

Question Paper Name: Paper I EHG 12th April 2019 Shift 2  
 Subject Name: Paper I EHG  
 Creation Date: 2019-04-12 19:35:39  
 Duration: 180  
 Total Marks: 360  
 Display Marks: Yes

### Paper I

Group Number : 1  
 Group Id : 416529161  
 Group Maximum Duration : 0  
 Group Minimum Duration : 180  
 Revisit allowed for view? : No  
 Revisit allowed for edit? : No  
 Break time: 0  
 Group Marks: 360

### Physics

Section Id : 416529277  
 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: 416529417  
 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 number density of molecules of a gas depends on their distance  $r$  from the origin as,  $n(r) = n_0 e^{-\alpha r^4}$ . Then the total number of molecules is proportional to :

Options :

1.  $n_0 \alpha^{-3}$

3.  $n_0 \alpha^{-3/4}$

4.  $n_0 \alpha^{1/4}$

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 गैस के अणुओं का संख्या घनत्व मूल बिन्दु से दूरी  $r$  पर निम्न ढंग से निर्भर है,  $n(r) = n_0 e^{-\alpha r^4}$  । तो इस गैस के अणुओं की कुल संख्या किसके समानुपाती होगी ?

Options :

1.  $n_0 \alpha^{-3}$

2.  $\sqrt{n_0} \alpha^{1/2}$

3.  $n_0 \alpha^{-3/4}$

4.  $n_0 \alpha^{1/4}$

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

વાયુ અણુઓની નંબર ઘનતા, ઉદ્ગમથી તેમના અંતર પર  $n(r) = n_0 e^{-\alpha r^4}$  મુજબ આધાર રાખે છે. તો કુલ અણુઓની સંખ્યા \_\_\_\_\_ ના સમપ્રમાણમાં હશે.

Options :

1.  $n_0 \alpha^{-3}$

2.  $\sqrt{n_0} \alpha^{1/2}$

3.  $n_0 \alpha^{-3/4}$

4.  $n_0 \alpha^{1/4}$

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

Options :

1.  $\frac{b^2 \tau}{4}$

2.  $\frac{b^2 \tau}{\sqrt{2}}$

3.  $\frac{b^2 \tau}{2}$

4.  $b^2 \tau$

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

Correct Marks : 4 Wrong Marks : 1

एक कण चाल  $v = b\sqrt{x}$  से धनात्मक  $x$ -अक्ष की दिशा में चल रहा है। समय  $t = \tau$  पर कण की चाल होगी :  
(माना कि  $t = 0$  पर कण मूल बिन्दु पर है ।)

Options :

1.  $\frac{b^2 \tau}{4}$

2.  $\frac{b^2 \tau}{\sqrt{2}}$

3.  $\frac{b^2 \tau}{2}$

4.  $b^2 \tau$

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

ગતિ કરે છે. કણનો  $t = \tau$  સમયે વેગ ગણો (ધારો કે કણ  $t = 0$  સમયે ઉગમબિંદુ પર છે)

Options :

1.  $\frac{b^2 \tau}{4}$

2.  $\frac{b^2 \tau}{\sqrt{2}}$

3.  $\frac{b^2 \tau}{2}$

4.  $b^2 \tau$

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

Two particles are projected from the same point with the same speed  $u$  such that they have the same range  $R$ , but different maximum heights,  $h_1$  and  $h_2$ . Which of the following is correct ?

Options :

1.  $R^2 = 16 h_1 h_2$

2.  $R^2 = 4 h_1 h_2$

3.  $R^2 = 2 h_1 h_2$

4.  $R^2 = h_1 h_2$

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

दो कणों को एक ही बिन्दु से एक ही चाल  $u$  से प्रक्षेपित किया जाता है जिससे उनकी परास  $R$  बराबर हैं किन्तु अधिकतम ऊँचाइयाँ  $h_1$  तथा  $h_2$  भिन्न हैं। निम्न में सत्य कथन चुनिये।

Options :

2.  $R^2 = 4 h_1 h_2$

3.  $R^2 = 2 h_1 h_2$

4.  $R^2 = h_1 h_2$

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

બે કણોને સમાન બિંદુથી સમાન ઝડપ  $u$  સાથે એવી રીતે પ્રક્ષિપ્ત કરવામાં આવે છે કે જેથી તેમની અવધિ  $R$  સમાન હોય પરંતુ મહત્તમ ઉંચાઈ  $h_1$  અને  $h_2$  જેટલી જૂદી-જૂદી હોય તો નીચેનામાંથી કયું સાચું છે?

Options :

1.  $R^2 = 16 h_1 h_2$

2.  $R^2 = 4 h_1 h_2$

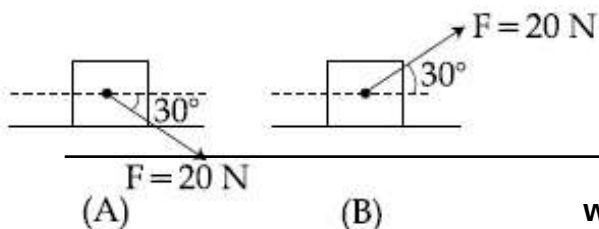
3.  $R^2 = 2 h_1 h_2$

4.  $R^2 = h_1 h_2$

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 block of mass 5 kg is (i) pushed in case (A) and (ii) pulled in case (B), by a force  $F = 20$  N, making an angle of  $30^\circ$  with the horizontal, as shown in the figures. The coefficient of friction between the block and floor is  $\mu = 0.2$ . The difference between the accelerations of the block, in case (B) and case (A) will be : ( $g = 10 \text{ ms}^{-2}$ )

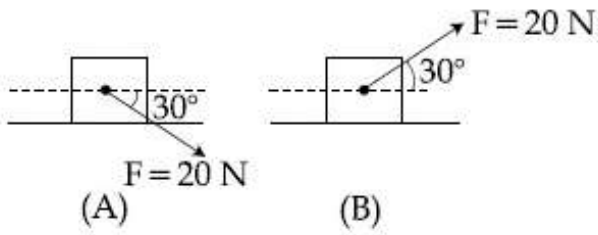


1.  $0 \text{ ms}^{-2}$
2.  $3.2 \text{ ms}^{-2}$
3.  $0.4 \text{ ms}^{-2}$
4.  $0.8 \text{ ms}^{-2}$

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

5 kg के एक गुटके को क्षैतिज से  $30^\circ$  कोण पर बल  $F = 20 \text{ N}$  से चित्रानुसार (i) दशा (A) में धकेलते हैं तथा (ii) दशा (B) में खींचते हैं। गुटके तथा समतल के बीच घर्षण गुणांक  $\mu = 0.2$  है। इन दो दशाओं (A) तथा (B), में गुटके के त्वरणों के अन्तर का मान होगा : ( $g = 10 \text{ ms}^{-2}$ )



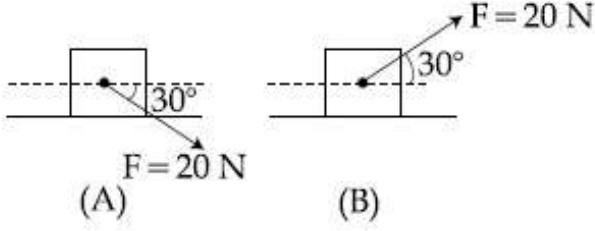
Options :

1.  $0 \text{ ms}^{-2}$
2.  $3.2 \text{ ms}^{-2}$
3.  $0.4 \text{ ms}^{-2}$
4.  $0.8 \text{ ms}^{-2}$

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

શોષણ, 5 kg દળવાળો એક ચોસલા ને સમક્ષિતિજ સાથે  $30^\circ$  ના કોણે લાગતા  $F = 20\text{ N}$  જેટલા બળ વડે, કિસ્સા (A) મુજબ ઘક્કો અને કિસ્સા (B) મુજબ ખેંચવામાં આવે છે. ચોસલા અને જમીન વચ્ચે ધર્ષણાંક  $\mu = 0.2$  છે. કિસ્સા (B) અને કિસ્સા (A) માટે સપાટી પર ચોસલાના પ્રવેગોમાં તફાવત \_\_\_\_\_ . ( $g = 10\text{ ms}^{-2}$ )



Options :

1.  $0\text{ ms}^{-2}$
2.  $3.2\text{ ms}^{-2}$
3.  $0.4\text{ ms}^{-2}$
4.  $0.8\text{ ms}^{-2}$

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 spring whose unstretched length is  $l$  has a force constant  $k$ . The spring is cut into two pieces of unstretched lengths  $l_1$  and  $l_2$  where,  $l_1 = nl_2$  and  $n$  is an integer. The ratio  $k_1/k_2$  of the corresponding force constants,  $k_1$  and  $k_2$  will be :

Options :

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

Correct Marks : 4 Wrong Marks : 1

एक स्प्रिंग की स्वतंत्र लम्बाई  $l$  तथा बल नियतांक  $k$  है। इसे काटकर  $l_1$  तथा  $l_2$  स्वतंत्र लम्बाई की दो स्प्रिंगों में बाँटते हैं।  $l_1 = n l_2$  है, जहाँ  $n$  एक पूर्णांक है। इनसे सम्बद्ध बल नियतांकों  $k_1$  तथा  $k_2$  का अनुपात,  $k_1/k_2$  होगा :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

એક સ્પ્રિંગ કે જેની ખેંચાણ મુક્ત સ્થિતિમાં લંબાઈ  $l$  છે તેનો બળ અચળાંક  $k$  છે. આ સ્પ્રિંગને ખેંચાણ રહિત  $l_1$  અને  $l_2$  લંબાઈના, જ્યાં  $l_1 = n l_2$  અને  $n$  એ પૂર્ણાંક, એવા બે ભાગમાં કાપવામાં આવે છે. આનુષંગિક બળ અચળાંકો  $k_1$  અને  $k_2$  નો ગુણોત્તર :

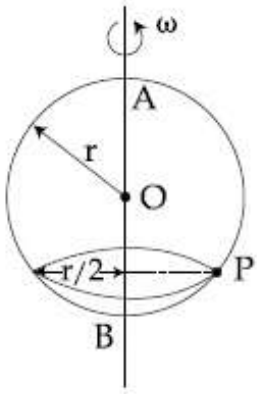
Options :

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

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

Correct Marks : 4 Wrong Marks : 1

A wire of length  $2\pi r$  is bent into a circle and kept in a vertical plane. A bead can slide smoothly on the wire. When the circle is rotating with angular speed  $\omega$  about the vertical diameter AB, as shown in figure, the bead is at rest with respect to the circular ring at position P as shown. Then the value of  $\omega^2$  is equal to :



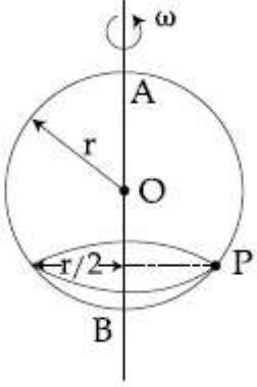
Options :

1.  $2g/r$
2.  $\frac{\sqrt{3}g}{2r}$
3.  $(g\sqrt{3})/r$
4.  $2g/(r\sqrt{3})$

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

Correct Marks : 4 Wrong Marks : 1

इके एक ध्वज, रहित तार को वृत्त बनाकर ऊर्ध्वाधर समतल में रखा है। एक मणिका (bead) इस तार पर फिसलती है। वृत्त को एक ऊर्ध्वाधर अक्ष AB के परितः चित्रानुसार कोणीय वेग  $\omega$  से घुमाया जाता है तो वृत्त के सापेक्ष मणिका चित्रानुसार बिन्दु P पर स्थिर पायी जाती है।  $\omega^2$  का मान होगा :



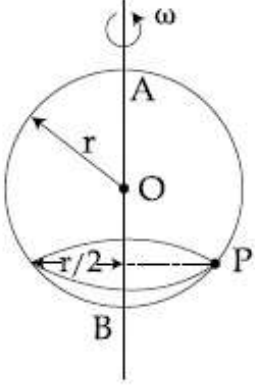
Options :

1.  $2g/r$
2.  $\frac{\sqrt{3}g}{2r}$
3.  $(g\sqrt{3})/r$
4.  $2g/(r\sqrt{3})$

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

Correct Marks : 4 Wrong Marks : 1

મણકો તાર પર સરળતાથી સરકી સકે છે. આકૃતિમાં દર્શાવ્યા મુજબ, જ્યારે વર્તુળના AB વ્યાસને ફરતે  $\omega$  જેટલી કોણીય ઝડપથી પરિભ્રમણ કરાવવામાં આવે છે, ત્યારે મણકો દર્શાવ્યા મુજબ P સ્થાને વર્તુળાકાર રિંગને સાપેક્ષે સ્થિર છે. તો  $\omega^2$  નું મૂલ્ય \_\_\_\_\_ ને બરાબર થશે.



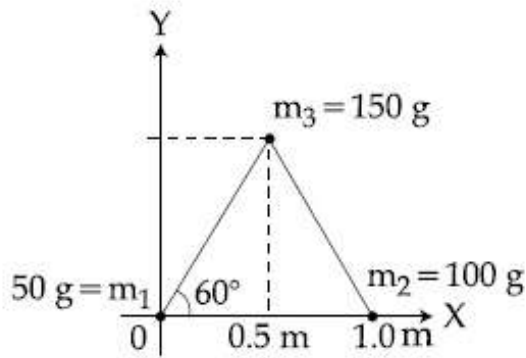
Options :

1.  $2g/r$
2.  $\frac{\sqrt{3}g}{2r}$
3.  $(g\sqrt{3})/r$
4.  $2g/(r\sqrt{3})$

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

Correct Marks : 4 Wrong Marks : 1

equilateral triangle of side 1 m (as shown in the figure). The  $(x, y)$  coordinates of the centre of mass will be :



Options :

1.  $\left( \frac{7}{12} \text{ m}, \frac{\sqrt{3}}{8} \text{ m} \right)$

2.  $\left( \frac{7}{12} \text{ m}, \frac{\sqrt{3}}{4} \text{ m} \right)$

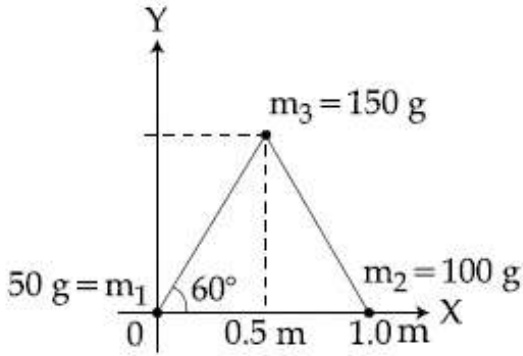
3.  $\left( \frac{\sqrt{3}}{4} \text{ m}, \frac{5}{12} \text{ m} \right)$

4.  $\left( \frac{\sqrt{3}}{8} \text{ m}, \frac{7}{12} \text{ m} \right)$

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

હૈ। ઇસ નિકાય કે દ્રવ્યમાન કેન્દ્ર (x તથા y) કે નિર્દેશાંક હોંગે :



Options :

1.  $\left( \frac{7}{12} \text{ m}, \frac{\sqrt{3}}{8} \text{ m} \right)$

2.  $\left( \frac{7}{12} \text{ m}, \frac{\sqrt{3}}{4} \text{ m} \right)$

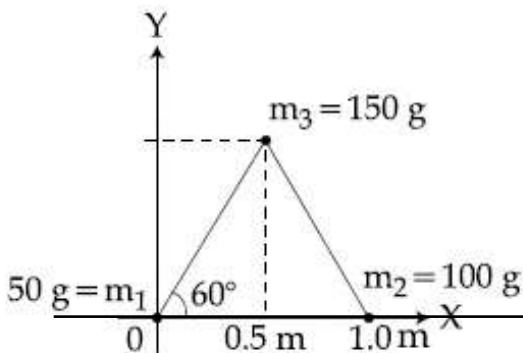
3.  $\left( \frac{\sqrt{3}}{4} \text{ m}, \frac{5}{12} \text{ m} \right)$

4.  $\left( \frac{\sqrt{3}}{8} \text{ m}, \frac{7}{12} \text{ m} \right)$

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

50 g, 100 g અને 150 g દળ ધરાવતા ત્રણ કણોને 1 m લંબાઈ ધરાવતા સમબાહુ ત્રિકોણના શિરોબિંદુઓ પર મુકવામાં આવેલ છે. દ્રવ્યમાન કેન્દ્રના (x, y) યામો \_\_\_\_\_ હશે.



Options :

1.  $\left(\frac{12}{m}, \frac{\sqrt{3}}{8}m\right)$

2.  $\left(\frac{7}{12}m, \frac{\sqrt{3}}{4}m\right)$

3.  $\left(\frac{\sqrt{3}}{4}m, \frac{5}{12}m\right)$

4.  $\left(\frac{\sqrt{3}}{8}m, \frac{7}{12}m\right)$

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

The ratio of the weights of a body on the Earth's surface to that on the surface of a planet is 9 : 4. The mass of the planet is  $\frac{1}{9}$ th of that of the Earth. If 'R' is the radius of the Earth, what is the radius of the planet ? (Take the planets to have the same mass density)

Options :

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

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

3.  $\frac{R}{9}$

4.  $\frac{R}{4}$

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

કે પૃથ્વી તથા એક દુસરે ગ્રહ કો સત્હ પર  
ભારોં કા અનુપાત 9 : 4 હૈં। દૂસરે ગ્રહ કા દ્રવ્યમાન પૃથ્વી

કે દ્રવ્યમાન કા  $\frac{1}{9}$  હૈ। યદિ પૃથ્વી કી ત્રિજ્યા 'R' હૈ તો  
ગ્રહ કી ત્રિજ્યા ક્યા હોગી? (માના કિ દોનોં ગ્રહોં કા  
દ્રવ્યમાન ઘનત્વ સમાન હૈ।)

Options :

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

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

3.  $\frac{R}{9}$

4.  $\frac{R}{4}$

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

Correct Marks : 4 Wrong Marks : 1

એક પદાર્થના વજનોનો પૃથ્વીની સપાટી પર અને એક  
ગ્રહની સપાટી પરનો ગુણોત્તર 9 : 4 છે. ગ્રહનું દળ  
પૃથ્વીના દળ કરતા  $\frac{1}{9}$  માં ભાગનું છે. જો પૃથ્વીની  
ત્રિજ્યા R હોય તો ગ્રહની ત્રિજ્યા કેટલી હશે?  
(ગ્રહો માટે સમાન દળ ઘનતા લો)

Options :

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

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

3.  $\frac{R}{9}$

4.  $\frac{R}{4}$

A uniform cylindrical rod of length  $L$  and radius  $r$ , is made from a material whose Young's modulus of Elasticity equals  $Y$ . When this rod is heated by temperature  $T$  and simultaneously subjected to a net longitudinal compressional force  $F$ , its length remains unchanged. The coefficient of volume expansion, of the material of the rod, is (nearly) equal to :

Options :

1.  $6F/(\pi r^2 Y T)$
2.  $9F/(\pi r^2 Y T)$
3.  $3F/(\pi r^2 Y T)$
4.  $F/(3\pi r^2 Y T)$

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

लम्बाई  $L$  तथा त्रिज्या  $r$  की एक एकसमान बेलनाकार छड़ का यंग प्रत्यास्थता गुणांक  $Y$  है। जब इस छड़ का तापमान  $T$  से बढ़ाते हैं तथा उस पर कुल अनुदैर्घ्य संपीड़न बल  $F$  लगाते हैं, तो उसकी लम्बाई अपरिवर्तित रहती है। छड़ के पदार्थ के आयतन प्रसार गुणांक का लगभग मान होगा :

Options :

1.  $6F/(\pi r^2 Y T)$
2.  $9F/(\pi r^2 Y T)$
3.  $3F/(\pi r^2 Y T)$
4.  $F/(3\pi r^2 Y T)$

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

બનેલો  $L$  લંબાઈનો અને  $r$  ત્રિજ્યા ધરાવતો એક સળંગ નળાકાર સળિયો છે. જ્યારે સળિયાને  $T$  તાપમાને ગરમ કરવામાં આવે છે તેજ સમયે તેના પર પ્રતાન (સંગત) દાબનીય બળ  $F$  પણ લગાડવામાં આવે છે, ત્યારે તેની લંબાઈમાં ફેરફાર થતો નથી. સળિયાના દ્રવ્યનો કદ પ્રસરણાંક \_\_\_\_\_ ની નજીકનો થશે.

Options :

1.  $6F/(\pi r^2 Y T)$
2.  $9F/(\pi r^2 Y T)$
3.  $3F/(\pi r^2 Y T)$
4.  $F/(3\pi r^2 Y T)$

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

Correct Marks : 4 Wrong Marks : 1

A solid sphere, of radius  $R$  acquires a terminal velocity  $v_1$  when falling (due to gravity) through a viscous fluid having a coefficient of viscosity  $\eta$ . The sphere is broken into 27 identical solid spheres. If each of these spheres acquires a terminal velocity,  $v_2$ , when falling through the same fluid, the ratio  $(v_1/v_2)$  equals :

Options :

1. 9
2.  $1/9$
3. 27
4.  $1/27$

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 द्रव में (गुरुत्वीय बल के कारण) सीमान्त वेग  $v_1$  है। यदि इस ठोस गोले को बराबर त्रिज्या के 27 गोलों में बाँटा जाये तो प्रत्येक गोले का सीमान्त वेग इसी द्रव में  $v_2$  पाया जाता है, तो  $v_1/v_2$  का मान होगा :

Options :

1. 9
2.  $1/9$
3. 27
4.  $1/27$

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

η જેટલો શ્ચાન્તાગુણક (સ્નિગ્ધતા અંક) ધરાવતા એક સ્નિગ્ધ પ્રવાહીના કદમાં, એક R ત્રિજ્યા ધરાવતા ધન ગોળાને (ગુરૂત્વાકર્ષણને કારણે) પતન કરાવતા તે  $v_1$  જેટલો ટર્મિનલ (અંતિમ) વેગ પ્રાપ્ત કરે છે. આ ગોળો એકસમાન 27 ધન ગોળામાં તૂટે છે. જ્યારે આ તેઓને અભિનમન (બે બાજુથી બાંધેલા) પ્રવાહીમાં પતન કરાવવામાં આવે છે ત્યારે આ દરેક ગોળાઓ  $v_2$  જેટલો અંતિમ વેગ ધારણ કરે છે, તો ગુણોત્તર  $v_1/v_2$  \_\_\_\_\_ બરાબર થશે.

Options :

1. 9
2.  $1/9$
3. 27
4.  $1/27$

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

The temperatures of the source and the sink are, respectively,

Options :

1.  $99^{\circ}\text{C}$ ,  $37^{\circ}\text{C}$
2.  $124^{\circ}\text{C}$ ,  $62^{\circ}\text{C}$
3.  $37^{\circ}\text{C}$ ,  $99^{\circ}\text{C}$
4.  $62^{\circ}\text{C}$ ,  $124^{\circ}\text{C}$

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

Correct Marks : 4 Wrong Marks : 1

एक कार्नो इंजन की क्षमता  $1/6$  है। जब ऊष्मा कुण्ड (sink) का तापमान  $62^{\circ}\text{C}$  कम किया जाता है तो क्षमता दोगुनी हो जाती है। ऊष्मा स्रोत तथा कुण्ड के, क्रमशः, तापमान होंगे :

Options :

1.  $99^{\circ}\text{C}$ ,  $37^{\circ}\text{C}$
2.  $124^{\circ}\text{C}$ ,  $62^{\circ}\text{C}$
3.  $37^{\circ}\text{C}$ ,  $99^{\circ}\text{C}$
4.  $62^{\circ}\text{C}$ ,  $124^{\circ}\text{C}$

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 કાર્નો એન્જિનની કાર્યક્ષમતા  $1/6$  છે. જ્યારે ઠંડાણનું તાપમાન  $62^{\circ}\text{C}$  જેટલું ઘટાડવામાં આવે છે ત્યારે તેની કાર્યક્ષમતા બમણી થાય છે. ઉષ્માપ્રાપ્તિ સ્થાન અને ઠંડાણના પ્રારંભિક તાપમાનો, અનુક્રમે \_\_\_\_\_.

Options :

1.  $99^{\circ}\text{C}$ ,  $37^{\circ}\text{C}$

3.  $37^{\circ}\text{C}$ ,  $99^{\circ}\text{C}$ 4.  $62^{\circ}\text{C}$ ,  $124^{\circ}\text{C}$ 

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

Correct Marks : 4 Wrong Marks : 1

A diatomic gas with rigid molecules does 10 J of work when expanded at constant pressure. What would be the heat energy absorbed by the gas, in this process ?

Options :

1. 25 J

2. 30 J

3. 35 J

4. 40 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

एक दृढ़ अणुओं वाली द्विपरमाणुक गैस का जब नियत दाब पर प्रसार होता है तो वह 10 J कार्य करती है। इस प्रक्रम में गैस द्वारा अवशोषित ऊष्मा का मान होगा :

Options :

1. 25 J

2. 30 J

3. 35 J

4. 40 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

10 J જેટલું કાર્ય કરે છે. આ પ્રક્રિયામાં વાયુ દ્વારા શોષાતા ઊષ્માઉર્જા કેટલી હશે ?

Options :

1. 25 J
2. 30 J
3. 35 J
4. 40 J

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 small speaker delivers 2 W of audio output. At what distance from the speaker will one detect 120 dB intensity sound ?  
 [Given reference intensity of sound as  $10^{-12} \text{ W/m}^2$ ]

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

एक छोटे स्पीकर से 2 W शक्ति की ध्वनि निकलती है।  
 इस स्पीकर से कितनी दूरी पर ध्वनि तीव्रता 120 dB  
 होगी? [दिया है : ध्वनि की निर्देश (reference)  
 तीव्रता =  $10^{-12} \text{ W/m}^2$ ]

Options :

1. 10 cm
2. 20 cm

4. 40 cm

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

Correct Marks : 4 Wrong Marks : 1

એક નાનું સ્પીકર 2 W જેટલો શ્રાવ્ય (audio) આઉટપુટ આપે છે. સ્પિકરથી કેટલા અંતરે 120 dB જેટલી ધ્વનિ તીવ્રતા નોંધી શકાય?

[ ધ્વનિની આપેલ સંદર્ભ તીવ્રતા  $10^{-12} \text{ W/m}^2$  છે ]

Options :

1. 10 cm

2. 20 cm

3. 30 cm

4. 40 cm

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

Two sources of sound  $S_1$  and  $S_2$  produce sound waves of same frequency 660 Hz. A listener is moving from source  $S_1$  towards  $S_2$  with a constant speed  $u$  m/s and he hears 10 beats/s. The velocity of sound is 330 m/s. Then,  $u$  equals :

Options :

1. 2.5 m/s

2. 5.5 m/s

3. 10.0 m/s

4. 15.0 m/s

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

શ્રોતો  $S_1$  તથા  $S_2$  એક જ આવૃત્તિ 660 Hz  
કી ધ્વનિ ઉત્પન્ન કરતે હૈં । એક શ્રોતા  $S_1$  સે  $S_2$  કી તરફ  
સ્થિર ગતિ  $u$  સે જાતે હુયે પ્રતિ સેકન્ડ 10 વિસ્પંદ સુનતા  
હૈં । યદિ ધ્વનિ કી ગતિ 330 m/s હૈં, તો  $u$  કા માન  
હોગા :

Options :

1. 2.5 m/s
2. 5.5 m/s
3. 10.0 m/s
4. 15.0 m/s

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

બે ધ્વનિ ઉદ્ગમો  $S_1$  અને  $S_2$  સમાન 660 Hz આવૃત્તિના  
ધ્વનિ તરંગો ઉત્પન્ન કરે છે. એક શ્રોતા  $u$  જેટલા અચળ  
ઝડપથી ઉદ્ગમ  $S_1$  થી  $S_2$  તરફ ગતિ કરે છે. અને તે  
10 સ્પંદ/સેકન્ડ સાંભળે છે. ધ્વનિનો વેગ  
330 m/s છે. તો  $u$  \_\_\_\_\_ છે.

Options :

1. 2.5 m/s
2. 5.5 m/s
3. 10.0 m/s
4. 15.0 m/s

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

Correct Marks : 4 Wrong Marks : 1

sphere of radius  $R$ , with the charge density given by  $\rho(r) = kr$ , where  $r$  is the distance from the centre. Two charges  $A$  and  $B$ , of  $-Q$  each, are placed on diametrically opposite points, at equal distance,  $a$ , from the centre. If  $A$  and  $B$  do not experience any force, then :

Options :

1.  $a = 8^{-1/4} R$

2.  $a = 2^{-1/4} R$

3.  $a = R/\sqrt{3}$

4.  $a = \frac{3R}{2^{1/4}}$

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

Correct Marks : 4 Wrong Marks : 1

कुल आवेश  $2Q$  को त्रिज्या  $R$  के गोले में इस प्रकार वितरित करते हैं कि आवेश घनत्व सम्बन्ध  $\rho(r) = kr$  से दिया जाता है जहाँ  $r$ , केन्द्र से दूरी है। दो बराबर  $-Q$  आवेशों  $A$  तथा  $B$  को केन्द्र से  $a$  दूरी पर व्यासीय विपरीत बिन्दुओं पर रखा गया है। यदि  $A$  और  $B$  कोई बल अनुभव नहीं करते हैं, तो :

Options :

1.  $a = 8^{-1/4} R$

2.  $a = 2^{-1/4} R$

3.  $a = R/\sqrt{3}$

4.  $a = \frac{3R}{2^{1/4}}$

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

Correct Marks : 4 Wrong Marks : 1

અંદરના ભાગમાં  $\rho(r) = kr$  સુત્ર અનુસાર જેટલી વિદ્યુતભાર ઘનતા મુજબ વહેંચાયેલ છે. જ્યાં  $r$  એ કેન્દ્રથી અંતર છે દરેક  $-Q$  જેટલા બે વિદ્યુતભારો A અને B ને કેન્દ્રથી  $a$  જેટલા સમાન અંતરે અને વિરુદ્ધ વ્યાસાંતે રહેલા બિંદુઓ પર મૂકવામાં આવે છે. જો A અને B કોઈપણ બળ અનુભવતા ના હોય, તો \_\_\_\_\_.

Options :

1.  $a = 8^{-1/4} R$

2.  $a = 2^{-1/4} R$

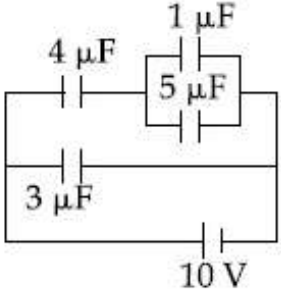
3.  $a = R/\sqrt{3}$

4.  $a = \frac{3R}{2^{1/4}}$

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

In the given circuit, the charge on  $4 \mu F$  capacitor will be :



Options :

1.  $9.6 \mu C$

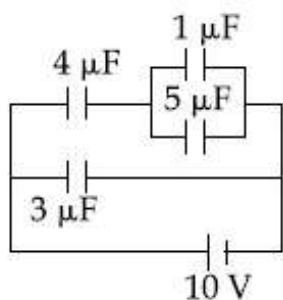
2.  $24 \mu C$

3.  $5.4 \mu C$

4.  $13.4 \mu C$

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



Options :

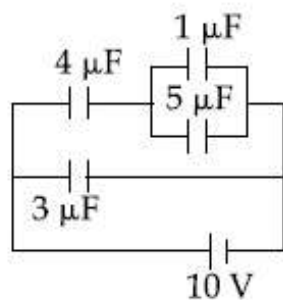
1.  $9.6 \mu\text{C}$
2.  $24 \mu\text{C}$
3.  $5.4 \mu\text{C}$
4.  $13.4 \mu\text{C}$

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

आपेल परिपथमा  $4 \mu\text{F}$  કેપેસીટર પરનો વિદ્યુતભાર

\_\_\_\_\_.



Options :

1.  $9.6 \mu\text{C}$
2.  $24 \mu\text{C}$
3.  $5.4 \mu\text{C}$
4.  $13.4 \mu\text{C}$

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

of water, at  $20^\circ\text{C}$ , is heated in an electric kettle whose heating element has a mean (temperature averaged) resistance of  $20\ \Omega$ . The rms voltage in the mains is  $200\text{ V}$ . Ignoring heat loss from the kettle, time taken for water to evaporate fully, is close to :

[Specific heat of water =  $4200\text{ J}/(\text{kg } ^\circ\text{C})$ ,  
Latent heat of water =  $2260\text{ kJ}/\text{kg}$ ]

Options :

1. 3 minutes
2. 10 minutes
3. 22 minutes
4. 16 minutes

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

माध्य प्रतिरोध (तापमान औसत)  $20\ \Omega$  की एक विद्युत केतली में  $20^\circ\text{C}$  के  $1\text{ kg}$  पानी को उबालते हैं। विद्युत आपूर्ति की rms वोल्टता  $200\text{ V}$  है। केतली से ऊष्मा हानि को नगण्य मानते हुए, पानी को पूर्णतया वाष्पित होने में लगभग समय लगेगा :

[पानी की विशिष्ट ऊष्मा =  $4200\text{ J}/(\text{kg } ^\circ\text{C})$ ,  
पानी की गुप्त ऊष्मा =  $2260\text{ kJ}/\text{kg}$ ]

Options :

1. 3 मिनट
2. 10 मिनट
3. 22 मिनट
4. 16 मिनट

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

કીટલી વડે ગરમ કરવામાં આવે છે કે જેના (ગરમ કરવામાં) તારનો (ફિલામેન્ટનો) (તાપમાન-સરેરાશ) સરેરાશ અવરોધ  $20 \Omega$  છે. મેઇન્સનો rms વોલ્ટેજ  $200 \text{ V}$  છે. ઊષ્મીય વ્યય અવગણતા, સંપૂર્ણ પાણીનું બાષ્પીભવન થતા લાગતો સમય \_\_\_\_\_ ની નજીકનો છે.

[ પાણીની વિશિષ્ટ ઉષ્મા  $= 4200 \text{ J}/(\text{kg } ^\circ\text{C})$ , પાણીની ગલન ગુપ્ત ઊષ્મા  $= 2260 \text{ kJ/kg}$  ]

Options :

1. 3 મિનિટ
2. 10 મિનિટ
3. 22 મિનિટ
4. 16 મિનિટ

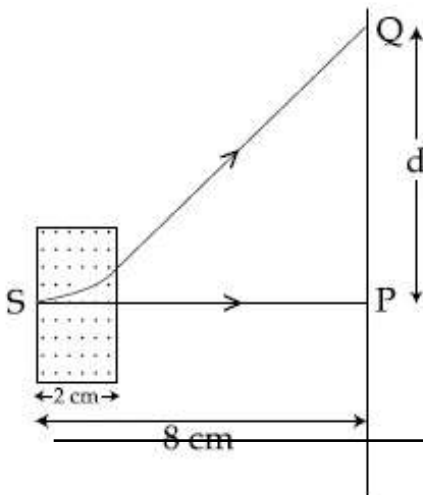
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An electron, moving along the  $x$ -axis with an initial energy of  $100 \text{ eV}$ , enters a region

of magnetic field  $\vec{B} = (1.5 \times 10^{-3} \text{ T}) \hat{k}$  at S (See figure). The field extends between  $x=0$  and  $x=2 \text{ cm}$ . The electron is detected at the point Q on a screen placed  $8 \text{ cm}$  away from the point S. The distance  $d$  between P and Q (on the screen) is :

(electron's charge  $= 1.6 \times 10^{-19} \text{ C}$ , mass of electron  $= 9.1 \times 10^{-31} \text{ kg}$ )



1. 1.22 cm
2. 12.87 cm
3. 11.65 cm
4. 2.25 cm

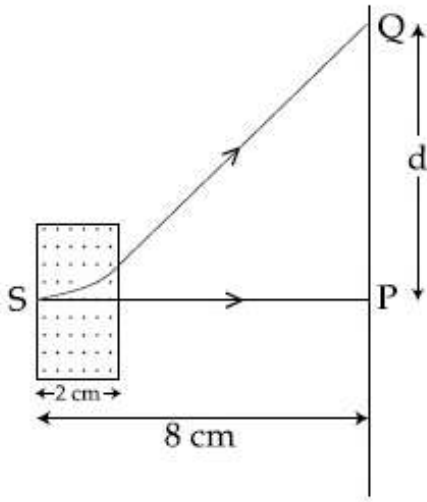
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

100 eV ऊर्जा का एक इलेक्ट्रॉन जो  $x$ -अक्ष के अनुदिश

गतिमान है,  $\vec{B} = (1.5 \times 10^{-3} \text{T}) \hat{k}$  के चुम्बकीय क्षेत्र में बिन्दु S पर प्रवेश करता है (चित्र देखिये)। चुम्बकीय क्षेत्र  $x=0$  से  $x=2 \text{ cm}$  तक विस्तृत है। बिन्दु S से 8 cm दूरी पर स्थित पर्दे पर इलेक्ट्रॉन का संसूचन बिन्दु Q पर होता है। बिन्दु P तथा Q के बीच की दूरी  $d$  (पर्दे पर) का मान होगा :

(इलेक्ट्रॉन का आवेश  $= 1.6 \times 10^{-19} \text{C}$ , इलेक्ट्रॉन का द्रव्यमान  $= 9.1 \times 10^{-31} \text{kg}$ )



Options :

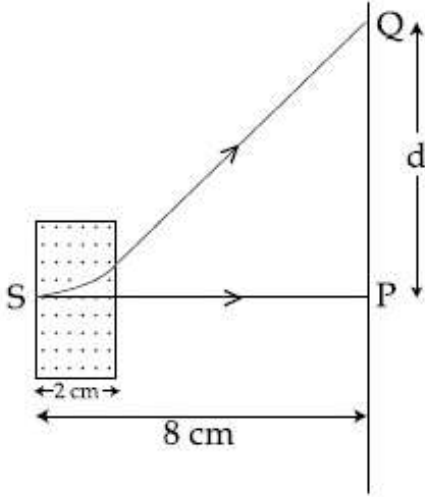
1. 1.22 cm
2. 12.87 cm
3. 11.65 cm
4. 2.25 cm

Correct Marks : 4 Wrong Marks : 1

100 eV જેટલી પ્રારંભિક ઊર્જા ધરાવતો એક ઇલેક્ટ્રોન

$x$ -અક્ષની દિશામાં ગતિ કરતા,  $\vec{B} = (1.5 \times 10^{-3} \text{T}) \hat{k}$  જેટલા ચુંબકીય ક્ષેત્ર ધરાવતા વિસ્તારમાં S આગળ (આકૃતિ જુઓ) દાખલ થાય છે. આ ક્ષેત્ર  $x=0$  અને  $x=2 \text{ cm}$  વચ્ચે પ્રસરેલું છે. આ ઇલેક્ટ્રોન, S થી 8 cm અંતરે રહેલા પડદા પરના Q બિંદુ આગળ નોંધાય છે. (પડદા પર) બિંદુ P અને Q વચ્ચેનું અંતર  $d$  :

(ઇલેક્ટ્રોનનો વિદ્યુતભાર  $= 1.6 \times 10^{-19} \text{C}$ , ઇલેક્ટ્રોનનું દળ  $= 9.1 \times 10^{-31} \text{ kg}$ )

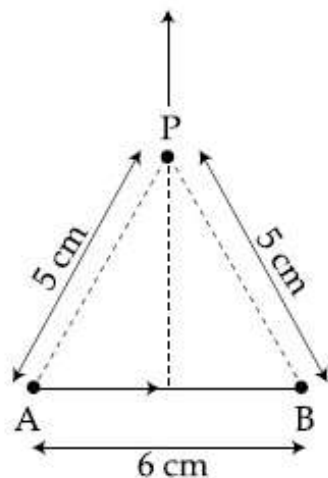


Options :

1. 1.22 cm
2. 12.87 cm
3. 11.65 cm
4. 2.25 cm

straight line segment AB of length 6 cm carrying a current of 5 A. (See figure)

$$(\mu_0 = 4\pi \times 10^{-7} \text{ N-A}^{-2})$$



Options :

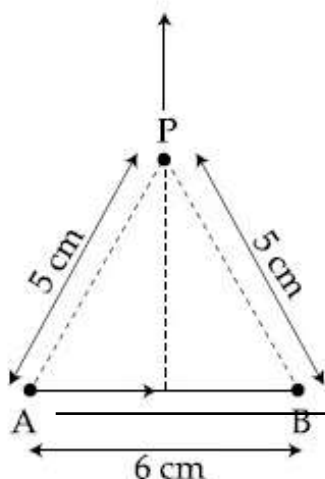
1.  $1.5 \times 10^{-5} \text{ T}$
2.  $2.0 \times 10^{-5} \text{ T}$
3.  $2.5 \times 10^{-5} \text{ T}$
4.  $3.0 \times 10^{-5} \text{ T}$

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

Correct Marks : 4 Wrong Marks : 1

5 A धारा के एक सीधे तार के 6 cm लम्बे खण्ड AB के कारण, (चित्रानुसार), बिन्दु P पर चुम्बकीय क्षेत्र ज्ञात कीजिए।

$$(\mu_0 = 4\pi \times 10^{-7} \text{ N-A}^{-2})$$



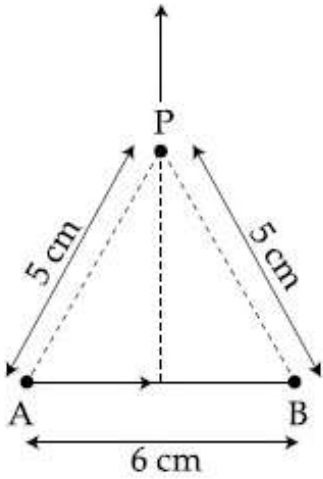
1.  $1.5 \times 10^{-5} \text{ T}$
2.  $2.0 \times 10^{-5} \text{ T}$
3.  $2.5 \times 10^{-5} \text{ T}$
4.  $3.0 \times 10^{-5} \text{ T}$

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

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા અનુસાર, 6cm લંબાઈ ધરાવતા સીધા પ્રવાહ ધારિત (5 A) ખંડ AB થી બિંદુ P આગળ ચુંબકીય ક્ષેત્ર શોધો?

$$(\mu_0 = 4\pi \times 10^{-7} \text{ N-A}^{-2})$$



Options :

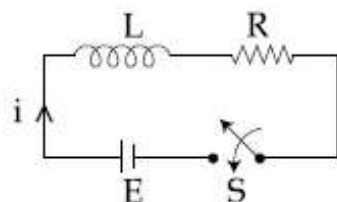
1.  $1.5 \times 10^{-5} \text{ T}$
2.  $2.0 \times 10^{-5} \text{ T}$
3.  $2.5 \times 10^{-5} \text{ T}$
4.  $3.0 \times 10^{-5} \text{ T}$

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

amount of charge that passes through the

battery between  $t=0$  and  $t=\frac{L}{R}$  is :



Options :

1.  $\frac{7.3 EL}{R^2}$

2.  $\frac{2.7 EL}{R^2}$

3.  $\frac{EL}{2.7R^2}$

4.  $\frac{EL}{7.3R^2}$

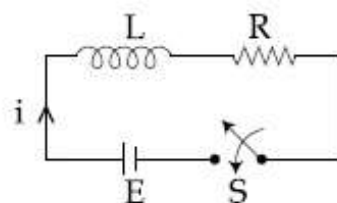
Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में एक LR परिपथ दर्शाया है। यदि  $t=0$  पर कुंजी S को बन्द करते हैं, तो सेल से निकलने वाले

आवेश का मान समयान्तराल  $t=0$  से  $t=\frac{L}{R}$  के बीच

होगा :



Options :

1.  $\frac{7.3 EL}{R^2}$

2.  $\frac{EL}{R^2}$

3.  $\frac{EL}{2.7R^2}$

4.  $\frac{EL}{7.3R^2}$

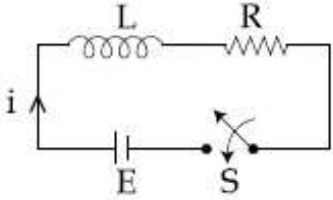
Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવેલ LR પરિપથ ધ્યાનમાં લો. જો  $t=0$

સમયે કળ બંધ હોય તો બેટરીમાંથી  $t=0$  અને  $t=\frac{L}{R}$

વચ્ચે પસાર થતો વિદ્યુતભાર :



Options :

1.  $\frac{7.3 EL}{R^2}$

2.  $\frac{2.7 EL}{R^2}$

3.  $\frac{EL}{2.7R^2}$

4.  $\frac{EL}{7.3R^2}$

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

frequency  $\nu = 23.9$  GHz propagates along the positive  $z$ -direction in free space. The peak value of the Electric Field is 60 V/m. Which among the following is the acceptable magnetic field component in the electromagnetic wave ?

Options :

1.  $\vec{B} = 60 \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t) \hat{k}$
2.  $\vec{B} = 2 \times 10^{-7} \sin(0.5 \times 10^3 z - 1.5 \times 10^{11} t) \hat{i}$
3.  $\vec{B} = 2 \times 10^7 \sin(0.5 \times 10^3 z + 1.5 \times 10^{11} t) \hat{i}$
4.  $\vec{B} = 2 \times 10^{-7} \sin(1.5 \times 10^2 x + 0.5 \times 10^{11} t) \hat{j}$

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

Correct Marks : 4 Wrong Marks : 1

मुक्त आकाश में  $\nu = 23.9$  GHz की एक समतल विद्युत चुम्बकीय तरंग धनात्मक  $z$ -अक्ष की दिशा में संचरण कर रही है। इसमें विद्युत क्षेत्र का अधिकतम मान 60 V/m है। निम्न में से कौन सा विकल्प इस तरंग के चुम्बकीय क्षेत्र के लिये स्वीकार्य है ?

Options :

1.  $\vec{B} = 60 \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t) \hat{k}$
2.  $\vec{B} = 2 \times 10^{-7} \sin(0.5 \times 10^3 z - 1.5 \times 10^{11} t) \hat{i}$
3.  $\vec{B} = 2 \times 10^7 \sin(0.5 \times 10^3 z + 1.5 \times 10^{11} t) \hat{i}$
4.  $\vec{B} = 2 \times 10^{-7} \sin(1.5 \times 10^2 x + 0.5 \times 10^{11} t) \hat{j}$

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

Correct Marks : 4 Wrong Marks : 1

વિદ્યુતચુંબકીય તરંગ મુક્ત અવકાશમાં ધન z-દિશામાં ગતિ કરે છે. વિદ્યુતક્ષેત્રનું મહત્તમ મૂલ્ય  $60 \text{ V/m}$  છે. વિદ્યુતચુંબકીય તરંગમાં સ્વીકાર્ય હોય તેવા ચુંબકીય ક્ષેત્રનો નીચેનામાંથી કયો ઘટક સ્વીકાર્ય હશે?

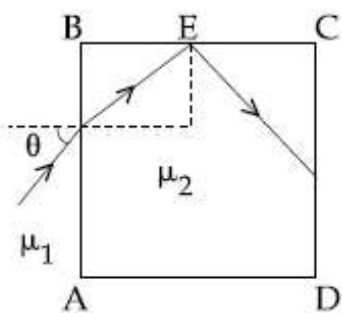
Options :

1.  $\vec{B} = 60 \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t) \hat{k}$
2.  $\vec{B} = 2 \times 10^{-7} \sin(0.5 \times 10^3 z - 1.5 \times 10^{11} t) \hat{i}$
3.  $\vec{B} = 2 \times 10^7 \sin(0.5 \times 10^3 z + 1.5 \times 10^{11} t) \hat{i}$
4.  $\vec{B} = 2 \times 10^{-7} \sin(1.5 \times 10^2 x + 0.5 \times 10^{11} t) \hat{j}$

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

Correct Marks : 4 Wrong Marks : 1

A transparent cube of side  $d$ , made of a material of refractive index  $\mu_2$ , is immersed in a liquid of refractive index  $\mu_1$  ( $\mu_1 < \mu_2$ ). A ray is incident on the face AB at an angle  $\theta$  (shown in the figure). Total internal reflection takes place at point E on the face BC.



Then  $\theta$  must satisfy :

Options :

1.  $\theta < \sin^{-1} \sqrt{\frac{\mu_2^2}{\mu_1^2} - 1}$
2.  $\theta > \sin^{-1} \sqrt{\frac{\mu_2^2}{\mu_1^2} - 1}$

3.

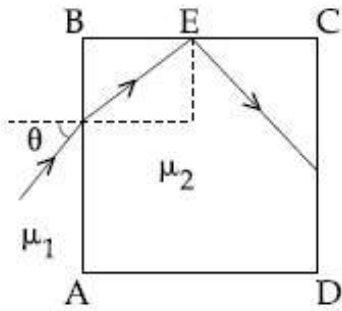
$$\theta < \sin^{-1} \frac{\mu_1}{\mu_2}$$

4.

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  $\mu_1$  के एक द्रव में अपवर्तनांक  $\mu_2 (\mu_1 < \mu_2)$  के पारदर्शी गुटके को डुबाया जाता है। प्रकाश की एक किरण इस गुटके के पृष्ठ AB पर द्रव से, चित्रानुसार,  $\theta$  कोण पर आपतित होती है। पृष्ठ BC के बिन्दु E पर पूर्ण आन्तरिक परावर्तन होने के लिये,  $\theta$  का मान कौन सा सम्बन्ध संतुष्ट करेगा ?



Options :

$$\theta < \sin^{-1} \sqrt{\frac{\mu_2^2}{\mu_1^2} - 1}$$

1.

$$\theta > \sin^{-1} \sqrt{\frac{\mu_2^2}{\mu_1^2} - 1}$$

2.

$$\theta > \sin^{-1} \frac{\mu_1}{\mu_2}$$

3.

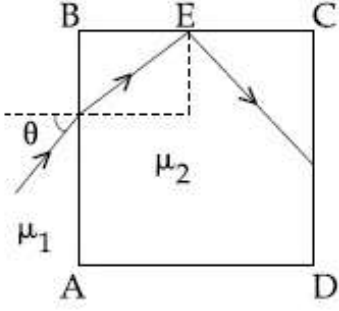
$$\theta < \sin^{-1} \frac{\mu_1}{\mu_2}$$

4.

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

બાજુ ધરાવતા અને  $\mu_2$  જેટલો વક્રીભવનાંક ધરાવતા માધ્યમમાંથી બનેલા એક પારદર્શક સમકોણીય ત્રિકોણના ધરાવતા પ્રવાહીમાં ડુબાડવામાં આવે છે ( $\mu_1 < \mu_2$ ). AB બાજુ પર  $\theta$  કોણે (આકૃતિમાં દર્શાવ્યા અનુસાર) એક કિરણ આપાત કરવામાં આવે છે. બાજુ BC પર બિંદુ E આગળ પૂર્ણઆંતરિક પરાવર્તન અનુભવાય છે.



$\theta$  નું મૂલ્ય \_\_\_\_\_ અનુસરતું હોવું જ જોઈએ.

Options :

1.  $\theta < \sin^{-1} \sqrt{\frac{\mu_2^2}{\mu_1^2} - 1}$

2.  $\theta > \sin^{-1} \sqrt{\frac{\mu_2^2}{\mu_1^2} - 1}$

3.  $\theta > \sin^{-1} \frac{\mu_1}{\mu_2}$

4.  $\theta < \sin^{-1} \frac{\mu_1}{\mu_2}$

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

Correct Marks : 4 Wrong Marks : 1

A system of three polarizers  $P_1, P_2, P_3$  is set up such that the pass axis of  $P_3$  is crossed with respect to that of  $P_1$ . The pass axis of  $P_2$  is inclined at  $60^\circ$  to the pass axis of  $P_3$ . When a beam of unpolarized light of intensity  $I_0$  is incident on  $P_1$ , the intensity of light transmitted by the three polarizers is  $I$ . The ratio  $(I_0/I)$  equals (nearly) :

Options :

2. 5.33
3. 10.67
4. 16.00

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

ત્રીણ ધ્રુવકોં  $P_1$ ,  $P_2$  તથા  $P_3$  કો ઇસ તરહ રલ્લતે હૈં કલ  $P_3$  કો પાસ-અક્ષ  $P_1$  કો પાસ અક્ષ સે ક્રોસલત હૈં।  $P_2$  કો પાસ-અક્ષ  $P_3$  કો પાસ-અક્ષ સે  $60^\circ$  કોણ પર હૈં। જલ્ એક  $I_0$  તીવ્રતા કા અધ્રુવલત પ્રકાશ કલરણ પુંજ  $P_1$  પર આપલતલ હોતા હૈં તો ઇસ ત્રીણ ધ્રુવકોં કે સમાયોજન સે  $I$  તીવ્રતા કા પ્રકાશ કલરણ પુંજ નલર્ગત હોતા હૈં। અનુપાત  $(I_0/I)$  કા નલકટતમ માન હોગા :

Options :

1. 1.80
2. 5.33
3. 10.67
4. 16.00

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

ત્રણ ધ્રુવક (પોલેરાઇઝર)  $P_1$ ,  $P_2$  અને  $P_3$  નું એક તંત્ર એવી રીતે રલ્લવામાં આવે છે કે જેથી પોલેરાઇઝર  $P_3$  ની દક્ષ-અક્ષ  $P_1$  ની દક્ષ-અક્ષ ને લંબ રૂપે રહે. પોલેરાઇઝર  $P_2$  ની દક્ષ-અક્ષ,  $P_3$  ની દક્ષ-અક્ષને  $60^\circ$  કોણે નમેલી છે. જ્યારે  $I_0$  તીવ્રતા ધરાવતો અધ્રુવીભૂત પ્રકાશ પોલેરાઇઝર  $P_1$  પર આપાત કરવામાં આવે છે, ત્યારે તંત્રમાંથી નલર્ગમન પામતી તીવ્રતા  $I$  મળે છે.  $(I_0/I)$  ગુણોત્તર \_\_\_\_\_ ની નજીકનો હશે.

Options :

1. 1.80

3. 10.67

4. 16.00

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

Correct Marks : 4 Wrong Marks : 1

Consider an electron in a hydrogen atom, revolving in its second excited state (having radius  $4.65 \text{ \AA}$ ). The de-Broglie wavelength of this electron is :

Options :

1.  $3.5 \text{ \AA}$ 2.  $6.6 \text{ \AA}$ 3.  $9.7 \text{ \AA}$ 4.  $12.9 \text{ \AA}$ 

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

Correct Marks : 4 Wrong Marks : 1

एक हाइड्रोजन परमाणु में इलेक्ट्रॉन दूसरी उत्तेजित कक्षा में घूम रहा है। (इस कक्षा की त्रिज्या  $4.65 \text{ \AA}$  है।) इस इलेक्ट्रॉन की डि-ब्रॉग्ली तरंगदैर्घ्य होगी :

Options :

1.  $3.5 \text{ \AA}$ 2.  $6.6 \text{ \AA}$ 3.  $9.7 \text{ \AA}$ 4.  $12.9 \text{ \AA}$ 

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

પરમાણુમાંના ઇલેક્ટ્રોનને બાઈનમાં લા કે જે તેની દ્વિતીય ઉત્તેજિત અવસ્થા (4.65Å જેટલી ત્રિજ્યા) માં ભ્રમણ કરે છે. આ ઇલેક્ટ્રોન સાથે સંકળાયેલ ડી-બ્રોગ્લી તરંગલંબાઈ \_\_\_\_\_.

Options :

1. 3.5 Å
2. 6.6 Å
3. 9.7 Å
4. 12.9 Å

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

Correct Marks : 4 Wrong Marks : 1

The electron in a hydrogen atom first jumps from the third excited state to the second excited state and subsequently to the first excited state. The ratio of the respective wavelengths,  $\lambda_1/\lambda_2$ , of the photons emitted in this process is :

Options :

1. 27/5
2. 7/5
3. 9/7
4. 20/7

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

Correct Marks : 4 Wrong Marks : 1

एक हाइड्रोजन परमाणु में इलेक्ट्रॉन पहले तीसरी उत्तेजित अवस्था से दूसरी उत्तेजित अवस्था में और तत्पश्चात् दूसरी से प्रथम उत्तेजित अवस्था में जाता है। इन दो संक्रमणों में उत्सर्जित फोटॉनों के संगत तरंगदैर्घ्यों का अनुपात  $\lambda_1/\lambda_2$  होगा :

Options :

2. 7/5
3. 9/7
4. 20/7

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

એક ઉત્તેજિત અવસ્થામાં રહેલા હાઇડ્રોજન પરમાણુમાં એક ઇલેક્ટ્રોન પ્રથમ તૃતીય ઉત્તેજિત અવસ્થામાંથી દ્વિતીય ઉત્તેજિત અવસ્થામાં અને પછી પ્રથમ ઉત્તેજિત અવસ્થામાં સંક્રાંતિ કરે છે. આ પ્રક્રિયા દરમિયાન અનુક્રમે ઉત્સર્જિત વિકિરણની તરંગલંબાઈઓનો ગુણોત્તર  $\lambda_1/\lambda_2$  :

Options :

1. 27/5
2. 7/5
3. 9/7
4. 20/7

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

Half lives of two radioactive nuclei A and B are 10 minutes and 20 minutes, respectively. If, initially a sample has equal number of nuclei, then after 60 minutes, the ratio of decayed numbers of nuclei A and B will be :

Options :

1. 1 : 8
2. 9 : 8
3. 8 : 1

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

दो रेडियोधर्मी नाभिकों, A तथा B, की अर्धआयु, क्रमशः, 10 minutes तथा 20 minutes है। यदि एक नमूने में आरम्भ में दोनों नाभिकों की संख्या बराबर है तो 60 minutes पश्चात् A तथा B के क्षयित नाभिकों की संख्या का अनुपात होगा :

Options :

1. 1 : 8
2. 9 : 8
3. 8 : 1
4. 3 : 8

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

Correct Marks : 4 Wrong Marks : 1

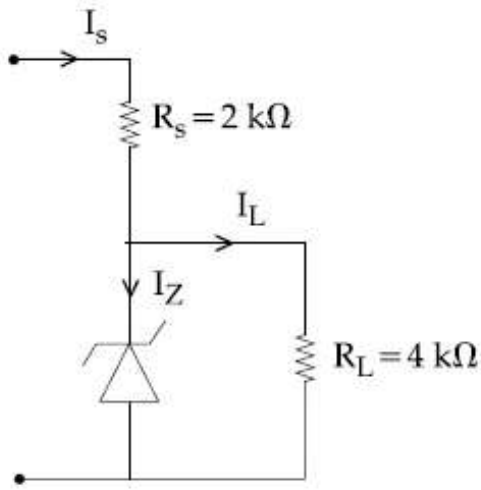
બે રેડિઓએક્ટિવ ન્યૂક્લિયસો A અને B નો અર્ધઆયુ અનુક્રમે 10 મિનિટ અને 20 મિનિટ છે. પ્રારંભમાં, નમૂનાઓમાં સમાન સંખ્યાના ન્યૂક્લિયસોની સંખ્યા ધારતા, 60 મિનિટ બાદ, A અને B ન્યૂક્લિયસોમાંથી ક્ષયપામતા ન્યૂક્લિયસોનો ગુણોત્તર \_\_\_\_\_ થશે.

Options :

1. 1 : 8
2. 9 : 8
3. 8 : 1
4. 3 : 8

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



Options :

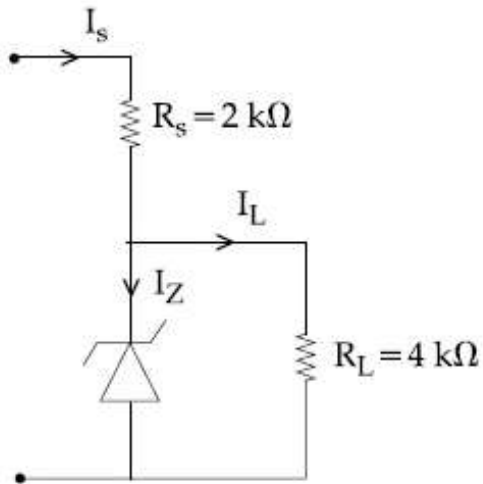
1. 7.5 mA
2. 1.5 mA
3. 2.5 mA
4. 3.5 mA

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

Correct Marks : 4 Wrong Marks : 1

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जिन वोल्टता = 6V के जेनर डायोड से बनाया  
विद्युत नियंत्रक परिपथ दिखाया है। यदि अनियंत्रित  
निवेशित विभव 10 V तथा 16 V के बीच बदलता है  
तो जेनर डायोड में अधिकतम धारा का मान होगा :



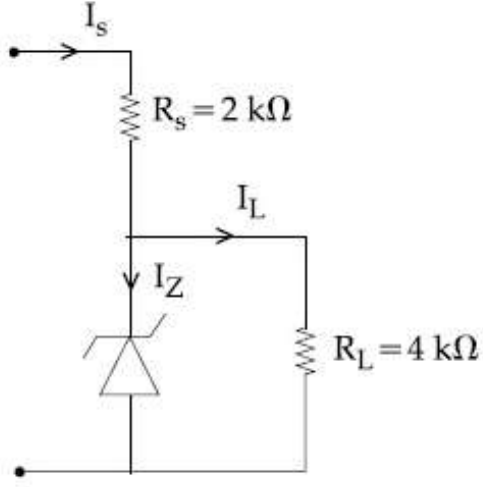
Options :

1. 7.5 mA
2. 1.5 mA
3. 2.5 mA
4. 3.5 mA

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

Correct Marks : 4 Wrong Marks : 1

બનેલો એક DC વોલ્ટેજ રેગ્યુલેટર (નિયામક) પારપે આકૃતિમાં દર્શાવેલ છે. જો unregulated (અનિયામક) ઇનપુટ વોલ્ટેજ 10 V અને 16 V ની વચ્ચે બદલાતો હોય તો મહત્તમ ઝેનર પ્રવાહ કેટલો હશે?



Options :

1. 7.5 mA
2. 1.5 mA
3. 2.5 mA
4. 3.5 mA

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

Correct Marks : 4 Wrong Marks : 1

In an amplitude modulator circuit, the carrier wave is given by,

$C(t) = 4 \sin(20000 \pi t)$  while modulating signal is given by,  $m(t) = 2 \sin(2000 \pi t)$ . The values of modulation index and lower side band frequency are :

Options :

1. 0.3 and 9 kHz
2. 0.4 and 10 kHz
3. 0.5 and 10 kHz

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

Correct Marks : 4 Wrong Marks : 1

एक आयामी मॉडुलन परिपथ में निवेशी वाहक तरंग  
 $C(t) = 4 \sin(20000 \pi t)$  है, जबकि मॉडुलन सिग्नल  
 $m(t) = 2 \sin(2000 \pi t)$  है। मॉडुलन सूचकांक तथा  
निचली पार्श्व बैंड आवृत्ति के मान होंगे :

Options :

1. 0.3 तथा 9 kHz
2. 0.4 तथा 10 kHz
3. 0.5 तथा 10 kHz
4. 0.5 तथा 9 kHz

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

Correct Marks : 4 Wrong Marks : 1

એક એમ્પ્લિટ્યૂડ (કંપવિસ્તાર) માડ્યુલેટર પરિપથમાં,  
કેરિયર તરંગ  $C(t) = 4 \sin(20000 \pi t)$  વડે જ્યારે  
માડ્યુલેટિંગ સિગ્નલ  $m(t) = 2 \sin(2000 \pi t)$  વડે  
આપવામાં આવે છે. માડ્યુલેશન અંક અને નિમ્ન  
(lower) સાઇડબેન્ડ ની આવૃત્તિ :

Options :

1. 0.3 અને 9 kHz
2. 0.4 અને 10 kHz
3. 0.5 અને 10 kHz
4. 0.5 અને 9 kHz

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

Correct Marks : 4 Wrong Marks : 1

in an experiment for measuring speed of sound ( $v$ ) in air by resonance tube method. Resonance is observed to occur at two successive lengths of the air column,  $l_1 = 30$  cm and  $l_2 = 70$  cm. Then,  $v$  is equal to :

Options :

1.  $338 \text{ ms}^{-1}$
2.  $379 \text{ ms}^{-1}$
3.  $384 \text{ ms}^{-1}$
4.  $332 \text{ ms}^{-1}$

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

अनुनाद नली विधि द्वारा वायु में ध्वनि की चाल ( $v$ ) ज्ञात करने के लिये एक प्रयोग में 480 Hz आवृत्ति के स्वरित्र का उपयोग करते हैं। वायु स्तम्भ की दो उत्तरोत्तर लम्बाइयों  $l_1 = 30$  cm तथा  $l_2 = 70$  cm के लिये अनुनाद प्राप्त होते हैं। तब  $v$  का मान है :

Options :

1.  $338 \text{ ms}^{-1}$
2.  $379 \text{ ms}^{-1}$
3.  $384 \text{ ms}^{-1}$
4.  $332 \text{ ms}^{-1}$

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

અનુનાદનળી-રીતથી હવામાં ધ્વનિની ઝડપ ( $v$ ) માપવાનાં એક પ્રયોગમાં વાપરવામાં આવેલ ધ્વનિ ચીપીયાની આવૃત્તિ 480 Hz છે. બે ક્રમિક આવતા  $l_1 = 30$  cm અને  $l_2 = 70$  cm લંબાઈના હવાના સ્તંભો માટે અનુનાદ જોવા મળે છે. તો  $v$  \_\_\_\_\_ થશે.

Options :

2.  $379 \text{ ms}^{-1}$
3.  $384 \text{ ms}^{-1}$
4.  $332 \text{ ms}^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

A moving coil galvanometer, having a resistance  $G$ , produces full scale deflection when a current  $I_g$  flows through it. This galvanometer can be converted into (i) an ammeter of range 0 to  $I_0$  ( $I_0 > I_g$ ) by connecting a shunt resistance  $R_A$  to it and (ii) into a voltmeter of range 0 to  $V$  ( $V = GI_0$ ) by connecting a series resistance  $R_V$  to it. Then,

Options :

1.  $R_A R_V = G^2$  and  $\frac{R_A}{R_V} = \left( \frac{I_g}{I_0 - I_g} \right)^2$

2.  $R_A R_V = G^2$  and  $\frac{R_A}{R_V} = \frac{I_g}{(I_0 - I_g)}$

3.  $R_A R_V = G^2 \left( \frac{I_g}{I_0 - I_g} \right)$  and

3.  $\frac{R_A}{R_V} = \left( \frac{I_0 - I_g}{I_g} \right)^2$

4.  $R_A R_V = G^2 \left( \frac{I_0 - I_g}{I_g} \right)$  and

4.  $\frac{R_A}{R_V} = \left( \frac{I_g}{(I_0 - I_g)} \right)^2$

પ્રતિરોધ  $G$  કે એક ચલ કુંડલી ધારામાપી મેં ધારા  $I_g$  પર પૂર્ણ વિક્ષેપ પાયા જાતા હૈ। ઇસ ધારામાપી કો પરાસ 0 સે  $I_0$  ( $I_0 > I_g$ ) ધારા કે અમીટર મેં એક શંટ પ્રતિરોધ  $R_A$  લગાકર પરિવર્તિત કર સકતે હૈ। ઇસી ધારામાપી કો પરાસ 0 સે  $V$  ( $V = GI_0$ ) કે વોલ્ટમીટર મેં એક શ્રેણી પ્રતિરોધ  $R_V$  લગાકર પરિવર્તિત કર સકતે હૈ। તો :

Options :

1.  $R_A R_V = G^2$  તથા  $\frac{R_A}{R_V} = \left( \frac{I_g}{I_0 - I_g} \right)^2$

2.  $R_A R_V = G^2$  તથા  $\frac{R_A}{R_V} = \frac{I_g}{(I_0 - I_g)}$

3.  $R_A R_V = G^2 \left( \frac{I_g}{I_0 - I_g} \right)$  તથા

$\frac{R_A}{R_V} = \left( \frac{I_0 - I_g}{I_g} \right)^2$

4.  $R_A R_V = G^2 \left( \frac{I_0 - I_g}{I_g} \right)$  તથા

$\frac{R_A}{R_V} = \left( \frac{I_g}{(I_0 - I_g)} \right)^2$



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

Correct Marks : 4 Wrong Marks : 1

$G$  જેટલો અવરોધ ધરાવતા એક ચલિત ગૂંચળાવાળા ગેલ્વેનોમીટરમાં  $I_g$  જેટલો પ્રવાહ પસાર કરતા પૂર્ણ સ્કેલ આવર્તન આપે છે. આ ગેલ્વેનોમીટરને (i)  $R_A$  જેટલો શંટ (લઘુ અવરોધ) જોડી 0 થી  $I_0$  ( $I_0 > I_g$ ) અવધી (રેંજ) ધરાવતા એમીટરમાં અને (ii)  $R_V$  જેટલો શ્રેણી અવરોધ જોડી 0 થી  $V$  ( $V = GI_0$ ) રેંજ ધરાવતા વોલ્ટમીટરમાં રૂપાંતરિત કરી શકાય છે. તો \_\_\_\_\_.

Options :

1.  $R_A R_V = G^2 \Rightarrow \frac{R_A}{R_V} = \left( \frac{I_g}{I_0 - I_g} \right)^2$

2.  $R_A R_V = G^2 \Rightarrow \frac{R_A}{R_V} = \frac{I_g}{(I_0 - I_g)}$

3.  $R_A R_V = G^2 \left( \frac{I_g}{I_0 - I_g} \right) \Rightarrow$

$\frac{R_A}{R_V} = \left( \frac{I_0 - I_g}{I_g} \right)^2$

4.  $R_A R_V = G^2 \left( \frac{I_0 - I_g}{I_g} \right) \Rightarrow$

$\frac{R_A}{R_V} = \left( \frac{I_g}{(I_0 - I_g)} \right)^2$

Chemistry

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:

416529278

2

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

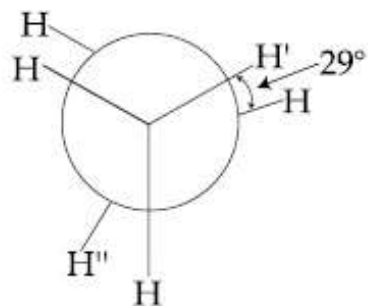
416529418

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



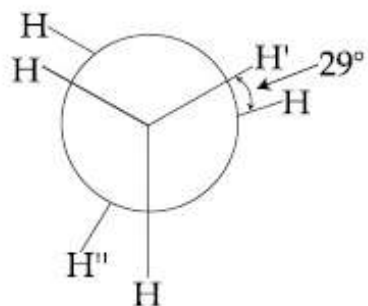
Options :

1.  $58^\circ$
2.  $151^\circ$
3.  $149^\circ$
4.  $120^\circ$

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

एथेन के निम्न विषमतलीय संरूपण में,  
 $H'-C-C-H''$  द्वितल कोण है :

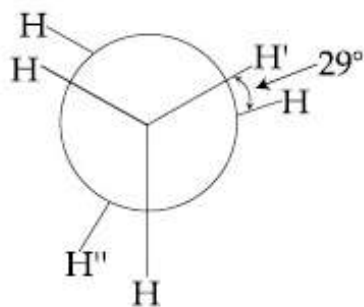


Options :

1.  $58^\circ$
2.  $151^\circ$
3.  $149^\circ$
4.  $120^\circ$

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

$H'-C-C-H''$  દ્વિતલ (ગ્રાઈહાઈડ્રલ) કોણ છે :



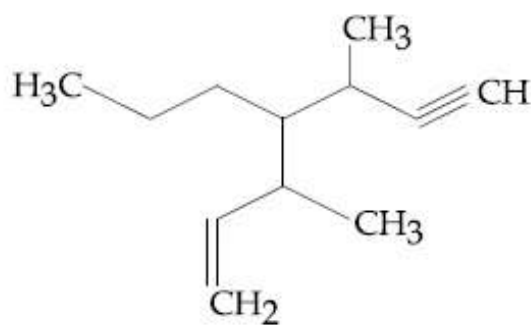
Options :

1.  $58^\circ$
2.  $151^\circ$
3.  $149^\circ$
4.  $120^\circ$

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

Correct Marks : 4 Wrong Marks : 1

The IUPAC name for the following compound is :



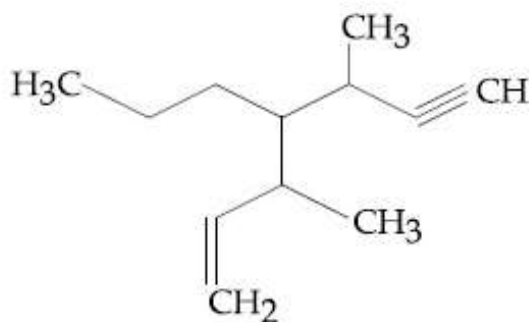
Options :

1. 3,5-dimethyl-4-propylhept-6-en-1-yne
2. 3-methyl-4-(3-methylprop-1-enyl)-1-heptyne
3. 3,5-dimethyl-4-propylhept-1-en-6-yne

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

નિમ્ન યૌગિક કે લિંઈ IUPAC નામ હૈ :



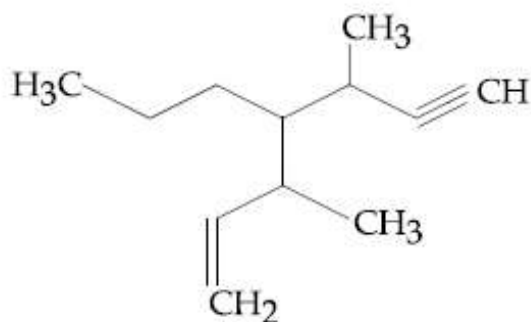
Options :

1. 3,5-ડાઈમેથિલ-4-પ્રોપિલહેપ્ટ-6-ઈન-1-આઈન
2. 3-મેથિલ-4-(3-મેથિલપ્રોપ-1-ઈનિલ)-1-હેપ્ટાઈન
3. 3,5-ડાઈમેથિલ-4-પ્રોપિલહેપ્ટ-1-ઈન-6-આઈન
4. 3-મેથિલ-4-(1-મેથિલપ્રોપ-2-આયનિલ)-1-હેપ્ટીન

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંયોજનનું IUPAC નામ છે :



Options :

1. આઈન

3-મિથાઈલ-4-(3-મિથાઈલપ્રોપ-1-ઇનાઇલ)-

2. 1-હેપ્ટાઈન

3,5-ડાઈમિથાઈલ-4-પ્રોપીલહેપ્ટ-1-ઇન-6-

3. આઈન

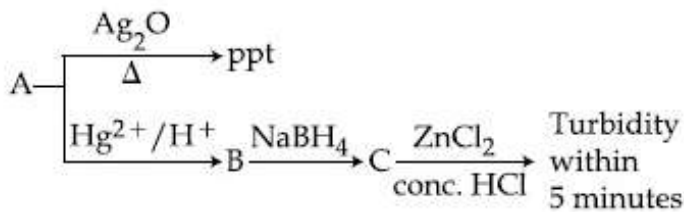
3-મિથાઈલ-4-(1-મિથાઈલપ્રોપ-2-

4. વાયનાઇલ)-1-હેપ્ટીન

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

Consider the following reactions :



'A' is :

Options :

1.  $\text{CH} \equiv \text{CH}$

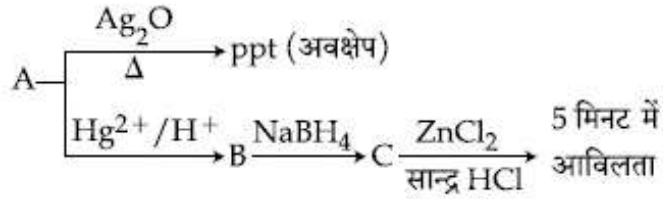
2.  $\text{CH}_3 - \text{C} \equiv \text{CH}$

3.  $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$

4.  $\text{CH}_2 = \text{CH}_2$

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



'A' है :

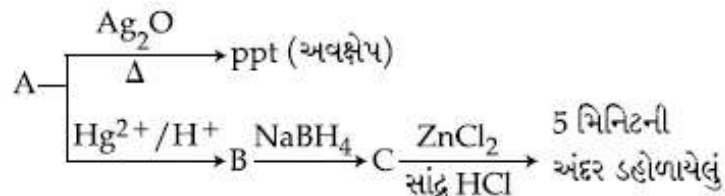
Options :

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

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

Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયાને ધ્યાનમાં લો :



'A' છે :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

Which of the given statements is

INCORRECT about glycogen ?

1. It is present in animal cells.

It is a straight chain polymer similar to amylose.

3. It is present in some yeast and fungi.

4. Only  $\alpha$ -linkages are present in the molecule.

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

ग्लायकोजेन के सम्बन्ध में दिये गये कथनों में से कौन सा सही नहीं है?

Options :

1. यह प्राणी-कोषिकाओं में उपस्थित है।

2. एमिलोज की तरह यह एक ऋजुशृंखल बहुलक है।

3. यह कुछ यीस्ट (खमीर) तथा कवकों में उपस्थित है।

4. अणुओं में मात्र  $\alpha$ -बंधन उपस्थित हैं।

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

ગ્લાયકોજન માટે આપેલા વિધાનો પૈકી કયુ સાચુ નથી?

Options :

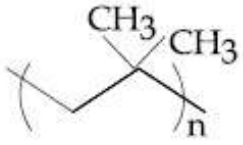
1. એ પ્રાણીના કોષમાં હાજર છે.

2. એ એમાયલોજના જેવો એક સીધી શૃંખલા ધરાવતો બહુલક છે.

3. તે અમુક યીસ્ટ અને ફૂગમાં હાજર છે.

4. આણુમાં ફક્ત  $\alpha$ -કડીઓ હાજર છે.

The correct name of the following polymer is :



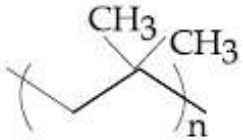
Options :

1. Polyisobutane
2. Polyisobutylene
3. Polytert-butylene
4. Polyisoprene

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

નિમ્ન બહુલક કા સહી નામ હૈ :



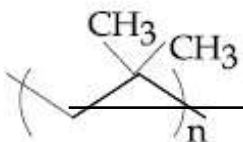
Options :

1. પાલીઆઇસોબ્યૂટેન
2. પાલીઆઇસોબ્યૂટાઇલીન
3. પાલીટર્ટ-બ્યૂટાઇલીન
4. પાલીઆઇસોપ્રીન

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

નીચેના બહુલકનું સાચું નામ છે :



Options :

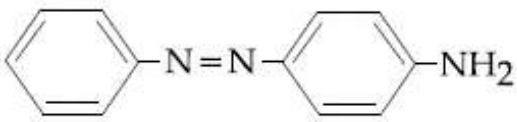
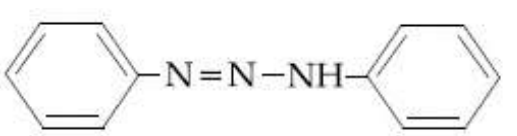
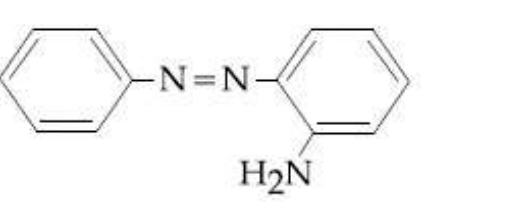
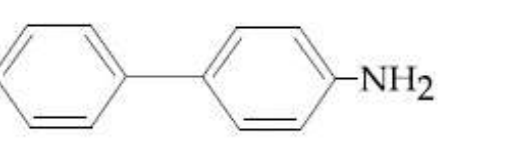
2. पोलीआइसोप्युटीलीन
3. पोलीटेट-प्युटीलीन
4. पोलीआइसोप्रीन

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

Benzene diazonium chloride on reaction with aniline in the presence of dilute hydrochloric acid gives :

Options :

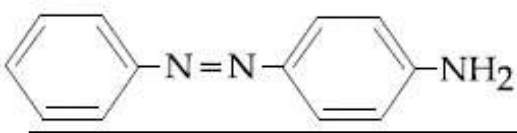
1. 
2. 
3. 
4. 

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

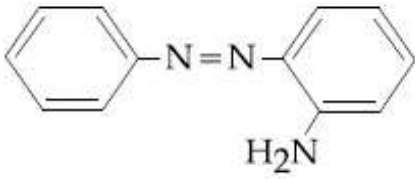
Correct Marks : 4 Wrong Marks : 1

तनु हाइड्रोक्लोरिक अम्ल की उपस्थिति में बेंजीन डाइजोनियम क्लोराइड, एनिलीन के साथ अभिक्रिया करके देता है :

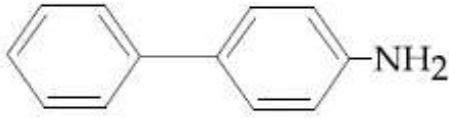
Options :

1. 

2.



3.



4.

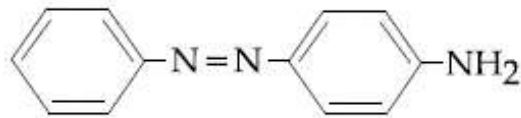
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

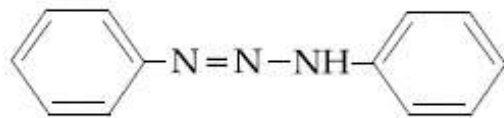
મંદ હાઇડ્રોકલોરીક એસિડની હાજરીમાં બેન્ઝિન ડાઇએઝોનિયમ ક્લોરાઇડની એનીલીન સાથે પ્રક્રિયા કરતા મળે છે.

Options :

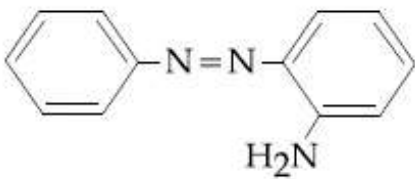
1.



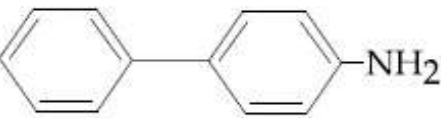
2.



3.



4.



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

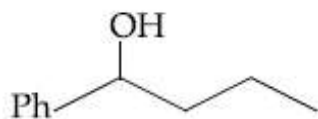
Correct Marks : 4 Wrong Marks : 1

Heating of 2-chloro-1-phenylbutane with EtOK/EtOH gives X as the major product. Reaction of X with  $\text{Hg}(\text{OAc})_2/\text{H}_2\text{O}$  followed by  $\text{NaBH}_4$  gives Y as the major product. Y is :

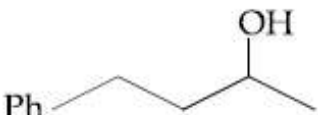
1.



2.



3.



4.



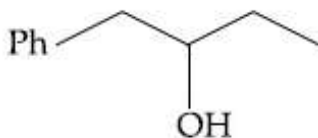
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

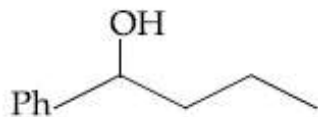
2-क्लोरो-1-फेनिलब्यूटेन को EtOK/EtOH के साथ गरम करने पर X मुख्य उत्पाद के रूप में प्राप्त होता है। Hg(OAc)<sub>2</sub>/H<sub>2</sub>O के साथ X की अभिक्रिया तत्पश्चात् NaBH<sub>4</sub> के साथ अभिक्रिया से प्राप्त Y मुख्य उत्पाद है। Y है :

Options :

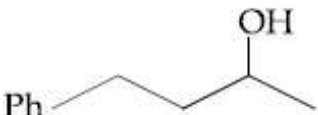
1.



2.



3.



4.

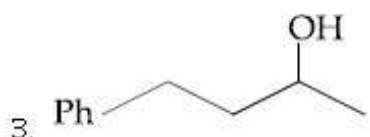
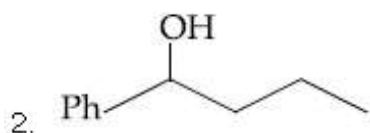
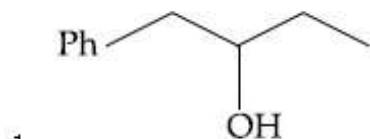


Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1-ઇથેલબ્રોઇડ ના  $\text{EtOK}/\text{EtOH}$  ની સાથે  
ગરમ કરતા મળતી મુખ્ય નીપજ X છે. X ની  
 $\text{Hg}(\text{OAc})_2/\text{H}_2\text{O}$  સાથે પ્રક્રિયા કર્યા બાદ  $\text{NaBH}_4$   
સાથે પ્રક્રિયા કરતા Y મુખ્ય નીપજ આપે છે તો Y એ :

Options :

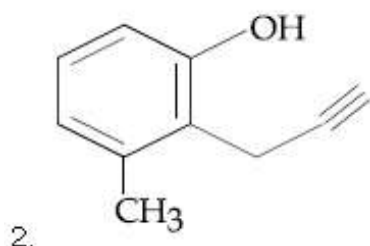
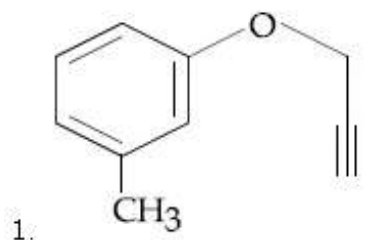


Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

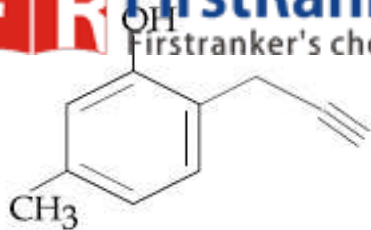
Correct Marks : 4 Wrong Marks : 1

What will be the major product when  
m-cresol is reacted with propargyl bromide  
( $\text{HC}\equiv\text{C}-\text{CH}_2\text{Br}$ ) in presence of  $\text{K}_2\text{CO}_3$  in  
acetone ?

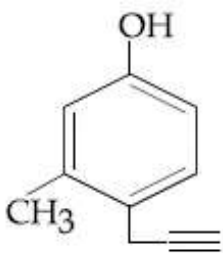
Options :



3.



4.



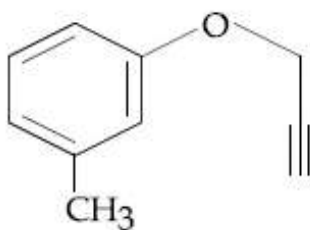
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

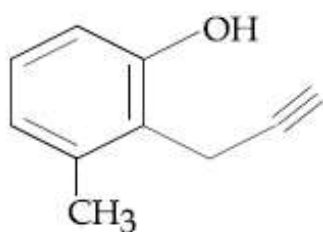
मुख्य उत्पाद क्या होगा जब m-क्रिसॉल को एसीटोन में  $K_2CO_3$  की उपस्थिति में प्रोपर्जिल ब्रोमाइड ( $HC \equiv C-CH_2Br$ ) के साथ अभिकृत किया जाता है?

Options :

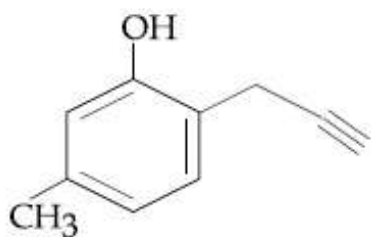
1.



2.



3.



4.



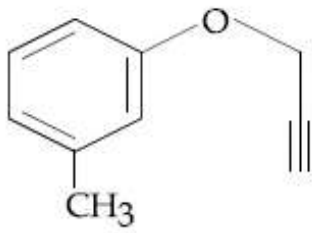
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

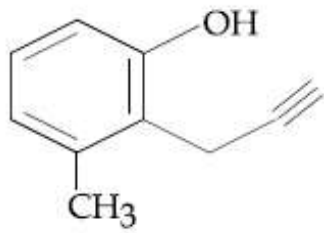
એસિટોનમાં  $K_2CO_3$  ની હાજરીમાં m-કેસોલની પ્રોપેગાઇલ બ્રોમાઇડ ( $HC \equiv C-CH_2Br$ ) ની સાથે પ્રક્રિયા કરતા મુખ્ય નીપજ શું હશે?

Options :

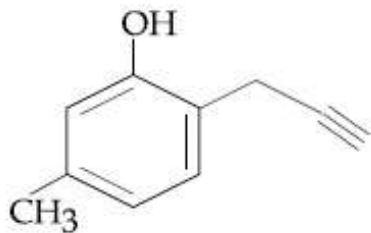
1.



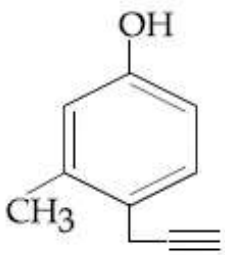
2.



3.



4.



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

**Assertion (A):** Vinyl halides do not undergo nucleophilic substitution easily.

**Reason (R):** Even though the intermediate carbocation is stabilized by loosely held  $\pi$ -electrons, the cleavage is difficult because of strong bonding.

Options :

1. Both (A) and (R) are correct statements and (R) is the correct explanation of (A).
2. Both (A) and (R) are correct statements but (R) is not the correct explanation of (A).
3. (A) is a correct statement but (R) is a wrong statement.
4. Both (A) and (R) are wrong statements.

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

एक 'कथन' तथा एक 'कारण' नीचे दिया गया है।

निम्न विकल्पों में से सही उत्तर का चुनाव कीजिए :

**कथन (A):** विनाइल हैलाइड का नाभिकरागी प्रतिस्थापन आसानी से नहीं होता।

**कारण (R):** अदृढ़  $\pi$ -इलेक्ट्रॉनों द्वारा मध्यवर्ती कार्बोकैटायन के स्थायित्व के बावजूद भी, प्रबल आबंधन के कारण विदलन कठिन है।

Options :

1. (A) तथा (R) दोनों सही हैं तथा (R), (A) की सही व्याख्या है।
2. (A) तथा (R) दोनों सही हैं परन्तु (R), (A) की सही व्याख्या नहीं है।

4. (A) तथा (R) दोनों ही गलत हैं।

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

Correct Marks : 4 Wrong Marks : 1

નીચે 'અભિધારણા' અને 'કારણ' આપેલા છે નીચે આપેલા વિકલ્પો પૈકી સાચો જવાબ પસંદ કરો.

અભિધારણા (A) : વિનાઇલ હેલાઈડો કેન્દ્ર સ્નેહી પ્રતિસ્થાપન અભિક્રિયા સહેલાય થી કરતા નથી.

કારણ (R) : માધ્યમિક સંયોજન કાર્બોકેટાયન નિર્બળ રીતે જોડાયેલા π ઇલેક્ટ્રોન્સથી સ્થાયી હોવા છતાં મજબૂત બંધાણના કારણે વિદલન (cleavage) મુશ્કેલ છે.

Options :

1. (A) અને (R) બંને સાચા વિધાનો છે અને (R) એ (A) ની સાચી સમજૂતી છે.

2. (A) અને (R) બંને સાચા વિધાનો છે અને (R) એ (A) ની સાચી સમજૂતી નથી.

3. વિધાન (A) સાચુ છે, પણ (R) ખોટું છે.

4. (A) અને (R) બંને ખોટા વિધાનો છે.

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

Correct Marks : 4 Wrong Marks : 1

Which one of the following is likely to give a precipitate with  $\text{AgNO}_3$  solution ?

Options :

1.  $\text{CCl}_4$
2.  $\text{CHCl}_3$
3.  $(\text{CH}_3)_3\text{CCl}$
4.  $\text{CH}_2=\text{CH}-\text{Cl}$

निम्न में से किसकी  $\text{AgNO}_3$  विलयन के साथ अवक्षेप देने की संभावना है?

Options :

1.  $\text{CCl}_4$
2.  $\text{CHCl}_3$
3.  $(\text{CH}_3)_3\text{CCl}$
4.  $\text{CH}_2=\text{CH}-\text{Cl}$

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

$\text{AgNO}_3$  ना द्रावणनी साथे नीचेना पैकी कयुं अके अवक्षेप आपी शके ?

Options :

1.  $\text{CCl}_4$
2.  $\text{CHCl}_3$
3.  $(\text{CH}_3)_3\text{CCl}$
4.  $\text{CH}_2=\text{CH}-\text{Cl}$

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

In comparison to boron, beryllium has :

Options :

1. greater nuclear charge and greater first ionisation enthalpy.
2. lesser nuclear charge and greater first ionisation enthalpy.
3. lesser nuclear charge and lesser first ionisation enthalpy.

4.

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

Correct Marks : 4 Wrong Marks : 1

बोरान की तुलना में बेरीलियम रखता है :

Options :

1. उच्चतर नाभिकीय आवेश तथा उच्चतर प्रथम आयनन एन्थैल्पी।
2. निम्नतर नाभिकीय आवेश तथा उच्चतर प्रथम आयनन एन्थैल्पी।
3. निम्नतर नाभिकीय आवेश तथा निम्नतर प्रथम आयनन एन्थैल्पी।
4. उच्चतर नाभिकीय आवेश तथा निम्नतर प्रथम आयनन एन्थैल्पी।

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

બોરોન ની સરખામણીમાં બેરીલિયમ પાસે, :

Options :

1. વધુ ન્યુક્લીયર ભાર અને વધુ પ્રથમ આયનીકરણ એન્થાલ્પી
2. ઓછો ન્યુક્લીયર ભાર અને વધુ પ્રથમ આયનીકરણ એન્થાલ્પી
3. ઓછો ન્યુક્લીયર ભાર અને ઓછી પ્રથમ આયનીકરણ એન્થાલ્પી
4. વધુ ન્યુક્લીયર ભાર અને ઓછી પ્રથમ આયનીકરણ એન્થાલ્પી

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

Correct Marks : 4 Wrong Marks : 1

The correct statement is :

Options :

1. due to the evolution of  $\text{CO}_2$ .

2. pig iron is obtained from cast iron.

3. leaching of bauxite using concentrated  $\text{NaOH}$  solution gives sodium aluminate and sodium silicate.

4. the Hall-Heroult process is used for the production of aluminium and iron.

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

સહી કથન છે :

Options :

1. ધાત્વિક પ્રક્રમ કે બીચ કૉપર કા બ્લિસ્ટર્ડ રૂપ  $\text{CO}_2$  કે નિર્ગમન કે કારણ હોતા છે।

2. કાસ્ટ આયરન (ઢલવાલોહા) સે પિગ આયરન(કચ્ચા લોહા) પ્રાપ્ત કિયા જાતા છે।

3. સાન્દ્ર  $\text{NaOH}$  વિલયન કા પ્રયોગ કરતે હુયે બાક્સાઈટ કા નિશ્કાલન સોડિયમ ઇલુમીનેટ તથા સોડિયમ સિલીકેટ દેતા છે।

4. ઇલુમીનિયમ તથા આયરન કે ઉત્પાદન કે લિઈ હાલ-હેરાલ્ટ પ્રક્રમ પ્રયુક્ત હોતા છે।

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

સાચું વિધાન છે :

Options :

1. ધાત્વીક્રીય પદ્ધતિમાં તાંબાનો ઉત્સ્ફોટિતીય દેખાવ  $\text{CO}_2$  ઉત્પન્ન થવાના સિધે છે.

3. બોક્સાઇટનું સાન્દ્ર NaOH માં દ્રાવણ વડે પ્રવાહીત નિક્ષાલન કરતા સોડિયમ એલ્યુમિનેટ અને સોડિયમ સિલિકેટ આપે છે.

4. હોલ-હેરાલ્ડ પદ્ધતી એલ્યુમિનિયમ અને લોખંડના ઉત્પાદનમાં વપરાય છે.

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

Correct Marks : 4 Wrong Marks : 1

The temporary hardness of a water sample is due to compound X. Boiling this sample converts X to compound Y. X and Y, respectively, are :

Options :

1.  $Mg(HCO_3)_2$  and  $Mg(OH)_2$
2.  $Mg(HCO_3)_2$  and  $MgCO_3$
3.  $Ca(HCO_3)_2$  and  $Ca(OH)_2$
4.  $Ca(HCO_3)_2$  and  $CaO$

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

जल प्रतिदर्श की अस्थायी कठोरता यौगिक X के कारण है। इस प्रतिदर्श को उबालने पर X बदलकर यौगिक Y हो जाता है। X तथा Y, क्रमशः, हैं :

Options :

1.  $Mg(HCO_3)_2$  तथा  $Mg(OH)_2$
2.  $Mg(HCO_3)_2$  तथा  $MgCO_3$
3.  $Ca(HCO_3)_2$  तथा  $Ca(OH)_2$
4.  $Ca(HCO_3)_2$  तथा  $CaO$

પાણીના નમૂનાની અસ્થાયી કઠીનતા સંયોજન X ના કારણે છે. આ નમૂનાને ઉકાળતા X નું સંયોજન Y માં રૂપાંતર થાય છે. X અને Y અનુક્રમે છે :

Options :

1.  $\text{Mg}(\text{HCO}_3)_2$  અને  $\text{Mg}(\text{OH})_2$
2.  $\text{Mg}(\text{HCO}_3)_2$  અને  $\text{MgCO}_3$
3.  $\text{Ca}(\text{HCO}_3)_2$  અને  $\text{Ca}(\text{OH})_2$
4.  $\text{Ca}(\text{HCO}_3)_2$  અને  $\text{CaO}$

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

Correct Marks : 4 Wrong Marks : 1

The INCORRECT statement is :

Options :

1.  $\text{LiNO}_3$  decomposes on heating to give  $\text{LiNO}_2$  and  $\text{O}_2$ .
2. Lithium is the strongest reducing agent among the alkali metals.
3. Lithium is least reactive with water among the alkali metals.
4.  $\text{LiCl}$  crystallises from aqueous solution as  $\text{LiCl} \cdot 2\text{H}_2\text{O}$ .

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

गलत कथन है :

Options :

1.  $\text{LiNO}_3$  गरम करने पर अपघटित होकर  $\text{LiNO}_2$  तथा  $\text{O}_2$  देता है।

2. કમક છે।

ક્ષાર ધાતુઓં મેં લીથિયમ જલ કે સાથ સબસે  
કમ અભિક્રિયાશીલ છે।

3.

LiCl જલીય વિલયન સે  $\text{LiCl} \cdot 2\text{H}_2\text{O}$  કે રૂપ  
મેં ક્રિસ્ટલિત હોતા છે।

4.

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

Correct Marks : 4 Wrong Marks : 1

સાચું વિધાન નથી તે :

Options :

$\text{LiNO}_3$  ને ગરમ કરતા વિઘટન પામી  $\text{LiNO}_2$   
અને  $\text{O}_2$  આપે છે.

1.

આલ્કલીય ધાતુઓમાં લીથીયમ સૌથી પ્રબળ  
રિડેક્શનકર્તા છે.

2.

આલ્કલીય ધાતુઓમાં લીથીયમ પાણી સાથે સૌથી  
ઓછો સક્રીય છે.

3.

જલીય દ્રાવણમાંથી LiCl નું સ્ફટીકીકરણ  
 $\text{LiCl} \cdot 2\text{H}_2\text{O}$  રૂપે થાય છે.

4.

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

Correct Marks : 4 Wrong Marks : 1

The C – C bond length is maximum in :

Options :

$\text{C}_{60}$

1.

graphite

2.

diamond

3.

$\text{C}_{70}$

4.

निम्न में से किसमें C-C आबन्ध लम्बाई अधिकतम है?

Options :

1.  $C_{60}$
2. ग्रेफाइट
3. हीरा (डायमंड)
4.  $C_{70}$

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

C-C બંધ લંબાઈ મહત્તમ શેમાં છે?

Options :

1.  $C_{60}$
2. ગ્રેફાઇટ
3. હીરો
4.  $C_{70}$

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

Thermal decomposition of a Mn compound (X) at 513 K results in compound Y,  $MnO_2$  and a gaseous product.  $MnO_2$  reacts with NaCl and concentrated  $H_2SO_4$  to give a pungent gas Z. X, Y, and Z, respectively, are :

Options :

1.  $K_2MnO_4$ ,  $KMnO_4$  and  $SO_2$
2.  $KMnO_4$ ,  $K_2MnO_4$  and  $Cl_2$

4.  $K_3MnO_4$ ,  $K_2MnO_4$  and  $Cl_2$

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

513 K પર, એક Mn યૌગિક (X) કે તાપીય અપઘટન સે યૌગિક Y,  $MnO_2$  તથા એક ગૈસીય ઉત્પાદ પ્રાપ્ત હોતા હૈ।  $NaCl$  તથા સાન્દ્ર  $H_2SO_4$  સે  $MnO_2$  અભિક્રિયા કરકે એક તીર્ણી ગૈસ Z દેતા હૈ। X, Y તથા Z ક્રમશઃ હૈ :

Options :

1.  $K_2MnO_4$ ,  $KMnO_4$  તથા  $SO_2$
2.  $KMnO_4$ ,  $K_2MnO_4$  તથા  $Cl_2$
3.  $K_2MnO_4$ ,  $KMnO_4$  તથા  $Cl_2$
4.  $K_3MnO_4$ ,  $K_2MnO_4$  તથા  $Cl_2$

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

513 K, Mn સંયોજન (X) નું ઉષ્મીય વિઘટન થતા સંયોજન Y,  $MnO_2$  અને વાયુમયી પેદાશ નીપજે છે.  $MnO_2$  એ  $NaCl$  અને સાન્દ્ર  $H_2SO_4$  સાથે પ્રક્રિયા કરી ગંધ મારતો વાયુ Z આપે છે. X, Y અને Z અનુક્રમે છે :

Options :

1.  $K_2MnO_4$ ,  $KMnO_4$  અને  $SO_2$
2.  $KMnO_4$ ,  $K_2MnO_4$  અને  $Cl_2$
3.  $K_2MnO_4$ ,  $KMnO_4$  અને  $Cl_2$
4.  $K_3MnO_4$ ,  $K_2MnO_4$  અને  $Cl_2$

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

Options :

1. Ti and Hf
2. Mn and Re
3. Sc and Ni
4. Mo and W

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

वह युग्म जिसकी परमाण्विक त्रिज्यायें एक जैसी हैं,  
होगा :

Options :

1. Ti तथा Hf
2. Mn तथा Re
3. Sc तथा Ni
4. Mo तथा W

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

જોડ કે જેની સરખી પરમાણ્વીય ત્રિજ્યા છે તે :

Options :

1. Ti અને Hf
2. Mn અને Re
3. Sc અને Ni
4. Mo અને W

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

Options :

1. D-penicillamine
2. EDTA
3. Cis-platin
4. desferrioxime B

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

लेड विषकृता के उपचार में प्रयुक्त यौगिक है :

Options :

1. D-पेनीसिलामाइन
2. EDTA
3. सिस-प्लेटिन
4. डेसफेरीआक्साइम B

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

लेड विषकृता उपचार माटे वपरातुं संयोजन छै :

Options :

1. D-पेनीसिलेमाइन
2. EDTA
3. सिस-प्लेटिन
4. डेसफेरीआक्साइम B

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

$[\text{Co}(\text{Cl})(\text{en})_2]\text{Cl}$  and  $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3]$

respectively, are :

(en = ethane-1, 2-diamine)

Options :

1. 6 and 6
2. 3 and 3
3. 5 and 6
4. 5 and 3

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

$[\text{Co}(\text{Cl})(\text{en})_2]\text{Cl}$  तथा  $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3]$  में Co

तथा Al की उपसहसंयोजन संख्यायें, क्रमशः, हैं :

(en = एथेन-1, 2-डाइऐमीन)

Options :

1. 6 तथा 6
2. 3 तथा 3
3. 5 तथा 6
4. 5 तथा 3

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

$[\text{Co}(\text{Cl})(\text{en})_2]\text{Cl}$  અને  $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3]$  માં Co

અને Al નો સર્વજ્ઞ આક્રમણક્રમ છે :

(en = ઇથેન-1, 2-ડાઈએમીન)

Options :

1. 6 અને 6
2. 3 અને 3
3. 5 અને 6

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

Correct Marks : 4 Wrong Marks : 1

The primary pollutant that leads to photochemical smog is :

Options :

1. ozone
2. sulphur dioxide
3. acrolein
4. nitrogen oxides

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

પ્રાથમિક પ્રદૂષક જો પ્રકાશરાસાયણિક ધૂમકુહા પૈદા કરતા હૈ, હૈ :

Options :

1. ઓઝોન
2. સલ્ફર ડાઇઑક્સાઇડ
3. એક્રોલીન
4. નાઇટ્રોજન ઑક્સાઇડે

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

પ્રાથમિક પ્રદૂષકો કે જે પ્રકાશ રાસાયણિક ધુમ-ધુમ્મસમાં દોરી જાય છે તે :

Options :

1. ઓઝોન
2. સલ્ફર ડાઇઑક્સાઇડ

4. નાઇટ્રોજન ઓક્સાઇડ્સ

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 g of an unknown hydrocarbon upon burning produces 88 g of  $\text{CO}_2$  and 9 g of  $\text{H}_2\text{O}$ . This unknown hydrocarbon contains :

Options :

1. 20 g of carbon and 5 g of hydrogen
2. 24 g of carbon and 1 g of hydrogen
3. 22 g of carbon and 3 g of hydrogen
4. 18 g of carbon and 7 g of hydrogen

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

एक अज्ञात हाइड्रोकार्बन के 25 g को जलाने पर 88 g  $\text{CO}_2$  तथा 9 g  $\text{H}_2\text{O}$  उत्पन्न होते हैं। इस अज्ञात हाइड्रोकार्बन में ये सन्निहित हैं,

Options :

1. 20 g कार्बन तथा 5 g हाइड्रोजन
2. 24 g कार्बन तथा 1 g हाइड्रोजन
3. 22 g कार्बन तथा 3 g हाइड्रोजन
4. 18 g कार्બન તથા 7 g હાઇડ્રોજન

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 g અજ્ઞાત હાઇડ્રોકાર્બને સળગાવતા 88 g  $\text{CO}_2$  અને 9 g પાણી ઉત્પન્ન થાય છે. અજ્ઞાત હાઇડ્રોકાર્બન ધરાવે છે.

1. 20 g કાર્બન અને 5 g હાઇડ્રોજન
2. 24 g કાર્બન અને 1 g હાઇડ્રોજન
3. 22 g કાર્બન અને 3 g હાઇડ્રોજન
4. 18 g કાર્બન અને 7 g હાઇડ્રોજન

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 ratio of number of atoms present in a simple cubic, body centered cubic and face centered cubic structure are, respectively :

Options :

1. 8:1:6
2. 1:2:4
3. 4:2:3
4. 4:2:1

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

Correct Marks : 4 Wrong Marks : 1

सरल घनीय, अंतःकेन्द्रित घनीय तथा फलक केन्द्रित घनीय संरचना में उपस्थित परमाणुओं की संख्या का अनुपात क्रमशः, होगा :

Options :

1. 8:1:6
2. 1:2:4
3. 4:2:3
4. 4:2:1



સાદા અને સરળ ઉત્તરો આપવા માટે આ પોર્ટલ કેન્દ્રીય છે.  
બંધારણમાં રહેતા પરમાણુઓની સંખ્યાનો ગુણોત્તર અનુક્રમે છે.

Options :

1. 8:1:6
2. 1:2:4
3. 4:2:3
4. 4:2:1

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

Among the following, the energy of 2s orbital is lowest in :

Options :

1. H
2. K
3. Na
4. Li

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

निम्न में, 2s कक्षक की ऊर्जा किसमें निम्नतम है?

Options :

1. H
2. K
3. Na
4. Li

નીચેના પૈકી કોની 2s કક્ષકની શક્તિ સૌથી ઓછી છે?

Options :

1. H
2. K
3. Na
4. Li

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

Correct Marks : 4 Wrong Marks : 1

The INCORRECT match in the following is :

Options :

1.  $\Delta G^0 < 0, K > 1$
2.  $\Delta G^0 < 0, K < 1$
3.  $\Delta G^0 > 0, K < 1$
4.  $\Delta G^0 = 0, K = 1$

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

निम्न में गलत मिलान किसमें है?

Options :

1.  $\Delta G^0 < 0, K > 1$
2.  $\Delta G^0 < 0, K < 1$
3.  $\Delta G^0 > 0, K < 1$
4.  $\Delta G^0 = 0, K = 1$

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

Options :

1.  $\Delta G^0 < 0, K > 1$
2.  $\Delta G^0 < 0, K < 1$
3.  $\Delta G^0 > 0, K < 1$
4.  $\Delta G^0 = 0, K = 1$

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

Correct Marks : 4 Wrong Marks : 1

A solution is prepared by dissolving 0.6 g of urea (molar mass =  $60 \text{ g mol}^{-1}$ ) and 1.8 g of glucose (molar mass =  $180 \text{ g mol}^{-1}$ ) in 100 mL of water at  $27^\circ\text{C}$ . The osmotic pressure of the solution is :

( $R = 0.08206 \text{ L atm K}^{-1} \text{ mol}^{-1}$ )

Options :

1. 4.92 atm
2. 2.46 atm
3. 1.64 atm
4. 8.2 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

$27^\circ\text{C}$  पर, एक विलयन को 100 mL जल में 0.6 g यूरिया (मोलर द्रव्यमान =  $60 \text{ g mol}^{-1}$ ) तथा 1.8 g ग्लूकोज (मोलर द्रव्यमान =  $180 \text{ g mol}^{-1}$ ) घोलकर तैयार किया गया। विलयन का परासरण दाब होगा :

( $R = 0.08206 \text{ L atm K}^{-1} \text{ mol}^{-1}$ )

Options :

1. 4.92 atm

3. 1.64 atm
4. 8.2 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

27 °C એ 0.6 g યુરિયા ( મોલર દળ = 60 g mol<sup>-1</sup> )  
અને 1.8 g સુક્રોઝનું ( મોલર દળ = 180 g mol<sup>-1</sup> )  
100 mL પાણીમાં ઓગાળીને દ્રાવણ બનવવામાં આવ્યું.  
દ્રાવણનું (પરાસરણ) અભિસારણ દબાણ છે :  
(R = 0.08206 L atm K<sup>-1</sup> mol<sup>-1</sup>)

Options :

1. 4.92 atm
2. 2.46 atm
3. 1.64 atm
4. 8.2 atm

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

In which one of the following equilibria,

$$K_p \neq K_c ?$$

Options :

1.  $\text{NO}_2(\text{g}) + \text{SO}_2(\text{g}) = \text{NO}(\text{g}) + \text{SO}_3(\text{g})$
2.  $2\text{HI}(\text{g}) = \text{H}_2(\text{g}) + \text{I}_2(\text{g})$
3.  $2\text{C}(\text{s}) + \text{O}_2(\text{g}) = 2\text{CO}(\text{g})$
4.  $2\text{NO}(\text{g}) = \text{N}_2(\text{g}) + \text{O}_2(\text{g})$

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

Options :

1.  $\text{NO}_2(\text{g}) + \text{SO}_2(\text{g}) = \text{NO}(\text{g}) + \text{SO}_3(\text{g})$
2.  $2\text{HI}(\text{g}) = \text{H}_2(\text{g}) + \text{I}_2(\text{g})$
3.  $2\text{C}(\text{s}) + \text{O}_2(\text{g}) = 2\text{CO}(\text{g})$
4.  $2\text{NO}(\text{g}) = \text{N}_2(\text{g}) + \text{O}_2(\text{g})$

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

નીચેના પૈકી કયા એક સંતુલનને  $K_p \neq K_c$  થશે?

Options :

1.  $\text{NO}_2(\text{g}) + \text{SO}_2(\text{g}) = \text{NO}(\text{g}) + \text{SO}_3(\text{g})$
2.  $2\text{HI}(\text{g}) = \text{H}_2(\text{g}) + \text{I}_2(\text{g})$
3.  $2\text{C}(\text{s}) + \text{O}_2(\text{g}) = 2\text{CO}(\text{g})$
4.  $2\text{NO}(\text{g}) = \text{N}_2(\text{g}) + \text{O}_2(\text{g})$

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

Correct Marks : 4 Wrong Marks : 1

The molar solubility of  $\text{Cd}(\text{OH})_2$  is  $1.84 \times 10^{-5} \text{ M}$  in water. The expected solubility of  $\text{Cd}(\text{OH})_2$  in a buffer solution of  $\text{pH} = 12$  is :

Options :

1.  $6.23 \times 10^{-11} \text{ M}$
2.  $2.49 \times 10^{-10} \text{ M}$
3.  $\frac{2.49}{1.84} \times 10^{-9} \text{ M}$

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

जल में  $\text{Cd}(\text{OH})_2$  की मोलर विलेयता  $1.84 \times 10^{-5} \text{ M}$  है।  $\text{pH} = 12$  के एक बफर विलयन में  $\text{Cd}(\text{OH})_2$  की सम्भावित विलेयता होगी :

Options :

1.  $6.23 \times 10^{-11} \text{ M}$
2.  $2.49 \times 10^{-10} \text{ M}$
3.  $\frac{2.49}{1.84} \times 10^{-9} \text{ M}$
4.  $1.84 \times 10^{-9} \text{ M}$

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

$\text{Cd}(\text{OH})_2$  ની પાણીમાં મોલર દ્રાવ્યતા  $1.84 \times 10^{-5} \text{ M}$  છે.  $\text{pH} = 12$  બફર દ્રાવણમાં  $\text{Cd}(\text{OH})_2$  ને આપેક્ષિત દ્રાવ્યતા છે :

Options :

1.  $6.23 \times 10^{-11} \text{ M}$
2.  $2.49 \times 10^{-10} \text{ M}$
3.  $\frac{2.49}{1.84} \times 10^{-9} \text{ M}$
4.  $1.84 \times 10^{-9} \text{ M}$

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

conductivity of the following aqueous

solutions is :

0.1 M Formic acid (A),

0.1 M Acetic acid (B),

0.1 M Benzoic acid (C).

Options :

1.  $A > B > C$

2.  $C > A > B$

3.  $C > B > A$

4.  $A > C > B$

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

निम्न जलीय विलयनों की विद्युतीय चालकता का घटता क्रम है,

0.1 M फार्मिक एसिड (A),

0.1 M एसिटिक एसिड (B),

0.1 M बेन्जोइक एसिड (C).

Options :

1.  $A > B > C$

2.  $C > A > B$

3.  $C > B > A$

4.  $A > C > B$

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

છે :

0.1 M ફાર્મિક એસિડ (A),

0.1 M એસિટિક એસિડ (B),

0.1 M બેન્ઝોઇક એસિડ (C)

Options :

1.  $A > B > C$

2.  $C > A > B$

3.  $C > B > A$

4.  $A > C > B$

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

$\text{NO}_2$  required for a reaction is produced by the decomposition of  $\text{N}_2\text{O}_5$  in  $\text{CCl}_4$  as per the equation,



The initial concentration of  $\text{N}_2\text{O}_5$  is  $3.00 \text{ mol L}^{-1}$  and it is  $2.75 \text{ mol L}^{-1}$  after 30 minutes. The rate of formation of  $\text{NO}_2$  is :

Options :

1.  $4.167 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$

2.  $8.333 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$

3.  $2.083 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$

4.  $1.667 \times 10^{-2} \text{ mol L}^{-1} \text{ min}^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

નીચે સમીકરણ મેં છે,



$\text{N}_2\text{O}_5$  કી પ્રારમ્ભિક સાન્દ્રતા  $3.00 \text{ mol L}^{-1}$  તથા 30 મિનટ કે બાદ કી સાન્દ્રતા  $2.75 \text{ mol L}^{-1}$  છે।

$\text{NO}_2$  કે સમ્ભવન કી દર હોગી :

Options :

1.  $4.167 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
2.  $8.333 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
3.  $2.083 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
4.  $1.667 \times 10^{-2} \text{ mol L}^{-1} \text{ min}^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

$\text{N}_2\text{O}_5$  નું  $\text{CCl}_4$  માં આપેલ સમીકરણ મુજબ વિઘટન કરી એક પ્રક્રિયામાટે જરૂરી  $\text{NO}_2$  નું ઉત્પાદન થાય છે.



$\text{N}_2\text{O}_5$  ની શરૂઆતની સાંદ્રતા  $3.00 \text{ mol L}^{-1}$  અને 30 મિનિટ પછી  $2.75 \text{ mol L}^{-1}$  છે. તો  $\text{NO}_2$  ની બનાવટનો દર શોધો :

Options :

1.  $4.167 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
2.  $8.333 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
3.  $2.083 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
4.  $1.667 \times 10^{-2} \text{ mol L}^{-1} \text{ min}^{-1}$

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

Among the following, the INCORRECT statement about colloids is :

Options :

- 1.
2. They can scatter light.

The osmotic pressure of a colloidal solution is of higher order than the true solution at the same concentration.

- 3.
4. They are larger than small molecules and have high molar mass.

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

कोलाइड्स के सम्बन्ध में निम्न कथनों में से कौन सा गलत है ?

Options :

कोलाइडी कणों के व्यास का परास

1. 1 तथा 1000 nm के बीच होता है।
2. ये प्रकाश को प्रकीर्ण कर सकते हैं।

एक ही सांद्रता पर, कोलाइडी विलयन का परासरण दाब, वास्तविक विलयन के दाब की तुलना में उच्चतर मान का होता है।

- 3.
4. ये छोटे अणुओं की तुलना में बड़े होते हैं और उनका मोलर द्रव्यमान उच्च होता है।

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

Correct Marks : 4 Wrong Marks : 1

નીચેના પૈકી કયું વિધાન કલિલો માટે સાચું નથી?

Options :

કલિલ કણોના વ્યાસનો વિસ્તાર 1 અને

1. 1000 nm ની વચ્ચે હોય છે.

2. તેઓ પ્રકાશનું પ્રકીર્ણન કરી શકે છે.

4. તેઓ નાના આણુઓ કરતા મોટા છે અને ઊંચું મોલર દળ ધરાવે છે.

## Mathematics

|                                      |           |
|--------------------------------------|-----------|
| Section Id :                         | 416529279 |
| 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:              | 416529419 |
| Question Shuffling Allowed : | Yes       |

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

Correct Marks : 4 Wrong Marks : 1

Let A, B and C be sets such that  $\phi \neq A \cap B \subseteq C$ . Then which of the following statements is not true ?

Options :

1.  $B \cap C \neq \phi$
2.  $(C \cup A) \cap (C \cup B) = C$
3. If  $(A - B) \subseteq C$ , then  $A \subseteq C$
4. If  $(A - C) \subseteq B$ , then  $A \subseteq B$

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

Correct Marks : 4 Wrong Marks : 1

माना समुच्चय A, B तथा C इस प्रकार हैं कि  $\phi \neq A \cap B \subseteq C$ , तो निम्न में से कौन सा कथन सत्य नहीं है?

1.  $B \cap C \neq \phi$
2.  $(C \cup A) \cap (C \cup B) = C$
3. यदि  $(A - B) \subseteq C$ , तो  $A \subseteq C$
4. यदि  $(A - C) \subseteq B$ , तो  $A \subseteq B$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે ગણ  $A$ ,  $B$  અને  $C$  માટે  $\phi \neq A \cap B \subseteq C$  તો નીચેના પૈકી કયું વિધાન સાચું નથી?

Options :

1.  $B \cap C \neq \phi$
2.  $(C \cup A) \cap (C \cup B) = C$
3. જો  $(A - B) \subseteq C$ , તો  $A \subseteq C$
4. જો  $(A - C) \subseteq B$ , તો  $A \subseteq B$

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

Correct Marks : 4 Wrong Marks : 1

Let  $z \in \mathbb{C}$  with  $\text{Im}(z) = 10$  and it satisfies

$$\frac{2z - n}{2z + n} = 2i - 1 \text{ for some natural number}$$

n. Then :

Options :

1.  $n = 20$  and  $\text{Re}(z) = 10$
2.  $n = 20$  and  $\text{Re}(z) = -10$
3.  $n = 40$  and  $\text{Re}(z) = 10$
4.  $n = 40$  and  $\text{Re}(z) = -10$

माना  $z \in \mathbb{C}$  जिसके लिए  $\text{Im}(z) = 10$  तथा किसी प्राकृत

संख्या  $n$  के लिए यह  $\frac{2z - n}{2z + n} = 2i - 1$  को संतुष्ट

करता है, तो :

Options :

1.  $n = 20$  तथा  $\text{Re}(z) = 10$
2.  $n = 20$  तथा  $\text{Re}(z) = -10$
3.  $n = 40$  तथा  $\text{Re}(z) = 10$
4.  $n = 40$  तथा  $\text{Re}(z) = -10$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $z \in \mathbb{C}$  માટે  $\text{Im}(z) = 10$  છે અને કોઈક પ્રાકૃતિક

સંખ્યા  $n$  માટે તે  $\frac{2z - n}{2z + n} = 2i - 1$  નું સમાધાન કરે

છે. તો :

Options :

1.  $n = 20$  અને  $\text{Re}(z) = 10$
2.  $n = 20$  અને  $\text{Re}(z) = -10$
3.  $n = 40$  અને  $\text{Re}(z) = 10$
4.  $n = 40$  અને  $\text{Re}(z) = -10$

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

Correct Marks : 4 Wrong Marks : 1

If  $\alpha$ ,  $\beta$  and  $\gamma$  are three consecutive terms of a non-constant G.P. such that the equations  $\alpha x^2 + 2\beta x + \gamma = 0$  and  $x^2 + x - 1 = 0$  have a common root, then  $\alpha(\beta + \gamma)$  is equal to :

Options :

2.  $\alpha\beta$ 3.  $\alpha\gamma$ 

4. 0

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

Correct Marks : 4 Wrong Marks : 1

यदि एक भिन्न पदों वाली गुणोत्तर श्रेणी के तीन क्रमागत पद  $\alpha$ ,  $\beta$  तथा  $\gamma$  इस प्रकार हैं कि समीकरणों  $\alpha x^2 + 2\beta x + \gamma = 0$  तथा  $x^2 + x - 1 = 0$  का एक मूल समान है, तो  $\alpha(\beta + \gamma)$  बराबर है :

Options :

1.  $\beta\gamma$ 2.  $\alpha\beta$ 3.  $\alpha\gamma$ 

4. 0

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

Correct Marks : 4 Wrong Marks : 1

જો  $\alpha$ ,  $\beta$  અને  $\gamma$  એ અચળ ન હોય તેવી સમગુણોત્તર શ્રેણી (G.P.) ના એવા ત્રણ ક્રમિક પદો હોય કે જેથી  $\alpha x^2 + 2\beta x + \gamma = 0$  અને  $x^2 + x - 1 = 0$  ને સામાન્ય બીજ હોય તો  $\alpha(\beta + \gamma)$  બરાબર \_\_\_\_\_ છે.

Options :

1.  $\beta\gamma$ 2.  $\alpha\beta$ 3.  $\alpha\gamma$ 

4. 0

A value of  $\theta \in (0, \pi/3)$ , for which

$$\begin{vmatrix} 1+\cos^2\theta & \sin^2\theta & 4\cos 6\theta \\ \cos^2\theta & 1+\sin^2\theta & 4\cos 6\theta \\ \cos^2\theta & \sin^2\theta & 1+4\cos 6\theta \end{vmatrix} = 0, \text{ is :}$$

Options :

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

2.  $\frac{\pi}{9}$

3.  $\frac{7\pi}{24}$

4.  $\frac{7\pi}{36}$

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

$\theta \in (0, \pi/3)$  का एक मान, जिसके लिए

$$\begin{vmatrix} 1+\cos^2\theta & \sin^2\theta & 4\cos 6\theta \\ \cos^2\theta & 1+\sin^2\theta & 4\cos 6\theta \\ \cos^2\theta & \sin^2\theta & 1+4\cos 6\theta \end{vmatrix} = 0 \text{ है, है:}$$

Options :

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

2.  $\frac{\pi}{9}$

3.  $\frac{7\pi}{24}$

4.  $\frac{7\pi}{36}$

$$\begin{vmatrix} 1+\cos^2\theta & \sin^2\theta & 4\cos 6\theta \\ \cos^2\theta & 1+\sin^2\theta & 4\cos 6\theta \\ \cos^2\theta & \sin^2\theta & 1+4\cos 6\theta \end{vmatrix} = 0 \text{ થાય}$$

તે માટે  $\theta \in (0, \pi/3)$  ની એક કિમત \_\_\_\_\_ છે.

Options :

1.  $\frac{\pi}{18}$
2.  $\frac{\pi}{9}$
3.  $\frac{7\pi}{24}$
4.  $\frac{7\pi}{36}$

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

Correct Marks : 4 Wrong Marks : 1

If  $[x]$  denotes the greatest integer  $\leq x$ , then the system of linear equations  
 $[\sin\theta]x + [-\cos\theta]y = 0$   
 $[\cot\theta]x + y = 0$

Options :

has a unique solution if

1.  $\theta \in \left(\frac{\pi}{2}, \frac{2\pi}{3}\right) \cup \left(\pi, \frac{7\pi}{6}\right)$ .

have infinitely many solutions if

2.  $\theta \in \left(\frac{\pi}{2}, \frac{2\pi}{3}\right) \cup \left(\pi, \frac{7\pi}{6}\right)$ .

and have infinitely many solutions if

$$\theta \in \left( \pi, \frac{7\pi}{6} \right).$$

3.

have infinitely many solutions if

$$\theta \in \left( \frac{\pi}{2}, \frac{2\pi}{3} \right) \text{ and has a unique}$$

$$\text{solution if } \theta \in \left( \pi, \frac{7\pi}{6} \right).$$

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

यदि  $[x]$  महत्तम पूर्णांक  $\leq x$  है, तो रेखिक समीकरण  
निकाय

$$[\sin\theta]x + [-\cos\theta]y = 0$$

$$[\cot\theta]x + y = 0$$

Options :

का मात्र एक हल है यदि

$$\theta \in \left( \frac{\pi}{2}, \frac{2\pi}{3} \right) \cup \left( \pi, \frac{7\pi}{6} \right).$$

1.

के अनन्त हल हैं यदि

$$\theta \in \left( \frac{\pi}{2}, \frac{2\pi}{3} \right) \cup \left( \pi, \frac{7\pi}{6} \right).$$

2.

का मात्र एक हल है यदि  $\theta \in \left( \frac{\pi}{2}, \frac{2\pi}{3} \right)$  तथा

$$\text{अनन्त हल हैं यदि } \theta \in \left( \pi, \frac{7\pi}{6} \right).$$

3.

के अनन्त हल हैं यदि  $\theta \in \left( \frac{\pi}{2}, \frac{2\pi}{3} \right)$  तथा मात्र

$$\text{एक हल है यदि } \theta \in \left( \pi, \frac{7\pi}{6} \right).$$

4.

Correct Marks : 4 Wrong Marks : 1

જો  $[x]$  એ  $x$  થી નાના અથવા  $x$  ને સમાન તમામ પૂર્ણાંકોમાં  
સૌથી મોટો પૂર્ણાંક દર્શાવે, તો સુરેખ સમીકરણ સંહિત

$$[\sin\theta]x + [-\cos\theta]y = 0$$

$$[\cot\theta]x + y = 0 \quad \text{ને :}$$

Options :

અનન્ય ઉકેલ છે જો

$$\theta \in \left(\frac{\pi}{2}, \frac{2\pi}{3}\right) \cup \left(\pi, \frac{7\pi}{6}\right).$$

1.

અનંત ઉકેલો છે જો

$$\theta \in \left(\frac{\pi}{2}, \frac{2\pi}{3}\right) \cup \left(\pi, \frac{7\pi}{6}\right).$$

2.

અનન્ય ઉકેલ છે જો  $\theta \in \left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$  અને અનંત

$$\text{ઉકેલો છે જો } \theta \in \left(\pi, \frac{7\pi}{6}\right).$$

3.

અનંત ઉકેલો છે જો  $\theta \in \left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$  અને અનન્ય

$$\text{ઉકેલ છે જો } \theta \in \left(\pi, \frac{7\pi}{6}\right).$$

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

A group of students comprises of 5 boys and  $n$  girls. If the number of ways, in which a team of 3 students can randomly be selected from this group such that there is at least one boy and at least one girl in each team, is 1750, then  $n$  is equal to :

Options :

24

1.

3. 27

4. 28

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

विद्यार्थियों के एक समूह में 5 लड़के तथा  $n$  लड़कियाँ हैं। यदि इस समूह में से तीन विद्यार्थियों की टीम यादृच्छिक इस प्रकार चुनने के तरीके, कि प्रत्येक टीम में कम से कम एक लड़का तथा कम से कम एक लड़की हो, 1750 हैं, तो  $n$  बराबर है :

Options :

1. 24

2. 25

3. 27

4. 28

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

વિદ્યાર્થીઓનો એક સમૂહ 5 છોકરાઓ અને  $n$  છોકરીઓ દ્વારા રચાયેલ છે. જો આ સમૂહમાંથી, ઓછામાં ઓછો એક છોકરો હોય અને ઓછામાં ઓછી એક છોકરી હોય તેવી ત્રણ વિદ્યાર્થીઓની એક ટુકડી, યાદચ્છિક રીતે પસંદ કરવાની રીતોની સંખ્યા 1750 હોય તો  $n$  બરાબર \_\_\_\_\_ છે.

Options :

1. 24

2. 25

3. 27

4. 28

Correct Marks : 4 Wrong Marks : 1

The term independent of  $x$  in the expansionof  $\left(\frac{1}{60} - \frac{x^8}{81}\right) \cdot \left(2x^2 - \frac{3}{x^2}\right)^6$  is equal to :

Options :

1.  $-108$
2.  $-72$
3.  $-36$
4.  $36$

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

Correct Marks : 4 Wrong Marks : 1

 $\left(\frac{1}{60} - \frac{x^8}{81}\right) \cdot \left(2x^2 - \frac{3}{x^2}\right)^6$  के प्रसार में  $x$  से

स्वतंत्र पद है :

Options :

1.  $-108$
2.  $-72$
3.  $-36$
4.  $36$

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

Correct Marks : 4 Wrong Marks : 1

 $\left(\frac{1}{60} - \frac{x^8}{81}\right) \cdot \left(2x^2 - \frac{3}{x^2}\right)^6$  ના વિસ્તરણમાં  $x$ 

થી સ્વતંત્ર પદ \_\_\_\_\_ છે.

Options :

1.  $-108$

3. -36

4. 36

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

If  $a_1, a_2, a_3, \dots$  are in A.P. such that  $a_1 + a_7 + a_{16} = 40$ , then the sum of the first 15 terms of this A.P. is :

Options :

1. 150

2. 120

3. 280

4. 200

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

Correct Marks : 4 Wrong Marks : 1

यदि  $a_1, a_2, a_3, \dots$  एक समान्तर श्रेणी में इस प्रकार हैं कि  $a_1 + a_7 + a_{16} = 40$  है, तो इस समान्तर श्रेणी के प्रथम 15 पदों का योगफल है :

Options :

1. 150

2. 120

3. 280

4. 200

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

જેથી  $a_1 + a_7 + a_{16} = 40$  તો આ A.P. ની 15

પદોનો સરવાળો \_\_\_\_\_ છે.

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Options :

1. 150
2. 120
3. 280
4. 200

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

If  ${}^{20}C_1 + (2^2) {}^{20}C_2 + (3^2) {}^{20}C_3 + \dots + (20^2) {}^{20}C_{20} = A(2^\beta)$ , then the ordered pair (A,  $\beta$ ) is equal to :

Options :

1. (380, 18)
2. (380, 19)
3. (420, 18)
4. (420, 19)

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

यदि  ${}^{20}C_1 + (2^2) {}^{20}C_2 + (3^2) {}^{20}C_3 + \dots + (20^2) {}^{20}C_{20} = A(2^\beta)$ , तो क्रमित युग्म (A,  $\beta$ ) बराबर है :

Options :

1. (380, 18)
2. (380, 19)
3. (420, 18)

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

જો  ${}^{20}C_1 + (2^2) {}^{20}C_2 + (3^2) {}^{20}C_3 + \dots + (20^2) {}^{20}C_{20} = A(2^\beta)$  તો કમયુક્ત જોડ  $(A, \beta)$  બરાબર \_\_\_\_\_ છે.

Options :

1. (380, 18)
2. (380, 19)
3. (420, 18)
4. (420, 19)

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

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow 0} \frac{x + 2\sin x}{\sqrt{x^2 + 2\sin x + 1} - \sqrt{\sin^2 x - x + 1}}$

is :

Options :

1. 1
2. 2
3. 3
4. 6

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

$\lim_{x \rightarrow 0} \frac{x + 2\sin x}{\sqrt{x^2 + 2\sin x + 1} - \sqrt{\sin^2 x - x + 1}}$

बराबर है :

Options :

1. 1

3. 3

4. 6

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

$$\lim_{x \rightarrow 0} \frac{x + 2 \sin x}{\sqrt{x^2 + 2 \sin x + 1} - \sqrt{\sin^2 x - x + 1}}$$

બરાબર \_\_\_\_\_ છે.

Options :

1. 1

2. 2

3. 3

4. 6

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

The derivative of  $\tan^{-1}\left(\frac{\sin x - \cos x}{\sin x + \cos x}\right)$ ,

with respect to  $\frac{x}{2}$ , where  $\left(x \in \left(0, \frac{\pi}{2}\right)\right)$  is:

Options :

1. 1

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

3. 2

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

$\frac{x}{2}$  के सापेक्ष  $\tan^{-1}\left(\frac{\sin x - \cos x}{\sin x + \cos x}\right)$ , जहाँ

$\left(x \in \left(0, \frac{\pi}{2}\right)\right)$  का अवकलज है :

Options :

1. 1

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

3. 2

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

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

$\tan^{-1}\left(\frac{\sin x - \cos x}{\sin x + \cos x}\right)$ , जहाँ  $\frac{x}{2}$  ની સાપેક્ષ વિકલન

\_\_\_\_\_ છે. અહીં  $\left(x \in \left(0, \frac{\pi}{2}\right)\right)$ .

Options :

1. 1

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

3. 2

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

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

Correct Marks : 4 Wrong Marks : 1

The tangents to the curve  $y = (x - 2)^2 - 1$  at its points of intersection with the line

$x - y = 3$ , intersect at the point :

1.  $\left(\frac{5}{2}, -1\right)$

2.  $\left(-\frac{5}{2}, -1\right)$

3.  $\left(\frac{5}{2}, 1\right)$

4.  $\left(-\frac{5}{2}, 1\right)$

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

Correct Marks : 4 Wrong Marks : 1

વક્ર  $y = (x - 2)^2 - 1$  કે રેખા  $x - y = 3$  સે પ્રતિચ્છેદન બિન્દુઓ પર વક્ર કી સ્પર્શિત્રાયેં નિમ્ન મેં સે કિસ બિન્દુ પર મિલતી હૈં?

Options :

1.  $\left(\frac{5}{2}, -1\right)$

2.  $\left(-\frac{5}{2}, -1\right)$

3.  $\left(\frac{5}{2}, 1\right)$

4.  $\left(-\frac{5}{2}, 1\right)$

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

Correct Marks : 4 Wrong Marks : 1

વક્ર  $y = (x - 2)^2 - 1$  ના રેખા  $x - y = 3$  સાથેના છેદબિંદુઓ આગળના સ્પર્શકો, \_\_\_\_\_ બિંદુમાં છેદે છે.

Options :

1.  $\left(\frac{5}{2}, -1\right)$

2.  $\left(-\frac{5}{2}, 1\right)$

3.  $\left(\frac{5}{2}, 1\right)$

4.  $\left(-\frac{5}{2}, 1\right)$

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

Let  $f(x) = 5 - |x - 2|$  and  $g(x) = |x + 1|$ ,  
 $x \in \mathbb{R}$ . If  $f(x)$  attains maximum value at  $\alpha$   
and  $g(x)$  attains minimum value at  $\beta$ , then

$\lim_{x \rightarrow -\alpha\beta} \frac{(x-1)(x^2 - 5x + 6)}{x^2 - 6x + 8}$  is equal to :

Options :

1.  $1/2$

2.  $-1/2$

3.  $3/2$

4.  $-3/2$

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

Correct Marks : 4 Wrong Marks : 1

माना  $f(x) = 5 - |x - 2|$  तथा  $g(x) = |x + 1|$ ,  
 $x \in \mathbb{R}$ . यदि  $f(x)$  का अधिकतम मान  $\alpha$  पर है तथा  $g(x)$   
का न्यूनतम मान  $\beta$  पर है, तो

$\lim_{x \rightarrow -\alpha\beta} \frac{(x-1)(x^2 - 5x + 6)}{x^2 - 6x + 8}$  बराबर है :

Options :

1.  $1/2$

3.  $3/2$ 4.  $-3/2$ 

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $f(x) = 5 - |x - 2|$  અને  $g(x) = |x + 1|$ ,  
 $x \in \mathbb{R}$  છે. જો  $f(x)$  એ  $\alpha$  આગળ મહત્તમ કિંમત મેળવે  
અને  $g(x)$  એ  $\beta$  આગળ ન્યૂનતમ કિંમત મેળવે તો

$$\lim_{x \rightarrow -\alpha\beta} \frac{(x-1)(x^2 - 5x + 6)}{x^2 - 6x + 8} = \underline{\hspace{2cm}}$$

છે.

Options :

1.  $1/2$ 2.  $-1/2$ 3.  $3/2$ 4.  $-3/2$ 

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

Correct Marks : 4 Wrong Marks : 1

Let  $\alpha \in (0, \pi/2)$  be fixed. If the integral

$$\int \frac{\tan x + \tan \alpha}{\tan x - \tan \alpha} dx =$$

$A(x) \cos 2\alpha + B(x) \sin 2\alpha + C$ , where  $C$  is a  
constant of integration, then the functions  
 $A(x)$  and  $B(x)$  are respectively :

Options :

1.  $x - \alpha$  and  $\log_e |\sin(x - \alpha)|$ 2.  $x + \alpha$  and  $\log_e |\sin(x - \alpha)|$ 3.  $x - \alpha$  and  $\log_e |\cos(x - \alpha)|$

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

Question Number : 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

માના  $\alpha \in (0, \pi/2)$  દિયા છે. યદિ સમાકલ

$$\int \frac{\tan x + \tan \alpha}{\tan x - \tan \alpha} dx =$$

$A(x) \cos 2\alpha + B(x) \sin 2\alpha + C$ , જ્યાં  $C$  એક સમાકલન અચર છે, તો ફલન  $A(x)$  તથા  $B(x)$  ક્રમશઃ છે :

Options :

1.  $x - \alpha$  ઓર  $\log_e |\sin(x - \alpha)|$
2.  $x + \alpha$  ઓર  $\log_e |\sin(x - \alpha)|$
3.  $x - \alpha$  ઓર  $\log_e |\cos(x - \alpha)|$
4.  $x + \alpha$  ઓર  $\log_e |\sin(x + \alpha)|$

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

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $\alpha \in (0, \pi/2)$  નિશ્ચિત કરવામાં આવે છે. જો

$$\text{સંકલિત } \int \frac{\tan x + \tan \alpha}{\tan x - \tan \alpha} dx =$$

$A(x) \cos 2\alpha + B(x) \sin 2\alpha + C$ , જ્યાં  $C$  એ સંકલનનો અચળાંક છે, તો વિધેયો  $A(x)$  અને  $B(x)$  અનુક્રમે \_\_\_\_\_ છે.

Options :

1.  $x - \alpha$  અને  $\log_e |\sin(x - \alpha)|$
2.  $x + \alpha$  અને  $\log_e |\sin(x - \alpha)|$
3.  $x - \alpha$  અને  $\log_e |\cos(x - \alpha)|$

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

Question Number : 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

A value of  $\alpha$  such that

$$\int_{\alpha}^{\alpha+1} \frac{dx}{(x+\alpha)(x+\alpha+1)} = \log_e \left( \frac{9}{8} \right) \text{ is :}$$

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

$\alpha$  का एक मान, जिसके लिए

$$\int_{\alpha}^{\alpha+1} \frac{dx}{(x+\alpha)(x+\alpha+1)} = \log_e \left( \frac{9}{8} \right) \text{ है, है :}$$

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

$$\int_{\alpha}^{\alpha+1} \frac{dx}{(x+\alpha)(x+\alpha+1)} = \log_e \left( \frac{9}{8} \right) \text{ था ?}$$

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

If the area (in sq. units) bounded by the parabola  $y^2 = 4\lambda x$  and the line  $y = \lambda x$ ,

$\lambda > 0$ , is  $\frac{1}{9}$ , then  $\lambda$  is equal to :

Options :

1.  $4\sqrt{3}$
2.  $2\sqrt{6}$
3.  $24$
4.  $48$

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

Correct Marks : 4 Wrong Marks : 1

यदि परवलय  $y^2 = 4\lambda x$  तथा रेखा  $y = \lambda x$ ,

$\lambda > 0$ , से घिरे क्षेत्र का क्षेत्रफल (वर्ग इकाइयों में)  $\frac{1}{9}$

है, तो  $\lambda$  बराबर है :

Options :

1.  $4\sqrt{3}$

3. 24

4. 48

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

Correct Marks : 4 Wrong Marks : 1

જો પરવલય  $y^2 = 4\lambda x$  અને રેખા  $y = \lambda x$ ,

$\lambda > 0$ , દ્વારા ઘેરાયેલ પ્રદેશનું ક્ષેત્રફળ (ચો.એકમમાં)  $\frac{1}{9}$

હોય તો  $\lambda$  બરાબર \_\_\_\_\_ છે.

Options :

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

3. 24

4. 48

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

The general solution of the differential equation  $(y^2 - x^3) dx - xy dy = 0$  ( $x \neq 0$ ) is :

(where c is a constant of integration)

Options :

1.  $y^2 + 2x^2 + cx^3 = 0$ 2.  $y^2 - 2x^3 + cx^2 = 0$ 3.  $y^2 + 2x^3 + cx^2 = 0$ 4.  $y^2 - 2x^2 + cx^3 = 0$ 

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

(x ≠ 0) का व्यापक हल है :

(जहाँ c एक समाकलन अचर है)

Options :

1.  $y^2 + 2x^2 + cx^3 = 0$
2.  $y^2 - 2x^3 + cx^2 = 0$
3.  $y^2 + 2x^3 + cx^2 = 0$
4.  $y^2 - 2x^2 + cx^3 = 0$

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

Correct Marks : 4 Wrong Marks : 1

વિકલ સમીકરણ  $(y^2 - x^3)dx - xydy = 0$  ( $x \neq 0$ )

નો વ્યાપક ઉકેલ \_\_\_\_\_ છે.

(જ્યાં c એ સંકલનનો અચળાંક છે)

Options :

1.  $y^2 + 2x^2 + cx^3 = 0$
2.  $y^2 - 2x^3 + cx^2 = 0$
3.  $y^2 + 2x^3 + cx^2 = 0$
4.  $y^2 - 2x^2 + cx^3 = 0$

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

A straight line L at a distance of 4 units from the origin makes positive intercepts on the coordinate axes and the perpendicular from the origin to this line makes an angle of  $60^\circ$  with the line  $x + y = 0$ . Then an equation of the line L is :

Options :

1.  $(\sqrt{3} + 1)x + (\sqrt{3} - 1)y = 8\sqrt{2}$

3.  $\sqrt{3}x + y = 8$

4.  $x + \sqrt{3}y = 8$

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

Question Number : 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

मूलबिन्दु से 4 इकाई की दूरी पर एक सरल रेखा L निर्देशांक अक्षों पर धनात्मक अंतःखण्ड बनाती है तथा मूलबिन्दु से इस रेखा पर लंब, रेखा  $x + y = 0$  के साथ  $60^\circ$  का कोण बनाता है। तो रेखा L का एक समीकरण है :

Options :

1.  $(\sqrt{3} + 1)x + (\sqrt{3} - 1)y = 8\sqrt{2}$

2.  $(\sqrt{3} - 1)x + (\sqrt{3} + 1)y = 8\sqrt{2}$

3.  $\sqrt{3}x + y = 8$

4.  $x + \sqrt{3}y = 8$

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

Question Number : 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

ઊગમબિંદુથી 4 એકમના અંતરે આવેલી એક રેખા L, યામાક્ષો પર ધન અંતઃખંડો બનાવે છે અને ઊગમબિંદુથી આ રેખા પરનો લંબ, રેખા  $x + y = 0$  સાથે  $60^\circ$  નો ખૂણો બનાવે છે. તો રેખા L નું એક સમીકરણ \_\_\_\_\_ છે.

Options :

1.  $(\sqrt{3} + 1)x + (\sqrt{3} - 1)y = 8\sqrt{2}$

2.  $(\sqrt{3} - 1)x + (\sqrt{3} + 1)y = 8\sqrt{2}$

4.  $x + \sqrt{3}y = 8$

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

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

Correct Marks : 4 Wrong Marks : 1

A triangle has a vertex at  $(1, 2)$  and the mid points of the two sides through it are  $(-1, 1)$  and  $(2, 3)$ . Then the centroid of this triangle is :

Options :

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

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

3.  $\left(1, \frac{7}{3}\right)$

4.  $\left(\frac{1}{3}, \frac{5}{3}\right)$

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

Correct Marks : 4 Wrong Marks : 1

एक त्रिभुज का एक शीर्ष  $(1, 2)$  पर है तथा इससे होकर जाने वाली दो भुजाओं के मध्य-बिन्दु  $(-1, 1)$  और  $(2, 3)$  हैं। तो इस त्रिभुज का केन्द्रक है :

Options :

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

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

3.  $\left(1, \frac{7}{3}\right)$

4.

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

Correct Marks : 4 Wrong Marks : 1

કોઈ ત્રિકોણનું એક શિરોબિંદુ  $(1, 2)$  આગળ છે અને તેમાંથી પસાર થતી બે બાજુઓના મધ્યબિંદુઓ  $(-1, 1)$  અને  $(2, 3)$  છે. તો આ ત્રિકોણનું મધ્યકેન્દ્ર \_\_\_\_\_ છે.

Options :

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

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

3.  $\left(1, \frac{7}{3}\right)$

4.  $\left(\frac{1}{3}, \frac{5}{3}\right)$

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

A circle touching the  $x$ -axis at  $(3, 0)$  and making an intercept of length 8 on the  $y$ -axis passes through the point :

Options :

1.  $(3, 10)$

2.  $(3, 5)$

3.  $(1, 5)$

4.  $(2, 3)$

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

वृत्त निम्न में से किस बिन्दु से होकर जाता है?

Options :

1. (3, 10)
2. (3, 5)
3. (1, 5)
4. (2, 3)

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

$x$ -અક્ષને  $(3, 0)$  અગળ સ્પર્શતું અને  $y$ -અક્ષ પર 8 લંબાઈનો અંતઃખંડ બનાવતું વર્તુળ \_\_\_\_\_ બિંદુમાંથી પસાર થશે.

Options :

1. (3, 10)
2. (3, 5)
3. (1, 5)
4. (2, 3)

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

Correct Marks : 4 Wrong Marks : 1

The equation of a common tangent to the curves,  $y^2 = 16x$  and  $xy = -4$ , is :

Options :

1.  $x - 2y + 16 = 0$
2.  $x + y + 4 = 0$
3.  $2x - y + 2 = 0$
4.  $x - y + 4 = 0$

Correct Marks : 4 Wrong Marks : 1

वक्रों  $y^2 = 16x$  तथा  $xy = -4$  की एक उभयनिष्ठ स्पर्शरेखा का समीकरण है :

Options :

1.  $x - 2y + 16 = 0$
2.  $x + y + 4 = 0$
3.  $2x - y + 2 = 0$
4.  $x - y + 4 = 0$

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

વક્રો  $y^2 = 16x$  અને  $xy = -4$  ના સામાન્ય સ્પર્શકનું સમીકરણ \_\_\_\_\_ છે.

Options :

1.  $x - 2y + 16 = 0$
2.  $x + y + 4 = 0$
3.  $2x - y + 2 = 0$
4.  $x - y + 4 = 0$

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

Correct Marks : 4 Wrong Marks : 1

An ellipse, with foci at  $(0, 2)$  and  $(0, -2)$  and minor axis of length 4, passes through which of the following points ?

Options :

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

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

4.

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

Correct Marks : 4 Wrong Marks : 1

एक दीर्घवृत्त, जिसकी नाभियाँ  $(0, 2)$  तथा  $(0, -2)$  पर हैं तथा जिसके लघु अक्ष की लम्बाई 4 है, निम्न में से किस बिन्दु से होकर जाता है?

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

$(0, 2)$  અને  $(0, -2)$  આગળ નાભિઓ અને ગોળા અક્ષની લંબાઈ 4 વાળો ઉપવલય નીચેના પૈકી કયા બિંદુમાંથી પસાર થશે?

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

point :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

दो दिए गए समतलों  $2x - y + 2z - 4 = 0$  तथा  $x + 2y + 2z - 2 = 0$  के बीच के कोण को समद्विभाजित करता एक समतल, निम्न में से किस बिन्दु से होकर जाता है?

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

આપેલા બે સમતલો  $2x - y + 2z - 4 = 0$  અને  $x + 2y + 2z - 2 = 0$  વચ્ચેના ખૂણાને દ્વિભાગતું સમતલ \_\_\_\_\_ બિંદુમાંથી પસાર થશે.

Options :

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

4. (1, 4, -1)

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

Correct Marks : 4 Wrong Marks : 1

The length of the perpendicular drawn from the point (2, 1, 4) to the plane containing the lines

$$\vec{r} = (\hat{i} + \hat{j}) + \lambda(\hat{i} + 2\hat{j} - \hat{k}) \quad \text{and}$$

$$\vec{r} = (\hat{i} + \hat{j}) + \mu(-\hat{i} + \hat{j} - 2\hat{k}) \text{ is :}$$

Options :

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

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

रेखाओं  $\vec{r} = (\hat{i} + \hat{j}) + \lambda(\hat{i} + 2\hat{j} - \hat{k})$  तथा

$\vec{r} = (\hat{i} + \hat{j}) + \mu(-\hat{i} + \hat{j} - 2\hat{k})$  को अंतर्विष्ट

करते समतल पर बिन्दु (2, 1, 4) से डाले गये लम्ब की लम्बाई है :

Options :

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

4.  $\sqrt{3}$

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

રેખાઓ  $\vec{r} = (\hat{i} + \hat{j}) + \lambda(\hat{i} + 2\hat{j} - \hat{k})$  અને

$\vec{r} = (\hat{i} + \hat{j}) + \mu(-\hat{i} + \hat{j} - 2\hat{k})$  ને સમાવતા

સમતલ પર બિંદુ  $(2, 1, 4)$  થી દોરેલ લંબની લંબાઈ \_\_\_\_\_ છે.

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

Let  $\alpha \in \mathbb{R}$  and the three vectors

$$\vec{a} = \alpha\hat{i} + \hat{j} + 3\hat{k}, \quad \vec{b} = 2\hat{i} + \hat{j} - \alpha\hat{k}$$

and  $\vec{c} = \alpha\hat{i} - 2\hat{j} + 3\hat{k}$ . Then the set

$S = \{\alpha : \vec{a}, \vec{b} \text{ and } \vec{c} \text{ are coplanar}\}$

Options :

1. is empty
2. is singleton
3. contains exactly two positive numbers

4.

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

Correct Marks : 4 Wrong Marks : 1

માના  $\alpha \in \mathbb{R}$  તથા ત્રીજા સદિશ  $\vec{a} = \alpha \hat{i} + \hat{j} + 3\hat{k}$ ,

$\vec{b} = 2\hat{i} + \hat{j} - \alpha\hat{k}$  ઓર

$\vec{c} = \alpha\hat{i} - 2\hat{j} + 3\hat{k}$  હે. તો સમુચ્ચ

$S = \{\alpha : \vec{a}, \vec{b} \text{ ઓર } \vec{c} \text{ સમતલીય હે}\}$

Options :

1. રિક્ત હે.
2. એકલ હે.
3. મેં તથ્યત: (exactly) દો ધનાત્મક સંખ્યાયે હે.
4. મેં તથ્યત: દો સંખ્યાયે હે જિનમેં સે કેવલ એક ધનાત્મક હે.

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $\alpha \in \mathbb{R}$  છે તથા  $\vec{a} = \alpha \hat{i} + \hat{j} + 3\hat{k}$ ,

$\vec{b} = 2\hat{i} + \hat{j} - \alpha\hat{k}$  અને

$\vec{c} = \alpha\hat{i} - 2\hat{j} + 3\hat{k}$  ત્રણ સદિશો છે. તો ગણ

$S = \{\alpha : \vec{a}, \vec{b} \text{ અને } \vec{c} \text{ સમતલીય છે}\}$

Options :

1. ખાલી ગણ છે.
2. એકકી છે.
3. ફક્ત બે ધન સંખ્યાઓ ધરાવે છે.

4. ९.

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

A person throws two fair dice. He wins Rs. 15 for throwing a doublet (same numbers on the two dice), wins Rs. 12 when the throw results in the sum of 9, and loses Rs. 6 for any other outcome on the throw. Then the expected gain/loss (in Rs.) of the person is :

Options :

1. 2 gain
2.  $\frac{1}{2}$  loss
3.  $\frac{1}{2}$  gain
4.  $\frac{1}{4}$  loss

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

एक व्यक्ति दो न्याय्य (fair) पासे उछालता है। एक द्विक (दोनों पासों पर एक ही संख्या) आने पर वह रु. 15 जीतता है, दोनों पासों पर आए अंकों का योग 9 होने पर रु. 12 जीतता है तथा किसी अन्य परिणाम (outcome) पर रु. 6 हारता है। तो उस व्यक्ति का प्रत्याशित (expected) लाभ/हानि (रु.में) है :

Options :

1. लाभ 2
2. हानि  $\frac{1}{2}$

3.

2

4.

હાનિ  $\frac{1}{4}$ 

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

Correct Marks : 4 Wrong Marks : 1

એક વ્યક્તિ બે સમતોલ પાસાને ઉછાળે છે. બંને પાસા પર સમાન અંક આવે તો તે 15 રૂપિયા જીતે, અંકોનો સરવાળો 9 આવે ત્યારે 12 રૂપિયા જીતે અને અન્ય પરિણામ આવે તો 6 રૂપિયા હારે છે. તો આ વ્યક્તિનો અપેક્ષિત નફો/ખોટ (રૂપિયામાં) \_\_\_\_\_ છે.

Options :

1.

2 નફો

2.

 $\frac{1}{2}$  ખોટ

3.

 $\frac{1}{2}$  નફો

4.

 $\frac{1}{4}$  ખોટ

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

For an initial screening of an admission test, a candidate is given fifty problems to solve. If the probability that the candidate can solve any problem is  $\frac{4}{5}$ , then the probability that he is unable to solve less than two problems is :

Options :

1.

 $\frac{201}{5} \left( \frac{1}{5} \right)^{49}$

2.  $\frac{316}{25} \left( \frac{4}{5} \right)^{48}$

4.  $\frac{164}{25} \left( \frac{1}{5} \right)^{48}$

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

પ્રારંભિક જાँચ કે લિષે ઁક પ્રવેશ પરીક્ષા મેં ઁક પરીક્ષાર્થી કો પચાસ પ્રશ્ન હલ કરને કે લિષે દિષે હેં। યદિ પરીક્ષાર્થી કે કિસી ઁક પ્રશ્ન કો હલ કર સકને કી પ્રાયિકતા  $\frac{4}{5}$  હે, તો ઁસકે દો સે કમ પ્રશ્નોં કો હલ કરને મેં અસમર્થ હોને કી પ્રાયિકતા હે :

Options :

1.  $\frac{201}{5} \left( \frac{1}{5} \right)^{49}$

2.  $\frac{54}{5} \left( \frac{4}{5} \right)^{49}$

3.  $\frac{316}{25} \left( \frac{4}{5} \right)^{48}$

4.  $\frac{164}{25} \left( \frac{1}{5} \right)^{48}$

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

કોઈક પ્રવેશ પરીક્ષાની પ્રાથમિક પસંદગી માટે ઉમેદવારને પચાસ પ્રશ્નો ઉકેલવા માટે આપેલ છે. જો ઉમેદવાર કોઈ ઁક પ્રશ્ન ઉકેલી શકે તેની સંભાવના  $\frac{4}{5}$  હોય તો તે બેથી ઁધોઁ પ્રશ્નો ઉકેલવામાં અસમર્થ રહે તેની સંભાવના કેટલી?

Options :

1.  $\frac{54}{5} \left(\frac{4}{5}\right)^{49}$
2.  $\frac{316}{25} \left(\frac{4}{5}\right)^{48}$
3.  $\frac{164}{25} \left(\frac{1}{5}\right)^{48}$
4.  $\frac{164}{25} \left(\frac{1}{5}\right)^{48}$

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

Let  $S$  be the set of all  $\alpha \in \mathbb{R}$  such that the equation,  $\cos 2x + \alpha \sin x = 2\alpha - 7$  has a solution. Then  $S$  is equal to :

Options :

1.  $\mathbb{R}$
2.  $[2, 6]$
3.  $[1, 4]$
4.  $[3, 7]$

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

माना सभी  $\alpha \in \mathbb{R}$ , जिसके लिए समीकरण  $\cos 2x + \alpha \sin x = 2\alpha - 7$  का एक हल है, का समुच्चय  $S$  है। तो  $S$  बराबर है :

Options :

1.  $\mathbb{R}$
2.  $[2, 6]$
3.  $[1, 4]$

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

ધારો કે  $S$  એ એવા તમામ  $\alpha \in \mathbb{R}$  નો ગણ છે કે જેથી  
સમીકરણ  $\cos 2x + \alpha \sin x = 2\alpha - 7$  ને ઉકેલ હોય, તો  
 $S$  બરાબર \_\_\_\_\_ છે.

Options :

1.  $\mathbb{R}$
2.  $[2, 6]$
3.  $[1, 4]$
4.  $[3, 7]$

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

Correct Marks : 4 Wrong Marks : 1

The angle of elevation of the top of a vertical tower standing on a horizontal plane is observed to be  $45^\circ$  from a point A on the plane. Let B be the point 30 m vertically above the point A. If the angle of elevation of the top of the tower from B be  $30^\circ$ , then the distance (in m) of the foot of the tower from the point A is :

Options :

1.  $15(3 - \sqrt{3})$
2.  $15(3 + \sqrt{3})$
3.  $15(1 + \sqrt{3})$
4.  $15(5 - \sqrt{3})$

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

Correct Marks : 4 Wrong Marks : 1

बिन्दु A से 30 मीटर उर्ध्वाधर ऊपर बिन्दु B है। यदि B से मीनार के शिखर का उन्नयन कोण  $30^\circ$  है, तो मीनार के पाद की बिन्दु A से दूरी (मीटर में) है :

Options :

1.  $15(3 - \sqrt{3})$
2.  $15(3 + \sqrt{3})$
3.  $15(1 + \sqrt{3})$
4.  $15(5 - \sqrt{3})$

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

Correct Marks : 4 Wrong Marks : 1

સમક્ષિતિજ સમતલ પર ઊભેલા એક શિરોલંબ ટાવરની ટોચનો ઉત્સેધકોણ આ સમતલ પરના બિંદુ A થી  $45^\circ$  જણાય છે. ધારો કે B એ બિંદુ A ની ઉપર શિરોલંબ દિશામાં 30 મીટર ઊંચાઈએ આવેલું બિંદુ છે. જો B થી ટાવરના ટોચનો ઉત્સેધકોણ  $30^\circ$  હોય, તો બિંદુ A થી ટાવરના તળિયાનું અંતર (મીટર માં) \_\_\_\_\_ છે.

Options :

1.  $15(3 - \sqrt{3})$
2.  $15(3 + \sqrt{3})$
3.  $15(1 + \sqrt{3})$
4.  $15(5 - \sqrt{3})$

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

Correct Marks : 4 Wrong Marks : 1

The Boolean expression  $\sim(p \Rightarrow (\sim q))$  is equivalent to :

Options :

2.  $q \Rightarrow \sim p$

3.  $p \wedge q$

4.  $p \vee q$

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

बूले का व्यंजक  $\sim(p \Rightarrow (\sim q))$  निम्न में से किसके समतुल्य है?

Options :

1.  $(\sim p) \Rightarrow q$

2.  $q \Rightarrow \sim p$

3.  $p \wedge q$

4.  $p \vee q$

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

બુલીયન નિરૂપણ  $\sim(p \Rightarrow (\sim q))$  એ \_\_\_\_\_ ને સમકક્ષ છે.

Options :

1.  $(\sim p) \Rightarrow q$

2.  $q \Rightarrow \sim p$

3.  $p \wedge q$

4.  $p \vee q$