

# National Testing Agency

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**Display Marks:** Yes

## Paper I

**Group Number :** 1  
**Group Id :** 416529122  
**Group Maximum Duration :** 0  
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## Physics

**Section Id :** 416529148  
**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:** 416529157  
**Question Shuffling Allowed :** Yes

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

**Correct Marks : 4 Wrong Marks : 1**

The least count of the main scale of a screw gauge is 1 mm. The minimum number of divisions on its circular scale required to measure 5  $\mu\text{m}$  diameter of a wire is :

**Options :**

1. 50

2. 100

3. 200

4. 500

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

Correct Marks : 4 Wrong Marks : 1

एक पेंचमापी के मुख्य पैमाने का अल्पतमांक 1 mm है। 5  $\mu\text{m}$  व्यास के तार का व्यास नापने के लिए इसके वृत्तीय पैमाने पर न्यूनतम भागों की संख्या होगी :

Options :

1. 50

2. 100

3. 200

4. 500

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

Correct Marks : 4 Wrong Marks : 1

એક સ્ક્રૂગેજની મુખ્ય માપપટ્ટીની લઘુત્તમ માપશક્તિ 1 mm છે. 5  $\mu\text{m}$  અને તેથી વધારે નો વ્યાસ ધરાવતાં તારોનો વ્યાસ માપવા માટે તેના વર્તુળાકાર માપપટ્ટી પર જરૂરી ઓછામાં ઓછા કાપાઓની સંખ્યા હશે :

Options :

1. 50

2. 100

3. 200

4. 500

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

A person standing on an open ground hears the sound of a jet aeroplane, coming from north at an angle  $60^\circ$  with ground level. But he finds the aeroplane right vertically above his position. If  $v$  is the speed of sound, speed of the plane is :

Options :

1.  $v$

2.  $\frac{v}{2}$

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

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

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

Correct Marks : 4 Wrong Marks : 1

खुले मैदान में खड़े एक व्यक्ति को उत्तर दिशा से आते हुए एक जेट एरोप्लेन की आवाज, धरती से  $60^\circ$  के कोण की दिशा से आती हुयी सुनाई देती है। लेकिन उसे यह हवाई जहाज अपने ठीक ऊपर दिखाई देता है। यदि ध्वनि की चाल  $v$  है तो हवाई जहाज की चाल होगी :

Options :

1.  $v$

2.  $\frac{v}{2}$

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

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

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

Correct Marks : 4 Wrong Marks : 1

ખુલ્લા મેદાનમાં ઉભેલ એક વ્યક્તિ મેદાન સાથે  $60^\circ$  નો ખુણો બનાવી ઉત્તર દિશામાંથી આવતા એક જેટ એરોપ્લેનનો અવાજ સાંભળે છે. પરંતુ તેના સ્થાનથી તેને આ એરોપ્લેન બરાબર શિરોલંબ દેખાય છે. જો  $v$  એ અવાજની ઝડપ હોય તો આ પ્લેનની ઝડપ \_\_\_\_\_ છે.

Options :

1.  $v$

2.  $\frac{v}{2}$

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

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

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

Correct Marks : 4 Wrong Marks : 1

A passenger train of length 60 m travels at a speed of 80 km/hr. Another freight train of length 120 m travels at a speed of 30 km/hr. The ratio of times taken by the passenger train to completely cross the freight train when : (i) they are moving in the same direction, and (ii) in the opposite directions is :

Options :

1.  $\frac{25}{11}$

2.  $\frac{11}{5}$

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

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

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

Correct Marks : 4 Wrong Marks : 1

एक 60 m लम्बी यात्री गाड़ी 80 km/hr की गति से चल रही है। 120 m लम्बाई की और एक माल गाड़ी 30 km/hr से चल रही है। ऐसे समयों का अनुपात जो यात्री गाड़ी को मालगाड़ी को पार करने में लगेंगे जब (i) गाड़ियाँ एक ही दिशा में जा रही हैं, और (ii) गाड़ियाँ विरोधी दिशाओं में जा रही हैं, होगा :

Options :

1.  $\frac{25}{11}$

2.  $\frac{11}{5}$

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

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

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

60 m લાંબી એક મુસાફર ટ્રેન 80 km/કલાક ની ઝડપથી ગતિ કરે છે. એક બીજી 120 m લાંબી માલગાડી 30 km/કલાકની ઝડપથી ગતિ કરે છે. જ્યારે (i) બન્ને ગાડીઓ એકજ દિશામાં ગતિ કરતી હોય, અને (ii) વિરુદ્ધ દિશામાં ગતિ કરતી હોય ત્યારે મુસાફર ટ્રેનને પૂરી રીતે માલગાડીની આગળ નીકળતા લાગતા સમયનો ગુણોત્તર :

Options :

1.  $\frac{25}{11}$

2.  $\frac{11}{5}$

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

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

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

Correct Marks : 4 Wrong Marks : 1

A simple pendulum, made of a string of length  $l$  and a bob of mass  $m$ , is released from a small angle  $\theta_0$ . It strikes a block of mass  $M$ , kept on a horizontal surface at its lowest point of oscillations, elastically. It bounces back and goes up to an angle  $\theta_1$ . Then  $M$  is given by :

Options :

1.  $\frac{m}{2} \left( \frac{\theta_0 - \theta_1}{\theta_0 + \theta_1} \right)$

2.  $\frac{m}{2} \left( \frac{\theta_0 + \theta_1}{\theta_0 - \theta_1} \right)$

3.  $m \left( \frac{\theta_0 + \theta_1}{\theta_0 - \theta_1} \right)$

4.  $m \left( \frac{\theta_0 - \theta_1}{\theta_0 + \theta_1} \right)$

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

Correct Marks : 4 Wrong Marks : 1

एक सरल दोलक, जो कि  $l$  लम्बाई की डोरी तथा  $m$  द्रव्यमान के गोलक से बना है, को एक छोटे कोण  $\theta_0$  से छोड़ा जाता है। यह गोलक एक द्रव्यमान  $M$  के गुटके को, जो कि क्षैतिज समतल पर रखा है, अपने दोलन के न्यूनतम बिन्दु पर प्रत्यास्थ संघट्ट करता है। गोलक संघट्ट कर कोण  $\theta_1$  तक जाता है। तो  $M$  का मान होगा :

Options :

1.  $\frac{m}{2} \left( \frac{\theta_0 - \theta_1}{\theta_0 + \theta_1} \right)$

2.  $\frac{m}{2} \left( \frac{\theta_0 + \theta_1}{\theta_0 - \theta_1} \right)$



3.  $m \left( \frac{\theta_0 + \theta_1}{\theta_0 - \theta_1} \right)$

4.  $m \left( \frac{\theta_0 - \theta_1}{\theta_0 + \theta_1} \right)$

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

Correct Marks : 4 Wrong Marks : 1

1 લંબાઈની દોરી ધરાવતાં અને  $m$  દ્રવ્યમાન ગોલક ધરાવતા એક સાદા લોલકને કોઈ એક નાના કોણ  $\theta_0$  થી છોડવામાં આવે છે. ખરબચડી સમક્ષિતિજ સપાટી પર મુકેલ  $M$  દ્રવ્યમાનના ચોસલાને તે તેના નિમ્ન બિંદુ પર સ્થિતિસ્થાપક રીતે અથડાય છે. તે પાછો ફેંકાય છે અને કોણ  $\theta_1$  સુધી પહોંચે છે, તો  $M$  ને \_\_\_\_\_ થી આપવામાં આવે છે.

Options :

1.  $\frac{m}{2} \left( \frac{\theta_0 - \theta_1}{\theta_0 + \theta_1} \right)$

2.  $\frac{m}{2} \left( \frac{\theta_0 + \theta_1}{\theta_0 - \theta_1} \right)$

3.  $m \left( \frac{\theta_0 + \theta_1}{\theta_0 - \theta_1} \right)$

4.  $m \left( \frac{\theta_0 - \theta_1}{\theta_0 + \theta_1} \right)$

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 satellite of mass  $M$  is in a circular orbit of radius  $R$  about the centre of the earth. A meteorite of the same mass, falling towards the earth, collides with the satellite completely inelastically. The speeds of the satellite and the meteorite are the same, just before the collision. The subsequent motion of the combined body will be :

Options :

1. in the same circular orbit of radius R
2. in a circular orbit of a different radius
3. in an elliptical orbit
4. such that it escapes to infinity

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

Correct Marks : 4 Wrong Marks : 1

M દ્રવ્યમાન કા એક ઉપગ્રહ પૃથ્વી કો પરિતઃ R ત્રિજ્યા કી એક વૃત્તીય કક્ષા મેં ઘૂર્ણન કર રહા હૈ। સમાન દ્રવ્યમાન કા એક ધૂમકેતૂ પૃથ્વી કી ઓર ગિરતે હુએ, ઇસ ઉપગ્રહ કો સાથ પૂર્ણતયા અપ્રત્યાસ્થ સંઘટ્ટ કરતા હૈ। ઉપગ્રહ તથા ધૂમકેતૂ કી ચાલેં સંઘટ્ટ સે ઠીક પહલે બરાબર હૈં। સંઘટ્ટ કો બાદ સંયુક્ત પિણ્ડ કી ગતિ હોગી :

Options :

1. R ત્રિજ્યા કી ઁસી વૃત્તીય કક્ષા મેં
2. ભિન્ન ત્રિજ્યા કી એક વૃત્તીય કક્ષા મેં
3. ઢીર્ઘવૃત્તીય કક્ષા મેં
4. ઇસ પ્રકાર કિ યહ અનન્ત મેં પલાયન કર જાયેગા

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

પૃથ્વીના કેન્દ્રની સાપેક્ષે R ત્રિજ્યાના વર્તુળાકાર કક્ષામાં M દ્રવ્યમાનનો એક ઉપગ્રહ છે. સમાન દ્રવ્યમાનનો એક ઊલ્કા પૃથ્વીના કેન્દ્રતરફ મુક્ત પતન કરી રહેલ છે. અને આ ઉપગ્રહ સાથે ઉપગ્રહની ઝડપ જેટલી ઝડપથી ઉપગ્રહ સાથે અસ્થિતિસ્થાપક અથડામણ અનુભવે છે. અને આ ઉપગ્રહ સાથે જોડાઈ જાય છે. આ સંયુક્ત પદાર્થની ત્યાર બાદની ગતિ \_\_\_\_\_ હશે.

Options :

1. R ત્રિજ્યાના તે જ વર્તુળાકાર કક્ષામાં ગતિ



2. જુદી ત્રિજ્યાની બીજી વર્તુળાકાર કક્ષામાં ગતિ

3. ઉપવલય કક્ષામાં ગતિ

એવી રીતે કે જેથી પૃથ્વીના ગુરૂત્વ ક્ષેત્રમાંથી અનંત

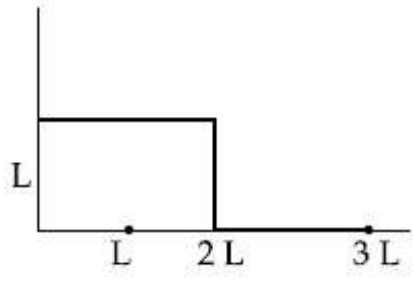
4. સુધી છટકી જાય.

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

The position vector of the centre of mass

$\vec{r}_{cm}$  of an asymmetric uniform bar of negligible area of cross-section as shown in figure is :



Options :

1.  $\vec{r}_{cm} = \frac{13}{8} L \hat{x} + \frac{5}{8} L \hat{y}$

2.  $\vec{r}_{cm} = \frac{5}{8} L \hat{x} + \frac{13}{8} L \hat{y}$

3.  $\vec{r}_{cm} = \frac{11}{8} L \hat{x} + \frac{3}{8} L \hat{y}$

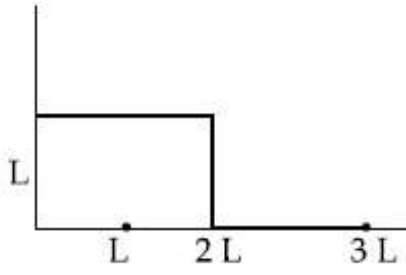
4.  $\vec{r}_{cm} = \frac{3}{8} L \hat{x} + \frac{11}{8} L \hat{y}$

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

चित्र में दिखायी गयी असममित किन्तु एकसमान छड़ जिसकी अनुप्रस्थ काट का क्षेत्रफल नगण्य है, के द्रव्यमान

केन्द्र का स्थिति सदिश,  $\vec{r}_{cm}$  होगा :



Options :

1.  $\vec{r}_{cm} = \frac{13}{8} L \hat{x} + \frac{5}{8} L \hat{y}$

2.  $\vec{r}_{cm} = \frac{5}{8} L \hat{x} + \frac{13}{8} L \hat{y}$

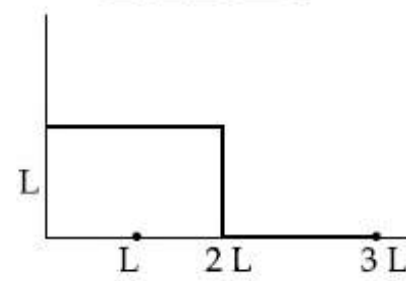
3.  $\vec{r}_{cm} = \frac{11}{8} L \hat{x} + \frac{3}{8} L \hat{y}$

4.  $\vec{r}_{cm} = \frac{3}{8} L \hat{x} + \frac{11}{8} L \hat{y}$

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

आकृतिमां भताव्या प्रमाणे अवगाण्य आऽछेदनुं क्षेत्रफल धरावता अेक असंभित समान चोसलानुं द्रव्यमान केन्द्र

$\vec{r}_{cm}$  \_\_\_\_\_ हसे.



Options :

1.  $\vec{r}_{cm} = \frac{13}{8} L \hat{x} + \frac{5}{8} L \hat{y}$

2.  $\vec{r}_{cm} = \frac{5}{8} L \hat{x} + \frac{13}{8} L \hat{y}$

3.  $\vec{r}_{cm} = \frac{11}{8} L \hat{x} + \frac{3}{8} L \hat{y}$

4.  $\vec{r}_{cm} = \frac{3}{8} L \hat{x} + \frac{11}{8} L \hat{y}$

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

Let the moment of inertia of a hollow cylinder of length 30 cm (inner radius 10 cm and outer radius 20 cm), about its axis be  $I$ . The radius of a thin cylinder of the same mass such that its moment of inertia about its axis is also  $I$ , is :

Options :

1. 14 cm
2. 12 cm
3. 18 cm
4. 16 cm

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

आंतरिक त्रिज्या 10 cm, बाह्य त्रिज्या 20 cm तथा लम्बाई 30 cm के एक खोखले बेलन का जड़त्व आघूर्ण, उसकी अक्ष के परितः  $I$  है। उसी द्रव्यमान के एक ऐसे खोखले एवं पतले बेलन की त्रिज्या, जिसका अपने अक्ष के परितः जड़त्व आघूर्ण  $I$  ही है, होगी :

Options :

1. 14 cm
2. 12 cm
3. 18 cm
4. 16 cm

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

30 cm લંબાઈના એક પોલા નળાકારની (અંદરની ત્રિજ્યા 10 cm અને બહારની ત્રિજ્યા 20 cm) તેના અક્ષની સાપેક્ષે જડત્વની ચાકમાત્રા I છે. આવું સમાન દ્રવ્યમાન ધરાવતા એક પાતળા નળાકારની તેના અક્ષની સાપેક્ષે જડત્વની ચાકમાત્રા પણ I છે, તો તેની ત્રિજ્યા \_\_\_\_\_ હશે.

Options :

1. 14 cm
2. 12 cm
3. 18 cm
4. 16 cm

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 straight rod of length L extends from  $x = a$  to  $x = L + a$ . The gravitational force it exerts on a point mass 'm' at  $x = 0$ , if the mass per unit length of the rod is  $A + Bx^2$ , is given by:

Options :

1.  $Gm \left[ A \left( \frac{1}{a+L} - \frac{1}{a} \right) + BL \right]$
2.  $Gm \left[ A \left( \frac{1}{a} - \frac{1}{a+L} \right) + BL \right]$
3.  $Gm \left[ A \left( \frac{1}{a+L} - \frac{1}{a} \right) - BL \right]$
4.  $Gm \left[ A \left( \frac{1}{a} - \frac{1}{a+L} \right) - BL \right]$

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

लम्बाई  $L$  की एक छड़  $x=a$  तथा  $x=L+a$  के मध्य रखी है। यदि इस छड़ का प्रति इकाई लम्बाई द्रव्यमान  $A+Bx^2$  है, तो बिन्दु  $x=0$  पर रखे हुए एक बिन्दु द्रव्यमान  $m$  पर, छड़ द्वारा लगाया गुरुत्वीय बल होगा :

Options :

1.  $Gm \left[ A \left( \frac{1}{a+L} - \frac{1}{a} \right) + BL \right]$

2.  $Gm \left[ A \left( \frac{1}{a} - \frac{1}{a+L} \right) + BL \right]$

3.  $Gm \left[ A \left( \frac{1}{a+L} - \frac{1}{a} \right) - BL \right]$

4.  $Gm \left[ A \left( \frac{1}{a} - \frac{1}{a+L} \right) - BL \right]$

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

$L$  लंबाईનો એક સીધો સળીયો  $x=a$  થી  $x=L+a$  સુધી લંબાયેલ છે. જો દ્રવ્યમાન પ્રતિ એકમ લંબાઈએ  $A+Bx^2$  હોય તો  $x=0$  પર બિંદુવત્ દ્રવ્યમાન  $m$  પર તેનાથી લાગતું ગુરૂત્વાકર્ષણ બળ :

Options :

1.  $Gm \left[ A \left( \frac{1}{a+L} - \frac{1}{a} \right) + BL \right]$

2.  $Gm \left[ A \left( \frac{1}{a} - \frac{1}{a+L} \right) + BL \right]$

3.  $Gm \left[ A \left( \frac{1}{a+L} - \frac{1}{a} \right) - BL \right]$

4.  $Gm \left[ A \left( \frac{1}{a} - \frac{1}{a+L} \right) - BL \right]$

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

Correct Marks : 4 Wrong Marks : 1

A cylinder of radius  $R$  is surrounded by a cylindrical shell of inner radius  $R$  and outer radius  $2R$ . The thermal conductivity of the material of the inner cylinder is  $K_1$  and that of the outer cylinder is  $K_2$ . Assuming no loss of heat, the effective thermal conductivity of the system for heat flowing along the length of the cylinder is :

Options :

1.  $K_1 + K_2$

2.  $\frac{K_1 + K_2}{2}$

3.  $\frac{K_1 + 3K_2}{4}$

4.  $\frac{2K_1 + 3K_2}{5}$

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

त्रिज्या  $R$  का एक बेलन एक बेलनाकार कोश, जिसकी आंतरिक त्रिज्या  $R$  तथा बाह्य त्रिज्या  $2R$  है, से घिरा है। आंतरिक बेलन की ऊष्मा चालकता  $K_1$  तथा बाह्य बेलन की ऊष्मा चालकता  $K_2$  है। माना कि बेलनों से ऊष्मा क्षय शून्य है, तो इस निकाय की प्रभावी ऊष्मा चालकता, जबकि ऊष्मा का प्रवाह बेलन की लम्बाई के अनुदिश है, होगी :

Options :

1.  $K_1 + K_2$

2.  $\frac{K_1 + K_2}{2}$

3.  $\frac{K_1 + 3K_2}{4}$

4.  $\frac{2K_1 + 3K_2}{5}$

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

R ત્રિજ્યાનો એક નળાકાર કે જેની અંદરની ત્રિજ્યા R અને બહારની ત્રિજ્યા 2R છે તેવા નળાકાર કોષથી ઘેરાયેલ છે. અંદરના નળાકારના દ્રવ્યની ઊષ્માવાહકતા  $K_1$  છે જ્યારે બહારના નળાકારની  $K_2$  છે. ઊષ્માનો વ્યય નથી તેમ ધારતા નળાકારની લંબાઈ તરફ વહેતી ઊષ્મા માટે આ તંત્રની ઊષ્માવાહકતા \_\_\_\_\_ છે.

Options :

1.  $K_1 + K_2$

2.  $\frac{K_1 + K_2}{2}$

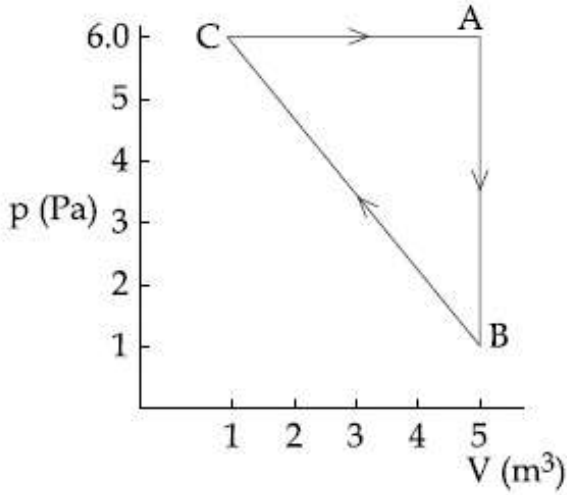
3.  $\frac{K_1 + 3K_2}{4}$

4.  $\frac{2K_1 + 3K_2}{5}$

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

For the given cyclic process CAB as shown for a gas, the work done is :



Options :

1. 30 J

2. 10 J

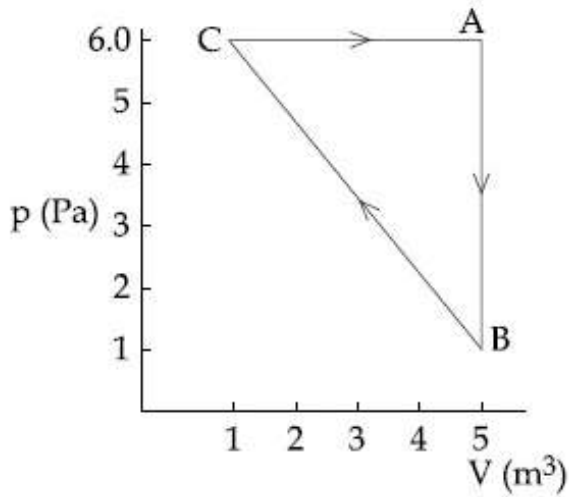
3. 5 J

4. 1 J

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

Correct Marks : 4 Wrong Marks : 1

एक गैस के लिए दिए गए चक्रीय प्रक्रम CAB में किया गया कार्य है :



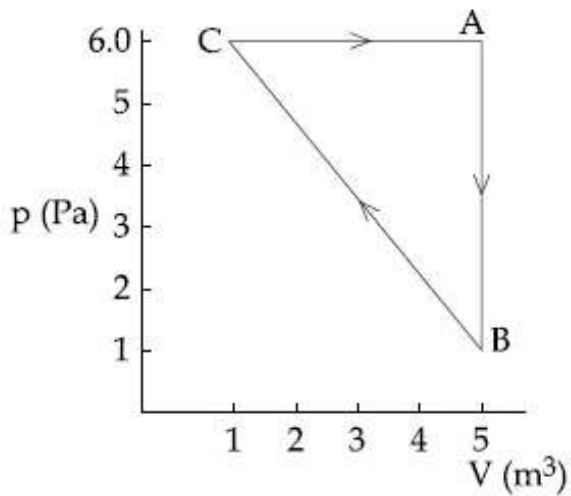
Options :

1. 30 J
2. 10 J
3. 5 J
4. 1 J

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

Correct Marks : 4 Wrong Marks : 1

કોઈ એક વાયુમાટે બતાવ્યા પ્રમાણે આપેલ ચક્રીય પ્રક્રીયા CAB માટે થતું કાર્ય :



Options :

1. 30 J
2. 10 J

3. 5J

4. 1J

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

An ideal gas occupies a volume of  $2 \text{ m}^3$  at a pressure of  $3 \times 10^6 \text{ Pa}$ . The energy of the gas is :

Options :

1.  $10^8 \text{ J}$

2.  $3 \times 10^2 \text{ J}$

3.  $9 \times 10^6 \text{ J}$

4.  $6 \times 10^4 \text{ J}$

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

Correct Marks : 4 Wrong Marks : 1

$3 \times 10^6 \text{ Pa}$  दाब पर एक आदर्श गैस  $2 \text{ m}^3$  आयतन घेरती है। इस गैस की ऊर्जा होगी :

Options :

1.  $10^8 \text{ J}$

2.  $3 \times 10^2 \text{ J}$

3.  $9 \times 10^6 \text{ J}$

4.  $6 \times 10^4 \text{ J}$

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

Correct Marks : 4 Wrong Marks : 1

એક આદર્શ વાયુ  $3 \times 10^6 \text{ Pa}$  દબાણે  $2 \text{ m}^3$  કદ રોકે છે. આ વાયુની ઊર્જા :

Options :

1.  $10^8 \text{ J}$

2.  $3 \times 10^2 \text{ J}$

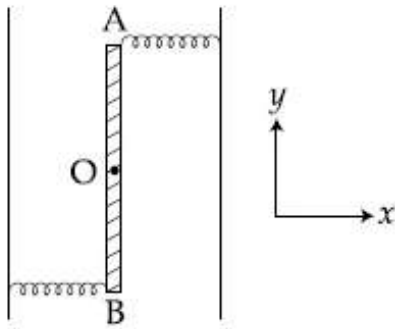
3.  $9 \times 10^6 \text{ J}$

4.  $6 \times 10^4 \text{ J}$

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

Correct Marks : 4 Wrong Marks : 1

Two light identical springs of spring constant  $k$  are attached horizontally at the two ends of a uniform horizontal rod  $AB$  of length  $l$  and mass  $m$ . The rod is pivoted at its centre ' $O$ ' and can rotate freely in horizontal plane. The other ends of the two springs are fixed to rigid supports as shown in figure. The rod is gently pushed through a small angle and released. The frequency of resulting oscillation is :



Options :

1.  $\frac{1}{2\pi} \sqrt{\frac{2k}{m}}$

2.  $\frac{1}{2\pi} \sqrt{\frac{k}{m}}$

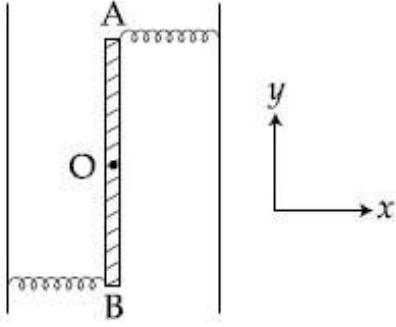
3.  $\frac{1}{2\pi} \sqrt{\frac{3k}{m}}$

4.  $\frac{1}{2\pi} \sqrt{\frac{6k}{m}}$

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

द्रव्यमान  $m$  व लम्बाई  $l$  की एक एकसमान क्षैतिज छड़  $AB$  के दो सिरों पर, चित्रानुसार, दो द्रव्यमान रहित समरूप कमानियों को जिनका स्प्रिंग नियतांक  $k$  है, क्षैतिज लगायी गयी हैं। छड़ अपने केन्द्र  $O$  पर धुराग्रस्त है तथा यह क्षैतिज समतल में घूर्णन के लिये स्वतंत्र है। दिखाये गये चित्रानुसार कमानियों के दूसरे सिरों को दो दृढ़ आधारों पर जोड़ा गया है। छड़ को हल्के से एक छोटे कोण से धकेल कर छोड़ दिया जाता है। छड़ के परिणामी दोलनों की आवृत्ति होगी :



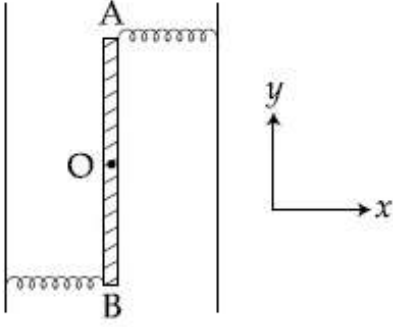
Options :

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

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

l લંબાઈના અને m દ્રવ્યમાનના એક સમક્ષિતિજ સળીયા AB ના બે છેડાઓ પર k સ્પ્રિંગ અચળાંક ધરાવતી બે હલકી સમાન સ્પ્રિંગો સમક્ષિતિજ જોડેલ છે. આ સળીયો તેના કેન્દ્ર 'O' થી જોડેલ છે. અને તે સમક્ષિતિજ સમતલમાં મુક્ત ભ્રમણ કરી શકે છે. આકૃતિમાં બતાવ્યા પ્રમાણે બે સ્પ્રિંગોના બીજા છેડાઓ જડ આધાર સાથે જોડેલ છે. આ સળીયાને હળવેકથી ફરતે કોઈ નાના ખુણે ફેરવીને છોડી દેવામાં આવે છે. પરિણામી દોલનની આવૃત્તિ :



Options :

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

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

A travelling harmonic wave is represented by the equation  $y(x, t) = 10^{-3} \sin(50t + 2x)$ , where  $x$  and  $y$  are in meter and  $t$  is in seconds. Which of the following is a correct statement about the wave ?

Options :

1. The wave is propagating along the positive  $x$ -axis with speed  $25 \text{ ms}^{-1}$ .



2. The wave is propagating along the negative  $x$ -axis with speed  $25 \text{ ms}^{-1}$ .

3. The wave is propagating along the positive  $x$ -axis with speed  $100 \text{ ms}^{-1}$ .

4. The wave is propagating along the negative  $x$ -axis with speed  $100 \text{ ms}^{-1}$ .

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

Correct Marks : 4 Wrong Marks : 1

एक प्रगामी आवर्ती तरंग को समीकरण

$y(x, t) = 10^{-3} \sin(50t + 2x)$  से निरूपित किया जाता है, जहाँ  $x$  तथा  $y$  मीटर में तथा  $t$  सेकण्ड में है। निम्न में से तरंग के लिए कौन सा कथन सत्य है?

Options :

1. तरंग  $25 \text{ ms}^{-1}$  की वेग से धनात्मक  $x$ -दिशा में चल रही है।

2. तरंग  $25 \text{ ms}^{-1}$  की वेग से ऋणात्मक  $x$ -दिशा में चल रही है।

3. तरंग  $100 \text{ ms}^{-1}$  की वेग से धनात्मक  $x$ -दिशा में चल रही है।

4. तरंग  $100 \text{ ms}^{-1}$  की वेग से ऋणात्मक  $x$ -दिशा में चल रही है।

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 પ્રગામી પ્રસંવાદી તરંગને સમીકરણ  $y(x, t) = 10^{-3} \sin(50t + 2x)$  વડે રજૂ કરવામાં આવે છે, જ્યાં  $x$  અને  $y$  એ મીટરમાં અને  $t$  એ સેકન્ડમાં છે. આ તરંગ માટે નીચેમાંથી કયું વિધાન સાચું છે?

Options :

1. તરંગ  $25 \text{ ms}^{-1}$ ની ગતિ સાથે ધન  $x$ - અક્ષ તરફ પ્રસરે છે.

2. તરંગ  $25 \text{ ms}^{-1}$  ની ગતિ સાથે ઋણ  $x$ - અક્ષ તરફ પ્રસરે છે.

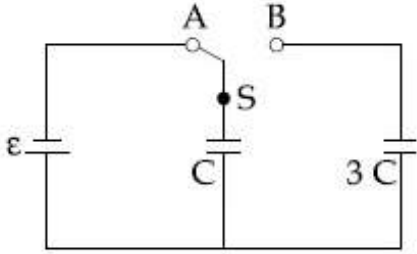
3. તરંગ  $100 \text{ ms}^{-1}$  ની ગતિ સાથે ધન  $x$ - અક્ષ તરફ પ્રસરે છે.

4. તરંગ  $100 \text{ ms}^{-1}$  ની ગતિ સાથે ઋણ  $x$ - અક્ષ તરફ પ્રસરે છે.

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

In the figure shown, after the switch 'S' is turned from position 'A' to position 'B', the energy dissipated in the circuit in terms of capacitance 'C' and total charge 'Q' is :



Options :

1.  $\frac{3}{4} \frac{Q^2}{C}$

2.  $\frac{1}{8} \frac{Q^2}{C}$

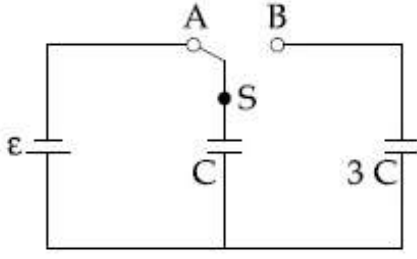
3.  $\frac{5}{8} \frac{Q^2}{C}$

4.  $\frac{3}{8} \frac{Q^2}{C}$

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

चित्र में दिखाये गये परिपथ में जब स्विच 'S' को 'A' से 'B' स्थिति में लाते हैं तो, धारिता 'C' तथा कुल आवेश 'Q' के रूप में, परिपथ में क्षयित ऊर्जा का मान होगा :



Options :

1.  $\frac{3}{4} \frac{Q^2}{C}$

2.  $\frac{1}{8} \frac{Q^2}{C}$

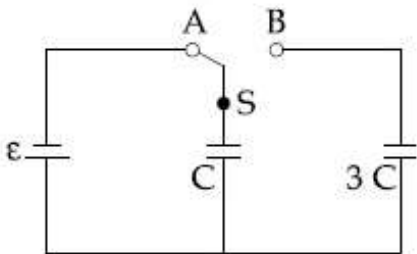
3.  $\frac{5}{8} \frac{Q^2}{C}$

4.  $\frac{3}{8} \frac{Q^2}{C}$

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

આકૃતિમાં બતાવ્યા પ્રમાણે કળ 'S' ને સ્થિતિ 'A' થી સ્થિતિ 'B' માં ફેરવ્યા બાદ કેપેસિટર 'C' અને કુલ વિદ્યુત ભાર 'Q' ના પદોમાં આ પરિપથમાં વ્યય થતી ઊર્જા \_\_\_\_\_ છે.



Options :

1.  $\frac{3}{4} \frac{Q^2}{C}$

2.  $\frac{1}{8} \frac{Q^2}{C}$

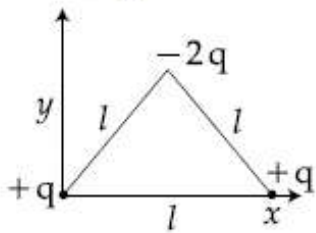
3.  $\frac{5}{8} \frac{Q^2}{C}$

4.  $\frac{3}{8} \frac{Q^2}{C}$

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

Determine the electric dipole moment of the system of three charges, placed on the vertices of an equilateral triangle, as shown in the figure :



Options :

1.  $(ql) \frac{\hat{i} + \hat{j}}{\sqrt{2}}$

2.  $-\sqrt{3} ql \hat{j}$

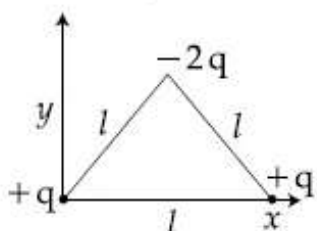
3.  $2ql \hat{j}$

4.  $\sqrt{3} ql \frac{\hat{j} - \hat{i}}{\sqrt{2}}$

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

Correct Marks : 4 Wrong Marks : 1

चित्र में दिये गये तीन आवेशों, जो एक समबाहु त्रिभुज के सिरों पर रखे हैं, के निकाय का विद्युत द्विध्रुव आघूर्ण ज्ञात कीजिए :



Options :

1.  $(ql) \frac{\hat{i} + \hat{j}}{\sqrt{2}}$

2.  $-\sqrt{3} ql \hat{j}$

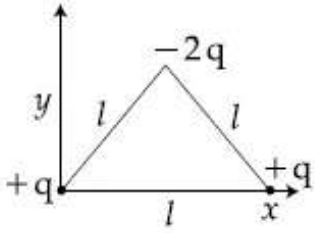
3.  $2ql \hat{j}$

4.  $\sqrt{3} ql \frac{\hat{j} - \hat{i}}{\sqrt{2}}$

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

Correct Marks : 4 Wrong Marks : 1

आकृतिमां जताव्या प्रमाणे ँक समबाजु त्रिकोणना शिरोबिंदुओ पर मुकेल त्राण विद्युतभारोनी विद्युत द्विध्रुवीय चाकमात्रा शोधो.



Options :

1.  $(ql) \frac{\hat{i} + \hat{j}}{\sqrt{2}}$

2.  $-\sqrt{3} ql \hat{j}$

3.  $2ql \hat{j}$

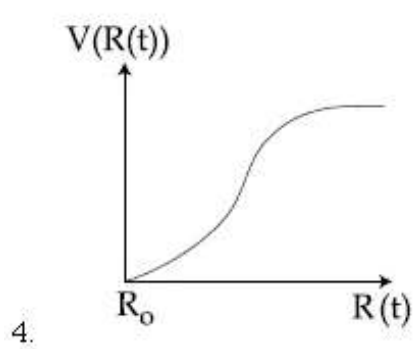
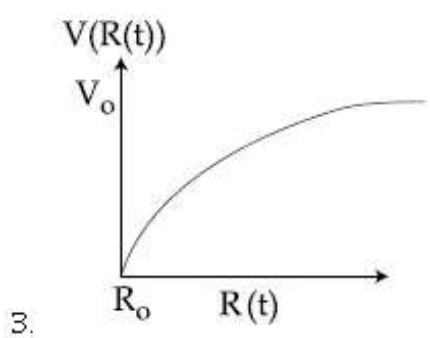
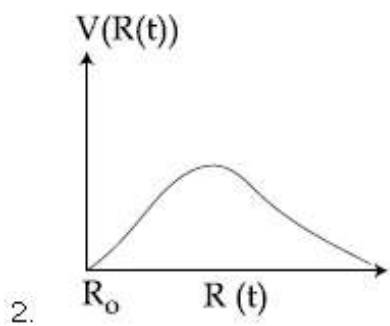
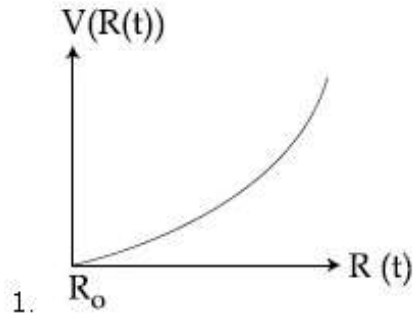
4.  $\sqrt{3} ql \frac{\hat{j} - \hat{i}}{\sqrt{2}}$

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

There is a uniform spherically symmetric surface charge density at a distance  $R_0$  from the origin. The charge distribution is initially at rest and starts expanding because of mutual repulsion. The figure that represents best the speed  $V(R(t))$  of the distribution as a function of its instantaneous radius  $R(t)$  is :

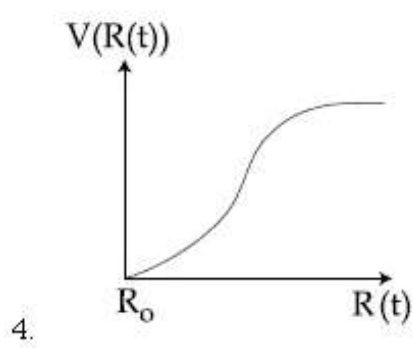
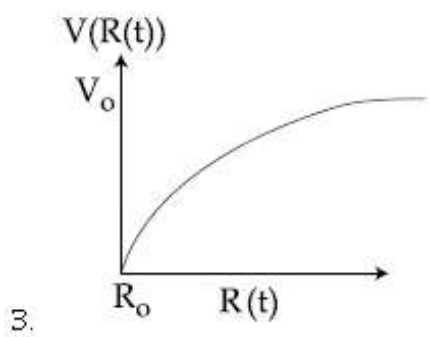
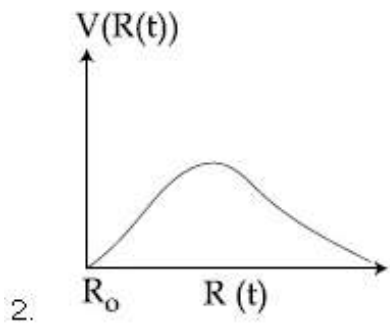
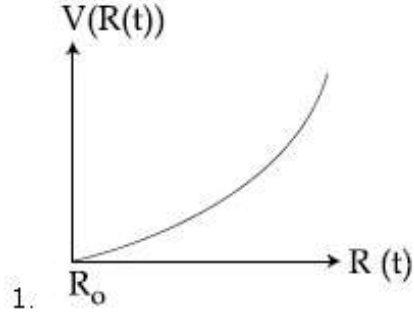
Options :





मूल बिन्दु से  $R_0$  दूरी पर एक एकसमान गोलीय सममित पृष्ठ आवेश घनत्व हैं। आरम्भ में आवेश वितरण विराम अवस्था में है और यह अन्योन्य प्रतिकर्षण के कारण प्रसारण करना प्रारम्भ करता हैं। दिये गये ग्राफ में से कौन सा इस वितरण की गति  $V(R(t))$  को तात्कालिक त्रिज्या,  $R(t)$  के साथ सबसे उत्तम दर्शाता है ?

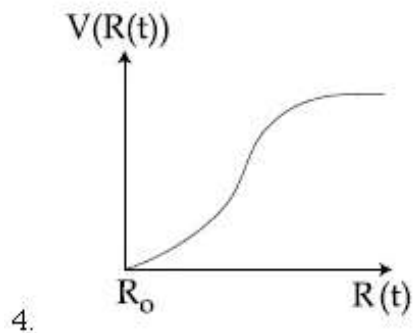
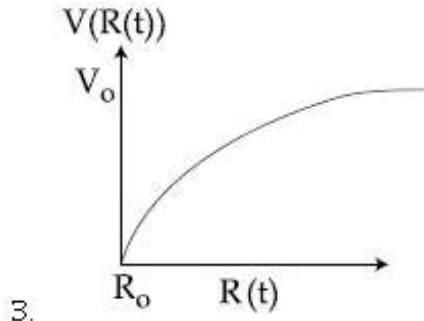
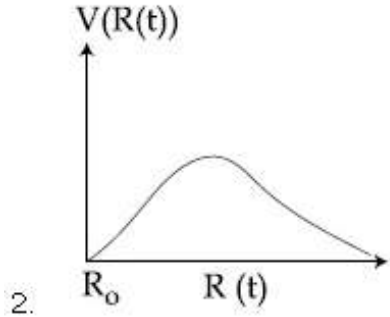
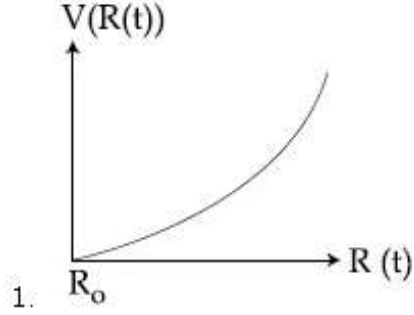
Options :



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

ઉગમબિંદુથી  $R_0$  અંતરે એક સમાન ગોલીય સંમિતિ ધરાવતી પૃષ્ઠ વિદ્યુતભાર ઘનતા રહેલ છે. વિદ્યુતભાર વિતરણ પ્રારંભમાં સ્થિર છે, અને પછી તેનું પરસ્પર અપાકર્ષણ થવાને કારણે સમાન રીતે વિસ્તરણ થાય છે. વિસ્તરણ માટે તેની તત્કાલિક ત્રિજ્યા  $R(t)$  ના વિધેય તરીકે ઝડપ  $V(R(t))$  ને રજૂ કરતી આકૃતિ :

Options :



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

1 m लम्बाई व  $5 \Omega$  प्रतिरोध के विभवमापी के प्राथमिक परिपथ में एक 4 V की आदर्श सेल तथा श्रेणीक्रम में प्रतिरोध R लगाते हैं। R का वह मान, जो विभवमापी की 10 cm लम्बाई पर 5 mV का विभवान्तर दिखाता है, होगा :

Options :

1.  $480 \Omega$
2.  $490 \Omega$
3.  $495 \Omega$
4.  $395 \Omega$

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

Correct Marks : 4 Wrong Marks : 1

1 m लंबाई અને  $5 \Omega$  અવરોધના એક પ્રાથમિક પોટેન્શિયોમીટર સાથે 4 V emf ની એક બેટરી અને શ્રેણી અવરોધ R જોડેલ છે. આ પોટેન્શિયોમીટરના તાર પર 10cm એ 5 mV વિજસ્થિતિમાનનો તફાવત આપે તેવું R નું મૂલ્ય \_\_\_\_\_ છે.

Options :

1.  $480 \Omega$
2.  $490 \Omega$
3.  $495 \Omega$
4.  $395 \Omega$

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

Correct Marks : 4 Wrong Marks : 1

An ideal battery of 4 V and resistance R are connected in series in the primary circuit of a potentiometer of length 1 m and resistance  $5 \Omega$ . The value of R, to give a potential difference of 5 mV across 10 cm of potentiometer wire, is :

Options :

1.  $480 \Omega$

2.  $490 \Omega$
3.  $495 \Omega$
4.  $395 \Omega$

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

Correct Marks : 4 Wrong Marks : 1

Two electric bulbs, rated at (25 W, 220 V) and (100 W, 220 V), are connected in series across a 220 V voltage source. If the 25 W and 100 W bulbs draw powers  $P_1$  and  $P_2$  respectively, then :

Options :

1.  $P_1 = 9 \text{ W}, P_2 = 16 \text{ W}$
2.  $P_1 = 16 \text{ W}, P_2 = 9 \text{ W}$
3.  $P_1 = 16 \text{ W}, P_2 = 4 \text{ W}$
4.  $P_1 = 4 \text{ W}, P_2 = 16 \text{ W}$

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

Correct Marks : 4 Wrong Marks : 1

(25 W, 220 V) तथा (100 W, 220 V) रेटिंग के दो बिजली के बल्बों को एक 220 V के स्रोत के साथ श्रेणीक्रम में लगाया गया है। यदि 25 W व 100 W के बल्ब द्वारा ली गयी शक्ति का मान क्रमशः  $P_1$  व  $P_2$  है तो :

Options :

1.  $P_1 = 9 \text{ W}, P_2 = 16 \text{ W}$
2.  $P_1 = 16 \text{ W}, P_2 = 9 \text{ W}$
3.  $P_1 = 16 \text{ W}, P_2 = 4 \text{ W}$
4.  $P_1 = 4 \text{ W}, P_2 = 16 \text{ W}$

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

Correct Marks : 4 Wrong Marks : 1

એક 220 V વોલ્ટેજ ઉદ્ગમને સમાંતર (25 W, 220 V) અને (100 W, 220 V) રેટિંગના બે વિદ્યુત ગોળાઓ શ્રેણીમાં જોડેલ છે. 25 W અને 100 W ના ગોળાઓ ક્રમશઃ  $P_1$  અને  $P_2$  પાવર ખેંચે તો :

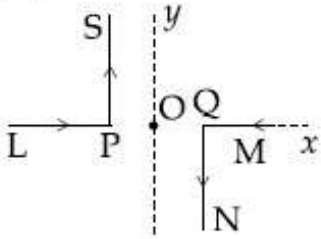
Options :

1.  $P_1 = 9 \text{ W}, P_2 = 16 \text{ W}$
2.  $P_1 = 16 \text{ W}, P_2 = 9 \text{ W}$
3.  $P_1 = 16 \text{ W}, P_2 = 4 \text{ W}$
4.  $P_1 = 4 \text{ W}, P_2 = 16 \text{ W}$

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

As shown in the figure, two infinitely long, identical wires are bent by  $90^\circ$  and placed in such a way that the segments LP and QM are along the  $x$ -axis, while segments PS and QN are parallel to the  $y$ -axis. If  $OP = OQ = 4 \text{ cm}$ , and the magnitude of the magnetic field at O is  $10^{-4} \text{ T}$ , and the two wires carry equal currents (see figure), the magnitude of the current in each wire and the direction of the magnetic field at O will be ( $\mu_0 = 4\pi \times 10^{-7} \text{ NA}^{-2}$ ):



Options :

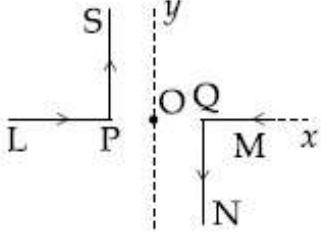
1. 20 A, perpendicular into the page
2. 20 A, perpendicular out of the page
3. 40 A, perpendicular into the page
4. 40 A, perpendicular out of the page

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



दो अनन्त लम्बाई के समरूप तारों को  $90^\circ$  से मोड़कर चित्रानुसार इस तरह रखा है कि उनके LP तथा QM भाग  $x$ -अक्ष पर हैं तथा PS व QN भाग  $y$ -अक्ष के समांतर हैं। यदि  $OP = OQ = 4 \text{ cm}$ , O पर चुम्बकीय क्षेत्र का मान  $10^{-4} \text{ T}$  है तथा दोनों तारों में बराबर धारा (चित्रानुसार) बह रही है तो प्रत्येक तार में धारा का मान तथा बिन्दु O पर चुम्बकीय क्षेत्र की दिशा होगी : ( $\mu_0 = 4\pi \times 10^{-7} \text{ NA}^{-2}$ )



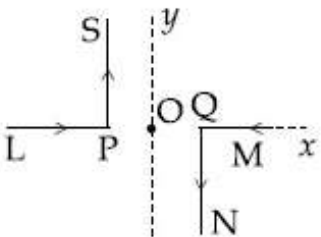
Options :

1. 20 A, पेज के लम्बवत् अन्दर की ओर
2. 20 A, पेज के लम्बवत् बाहर की ओर
3. 40 A, पेज के लम्बवत् अन्दर की ओर
4. 40 A, पेज के लम्बवत् बाहर की ओर

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

બે અનંત લંબાઈના સમાન તારોને  $90^\circ$  પર એ રીતે વાળવામાં આવે છે અને મુકવામાં આવે છે કે જેથી ખંડો LP અને QM એ  $x$ -અક્ષ તરફ રહે જ્યારે ખંડો PS અને QN એ  $y$ -અક્ષ ને સમાંતર હોય. જો  $OP = OQ = 4 \text{ cm}$  અને O પર  $10^{-4} \text{ T}$  ચુંબકીય ક્ષેત્રનું માન હોય તથા બન્ને તારો સમાન પ્રવાહ ધારિત હોય, તો બન્ને તારોમાં વિજ પ્રવાહનુમાન અને O પર ચુંબકીય ક્ષેત્ર \_\_\_\_\_ હશે. ( $\mu_0 = 4\pi \times 10^{-7} \text{ NA}^{-2}$ )



Options :

1. 20 A, આ કાગળની અંદર તરફ લંબ



2. 20 A, આ કાગળની બહારની તરફ લંબ
3. 40 A, આ કાગળની અંદર તરફ લંબ
4. 40 A, આ કાગળની બહારની તરફ લંબ

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

Correct Marks : 4 Wrong Marks : 1

A proton and an  $\alpha$ -particle (with their masses in the ratio of 1 : 4 and charges in the ratio of 1 : 2) are accelerated from rest through a potential difference  $V$ . If a uniform magnetic field ( $B$ ) is set up perpendicular to their velocities, the ratio of the radii  $r_p : r_\alpha$  of the circular paths described by them will be :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

વિભવાન્તર  $V$  સે એક પ્રોટોન તથા એક  $\alpha$ -કણ (જિનકે દ્રવ્યમાન કા અનુપાત 1 : 4 તથા આવેશોં કા અનુપાત 1 : 2 હૈ) કો સ્થિરાવસ્થા સે ત્વરિત કરતે હૈં। યદિ ડનકે વેગોં કે લમ્બવત્ એક એકસમાન ચુમ્બકીય ક્ષેત્ર ( $B$ ) લગાયા જાયે તો ડન કણોં કે વૃત્તાકાર પથોં કી ત્રિજ્યાઓં કા અનુપાત  $r_p : r_\alpha$  હોગા :

Options :

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

4.  $1 : \sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

એક પ્રોટોન અને એક  $\alpha$ -કણ (તેમનાં દ્રવ્યમાનનો ગુણોત્તર  $1 : 4$  અને વિદ્યુતભારનો ગુણોત્તર  $1 : 2$ ) સ્થિર સ્થિતિમાંથી  $V$  વિજસ્થિતિમાનના તફાવતથી પ્રવેગીત કરવામાં આવે છે. જો તેમની ગતિઓને લંબ એકસમાન ચુંબકીય ક્ષેત્ર (B) પ્રસ્થાપિત કરવામાં આવે, તો તેઓના વળે કપાતા વર્તુળાકાર પથની ત્રિજ્યાઓનો ગુણોત્તર  $r_p : r_\alpha$  \_\_\_\_\_ હશે.

Options :

1.  $1 : 2$

2.  $1 : \sqrt{2}$

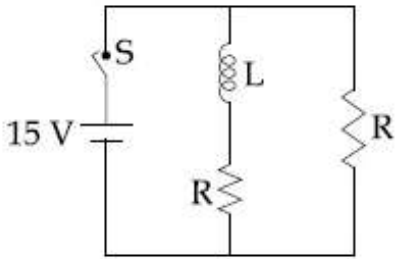
3.  $1 : 3$

4.  $1 : \sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

In the figure shown, a circuit contains two identical resistors with resistance  $R = 5 \Omega$  and an inductance with  $L = 2 \text{ mH}$ . An ideal battery of  $15 \text{ V}$  is connected in the circuit. What will be the current through the battery long after the switch is closed ?



Options :

1.  $5.5 \text{ A}$

2.  $7.5 \text{ A}$

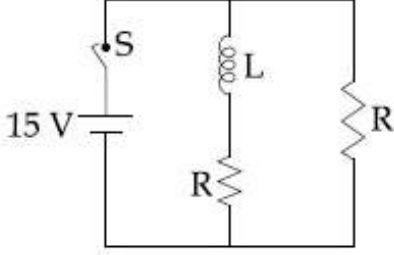
3.  $6 \text{ A}$

4. 3 A

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

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाये गये परिपथ में दो समान प्रतिरोध हैं जिनका प्रतिरोध  $R=5\ \Omega$  है तथा एक प्रेरकत्व  $L=2\ \text{mH}$  है।  $15\ \text{V}$  की एक आदर्श बैटरी को परिपथ में जोड़ा गया है। स्विच को बन्द करने के लम्बे अन्तराल के बाद बैटरी से प्रवाहित धारा होगी :



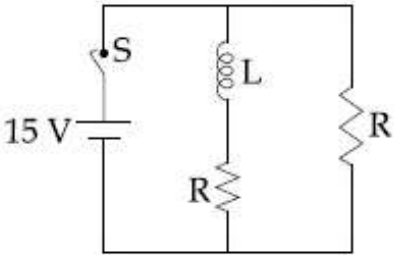
Options :

1. 5.5 A
2. 7.5 A
3. 6 A
4. 3 A

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

Correct Marks : 4 Wrong Marks : 1

$R=5\ \Omega$  ના બે સમાન અવરોધો અને  $L=2\ \text{mH}$  ના એક ઇન્ડક્ટર ધરાવતો એક પરિપથ નીચેનું આકૃતિમાં દર્શાવેલ છે.  $15\ \text{V}$  ની એક આદર્શ બેટરી આ પરિપથમાં જોડેલ છે. કળ બંધ કર્યાના લાંબા સમય બાદ બેટરીમાંથી વહેતો પ્રવાહ શું હશે?



Options :

1. 5.5 A

2. 7.5 A
3. 6 A
4. 3 A

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

Correct Marks : 4 Wrong Marks : 1

A light wave is incident normally on a glass slab of refractive index 1.5. If 4% of light gets reflected and the amplitude of the electric field of the incident light is 30 V/m, then the amplitude of the electric field for the wave propagating in the glass medium will be :

Options :

1. 10 V/m
2. 24 V/m
3. 6 V/m
4. 30 V/m

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

अपवर्तनांक 1.5 की एक काँच की पट्टी पर प्रकाश किरण अभिलम्बवत् आपतित होती है। यदि 4% प्रकाश परावर्तित होती है तथा आपतित प्रकाश के वैद्युत क्षेत्र का आयाम 30 V/m है तो, काँच के माध्यम में चलने वाली तरंग के विद्युतक्षेत्र का आयाम होगा :

Options :

1. 10 V/m
2. 24 V/m
3. 6 V/m
4. 30 V/m

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

1.5 વક્રીભવનાંક ધરાવતા કાચના એક ચોસલા પર કોઈ પ્રકાશ આપાત થાય છે. જો 4% પ્રકાશ પરાવર્તિત થતો હોય અને આપાત પ્રકાશના વિદ્યુત ક્ષેત્રનો કંપવિસ્તાર  $30 \text{ V/m}$  હોય, તો કાચના માધ્યમમાં પ્રસરતા તરંગ માટેના વિદ્યુતક્ષેત્રનો કંપવિસ્તાર :

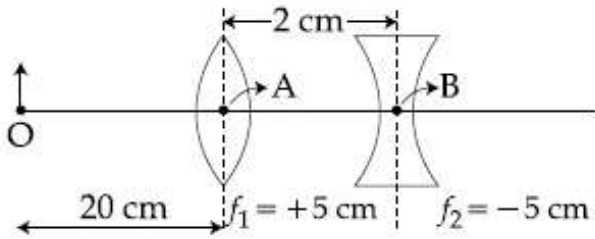
Options :

1.  $10 \text{ V/m}$
2.  $24 \text{ V/m}$
3.  $6 \text{ V/m}$
4.  $30 \text{ V/m}$

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

What is the position and nature of image formed by lens combination shown in figure ? ( $f_1, f_2$  are focal lengths)



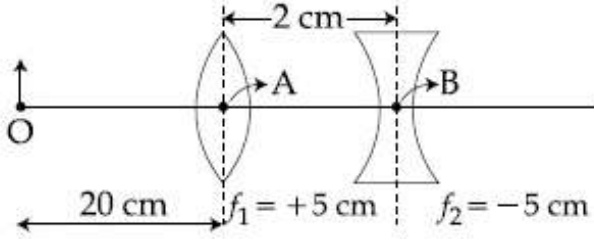
Options :

1. 40 cm from point B at right; real
2. 70 cm from point B at left; virtual
3. 70 cm from point B at right; real
4.  $\frac{20}{3}$  cm from point B at right, real

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

दिये गये चित्र में लेन्स संयोजन से बने प्रतिबिम्ब की स्थिति व प्रकृति होगी : ( $f_1, f_2$  फोकस दूरियाँ हैं)



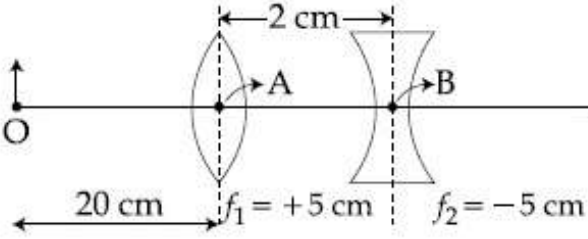
Options :

1. बिन्दु B से 40 cm दायी ओर; वास्तविक
2. बिन्दु B से 70 cm बायी ओर; आभासी
3. बिन्दु B से 70 cm दायी ओर; वास्तविक
4. बिन्दु B से  $\frac{20}{3}$  cm दायी ओर; वास्तविक

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

આકૃતિમાં દર્શાવેલ લેન્સના સંયોજનથી કયા સ્થાન પર અને કેવું પ્રતિબિંબ રચાશે ? ( $f_1, f_2$  એ કેન્દ્ર લંબાઈ છે.)



Options :

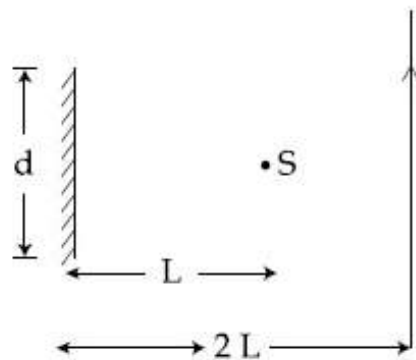
1. બિંદુ B થી 40 cm જમણી બાજુએ, અને વાસ્તવિક.
2. બિંદુ B થી 70 cm ડાબી બાજુએ, અને આભાસી
3. બિંદુ B થી 70 cm જમણી બાજુએ, અને વાસ્તવિક.
4. બિંદુ B થી  $\frac{20}{3}$  cm જમણી બાજુએ, અને વાસ્તવિક.

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 point source of light, S is placed at a distance L in front of the centre of plane mirror of width d which is hanging vertically on a wall. A man walks in front of the mirror along a line parallel to the mirror, at a distance 2L as shown below. The distance over which the man can see the image of the light source in the mirror is :



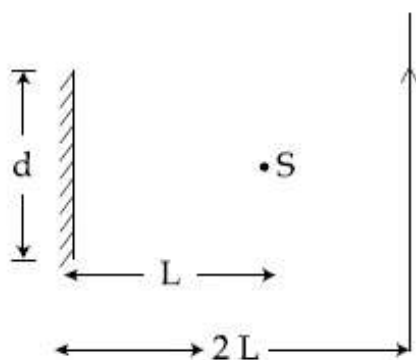
Options :

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

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

दीवार पर ऊर्ध्वाधर टाँगे हुए  $d$  चौड़ाई के समतल दर्पण के सामने, उसके मध्य बिन्दु से  $L$  दूरी पर, प्रकाश का एक बिन्दु स्रोत  $S$  रखा हुआ है। दिखाये अनुसार दर्पण के सामने  $2L$  दूरी पर, एक व्यक्ति दर्पण के समान्तर, एक रेखा में चलता है। वह दूरी, जहाँ तक व्यक्ति प्रकाश स्रोत का प्रतिबिम्ब देख सकता है, होगी :



Options :

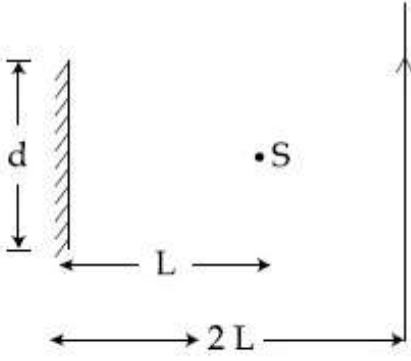


1.  $\frac{d}{2}$
2.  $3d$
3.  $2d$
4.  $d$

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 દિવાલ પર શિરોલંબ લટકાવેલ  $d$  પહોળાઈના એક સપાટ અરિસાના કેન્દ્રની સામે  $L$  અંતર પર પ્રકાશનો એક બિંદુવત્ ઉદ્ગમ  $S$  મુકેલ છે. આ અરિસાથી  $2L$  અંતરે એક સમાંતર રેખા પર અરિસાની સામેથી એક માણસ પસાર થાય છે આ માણસને અરિસામાં પ્રકાશના ઉદ્ગમનું પ્રતિબિંબ કયા અંતરે દેખાશે ?



Options :

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

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

Correct Marks : 4 Wrong Marks : 1

A particle A of mass 'm' and charge 'q' is accelerated by a potential difference of 50 V. Another particle B of mass '4 m' and charge 'q' is accelerated by a potential difference of 2500 V. The ratio of de-Broglie

wavelengths  $\frac{\lambda_A}{\lambda_B}$  is close to :

Options :

1. 4.47
2. 10.00
3. 0.07
4. 14.14

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

द्रव्यमान 'm' तथा आवेश 'q' के एक कण A को 50 V विभवान्तर से त्वरित करते हैं। द्रव्यमान '4 m' तथा आवेश 'q' के दूसरे कण B को 2500 V के विभवान्तर से त्वरित करते हैं। इन कणों की दे-ब्रोग्ली

तरंगदैर्घ्यों के अनुपात  $\frac{\lambda_A}{\lambda_B}$  का सन्निकट मान है :

Options :

1. 4.47
2. 10.00
3. 0.07
4. 14.14

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

50 V મૂલ્યના સ્થિતિમાનની હાજરીમાં 'm' દ્રવ્યમાન અને 'q' વિજભારના કણને પ્રેવગીત કરવામાં આવે છે. '4 m' દળ ધરાવતો અને 'q' જેટલો વિદ્યુતભાર ધરાવતો બીજો કણ B ને 2500 V ના સ્થિતિમાનના તફાવતથી પ્રેવગીત કરવામાં આવે છે. આ કણોની ડી-બ્રોગ્લી

તરંગલંબાઈઓનો ગુણોત્તર  $\frac{\lambda_A}{\lambda_B}$  \_\_\_\_\_ ની

નજીકનો હશે.

Options :

1. 4.47
2. 10.00
3. 0.07
4. 14.14

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

A particle of mass m moves in a circular orbit in a central potential field

$$U(r) = \frac{1}{2} kr^2. \text{ If Bohr's quantization}$$

conditions are applied, radii of possible orbits and energy levels vary with quantum number n as :

Options :

1.  $r_n \propto n^2, E_n \propto \frac{1}{n^2}$
2.  $r_n \propto n, E_n \propto n$
3.  $r_n \propto \sqrt{n}, E_n \propto \frac{1}{n}$
4.  $r_n \propto \sqrt{n}, E_n \propto n$

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

m દ્રવ્યમાન કા એક કણ,  $U(r) = \frac{1}{2} kr^2$  કે કેન્દ્રીય

વિભવ ક્ષેત્ર કે અન્તર્ગત એક વૃત્તીય કક્ષા મેં ઘૂમ રહા હૈ ।  
યદિ બોર કે ક્વાન્ટમીકરણ પ્રતિબંધ કા ઉપયોગ કરે તો  
સમ્ભવ કક્ષાઓં કી ત્રિજ્યા ઓર ઊર્જા સ્તરોં કા ક્વાન્ટમ  
સંખ્યા, n કે સાથ સમ્બન્ધ હોગા :

Options :

1.  $r_n \propto n^2, E_n \propto \frac{1}{n^2}$

2.  $r_n \propto n, E_n \propto n$

3.  $r_n \propto \sqrt{n}, E_n \propto \frac{1}{n}$

4.  $r_n \propto \sqrt{n}, E_n \propto n$

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

$U(r) = \frac{1}{2} kr^2$  ના કેન્દ્રીય સ્થિતિમાન ક્ષેત્રમાં એક

વર્તુળાકાર કક્ષામાં m દ્રવ્યમાન વાળો એક કણ ગતિ કરે  
છે. જો બોહ્રની ક્વોન્ટાઇઝેશન શરતો લગાડવામાં આવે  
તો શક્ય કક્ષકો અને તેના ઊર્જાસ્તરો એ ક્વોન્ટમ ક્રમ  
(સંખ્યા) n સાથે \_\_\_\_\_ થી ચલે છે.

Options :

1.  $r_n \propto n^2, E_n \propto \frac{1}{n^2}$

2.  $r_n \propto n, E_n \propto n$

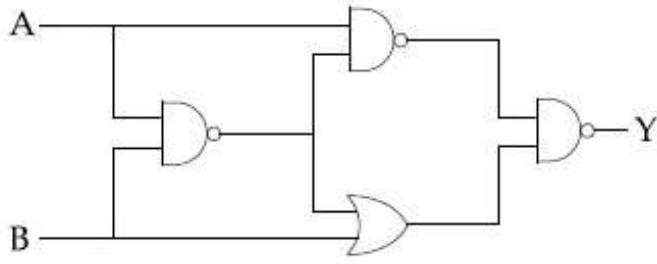
3.  $r_n \propto \sqrt{n}, E_n \propto \frac{1}{n}$

4.  $r_n \propto \sqrt{n}, E_n \propto n$

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 output of the given logic circuit is :



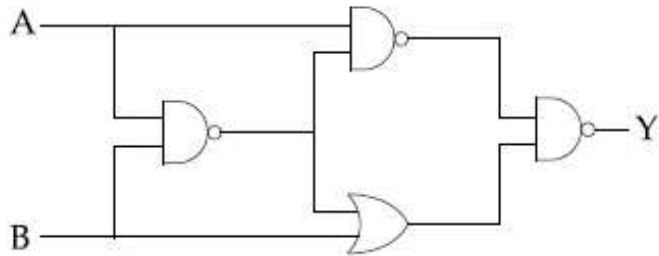
Options :

1.  $A\bar{B} + \bar{A}B$
2.  $A\bar{B}$
3.  $\bar{A}B$
4.  $AB + \bar{A}\bar{B}$

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

Correct Marks : 4 Wrong Marks : 1

दिये गये लॉजिक गेट का निर्गम है :



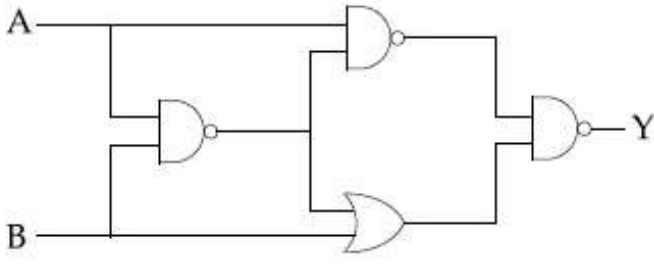
Options :

1.  $A\bar{B} + \bar{A}B$
2.  $A\bar{B}$
3.  $\bar{A}B$
4.  $AB + \bar{A}\bar{B}$

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

आपेल लोजिक परिपथनुं आउटपूट :



Options :

1.  $A\bar{B} + \bar{A}B$
2.  $A\bar{B}$
3.  $\bar{A}B$
4.  $AB + \bar{A}\bar{B}$

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

Correct Marks : 4 Wrong Marks : 1

A 100 V carrier wave is made to vary between 160 V and 40 V by a modulating signal. What is the modulation index ?

Options :

1. 0.3
2. 0.6
3. 0.5
4. 0.4

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

एक माडुलन सिग्नल के द्वारा 100 V की वाहक तरंग को 160 V तथा 40 V के बीच परिवर्तित करते हैं। माडुलन सूचकांक क्या होगा ?

Options :

1. 0.3

2. 0.6

3. 0.5

4. 0.4

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

એક 100 V કેરિયર તરંગને મોડ્યુલેટિંગ સિગ્નલ વડે 160 V અને 40 Vની વચ્ચે બદલવામાં આવે છે. મોડ્યુલેશન અંક શું થશે ?

Options :

1. 0.3

2. 0.6

3. 0.5

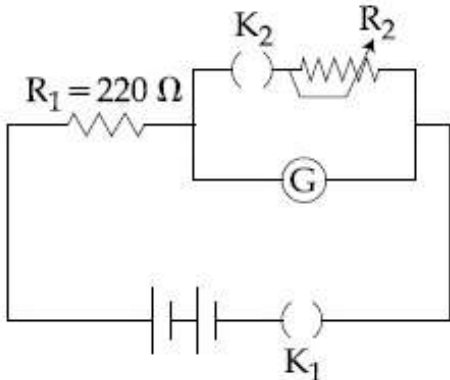
4. 0.4

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

Correct Marks : 4 Wrong Marks : 1

The galvanometer deflection, when key  $K_1$  is closed but  $K_2$  is open, equals  $\theta_0$  (see figure). On closing  $K_2$  also and adjusting  $R_2$  to  $5 \Omega$ , the deflection in galvanometer

becomes  $\frac{\theta_0}{5}$ . The resistance of the galvanometer is, then, given by [Neglect the internal resistance of battery] :



Options :

1.  $22 \Omega$

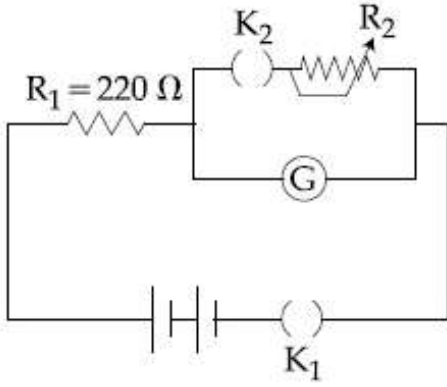


2.  $12 \Omega$
3.  $5 \Omega$
4.  $25 \Omega$

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

जब कुंजी  $K_1$  बन्द है तथा कुंजी  $K_2$  खुली है तो गैल्वैनोमापी में विक्षेप  $\theta_0$  है (चित्र देखिये)।  $K_2$  को बन्द करके  $R_2$  को  $5 \Omega$  रखने पर गैल्वैनोमापी में विक्षेप  $\frac{\theta_0}{5}$  हो जाता है। गैल्वैनोमापी का प्रतिरोध होगा (बैटरी का आन्तरिक प्रतिरोध नगण्य है) :



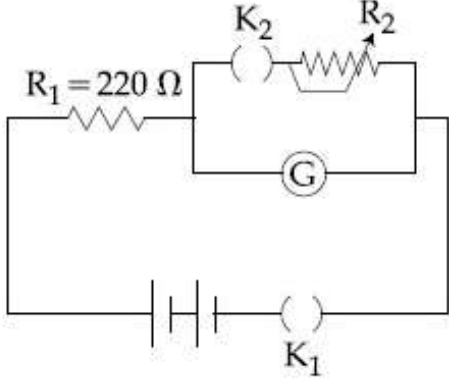
Options :

1.  $22 \Omega$
2.  $12 \Omega$
3.  $5 \Omega$
4.  $25 \Omega$

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

જ્યારે કળ  $K_1$  બંધ હોય અને  $K_2$  ખુલ્લી હોય ત્યારે ગેલ્વેનોમીટરનું આવર્તન  $\theta_0$  બરાબર છે (આકૃતિ જુઓ).  $K_2$  ને પણ બંધ કરતા તથા  $R_2$ ને  $5 \Omega$  ગોઠાવતાં ગેલ્વેનોમીટરમાં આવર્તન  $\frac{\theta_0}{5}$  થાય છે. તો આ ગેલ્વેનોમીટરના અવરોધને \_\_\_\_\_ વડે આપવામાં આવે છે. (બેટરીનો આંતરિક અવરોધ અવગણો).



Options :

1.  $22 \Omega$
2.  $12 \Omega$
3.  $5 \Omega$
4.  $25 \Omega$

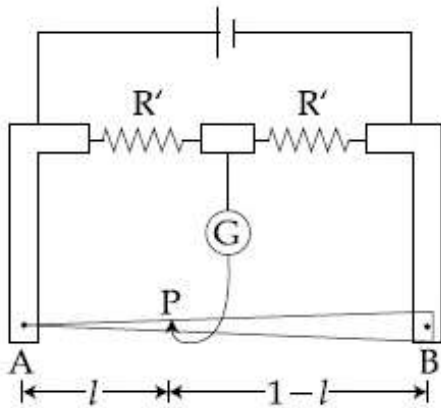
Question Number : 30 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

In a meter bridge, the wire of length 1 m has a non-uniform cross-section such that,

the variation  $\frac{dR}{dl}$  of its resistance  $R$  with

length  $l$  is  $\frac{dR}{dl} \propto \frac{1}{\sqrt{l}}$ . Two equal resistances

are connected as shown in the figure. The galvanometer has zero deflection when the jockey is at point  $P$ . What is the length  $AP$ ?



Options :

1. 0.2 m
2. 0.25 m
3. 0.3 m
4. 0.35 m

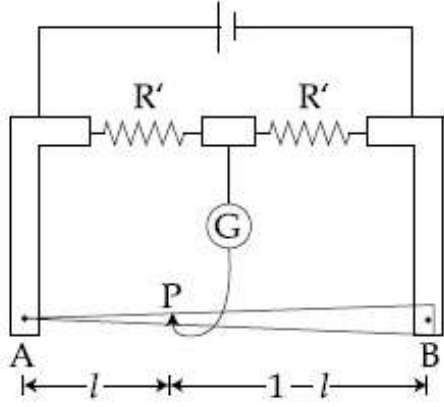
Question Number : 30 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक मीटर सेतु में, 1 मी. लम्बाई के तार का असमान अनुप्रस्थ काट इस प्रकार है कि, इसके प्रतिरोध  $R$  का

लम्बाई  $l$  के साथ परिवर्तन  $\frac{dR}{dl}$  को  $\frac{dR}{dl} \propto \frac{1}{\sqrt{l}}$  से

दिया जाता है। दिखाये गये चित्रानुसार दो बराबर प्रतिरोधों को जोड़ा गया है। जब जॉकी बिन्दु  $P$  पर है तो गैल्वैनोमापी में शून्य विक्षेप है। लम्बाई  $AP$  क्या होगी ?



Options :

1. 0.2 m
2. 0.25 m
3. 0.3 m
4. 0.35 m

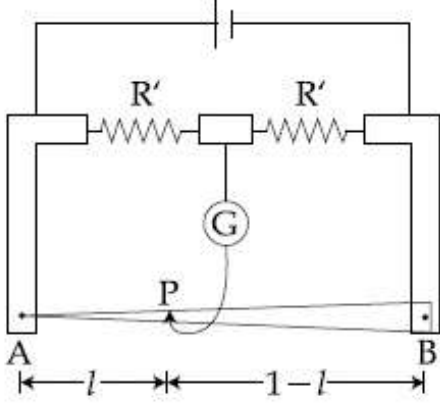
Question Number : 30 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક મીટરબ્રીજમાં, 1 m લંબાઈનો તાર અસમાન આડછેદ  
એવી રીતે ધરાવે છે કે તેના અવરોધ R નો લંબાઈ l

સાથેનો ફેરફાર  $\frac{dR}{dl}$  એ  $\frac{dR}{dl} \propto \frac{1}{\sqrt{l}}$  છે. આકૃતિમાં

ખતાવ્યા પ્રમાણે બે સમાન અવરોધો જોડેલ છે. જ્યારે  
જોકી એ બિંદુ P પર હોય ત્યારે ગેલ્વેનોમીટરમાં આવર્તન  
શૂન્ય છે. લંબાઈ AP કેટલી હશે?



Options :

1. 0.2 m
2. 0.25 m
3. 0.3 m
4. 0.35 m

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

Chemistry

416529149

2

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

416529158

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

Poly- $\beta$ -hydroxybutyrate-co- $\beta$ -hydroxyvalerate(PHBV) is a copolymer of \_\_\_\_\_

Options :

1. 2-hydroxybutanoic acid and 3-hydroxypentanoic acid
2. 3-hydroxybutanoic acid and 3-hydroxypentanoic acid
3. 3-hydroxybutanoic acid and 2-hydroxypentanoic acid
4. 3-hydroxybutanoic acid and 4-hydroxypentanoic acid

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

पॉली- $\beta$ -हाइड्रॉक्सीब्यूटीरेट-co- $\beta$ -हाइड्रॉक्सीवैलिरेट (PHBV) जिसका सह बहुलक है, वे हैं :

Options :

1. 2-हाइड्रॉक्सीब्यूटेनोइक एसिड तथा 3-हाइड्रॉक्सीपेन्टेनोइक एसिड
2. 3-हाइड्रॉक्सीब्यूटेनोइक एसिड तथा 3-हाइड्रॉक्सीपेन्टेनोइक एसिड
3. 3-हाइड्रॉक्सीब्यूटेनोइक एसिड तथा 2-हाइड्रॉक्सीपेन्टेनोइक एसिड
4. 3-हाइड्रॉक्सीब्यूटेनोइक एसिड तथा 4-हाइड्रॉक्सीपेन्टेनोइक एसिड

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

पॉली- $\beta$ -हाइड्रॉक्सीब्यूटीरेट-co- $\beta$ -हाइड्रॉक्सीवैलिरेट (PHBV) એ શાનો કો-પોલિમર છે?

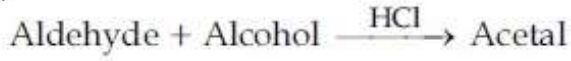
Options :

1. 2-હાઇડ્રોક્ષીબ્યુટાનોઇક એસિડ અને 3-હાઇડ્રોક્ષીપેન્ટાનોઇક એસિડ

- 3-હાઇડ્રોક્સીબ્યુટાનોઇક એસિડ અને
2. 3-હાઇડ્રોક્સીપેન્ટાનોઇક એસિડ
- 3-હાઇડ્રોક્સીબ્યુટાનોઇક એસિડ અને
3. 2-હાઇડ્રોક્સીપેન્ટાનોઇક એસિડ
- 3-હાઇડ્રોક્સીબ્યુટાનોઇક એસિડ અને
4. 4-હાઇડ્રોક્સીપેન્ટાનોઇક એસિડ

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

In the following reaction



| Aldehyde            | Alcohol           |
|---------------------|-------------------|
| HCHO                | <sup>t</sup> BuOH |
| CH <sub>3</sub> CHO | MeOH              |

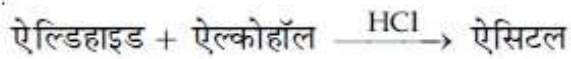
The best combination is :

Options :

1. HCHO and MeOH
2. HCHO and <sup>t</sup>BuOH
3. CH<sub>3</sub>CHO and <sup>t</sup>BuOH
4. CH<sub>3</sub>CHO and MeOH

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

निम्न अभिक्रिया में



| ऐलिडहाइड            | ऐल्कोહॉल          |
|---------------------|-------------------|
| HCHO                | <sup>t</sup> BuOH |
| CH <sub>3</sub> CHO | MeOH              |

सर्वोत्तम संयोजन है :

Options :

1. HCHO तथा MeOH

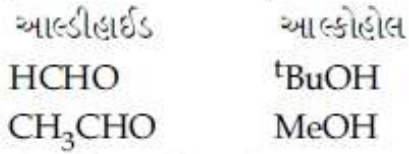
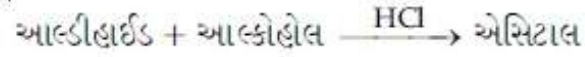


2. HCHO तथा <sup>t</sup>BuOH
3. CH<sub>3</sub>CHO तथा <sup>t</sup>BuOH
4. CH<sub>3</sub>CHO तथा MeOH

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

નીચેની પ્રક્રિયામાં



સૌથી યોગ્ય જોડી કઈ?

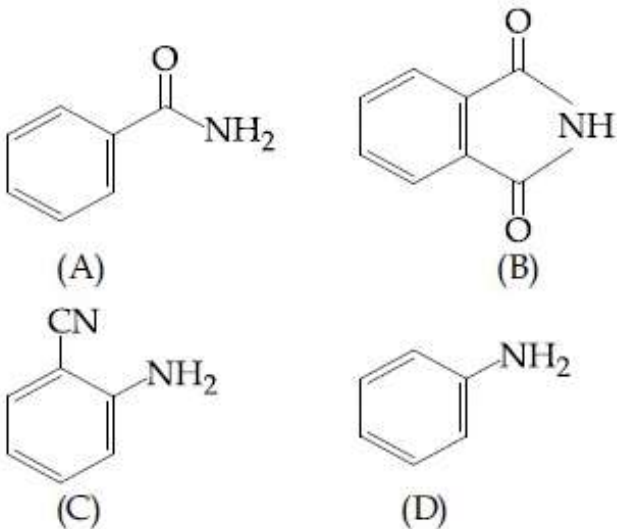
Options :

1. HCHO અને MeOH
2. HCHO અને <sup>t</sup>BuOH
3. CH<sub>3</sub>CHO અને <sup>t</sup>BuOH
4. CH<sub>3</sub>CHO અને MeOH

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

નિમ્ન યૌગિકોં કી ઍલ્કલ હૈલાઇડ કૈ સાથ સીધી અભિક્રિયા કી અભિક્રિયાશીલતા કા બઢતા ક્રમ હૈ :



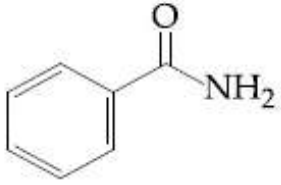
Options :

1. (B)<(A)<(D)<(C)
2. (A)<(B)<(C)<(D)
3. (A)<(C)<(D)<(B)
4. (B)<(A)<(C)<(D)

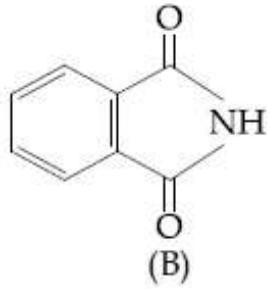
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

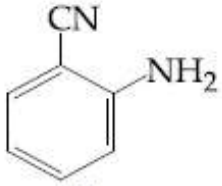
નીચેના આપેલા સંયોજનોની આલ્કાઈલ હેલાઈડ સાથેની સીધી પ્રક્રિયા માટેની સક્રિયતાનો ચઢતો ક્રમ શોધો ?



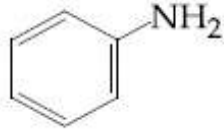
(A)



(B)



(C)



(D)

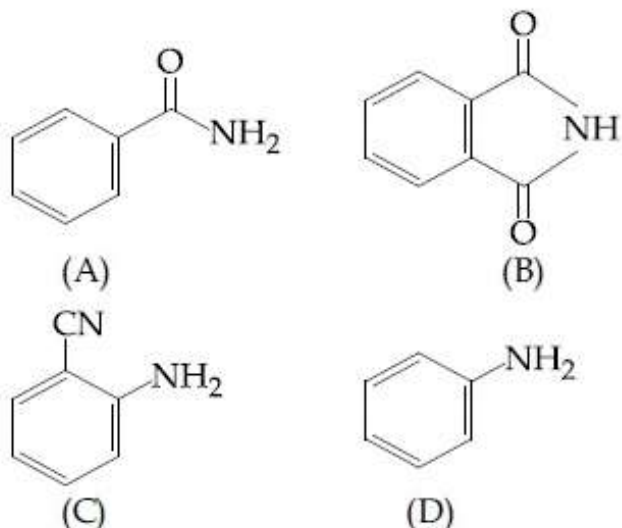
Options :

1. (B)<(A)<(D)<(C)
2. (A)<(B)<(C)<(D)
3. (A)<(C)<(D)<(B)
4. (B)<(A)<(C)<(D)

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

Correct Marks : 4 Wrong Marks : 1

The increasing order of reactivity of the following compounds towards reaction with alkyl halides directly is :

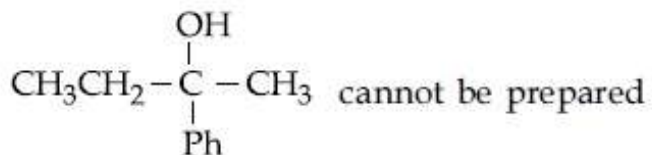


Options :

1. (B)<(A)<(D)<(C)
2. (A)<(B)<(C)<(D)
3. (A)<(C)<(D)<(B)
4. (B)<(A)<(C)<(D)

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



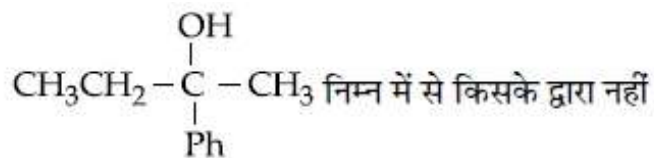
by :

Options :

1.  $\text{PhCOCH}_3 + \text{CH}_3\text{CH}_2\text{MgX}$
2.  $\text{CH}_3\text{CH}_2\text{COCH}_3 + \text{PhMgX}$
3.  $\text{PhCOCH}_2\text{CH}_3 + \text{CH}_3\text{MgX}$
4.  $\text{HCHO} + \text{PhCH}(\text{CH}_3)\text{CH}_2\text{MgX}$

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



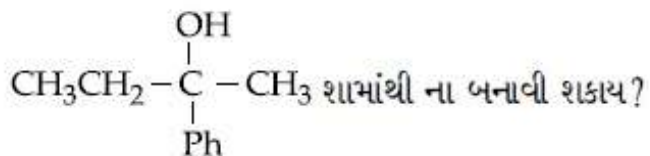
बनाया जा सकता है ?

Options :

1.  $\text{PhCOCH}_3 + \text{CH}_3\text{CH}_2\text{MgX}$
2.  $\text{CH}_3\text{CH}_2\text{COCH}_3 + \text{PhMgX}$
3.  $\text{PhCOCH}_2\text{CH}_3 + \text{CH}_3\text{MgX}$
4.  $\text{HCHO} + \text{PhCH}(\text{CH}_3)\text{CH}_2\text{MgX}$

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



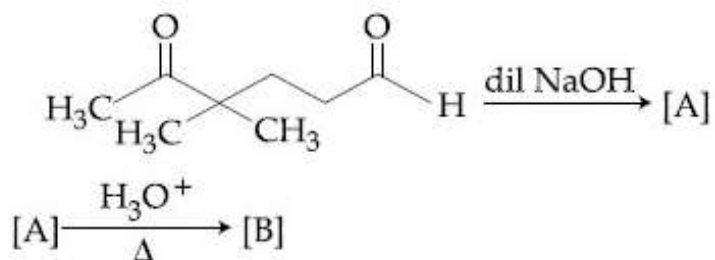
Options :

1.  $\text{PhCOCH}_3 + \text{CH}_3\text{CH}_2\text{MgX}$
2.  $\text{CH}_3\text{CH}_2\text{COCH}_3 + \text{PhMgX}$
3.  $\text{PhCOCH}_2\text{CH}_3 + \text{CH}_3\text{MgX}$
4.  $\text{HCHO} + \text{PhCH}(\text{CH}_3)\text{CH}_2\text{MgX}$

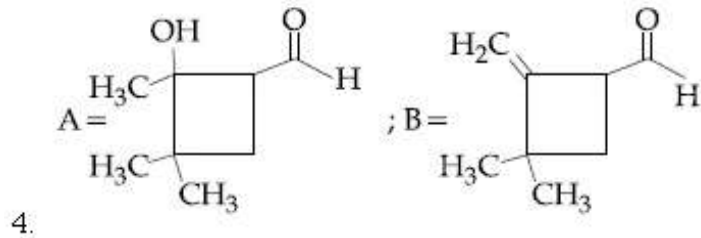
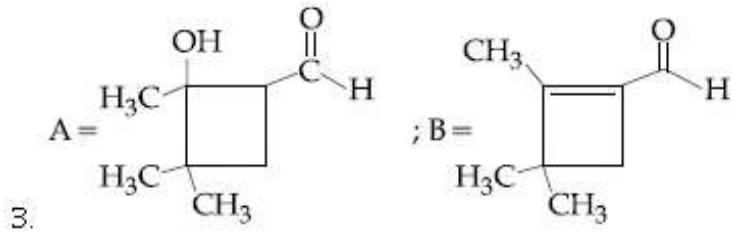
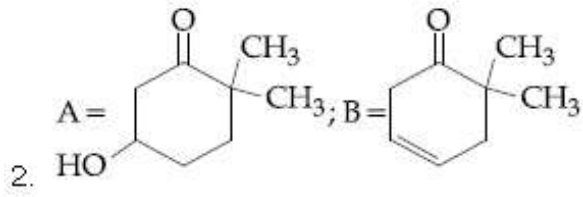
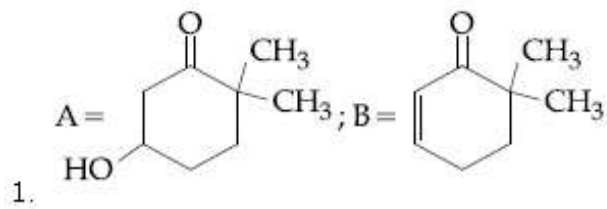
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In the following reactions, products A and B are :



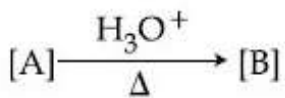
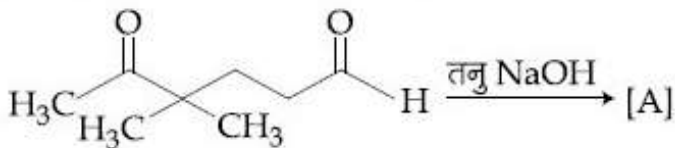
Options :



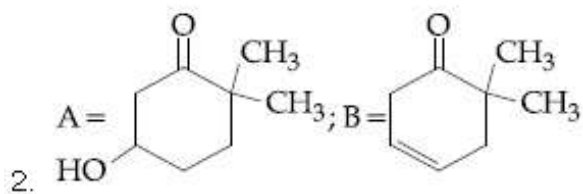
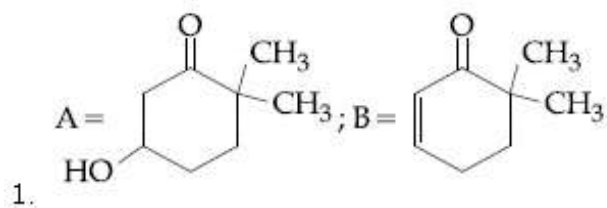
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

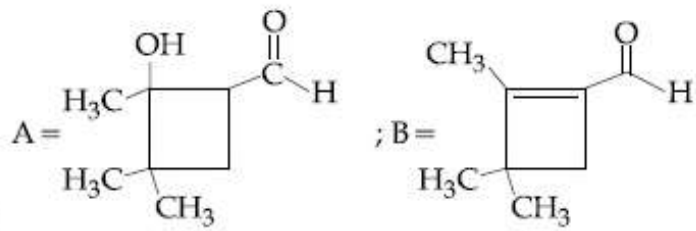
निम्न अभिक्रियाओं में उत्पाद A तथा B हैं :



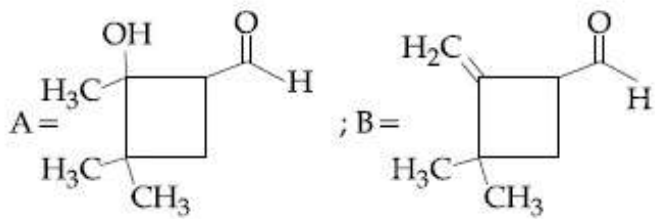
Options :



3.



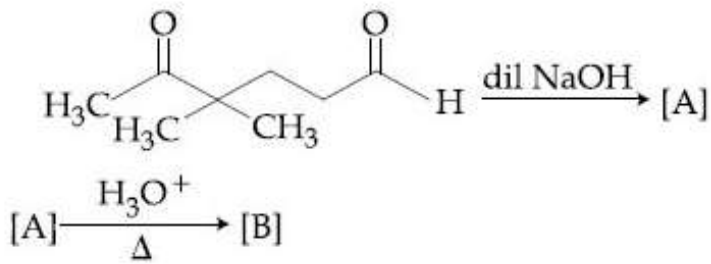
4.



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

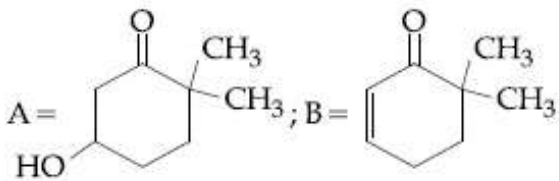
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયામાં મળતી નીપજો A અને B શોધો :

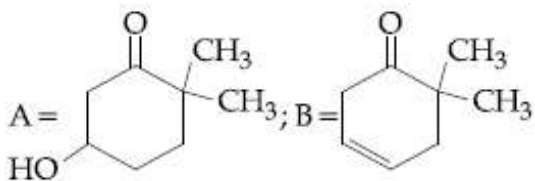


Options :

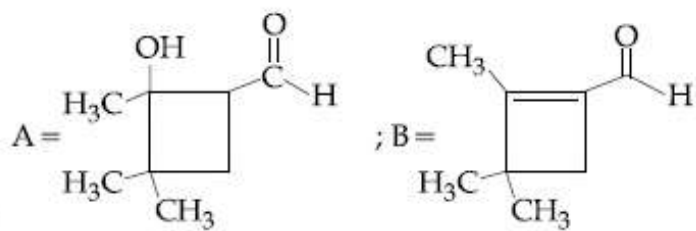
1.



2.

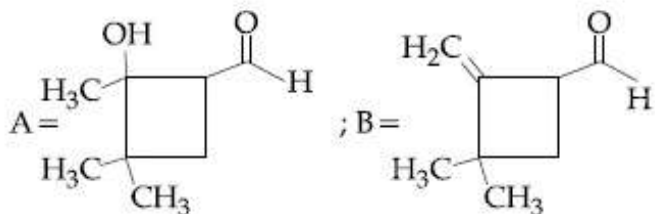


3.





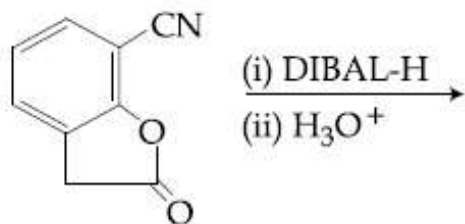
4.



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

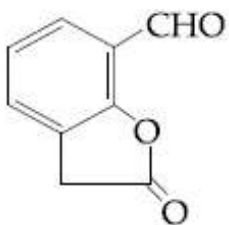
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

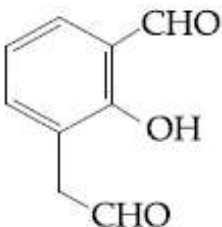


Options :

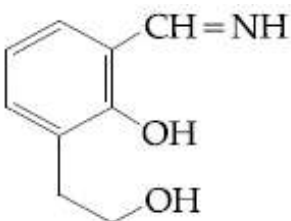
1.



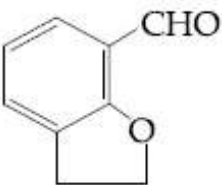
2.



3.



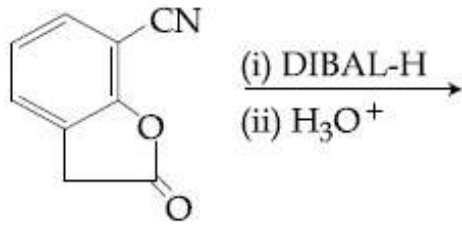
4.



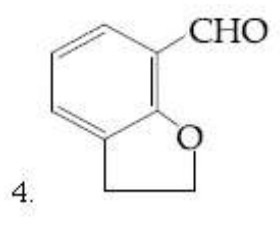
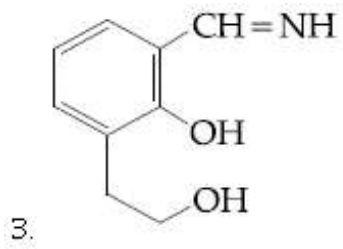
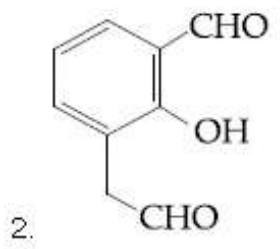
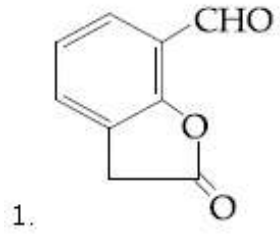
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :



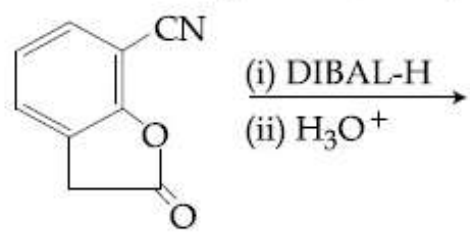
Options :



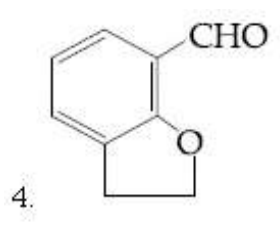
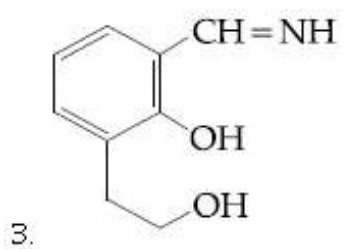
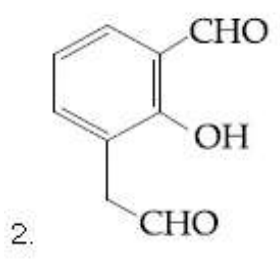
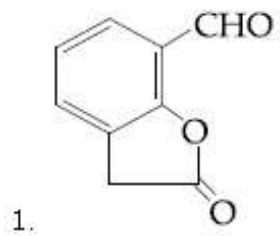
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયાની મુખ્ય નીપજ આપો?



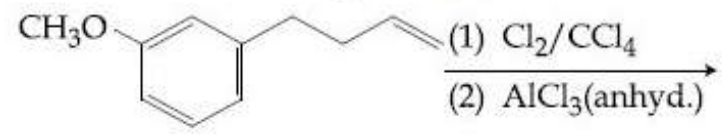
Options :



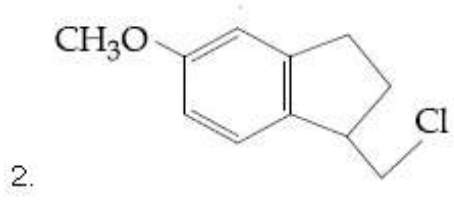
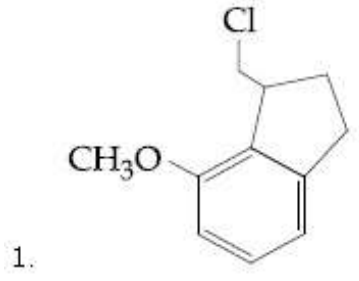
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

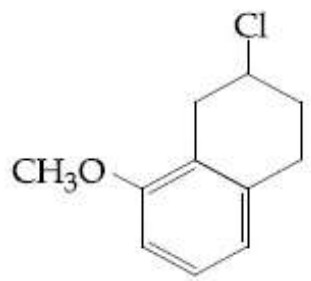
निम्न अभिक्रिया का मुख्य उत्पाद है :



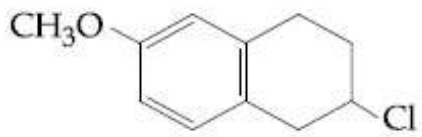
Options :



3.

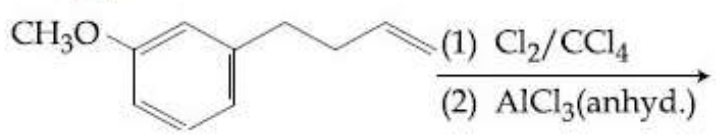


4.



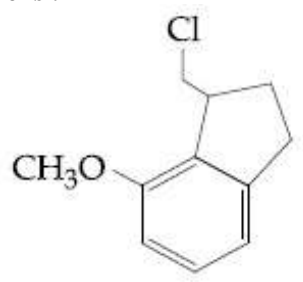
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical  
 Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

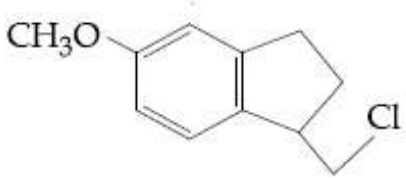


Options :

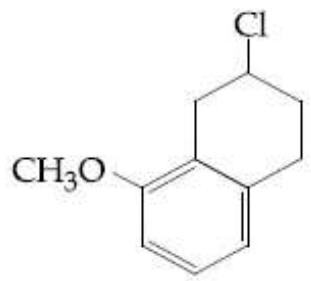
1.



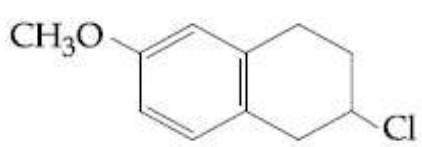
2.



3.

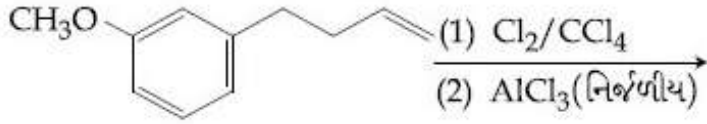


4.

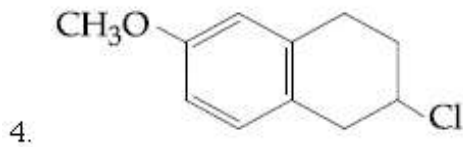
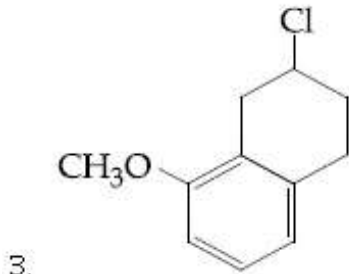
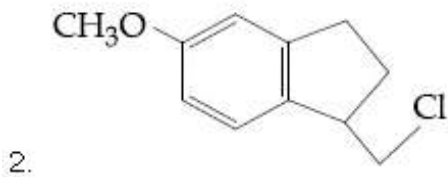
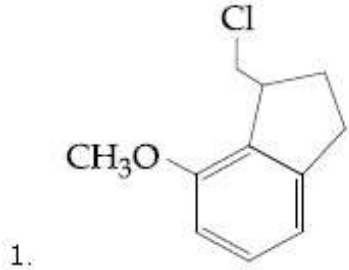


Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical  
 Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?



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

Among the following compounds most basic amino acid is :

Options :

1. Histidine

2. Serine

3. Lysine

4. Asparagine

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

Correct Marks : 4 Wrong Marks : 1

निम्न यौगिकों में से सबसे ज्यादा क्षारीय ऐमीनों अम्ल है :

Options :

1. हिस्टीडीन
2. सेरीन
3. लाइसीन
4. ऐस्पेराजीन

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

नीचे आपेला संयोजनो पैकी सौथी वधु बेजिक ऐमिनो ऐसिड कयो ?

Options :

1. हीस्टीडीन
2. सिरीन
3. लाईसीन
4. ऐस्पेराजीन

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 correct order for acid strength of compounds

$\text{CH} \equiv \text{CH}$ ,  $\text{CH}_3 - \text{C} \equiv \text{CH}$  and  $\text{CH}_2 = \text{CH}_2$  is as follows :

Options :

1.  $\text{HC} \equiv \text{CH} > \text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2$
2.  $\text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2$
3.  $\text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{HC} \equiv \text{CH}$
4.  $\text{CH} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{CH}_3 - \text{C} \equiv \text{CH}$

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

$\text{CH} \equiv \text{CH}$ ,  $\text{CH}_3 - \text{C} \equiv \text{CH}$  तथा  $\text{CH}_2 = \text{CH}_2$

यौगिकों के अम्लीय सामर्थ्य का सही क्रम है :

Options :

1.  $\text{HC} \equiv \text{CH} > \text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2$
2.  $\text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2$
3.  $\text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{HC} \equiv \text{CH}$
4.  $\text{CH} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{CH}_3 - \text{C} \equiv \text{CH}$

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

આપેલા સંયોજનો

$\text{CH} \equiv \text{CH}$ ,  $\text{CH}_3 - \text{C} \equiv \text{CH}$  અને  $\text{CH}_2 = \text{CH}_2$

માંટે તેમના એસિડ સામર્થ્ય નો સાચો ક્રમ શોધો?

Options :

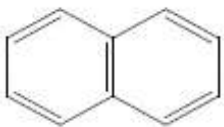
1.  $\text{HC} \equiv \text{CH} > \text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2$
2.  $\text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2$
3.  $\text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{HC} \equiv \text{CH}$
4.  $\text{CH} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{CH}_3 - \text{C} \equiv \text{CH}$

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

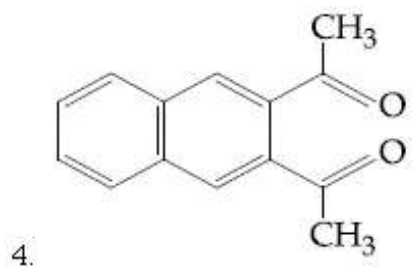
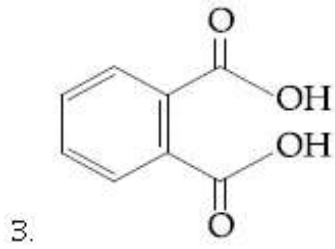
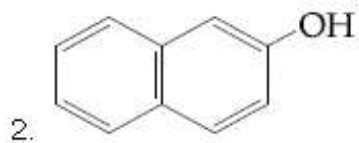
Among the following four aromatic compounds, which one will have the lowest melting point ?

Options :



1.



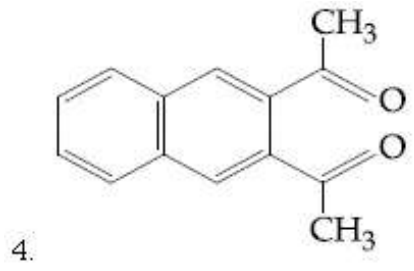
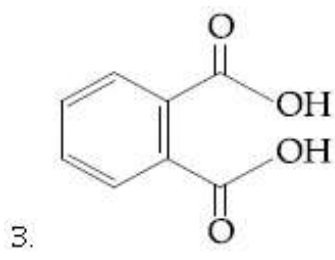
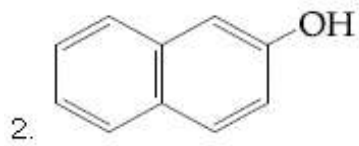
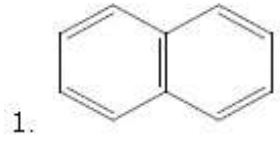


Question Number : 40 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न चार एरोमैटिक यौगिकों में से किसका गलनांक निम्नतम होगा ?

Options :


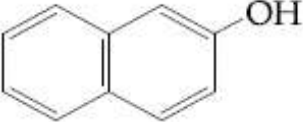
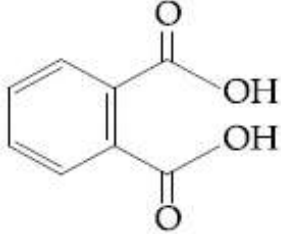
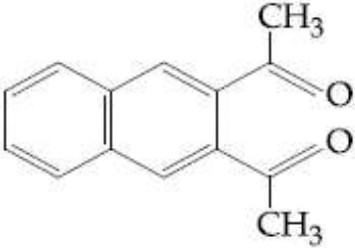


Question Number : 40 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આપેલા ચાર એરોમેટિક સંયોજન પૈકી, કયું એક ઓછામાં ઓછું ગલનબિંદુ ધરાવે છે?

Options :

- 
- 
- 
- 

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 element with  $Z=120$  (not yet discovered) will be an/a :

Options :

- alkali metal
- alkaline earth metal
- transition metal
- inner-transition metal

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

તત્વ  $Z=120$  (જે હમણા સુધી શોધાયો નથી) તે શું હોઈ શકે?

Options :

1. आल्कली धातु
2. आल्कलार्थन अर्थ धातु
3. संक्रांति धातु
4. आंतरिक संक्रांति तत्व

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

वह तत्व जिसका  $Z = 120$  है (जिसकी खोज अभी तक नहीं हुई है) होगा :

Options :

1. क्षार धातु
2. क्षारीय मृदा धातु
3. संक्रमण धातु
4. आंतर संक्रमण धातु

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

In the Hall-Heroult process, aluminium is formed at the cathode. The cathode is made out of :

Options :

1. Platinum
2. Pure aluminium
3. Copper
4. Carbon

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

हाल-हेराल्ट प्रक्रम में एलुमिनियम कैथोड पर बनता है। कैथोड जिसका बनता है, वह है :

Options :

1. પ્લેટિનમ
2. શુદ્ધ એલુમિનિયમ
3. તાંબા
4. કાર્બન

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

હોલહેરાલ્ડ પદ્ધતિમાં એલ્યુમિનિયમ કેથોડ ઊપર જમા થાય છે આ કેથોડ શેનો બનેલો હોય છે?

Options :

1. પ્લેટિનમ
2. શુદ્ધ એલ્યુમિનિયમ
3. કોપર
4. કાર્બન

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 hardness of a water sample (in terms of equivalents of  $\text{CaCO}_3$ ) containing  $10^{-3} \text{ M CaSO}_4$  is :

(molar mass of  $\text{CaSO}_4 = 136 \text{ g mol}^{-1}$ )

Options :

1. 90 ppm
2. 100 ppm
3. 10 ppm
4. 50 ppm

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

Correct Marks : 4 Wrong Marks : 1

पानी के उस प्रतिदर्श की कठोरता ( $\text{CaCO}_3$  के समतुल्य के सापेक्ष) जिसमें  $10^{-3} \text{ M CaSO}_4$  है, होगी :

( $\text{CaSO}_4$  का मोलर द्रव्यमान =  $136 \text{ g mol}^{-1}$ )

Options :

1. 90 ppm
2. 100 ppm
3. 10 ppm
4. 50 ppm

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

Correct Marks : 4 Wrong Marks : 1

$10^{-3} \text{ M CaSO}_4$  धरावता पाएगीना अक नमूनामां पाएगीनी कठिनता ( $\text{CaCO}_3$  नी तुल्यतानां छे ते संदर्भमां) शोधो?

( $\text{CaSO}_4$  नुं मोलर द्रव्यमान =  $136 \text{ g mol}^{-1}$ )

Options :

1. 90 ppm
2. 100 ppm
3. 10 ppm
4. 50 ppm

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

Correct Marks : 4 Wrong Marks : 1

एक धातु, वायु के आधिक्य में, दहन होने पर X बनाती है। X जल के साथ जल अपघटित होकर  $\text{H}_2\text{O}_2$  तथा  $\text{O}_2$  और कुछ अन्य उत्पाद देता है। धातु है :

Options :

1. Li
2. Na
3. Rb

4. Mg

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

એક ધાતુનું વધુ પડતી હવાની હાજરીમાં દહન કરતા X બનાવે છે. X નું પાણી વડે જળ વિભાજન કરતા બીજી નીપજની સાથે  $H_2O_2$  અને  $O_2$  બને છે તો આ ધાતુ શોધો ?

Options :

1. Li
2. Na
3. Rb
4. Mg

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 metal on combustion in excess air forms X. X upon hydrolysis with water yields  $H_2O_2$  and  $O_2$  along with another product. The metal is :

Options :

1. Li
2. Na
3. Rb
4. Mg

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

Iodine reacts with concentrated  $HNO_3$  to yield Y along with other products. The oxidation state of iodine in Y, is :

Options :

1. 1

2. 3

3. 5

4. 7

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

आयोडीन सान्द्र  $\text{HNO}_3$  के साथ अभिक्रिया करके अन्य उत्पादों के साथ Y पैदा करती है। Y में आयोडीन की ऑक्सीकरण संख्या है :

Options :

1. 1

2. 3

3. 5

4. 7

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

आयोडीननी सान्द्र  $\text{HNO}_3$  नी साथे प्रक्रिया करता Y नी साथे बीछ नीपले आपे छे. तो Y मां आयोडीन ऑक्सीडेशन अवस्था शोधो

Options :

1. 1

2. 3

3. 5

4. 7

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 pair of metal ions that can give a spin-only magnetic moment of 3.9 BM for the complex  $[\text{M}(\text{H}_2\text{O})_6]\text{Cl}_2$  is :

Options :



1.  $\text{Cr}^{2+}$  and  $\text{Mn}^{2+}$
2.  $\text{V}^{2+}$  and  $\text{Fe}^{2+}$
3.  $\text{V}^{2+}$  and  $\text{Co}^{2+}$
4.  $\text{Co}^{2+}$  and  $\text{Fe}^{2+}$

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

Correct Marks : 4 Wrong Marks : 1

સંકિર્ણ  $[\text{M}(\text{H}_2\text{O})_6]\text{Cl}_2$  માં ધાતુ આયનની કઈ બ્રેડી 3.9 BM ની ફક્ત સ્પિન ચુંબકીય ચાકમાત્રા આપે છે તે શોધો?

Options :

1.  $\text{Cr}^{2+}$  અને  $\text{Mn}^{2+}$
2.  $\text{V}^{2+}$  અને  $\text{Fe}^{2+}$
3.  $\text{V}^{2+}$  અને  $\text{Co}^{2+}$
4.  $\text{Co}^{2+}$  અને  $\text{Fe}^{2+}$

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

Correct Marks : 4 Wrong Marks : 1

સંકુલ  $[\text{M}(\text{H}_2\text{O})_6]\text{Cl}_2$  કે લિષ ધાતુ આયનોં કા યુગ્મ જો 3.9 BM કા ઁક સ્પિન માત્ર ચુમ્બકીય આઘૂર્ણ દેતા હૈ, હોગા :

Options :

1.  $\text{Cr}^{2+}$  તથા  $\text{Mn}^{2+}$
2.  $\text{V}^{2+}$  તથા  $\text{Fe}^{2+}$
3.  $\text{V}^{2+}$  તથા  $\text{Co}^{2+}$
4.  $\text{Co}^{2+}$  તથા  $\text{Fe}^{2+}$

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

Correct Marks : 4 Wrong Marks : 1

The metal d-orbitals that are directly facing the ligands in  $K_3[Co(CN)_6]$  are :

Options :

1.  $d_{xy}$  and  $d_{x^2-y^2}$
2.  $d_{xy}$ ,  $d_{xz}$  and  $d_{yz}$
3.  $d_{xz}$ ,  $d_{yz}$  and  $d_{z^2}$
4.  $d_{x^2-y^2}$  and  $d_{z^2}$

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

Correct Marks : 4 Wrong Marks : 1

धातु के d-कक्षक जो  $K_3[Co(CN)_6]$  में लिगण्ड के सीधे सामने पड़ते हैं, हैं :

Options :

1.  $d_{xy}$  तथा  $d_{x^2-y^2}$
2.  $d_{xy}$ ,  $d_{xz}$  तथा  $d_{yz}$
3.  $d_{xz}$ ,  $d_{yz}$  तथा  $d_{z^2}$
4.  $d_{x^2-y^2}$  तथा  $d_{z^2}$

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

Correct Marks : 4 Wrong Marks : 1

$K_3[Co(CN)_6]$  માં ધાતુની કઈ d-કક્ષકો જે સીધી રીતે લિગાન્ડની સામે છે તે શોધો ?

Options :

1.  $d_{xy}$  અને  $d_{x^2-y^2}$
2.  $d_{xy}$ ,  $d_{xz}$  અને  $d_{yz}$
3.  $d_{xz}$ ,  $d_{yz}$  અને  $d_{z^2}$

4.  $d_{x^2-y^2}$  અને  $d_{z^2}$

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

Correct Marks : 4 Wrong Marks : 1

$Mn_2(CO)_{10}$  is an organometallic compound due to the presence of :

Options :

1. Mn - C bond
2. Mn - Mn bond
3. C - O bond
4. Mn - O bond

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

जिसकी उपस्थिति के कारण  $Mn_2(CO)_{10}$  एक कार्बधात्विक यौगिक है, वह है :

Options :

1. Mn - C आबन्ध
2. Mn - Mn आबन्ध
3. C - O आबन्ध
4. Mn - O आबन्ध

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

$Mn_2(CO)_{10}$  એક ઓર્ગેનોમેટાલિક સંયોજન નીચે આપેલા માંથી કોની હાજરી ના કારણે છે ?

Options :

1. Mn - C બંધ
2. Mn - Mn બંધ
3. C - O બંધ

4. Mn - O બંધ

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

Water samples with BOD values of 4 ppm and 18 ppm, respectively, are :

Options :

1. Clean and Clean
2. Highly polluted and Clean
3. Clean and Highly polluted
4. Highly polluted and Highly polluted

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

4 ppm તથા 18 ppm BOD (બી.ઓ.ડી.) માનવાલે જલ કે નમૂને ક્રમશઃ હોંગે :

Options :

1. સ્વચ્છ તથા સ્વચ્છ
2. અત્યધિક પ્રદૂષિત તથા સ્વચ્છ
3. સ્વચ્છ તથા અત્યધિક પ્રદૂષિત
4. અત્યધિક પ્રદૂષિત તથા અત્યધિક પ્રદૂષિત

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

પાણી ના નમૂનાઓમાં BOD નું મૂલ્ય 4 ppm અને 18 ppm છે. તે આ પાણી :

Options :

1. ચોખ્ખુ અને ચોખ્ખુ
2. અતિ પ્રદૂષિત અને ચોખ્ખુ
3. ચોખ્ખુ અને અતિ પ્રદૂષિત

4. अति प्रदूषित अने अति प्रदूषित

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

Correct Marks : 4 Wrong Marks : 1

The molecule that has minimum/no role in the formation of photochemical smog, is :

Options :

1.  $O_3$
2.  $N_2$
3. NO
4.  $CH_2=O$

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

उस अणु को बताइये जिसकी प्रकाश रासायनिक धूमकुहा के बनने में कम से कम/कुछ नहीं भूमिका होती है, :

Options :

1.  $O_3$
2.  $N_2$
3. NO
4.  $CH_2=O$

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

नीचे आपेला अणुओ पैकी कयानो प्रकाश रासायनिक धूम-धुम्समां इणो न्युनतम/नथी ते जणुओ?

Options :

1.  $O_3$
2.  $N_2$
3. NO



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

50 mL of 0.5 M oxalic acid is needed to neutralize 25 mL of sodium hydroxide solution. The amount of NaOH in 50 mL of the given sodium hydroxide solution is :

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

Options :

1. 20 g
2. 40 g
3. 80 g
4. 10 g

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

Correct Marks : 4 Wrong Marks : 1

25 mL सोडियम हाइड्रॉक्साइड विलयन के उदासीनीकरण के लिए 0.5 M आकजेलिक अम्ल के 50 mL की आवश्यकता होती है। दिये गये सोडियम हाइड्रॉक्साइड विलयन के 50 mL में NaOH की मात्रा होगी :

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

Options :

1. 20 g
2. 40 g
3. 80 g
4. 10 g

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

Correct Marks : 4 Wrong Marks : 1

25 mL सोडियम हायड्रोक्साईडना द्रावणनुं तटस्थीकरण करवाभाटे 50 mL 0.5 M ओक्जलिक एसिडनी जरूर पडे छे. तो 50 mL सोडियम हायड्रोक्साईडना आपेला द्रावणमां NaOH नो बस्थो केटलो?

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

Options :

1. 20 g
2. 40 g
3. 80 g
4. 10 g

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

Correct Marks : 4 Wrong Marks : 1

The volume of gas A is twice than that of gas B. The compressibility factor of gas A is thrice than that of gas B at same temperature. The pressures of the gases for equal number of moles are :

Options :

1.  $P_A = 2P_B$
2.  $P_A = 3P_B$
3.  $2P_A = 3P_B$
4.  $3P_A = 2P_B$

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

गैस A का आयतन गैस B के आयतन का दो गुना है। एक ही ताप पर गैस A का संपीड्यता गुणांक गैस B के संपीड्यता गुणांक की तुलना में तीन गुना है। मोलों की समान संख्या के लिए गैसों का दाब होगा :

Options :

1.  $P_A = 2P_B$



2.  $P_A = 3P_B$

3.  $2P_A = 3P_B$

4.  $3P_A = 2P_B$

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

વાયુ Aનું કદ વાયુ B ના કદ કરતા બમણું છે આજ તાપમાને વાયુ A નો દબનીય અવયવ, વાયુ B કરતા ત્રણ ગણો છે તો વાયુઓના એક સરખા મોલ માટે તેના દબાણ શોધો?

Options :

1.  $P_A = 2P_B$

2.  $P_A = 3P_B$

3.  $2P_A = 3P_B$

4.  $3P_A = 2P_B$

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

What is the work function of the metal if the light of wavelength  $4000\text{\AA}$  generates photoelectrons of velocity  $6 \times 10^5 \text{ ms}^{-1}$  from it?

(Mass of electron =  $9 \times 10^{-31} \text{ kg}$

Velocity of light =  $3 \times 10^8 \text{ ms}^{-1}$

Planck's constant =  $6.626 \times 10^{-34} \text{ Js}$

Charge of electron =  $1.6 \times 10^{-19} \text{ JeV}^{-1}$ )

Options :

1. 4.0 eV

2. 2.1 eV

3. 0.9 eV

4. 3.1 eV

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

धातु का कार्यफलन क्या होगा, यदि  $4000\text{\AA}$  तरंगदैर्घ्य का प्रकाश इससे  $6 \times 10^5 \text{ ms}^{-1}$  वेग के फोटोइलेक्ट्रॉनों को उत्पन्न करता है?

(इलेक्ट्रॉन की संहति  $= 9 \times 10^{-31} \text{ kg}$

प्रकाश का वेग  $= 3 \times 10^8 \text{ ms}^{-1}$

प्लैंक स्थिरांक  $= 6.626 \times 10^{-34} \text{ Js}$

तथा इलेक्ट्रॉन का आवेश  $= 1.6 \times 10^{-19} \text{ JeV}^{-1}$ )

Options :

1. 4.0 eV
2. 2.1 eV
3. 0.9 eV
4. 3.1 eV

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

$4000\text{\AA}$  तरंगदैर्घ्य धरायता प्रकाशना किरणों पर धातु परथी उत्सर्जित तथा फोटोइलेक्ट्रॉनों को वेग  $6 \times 10^5 \text{ ms}^{-1}$  होय तो आ धातुनुं कार्य विधेय (work function) केटलुं?

(इलेक्ट्रॉननुं द्रव्य  $= 9 \times 10^{-31} \text{ kg}$

प्रकाशनो वेग  $= 3 \times 10^8 \text{ ms}^{-1}$

प्लान्क अथवांक  $= 6.626 \times 10^{-34} \text{ Js}$

अने इलेक्ट्रॉननो भार  $= 1.6 \times 10^{-19} \text{ JeV}^{-1}$ )

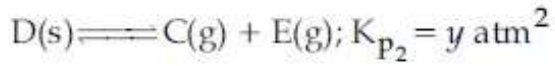
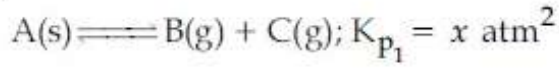
Options :

1. 4.0 eV
2. 2.1 eV
3. 0.9 eV
4. 3.1 eV

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

दो ठोस निम्न प्रकार वियोजित होते हैं



जब दोनों ठोस एक ही साथ वियोजित हों तो कुल दाब होगा :

Options :

1.  $\sqrt{x+y} \text{ atm}$

2.  $(x+y) \text{ atm}$

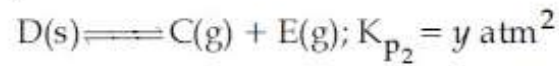
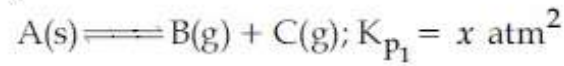
3.  $2(\sqrt{x+y}) \text{ atm}$

4.  $x^2+y^2 \text{ atm}$

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

બે ઘન પદાર્થ નીચે મુજબ વાયોજિત થાય છે



જો બન્ને ઘન પદાર્થો એકી સાથે વાયોજિત થાય તો કુલ દબાણ કેટલું થશે?

Options :

1.  $\sqrt{x+y} \text{ atm}$

2.  $(x+y) \text{ atm}$

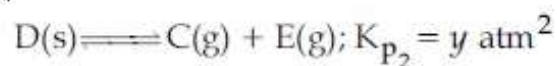
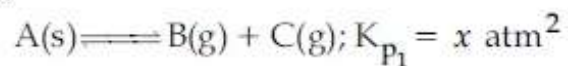
3.  $2(\sqrt{x+y}) \text{ atm}$

4.  $x^2+y^2 \text{ atm}$

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

Correct Marks : 4 Wrong Marks : 1

Two solids dissociate as follows



The total pressure when both the solids dissociate simultaneously is :

Options :

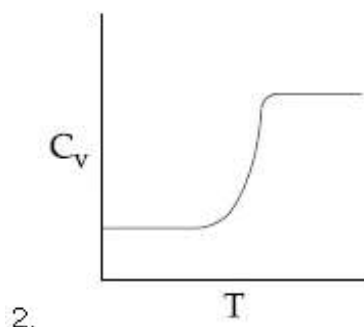
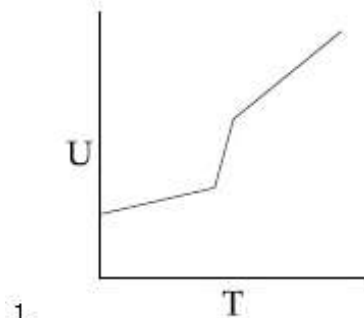
1.  $\sqrt{x+y}$  atm
2.  $(x+y)$  atm
3.  $2(\sqrt{x+y})$  atm
4.  $x^2+y^2$  atm

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

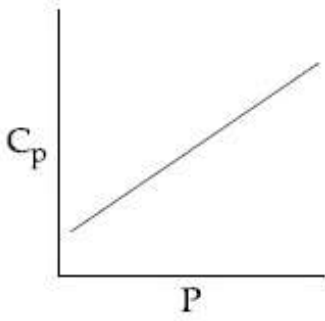
Correct Marks : 4 Wrong Marks : 1

For a diatomic ideal gas in a closed system, which of the following plots does not correctly describe the relation between various thermodynamic quantities ?

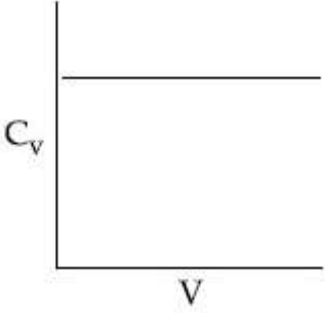
Options :



3.



4.



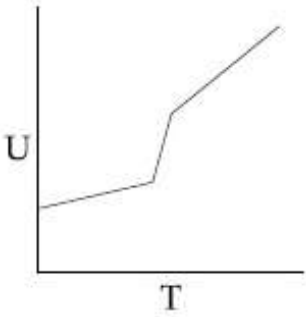
Question Number : 55 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

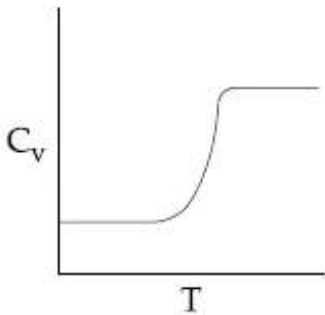
एक बंद निकाय में एक द्विपरमाणुक आदर्श गैस के लिए निम्न में से कौन सा एक प्लॉट विभिन्न ऊष्मागतिक परिमाणों के मध्य सम्बन्धों को सही-सही नहीं बताता ?

Options :

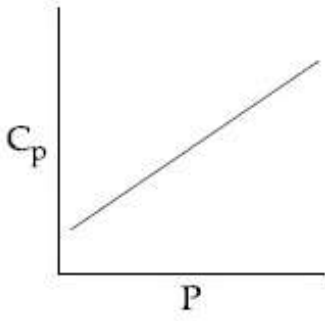
1.



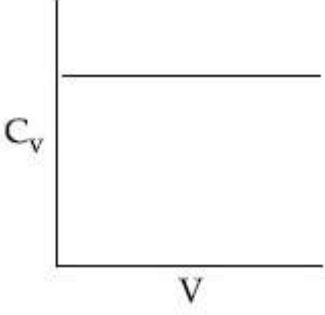
2.



3.



4.



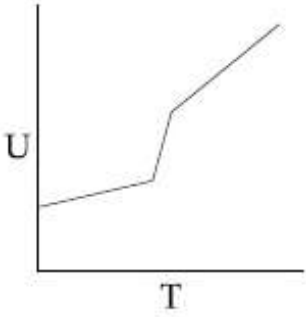
Question Number : 55 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

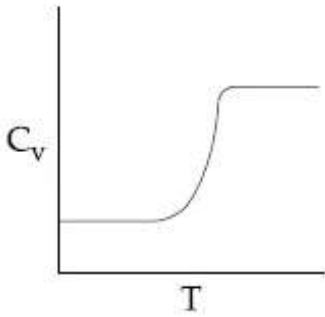
એક બંધ પ્રણાલીમાં દ્વિઆણ્વિક આદર્શ વાયુ માટે નીચે આપેલા આલેખો પૈકી કયો ઊષ્માગતિશાસ્ત્રના વિવિધ પરિમાણો વચ્ચેનો સાચો સંબંધ વર્ણવતો નથી?

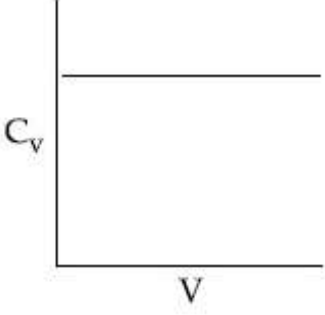
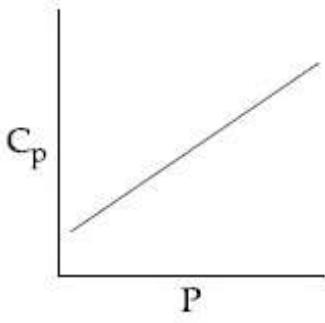
Options :

1.



2.





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

X के 4% जलीय विलयन का हिमांक, Y के 12% जलीय विलयन के हिमांक के बराबर है। यदि X का अणुभार A है तो Y का अणुभार होगा :

Options :

1. A
2. 2A
3. 3A
4. 4A

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

X ના 4% જલીય દ્રાવણનું ઠાર બિંદુ, Y ના 12% જલીય દ્રાવણના ઠાર બિંદુ જેટલું છે. જો X નો અણુભાર A હોય તો Y નો અણુભાર ?

Options :

1. A
2. 2A
3. 3A



4. 4A

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

Freezing point of a 4% aqueous solution of X is equal to freezing point of 12% aqueous solution of Y. If molecular weight of X is A, then molecular weight of Y is :

Options :

1. A

2. 2A

3. 3A

4. 4A

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

In a chemical reaction,  $A + 2B \xrightleftharpoons{K} 2C + D$ , the initial concentration of B was 1.5 times of the concentration of A, but the equilibrium concentrations of A and B were found to be equal. The equilibrium constant(K) for the aforesaid chemical reaction is :

Options :

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

2. 4

3. 1

4. 16

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

एक रासायनिक अभिक्रिया,  $A+2B \xrightleftharpoons{K} 2C+D$  में, B की प्रारम्भिक सान्द्रता A की सान्द्रता की 1.5 गुना थी लेकिन A तथा B साम्य सान्द्रतायें बराबर पाई गईं। उपरोक्त अभिक्रिया के लिए साम्य स्थिरांक (K) होगा :

Options :

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

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

रासायनिक प्रक्रिया,  $A+2B \xrightleftharpoons{K} 2C+D$  में B की शुरुआत की सांद्रता A की शुरुआत की सांद्रता के 1.5 गुणा होती है, परंतु संतुलन में A और B की सांद्रता समान हो जाती है, तो उपरोक्त रासायनिक प्रक्रिया के संतुलन स्थिरांक (K) का मान होगा :

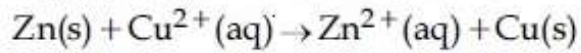
Options :

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

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

The standard electrode potential  $E^\ominus$  and its temperature coefficient  $\left(\frac{dE^\ominus}{dT}\right)$  for a cell are 2 V and  $-5 \times 10^{-4} \text{ VK}^{-1}$  at 300 K respectively. The cell reaction is



The standard reaction enthalpy ( $\Delta_r H^\ominus$ ) at 300 K in  $\text{kJ mol}^{-1}$  is,

[Use  $R = 8 \text{ JK}^{-1} \text{ mol}^{-1}$  and  $F = 96,000 \text{ C mol}^{-1}$ ]

Options :

1. -412.8
2. 206.4
3. -384.0
4. 192.0

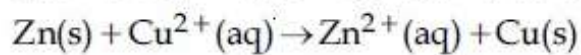
Question Number : 58 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक सेल के लिए मानक इलेक्ट्रोड विभव  $E^\ominus$  तथा

उसका ताप गुणांक  $\left(\frac{dE^\ominus}{dT}\right)$  300 K पर क्रमशः 2 V

तथा  $-5 \times 10^{-4} \text{ VK}^{-1}$  हैं। सेल अभिक्रिया है,



300 K पर मानक अभिक्रिया एन्थैल्पी ( $\Delta_r H^\ominus$ ),  $\text{kJ mol}^{-1}$  में होगी :

[ $R = 8 \text{ JK}^{-1} \text{ mol}^{-1}$  तथा  $F = 96,000 \text{ C mol}^{-1}$ ]

Options :

1. -412.8
2. 206.4
3. -384.0
4. 192.0

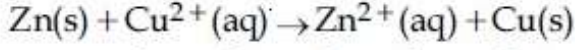
Question Number : 58 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

300 K એ એક કોષનો પ્રમાણિત ઇલેક્ટ્રોડ પોટેન્શિયલ

$E^{\ominus}$  અને તેના તાપમાનનો સહ ગુણક  $\left(\frac{dE^{\ominus}}{dT}\right)$  અનુક્રમે

2 V અને  $-5 \times 10^{-4} \text{VK}^{-1}$  છે. કોષ પ્રક્રિયા



300 K એ પ્રમાણિત પ્રક્રિયા એન્થાલ્પી ( $\Delta_r H^{\ominus}$ ),

$\text{kJ mol}^{-1}$  માં શોધો :

[ $R = 8 \text{JK}^{-1} \text{mol}^{-1}$  અને  $F = 96,000 \text{C mol}^{-1}$ ]

Options :

1. -412.8

2. 206.4

3. -384.0

4. 192.0

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

Decomposition of X exhibits a rate constant of  $0.05 \mu\text{g}/\text{year}$ . How many years are required for the decomposition of  $5 \mu\text{g}$  of X into  $2.5 \mu\text{g}$  ?

Options :

1. 20

2. 50

3. 25

4. 40

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

X का विघटन  $0.05 \mu\text{g}/\text{वर्ष}$  का दर नियतांक प्रदर्शित करता है। X के  $5 \mu\text{g}$  को विघटित होकर  $2.5 \mu\text{g}$  होने में कितने वर्ष लगेंगे ?

Options :

1. 20

2. 50
3. 25
4. 40

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

X ના એક નમૂના ના વિઘટનનો વેગ અચળાંક  $0.05 \mu\text{g}/\text{વર્ષ}$  છે, તો X ના  $5 \mu\text{g}$  ને  $2.5 \mu\text{g}$  માં વિઘટન કરવા માટે કેટલા વર્ષો લાગશે?

Options :

1. 20
2. 50
3. 25
4. 40

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

દિયા ગયા છે

| ગૈસ            | H <sub>2</sub> | CH <sub>4</sub> | CO <sub>2</sub> | SO <sub>2</sub> |
|----------------|----------------|-----------------|-----------------|-----------------|
| ક્રાંતિક તાપ/K | 33             | 190             | 304             | 630             |

ઊપર દિયે ગયે આંકડોં કે આધાર પર પ્રાગુક્તિ કીજિએ કિ નિમ્ન મેં સે કૌન સી ગૈસ ચારકોલ કી એક નિશ્ચિત માત્રા પર ન્યૂનતમ અધિશોષણ પ્રદર્શિત કરેગી?

Options :

1. SO<sub>2</sub>
2. CO<sub>2</sub>
3. CH<sub>4</sub>
4. H<sub>2</sub>

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

આપેલ

વાયુ H<sub>2</sub> CH<sub>4</sub> CO<sub>2</sub> SO<sub>2</sub>

ક્રાંતિ તાપમાન/K 33 190 304 630

ઉપરની માહિતીના આધારે, નીચેનામાંથી કયો વાયુ ચોક્કસ જથ્થાના કોલસા (ચારકોલ) પર ઓછામાં ઓછું અધિશોષણ કરશે?

Options :

1. SO<sub>2</sub>

2. CO<sub>2</sub>

3. CH<sub>4</sub>

4. H<sub>2</sub>

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

Given

Gas H<sub>2</sub> CH<sub>4</sub> CO<sub>2</sub> SO<sub>2</sub>

Critical 33 190 304 630

Temperature/K

On the basis of data given above, predict which of the following gases shows least adsorption on a definite amount of charcoal ?

Options :

1. SO<sub>2</sub>

2. CO<sub>2</sub>

3. CH<sub>4</sub>

4. H<sub>2</sub>

Mathematics

Section Id :

416529150

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:

416529159

Question Shuffling Allowed :

Yes

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

Correct Marks : 4 Wrong Marks : 1

Let  $S = \{1, 2, 3, \dots, 100\}$ . The number of non-empty subsets  $A$  of  $S$  such that the product of elements in  $A$  is even is :

Options :

1.  $2^{100} - 1$

2.  $2^{50} - 1$

3.  $2^{50} (2^{50} - 1)$

4.  $2^{50} + 1$

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

माना  $S = \{1, 2, 3, \dots, 100\}$ , तो  $S$  के उन सभी अरिक्त (non-empty) उपसमुच्चयों  $A$  जिनके अवयवों का गुणनफल सम है, की संख्या है :

Options :

1.  $2^{100} - 1$

2.  $2^{50} - 1$

3.  $2^{50} (2^{50} - 1)$

4.  $2^{50} + 1$

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

ધારોકે  $S = \{1, 2, 3, \dots, 100\}$  છે. જો  $A$  એ  $S$  નો એવો અરિક્ત ઉપગણ હોય કે જેના ઘટકોનો ગુણાકાર યુગ્મ થાય, તો આવા ઉપગણો  $A$  ની સંખ્યા \_\_\_\_\_ છે.



Options :

1.  $2^{100} - 1$
2.  $2^{50} - 1$
3.  $2^{50} (2^{50} - 1)$
4.  $2^{50} + 1$

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  $\frac{z - \alpha}{z + \alpha}$  ( $\alpha \in \mathbb{R}$ ) is a purely imaginary number and  $|z| = 2$ , then a value of  $\alpha$  is :

Options :

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

यदि  $\frac{z - \alpha}{z + \alpha}$  ( $\alpha \in \mathbb{R}$ ) एक शुद्ध रूप से काल्पनिक संख्या है, तथा  $|z| = 2$  है, तो  $\alpha$  का एक मान है :

Options :

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

જો  $\frac{z-\alpha}{z+\alpha}$  ( $\alpha \in \mathbb{R}$ ) એ શુદ્ધ કાલ્પનિક સંખ્યા હોય અને

$|z|=2$ , તો  $\alpha$  ની કોઈ એક કિંમત \_\_\_\_\_ છે.

Options :

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

2. 2

3.  $\sqrt{2}$

4. 1

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

If  $\lambda$  be the ratio of the roots of the quadratic equation in  $x$ ,  $3m^2x^2 + m(m-4)x + 2 = 0$ , then the least value of  $m$  for which

$$\lambda + \frac{1}{\lambda} = 1, \text{ is :}$$

Options :

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

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

3.  $2 - \sqrt{3}$

4.  $-2 + \sqrt{2}$

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

यदि  $x$  में द्विघात समीकरण

$3m^2x^2 + m(m-4)x + 2 = 0$  के मूलों का अनुपात

$\lambda$  है, तो  $m$  का वह न्यूनतम मान जिसके लिए

$$\lambda + \frac{1}{\lambda} = 1 \text{ है, है :}$$

Options :

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

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

3.  $2 - \sqrt{3}$

4.  $-2 + \sqrt{2}$

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

જો  $\lambda$  એ  $x$  માં દ્વિઘાત સમીકરણ

$$3m^2x^2 + m(m-4)x + 2 = 0$$
 નાં બીજાનો ગુણોત્તર

હોય, તો  $\lambda + \frac{1}{\lambda} = 1$  થાય તે માટેની  $m$  ની ન્યુનતમ

કિંમત \_\_\_\_\_ છે.

Options :

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

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

3.  $2 - \sqrt{3}$

4.  $-2 + \sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

Let  $P = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 1 & 0 \\ 9 & 3 & 1 \end{bmatrix}$  and  $Q = [q_{ij}]$  be two

$3 \times 3$  matrices such that  $Q - P^5 = I_3$ . Then

$\frac{q_{21} + q_{31}}{q_{32}}$  is equal to :

Options :

1. 9

2. 10

3. 15

4. 135

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

Correct Marks : 4 Wrong Marks : 1

यदि  $P = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 1 & 0 \\ 9 & 3 & 1 \end{bmatrix}$  तथा  $Q = [q_{ij}]$  दो ऐसे  $3 \times 3$

आव्यूह हैं, कि  $Q - P^5 = I_3$  है, तो  $\frac{q_{21} + q_{31}}{q_{32}}$

बराबर है :

Options :

1. 9
2. 10
3. 15
4. 135

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

ધારોકે  $P = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 1 & 0 \\ 9 & 3 & 1 \end{bmatrix}$  અને  $Q = [q_{ij}]$  એવા બે

$3 \times 3$  શ્રેણિકો છે કે જેથી  $Q - P^5 = I_3$  થાય, તો

$\frac{q_{21} + q_{31}}{q_{32}}$  બરાબર \_\_\_\_\_ છે.

Options :

1. 9
2. 10
3. 15
4. 135

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

एक ऐसा क्रमित युग्म  $(\alpha, \beta)$  जिसके लिए रेखिक समीकरण निकाय

$$(1 + \alpha)x + \beta y + z = 2$$

$$\alpha x + (1 + \beta)y + z = 3$$

$$\alpha x + \beta y + 2z = 2$$

का एकमात्र एक हल है, है :

Options :

1.  $(1, -3)$

2.  $(-3, 1)$

3.  $(-4, 2)$

4.  $(2, 4)$

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

सुरेभ समीकरण संलति

$$(1 + \alpha)x + \beta y + z = 2$$

$$\alpha x + (1 + \beta)y + z = 3$$

$$\alpha x + \beta y + 2z = 2$$

ने अनन्य उकेल होय तेवी कभयुक्त जोड  $(\alpha, \beta)$  पुरापर  
\_\_\_\_\_ छे.

Options :

1.  $(1, -3)$

2.  $(-3, 1)$

3.  $(-4, 2)$

4.  $(2, 4)$

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

An ordered pair  $(\alpha, \beta)$  for which the system of linear equations

$$(1 + \alpha)x + \beta y + z = 2$$

$$\alpha x + (1 + \beta)y + z = 3$$

$$\alpha x + \beta y + 2z = 2$$

has a unique solution, is :

Options :

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

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

Consider three boxes, each containing 10 balls labelled  $1, 2, \dots, 10$ . Suppose one ball is randomly drawn from each of the boxes. Denote by  $n_i$ , the label of the ball drawn from the  $i^{\text{th}}$  box, ( $i=1, 2, 3$ ). Then, the number of ways in which the balls can be chosen such that  $n_1 < n_2 < n_3$  is :

Options :

1. 120
2. 164
3. 82
4. 240

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

तीन ऐसे डिब्बों पर विचार कीजिए जिनमें प्रत्येक में  $1, 2, \dots, 10$  तक संख्याओं से अंकित 10 गेंदें हैं। माना कि प्रत्येक डिब्बे में से यादृच्छया एक गेंद निकाली गई। यदि  $i$  वें ( $i=1, 2, 3$ ) डिब्बे में से निकाली गई गेंद पर अंकित संख्या को  $n_i$  से प्रदर्शित किया जाए, तो जितने तरीकों से यह गेंदें निकाली जा सकती हैं, ताकि  $n_1 < n_2 < n_3$  है, हैं :

Options :

1. 120
2. 164

3. 82

4. 240

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

પ્રત્યેક ખોખામાં 1, 2, ..., 10 અંકો વડે અંકિત કરેલા 10 દડા હોય તેવા ત્રણ ખોખાઓ આપેલા છે. ધારોકે પ્રત્યેક ખોખામાંથી યાદચ્છિક રીતે એક દડો પસંદ કરવામાં આવે છે અને  $i$  મા ખોખામાંથી પસંદ કરેલ દડાનો અંક  $n_i$  વડે દર્શાવાય છે, જ્યાં  $i = 1, 2, 3$  તો  $n_1 < n_2 < n_3$  થાય તેવી કેટલી રીતે દડા પસંદ કરી શકાય?

Options :

1. 120

2. 164

3. 82

4. 240

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

A ratio of the 5<sup>th</sup> term from the beginning to the 5<sup>th</sup> term from the end in the binomial

expansion of  $\left(2^{1/3} + \frac{1}{2(3)^{1/3}}\right)^{10}$  is :

Options :

1.  $1 : 2(6)^{1/3}$

2.  $2(36)^{1/3} : 1$

3.  $4(36)^{1/3} : 1$



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

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

Correct Marks : 4 Wrong Marks : 1

$\left(2^{\frac{1}{3}} + \frac{1}{2(3)^{\frac{1}{3}}}\right)^{10}$  के द्विपद प्रसार में आरम्भ से

5वें तथा अंत से (प्रथम की ओर) 5 वें पदों का एक अनुपात है :

Options :

1.  $1 : 2(6)^{\frac{1}{3}}$

2.  $2(36)^{\frac{1}{3}} : 1$

3.  $4(36)^{\frac{1}{3}} : 1$

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

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

Correct Marks : 4 Wrong Marks : 1

$\left(2^{\frac{1}{3}} + \frac{1}{2(3)^{\frac{1}{3}}}\right)^{10}$  ना द्विपदी विस्तारणामां शङ्थी

5 भा पद अने छेल्थेथी 5 भा पद नो गुणोत्तर  
\_\_\_\_\_ थाय.

Options :

1.  $1 : 2(6)^{\frac{1}{3}}$

2.  $2(36)^{\frac{1}{3}} : 1$

3.  $4(36)^{\frac{1}{3}} : 1$

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

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

Correct Marks : 4 Wrong Marks : 1

The product of three consecutive terms of a G.P. is 512. If 4 is added to each of the first and the second of these terms, the three terms now form an A.P. Then the sum of the original three terms of the given G.P. is :

Options :

1. 36

2. 32

3. 28

4. 24

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

एक गुणोत्तर श्रेणी के तीन क्रमागत (consecutive) पदों का गुणनफल 512 है। यदि इसके पहले तथा दूसरे प्रत्येक पद में 4 जोड़ दें, तो यह तीन संख्याएँ एक समांतर श्रेणी बनाती हैं। तो दी हुई गुणोत्तर श्रेणी के तीनों पदों का योग है :

Options :

1. 36

2. 32

3. 28

4. 24

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

કોઈ એક સમગુણોત્તર શ્રેણી (G.P.) ના પ્રથમ ત્રણ પદોનો ગુણાકાર 512 છે. જો આ ત્રણ પદોમાંથી પહેલા અને બીજા બન્ને પદમાં 4 ઉમેરવામાં આવે, તો હવે આ પદો સમાંતર શ્રેણી (A.P.)માં છે; તો આપેલ (G.P.) ના આ ત્રણ પદોનો સરવાળો \_\_\_\_\_ છે.

Options :

1. 36
2. 32
3. 28
4. 24

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

Let  $S_k = \frac{1 + 2 + 3 + \dots + k}{k}$ . If

$S_1^2 + S_2^2 + \dots + S_{10}^2 = \frac{5}{12} A$ , then A

is equal to :

Options :

1. 156
2. 283
3. 301
4. 303

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

माना  $S_k = \frac{1 + 2 + 3 + \dots + k}{k}$  है। यदि

$S_1^2 + S_2^2 + \dots + S_{10}^2 = \frac{5}{12} A$  है, तो A

बराबर है :

Options :

1. 156

2. 283

3. 301

4. 303

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

ધારો કે  $S_k = \frac{1 + 2 + 3 + \dots + k}{k}$ . જો

$$S_1^2 + S_2^2 + \dots + S_{10}^2 = \frac{5}{12} A, \text{ તો } A$$

બરાબર \_\_\_\_\_ છે.

Options :

1. 156

2. 283

3. 301

4. 303

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

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow \pi/4} \frac{\cot^3 x - \tan x}{\cos(x + \pi/4)}$  is :

Options :

1.  $4\sqrt{2}$

2. 4

3.  $8\sqrt{2}$

4. 8

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

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow \pi/4} \frac{\cot^3 x - \tan x}{\cos(x + \pi/4)}$  बराबर है :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow \pi/4} \frac{\cot^3 x - \tan x}{\cos(x + \pi/4)}$  बराबर \_\_\_\_\_ है.

Options :

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

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

For  $x > 1$ , if  $(2x)^{2y} = 4e^{2x - 2y}$ , then

$(1 + \log_e 2x)^2 \frac{dy}{dx}$  is equal to :

Options :

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

4.  $x \log_e 2x$

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

Correct Marks : 4 Wrong Marks : 1

यदि  $x > 1$  के लिए  $(2x)^{2y} = 4e^{2x - 2y}$  है, तो

$(1 + \log_e 2x)^2 \frac{dy}{dx}$  बराबर है :

Options :

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

2.  $\log_e 2x$

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

4.  $x \log_e 2x$

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

$x > 1$  मानते हैं कि  $(2x)^{2y} = 4e^{2x - 2y}$  है तो

$(1 + \log_e 2x)^2 \frac{dy}{dx}$  बराबर \_\_\_\_\_ है.

Options :

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

2.  $\log_e 2x$

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

4.  $x \log_e 2x$

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

Correct Marks : 4 Wrong Marks : 1

Let S be the set of all points in  $(-\pi, \pi)$  at which the function,  $f(x) = \min \{\sin x, \cos x\}$  is not differentiable. Then S is a subset of which of the following ?

Options :

1.  $\left\{ -\frac{\pi}{2}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{\pi}{2} \right\}$

2.  $\left\{ -\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{4} \right\}$

3.  $\left\{ -\frac{3\pi}{4}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{4} \right\}$

4.  $\left\{ -\frac{\pi}{4}, 0, \frac{\pi}{4} \right\}$

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

Correct Marks : 4 Wrong Marks : 1

माना S, अंतराल  $(-\pi, \pi)$  के बीच में स्थित ऐसे सभी बिंदुओं का समुच्चय है, जिन पर फलन,  $f(x) = \min \{\sin x, \cos x\}$  अवकलनीय नहीं है, तो S निम्न में से किसका उपसमुच्चय है ?

Options :

1.  $\left\{ -\frac{\pi}{2}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{\pi}{2} \right\}$

2.  $\left\{ -\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{4} \right\}$

3.  $\left\{ -\frac{3\pi}{4}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{4} \right\}$

4.  $\left\{ -\frac{\pi}{4}, 0, \frac{\pi}{4} \right\}$

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

Correct Marks : 4 Wrong Marks : 1



વિધેય  $f(x) = \min \{\sin x, \cos x\}$  વિકલનીય ન હોય તેવા  $(-\pi, \pi)$  માંના તમામ બિંદુઓનો ગણ ધારોકે S છે. તો S એ \_\_\_\_\_ માં સમાયેલ છે અથવા તેની બરાબર છે.

Options :

1.  $\left\{-\frac{\pi}{2}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{\pi}{2}\right\}$

2.  $\left\{-\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{4}\right\}$

3.  $\left\{-\frac{3\pi}{4}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{4}\right\}$

4.  $\left\{-\frac{\pi}{4}, 0, \frac{\pi}{4}\right\}$

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

Correct Marks : 4 Wrong Marks : 1

The maximum area (in sq. units) of a rectangle having its base on the  $x$ -axis and its other two vertices on the parabola,  $y = 12 - x^2$  such that the rectangle lies inside the parabola, is :

Options :

1. 36

2. 32

3.  $20\sqrt{2}$

4.  $18\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

एक ऐसी आयत, जिसका आधार  $x$ -अक्ष पर है तथा अन्य दो शीर्ष परवलय  $y = 12 - x^2$  पर इस प्रकार स्थित हैं कि आयत, परवलय के अन्तः भाग में है, का अधिकतम क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1. 36
2. 32
3.  $20\sqrt{2}$
4.  $18\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

જે લંબચોરસનો પાયો  $x$ -અક્ષ પર હોય અને તેના અન્ય બે શિરોબિંદુઓ પરવલય  $y = 12 - x^2$  પર હોય કે જેથી લંબચોરસ આ પરવલયની અંદર રહે તેવા લંબચોરસનું મહત્તમ ક્ષેત્રફળ (ચો. એકમમાં) \_\_\_\_\_ છે.

Options :

1. 36
2. 32
3.  $20\sqrt{2}$
4.  $18\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

The integral  $\int \cos(\log_e x) dx$  is equal to :

(where C is a constant of integration)

Options :

1.  $x [\cos(\log_e x) + \sin(\log_e x)] + C$
2.  $x [\cos(\log_e x) - \sin(\log_e x)] + C$
3.  $\frac{x}{2} [\sin(\log_e x) - \cos(\log_e x)] + C$
4.  $\frac{x}{2} [\cos(\log_e x) + \sin(\log_e x)] + C$

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

Correct Marks : 4 Wrong Marks : 1

समाकल  $\int \cos(\log_e x) dx$  बराबर है :

(जहाँ C एक समाकलन अचर है)

Options :

1.  $x [\cos(\log_e x) + \sin(\log_e x)] + C$

2.  $x [\cos(\log_e x) - \sin(\log_e x)] + C$

3.  $\frac{x}{2} [\sin(\log_e x) - \cos(\log_e x)] + C$

4.  $\frac{x}{2} [\cos(\log_e x) + \sin(\log_e x)] + C$

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

Correct Marks : 4 Wrong Marks : 1

સંકલિત  $\int \cos(\log_e x) dx$  બરાબર \_\_\_\_\_ છે.

(જ્યાં C એ સંકલનનો અચળાંક છે.)

Options :

1.  $x [\cos(\log_e x) + \sin(\log_e x)] + C$

2.  $x [\cos(\log_e x) - \sin(\log_e x)] + C$

3.  $\frac{x}{2} [\sin(\log_e x) - \cos(\log_e x)] + C$

4.  $\frac{x}{2} [\cos(\log_e x) + \sin(\log_e x)] + C$

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

Correct Marks : 4 Wrong Marks : 1

Let  $f$  and  $g$  be continuous functions on  $[0, a]$  such that  $f(x) = f(a-x)$  and

$g(x) + g(a-x) = 4$ , then  $\int_0^a f(x) g(x) dx$  is

equal to :

Options :

1.  $\int_0^a f(x) dx$

2.  $2 \int_0^a f(x) dx$

3.  $4 \int_0^a f(x) dx$

4.  $-3 \int_0^a f(x) dx$

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

Correct Marks : 4 Wrong Marks : 1

माना  $f$  तथा  $g$ ,  $[0, a]$  पर ऐसे संतत फलन हैं कि  $f(x) = f(a-x)$  तथा  $g(x) + g(a-x) = 4$  है, तो

$\int_0^a f(x) g(x) dx$  बराबर है :

Options :

1.  $\int_0^a f(x) dx$

2.  $2 \int_0^a f(x) dx$

3.  $4 \int_0^a f(x) dx$

4.  $-3 \int_0^a f(x) dx$

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

ધારોકે  $f$  અને  $g$  એ  $[0, a]$  પર એવા સતત વિધેયો છે કે જેથી  $f(x) = f(a-x)$  અને  $g(x) + g(a-x) = 4$ ; તો

$$\int_0^a f(x) g(x) dx \text{ બરાબર } \underline{\hspace{2cm}} \text{ છે.}$$

Options :

1.  $\int_0^a f(x) dx$

2.  $2 \int_0^a f(x) dx$

3.  $4 \int_0^a f(x) dx$

4.  $-3 \int_0^a f(x) dx$

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

પરવલય  $y = x^2 + 2$  તથા રેખાઓ  $y = x + 1$ ,  $x = 0$  ઓર  $x = 3$  દ્વારા ઘેરે હુએ ક્ષેત્ર કા ક્ષેત્રફલ (વર્ગ ઇકાઇયો મેં) હૈ :

Options :

1.  $\frac{15}{2}$

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

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

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

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

પરવલય  $y=x^2+2$  તથા રેખાઓ  $y=x+1$ ,  $x=0$   
અને  $x=3$  દ્વારા આવૃત્ત પ્રદેશનું ક્ષેત્રફળ (ચો.એકમમાં)  
બરાબર \_\_\_\_\_ છે.

Options :

1.  $\frac{15}{2}$

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

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

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

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 parabola,  $y=x^2+2$  and the lines,  
 $y=x+1$ ,  $x=0$  and  $x=3$ , is :

Options :

1.  $\frac{15}{2}$

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

Let  $y=y(x)$  be the solution of the differential  
equation,  $x \frac{dy}{dx} + y = x \log_e x$ , ( $x > 1$ ). If  
 $2y(2) = \log_e 4 - 1$ , then  $y(e)$  is equal to :

Options :

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

2.  $\frac{e^2}{4}$

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

4.  $-\frac{e^2}{2}$

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

માના  $y = y(x)$ , અવકલ સમીકરણ

$x \frac{dy}{dx} + y = x \log_e x, (x > 1)$  કા હલ હૈ। યદિ

$2y(2) = \log_e 4 - 1$  હૈ, તો  $y(e)$  બરાબર હૈ :

Options :

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

2.  $\frac{e^2}{4}$

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

4.  $-\frac{e^2}{2}$

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

ધારોકે  $y = y(x)$  એ વિકલ સમીકરણ

$x \frac{dy}{dx} + y = x \log_e x, (x > 1)$  નો ઉકલ છે. જો

$2y(2) = \log_e 4 - 1$  તો  $y(e)$  બરાબર \_\_\_\_\_ છે.

Options :



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

2.  $\frac{e^2}{4}$

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

4.  $-\frac{e^2}{2}$

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

If the straight line,  $2x - 3y + 17 = 0$  is perpendicular to the line passing through the points  $(7, 17)$  and  $(15, \beta)$ , then  $\beta$  equals :

Options :

1.  $-5$

2.  $\frac{35}{3}$

3.  $5$

4.  $-\frac{35}{3}$

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

Correct Marks : 4 Wrong Marks : 1

यदि सरल रेखा  $2x - 3y + 17 = 0$ , बिन्दुओं  $(7, 17)$  तथा  $(15, \beta)$  से होकर जाने वाली रेखा के लंबवत है, तो  $\beta$  बराबर है :

Options :

1.  $-5$

2.  $\frac{35}{3}$

3.  $5$

4.  $-\frac{35}{3}$

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

Correct Marks : 4 Wrong Marks : 1

બિંદુઓ  $(7, 17)$  અને  $(15, \beta)$  માંથી પસાર થતી રેખાને જો રેખા  $2x - 3y + 17 = 0$  લંબ હોય, તો  $\beta$  બરાબર \_\_\_\_\_ છે.

Options :

1.  $-5$

2.  $\frac{35}{3}$

3.  $5$

4.  $-\frac{35}{3}$

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

Correct Marks : 4 Wrong Marks : 1

If a variable line,  $3x + 4y - \lambda = 0$  is such that the two circles  $x^2 + y^2 - 2x - 2y + 1 = 0$  and  $x^2 + y^2 - 18x - 2y + 78 = 0$  are on its opposite sides, then the set of all values of  $\lambda$  is the interval :

Options :

1.  $(23, 31)$

2.  $(2, 17)$

3.  $[13, 23]$

4.  $[12, 21]$

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

यदि एक चर रेखा  $3x + 4y - \lambda = 0$  इस प्रकार है कि दो वृत्त  $x^2 + y^2 - 2x - 2y + 1 = 0$  तथा  $x^2 + y^2 - 18x - 2y + 78 = 0$  इसके दोनों ओर (opposite sides) हैं, तो  $\lambda$  के सभी मानों का समुच्चय निम्न में से कौनसा अन्तराल है?

Options :

1. (23, 31)
2. (2, 17)
3. [13, 23]
4. [12, 21]

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

જો  $3x + 4y - \lambda = 0$  એક એવી ચલિત રેખા છે કે જેથી બે વર્તુળો  $x^2 + y^2 - 2x - 2y + 1 = 0$  અને  $x^2 + y^2 - 18x - 2y + 78 = 0$  તેની વિરુદ્ધ બાજુએ હોય, તો  $\lambda$  ની તમામ કિંમતનો ગણ બરાબર \_\_\_\_\_ છે.

Options :

1. (23, 31)
2. (2, 17)
3. [13, 23]
4. [12, 21]

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

माना  $C_1$  तथा  $C_2$  क्रमशः वृत्तों  $x^2 + y^2 - 2x - 2y - 2 = 0$  तथा  $x^2 + y^2 - 6x - 6y + 14 = 0$  के केंद्र हैं। यदि P तथा Q इन वृत्तों के प्रतिच्छेदन बिंदु हैं, तो चतुर्भुज  $PC_1QC_2$  का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1. 4

2. 6

3. 8

4. 9

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

ધારોકે  $C_1$  અને  $C_2$  એ અનુક્રમે વર્તુળો

$$x^2 + y^2 - 2x - 2y - 2 = 0 \text{ અને}$$

$$x^2 + y^2 - 6x - 6y + 14 = 0 \text{ ના કેન્દ્રો છે. જો આ}$$

વર્તુળોના છેદ બિંદુઓ P અને Q હોય તો ચતુષ્કોણ

$PC_1QC_2$  નું ક્ષેત્રફળ (ચો. એકમમાં) \_\_\_\_\_ છે.

Options :

1. 4

2. 6

3. 8

4. 9

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

Let  $C_1$  and  $C_2$  be the centres of the circles

$$x^2 + y^2 - 2x - 2y - 2 = 0 \text{ and}$$

$$x^2 + y^2 - 6x - 6y + 14 = 0 \text{ respectively. If P}$$

and Q are the points of intersection of these

circles, then the area (in sq. units) of the

quadrilateral  $PC_1QC_2$  is :

Options :

1. 4

2. 6

3. 8

4. 9

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

Correct Marks : 4 Wrong Marks : 1

Let  $P(4, -4)$  and  $Q(9, 6)$  be two points on the parabola,  $y^2 = 4x$  and let  $X$  be any point on the arc  $POQ$  of this parabola, where  $O$  is the vertex of this parabola, such that the area of  $\Delta PXQ$  is maximum. Then this maximum area (in sq. units) is :

Options :

1.  $\frac{125}{2}$

2.  $\frac{625}{4}$

3.  $\frac{125}{4}$

4.  $\frac{75}{2}$

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

माना  $P(4, -4)$  तथा  $Q(9, 6)$  परवलय  $y^2 = 4x$  पर स्थित दो बिंदु हैं।  $O$  इस परवलय का शीर्ष बिंदु है तथा  $X$  इस परवलय की चाप  $POQ$  का कोई ऐसा बिंदु है, जिसके लिए  $\Delta PXQ$  का क्षेत्रफल अधिकतम है, तो यह अधिकतम क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1.  $\frac{125}{2}$

2.  $\frac{625}{4}$

3.  $\frac{125}{4}$

4.  $\frac{75}{2}$

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

P(4, -4) અને Q(9, 6) પરવલય  $y^2 = 4x$  પરનાં બે બિંદુઓ છે. ધારોકે O એ આ પરવલયનું શિરોબિંદુ છે, અને X એ આ પરવલયના ચાપ POQ પરનું એવું બિંદુ છે કે જેથી  $\Delta PXQ$  નું ક્ષેત્રફળ મહત્તમ થાય. તો આ મહત્તમ ક્ષેત્રફળ (ચો. એકમમાં) \_\_\_\_\_ છે.

Options :

1.  $\frac{125}{2}$

2.  $\frac{625}{4}$

3.  $\frac{125}{4}$

4.  $\frac{75}{2}$

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

Correct Marks : 4 Wrong Marks : 1

If the vertices of a hyperbola be at  $(-2, 0)$  and  $(2, 0)$  and one of its foci be at  $(-3, 0)$ , then which one of the following points does not lie on this hyperbola ?

Options :

1.  $(4, \sqrt{15})$

2.  $(2\sqrt{6}, 5)$

3.  $(6, 5\sqrt{2})$

4.  $(-6, 2\sqrt{10})$

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 एक अतिपरवलय के शीर्ष  $(-2, 0)$  तथा  $(2, 0)$  पर हैं तथा इसकी एक नाभि  $(-3, 0)$  पर है, तो निम्न में से कौन सा बिंदु इस अतिपरवलय पर स्थित नहीं है?

Options :

1.  $(4, \sqrt{15})$

2.  $(2\sqrt{6}, 5)$

3.  $(6, 5\sqrt{2})$

4.  $(-6, 2\sqrt{10})$

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 કોઈ અતિવલયના શિરોબિંદુઓ  $(-2, 0)$  અને  $(2, 0)$  આગળ આવેલા હોય અને તેની કોઈ એક નાભી  $(-3, 0)$  આગળ આવેલ હોય, તો નીચેના પૈકી કયું બિંદુ આ અતિવલય પર આવેલું નથી?

Options :

1.  $(4, \sqrt{15})$

2.  $(2\sqrt{6}, 5)$

3.  $(6, 5\sqrt{2})$

4.  $(-6, 2\sqrt{10})$

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

Correct Marks : 4 Wrong Marks : 1

The perpendicular distance from the origin to the plane containing the two lines,

$$\frac{x+2}{3} = \frac{y-2}{5} = \frac{z+5}{7} \text{ and}$$

$$\frac{x-1}{1} = \frac{y-4}{4} = \frac{z+4}{7}, \text{ is:}$$

Options :

1. 11



2.  $11\sqrt{6}$

3.  $\frac{11}{\sqrt{6}}$

4.  $6\sqrt{11}$

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

दो रेखाओं  $\frac{x+2}{3} = \frac{y-2}{5} = \frac{z+5}{7}$  तथा

$\frac{x-1}{1} = \frac{y-4}{4} = \frac{z+4}{7}$  को अंतर्विष्ट करने

वाले समतल की मूलबिंदु से लंबवत दूरी है :

Options :

1. 11

2.  $11\sqrt{6}$

3.  $\frac{11}{\sqrt{6}}$

4.  $6\sqrt{11}$

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

अभिमुखित रेखाओं  $\frac{x+2}{3} = \frac{y-2}{5} = \frac{z+5}{7}$

अने  $\frac{x-1}{1} = \frac{y-4}{4} = \frac{z+4}{7}$  ने समापता

समतलनु लंब अंतर \_\_\_\_\_ छे.

Options :

1. 11

2.  $11\sqrt{6}$

3.  $\frac{11}{\sqrt{6}}$

4.  $6\sqrt{11}$

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

A tetrahedron has vertices  $P(1, 2, 1)$ ,  $Q(2, 1, 3)$ ,  $R(-1, 1, 2)$  and  $O(0, 0, 0)$ . The angle between the faces  $OPQ$  and  $PQR$  is :

Options :

1.  $\cos^{-1}\left(\frac{19}{35}\right)$

2.  $\cos^{-1}\left(\frac{17}{31}\right)$

3.  $\cos^{-1}\left(\frac{9}{35}\right)$

4.  $\cos^{-1}\left(\frac{7}{31}\right)$

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

Correct Marks : 4 Wrong Marks : 1

एक चतुष्फलक (tetrahedron) के शीर्ष  $P(1, 2, 1)$ ,  $Q(2, 1, 3)$ ,  $R(-1, 1, 2)$  तथा  $O(0, 0, 0)$  हैं। फलक  $OPQ$  तथा  $PQR$  के बीच का कोण है :

Options :

1.  $\cos^{-1}\left(\frac{19}{35}\right)$

2.  $\cos^{-1}\left(\frac{17}{31}\right)$

3.  $\cos^{-1}\left(\frac{9}{35}\right)$

4.  $\cos^{-1}\left(\frac{7}{31}\right)$

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

કોઈ ચતુષ્કલકના શિરોબિંદુઓ  $P(1, 2, 1)$ ,  $Q(2, 1, 3)$ ,  $R(-1, 1, 2)$  અને  $O(0, 0, 0)$  છે. તો પૃષ્ઠો  $OPQ$  અને  $PQR$  વચ્ચેનો ખૂણો \_\_\_\_\_ છે.

Options :

1.  $\cos^{-1}\left(\frac{19}{35}\right)$

2.  $\cos^{-1}\left(\frac{17}{31}\right)$

3.  $\cos^{-1}\left(\frac{9}{35}\right)$

4.  $\cos^{-1}\left(\frac{7}{31}\right)$

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

Correct Marks : 4 Wrong Marks : 1

The sum of the distinct real values of  $\mu$ , for

which the vectors,  $\mu\hat{i} + \hat{j} + \hat{k}$ ,

$\hat{i} + \mu\hat{j} + \hat{k}$ ,  $\hat{i} + \hat{j} + \mu\hat{k}$  are

co-planar, is :

Options :

1. 0

2. -1

3. 1

4. 2

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

Correct Marks : 4 Wrong Marks : 1

$\mu$  के उन भिन्न वास्तविक मानों का योग, जिनके लिए

सदिश  $\mu\hat{i} + \hat{j} + \hat{k}$ ,  $\hat{i} + \mu\hat{j} + \hat{k}$  तथा

$\hat{i} + \hat{j} + \mu\hat{k}$  सहतलीय (co-planar) हैं, है :

Options :

1. 0
2. -1
3. 1
4. 2

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

Correct Marks : 4 Wrong Marks : 1

સદિશો  $\mu\hat{i} + \hat{j} + \hat{k}$ ,  $\hat{i} + \mu\hat{j} + \hat{k}$ ,

$\hat{i} + \hat{j} + \mu\hat{k}$  સમતલીય હોય તો તે માટેની  $\mu$  ની  
બિન્ન વાસ્તવિક કિંમતોનો સરવાળો \_\_\_\_\_ છે.

Options :

1. 0
2. -1
3. 1
4. 2

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

Correct Marks : 4 Wrong Marks : 1

If the sum of the deviations of 50 observations from 30 is 50, then the mean of these observations is :

Options :

1. 50
2. 51
3. 30
4. 31

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 के 30 से विचलनों (deviations) का योग 50 है, तो इन प्रेक्षणों का माध्य है :

Options :

1. 50
2. 51
3. 30
4. 31

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

50 अवलोकनों का 30 थी विचलनों का योग 50 हो, तो इन अवलोकनों का माध्य \_\_\_\_\_ है.

Options :

1. 50
2. 51
3. 30
4. 31

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

In a random experiment, a fair die is rolled until two fours are obtained in succession. The probability that the experiment will end in the fifth throw of the die is equal to :

Options :

1.  $\frac{200}{6^5}$
2.  $\frac{150}{6^5}$
3.  $\frac{225}{6^5}$

4.  $\frac{175}{6^5}$

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

Correct Marks : 4 Wrong Marks : 1

एक यादृच्छिक प्रयोग में, एक अनभिन्न (Fair) पासे को तब तक उछाला जाता है जब तक कि लगातार दो बार 4 न आए। तो इस प्रयोग के पाँचवीं बार पासे के उछाल (throw) तक समाप्त होने की प्रायिकता है :

Options :

1.  $\frac{200}{6^5}$

2.  $\frac{150}{6^5}$

3.  $\frac{225}{6^5}$

4.  $\frac{175}{6^5}$

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

Correct Marks : 4 Wrong Marks : 1

કોઈ યાદચ્છિક પ્રયોગમાં, એક સમતોલ પાસો સળંગ બે વખત 4 ન આવે ત્યાં સુધી ગબડાવવામાં આવે છે. તો આ પ્રયોગ પાંચમાં પ્રયત્ને પૂરો થાય તેની સંભાવના \_\_\_\_\_ છે.

Options :

1.  $\frac{200}{6^5}$

2.  $\frac{150}{6^5}$

3.  $\frac{225}{6^5}$

4.  $\frac{175}{6^5}$

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

Correct Marks : 4 Wrong Marks : 1

The maximum value of  
 $3 \cos\theta + 5 \sin\left(\theta - \frac{\pi}{6}\right)$  for any real value

of  $\theta$  is :

Options :

1.  $\frac{\sqrt{79}}{2}$

2.  $\sqrt{19}$

3.  $\sqrt{31}$

4.  $\sqrt{34}$

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

$3 \cos\theta + 5 \sin\left(\theta - \frac{\pi}{6}\right)$  का  $\theta$  के किसी भी  
वास्तविक मान के लिए अधिकतम मान है :

Options :

1.  $\frac{\sqrt{79}}{2}$

2.  $\sqrt{19}$

3.  $\sqrt{31}$

4.  $\sqrt{34}$

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

$\theta$  ની કોઈપણ વાસ્તવિક કિંમત માટે,

$3 \cos\theta + 5 \sin\left(\theta - \frac{\pi}{6}\right)$  ની મહત્તમ કિંમત  
\_\_\_\_\_ છે.

Options :



1.  $\frac{\sqrt{79}}{2}$

2.  $\sqrt{19}$

3.  $\sqrt{31}$

4.  $\sqrt{34}$

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

Considering only the principal values of inverse functions, the set

$$A = \left\{ x \geq 0 : \tan^{-1}(2x) + \tan^{-1}(3x) = \frac{\pi}{4} \right\}$$

Options :

1. is an empty set

2. is a singleton

3. contains two elements

4. contains more than two elements

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

प्रतिलोम फलनों (inverse functions) के केवल मुख्य मान (principal values) लेते हुए, समुच्चय

$$A = \left\{ x \geq 0 : \tan^{-1}(2x) + \tan^{-1}(3x) = \frac{\pi}{4} \right\}$$

Options :

1. एक रिक्त समुच्चय है।

2. एक एकल समुच्चय है।

3. में दो अवयव हैं।

4. दो से अधिक अवयव हैं।

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

प्रतिविधेयोना इकत मुष्य भूयो सेतां, गण

$$A = \left\{ x \geq 0 : \tan^{-1}(2x) + \tan^{-1}(3x) = \frac{\pi}{4} \right\}$$

Options :

1. એ ખાલી ગણ છે.
2. એ એકાકી ગણ છે.
3. એ બે ઘટકો ધરાવે છે.
4. એ બે કરતાં વધારે ઘટકો ધરાવે છે.

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 Boolean expression  $((p \wedge q) \vee (p \vee \sim q)) \wedge (\sim p \wedge \sim q)$  is equivalent to :

Options :

1.  $p \wedge (\sim q)$
2.  $p \vee (\sim q)$
3.  $(\sim p) \wedge (\sim q)$
4.  $p \wedge q$

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

बूलीय व्यंजक (Boolean expression)  $((p \wedge q) \vee (p \vee \sim q)) \wedge (\sim p \wedge \sim q)$  निम्न में जिसके तुल्य है, वह है :

Options :

1.  $p \wedge (\sim q)$

2.  $P \vee (\sim Q)$

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

4.  $P \wedge Q$

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

$((P \wedge Q) \vee (P \vee \sim Q)) \wedge (\sim P \wedge \sim Q)$  એ \_\_\_\_\_ ને સમકક્ષ છે.

Options :

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

2.  $P \vee (\sim Q)$

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

4.  $P \wedge Q$