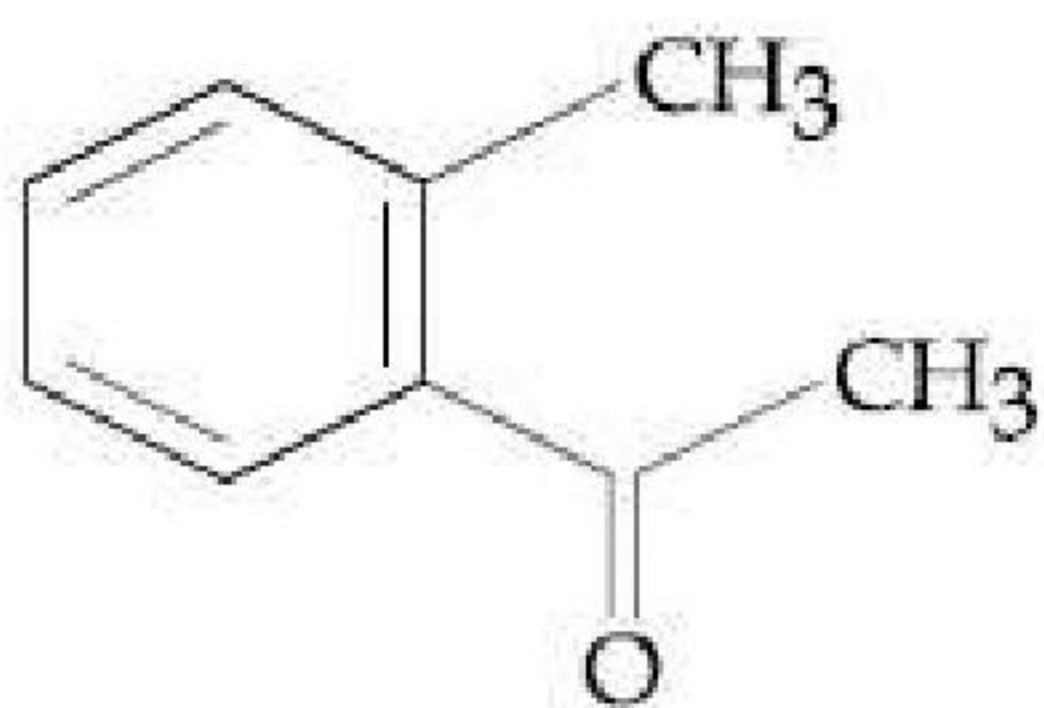
સંયોજન A($C_9H_{10}O$) હકારાત્મક આયોડોફર્મ કસોટી આપે છે. A નું $KMnO_4/KOH$ વડે ઓક્સીડેશન કરતા ઁસિડ B($C_8H_6O_4$) આપે છે. ફિનોલ્ફથેલીનની બનાવટામાં Bનાં ઁનહાઇડ્રાઇડ ઉપયોગ કરવામાં આવે છે. તો સંયોજન A છે :

Options :

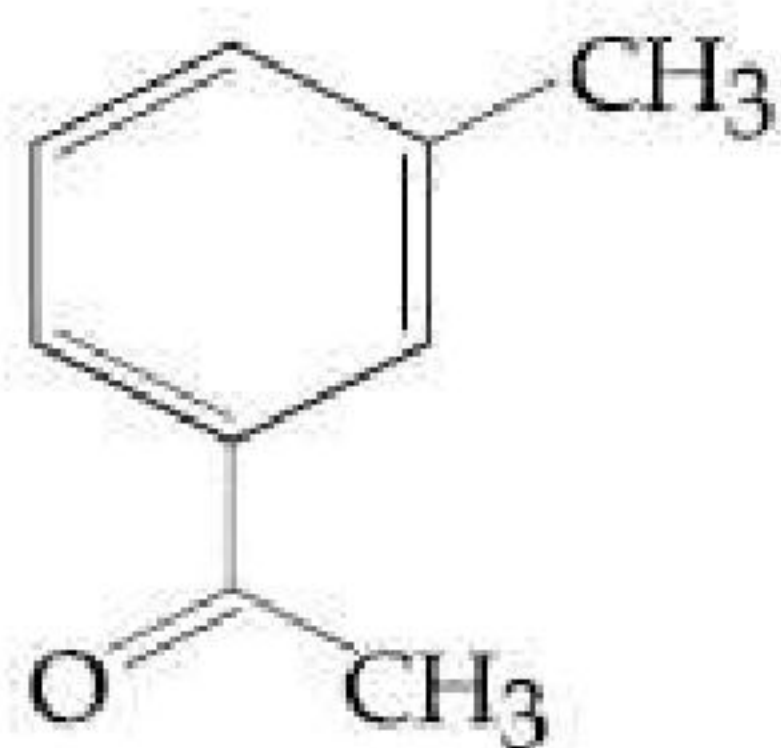
1.



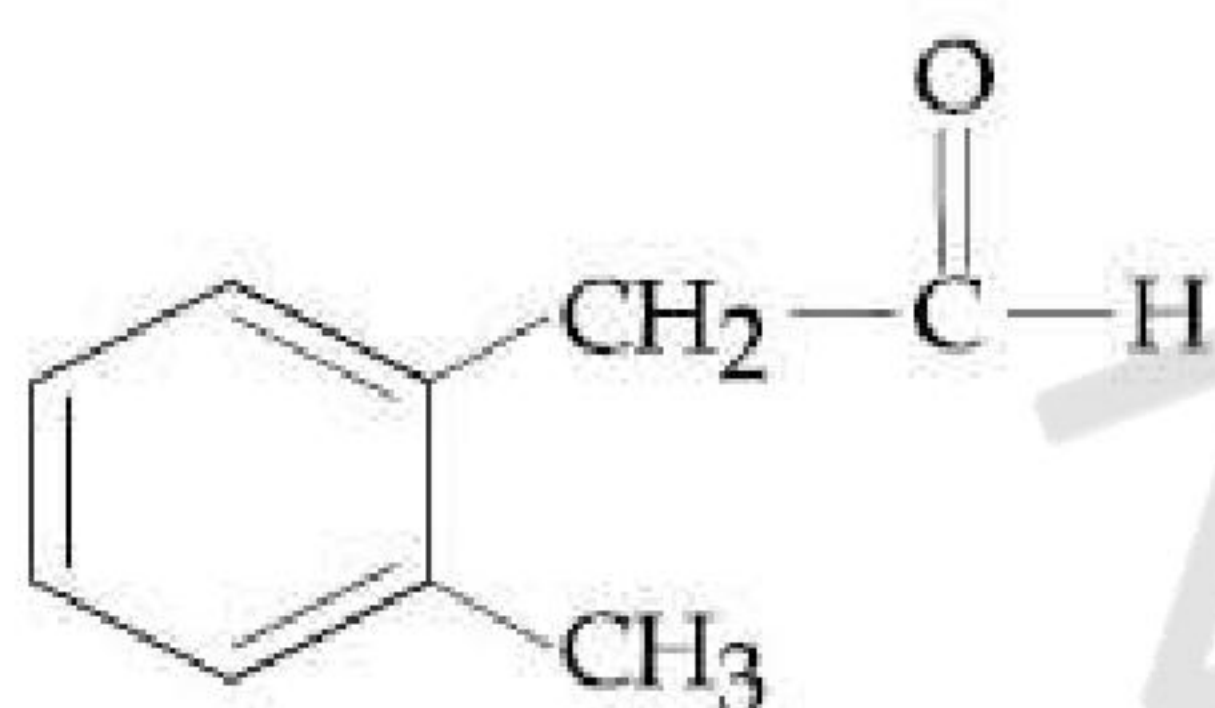
2.



3.



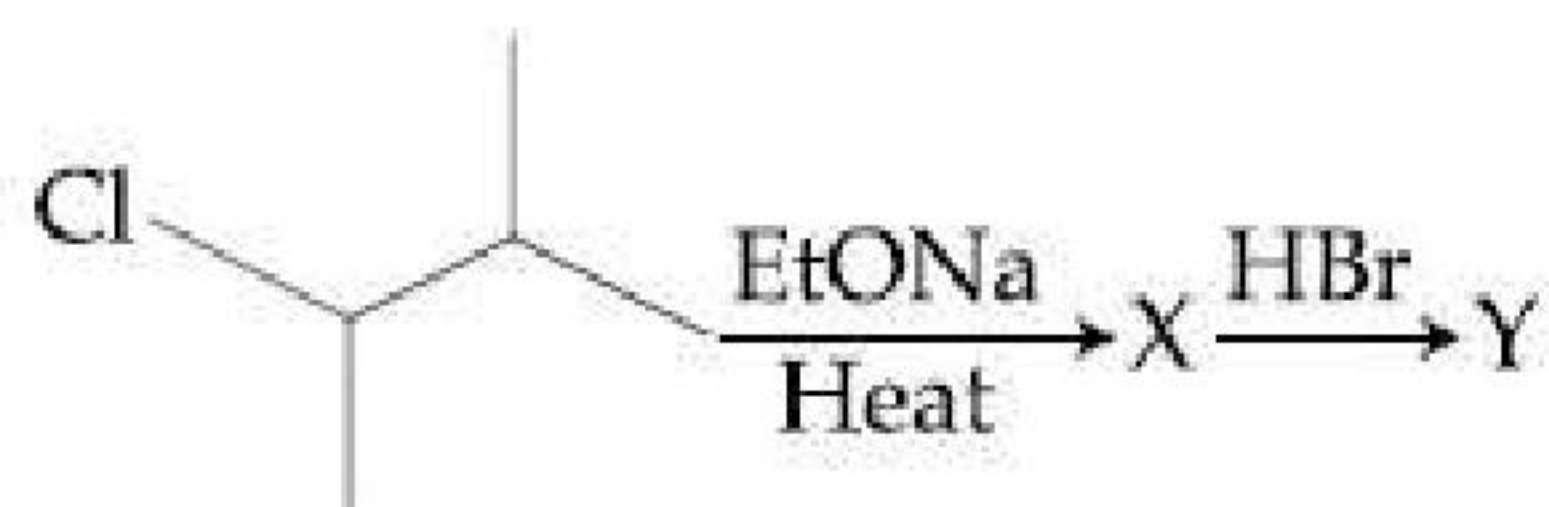
4.



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

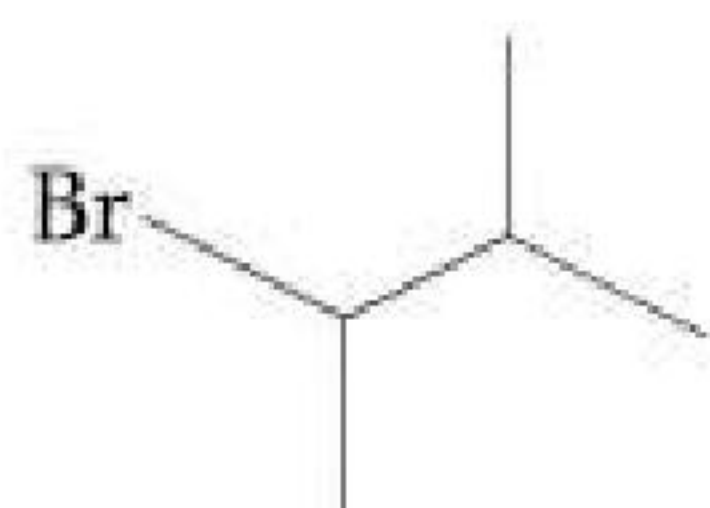
Correct Marks : 4 Wrong Marks : 1

The major product 'Y' in the following reaction is :

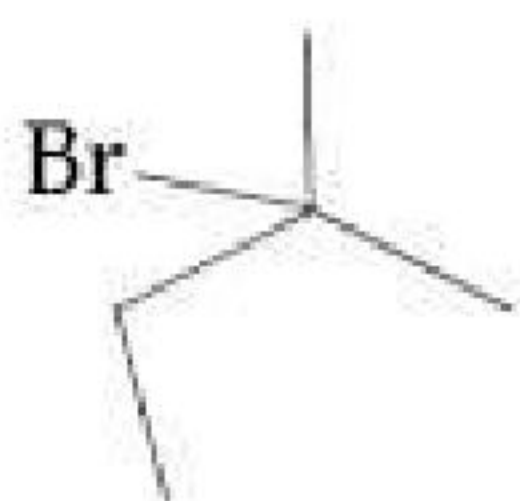


Options :

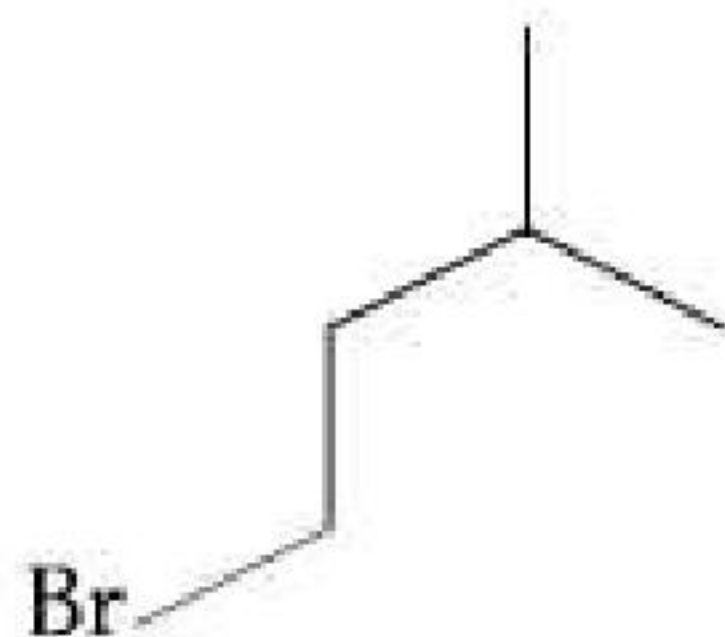
1.



3.



4.



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

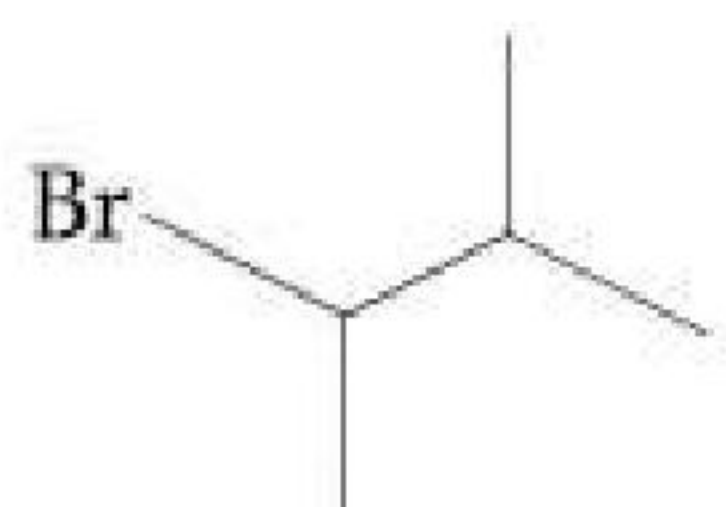
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में मुख्य उत्पाद 'Y' है :

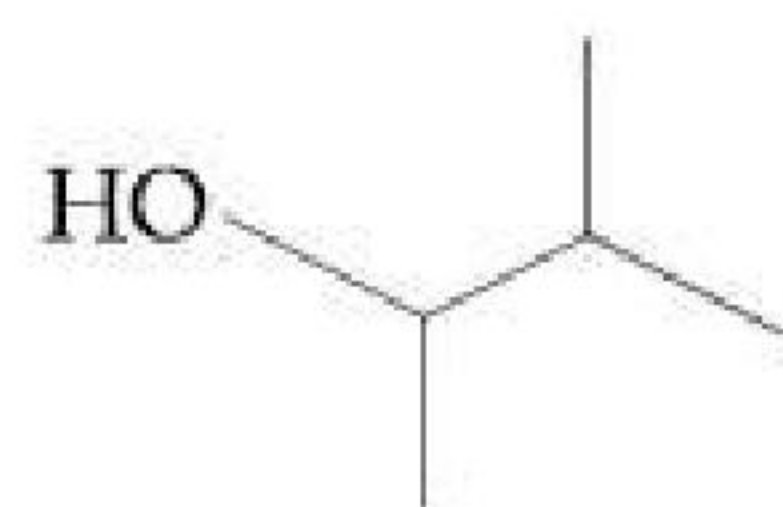


Options :

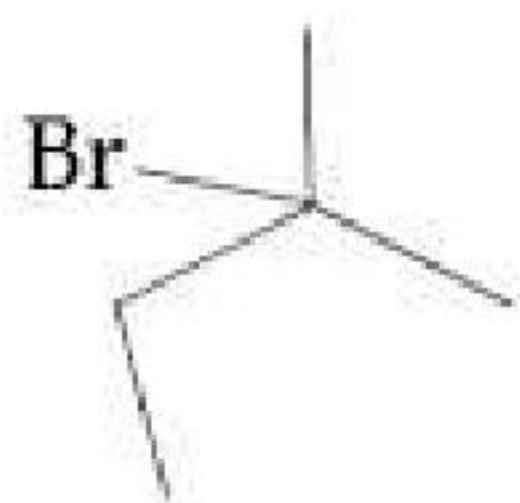
1.



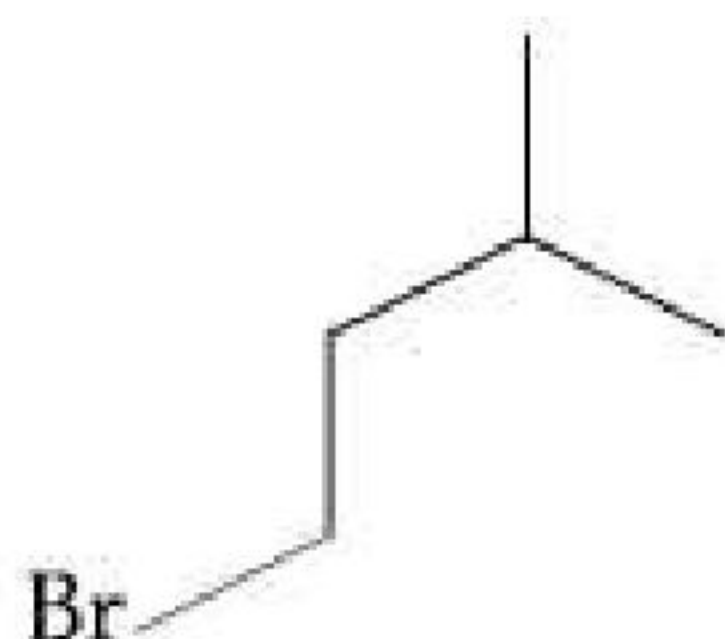
2.



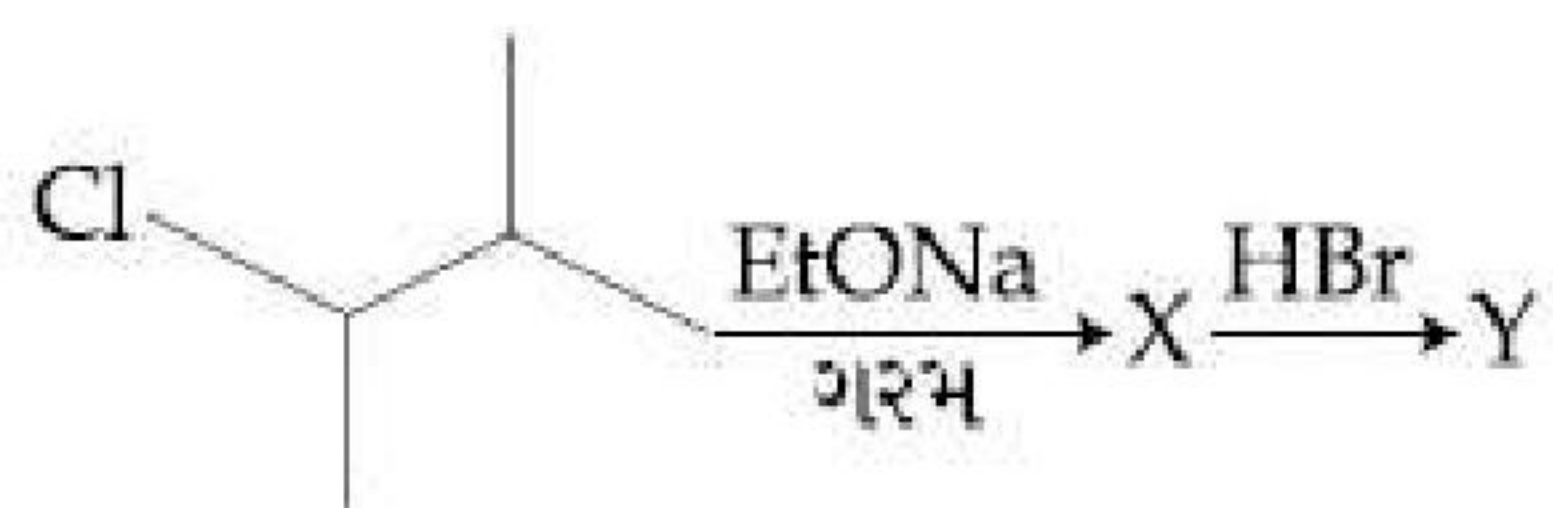
3.



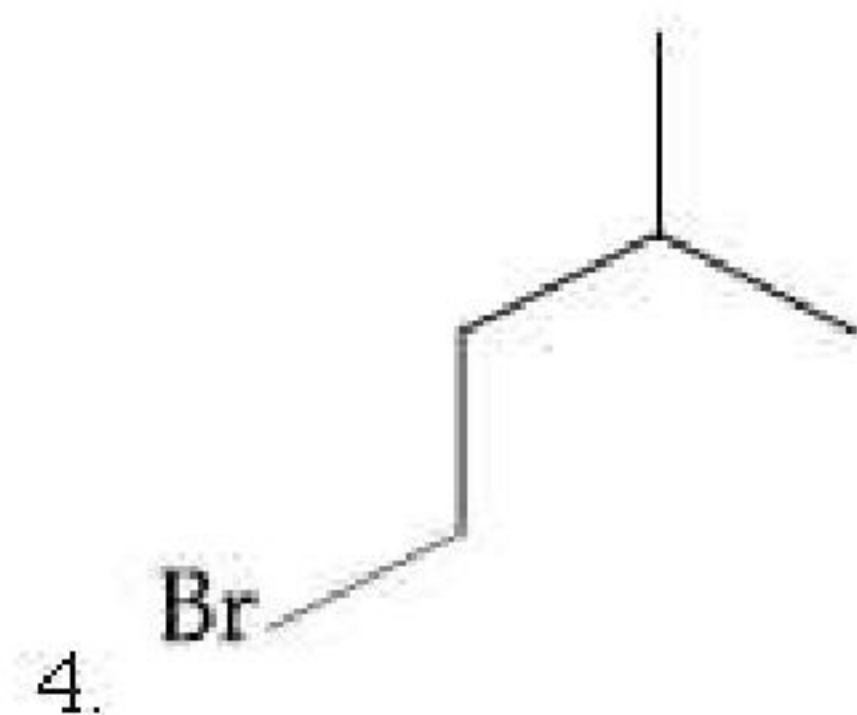
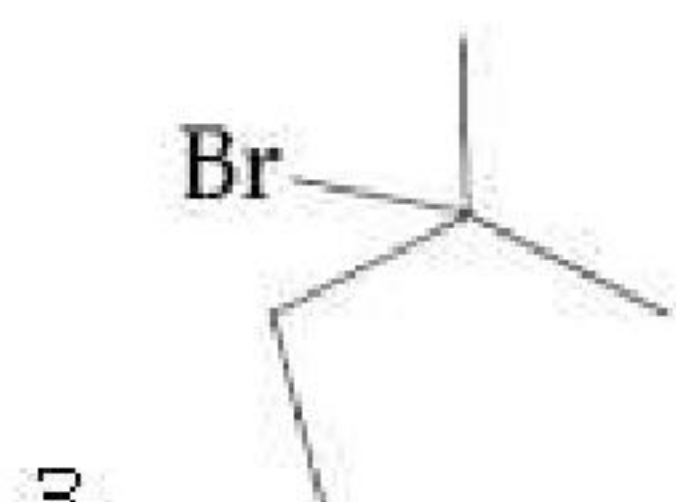
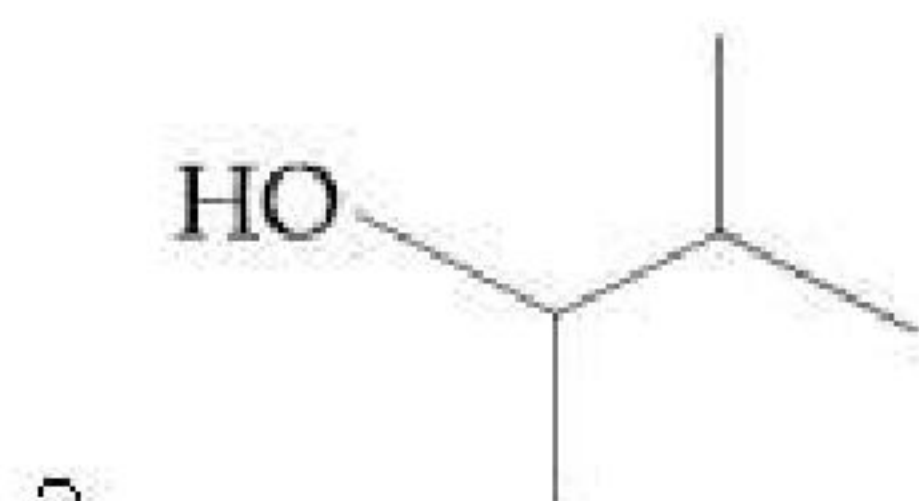
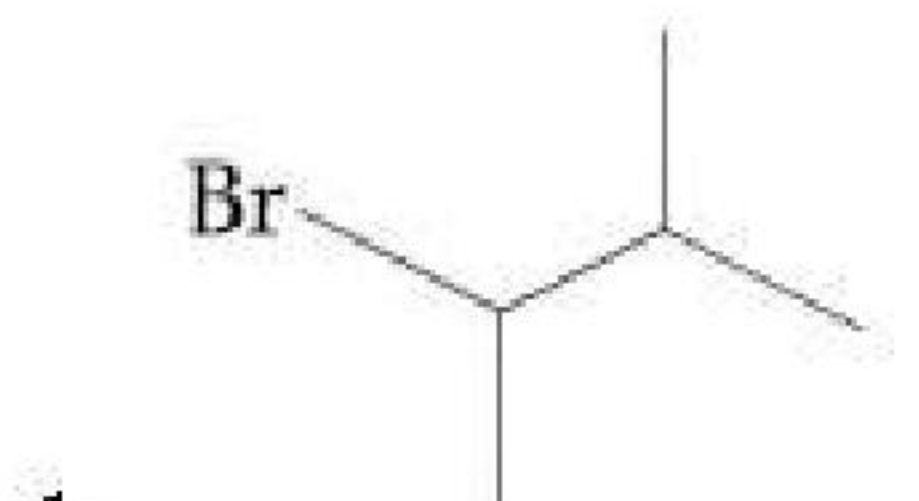
4.



નીચે આપેલી પ્રક્રિયામાં મુખ્ય નીપજ 'Y' છે :

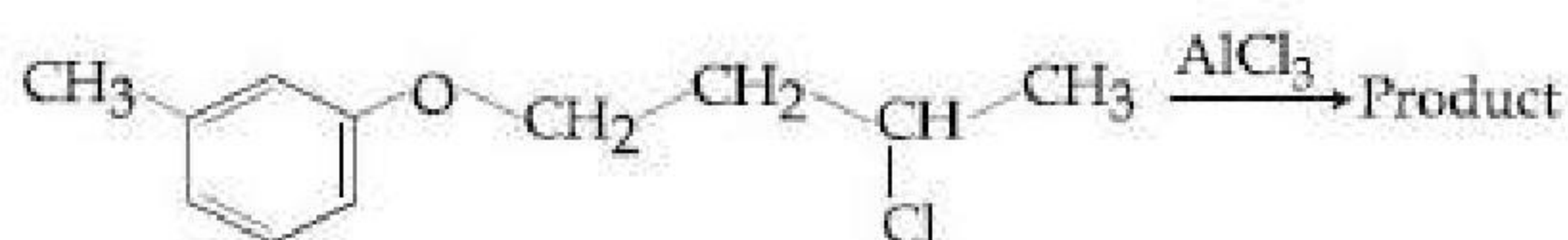


Options :

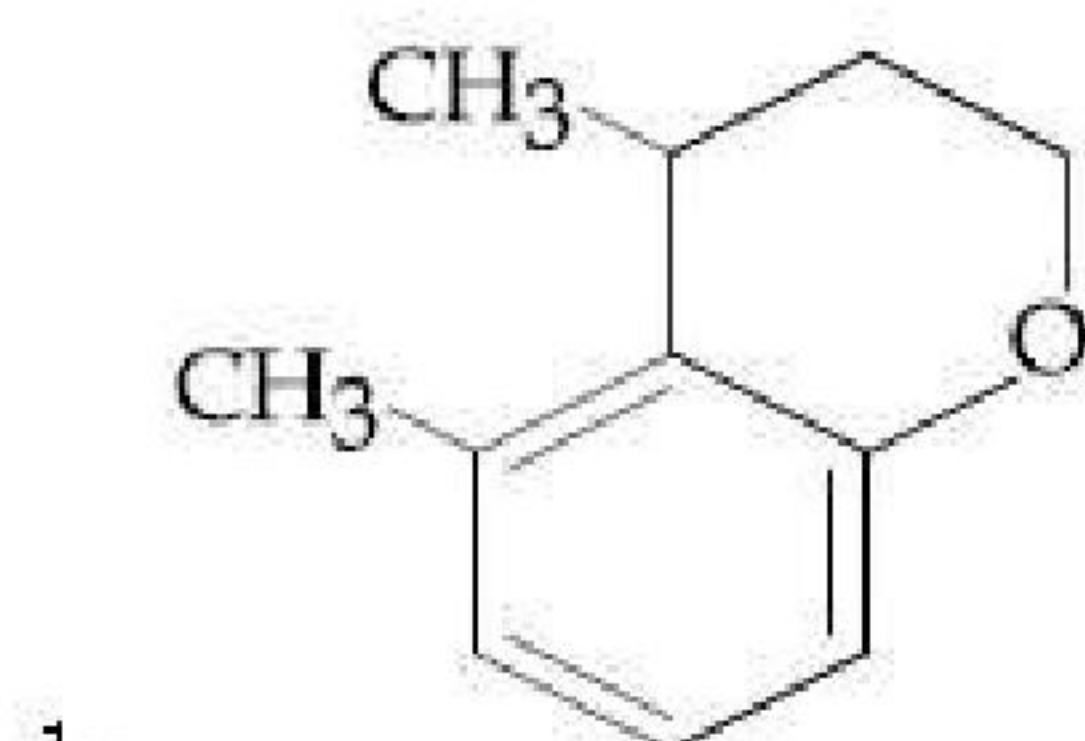


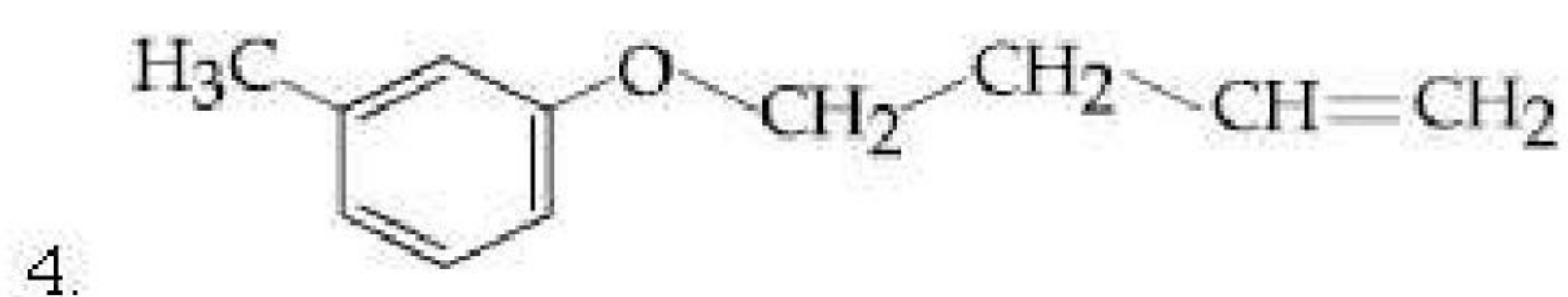
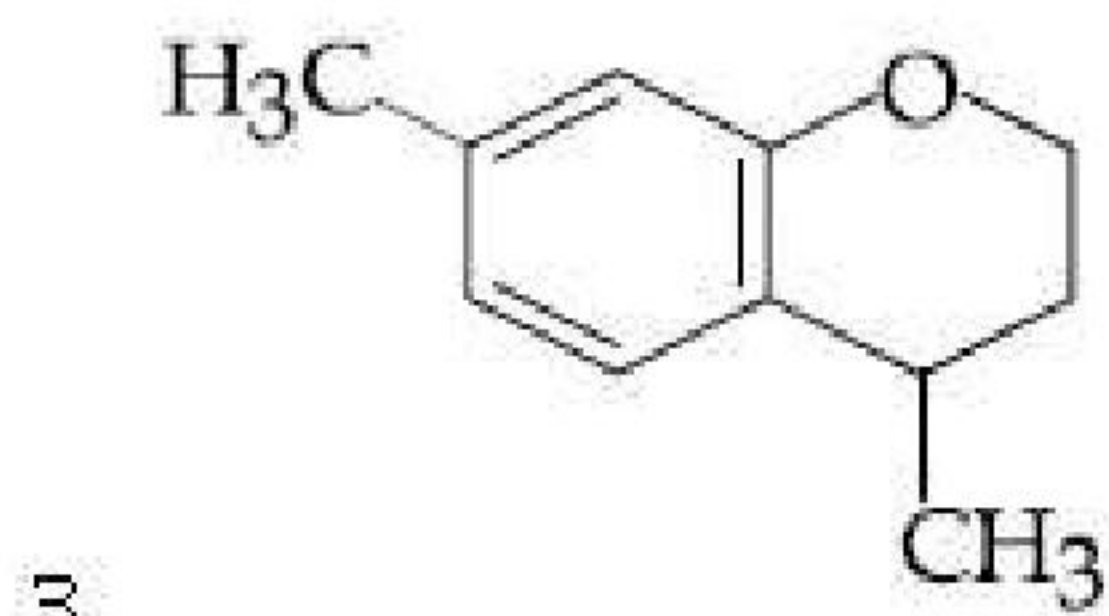
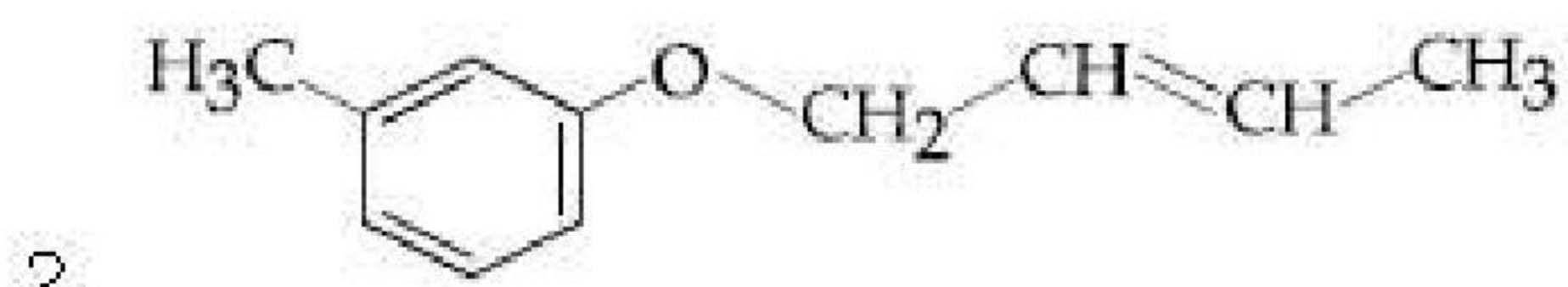
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The major product obtained in the given reaction is :



Options :

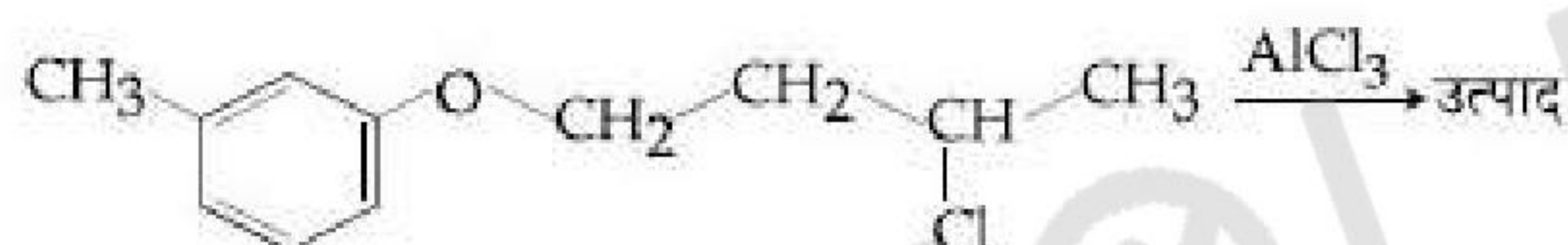




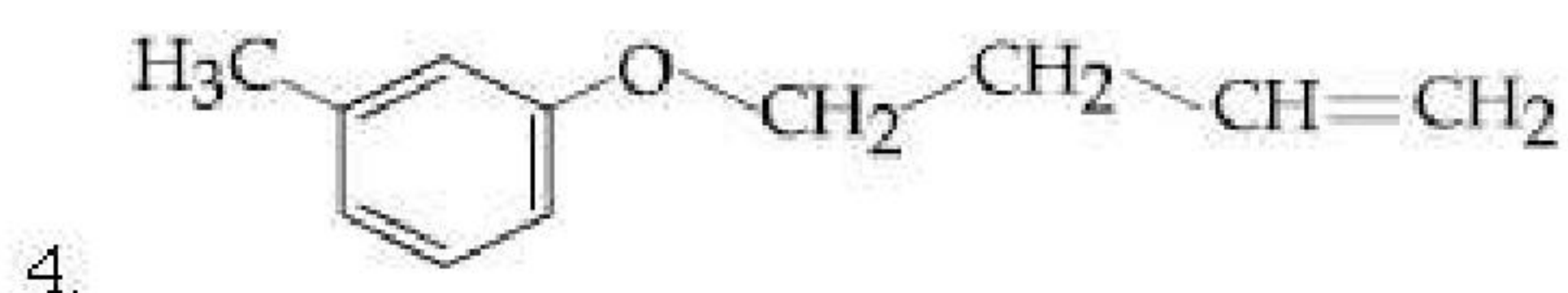
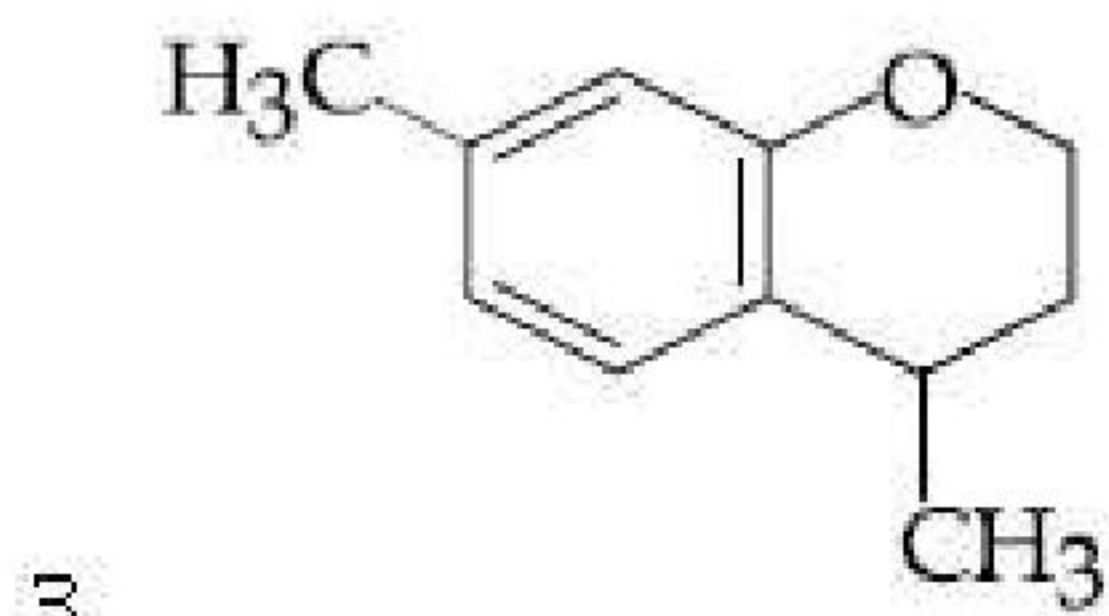
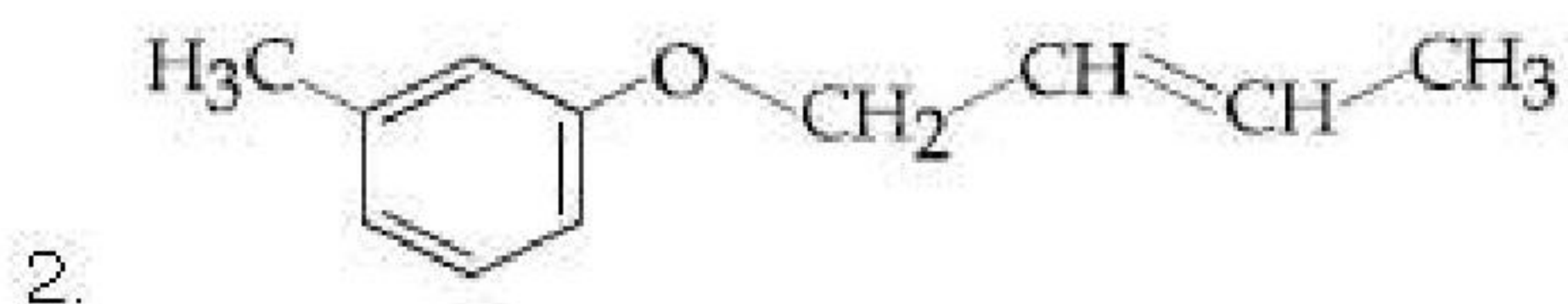
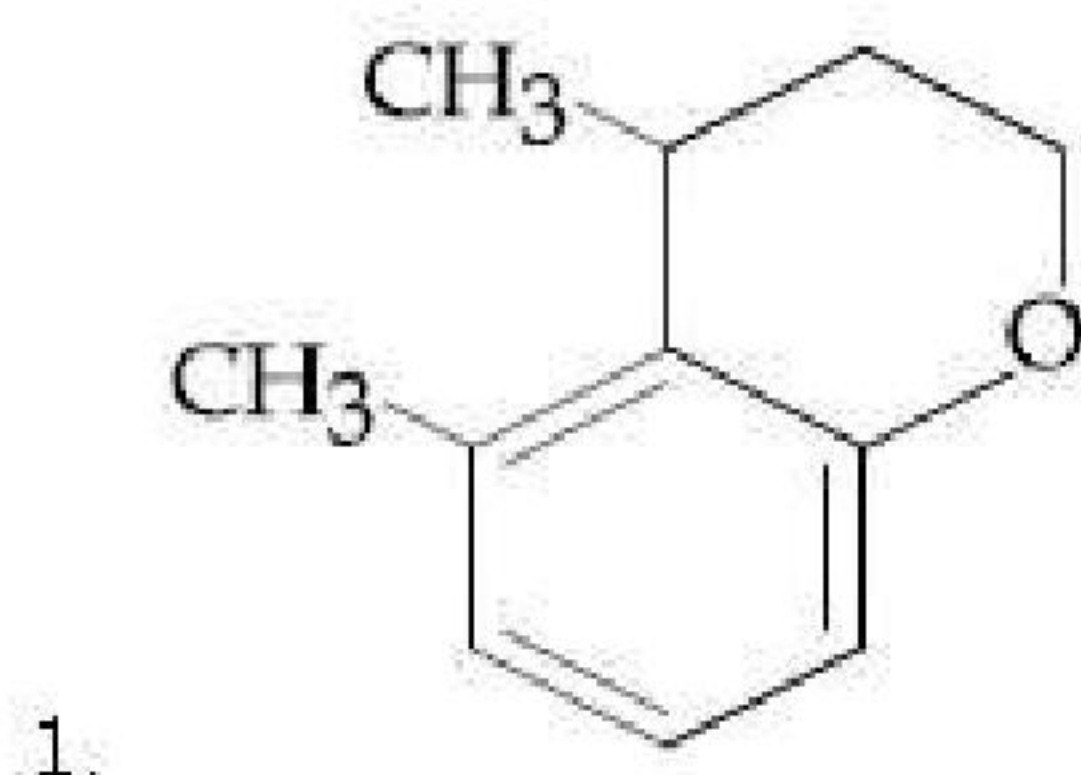
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

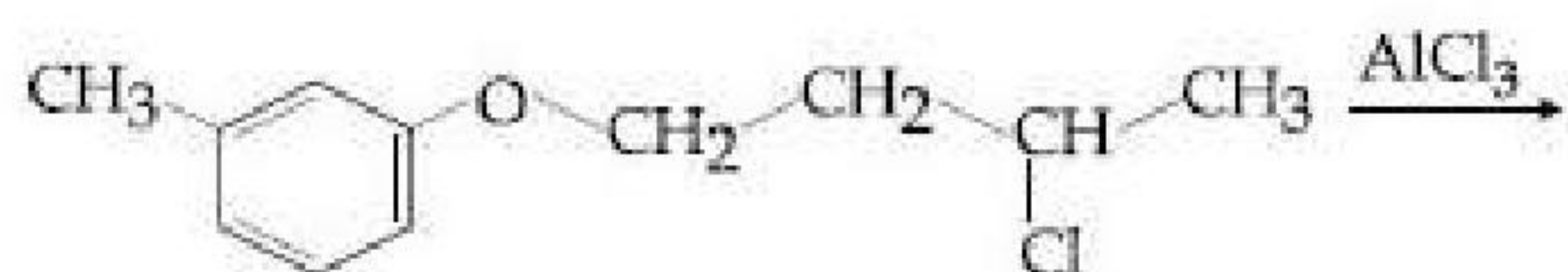
दी गयी अभिक्रिया में प्राप्त मुख्य उत्पाद है :



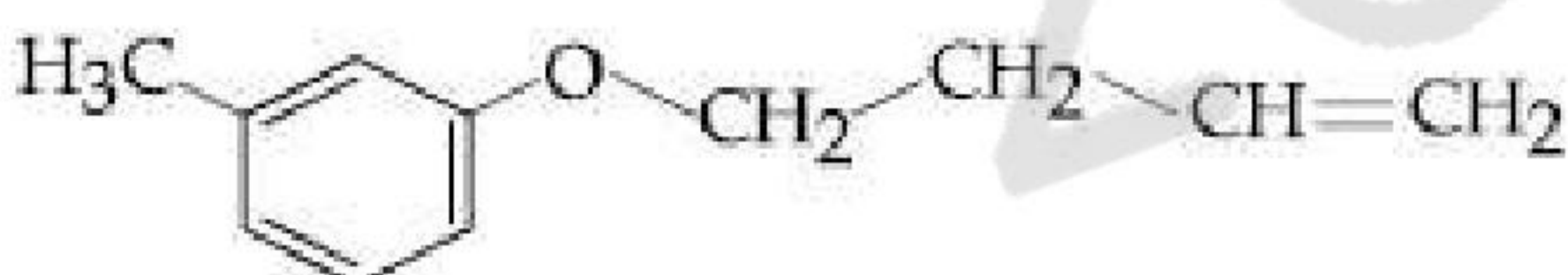
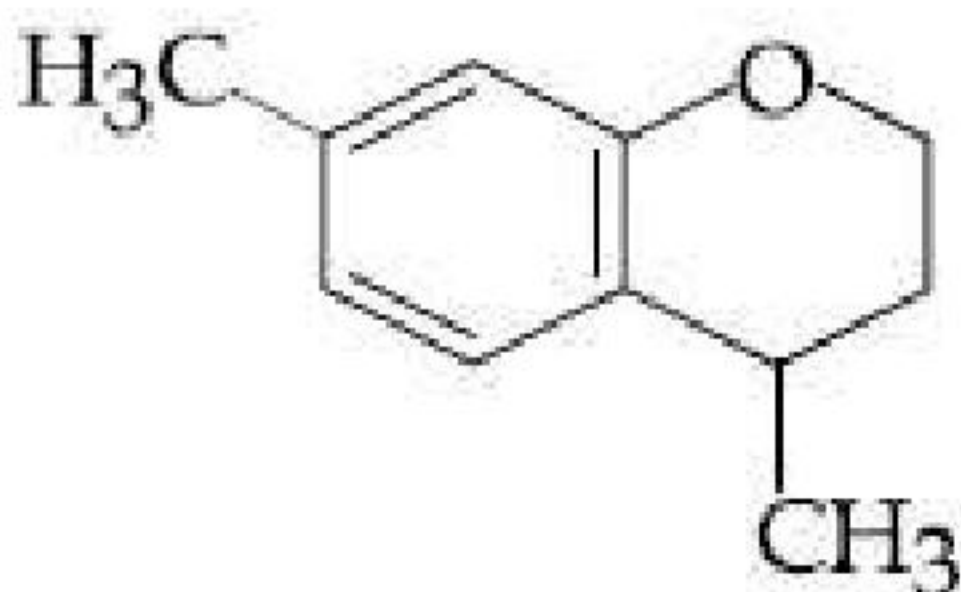
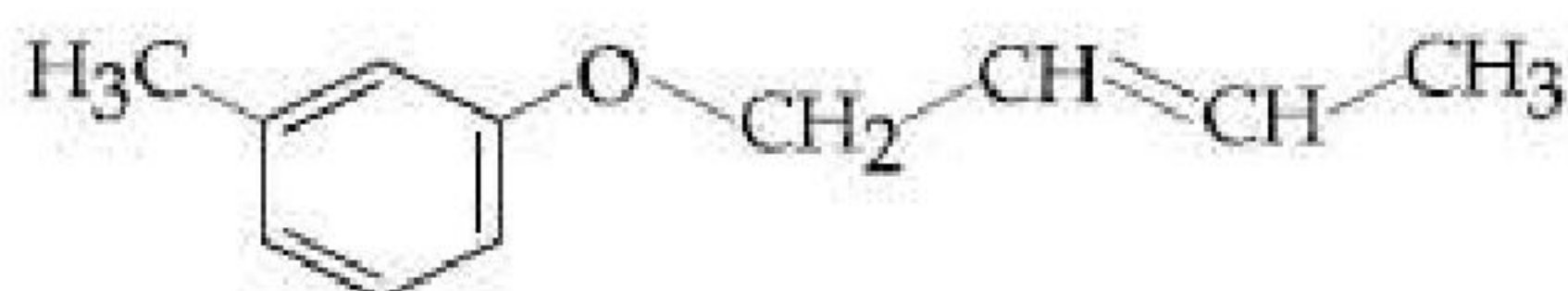
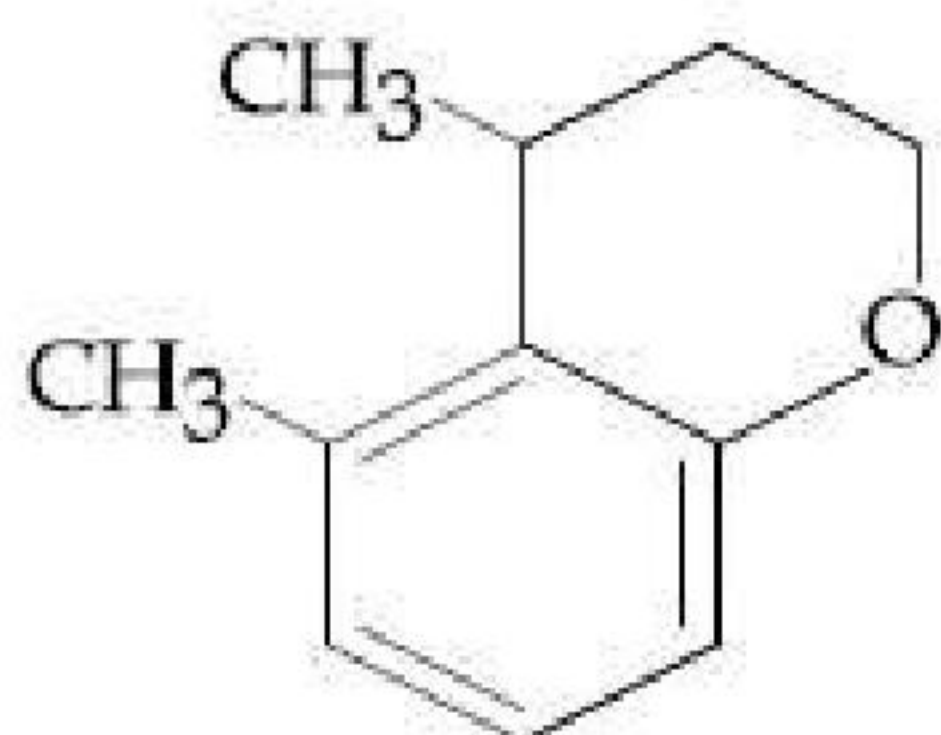
Options :



નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો :



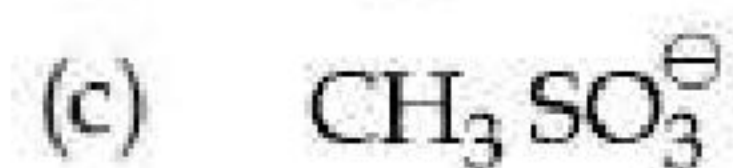
Options :



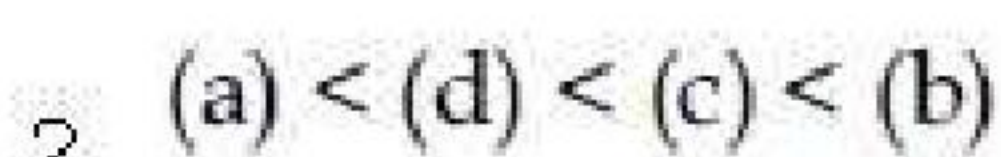
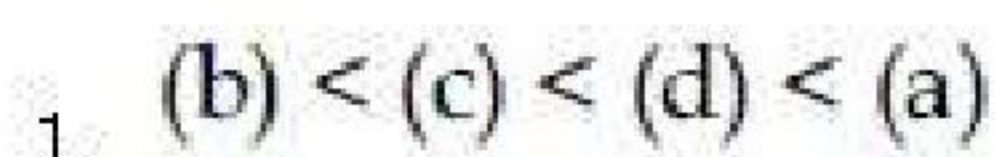
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The increasing order of nucleophilicity of the following nucleophiles is :



Options :

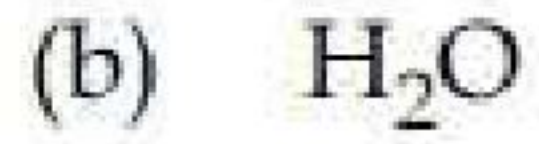


4. (d) < (a) < (c) < (b)

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 नाभिकरागियों के नाभिकरागिता का बढ़ता क्रम है :



Options :

1. (b) < (c) < (d) < (a)

2. (a) < (d) < (c) < (b)

3. (b) < (c) < (a) < (d)

4. (d) < (a) < (c) < (b)

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 આપેલા કેન્દ્ર અનુરાગીઓ ને તેમની કેન્દ્ર અનુરાગીતાના ચઢતા ક્રમમાં ગોઠવો :



Options :

1. (b) < (c) < (d) < (a)

2. (a) < (d) < (c) < (b)

3. (b) < (c) < (a) < (d)

4. (d) < (a) < (c) < (b)

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

Which of the following is NOT a correct method of the preparation of benzylamine from cyanobenzene ?

Options :

1. (i) $\text{HCl}/\text{H}_2\text{O}$ (ii) NaBH_4
2. (i) LiAlH_4 (ii) H_3O^+
3. H_2/Ni
4. (i) $\text{SnCl}_2 + \text{HCl}(\text{gas})$ (ii) NaBH_4

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

निम्न में से कौन सायनोबेंजीन से बेंजिलैमीन के बनाने का सही तरीका नहीं है ?

Options :

1. (i) $\text{HCl}/\text{H}_2\text{O}$ (ii) NaBH_4
2. (i) LiAlH_4 (ii) H_3O^+
3. H_2/Ni
4. (i) $\text{SnCl}_2 + \text{HCl}(\text{gas})$ (ii) NaBH_4

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

સાયનોબેન્ઝિનમાંથી બેન્ઝાઇલ એમાઇન નિ બનાવટમાં નીચે આપેલી પદ્ધતિઓ પૈકી કઈ એક સાચી પદ્ધતિ નથી ?

Options :

1. (i) $\text{HCl}/\text{H}_2\text{O}$ (ii) NaBH_4

3. H_2/Ni

4. (i) $\text{SnCl}_2 + \text{HCl}(\text{gas})$ (ii) NaBH_4

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

Correct Marks : 4 Wrong Marks : 1

The correct order of the first ionization enthalpies is :

Options :

1. $\text{Ti} < \text{Mn} < \text{Ni} < \text{Zn}$

2. $\text{Mn} < \text{Ti} < \text{Zn} < \text{Ni}$

3. $\text{Ti} < \text{Mn} < \text{Zn} < \text{Ni}$

4. $\text{Zn} < \text{Ni} < \text{Mn} < \text{Ti}$

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

प्रथम आयनन एन्थैल्पियों का सही क्रम है :

Options :

1. $\text{Ti} < \text{Mn} < \text{Ni} < \text{Zn}$

2. $\text{Mn} < \text{Ti} < \text{Zn} < \text{Ni}$

3. $\text{Ti} < \text{Mn} < \text{Zn} < \text{Ni}$

4. $\text{Zn} < \text{Ni} < \text{Mn} < \text{Ti}$

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

પ્રથમ આયોનાઈઝેશન એન્થાલ્પીનો સાચો ક્રમ શોધો :

Options :

1. $\text{Ti} < \text{Mn} < \text{Ni} < \text{Zn}$

3. $Ti < Mn < Zn < Ni$

4. $Zn < Ni < Mn < Ti$

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 is :

Options :

1. aniline is a froth stabilizer.

2. sodium cyanide cannot be used in the metallurgy of silver.

3. zincite is a carbonate ore.

4. zone refining process is used for the refining of titanium.

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

सही कथन है :

Options :

1. एनिलीन एक फेन-स्थायीकारक है।

2. सोडियम सायनाइड का उपयोग सिल्वर (चाँदी) के धातुकर्म में नहीं कर सकते हैं।

3. जिंसाइट एक कार्बोनेट अयस्क है।

4. जोन परिष्करण प्रक्रम टाइटेनियम के परिष्करण के लिए प्रयुक्त होता 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

साथु विधान :

Options :

- ચાંદીની ધાત્વીકીમાં સોડિયમ સાઇનાઇડનો ઉપયોગ
2. થઇ શકે નહીં.
3. ઝિંકસાઇડ એ કાર્બોનેટ અયસ્ક છે.

- ટાઇટેનિયમનો શુદ્ધિકરણ માટે ઝોન રિફાઇનિંગ
4. પદ્ધતીનો ઉપયોગ કરવામાં આવે છે.

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 correct statements among (a) to (d) are :

- (a) saline hydrides produce H_2 gas when reacted with H_2O .
- (b) reaction of $LiAlH_4$ with BF_3 leads to B_2H_6 .
- (c) PH_3 and CH_4 are electron - rich and electron - precise hydrides, respectively.
- (d) HF and CH_4 are called as molecular hydrides.

Options :

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

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

(a) से (d) के बीच, सही कथन हैं :

- (a) लवण हाइड्राइड्स H_2O के साथ अभिक्रिया करने पर H_2 गैस देते हैं।
- (b) BF_3 के साथ $LiAlH_4$ की अभिक्रिया से B_2H_6 बनता है।
- (c) PH_3 तथा CH_4 क्रमशः इलेक्ट्रॉन-सम्पन्न तथा इलेक्ट्रॉन-परिशुद्ध हाइड्राइड्स हैं।
- (d) HF तथा CH_4 आय्विक हाइड्राइड कहे जाते हैं।

Options :

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

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

(a) થી (d) માં સાચા વિધાનો :

- (a) સલાઇન હાઇડ્રાઇડ ને H_2O સાથે પ્રક્રિયા કરતા H_2 વાયુ ઉત્પન્ન થાય છે.
- (b) $LiAlH_4$ ની BF_3 સાથે પ્રક્રિયા કરતા B_2H_6 આપે છે.
- (c) PH_3 અને CH_4 એ અનુક્રમે ઇલેક્ટ્રોન પ્રચુર અને ઇલેક્ટ્રોન પરિશુદ્ધ (precise) હાઇડ્રાઇડ છે.
- (d) HF અને CH_4 ને આણ્વીય હાઇડ્રાઇડ્સ તરીકે ઓળખાય છે.

Options :

1. ફક્ત (c) અને (d)
2. ફક્ત (a), (c) અને (d)

4. (a), (b), (c) અને (d)

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

A hydrated solid X on heating initially gives a monohydrated compound Y. Y upon heating above 373 K leads to an anhydrous white powder Z. X and Z, respectively, are :

Options :

1. Baking soda and soda ash.
2. Washing soda and dead burnt plaster.
3. Washing soda and soda ash.
4. Baking soda and dead burnt plaster.

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

एक जलयोजित ठोस X गर्म करने पर प्रारम्भ में एक एकल-जलयोजित यौगिक Y देता है। 373 K के ऊपर Y को गर्म करने पर एक निर्जल सफेद पाउडर Z मिलता है। X तथा Z क्रमशः हैं :

Options :

1. बेकिंग सोडा तथा सोडा ऐश
2. वाशिंग सोडा तथा पूर्णदग्ध प्लास्टर
3. वाशिंग सोडा तथा सोडा ऐश
4. बेकिंग सोडा तथा पूर्णदग्ध प्लास्टर

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

જળયુક્ત ધન Xને ગરમ કરતા પ્રથમ એક આર્દ્ર સંયોજન (monohydrated) Y આપે છે. Y ને 373 K એ ગરમ કરતા નિર્જળ સ્ફેદ ભુકો Z મળે છે. X અને Z અનુક્રમે છે .

Options :

1. ખાવાનો સોડા અને સોડા એશ

2. ધોવાનો સોડા અને મૃત સળગાવેલું પ્લાસ્ટર (dead burnt plaster)

3. ધોવાનો સોડા અને સોડા એશ

4. ખાવાનો સોડા અને મૃત સળગાવેલ પ્લાસ્ટર (dead burnt plaster)

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

वह उत्कृष्ट गैस जो वायुमंडल में उपस्थित नहीं है, होगी :

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

Options :

1. He

2. Ne

3. Kr

4. Ra

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

Correct Marks : 4 Wrong Marks : 1

The noble gas that does NOT occur in the atmosphere is :

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

Options :

1. He

2. Ne

3. Kr

4. Ra

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

ઉમદા વાયુ કે જે વાતાવરણમાં બનતો નથી તે :

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

Options :

1. He

2. Ne

3. Kr

4. Ra

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

Correct Marks : 4 Wrong Marks : 1

The number of pentagons in C_{60} and trigons (triangles) in white phosphorus, respectively, are :

Options :

1. 12 and 4

2. 12 and 3

3. 20 and 3

4. 20 and 4

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

Correct Marks : 4 Wrong Marks : 1

C_{60} में पंचभुजों तथा सफेद फास्फोरस में त्रिभुजों

1. 12 તથા 4
2. 12 તથા 3
3. 20 તથા 3
4. 20 તથા 4

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

Correct Marks : 4 Wrong Marks : 1

C_{60} માં રહેલા પંચકોણો અને સફેદ ફોસ્ફોરસમાં રહેલા ત્રિકોણો અનુક્રમે :

Options :

1. 12 અને 4
2. 12 અને 3
3. 20 અને 3
4. 20 અને 4

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 highest possible oxidation states of uranium and plutonium, respectively, are :

Options :

1. 7 and 6
2. 6 and 7
3. 6 and 4
4. 4 and 6

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

यूरेनियम तथा प्लुटोनियम की उच्चतम सम्भव ऑक्सीकरण अवस्थायें क्रमशः हैं :

Options :

1. 7 तथा 6
2. 6 तथा 7
3. 6 तथा 4
4. 4 तथा 6

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

યુરેનિયમ અને પ્લુટોનિયમ ની શક્ય મહત્તમ ઓક્સીડેશન અવસ્થાઓ અનુક્રમે છે :

Options :

1. 7 અને 6
2. 6 અને 7
3. 6 અને 4
4. 4 અને 6

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

Correct Marks : 4 Wrong Marks : 1

The crystal field stabilization energy (CFSE) of $[\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_2$ and $\text{K}_2[\text{NiCl}_4]$, respectively, are :

Options :

1. $-0.6\Delta_o$ and $-0.8\Delta_t$
2. $-0.4\Delta_o$ and $-0.8\Delta_t$
3. $-2.4\Delta_o$ and $-1.2\Delta_t$
4. $-0.4\Delta_o$ and $-1.2\Delta_t$

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

$[\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_2$ तथा $\text{K}_2[\text{NiCl}_4]$ की क्रिस्टल क्षेत्र स्थायीकरण ऊर्जा (सी.एफ.एस.ई.) क्रमशः हैं :

Options :

1. $-0.6\Delta_o$ तथा $-0.8\Delta_t$
2. $-0.4\Delta_o$ तथा $-0.8\Delta_t$
3. $-2.4\Delta_o$ तथा $-1.2\Delta_t$
4. $-0.4\Delta_o$ तथा $-1.2\Delta_t$

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

$[\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_2$ અને $\text{K}_2[\text{NiCl}_4]$ માં સ્ફટિક ક્ષેત્ર સ્થિરતા ઊર્જા (CFSE) અનુક્રમે :

Options :

1. $-0.6\Delta_o$ અને $-0.8\Delta_t$
2. $-0.4\Delta_o$ અને $-0.8\Delta_t$
3. $-2.4\Delta_o$ અને $-1.2\Delta_t$
4. $-0.4\Delta_o$ અને $-1.2\Delta_t$

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

Correct Marks : 4 Wrong Marks : 1

The INCORRECT statement is :

Options :

1. the spin-only magnetic moment of $[\text{Ni}(\text{NH}_3)_4(\text{H}_2\text{O})_2]^{2+}$ is 2.83 BM.
2. the spin-only magnetic moments of $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ and $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$ are nearly similar.

3. the color of $[\text{CoCl}(\text{NH}_3)_5]^{2+}$ is violet as it absorbs the yellow light.
4. the gemstone, ruby, has Cr^{3+} ions occupying the octahedral sites of beryl.

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

गलत कथन है :

Options :

1. $[\text{Ni}(\text{NH}_3)_4(\text{H}_2\text{O})_2]^{2+}$ का स्पिनमात्र-चुम्बकीय आघूर्ण 2.83 BM है।
2. $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ तथा $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$ के स्पिनमात्र-चुम्बकीय आघूर्ण लगभग एक जैसे हैं।
3. जब $[\text{CoCl}(\text{NH}_3)_5]^{2+}$ पीला प्रकाश शोषित करता है तो इसका रंग बैंगनी हो जाता है।
4. जेमस्टोन, रूबी, में Cr^{3+} आयन होता है जो बेरिल के अष्टफलकीय स्थल में उपस्थित रहता है।

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

વિધાન સાચુ નથી તે :

Options :

1. $[\text{Ni}(\text{NH}_3)_4(\text{H}_2\text{O})_2]^{2+}$ ની ફક્ત સ્પિન ચુંબકીય ચાકમાત્રા 2.83 BM છે.
2. $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ અને $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$ ની ફક્ત સ્પિન ચુંબકીય ચાકમાત્રા લગભગ સરખી છે.
3. $[\text{CoCl}(\text{NH}_3)_5]^{2+}$ નો રંગ જાંબલી છે કેમ કે તે પીળા પ્રકાશનું શોષણ કરે છે.

- રત્ન, માણિક માં Cr^{3+} આયન બેરાઈલની અષ્ટફલકીય સ્થાન પર ગોઠવાયેલા હોય છે.
- 4.

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

Air pollution that occurs in sunlight is :

Options :

1. acid rain
2. fog
3. reducing smog
4. oxidising smog

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

वह वायु प्रदूषण जो सूर्य के प्रकाश में होता है, है :

Options :

1. अम्लीय वर्षा
2. फॉग
3. अपचायी स्मॉग (धूमकुहा)
4. आक्सीकारक धૂમકુહા

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

વાયુ પ્રદૂષણ જે સૂર્ય પ્રકાશમાં થાય છે તે :

Options :

1. એસિડ વર્ષા
2. ધુમ્મસ

4. ऑक्सीडेशन कर्ता धुम धुम्भस

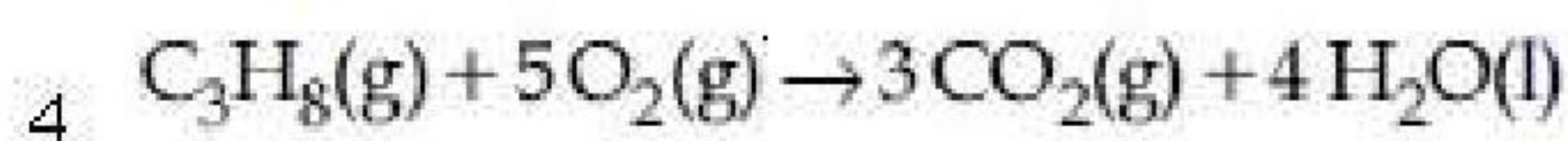
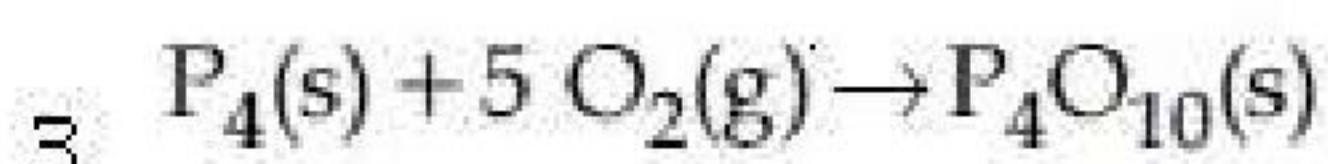
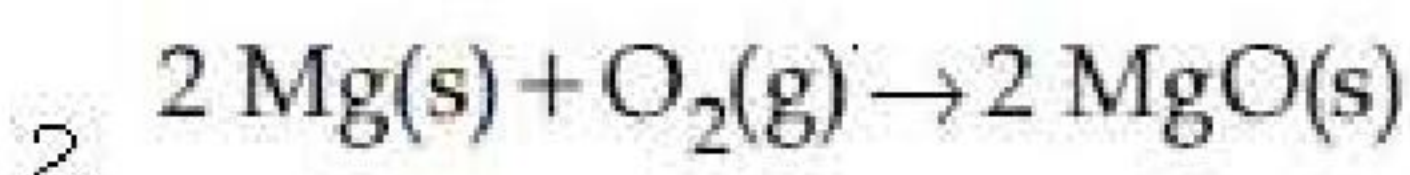
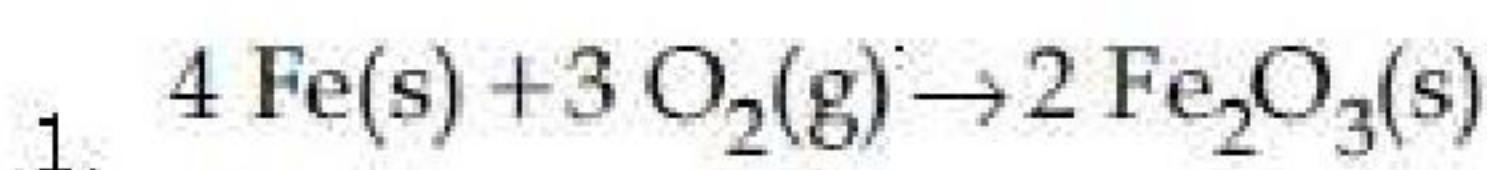
Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The minimum amount of $O_2(g)$ consumed per gram of reactant is for the reaction :

(Given atomic mass : Fe = 56, O = 16, Mg = 24, P = 31, C = 12, H = 1)

Options :



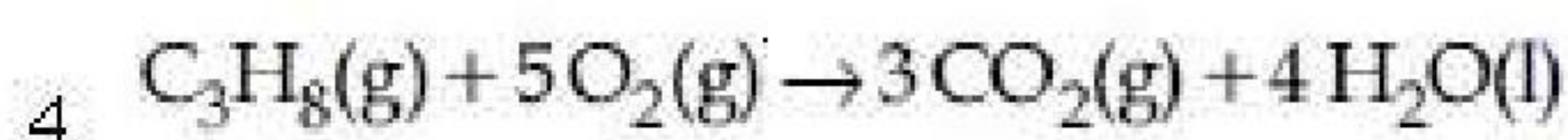
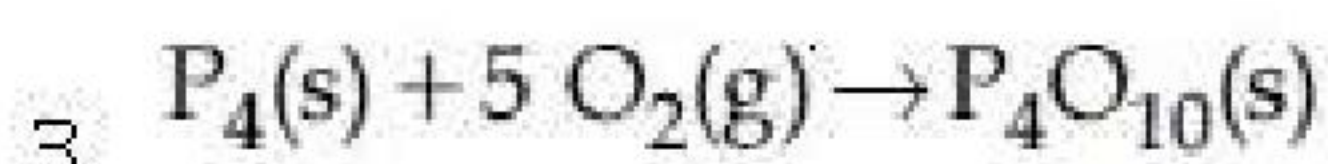
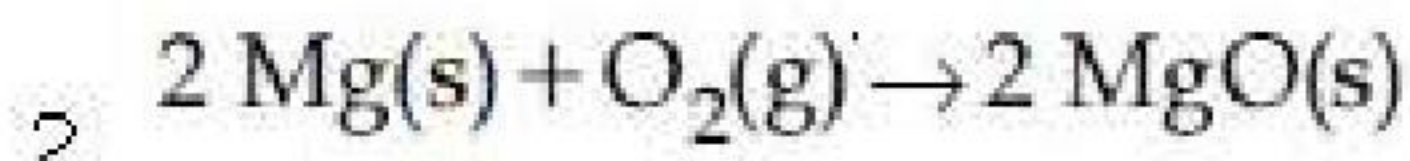
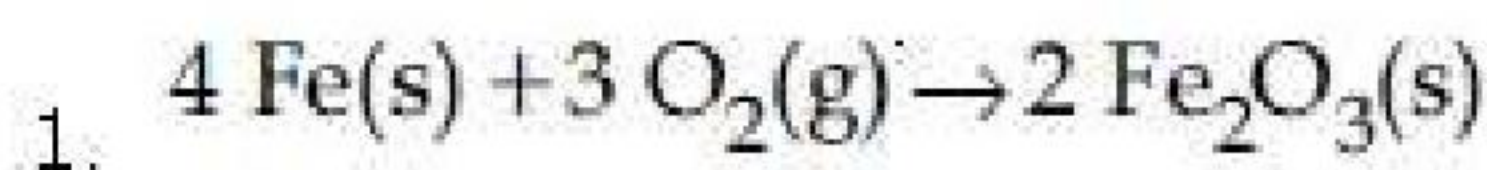
Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिकारक के प्रतिग्राम के लिए $O_2(g)$ की लगनेवाली अल्पतम मात्रा निम्न में से किस अभिक्रिया के लिए होगी ?

(दिया गया परमाणु द्रव्यमान : Fe = 56, O = 16, Mg = 24, P = 31, C = 12, H = 1)

Options :



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

નીચે આપેલી પ્રક્રિયાઓ પૈકી કઈ એકમાં પ્રતિ ગ્રામ પ્રક્રિયક માટે $O_2(g)$ ની ઓછામાં ઓછી માત્રા વપરાય છે તે શોધો :

(આપેલ પરમાણ્વીય દળ : $Fe = 56$, $O = 16$, $Mg = 24$, $P = 31$, $C = 12$, $H = 1$)

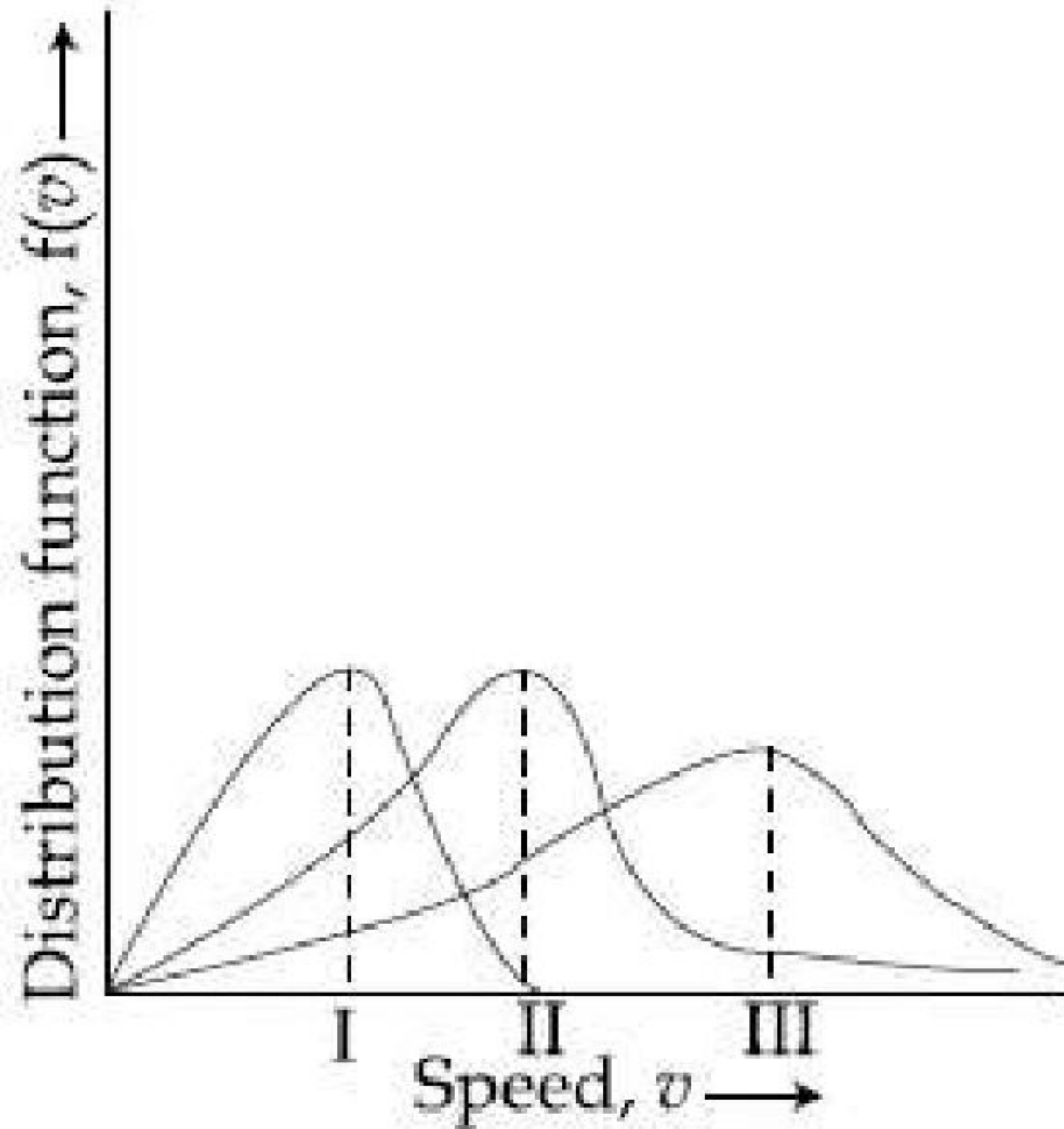
Options :

1. $4 Fe(s) + 3 O_2(g) \rightarrow 2 Fe_2O_3(s)$
2. $2 Mg(s) + O_2(g) \rightarrow 2 MgO(s)$
3. $P_4(s) + 5 O_2(g) \rightarrow P_4O_{10}(s)$
4. $C_3H_8(g) + 5 O_2(g) \rightarrow 3 CO_2(g) + 4 H_2O(l)$

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

Points I, II and III in the following plot respectively correspond to
(V_{mp} : most probable velocity)



Options :

1. V_{mp} of H_2 (300 K); V_{mp} of N_2 (300 K);
 V_{mp} of O_2 (400 K)
2. V_{mp} of O_2 (400 K); V_{mp} of N_2 (300 K);
 V_{mp} of H_2 (300 K)

3. V_{mp} of N_2 (300 K); V_{mp} of O_2 (400 K);
 V_{mp} of H_2 (300 K)

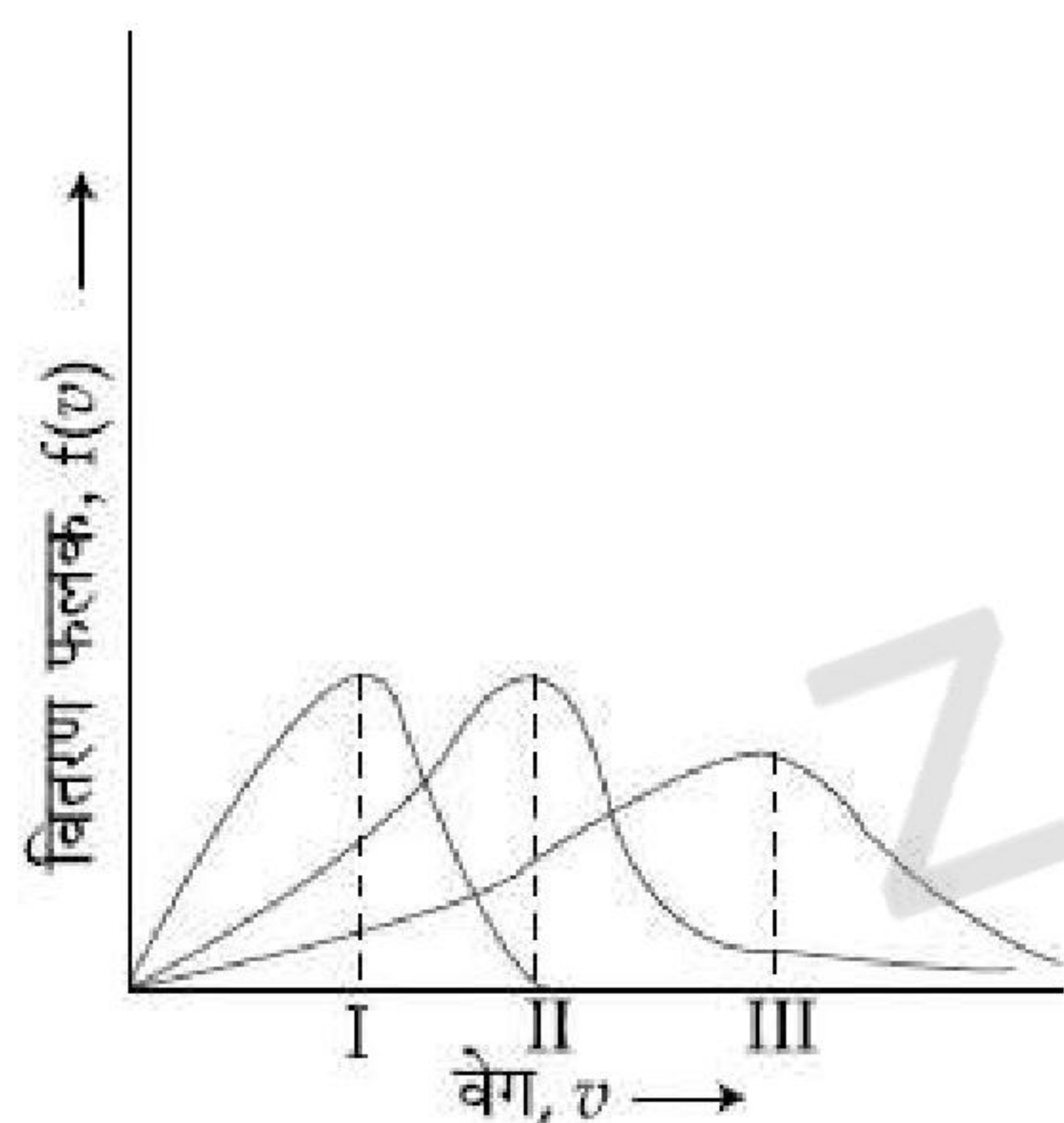
4. V_{mp} of N_2 (300 K); V_{mp} of H_2 (300 K);
 V_{mp} of O_2 (400 K)

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

आलेख में बिन्दु I, II तथा III क्रमशः इनसे सम्बन्धित हैं,

(V_{mp} : प्रायिकतम वेग)



Options :

1. H_2 का V_{mp} (300 K); N_2 का V_{mp} (300 K); O_2 का V_{mp} (400 K)

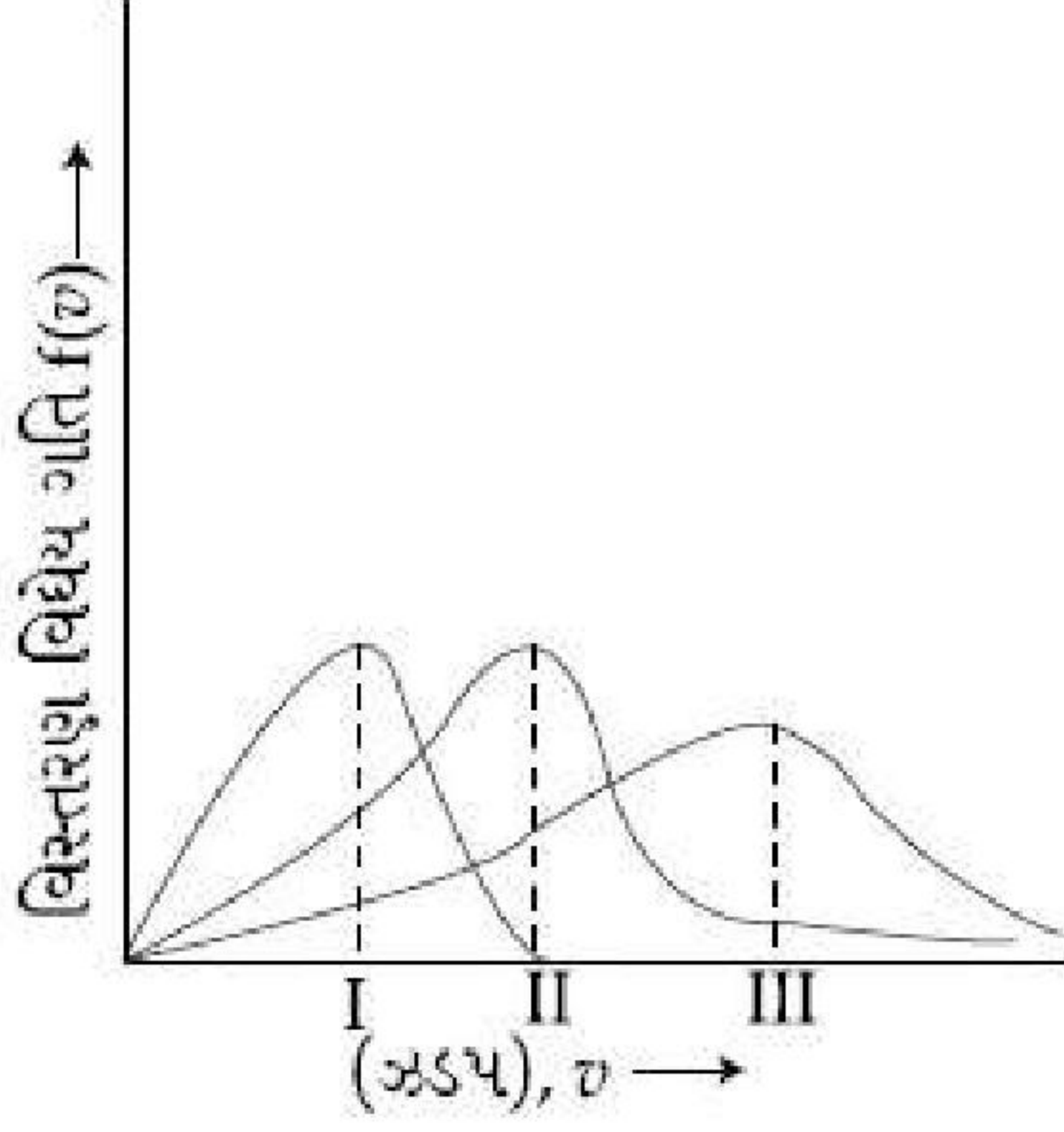
2. O_2 का V_{mp} (400 K); N_2 का V_{mp} (300 K); H_2 का V_{mp} (300 K)

3. N_2 का V_{mp} (300 K); O_2 का V_{mp} (400 K); H_2 का V_{mp} (300 K)

4. N_2 का V_{mp} (300 K); H_2 का V_{mp} (300 K); O_2 का V_{mp} (400 K)

નીચે આપેલા વક્રમાં બિંદુ I, II અને III અનુક્રમે શું દર્શાવે છે:

(V_{mp} : સૌથી સંભવિત ઝડપ)



Options :

1. H_2 ની V_{mp} (300 K); N_2 ની V_{mp} (300 K); O_2 ની V_{mp} (400 K)
2. O_2 ની V_{mp} (400 K); N_2 ની V_{mp} (300 K); H_2 ની V_{mp} (300 K)
3. N_2 ની V_{mp} (300 K); O_2 ની V_{mp} (400 K); H_2 ની V_{mp} (300 K)
4. N_2 ની V_{mp} (300 K); H_2 ની V_{mp} (300 K); O_2 ની V_{mp} (400 K)

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

Correct Marks : 4 Wrong Marks : 1

The ratio of the shortest wavelength of two spectral series of hydrogen spectrum is found to be about 9. The spectral series are :

Options :

1. Balmer and Brackett

3. Paschen and Pfund

4. Brackett and Pfund

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

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन स्पेक्ट्रम के दो स्पेक्ट्रमी श्रेणियों के लघुतम तरंगदैर्घ्य का अनुपात लगभग 9 पाया गया। स्पेक्ट्रमी श्रेणियाँ हैं :

Options :

1. बामर तथा ब्रैकेट

2. लाइमन तथा पाश्चेन

3. पाश्चेन तथा फुन्ड

4. ब्रैकेट तथा फुन्ड

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

હાઈડ્રોજન વર્ણપટ માટેની બે વર્ણપટ શ્રેણીઓની ટુંકી તરંગલંબાઈ સીમાનો ગુણોત્તર લગભગ 9 માલૂમ પડ્યો તો આ વર્ણપટ શ્રેણીઓ :

Options :

1. બામર અને બ્રેકેટ

2. લાઈમન અને પાશ્ચેન

3. પાશ્ચેન અને ફુન્ડ

4. બ્રેકેટ અને ફુન્ડ

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

The difference between ΔH and ΔU ($\Delta H - \Delta U$), when the combustion of one mole of heptane(l) is carried out at a temperature T, is equal to :

Options :

1. $4 RT$
2. $3 RT$
3. $-4 RT$
4. $-3 RT$

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

જબ એક મોલ હેપ્ટેન (l) કા દહન T તાપ પર કિયા જાતા હૈ તો ΔH તથા ΔU કા અન્તર, ($\Delta H - \Delta U$), નિમ્ન કે બરાબર હોગા :

Options :

1. $4 RT$
2. $3 RT$
3. $-4 RT$
4. $-3 RT$

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

એક તાપમાન T એ એક મોલ હેપ્ટેન(l) નું દહન કરવામાં આવે ત્યારે ΔH અને ΔU ($\Delta H - \Delta U$) નો તફાવત કોના બરાબર હશે?

Options :

1. $4 RT$
2. $3 RT$

4. $-3RT$

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

1 g of a non-volatile non-electrolyte solute is dissolved in 100 g of two different solvents A and B whose ebullioscopic constants are in the ratio of 1 : 5. The ratio of the elevation in their boiling points,

$$\frac{\Delta T_b(A)}{\Delta T_b(B)}, \text{ is :}$$

Options :

1. 1 : 0.2
2. 5 : 1
3. 1 : 5
4. 10 : 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

जब एक अवाष्पशील वैद्युत-अनुपघट्य के 1 g को दो अलग-अलग विलायकों (A तथा B), जिनके इब्यूलियोस्कोपिक स्थिरांक 1 : 5 अनुपात में हैं, के 100 g में घोला जाय तो उनके क्वथनांकों के उन्नयन का

$$\text{अनुपात } \frac{\Delta T_b(A)}{\Delta T_b(B)}, \text{ होगा :}$$

Options :

1. 1 : 0.2
2. 5 : 1
3. 1 : 5
4. 10 : 1

1 g અબાષ્પશીલ અને અવિદ્યુતવિભાજ્ય દ્રાવકને 100 g ના બે જુદા-જુદા દ્રાવણ A અને B માં ઓગળવામાં આવ્યો જેનાં ઈબ્બુલોસ્કોપીક અચળાંકનો ગુણોત્તર 1 : 5 છે. તો ઉત્કલન બિંદુના ઉન્નયન નો

ગુણોત્તર $\frac{\Delta T_b(A)}{\Delta T_b(B)}$ શોધો :

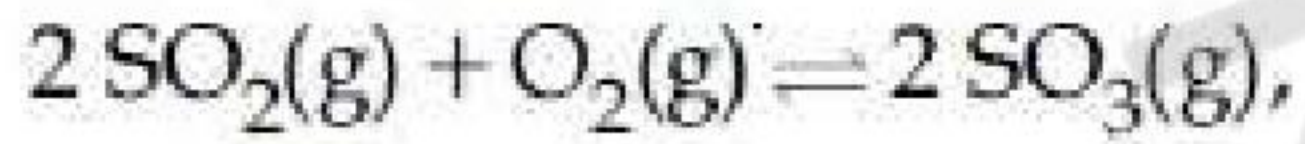
Options :

1. 1 : 0.2
2. 5 : 1
3. 1 : 5
4. 10 : 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

For the reaction,



$\Delta H = -57.2 \text{ kJ mol}^{-1}$ and

$$K_c = 1.7 \times 10^{16}.$$

Which of the following statement is INCORRECT ?

Options :

1. The equilibrium constant decreases as the temperature increases.
2. The equilibrium will shift in forward direction as the pressure increases.
3. The addition of inert gas at constant volume will not affect the equilibrium constant.
4. The equilibrium constant is large suggestive of reaction going to completion and so no catalyst is required.

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

અભિક્રિયા $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$ કે લિએ

$\Delta H = -57.2 \text{ kJ mol}^{-1}$ તથા

$K_c = 1.7 \times 10^{16}$

નિમ્ન મેં સે કૌન સા કથન ગલત હૈ?

Options :

1. જબ તાપ બઢતા હૈ તો સામ્ય સ્થિરાંક ઘટતા હૈ।

2. જબ દાબ બઢતા હૈ તો સામ્ય અગ્ર દિશા મેં વિસ્થાપિત હોતી હૈ।

3. સ્થિર આયતન પર, નિષ્ક્રિય ગૈસ કે મિલાને પર સામ્ય સ્થિરાંક પ્રભાવિત નહીં હોગા।

4. સામ્ય સ્થિરાંક બઢા હોના બતાતા હૈ કિ અભિક્રિયા પૂર્ણતા કો જા રહી હૈ ઓર ઉત્પ્રેરક કી આવશ્યકતા નહીં હૈ।

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

આપેલી પ્રક્રિયા માટે

$2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$,

$\Delta H = -57.2 \text{ kJ mol}^{-1}$ અને

$K_c = 1.7 \times 10^{16}$

નીચે આપેલા વિધાનો પૈકી કયું સાચું નથી?

Options :

1. જેમ તાપમાનમાં વધારો થાય તેમ સંતુલન અચળાંકમાં ઘટાડો થાય છે.

2. જેમ દબાણમાં વધારો થાય તેમ સંતુલન પુરાગામી દિશામાં ખસે છે.

3. અચળ કદે અક્રિય વાયુ ઉમેરતા સંતુલન અચળાંક પર અસર થશે નહીં.

- સંતુલન અચળાંક મોટો છે જે દર્શાવે છે કે પ્રક્રિયા પૂર્ણ થવાના આરે છે અને કોઈ ઉદ્દીપકની જરૂર નથી.
- 4.

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

The pH of a 0.02 M NH_4Cl solution will be
[given $K_b(\text{NH}_4\text{OH}) = 10^{-5}$ and $\log 2 = 0.301$]

Options :

1. 4.65
2. 2.65
3. 5.35
4. 4.35

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

0.02 M NH_4Cl વિલયન કા pH હોગા : [દિયા ગયા
હૈ : $K_b(\text{NH}_4\text{OH}) = 10^{-5}$ તથા $\log 2 = 0.301$]

Options :

1. 4.65
2. 2.65
3. 5.35
4. 4.35

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

0.02 M NH_4Cl ના દ્રાવણની pH શોધો :
[આપેલ $K_b(\text{NH}_4\text{OH}) = 10^{-5}$ અને $\log 2 = 0.301$]

Options :

1. 4.65

3. 5.35

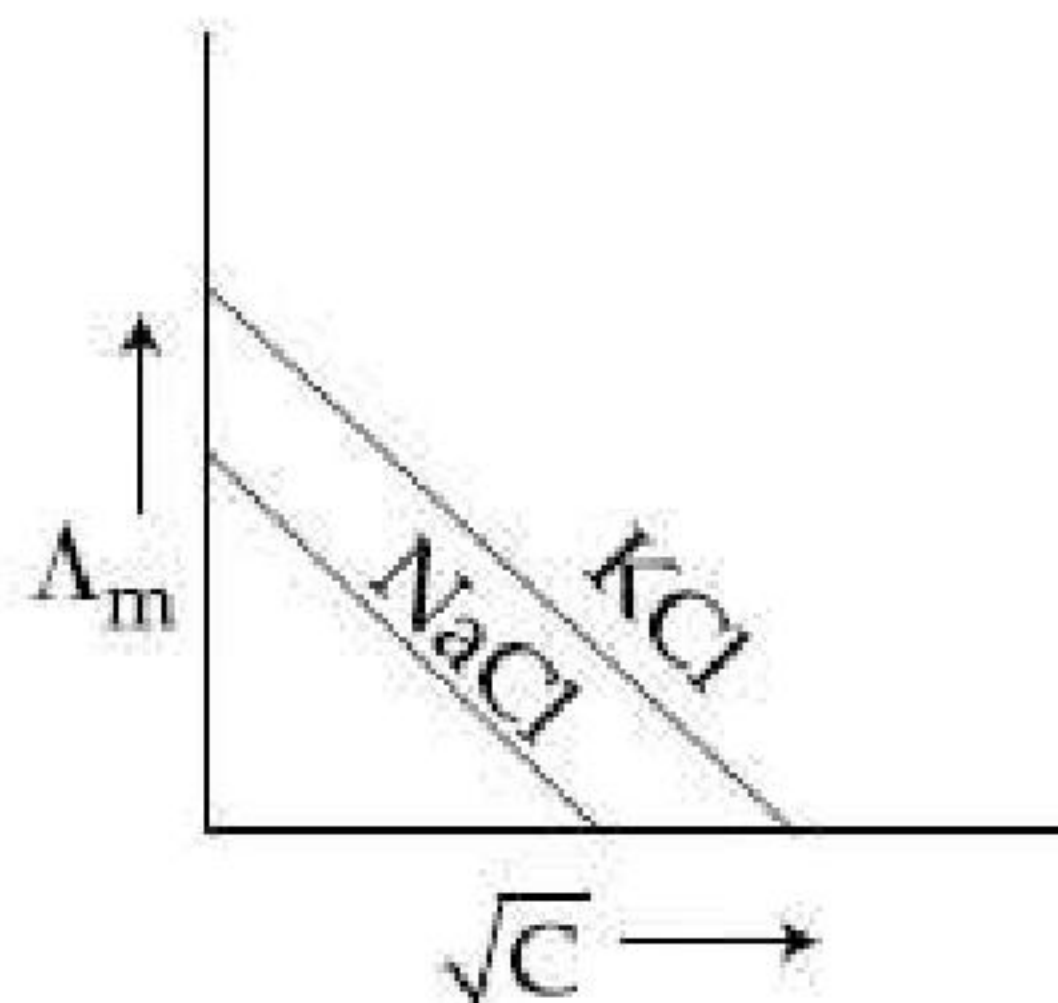
4. 4.35

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

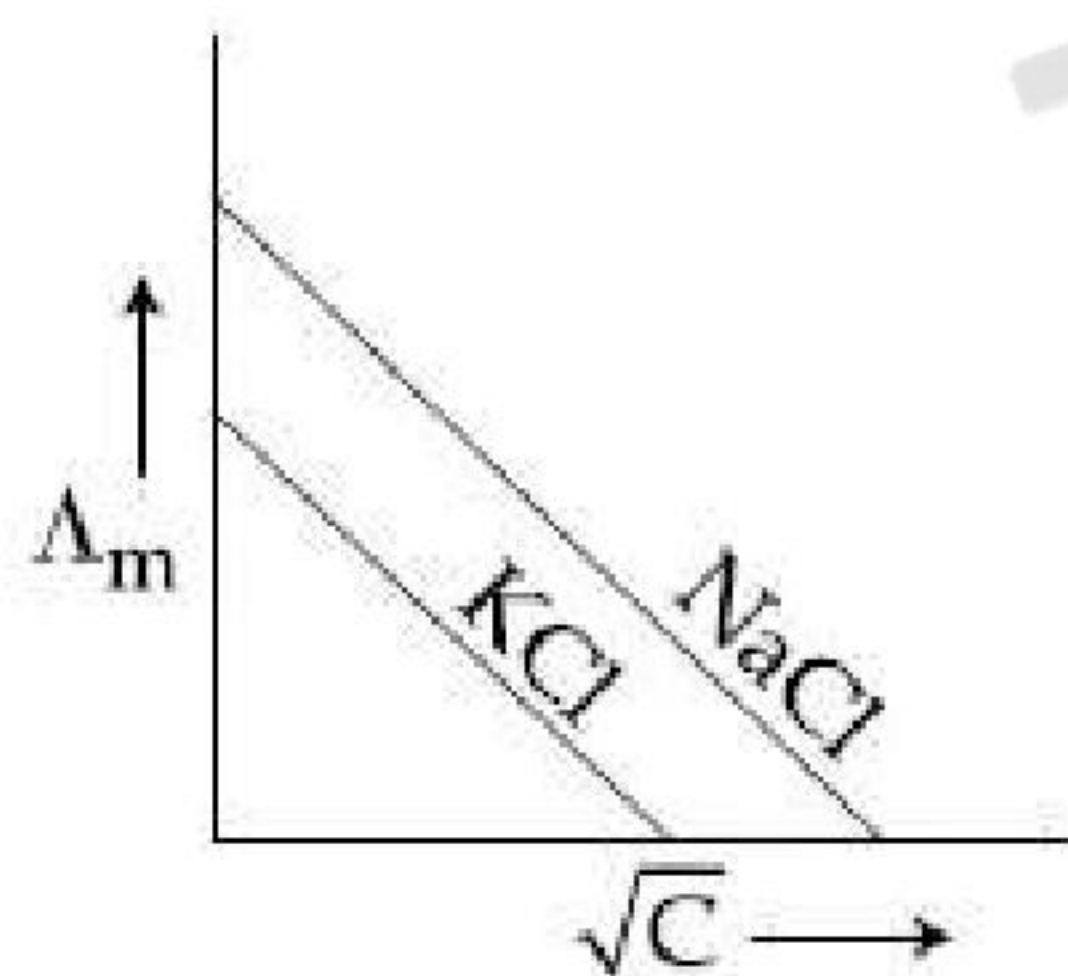
Correct Marks : 4 Wrong Marks : 1

Which one of the following graphs between molar conductivity(Λ_m) versus $\sqrt{C}$ is correct ?

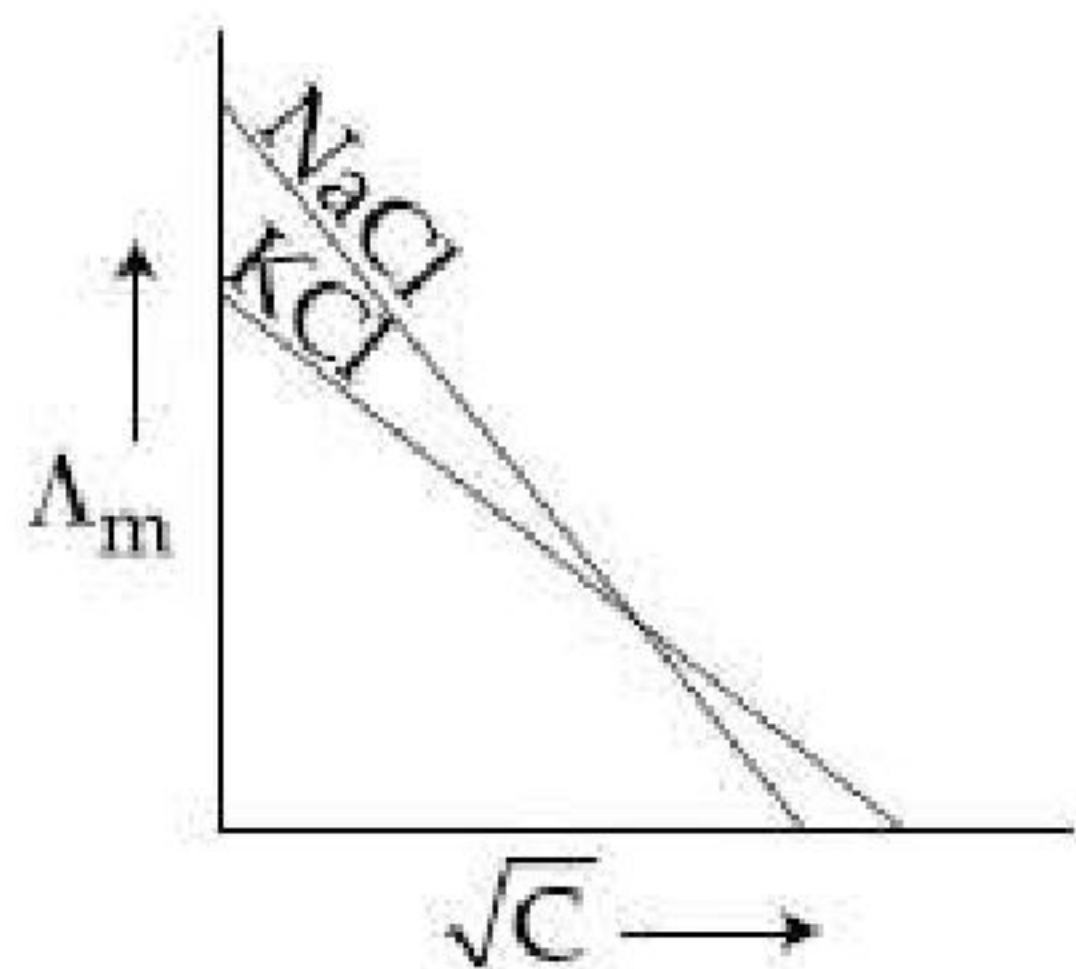
Options :



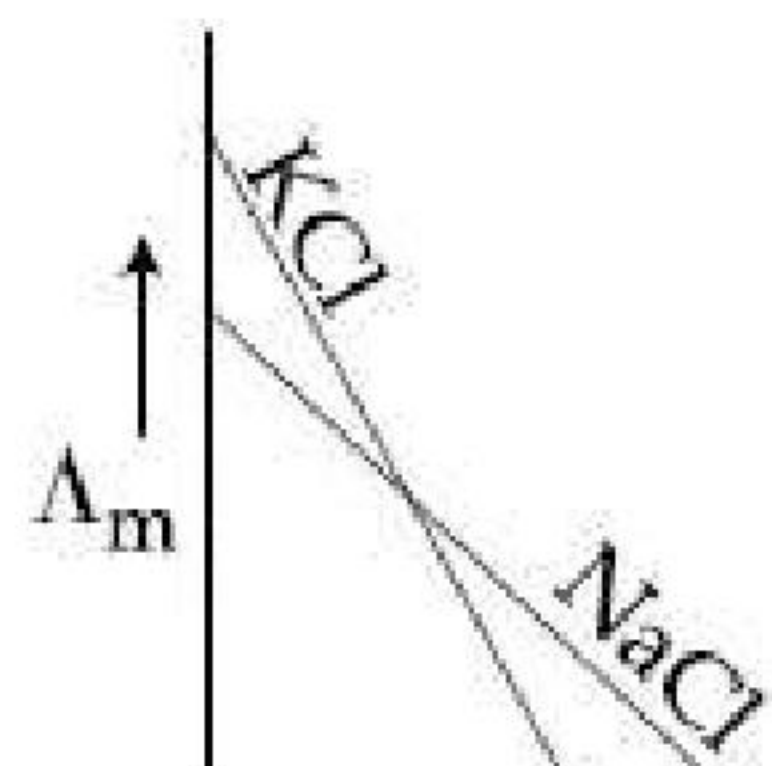
1.



2.



3.

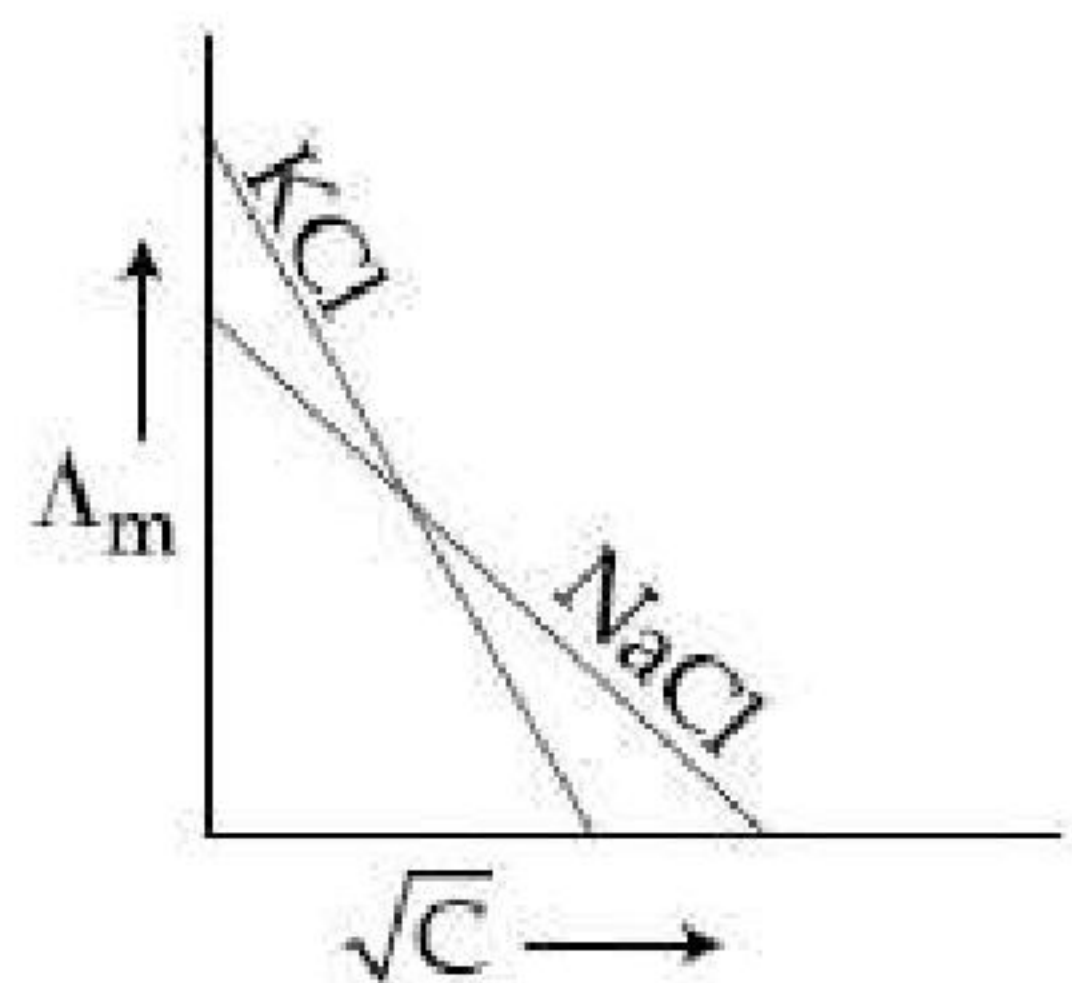
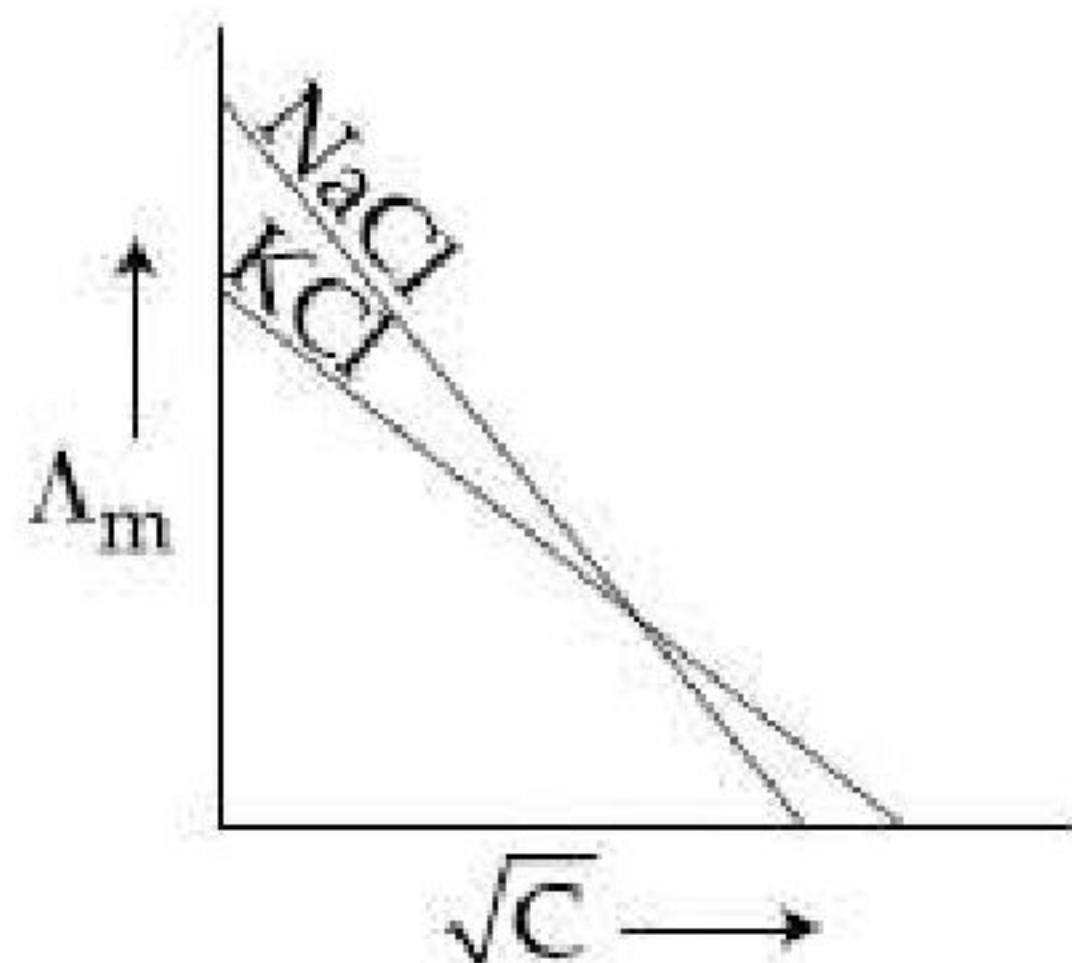
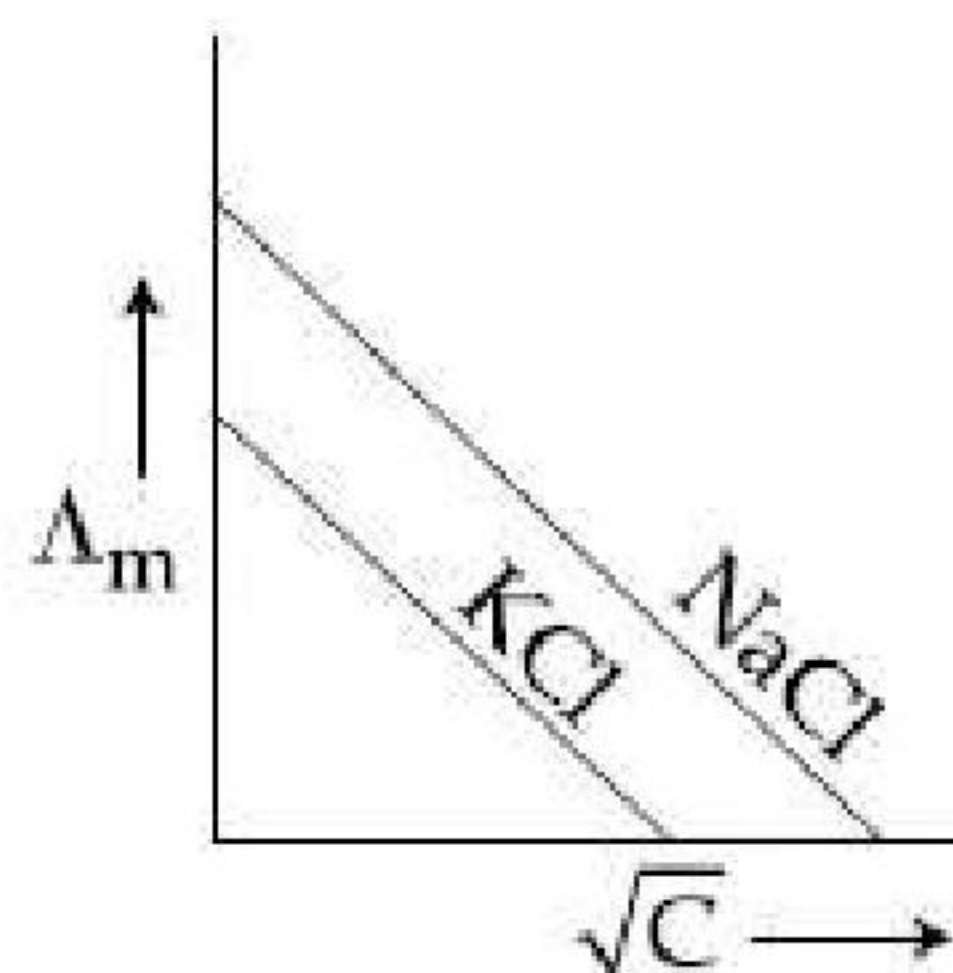
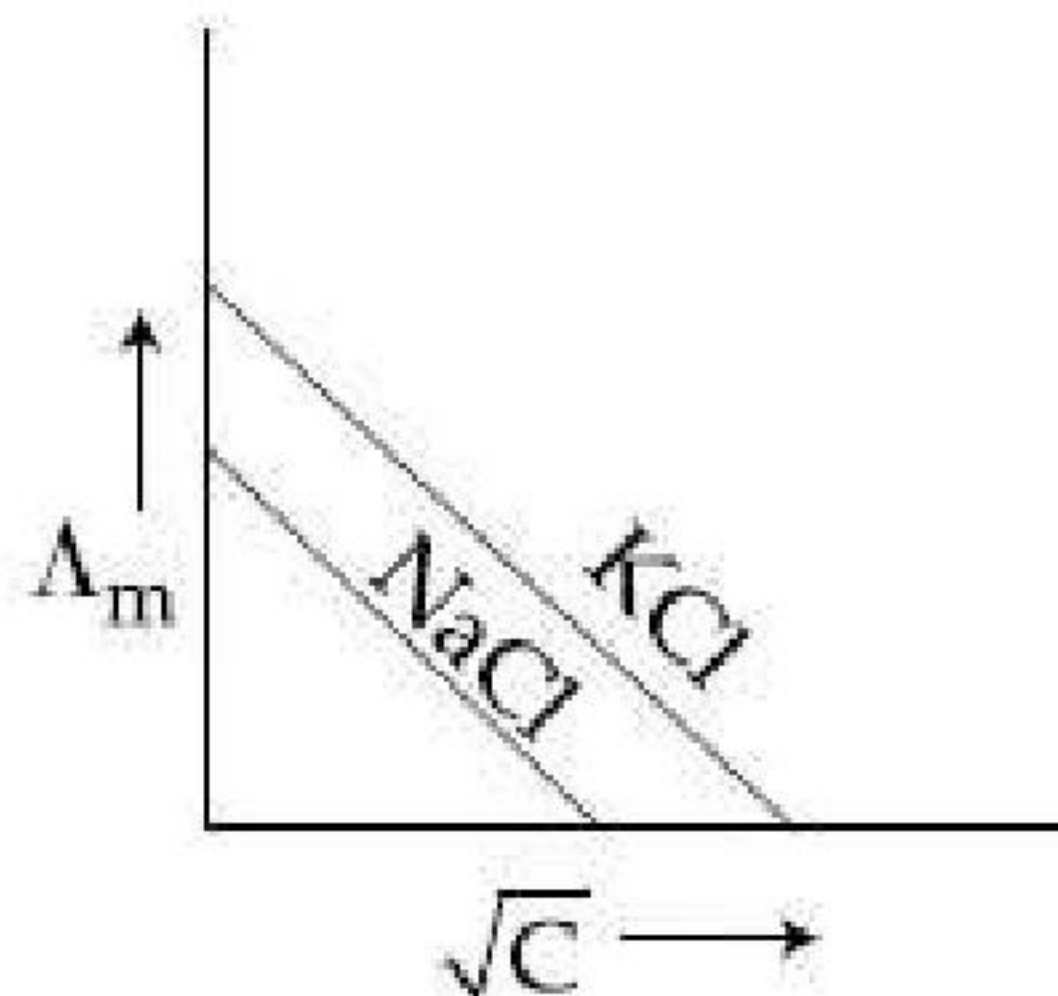


Question Number : 58 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

मोलर चालकता (Λ_m) तथा $\sqrt{C}$ के बीच बने ग्राफों में से कौन सा सही है?

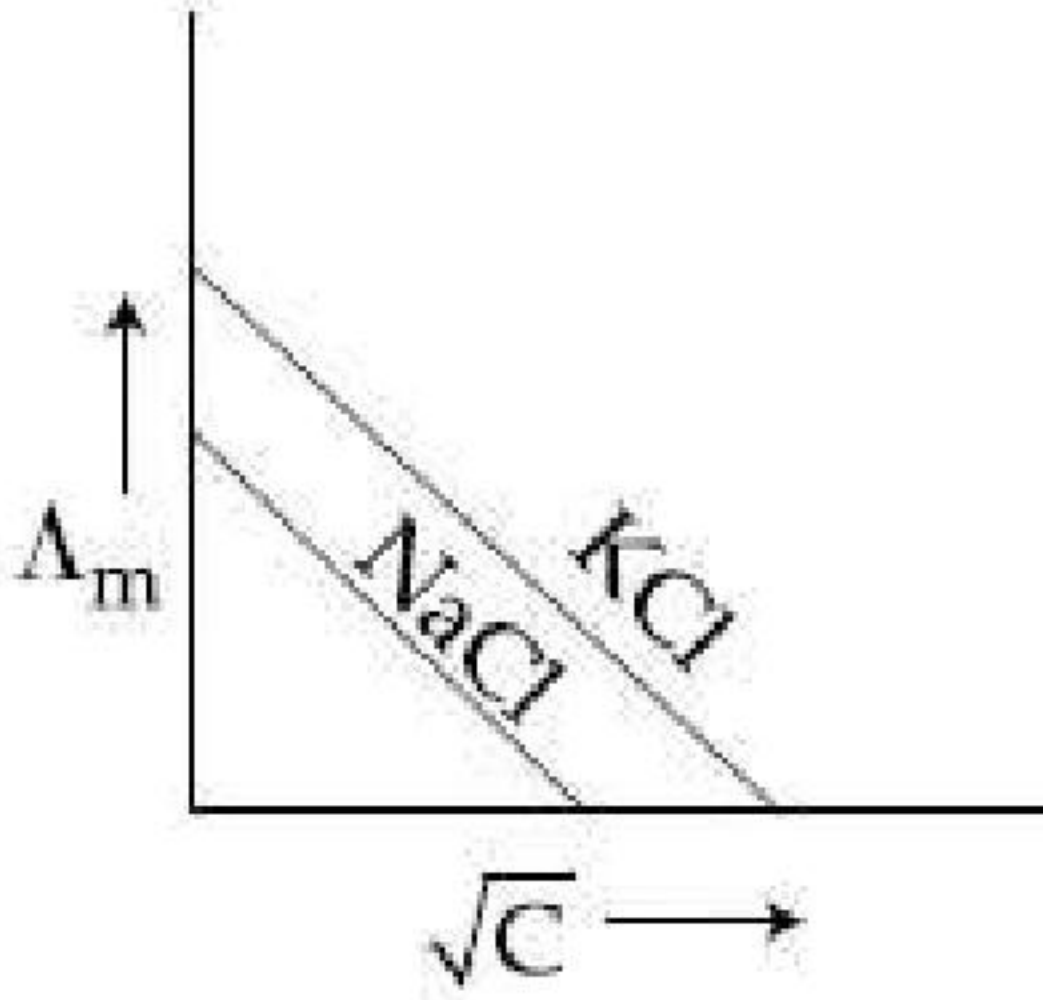
Options :



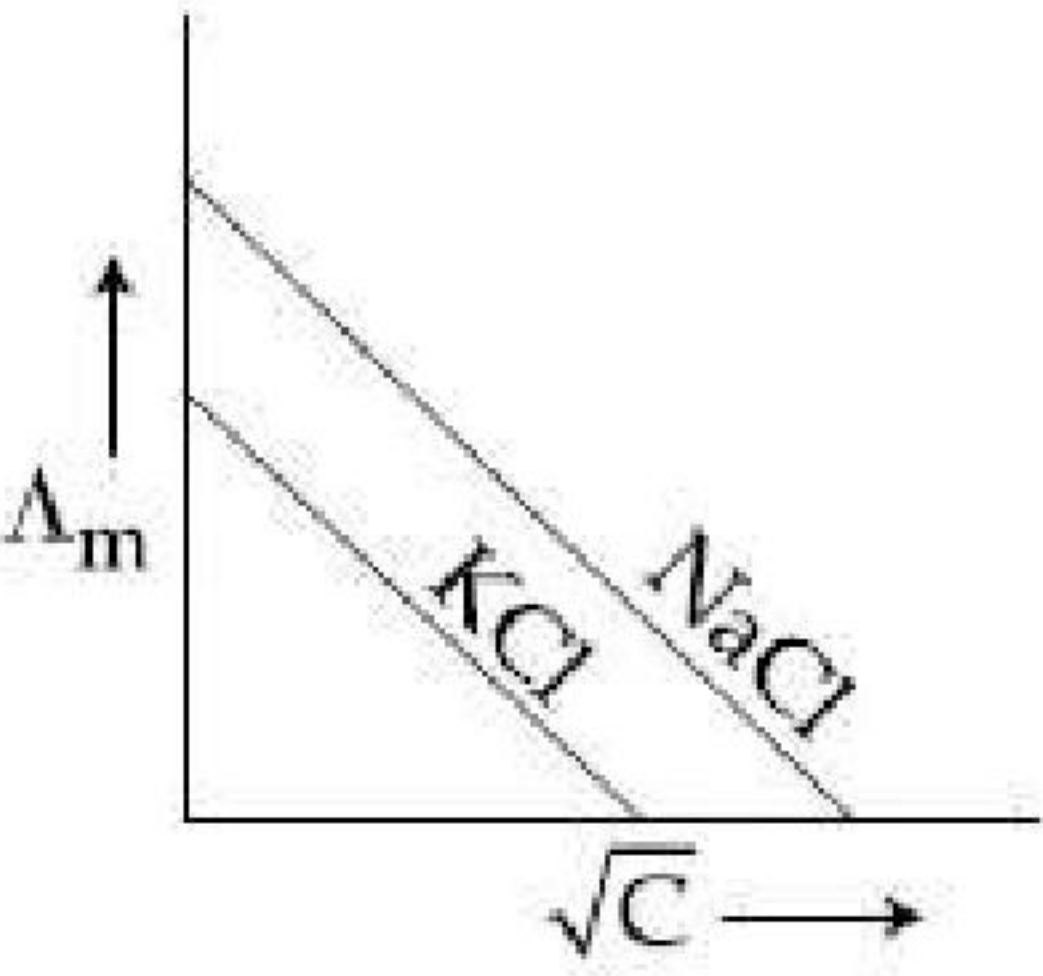
Question Number : 58 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

નીચે આપેલા મોલર વાહકતા(Λ_m) વિરૂધ્ધ $\sqrt{C}$ નાં આલેખો પૈકી કયો સાચો છે?

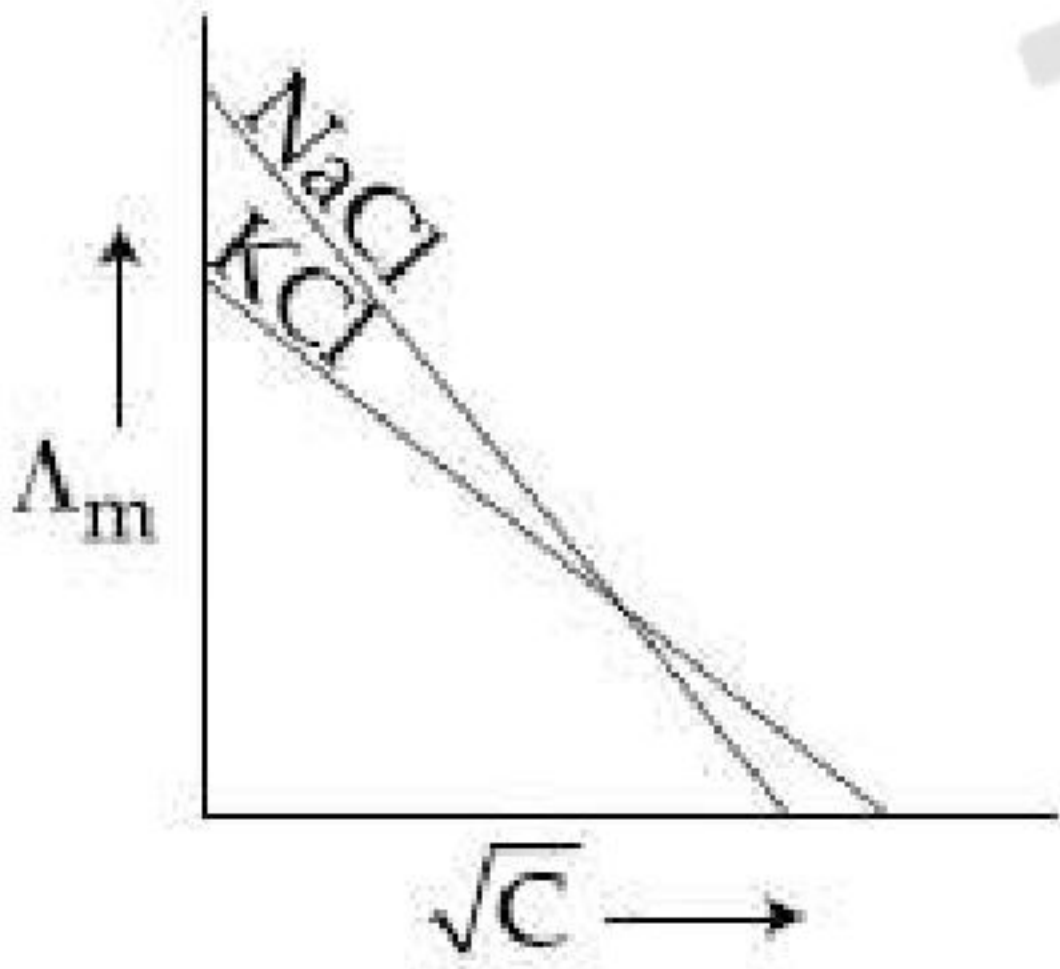
Options :



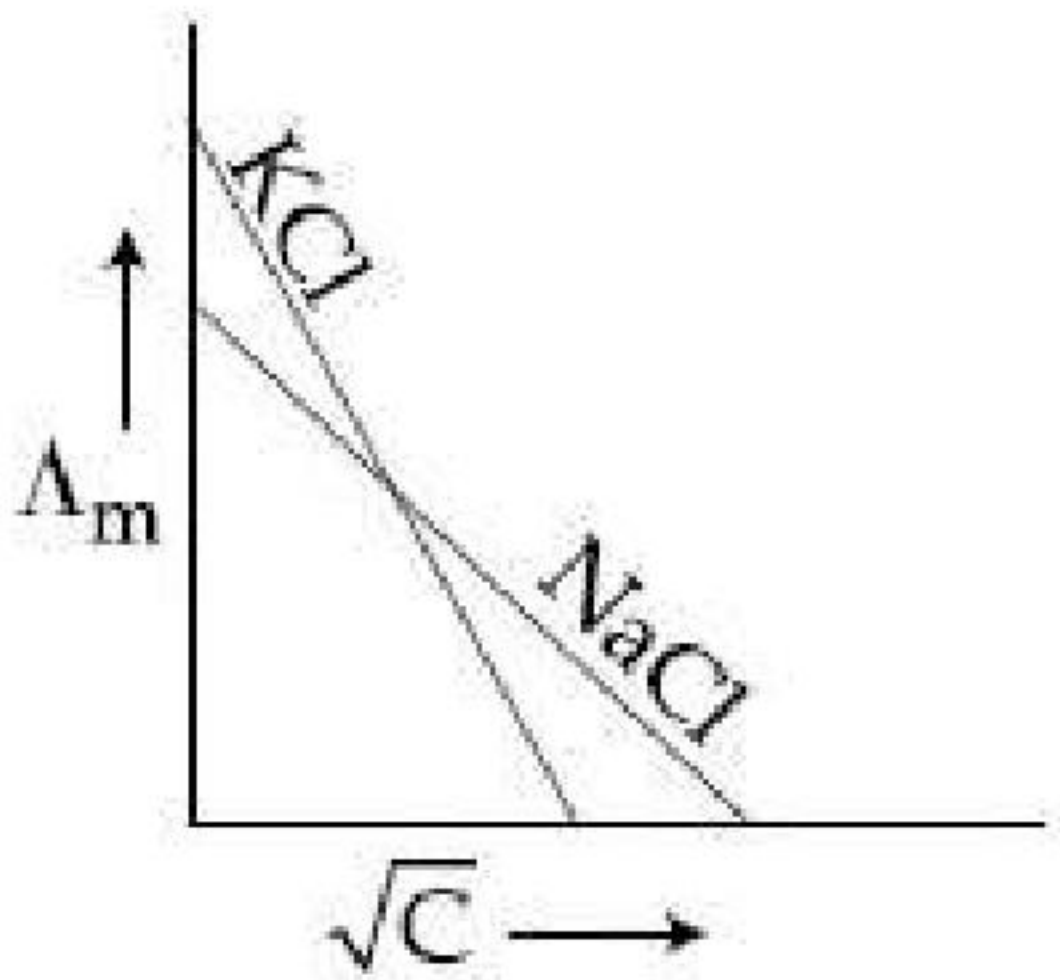
1.



2.



3.



4.

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 of H_2 with I_2 , the rate constant is $2.5 \times 10^{-4} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ at 327°C and $1.0 \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ at 527°C . The activation energy for the reaction, in kJ mol^{-1} is :

($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$)

Options :

1. 59
2. 72
3. 150
4. 166

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

I_2 के साथ H_2 की अभिक्रिया के लिये दर नियतांक 327°C पर $2.5 \times 10^{-4} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ तथा 527°C पर $1.0 \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ है। अभिक्रिया की सक्रियण ऊर्जा (kJ mol^{-1} में) होगी :

($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$)

Options :

1. 59
2. 72
3. 150
4. 166

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

H_2 અને I_2 ની પ્રક્રિયામાં 327°C એ વેગ અચળાંક $2.5 \times 10^{-4} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ અને 527°C પર $1.0 \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ છે. આ પ્રક્રિયા માટે સક્રિયકરણ શક્તિ (kJ mol^{-1} માં) શોધો :

1. 59
2. 72
3. 150
4. 166

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

The correct option among the following is :

Options :

1. Addition of alum to water makes it unfit for drinking.

2. Colloidal medicines are more effective because they have small surface area.

3. Colloidal particles in lyophobic sols can be precipitated by electrophoresis.

4. Brownian motion in colloidal solution is faster if the viscosity of the solution is very high.

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

Correct Marks : 4 Wrong Marks : 1

निम्न में से सही विकल्प है :

Options :

1. पानी में फिटकिरी मिलाने से वह (पानी) पीने के अयोग्य हो जाता है।

2. कोलाइडी औषधियाँ ज्यादा प्रभावशाली हैं क्योंकि उनका पृष्ठीय क्षेत्रफल छोटा होता है।

3. द्रवविरागी सॉल में कोलाइडी कण वैद्युत कण संचलन द्वारा अवक्षेपित किये जा सकते हैं।

4. कोलाइडी विलयन में यदि विलयन की श्यानता बहुत ज्यादा है तो ब्राउनियन गति तीव्रतर होती है।

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

નીચેના પૈકી સાચો વિકલ્પ શોધો :

Options :

1. ફટકડી ને પાણીમાં ઉમેરતા તે ખીવા લાયક રહેતું નથી.

2. કલીલી દવાઓ વધુ અસરકારક હોય છે કારણ કે તેમની સપાટીનું ક્ષેત્રફળ નાનું હોય છે.

3. લાયોફિલિક સોલમાં રહેલા કલીલી કણનું અવક્ષેપન વિદ્યુતકણ સંચલન દ્વારા કરી શકાય.

4. જો દ્રાવણની સ્નિગ્ધતા વધુ તો કલીલી દ્રાવણમાં બ્રાઉનિયન ગતિ વધારે.

Mathematics

Section Id :	416529309
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529449
Question Shuffling Allowed :	Yes

Let $f(x) = \log_e(\sin x)$, $(0 < x < \pi)$ and $g(x) = \sin^{-1}(e^{-x})$, $(x \geq 0)$. If α is a positive real number such that $a = (f \circ g)'(\alpha)$ and $b = (f \circ g)(\alpha)$, then :

Options :

1. $a\alpha^2 - b\alpha - a = 0$
2. $a\alpha^2 + b\alpha + a = 0$
3. $a\alpha^2 + b\alpha - a = -2\alpha^2$
4. $a\alpha^2 - b\alpha - a = 1$

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 $f(x) = \log_e(\sin x)$, $(0 < x < \pi)$ તથા $g(x) = \sin^{-1}(e^{-x})$, $(x \geq 0)$ હૈં। યદિ ઁક ધનાત્મક વાસ્તવિક સંખ્યા α કે લિઁ $a = (f \circ g)'(\alpha)$ તથા $b = (f \circ g)(\alpha)$ હૈ, તો :

Options :

1. $a\alpha^2 - b\alpha - a = 0$
2. $a\alpha^2 + b\alpha + a = 0$
3. $a\alpha^2 + b\alpha - a = -2\alpha^2$
4. $a\alpha^2 - b\alpha - a = 1$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f(x) = \log_e(\sin x)$, $(0 < x < \pi)$ અને $g(x) = \sin^{-1}(e^{-x})$, $(x \geq 0)$. જો α ઁ ઁવી ધન વાસ્તવિક સંખ્યા છે કે જેથી $a = (f \circ g)'(\alpha)$ અને $b = (f \circ g)(\alpha)$ તો :

Options :

1. $a\alpha^2 - b\alpha - a = 0$
2. $a\alpha^2 + b\alpha + a = 0$

3. $a\alpha^2 + b\alpha - a = -2\alpha^2$

4. $a\alpha^2 - b\alpha - a = 1$

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

Correct Marks : 4 Wrong Marks : 1

If z and w are two complex numbers such

that $|zw| = 1$ and $\arg(z) - \arg(w) = \frac{\pi}{2}$,

then :

Options :

1. $\bar{z}w = -i$

2. $\bar{z}w = \frac{-1+i}{\sqrt{2}}$

3. $\bar{z}w = i$

4. $\bar{z}w = \frac{1-i}{\sqrt{2}}$

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

Correct Marks : 4 Wrong Marks : 1

यदि z तथा w दो ऐसी सम्मिश्र संख्याएँ हैं कि

$|zw| = 1$ तथा $\arg(z) - \arg(w) = \frac{\pi}{2}$, तो :

Options :

1. $\bar{z}w = -i$

2. $\bar{z}w = \frac{-1+i}{\sqrt{2}}$

3. $\bar{z}w = i$

4. $\bar{z}w = \frac{1-i}{\sqrt{2}}$

જો z અને w એ એવી બે સંકર સંખ્યાઓ છે કે જેથી

$$|zw| = 1 \text{ અને } \arg(z) - \arg(w) = \frac{\pi}{2} \text{ હોય તો :}$$

Options :

1. $\bar{z}w = -i$

2. $\bar{z}w = \frac{-1+i}{\sqrt{2}}$

3. $\bar{z}w = i$

4. $\bar{z}w = \frac{1-i}{\sqrt{2}}$

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

Correct Marks : 4 Wrong Marks : 1

The number of real roots of the equation

$$5 + |2^x - 1| = 2^x(2^x - 2) \text{ is :}$$

Options :

1. 4

2. 1

3. 2

4. 3

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

Correct Marks : 4 Wrong Marks : 1

समीकरण $5 + |2^x - 1| = 2^x(2^x - 2)$ के

वास्तविक मूलों की संख्या है :

Options :

1. 4

2. 1

3. 2

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

Correct Marks : 4 Wrong Marks : 1

સમીકરણ $5 + |2^x - 1| = 2^x(2^x - 2)$ ની
વાસ્તવિક બીજો ની સંખ્યા _____ છે.

Options :

1. 4

2. 1

3. 2

4. 3

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

Correct Marks : 4 Wrong Marks : 1

The sum of the real roots of the equation

$$\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0, \text{ is equal to:}$$

Options :

1. -4

2. 0

3. 1

4. 6

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

સમીકરણ $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0$, કે

વાસ્તવિક મૂલોં કા યોગફલ હૈ :

Options :

1. -4

2. 0

3. 1

4. 6

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

સમીકરણ $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0$ ની

વાસ્તવિક બીજોનો સરવાળો _____ છે.

Options :

1. -4

2. 0

3. 1

4. 6

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

Let λ be a real number for which the system

of linear equations

$$x + y + z = 6$$

$$4x + \lambda y - \lambda z = \lambda - 2$$

$$3x + 2y - 4z = -5$$

has infinitely many solutions. Then λ is a root of the quadratic equation :

Options :

1. $\lambda^2 + 3\lambda - 4 = 0$

2. $\lambda^2 - 3\lambda - 4 = 0$

3. $\lambda^2 + \lambda - 6 = 0$

4. $\lambda^2 - \lambda - 6 = 0$

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

માના λ એક એવી વાસ્તવિક સંખ્યા છે જેણે
રેખિક સમીકરણ નિકાલ

$$x + y + z = 6$$

$$4x + \lambda y - \lambda z = \lambda - 2$$

$$3x + 2y - 4z = -5$$

કે અનંત હલ છે. તો λ જેણે દ્વિઘાત સમીકરણ
એક મૂલ છે, તે છે :

Options :

1. $\lambda^2 + 3\lambda - 4 = 0$

2. $\lambda^2 - 3\lambda - 4 = 0$

3. $\lambda^2 + \lambda - 6 = 0$

4. $\lambda^2 - \lambda - 6 = 0$

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

ધારો કે λ એ એવી વાસ્તવિક સંખ્યા છે કે જેથી સુરેખ
સમીકરણ સંહિત

$$x + y + z = 6$$

$$4x + \lambda y - \lambda z = \lambda - 2$$

$$3x + 2y - 4z = -5$$

ને અનંત ઉકેલો હોય. તો λ એ દ્વિઘાત સમીકરણ
_____નું બીજ છે.

Options :

1. $\lambda^2 + 3\lambda - 4 = 0$

2. $\lambda^2 - 3\lambda - 4 = 0$

3. $\lambda^2 + \lambda - 6 = 0$

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

Suppose that 20 pillars of the same height have been erected along the boundary of a circular stadium. If the top of each pillar has been connected by beams with the top of all its non-adjacent pillars, then the total number of beams is :

Options :

1. 170
2. 190
3. 180
4. 210

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

માના એક વૃત્તીય સ્ટેડિયમ કી સીમા પર એક હી ઝૂંચાઈ કે 20 સ્તંભે સ્થાપિત કિયે ગયે હૈં। યદિ પ્રત્યેક સ્તંભે કે શિખર કો સમી અસંલગ્ન સ્તંભો કે શિખરો સે કડિયો (beams) દ્વારા જોડા ગયા હૈ, તો એસી કડિયો કી કુલ સંખ્યા હૈ :

Options :

1. 170
2. 190
3. 180
4. 210

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

ધારે કે એક સરખી ઊંચાઈના 20 સ્તંભો, એક વર્તુળાકાર સ્ટેડિયમની સીમા પર ઉભા કરેલ છે. જો દરેક સ્તંભની ટોચને તેની પાસપાસે ન હોય તેવા સ્તંભની ટોચ સાથે

1. 170
2. 190
3. 180
4. 210

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 smallest natural number n , such that the coefficient of x in the expansion of

$$\left(x^2 + \frac{1}{x^3}\right)^n \text{ is } {}^nC_{23}, \text{ is :}$$

Options :

1. 23
2. 38
3. 35
4. 58

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

वह न्यूनतम प्राकृत संख्या n , जिसके लिए

$$\left(x^2 + \frac{1}{x^3}\right)^n \text{ के प्रसार में } x \text{ का गुणांक } {}^nC_{23} \text{ है, है :}$$

Options :

1. 23
2. 38
3. 35
4. 58

$\left(x^2 + \frac{1}{x^3}\right)^n$ ના વિસ્તરણમાં x નો સહગુણ ${}^nC_{23}$

થાય તેવી નાનામાં નાની પ્રાકૃતિક સંખ્યા n કઈ છે?

Options :

1. 23
2. 38
3. 35
4. 58

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 in G.P. with common ratio

r , where $a \neq 0$ and $0 < r \leq \frac{1}{2}$. If $3a, 7b$ and

$15c$ are the first three terms of an A.P., then the 4th term of this A.P. is :

Options :

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

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

માના a, b તથા c ગુણોત્તર શ્રેણી મેં હૈં જિસકા સાર્વઅનુપાત

r હૈ, જહાં $a \neq 0$ ઔર $0 < r \leq \frac{1}{2}$ હૈ। યદિ $3a, 7b$

તથા $15c$ ઁક સમાંતર શ્રેણી કે પ્રથમ ત્રીન પદ હૈં, તો ઇસ સમાંતર શ્રેણી કા ચૌથા પદ હૈ :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે a, b અને c એ સામાન્ય ગુણોત્તર r હોય તેવી સમગુણોત્તર શ્રેણીમાં છે. જ્યાં $a \neq 0$ અને $0 < r \leq \frac{1}{2}$. જો $3a, 7b$ અને $15c$ એ એક સમાંતર શ્રેણીના પ્રથમ ત્રણ પદો હોય, તો આ સમાંતર શ્રેણીનું ચોથું પદ _____ છે.

Options :

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

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 $1 + \frac{1^3+2^3}{1+2} + \frac{1^3+2^3+3^3}{1+2+3} + \dots$

$+ \frac{1^3+2^3+3^3+\dots+15^3}{1+2+3+\dots+15} - \frac{1}{2}(1+2+3+\dots+15)$

is equal to :

Options :

1. 620

2. 660
3. 1240
4. 1860

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

$$\text{योगफल } 1 + \frac{1^3 + 2^3}{1 + 2} + \frac{1^3 + 2^3 + 3^3}{1 + 2 + 3} + \dots$$

$$+ \frac{1^3 + 2^3 + 3^3 + \dots + 15^3}{1 + 2 + 3 + \dots + 15} - \frac{1}{2}(1 + 2 + 3 + \dots + 15)$$

बराबर है :

Options :

1. 620
2. 660
3. 1240
4. 1860

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

$$1 + \frac{1^3 + 2^3}{1 + 2} + \frac{1^3 + 2^3 + 3^3}{1 + 2 + 3} + \dots$$

$$+ \frac{1^3 + 2^3 + 3^3 + \dots + 15^3}{1 + 2 + 3 + \dots + 15} - \frac{1}{2}(1 + 2 + 3 + \dots + 15)$$

$$= \underline{\hspace{2cm}}$$

Options :

1. 620
2. 660
3. 1240
4. 1860

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

If $\lim_{x \rightarrow 1} \frac{x^2 - ax + b}{x - 1} = 5$, then $a + b$ is equal to :

Options :

1. 1
2. 5
3. -4
4. -7

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

Correct Marks : 4 Wrong Marks : 1

यदि $\lim_{x \rightarrow 1} \frac{x^2 - ax + b}{x - 1} = 5$ है, तो $a + b$ बराबर है :

Options :

1. 1
2. 5
3. -4
4. -7

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

अतः $\lim_{x \rightarrow 1} \frac{x^2 - ax + b}{x - 1} = 5$, तब $a + b$ = _____.

Options :

1. 1
2. 5

4. -7

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

Correct Marks : 4 Wrong Marks : 1

Let $a_1, a_2, a_3, \dots$ be an A.P. with $a_6 = 2$. Then the common difference of this A.P., which maximises the product $a_1 a_4 a_5$, is :

Options :

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

2. $\frac{8}{5}$

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

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

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

माना $a_1, a_2, a_3, \dots$ एक समांतर श्रेणी है जिसमें $a_6 = 2$ है। तो इस समांतर श्रेणी का वह सार्वअंतर जो गुणनफल $a_1 a_4 a_5$ को अधिकतम करता है, है :

Options :

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

2. $\frac{8}{5}$

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

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

ધારો કે $a_1, a_2, a_3, \dots$ એક સમાંતર શ્રેણી છે જ્યાં $a_6 = 2$ છે. તો ગુણાકાર $a_1 a_4 a_5$ મહત્તમ થાય તેવો આ સમાંતર શ્રેણીનો સામાન્ય તફાવત _____ છે.

Options :

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

2. $\frac{8}{5}$

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

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

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

A spherical iron ball of radius 10 cm is coated with a layer of ice of uniform thickness that melts at a rate of $50 \text{ cm}^3/\text{min}$. When the thickness of the ice is 5 cm, then the rate at which the thickness (in cm/min) of the ice decreases, is :

Options :

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

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

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

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

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

10 સેમી ત્રિજ્યા કી લોહે કી ઁક ગોલાકાર ગેંદ કે ચારોં ઓર સમાન મોટાઈ કી બર્ફ કી તહ ચઢાઈ ગઈ હૈ, જો 50 ઘન સેમી/મિનટ કી દર સે પિઘલ રહી હૈ। જબ બર્ફ કી મોટાઈ 5 સેમી હૈ, તબ બર્ફ કી મોટાઈ કે ઘટને કી દર (સેમી/મિનટ) મેં, હૈ :

Options :

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

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

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

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

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

10 સે.મી. ત્રિજ્યાવાળો ઁક લોખંડનો ગોળાકાર દડો બરફના ઁક સરખી જાડાઈના થરથી ઢંકાયેલ છે, જે 50 સેમી³/મિનિટ ના દરે પીગળે છે. જ્યારે બરફની જાડાઈ 5 સેમી હોય ત્યારે બરફની જાડાઈ ઘટવાનો દર (સેમી/મિનિટમાં) _____ છે.

Options :

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

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

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

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

If the tangent to the curve $y = \frac{x}{x^2-3}$,

$x \in \mathbb{R}$, ($x \neq \pm \sqrt{3}$), at a point $(\alpha, \beta) \neq (0, 0)$ on it is parallel to the line $2x + 6y - 11 = 0$, then :

Options :

1. $|6\alpha + 2\beta| = 19$

2. $|2\alpha + 6\beta| = 11$

3. $|6\alpha + 2\beta| = 9$

4. $|2\alpha + 6\beta| = 19$

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

Correct Marks : 4 Wrong Marks : 1

यदि वक्र $y = \frac{x}{x^2-3}$, $x \in \mathbb{R}$, ($x \neq \pm \sqrt{3}$) के

एक बिंदु $(\alpha, \beta) \neq (0, 0)$ पर खींची गई स्पर्शरेखा, रेखा $2x + 6y - 11 = 0$ के समांतर है, तो :

Options :

1. $|6\alpha + 2\beta| = 19$

2. $|2\alpha + 6\beta| = 11$

3. $|6\alpha + 2\beta| = 9$

4. $|2\alpha + 6\beta| = 19$

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

Correct Marks : 4 Wrong Marks : 1

જો વક્ર $y = \frac{x}{x^2-3}$, $x \in \mathbb{R}$, ($x \neq \pm \sqrt{3}$) પરના

બિંદુ $(\alpha, \beta) \neq (0, 0)$ આગળનો સ્પર્શક રેખા $2x + 6y - 11 = 0$ ને સમાંતર હોય, તો :

1. $|6\alpha + 2\beta| = 19$

2. $|2\alpha + 6\beta| = 11$

3. $|6\alpha + 2\beta| = 9$

4. $|2\alpha + 6\beta| = 19$

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

Correct Marks : 4 Wrong Marks : 1

If $\int x^5 e^{-x^2} dx = g(x)e^{-x^2} + c$, where c is a constant of integration, then $g(-1)$ is equal to :

Options :

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

2. -1

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

4. 1

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

Correct Marks : 4 Wrong Marks : 1

यदि $\int x^5 e^{-x^2} dx = g(x)e^{-x^2} + c$ है, जहाँ c एक समाकलन अचर है, तो $g(-1)$ बराबर है :

Options :

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

2. -1

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

4. 1

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

Correct Marks : 4 Wrong Marks : 1

જો $\int x^5 e^{-x^2} dx = g(x)e^{-x^2} + c$, જ્યાં c

સંકલનનો અચળાંક હોય તો $g(-1) = \underline{\hspace{2cm}}$.

Options :

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

2. -1

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

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

The integral $\int_{\pi/6}^{\pi/3} \sec^{2/3} x \operatorname{cosec}^{4/3} x \, dx$ is

equal to :

Options :

1. $3^{5/3} - 3^{1/3}$

2. $3^{4/3} - 3^{1/3}$

3. $3^{5/6} - 3^{2/3}$

4. $3^{7/6} - 3^{5/6}$

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

સમાકલ $\int_{\pi/6}^{\pi/3} \sec^{2/3} x \operatorname{cosec}^{4/3} x \, dx$ બરાબર છે :

1. $3^{5/3} - 3^{1/3}$

2. $3^{4/3} - 3^{1/3}$

3. $3^{5/6} - 3^{2/3}$

4. $3^{7/6} - 3^{5/6}$

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

Correct Marks : 4 Wrong Marks : 1

$$\int_{\pi/6}^{\pi/3} \sec^{2/3} x \operatorname{cosec}^{4/3} x \, dx = \underline{\hspace{2cm}}.$$

Options :

1. $3^{5/3} - 3^{1/3}$

2. $3^{4/3} - 3^{1/3}$

3. $3^{5/6} - 3^{2/3}$

4. $3^{7/6} - 3^{5/6}$

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

Correct Marks : 4 Wrong Marks : 1

वक्रों $y=2^x$ तथा $y=|x+1|$ द्वारा प्रथम चतुर्थांश में
परिबद्ध क्षेत्र का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

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

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

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

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

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

વક્રો $y=2^x$ અને $y=|x+1|$ દ્વારા પ્રથમ ચરણમાં ઘેરાયેલ પ્રદેશનું ક્ષેત્રફળ (ચો.એકમમાં) _____ છે.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

The area (in sq. units) of the region bounded by the curves $y=2^x$ and $y=|x+1|$, in the first quadrant is :

Options :

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

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

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

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

Let $y = y(x)$ be the solution of the differential

equation, $\frac{dy}{dx} + y \tan x = 2x + x^2 \tan x,$

$x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, such that $y(0) = 1$. Then :

Options :

1. $y\left(\frac{\pi}{4}\right) - y\left(-\frac{\pi}{4}\right) = \sqrt{2}$

2. $y\left(\frac{\pi}{4}\right) + y\left(-\frac{\pi}{4}\right) = \frac{\pi^2}{2} + 2$

3. $y'\left(\frac{\pi}{4}\right) - y'\left(-\frac{\pi}{4}\right) = \pi - \sqrt{2}$

4. $y'\left(\frac{\pi}{4}\right) + y'\left(-\frac{\pi}{4}\right) = -\sqrt{2}$

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

माना $y = y(x)$, अवकल समीकरण

$$\frac{dy}{dx} + y \tan x = 2x + x^2 \tan x,$$

$x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, जबकि $y(0) = 1$ है, का हल है।

तो :

Options :

1. $y\left(\frac{\pi}{4}\right) - y\left(-\frac{\pi}{4}\right) = \sqrt{2}$

2. $y\left(\frac{\pi}{4}\right) + y\left(-\frac{\pi}{4}\right) = \frac{\pi^2}{2} + 2$

3. $y'\left(\frac{\pi}{4}\right) - y'\left(-\frac{\pi}{4}\right) = \pi - \sqrt{2}$

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

ધારો કે $y = y(x)$ એ વિકલ સમીકરણ

$$\frac{dy}{dx} + y \tan x = 2x + x^2 \tan x,$$

$x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ નો એવો ઉકેલ છે કે જેથી $y(0) = 1$

હોય તો :

Options :

1. $y\left(\frac{\pi}{4}\right) - y\left(-\frac{\pi}{4}\right) = \sqrt{2}$

2. $y\left(\frac{\pi}{4}\right) + y\left(-\frac{\pi}{4}\right) = \frac{\pi^2}{2} + 2$

3. $y'\left(\frac{\pi}{4}\right) - y'\left(-\frac{\pi}{4}\right) = \pi - \sqrt{2}$

4. $y'\left(\frac{\pi}{4}\right) + y'\left(-\frac{\pi}{4}\right) = -\sqrt{2}$

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

Lines are drawn parallel to the line

$4x - 3y + 2 = 0$, at a distance $\frac{3}{5}$ from the

origin. Then which one of the following points lies on any of these lines ?

Options :

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

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

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

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

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

રેખા $4x - 3y + 2 = 0$ કે સમાંતર રેખાએ ઝીંચી ગઈ છે
જો મૂલબિંદુ સે $\frac{3}{5}$ કી દૂરી પર છે। તો નિમ્ન મેં સે
કૌન-સા એક બિંદુ ઇનમેં સે કિસી રેખા પર સ્થિત છે?

Options :

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

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

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

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

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

ઉગમબિંદુથી $\frac{3}{5}$ અંતરે, રેખા $4x - 3y + 2 = 0$ ને
સમાંતર રેખાઓ દોરેલ છે. તો નીચેનામાંથી કયું બિંદુ
આમાંની કોઈક રેખા પર આવેલું છે?

Options :

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

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

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

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

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

The locus of the centres of the circles, which touch the circle, $x^2 + y^2 = 1$ externally, also touch the y -axis and lie in the first quadrant, is :

Options :

1. $y = \sqrt{1+2x}, x \geq 0$

2. $y = \sqrt{1+4x}, x \geq 0$

3. $x = \sqrt{1+4y}, y \geq 0$

4. $x = \sqrt{1+2y}, y \geq 0$

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

ऐसे वृत्तों, जो वृत्त $x^2 + y^2 = 1$ को बाह्य स्पर्श करते हैं, y -अक्ष को भी स्पर्श करते हैं तथा प्रथम चतुर्थांश में स्थित हैं, के केंद्रों का बिन्दुपथ है :

Options :

1. $y = \sqrt{1+2x}, x \geq 0$

2. $y = \sqrt{1+4x}, x \geq 0$

3. $x = \sqrt{1+4y}, y \geq 0$

4. $x = \sqrt{1+2y}, y \geq 0$

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

વર્તુળ $x^2 + y^2 = 1$ ને બહારથી સ્પર્શતા તેમજ y -અક્ષને સ્પર્શતા અને પ્રથમ ચરણમાં આવેલા વર્તુળોનાં કેન્દ્રનો બિંદુપથ _____ છે.

Options :

1. $y = \sqrt{1+2x}, x \geq 0$

2. $y = \sqrt{1+4x}, x \geq 0$

3. $x = \sqrt{1+4y}, y \geq 0$

4. $x = \sqrt{1+2y}, y \geq 0$

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 line $ax + y = c$, touches both the curves

$x^2 + y^2 = 1$ and $y^2 = 4\sqrt{2}x$, then $|c|$ is equal to :

Options :

1. $\sqrt{2}$

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

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

4. 2

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

Correct Marks : 4 Wrong Marks : 1

यदि रेखा $ax + y = c$, दोनों वक्रों $x^2 + y^2 = 1$ तथा

$y^2 = 4\sqrt{2}x$, को स्पर्श करती है, तो $|c|$ बराबर है :

Options :

1. $\sqrt{2}$

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

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

4. 2

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

Correct Marks : 4 Wrong Marks : 1

જો રેખા $ax + y = c$ એ બંને વક્રો $x^2 + y^2 = 1$ અને $y^2 = 4\sqrt{2}x$ ને સ્પર્શે તો $|c| =$ _____.

Options :

1. $\sqrt{2}$

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

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

4. 2

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

Correct Marks : 4 Wrong Marks : 1

The tangent and normal to the ellipse $3x^2 + 5y^2 = 32$ at the point $P(2, 2)$ meet the x -axis at Q and R , respectively. Then the area (in sq. units) of the triangle PQR is :

Options :

1. $\frac{34}{15}$

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

3. $\frac{14}{3}$

4. $\frac{68}{15}$

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

दीर्घवृत्त $3x^2 + 5y^2 = 32$ के बिंदु $P(2, 2)$ पर खींची गई स्पर्शरेखा तथा अभिलंब, x -अक्ष को क्रमशः Q तथा R पर काटते हैं। तो त्रिभुज PQR का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1. $\frac{34}{15}$

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

3. $\frac{14}{3}$

4. $\frac{68}{15}$

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

ઉપવલય $3x^2 + 5y^2 = 32$ ના બિંદુ $P(2, 2)$ આગળના સ્પર્શક અને અભિલંબ x -અક્ષને અનુક્રમે Q અને R માં છેદે છે. તો ત્રિકોણ PQR નું ક્ષેત્રફળ (ચો.એકમમાં) _____ છે.

Options :

1. $\frac{34}{15}$

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

3. $\frac{14}{3}$

4. $\frac{68}{15}$

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

Correct Marks : 4 Wrong Marks : 1

If $5x + 9 = 0$ is the directrix of the hyperbola $16x^2 - 9y^2 = 144$, then its corresponding focus is :

Options :

1. $(-5, 0)$

2. $(5, 0)$

3. $\left(-\frac{5}{3}, 0\right)$

4. $\left(\frac{5}{3}, 0\right)$

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

Correct Marks : 4 Wrong Marks : 1

यदि अतिपरवलय $16x^2 - 9y^2 = 144$ की नियता (directrix) $5x + 9 = 0$ है, तो इसका संगत नाभिकेंद्र है :

Options :

1. $(-5, 0)$

2. $(5, 0)$

3. $\left(-\frac{5}{3}, 0\right)$

4. $\left(\frac{5}{3}, 0\right)$

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

Correct Marks : 4 Wrong Marks : 1

જો $5x + 9 = 0$ એ અતિવલય $16x^2 - 9y^2 = 144$ ની નિયામિકા હોય તો તેને અનુરૂપ નાભિ _____ છે.

1. $(-5, 0)$
2. $(5, 0)$
3. $\left(-\frac{5}{3}, 0\right)$
4. $\left(\frac{5}{3}, 0\right)$

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

A perpendicular is drawn from a point on

the line $\frac{x-1}{2} = \frac{y+1}{-1} = \frac{z}{1}$ to the plane

$x + y + z = 3$ such that the foot of the perpendicular Q also lies on the plane $x - y + z = 3$. Then the co-ordinates of Q are :

Options :

1. $(2, 0, 1)$
2. $(1, 0, 2)$
3. $(-1, 0, 4)$
4. $(4, 0, -1)$

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

Correct Marks : 4 Wrong Marks : 1

रेखा $\frac{x-1}{2} = \frac{y+1}{-1} = \frac{z}{1}$ के एक बिंदु से समतल

$x + y + z = 3$ पर एक लंब इस प्रकार डाला गया कि इसका लंबपाद Q, समतल $x - y + z = 3$ पर भी स्थित है। तो Q के निर्देशांक हैं :

Options :

1. $(2, 0, 1)$

3. $(-1, 0, 4)$

4. $(4, 0, -1)$

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

Correct Marks : 4 Wrong Marks : 1

રેખા $\frac{x-1}{2} = \frac{y+1}{-1} = \frac{z}{1}$ પરના એક બિંદુથી સમતલ

$x + y + z = 3$ પર એક એવો લંબ દોરેલો છે કે જેથી લંબનો લંબપાદ Q એ સમતલ $x - y + z = 3$ પર પડે હોય તો Q ના યામ _____ છે.

Options :

1. $(2, 0, 1)$

2. $(1, 0, 2)$

3. $(-1, 0, 4)$

4. $(4, 0, -1)$

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

Correct Marks : 4 Wrong Marks : 1

If the plane $2x - y + 2z + 3 = 0$ has the

distances $\frac{1}{3}$ and $\frac{2}{3}$ units from the planes

$4x - 2y + 4z + \lambda = 0$ and $2x - y + 2z + \mu = 0$, respectively, then the maximum value of $\lambda + \mu$ is equal to :

Options :

1. 5

2. 9

3. 13

4. 15

Question Number : 84 Question Type : MCO Option Shuffling : Yes Display Question Number

यदि समतल $2x - y + 2z + 3 = 0$ की समतलों
 $4x - 2y + 4z + \lambda = 0$ तथा $2x - y + 2z + \mu = 0$ से
दूरियाँ क्रमशः $\frac{1}{3}$ तथा $\frac{2}{3}$ इकाइयाँ हैं, तो $\lambda + \mu$ का
अधिकतम मान है :

Options :

1. 5
2. 9
3. 13
4. 15

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

જો સમતલ $2x - y + 2z + 3 = 0$ ની સમતલો
 $4x - 2y + 4z + \lambda = 0$ અને $2x - y + 2z + \mu = 0$ થી
અંતરો અનુક્રમે $\frac{1}{3}$ અને $\frac{2}{3}$ એકમ હોય તો $\lambda + \mu$ ની
મહત્તમ કિંમત _____ છે.

Options :

1. 5
2. 9
3. 13
4. 15

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

Correct Marks : 4 Wrong Marks : 1

The distance of the point having position
vector $-\hat{i} + 2\hat{j} + 6\hat{k}$ from the straight
line passing through the point $(2, 3, -4)$
and parallel to the vector, $6\hat{i} + 3\hat{j} - 4\hat{k}$
is :

1. 6

2. 7

3. $2\sqrt{13}$

4. $4\sqrt{3}$

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

एक बिंदु जिसका स्थिति सदिश $-\hat{i} + 2\hat{j} + 6\hat{k}$ है, की एक सरल रेखा, जो बिंदु $(2, 3, -4)$ से होकर जाती है तथा सदिश $6\hat{i} + 3\hat{j} - 4\hat{k}$ के समांतर है, से दूरी है :

Options :

1. 6

2. 7

3. $2\sqrt{13}$

4. $4\sqrt{3}$

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

જેનો સ્થાન સદિશ $-\hat{i} + 2\hat{j} + 6\hat{k}$ હોય તેવા બિંદુનું, બિંદુ $(2, 3, -4)$ માંથી પસાર થતી અને સદિશ $6\hat{i} + 3\hat{j} - 4\hat{k}$ ને સમાંતર હોય તેવી તો રેખા થી અંતર _____ છે.

Options :

1. 6

2. 7

3. $2\sqrt{13}$

4. $4\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

If both the mean and the standard deviation of 50 observations $x_1, x_2, \dots, x_{50}$ are equal to 16, then the mean of $(x_1 - 4)^2, (x_2 - 4)^2, \dots, (x_{50} - 4)^2$ is :

Options :

1. 380

2. 400

3. 480

4. 525

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

Correct Marks : 4 Wrong Marks : 1

यदि 50 प्रेक्षणों $x_1, x_2, \dots, x_{50}$ का माध्य तथा मानक विचलन दोनों 16 हैं, तो $(x_1 - 4)^2, (x_2 - 4)^2, \dots, (x_{50} - 4)^2$ का माध्य है :

Options :

1. 380

2. 400

3. 480

4. 525

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

Correct Marks : 4 Wrong Marks : 1

જો 50 અવલોકનો $x_1, x_2, \dots, x_{50}$ નો માધ્યક અને પ્રમાણિત વિચલન બંને 16 હોય તો $(x_1 - 4)^2, (x_2 - 4)^2, \dots, (x_{50} - 4)^2$ નો મધ્યક _____ છે.

Options :

2. 400

3. 480

4. 525

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

Minimum number of times a fair coin must be tossed so that the probability of getting at least one head is more than 99% is :

Options :

1. 5

2. 6

3. 7

4. 8

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 न्याय्य सिक्के को न्यूनतम कितनी बार उछालें कि कम से कम एक चित्त आने की प्रायिकता 99% से अधिक हो?

Options :

1. 5

2. 6

3. 7

4. 8

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

ઓછામાં ઓછી એક વખત છાપ મળે તેની સંભાવના

1. 5

2. 6

3. 7

4. 8

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

Correct Marks : 4 Wrong Marks : 1

If $\cos^{-1} x - \cos^{-1} \frac{y}{2} = \alpha$, where $-1 \leq x \leq 1$,

$-2 \leq y \leq 2$, $x \leq \frac{y}{2}$, then for all x, y ,

$4x^2 - 4xy \cos \alpha + y^2$ is equal to :

Options :

1. $2 \sin^2 \alpha$

2. $4 \sin^2 \alpha - 2x^2 y^2$

3. $4 \sin^2 \alpha$

4. $4 \cos^2 \alpha + 2x^2 y^2$

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

Correct Marks : 4 Wrong Marks : 1

यदि $\cos^{-1} x - \cos^{-1} \frac{y}{2} = \alpha$, जहाँ $-1 \leq x \leq 1$,

$-2 \leq y \leq 2$, $x \leq \frac{y}{2}$ है, तो सभी x, y के लिए,

$4x^2 - 4xy \cos \alpha + y^2$ बराबर है :

Options :

1. $2 \sin^2 \alpha$

2. $4 \sin^2 \alpha - 2x^2 y^2$

3. $4 \sin^2 \alpha$

4. $4 \cos^2 \alpha + 2x^2 y^2$

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 $\cos^{-1} x - \cos^{-1} \frac{y}{2} = \alpha$ જ્યાં $-1 \leq x \leq 1$,

$-2 \leq y \leq 2$, $x \leq \frac{y}{2}$, તો પ્રત્યેક x, y માટે

$4x^2 - 4xy \cos \alpha + y^2 = \underline{\hspace{2cm}}$.

Options :

1. $2 \sin^2 \alpha$

2. $4 \sin^2 \alpha - 2x^2 y^2$

3. $4 \sin^2 \alpha$

4. $4 \cos^2 \alpha + 2x^2 y^2$

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

The angles A, B and C of a triangle ABC are in A.P. and $a : b = 1 : \sqrt{3}$. If $c = 4$ cm, then the area (in sq.cm) of this triangle is :

Options :

1. $4\sqrt{3}$

2. $2\sqrt{3}$

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

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

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

एक त्रिभुज ABC के कोण A, B तथा C समांतर श्रेणी में हैं तथा $a : b = 1 : \sqrt{3}$ है। यदि $c = 4$ सेमी है, तो इस त्रिभुज का क्षेत्रफल (वर्ग सेमी में) है :

Options :

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

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

ત્રિકોણ ABC ના ખૂણાઓ A, B અને C સમાંતર શ્રેણીમાં છે અને $a : b = 1 : \sqrt{3}$ છે. જો $c = 4$ સેમી હોય તો ત્રિકોણનું ક્ષેત્રફળ (ચો.સેમીમાં) _____ છે.

Options :

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

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 negation of the Boolean expression

$\sim s \vee (\sim r \wedge s)$ is equivalent to :

Options :

1. $s \vee r$

3. r

4. $\sim s \wedge \sim r$

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

बूले व्यंजक $\sim s \vee (\sim r \wedge s)$ का निषेधन निम्न में से किस के समतुल्य है?

Options :

1. $s \vee r$

2. $s \wedge r$

3. r

4. $\sim s \wedge \sim r$

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

બુલિયન નિરૂપણ $\sim s \vee (\sim r \wedge s)$ નું નિષેધ એ _____ ને સમકક્ષ છે.

Options :

1. $s \vee r$

2. $s \wedge r$

3. r

4. $\sim s \wedge \sim r$