Question Paper Name:	Paper I EHG 8th April 2019 Shift 2 S2
Subject Name:	Paper I EHG
Creation Date:	2019-04-08 19:13:02
Duration:	180
Total Marks:	360
Display Marks:	Yes

Paper I

Group Number :	1
Group Id :	416529175
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 :	416529319
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:	416529459
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

If Surface tension (S), Moment of Inertia (I) and Planck's constant (h), were to be taken as the fundamental units, the dimensional formula for linear momentum would be :

Options :

1. $S^{1/2}I^{1/2}h^{0}$

3. $S^{1/2}I^{3/2}h^{-1}$

4. $S^{1/2}I^{1/2}h^{-1}$

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

यदि पृष्ठ तनाव (S), जड़त्व आघूर्ण (I) तथा प्लांक नियतांक (h) को मूलभूत इकाई मानें तो रेखीय संवेग का विमा सूत्र होगा :

Options :

1. $S^{1/2}I^{1/2}h^{0}$

2. $S^{3/2}I^{1/2}h^{0}$

3. $S^{1/2}I^{3/2}h^{-1}$

4. $S^{1/2}I^{1/2}h^{-1}$

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

જો પૃષ્ઠતાણ (S), જડત્વની ચાકમાત્રા (I) અને પ્લાંક અચળાંક (h) ને મૂળભૂત એકમો તરીકે લેવામાં આવે તો રેખીય વેગમાનનું પારીમાણિક સૂત્ર થશે :

Options :

1. $S^{1/2}I^{1/2}h^{0}$

2. $S^{3/2}I^{1/2}h^{0}$

3. $S^{1/2}I^{3/2}h^{-1}$

4. $S^{1/2}I^{1/2}h^{-1}$

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

$=3, |\overrightarrow{A_2}|=5$ and $|\overrightarrow{A_1}+\overrightarrow{A_2}|=5$. The value of $\left(2\overrightarrow{A_1}+3\overrightarrow{A_2}\right)\cdot\left(3\overrightarrow{A_1}-2\overrightarrow{A_2}\right)$ is :

Options :

1. -99.5

2. -106.5

3. -112.5

4. -118.5

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

दिया है $|\overrightarrow{A_1}|=3, |\overrightarrow{A_2}|=5$ तथा $|\overrightarrow{A_1}+\overrightarrow{A_2}|=5$ तो

$\left(2\overrightarrow{A_1}+3\overrightarrow{A_2}\right)\cdot\left(3\overrightarrow{A_1}-2\overrightarrow{A_2}\right)$ का मान होगा :

Options :

1. -99.5

2. -106.5

3. -112.5

4. -118.5

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

જો $|\overrightarrow{A_1}|=3, |\overrightarrow{A_2}|=5$ અને $|\overrightarrow{A_1}+\overrightarrow{A_2}|=5$ હોય તો

$\left(2\overrightarrow{A_1}+3\overrightarrow{A_2}\right)\cdot\left(3\overrightarrow{A_1}-2\overrightarrow{A_2}\right)$ નું મૂલ્ય :

Options :

1. -99.5

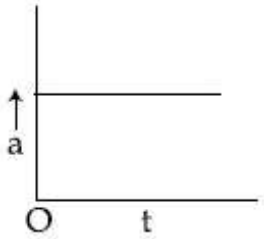
2. -106.5

3. -112.5

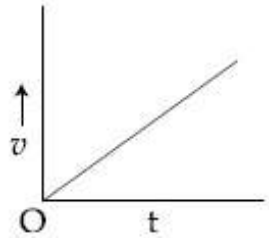
Question Number : 3 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

A particle starts from origin O from rest and moves with a uniform acceleration along the positive x-axis. Identify all figures that correctly represent the motion qualitatively.
(a = acceleration, v = velocity, x = displacement, t = time)

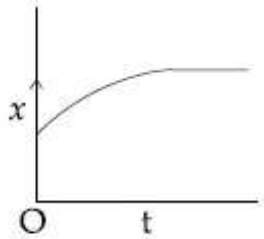
(A)



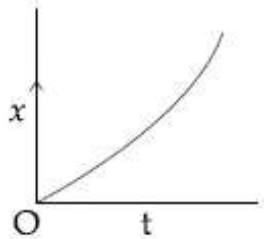
(B)



(C)



(D)



Options :

1. (A)

2. (A), (B), (D)

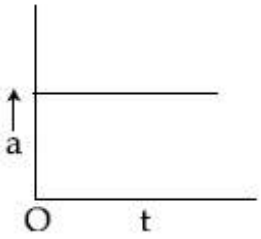
3. (A), (B), (C)

4. (B), (C)

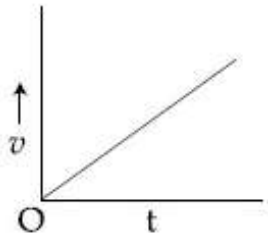
एक कण स्थिरावस्था से एक धनात्मक x-अक्ष की दिशा में मूलबिंदु O से नियत त्वरण से चलता है। वह सभी चित्र ज्ञात कीजिये जो इस कण की गति को गुणात्मक रूप में सही दर्शाते हैं।

(a = त्वरण, v = वेग, x = विस्थापन, t = समय)

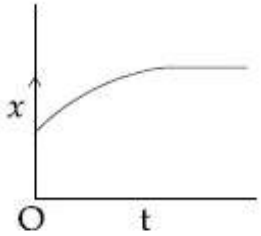
(A)



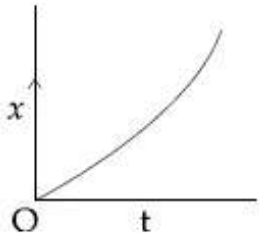
(B)



(C)



(D)



Options :

1. (A)

2. (A), (B), (D)

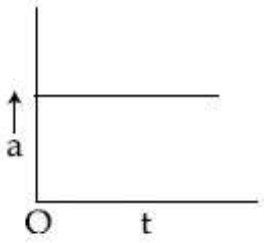
3. (A), (B), (C)

4. (B), (C)

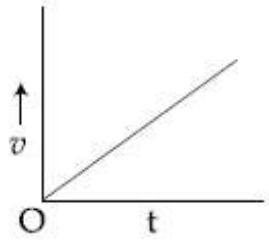
તેની સ્થિર અવસ્થામાંથી, તેના ઉદ્‌ગમ O પરથી ધન x-અક્ષની તરફ અચળ પ્રવેગથી ગતિ કરે છે. આ ગતિ દર્શાવવા માટે નીચેના માંથી કઇ આકૃતિ ગુણાત્મક રીતે સાચી છે તે શોધો :

(a = પ્રવેગ, v = વેગ, x = સ્થાનાંતર, t = સમય)

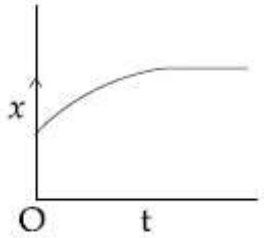
(A)



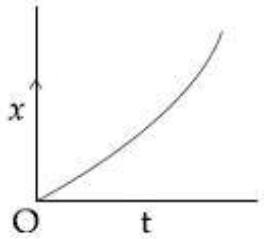
(B)



(C)



(D)



Options :

1. (A)

2. (A), (B), (D)

3. (A), (B), (C)

4. (B), (C)

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

of mass m_1 moving with an unknown velocity of $v_1\hat{i}$, undergoes a collinear collision with a body of mass m_2 moving with a velocity $v_2\hat{i}$. After collision, m_1 and m_2 move with velocities of $v_3\hat{i}$ and $v_4\hat{i}$, respectively.
If $m_2 = 0.5\ m_1$ and $v_3 = 0.5\ v_1$, then v_1 is :

Options :

1. $v_4 - v_2$

2. $v_4 - \frac{v_2}{2}$

3. $v_4 + v_2$

4. $v_4 - \frac{v_2}{4}$

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

द्रव्यमान m_1 का एक पिण्ड अज्ञात वेग $v_1\hat{i}$ से चलते हुए एक दूसरे द्रव्यमान m_2 तथा वेग $v_2\hat{i}$ से जाते हुये एक पिण्ड से समरेखीय संघट्ट करता है। संघट्ट के बाद m_1 तथा m_2 क्रमश: वेग $v_3\hat{i}$ तथा $v_4\hat{i}$ से चलते हैं। यदि $m_2 = 0.5\ m_1$ तथा $v_3 = 0.5\ v_1$ हो, तो v_1 होगा :

Options :

1. $v_4 - v_2$

2. $v_4 - \frac{v_2}{2}$

3. $v_4 + v_2$

4. $v_4 - \frac{v_2}{4}$

m_1 દળ ધરાવતો એક પદાર્થ $v_1\,\hat{i}$ જેટલા અચળ વેગથી ગતિ કરે છે જે $v_2\,\hat{i}$ વેગથી ગતિ કરતા m_2 દળવાળા પદાર્થ સાથે સમરેખીય અથડામણ અનુભવે છે. અથડામણ થયા પછી m_1 અને m_2 અનુક્રમે વેગ $v_3\,\hat{i}$ અને $v_4\,\hat{i}$ થી ગતિ કરે છે. જો $m_2 = 0.5\,m_1$ અને $v_3 = 0.5\,v_1$ હોય તો, v_1 હશે :

Options :

1. $v_4 - v_2$

2. $v_4 - \frac{v_2}{2}$

3. $v_4 + v_2$

4. $v_4 - \frac{v_2}{4}$

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 solid sphere and solid cylinder of identical radii approach an incline with the same linear velocity (see figure). Both roll without slipping all throughout. The two climb maximum heights h_{sph} and h_{cyl} on the incline. The ratio $\frac{h_{sph}}{h_{cyl}}$ is given by :

Options :

1. 1

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

3. $\frac{14}{15}$

4. $\frac{1}{5}$

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

एक ठोस गोला तथा एक ठोस बेलन जिनकी त्रिज्यायें समान है, एक आनत तल की तरफ समान रेखीय वेग से जा रहे हैं (चित्र देखें)। शुरू से अंत तक दोनों बिना फिसले लुढ़कते हुये चलते हैं। ये आनत तल पर अधिकतम ऊँचाई h_{sph} तथा h_{cyl} तक चढ़ पाते हैं तो अनुपात $\frac{h_{sph}}{h_{cyl}}$ होगा :

Options :

1. 1

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

3. $\frac{14}{15}$

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

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 સરખી ત્રિજ્યા ધરાવતા એક ઘન ગોળો અને ઘન નળાકાર એક સરખા રેખીય વેગથી ઢોળાવ તરફ જઈ રહયા છે. આ બન્ને લપસ્યા વગર અંત સુધી ગબડે છે. ઢોળાવ પર આ બન્ને મહત્તમ ઊંચાઇ h_{sph} અને h_{cyl} પ્રાપ્ત કરે છે. ગુણોત્તર $\frac{h_{sph}}{h_{cyl}}$ હશે :

1. 1

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

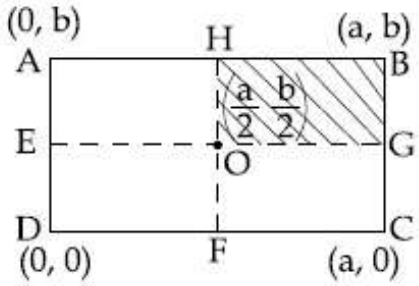
3. $\frac{14}{15}$

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

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 uniform rectangular thin sheet ABCD of mass M has length a and breadth b, as shown in the figure. If the shaded portion HBGO is cut-off, the coordinates of the centre of mass of the remaining portion will be :



Options :

1. $\left(\frac{5a}{12}, \frac{5b}{12}\right)$

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

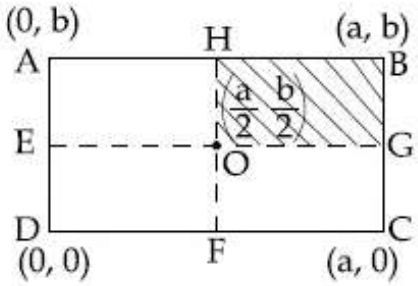
3. $\left(\frac{3a}{4}, \frac{3b}{4}\right)$

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

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

Correct Marks : 4 Wrong Marks : 1

M की एकसमान आयताकार पतली चद्दर ABCD, जिसकी लम्बाई a तथा चौड़ाई b है, को चित्र में दिखाया गया है। यदि इसके आच्छादित भाग HBGO को काटकर हटा देते हैं तो बाकी चद्दर के द्रव्यमान केन्द्र का निर्देशांक होगा :



Options :

1. $\left(\frac{5a}{12}, \frac{5b}{12}\right)$

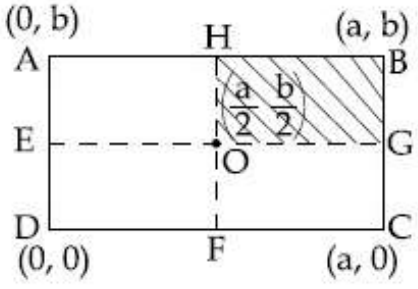
2. $\left(\frac{5a}{3}, \frac{5b}{3}\right)$

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

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

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

આકૃતિમાં બતાવ્યા પ્રમાણે એક M દળ ધરાવતી એક સમાન લંબચોરસ પાતળી ફલક ABCD ની લંબાઈ a અને પહોળાઇ b છે. જો આકૃતિમાં અંકિત કરેલા ભાગ HBGO ને કાપી નાખવામાં આવે તો બાકી રહેલા ભાગના દ્રવ્યમાન કેન્દ્રના યામો હશે :



Options :

1. $\left(\frac{5a}{12}, \frac{5b}{12}\right)$

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

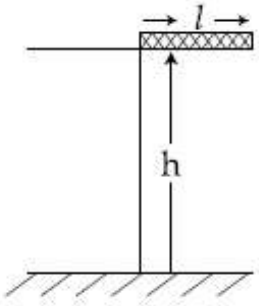
3. $\left(\frac{3a}{4}, \frac{3b}{4}\right)$

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

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

A rectangular solid box of length 0.3 m is held horizontally, with one of its sides on the edge of a platform of height 5 m. When released, it slips off the table in a very short time $\tau = 0.01$ s, remaining essentially horizontal. The angle by which it would rotate when it hits the ground will be (in radians) close to :



Options :

1. 0.3

2. 0.02

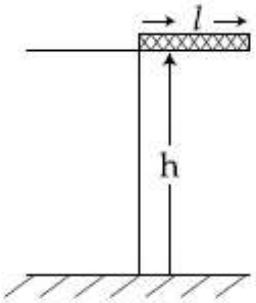
3. 0.5

4. 0.28

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

ब्वाई के एक ठोस आयताकार डिब्बे के एक सिरे को 5 m ऊंचे प्लेटफॉर्म के किनारे पर क्षैतिज पकड़ा हुआ है। जब उसे छोड़ते हैं तो लगभग क्षैतिज रहते हुए बहुत कम समय $\tau = 0.01$ s में मेज पर से फिसल जाता है। जब यह जमीन पर गिरता है तो यह लगभग किस कोण (रेडियन में) घूम जायेगा?



Options :

1. 0.3

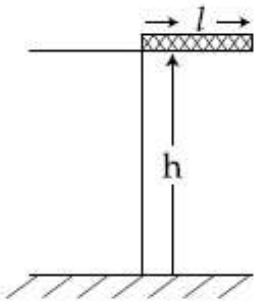
2. 0.02

3. 0.5

4. 0.28

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

0.3 m લંબાઈ ધરાવતા એક લંબચોરસ ઘન બોક્ષને તેની એક બાજુ 5 m ઊંચાઇ ધરાવતા પ્લેટફોર્મની ધાર આગળ સમક્ષિતિજ રહે તેમ રાખવામાં આવેલ છે. જ્યારે તેને મુક્ત કરવામાં આવે છે ત્યારે તે પ્લેટફોર્મ (ટેબલ) પરથી ખૂબજ ટૂંકા સમયે $\tau = 0.01$ s માં સરકીને અંતે સમક્ષિતિજ બને છે. જ્યારે તે ભોંયતળિયાને અથડાશે ત્યારે તેણે કરેલ ભ્રમણનો કોણ (રેડિયનમાં) _____ ની નજીકનો હશે.



Options :

2. 0.02

3. 0.5

4. 0.28

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

Correct Marks : 4 Wrong Marks : 1

A rocket has to be launched from earth in such a way that it never returns. If E is the minimum energy delivered by the rocket launcher, what should be the minimum energy that the launcher should have if the same rocket is to be launched from the surface of the moon ? Assume that the density of the earth and the moon are equal and that the earth's volume is 64 times the volume of the moon.

Options :

1. $\frac{E}{64}$

2. $\frac{E}{32}$

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

4. $\frac{E}{4}$

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

एक रॉकेट को पृथ्वी से इस तरह प्रक्षेपित करते हैं कि वह वापस नहीं आता है। यदि इसके लिये राकेट प्रक्षेपक (launcher) द्वारा दी गयी न्यूनतम ऊर्जा E है तो उसी राकेट को चन्द्रमा की सतह से प्रक्षेपित करने के लिए प्रक्षेपक द्वारा दी गयी न्यूनतम ऊर्जा क्या होगी ? मानिये कि पृथ्वी तथा चन्द्रमा का घनत्व समान है तथा पृथ्वी का आयतन चन्द्रमा से 64 गुना ज्यादा है :

1. $\frac{E}{64}$

2. $\frac{E}{32}$

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

4. $\frac{E}{4}$

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

પૃથ્વી પરથી એક રૉકેટ ને એવી રીતે પ્રક્ષેપિત કરવામાં આવે છે કે જે ફરી પાછું પૃથ્વીપર આવતુ નથી. જો રૉકેટ લોન્ચર દ્વારા આપવામાં આવતી ન્યૂનત્તમ ઊર્જા E હોય તો, આ જ રૉકેટ ને ચંદ્રની સપાટી પરથી પ્રક્ષેપિત કરવામાં આવે તો લોન્ચર દ્વારા આપવામાં આવતી ન્યૂનત્તમ ઊર્જા કેટલી હોવી જોઇએ. અંહી એવુ ધારોકે પૃથ્વીની અને ચંદ્રની ઘનતા એકસરખી છે અને પૃથ્વીનું દળ ચંદ્રના દળ કરતા 64 ગણુ છે :

Options :

1. $\frac{E}{64}$

2. $\frac{E}{32}$

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

4. $\frac{E}{4}$

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

moduli of two wires A and B are in the ratio 7 : 4. Wire A is 2 m long and has radius R. Wire B is 1.5 m long and has radius 2 mm. If the two wires stretch by the same length for a given load, then the value of R is close to :

Options :

1. 1.3 mm

2. 1.5 mm

3. 1.7 mm

4. 1.9 mm

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

Correct Marks : 4 Wrong Marks : 1

दो तारों A तथा B के यंग प्रत्यास्थता गुणांकों का अनुपात 7 : 4 है। तार A की लम्बाई 2 m तथा त्रिज्या R है। तार B की लम्बाई 1.5 m तथा त्रिज्या 2 mm है। यदि इन दोनों तारों की लम्बाई में वृद्धि, एक दिये गये भार के कारण, बराबर है तो R का सन्निकट मान होगा :

Options :

1. 1.3 mm

2. 1.5 mm

3. 1.7 mm

4. 1.9 mm

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

Correct Marks : 4 Wrong Marks : 1

બે તાર A અને B ના યંગ મોડ્યુલસો નો ગુણોત્તર 7 : 4 છે. તાર A ની લંબાઈ 2 m અને ત્રિજ્યા R છે જ્યારે તાર B ની લંબાઈ 1.5 m અને ત્રિજ્યા 2 mm છે. જ્યારે બન્ને તારોને આપવામાં આવેલા ભાર વડે એક સરખી લંબાઈથી ખેંચવામાં આવે છે ત્યારે R નું મૂલ્ય _____ ની નજીકનું હશે :

Options :

2. 1.5 mm

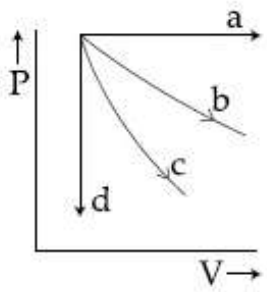
3. 1.7 mm

4. 1.9 mm

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

Correct Marks : 4 Wrong Marks : 1

The given diagram shows four processes i.e., isochoric, isobaric, isothermal and adiabatic. The correct assignment of the processes, in the same order is given by :



Options :

1. d a c b

2. a d b c

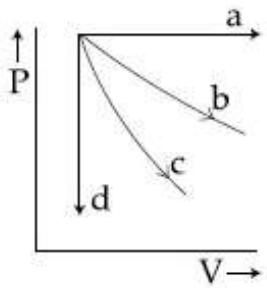
3. a d c b

4. d a b c

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

त्र में चार प्रक्रम, समआयतनिक, समदाबीय, समतापीय तथा रुद्धोष्म, दिखाये गये हैं। इन ग्राफों का इसी क्रम में सही निर्दिष्टीकरण होगा :



Options :

1. d a c b

2. a d b c

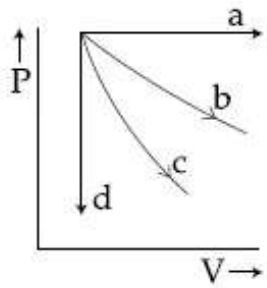
3. a d c b

4. d a b c

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

આકૃતિમાં ચાર પ્રક્રિયા : સમઆયતનિક (isochoric), સમદાબી (isobaric), સમતાપી (isothermal) અને સમોષ્મી (adiabatic) દર્શાવી છે. આ જ ક્રમમાં પ્રક્રિયાનો સાચો વિકલ્પ _____ હશે.



Options :

1. d a c b

2. a d b c

3. a d c b

4. d a b c

The temperature, at which the root mean square velocity of hydrogen molecules equals their escape velocity from the earth, is closest to :

[Boltzmann Constant $k_B = 1.38 \times 10^{-23}$ J/K

Avogadro Number $N_A = 6.02 \times 10^{26}$ /kg

Radius of Earth : 6.4×10^6 m

Gravitational acceleration on Earth $= 10$ ms^{-2}]

Options :

1. 800 K

2. 650 K

3. 10^4 K

4. 3×10^5 K

वह तापमान, जिस पर हाइड्रोजन अणु का वर्ग माध्य मूल वेग, पृथ्वी से उसके पलायन वेग के बराबर होगा, का सन्निकट मान है :

[दिया है : बोल्टजमॉन नियतांक $= 1.38 \times 10^{-23}$ J/K

आवोगाद्रो संख्या $= 6.02 \times 10^{26}$ /kg

पृथ्वी की त्रिज्या $= 6.4 \times 10^6$ m

पृथ्वी पर गुरुत्वीय त्वरण $= 10$ ms^{-2}]

Options :

1. 800 K

2. 650 K

3. 10^4 K

4. 3×10^5 K

અણુનો rms વેગ, તેનો પૃથ્વી પરનો નિષ્ક્રમણ વેગ જેટલો થાય તે તાપમાનનું મૂલ્ય _____ K ની નજીકનું થશે.

[બોલ્ટઝમેન અચળાંક $k_B = 1.38 \times 10^{-23}$ J/K

એવોગેડ્રો અંક $N_A = 6.02 \times 10^{26}$ /kg

પૃથ્વીની ત્રિજ્યા $= 6.4 \times 10^6$ m

પૃથ્વી પરનો ગુરુત્વપ્રવેગ $= 10\ ms^{-2}$]

Options :

1. 800 K

2. 650 K

3. 10^4 K

4. 3×10^5 K

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 damped harmonic oscillator has a frequency of 5 oscillations per second. The amplitude drops to half its value for every 10 oscillations. The time it will take to drop to $\frac{1}{1000}$ of the original amplitude is close to :

Options :

1. 100 s

2. 50 s

3. 20 s

4. 10 s

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

न्दित आवर्ती दोलक की आवृत्ति प्रति सेकण्ड 5 दोलन है। इसका आयाम प्रत्येक 10 दोलन के बाद आधा हो जाता है। इसके मूल आयाम को $\frac{1}{1000}$ गुना घटाने में लगे समय का सन्निकट मान होगा :

Options :

1. 100 s
2. 50 s
3. 20 s
4. 10 s

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

અવમંદિત પ્રસંવાદી દોલકની આવૃત્તિ 5 દોલનો/સેકન્ડ છે. દરેક 10 દોલનો એ તેના કંપવિસ્તારનું મૂલ્ય ઘટીને અડધુ થાય છે. પ્રારંભિક કંપવિસ્તારથી ઘટીને $\frac{1}{1000}$ જેટલું મૂલ્ય માટે લાગતો સમય _____ ની નજીકનો હશે.

Options :

1. 100 s
2. 50 s
3. 20 s
4. 10 s

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

An electric dipole is formed by two equal and opposite charges q with separation d. The charges have same mass m. It is kept in a uniform electric field E. If it is slightly rotated from its equilibrium orientation, then its angular frequency ω is :

Options :

1. $\sqrt{2md}$

2. $\sqrt{\frac{2qE}{md}}$

3. $\sqrt{\frac{qE}{md}}$

4. $2\sqrt{\frac{qE}{md}}$

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 विद्युत द्विध्रुव d दूरी पर रखे दो बराबर एवं विपरीत आवेश q से बना है। आवेशों का एकसमान द्रव्यमान m है। इसको एकसमान विद्युत क्षेत्र E में रखते हैं। इसे इसकी साम्यावस्था के अभिविन्यास से थोड़ा सा घुमाते हैं तो, कोणीय आवृत्ति ω होगी :

Options :

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

2. $\sqrt{\frac{2qE}{md}}$

3. $\sqrt{\frac{qE}{md}}$

4. $2\sqrt{\frac{qE}{md}}$

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

[illegible] અંતરે રાખેલા બે સમાન અને વિરૂદ્ધ વિજભારો q વિદ્યુત દ્વિધ્રુવી બનાવે છે. બન્ને વિજભારોનુ દળ એકસમાન m છે. જેને સમાન વિદ્યુત ક્ષેત્ર E માં મુક્વામાં આવે છે. જ્યારે તેને તેની સંતુલન સ્થિતિમાથી થોડુ ભ્રમણ કરાવવામાં આવે છે ત્યારે તેની કોણીય આવૃતિ ω હશે.

Options :

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

2. $\sqrt{\frac{2qE}{md}}$

3. $\sqrt{\frac{qE}{md}}$

4. $2\sqrt{\frac{qE}{md}}$

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

Correct Marks : 4 Wrong Marks : 1

A parallel plate capacitor has 1μF capacitance. One of its two plates is given +2 μC charge and the other plate, +4 μC charge. The potential difference developed across the capacitor is :

Options :

1. 1 V

2. 5 V

3. 2 V

4. 3 V

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

Correct Marks : 4 Wrong Marks : 1

एक समान्तर प्लेट संधारित्र की धारिता 1 μF है। इसकी एक प्लेट को +2 μC तथा दूसरी प्लेट को +4 μC आवेश देते हैं। संधारित्र पर उत्पन्न विभवान्तर है :

1. 1 V

2. 5 V

3. 2 V

4. 3 V

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

સમાંતર પ્લેટ કેપેસિટરનું કેપેસિટન્સ 1μF છે. બે માંની એક પ્લેટને +2 μC વિજભાર આપવામાં આવે છે અને બીજી પ્લેટને +4 μC વિજભાર આપવામાં આવે છે. કેપેસિટરને સમાંતર ઉદ્‌ભવતો વિદ્યુત સ્થિતિમાનનો તફાવત :

Options :

1. 1 V

2. 5 V

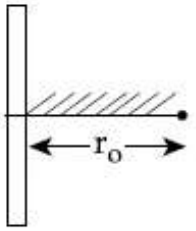
3. 2 V

4. 3 V

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

A positive point charge is released from rest at a distance r_o from a positive line charge with uniform density. The speed (v) of the point charge, as a function of instantaneous distance r from line charge, is proportional to :



Options :

1. $v \propto \left(\frac{r}{r_o}\right)$

2. $v \propto \left(\frac{r}{r_o}\right)$

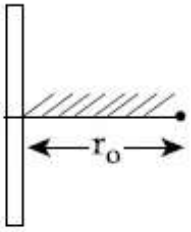
3. $v \propto \sqrt{ln\left(\frac{r}{r_o}\right)}$

4. $v \propto e^{+r/r_o}$

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

विरामावस्था से एक बिन्दु धन आवेश को एक एकसमान घनत्व के धनात्मक रेखीय आवेश से r_o दूरी पर छोड़ते हैं। बिन्दु आवेश की चाल (v) रेखीय आवेश से तात्क्षणिक दूरी r के फलन के रूप में समानुपाती होगी :



Options :

1. $v \propto ln\left(\frac{r}{r_o}\right)$

2. $v \propto \left(\frac{r}{r_o}\right)$

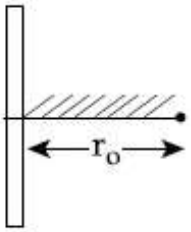
3. $v \propto \sqrt{ln\left(\frac{r}{r_o}\right)}$

4. $v \propto e^{+r/r_o}$

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

ચનતા ધરાવતા એક ઘન રેખીય વિજભારમાંથી r_o અંતરેથી તેની સ્થિર અવસ્થામાંથી એક ઘન બિંદુવત્ત વિજભાર ને છોડવામાં આવે છે. બિંદુવત્ત વિજભારની ઝડપ v એ રેખીય વિજભારથી તત્કાલીન અંતર r ના વિધેયમાં હોય તો તેને સૌથી સારી રીતે _____ થી વર્ણવી શકાય.



Options :

1. $v \propto ln\left(\frac{r}{r_o}\right)$

2. $v \propto \left(\frac{r}{r_o}\right)$

3. $v \propto \sqrt{ln\left(\frac{r}{r_o}\right)}$

4. $v \propto e^{+r/r_o}$

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

The electric field in a region is given by $\vec{E}=(Ax+B)\hat{i}$, where E is in NC^{-1} and x is in metres. The values of constants are A = 20 SI unit and B = 10 SI unit. If the potential at $x=1$ is V_1 and that at $x=-5$ is V_2, then $V_1 - V_2$ is :

Options :

1. -520 V

2. 320 V

3. 180 V

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

एक स्थान पर विद्युत क्षेत्र $\vec{E}=(Ax+B)\hat{i}$ है, जहाँ E NC^{-1} में तथा x मीटर में है। नियतांकों के मान, $A=20$ SI unit तथा $B=10$ SI unit हैं। यदि $x=1$ पर विभव V_1 तथा $x=-5$ पर विभव V_2 है तो V_1-V_2 होगा :

Options :

1. -520 V

2. 320 V

3. 180 V

4. -48 V

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

આપેલ વિસ્તારમાં વિદ્યુત ક્ષેત્ર $\vec{E}=(Ax+B)\hat{i}$ આપેલ છે જ્યાં E એ NC^{-1} માં અને x એ m માં છે. રાશિઓ $A=20$ SI એકમ અને $B=10$ SI એકમમાં છે. જો $x=1$ આગળ સ્થિતિમાન V_1 હોય અને $x=-5$ આગળ તે V_2 હોય તો V_1-V_2 હશે :

Options :

1. -520 V

2. 320 V

3. 180 V

4. -48 V

Question Number : 17 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

A cell of internal resistance r drives current through an external resistance R. The power delivered by the cell to the external resistance will be maximum when :

Options :

1. $R = 1000\ r$

2. $R = 0.001\ r$

3. $R = r$

4. $R = 2r$

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

आंतरिक प्रतिरोध r की एक सेल एक बाह्य प्रतिरोध R में धारा प्रवाहित करती है। सेल द्वारा प्रतिरोध को प्रदान की गयी शक्ति का मान अधिकतम होगा, जब :

Options :

1. $R = 1000\ r$

2. $R = 0.001\ r$

3. $R = r$

4. $R = 2r$

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

r આંતરિક અવરોધ ધરાવતો કોષ (Cell) R બાહ્ય અવરોધમાંથી પ્રવાહ પસાર કરે છે. આ કોષ દ્વારા બાહ્ય અવરોધ R ને આપવામાં આવતો પાવર મહત્તમ હશે જ્યારે :

Options :

1. $R = 1000\ r$

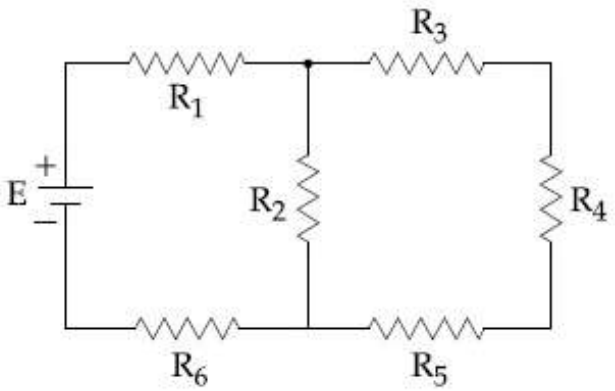
2. $R = 0.001\ r$

3. $R = r$

Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

In the figure shown, what is the current (in Ampere) drawn from the battery ? You are given :

$R_1 = 15\ \Omega$, $R_2 = 10\ \Omega$, $R_3 = 20\ \Omega$, $R_4 = 5\ \Omega$, $R_5 = 25\ \Omega$, $R_6 = 30\ \Omega$, $E = 15$ V



Options :

1. 9/32

2. 13/24

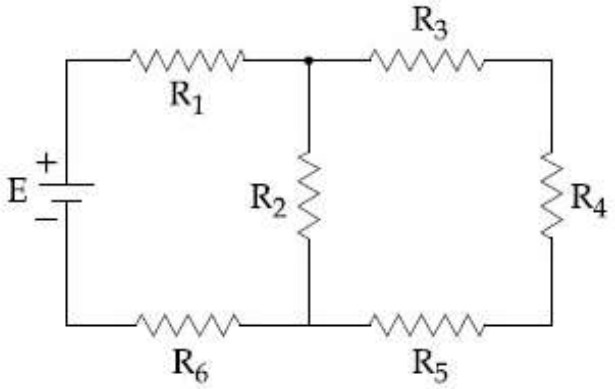
3. 20/3

4. 7/18

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

खाई गयी बैटरी से निकली धारा का मान (एम्पियर में) क्या होगा? दिया गया है :

$R_1 = 15\ \Omega$, $R_2 = 10\ \Omega$, $R_3 = 20\ \Omega$, $R_4 = 5\ \Omega$, $R_5 = 25\ \Omega$, $R_6 = 30\ \Omega$, $E = 15$ V



Options :

1. 9/32

2. 13/24

3. 20/3

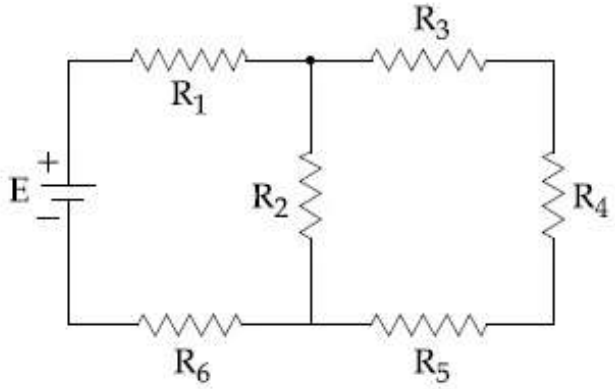
4. 7/18

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

આકૃતિમાં બતાવેલ બેટરીમાંથી પસાર થતો પ્રવાહ (એમ્પિયરમાં) કેટલો હશે? અંહી,

$R_1 = 15\ \Omega$, $R_2 = 10\ \Omega$, $R_3 = 20\ \Omega$, $R_4 = 5\ \Omega$, $R_5 = 25\ \Omega$, $R_6 = 30\ \Omega$, $E = 15$ V આપેલ છે.



Options :

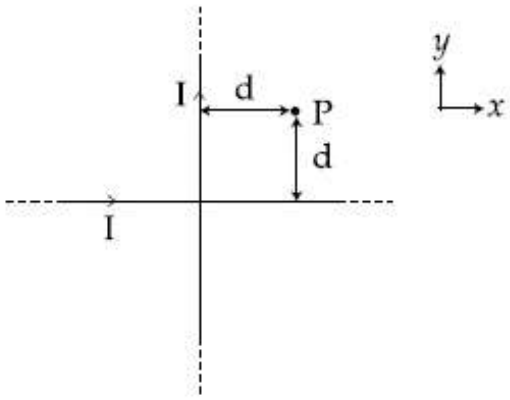
1. 9/32

3. $20/3$

4. $7/18$

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

Two very long, straight, and insulated wires are kept at 90° angle from each other in xy-plane as shown in the figure.



These wires carry currents of equal magnitude I, whose directions are shown in the figure. The net magnetic field at point P will be :

Options :

1. $\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

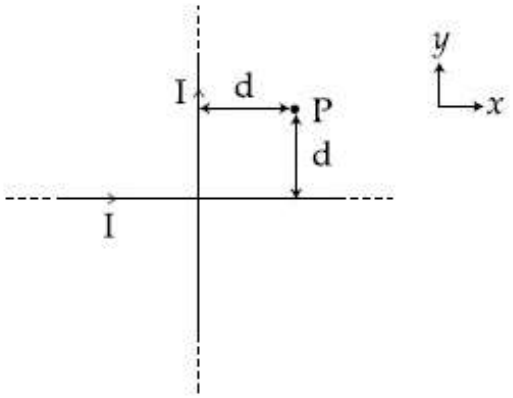
2. $-\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

3. $\frac{+\mu_0 I}{\pi d}(\hat{z})$

4. Zero

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

लम्बे, सीधे तथा विद्युत धारी तारों को एक दूसरे से 90° कोण पर चित्रानुसार xy-समतल में रखा है।



तारों में एकसमान धारा I, चित्र में दिखायी दिशा में, बह रही है। बिन्दु P पर परिणामी चुम्बकीय क्षेत्र होगा :

Options :

1. $\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

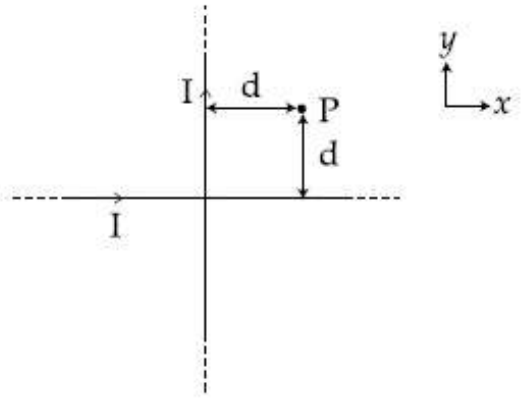
2. $-\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

3. $\frac{+\mu_0 I}{\pi d}(\hat{z})$

4. शून्य

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

બતાવ્યા પ્રમાણે બે ખૂબ લાંબા સીધા અને અવાહક પડ ચઢાવેલ તારોને xy-સમતલમાં $90°$ નાં ખૂણે મુકેલ છે.



આ બન્ને તારો એક સમાન મૂલ્યનો પ્રવાહ I ધરાવે છે. જેની દિશા આકૃતિમાં બતાવી છે તો બિંદુ P આગળ ચોખ્ખુ ચુંબકીય ક્ષેત્ર _____ હશે.

Options :

1. $\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

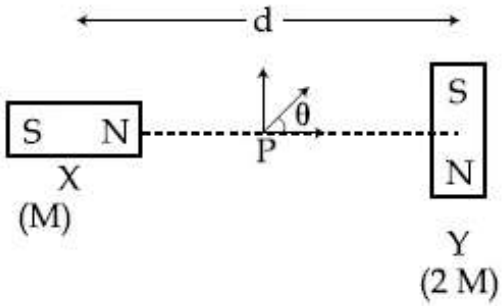
2. $-\frac{\mu_0 I}{2\pi d}(\hat{x}+\hat{y})$

3. $\frac{+\mu_0 I}{\pi d}(\hat{z})$

4. શૂન્ય

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

Magnetic dipoles X and Y are placed at a separation d, with their axes perpendicular to each other. The dipole moment of Y is twice that of X. A particle of charge q is passing through their mid-point P, at angle $\theta = 45°$ with the horizontal line, as shown in figure. What would be the magnitude of force on the particle at that instant ? (d is much larger than the dimensions of the dipole)



Options :

1. $\left(\frac{\mu_0}{4\pi}\right)\frac{2M}{\left(d/2\right)^3}\times qv$

2. $\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

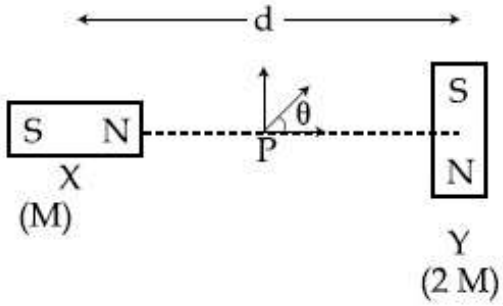
3. 0

4. $\sqrt{2}\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

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

...य द्विध्रुव X तथा Y को चित्रानुसार d दूरी पर, उनके अक्षों को परस्पर लम्बवत् करके, रखा है। Y का द्विध्रुव आघूर्ण X का दो गुना है। q आवेश का एक कण इन दोनों के ठीक मध्य बिंदु P से क्षैतिज रेखा से $\theta = 45°$ के कोण पर, चित्रानुसार, गुजरता है। इस क्षण पर कण पर एक लगे बल का परिमाण क्या होगा? (दिया है : d द्विध्रुव के आकार (dimensions) से अत्यधिक बड़ा है)



Options :

1. $\left(\frac{\mu_0}{4\pi}\right)\frac{2M}{\left(d/2\right)^3}\times qv$

2. $\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

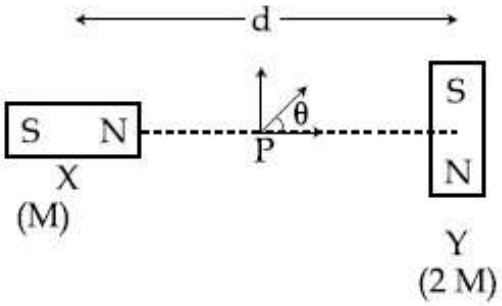
3. 0

4. $\sqrt{2}\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

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

દ્વિધ્રુવી (magnetic dipoles) X અને Y ને એકબીજાથી d અંતરે એવી રીતે મુકવામાં આવે છે કે જેથી બન્નેની અક્ષ એકબીજાને લંબ રહે. Y ની દ્વિધ્રુવી ચાકમાત્રા X કરતા બે ગણી છે. આકૃતિમાં દર્શાવ્યા પ્રમાણે એક વિદ્યુતભારિત કણ q વિદ્યુતભાર સાથે તેમનાં મધ્યબિંદુ P આગળ સમક્ષિતિજ રેખા સાથે બનાવેલ $\theta = 45°$ ના કોણેથી પસાર થાય છે. તે ક્ષણે કણ પર લાગતા બળનું મૂલ્ય કેટલું હશે? (d એ દ્વિધ્રુવીના પરિમાણ કરતા ઘણું મોટુ છે.)



Options :

1. $\left(\frac{\mu_0}{4\pi}\right)\frac{2M}{\left(d/2\right)^3}\times qv$

2. $\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

3. 0

4. $\sqrt{2}\left(\frac{\mu_0}{4\pi}\right)\frac{M}{\left(d/2\right)^3}\times qv$

Question Number : 21 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

A circuit connected to an ac source of emf $e = e_0\sin(100t)$ with t in seconds, gives a phase difference of $\frac{\pi}{4}$ between the emf e and current i. Which of the following circuits will exhibit this ?

Options :

1. RC circuit with $R = 1\,k\Omega$ and $C = 1\,\mu F$

2. circuit with R = 1 kΩ and C = 10 μF

3. RL circuit with R = 1 kΩ and L = 10 mH

4. RL circuit with R = 1 kΩ and L = 1 mH

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

जब एक विद्युत वाहक बल $e = e_0 \sin(100t)$, जहाँ t सेकण्ड में है, के प्रत्यावर्ती स्रोत को एक परिपथ से जोड़ते हैं तो विद्युत वाहक बल e तथा धारा i में $\frac{\pi}{4}$ का कलान्तर पाया जाता है। निम्न में से किस परिपथ में ऐसा होगा?

Options :

1. RC - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $C = 1\ \mu F$

2. RC - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $C = 10\ \mu F$

3. RL - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $L = 10\ mH$

4. RL - परिपथ, जहाँ $R = 1\ k\Omega$ तथा $L = 1\ mH$

Question Number : 21 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

એક પરિપથ જ્યારે $e = e_0 \sin(100t)$, જ્યાં t સેકન્ડમાં, emf જેટલા ac ઉદ્‌ગમ સાથે જોડવામાં આવે છે ત્યારે emf e અને પ્રવાહ i વચ્ચે $\frac{\pi}{4}$ જેટલો કળાતફાવત આપે છે. નીચે આપેલ પરિપથોમાંથી ક્યો પરિપથ આ દર્શાવશે?

Options :

1. $R = 1\ k\Omega$ અને $C = 1\ \mu F$ ધરાવતો RC - પરિપથ.

2. Ω અને $C = 10\ \mu F$ ધરાવતો RC - પરિપથ.

3. $R = 1\ k\Omega$ અને $L = 10\ mH$ ધરાવતો RL - પરિપથ.

4. $R = 1\ k\Omega$ અને $L = 1\ mH$ ધરાવતો RL - પરિપથ.

Question Number : 22 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The magnetic field of an electromagnetic wave is given by :

$$\vec{B} = 1.6\times10^{-6}\cos\left(2\times10^{7}z + 6\times10^{15}t\right)(2\hat{i}+\hat{j})\frac{Wb}{m^2}$$

The associated electric field will be :

Options :

1. $\vec{E} = 4.8\times10^{2}\cos\left(2\times10^{7}z + 6\times10^{15}t\right)(-\hat{i}+2\hat{j})\frac{V}{m}$

2. $\vec{E} = 4.8\times10^{2}\cos\left(2\times10^{7}z - 6\times10^{15}t\right)(-2\hat{j}+\hat{i})\frac{V}{m}$

3. $\vec{E} = 4.8\times10^{2}\cos\left(2\times10^{7}z + 6\times10^{15}t\right)(\hat{i}-2\hat{j})\frac{V}{m}$

4. $\vec{E} = 4.8\times10^{2}\cos\left(2\times10^{7}z - 6\times10^{15}t\right)(2\hat{i}+\hat{j})\frac{V}{m}$

Question Number : 22 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

एक विद्युत चुम्बकीय तरंग का चुम्बकीय क्षेत्र निम्न है :

$$\vec{B} = 1.6\times10^{-6}\cos(2\times10^{7}z + 6\times10^{15}t)(2\hat{i}+\hat{j})\frac{Wb}{m^2}$$

इसके संगत विद्युत क्षेत्र होगा :

Options :

1. $\vec{E} = 4.8\times10^{2}\cos\left(2\times10^{7}z + 6\times10^{15}t\right)(-\hat{i}+2\hat{j})\frac{V}{m}$

2. $\vec{E}=4.8\times10^{2}\cos(2\times10^{7}z+6\times10^{15}t)(-2\hat{j}+\hat{i})\frac{V}{m}$

3. $\vec{E}=4.8\times10^{2}\cos(2\times10^{7}z+6\times10^{15}t)(\hat{i}-2\hat{j})\frac{V}{m}$

4. $\vec{E}=4.8\times10^{2}\cos(2\times10^{7}z-6\times10^{15}t)(2\hat{i}+\hat{j})\frac{V}{m}$

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

Correct Marks : 4 Wrong Marks : 1

એક વિદ્યુત ચુંબકીય તરંગમાં ચુંબકીય ક્ષેત્ર :

$\vec{B}=1.6\times10^{-6}\cos(2\times10^{7}z+6\times10^{15}t)(2\hat{i}+\hat{j})\frac{Wb}{m^2}$

વડે આપવામાં આવે છે. સંકળાયેલ વિદ્યુત ક્ષેત્ર :

Options :

1. $\vec{E}=4.8\times10^{2}\cos(2\times10^{7}z+6\times10^{15}t)(-\hat{i}+2\hat{j})\frac{V}{m}$

2. $\vec{E}=4.8\times10^{2}\cos(2\times10^{7}z-6\times10^{15}t)(-2\hat{j}+\hat{i})\frac{V}{m}$

3. $\vec{E}=4.8\times10^{2}\cos(2\times10^{7}z+6\times10^{15}t)(\hat{i}-2\hat{j})\frac{V}{m}$

4. $\vec{E}=4.8\times10^{2}\cos(2\times10^{7}z-6\times10^{15}t)(2\hat{i}+\hat{j})\frac{V}{m}$

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

Correct Marks : 4 Wrong Marks : 1

A convex lens (of focal length 20 cm) and a concave mirror, having their principal axes along the same lines, are kept 80 cm apart from each other. The concave mirror is to the right of the convex lens. When an object is kept at a distance of 30 cm to the left of the convex lens, its image remains at the same position even if the concave mirror is removed. The maximum distance of the object for which this concave mirror, by itself would produce a virtual image would be :

Options :

1. 30 cm

3. 20 cm

4. 10 cm

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

एक उत्तल लेंस (फोकस दूरी 20 cm) तथा एक अवतल दर्पण, जिनके मुख्य अक्ष एक ही रेखा में हैं, को एक दूसरे से 80 cm की दूरी पर रखा गया है; अवतल दर्पण उत्तल लेंस के दाहिनी तरफ रखा है। जब एक वस्तु उत्तल लेंस के बाँयी तरफ 30 cm की दूरी पर रखी जाती है, तो उसका प्रतिबिंब उसी स्थान पर ही रहता है, भले ही अवतल दर्पण को उसकी स्थिति से हटा दिया जाये। वस्तु की अधिकतम दूरी, जिसके लिए वह अवतल दर्पण खुद से ही आभासी प्रतिबिंब बनाये, होगी :

Options :

1. 30 cm

2. 25 cm

3. 20 cm

4. 10 cm

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

તેમની મુખ્યઅક્ષો એકજ રેખા ઉપર રહે તે રીતે એક બહિર્ગોળ લેન્સ (20 cm જેટલી કેન્દ્ર લંબાઈ ધરાવતો) અને એક અંતર્ગોળ અરીસો એક બીજાથી 80 cm અંતરે, અંતર્ગોળ અરીસો બહિર્ગોળ લેન્સને જમણી બાજુ રહે તેમ રાખેલા છે. જ્યારે એક વસ્તુને બહિર્ગોળ લેન્સની ડાબી બાજુ 30 cm અંતરે રાખવામાં આવે છે ત્યારે અંતર્ગોળ અરીસાને દૂર કરવામાં આવે તો પણ પ્રતિબિંબનું સ્થાન બદલાતું નથી. અંતર્ગોળ અરીસો પોતાની રીતે જ અભાસી પ્રતિબિંબ બનાવે તે માટેની વસ્તુનું મહત્તમ અંતર _____ હશે.

1. 30 cm

2. 25 cm

3. 20 cm

4. 10 cm

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

Calculate the limit of resolution of a telescope objective having a diameter of 200 cm, if it has to detect light of wavelength 500 nm coming from a star.

Options :

1. 152.5×10^{-9} radian

2. 457.5×10^{-9} radian

3. 610×10^{-9} radian

4. 305×10^{-9} radian

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 तारे से आ रहे 500 nm तरंगदैर्ध्य के प्रकाश को संसूचित (detect) करने के लिये 200 cm व्यास के अभिदृश्यक लेंस वाले दूरदर्शी की विभेदन सीमा ज्ञात कीजिये :

Options :

1. 152.5×10^{-9} radian

2. 457.5×10^{-9} radian

3. 610×10^{-9} radian

4. 305×10^{-9} radian

જો તારામાંથી આવતા પ્રકાશની તરંગલંબાઈ 500 nm હોય તો 200 cm નો વ્યાસ ધરાવતા વસ્તુકાચ વાળા ટેલીસ્કોપની વિભેદન શક્તિ ગણો :

Options :

1. 152.5×10^{-9} રેડિયન

2. 457.5×10^{-9} રેડિયન

3. 610×10^{-9} રેડિયન

4. 305×10^{-9} રેડિયન

Question Number : 25 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

A nucleus A, with a finite de-broglie wavelength λ_A, undergoes spontaneous fission into two nuclei B and C of equal mass. B flies in the same direction as that of A, while C flies in the opposite direction with a velocity equal to half of that of B. The de-Broglie wavelengths λ_B and λ_C of B and C are respectively :

Options :

1. $2\lambda_A, \lambda_A$

2. $\lambda_A, 2\lambda_A$

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

4. $\lambda_A, \frac{\lambda_A}{2}$

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

डी-ब्रॉग्ली तरंगदैर्घ्य λ_A के एक नाभिक A का स्वत: विखण्डन बराबर द्रव्यमान के दो नाभिकों B तथा C में होता है। B नाभिक A की दिशा में तथा C नाभिक उसके विपरीत दिशा में B के आधे वेग से जाता है। तो B व C की दे-ब्रॉग्ली तरंगदैर्घ्य, λ_B तथा λ_C क्रमश: होंगी :

Options :

1. $2\lambda_A, \lambda_A$

2. $\lambda_A, 2\lambda_A$

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

4. $\lambda_A, \frac{\lambda_A}{2}$

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

λ_A જેટલી ચોક્કસ ડી-બ્રોગ્લી તરંગલંબાઈ ધરાવતો એક ન્યૂક્લિયસ A તત્ક્ષણિક વિખંડન અનુભવી બે ન્યૂક્લિયસો B અને C માં પરિણમે છે. B એ A ની દિશામાં ઉડે (ફેંકાય) છે જ્યારે C એ B ના વેગ કરતા અડધા વેગ સાથે વિરુદ્ધ દિશામાં ઉડે છે. B અને C ની ડી-બ્રોગ્લી તરંગલંબાઈઓ અનુક્રમે λ_B અને λ_C હશે :

Options :

1. $2\lambda_A, \lambda_A$

2. $\lambda_A, 2\lambda_A$

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

4. $\lambda_A, \frac{\lambda_A}{2}$

Question Number : 26 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The ratio of mass densities of nuclei of ^{40}Ca and ^{16}O is close to :

1. 0.1

2. 5

3. 2

4. 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

^{40}Ca तथा ^{16}O के नाभिकों के द्रव्यमान घनत्व के अनुपात का सन्निकट मान होगा :

Options :

1. 0.1

2. 5

3. 2

4. 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

^{40}Ca અને ^{16}O ની દળ ઘનતાનો ગુણોત્તર _____ ની નજીકનો છે.

Options :

1. 0.1

2. 5

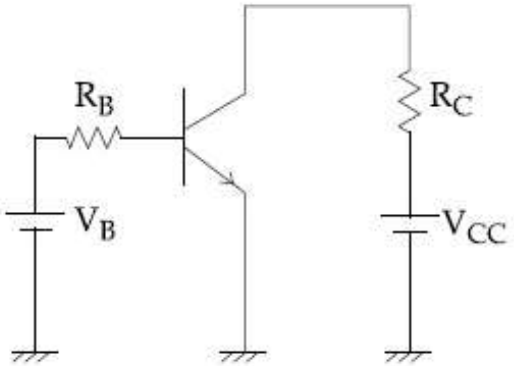
3. 2

4. 1

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

Correct Marks : 4 Wrong Marks : 1

एक npn ट्रांसिस्टर द्वारा बनाये गये उभयनिष्ठ उत्सर्जक प्रवर्धक को दिखाया गया है। इसका dc धारा प्रवर्धन 250 है तथा इसमें $R_C = 1\ k\Omega$ तथा $V_{CC} = 10\ V$ है। V_{CE} की संतृप्ति (saturation) के लिये आधार धारा का न्यूनतम मान होगा :



Options :

1. $10\ \mu A$

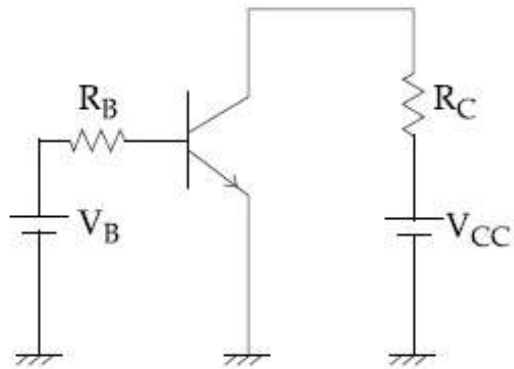
2. $40\ \mu A$

3. $7\ \mu A$

4. $100\ \mu A$

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

npn ટ્રાન્ઝિસ્ટરનો ઉપયોગ કરીને એક કોમન એમીટર એમ્પલીફાયરનો વિજપરિપથ આકૃતિમાં દર્શાવેલ છે. જેની dc પ્રવાહલબ્ધી 250, $R_C = 1\ k\Omega$ અને $V_{CC} = 10\ V$ છે. V_{CE} સંતૃપ્ત અવસ્થામાં પહોંચે તે માટેનો લઘુત્તમ બેઇઝ પ્રવાહ કેટલો છે?



Options :

1. $10\ \mu A$

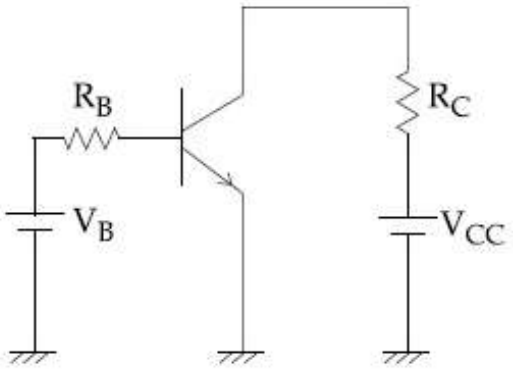
3. 7 μA

4. 100 μA

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

A common emitter amplifier circuit, built using an npn transistor, is shown in the figure. Its dc current gain is 250, $R_C = 1\ k\Omega$ and $V_{CC} = 10\ V$. What is the minimum base current for V_{CE} to reach saturation ?



Options :

1. 10 μA

2. 40 μA

3. 7 μA

4. 100 μA

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

Correct Marks : 4 Wrong Marks : 1

In a line of sight radio communication, a distance of about 50 km is kept between the transmitting and receiving antennas. If the height of the receiving antenna is 70 m, then the minimum height of the transmitting antenna should be :
(Radius of the Earth = 6.4×10^6 m).

Options :

1. 40 m

3. 51 m

4. 20 m

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 दृष्टिरेखीय रेडियो संचरण में प्रेषक तथा अभिग्राही एन्टीना के बीच 50 km की दूरी है। यदि अभिग्राही एन्टीना की ऊँचाई 70 m है तो प्रेषक एन्टीना की न्यूनतम ऊँचाई होनी चाहिये :
(दिया है : पृथ्वी की त्रिज्या= 6.4×10^6 m)

Options :

1. 40 m

2. 32 m

3. 51 m

4. 20 m

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 દૃષ્ટિ-રેખા (line of sight) સંચારણ (પ્રસરણ) માટે ટ્રાન્સમીટિંગ (પ્રસરણ) એન્ટિના અને રિસિવિંગ (ગ્રહણ) એન્ટિના વચ્ચે 50 km જેટલું અંતર જરૂરી છે. જો રિસિવિંગ એન્ટિનાની ઊંચાઈ 70 m હોય તો ટ્રાન્સમિટિંગ એન્ટિનાની ઓછામા ઓછી ઊંચાઈ _____ હશે.
(પૃથ્વીની ત્રિજ્યા = 6.4×10^6 m)

Options :

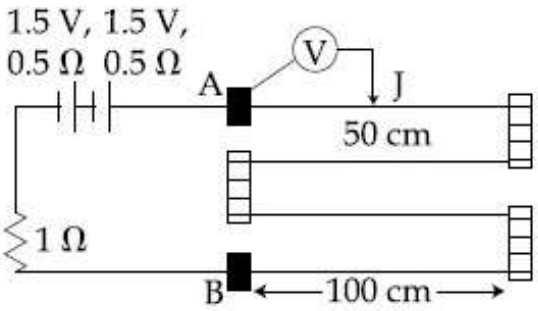
1. 40 m

2. 32 m

3. 51 m

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 the circuit shown, a four-wire potentiometer is made of a 400 cm long wire, which extends between A and B. The resistance per unit length of the potentiometer wire is $r = 0.01\ \Omega/cm$. If an ideal voltmeter is connected as shown with jockey J at 50 cm from end A, the expected reading of the voltmeter will be :



Options :

1. 0.25 V

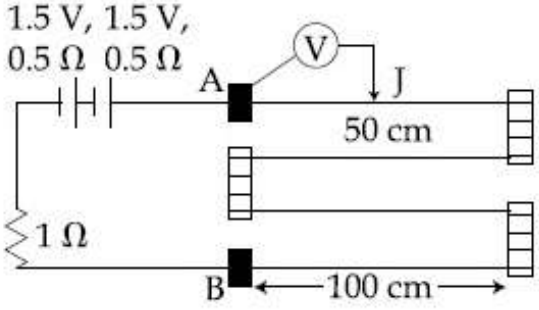
2. 0.20 V

3. 0.50 V

4. 0.75 V

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

प्रे परिपथ में एक चार तार वाले विभवमापी के 400 cm लम्बे तार को A तथा B के बीच में लगाया गया है (चित्र देखिये)। इस विभवमापी तार का एकाकी लम्बाई प्रतिरोध $r = 0.01\ \Omega/cm$ है। यदि एक आदर्श वोल्टमीटर को चित्रानुसार जॉकी J के साथ सिरे A से 50 cm दूरी पर लगाते हैं, तो वोल्टमीटर के पाठ्यांक का अपेक्षित मान होगा :



Options :

1. 0.25 V

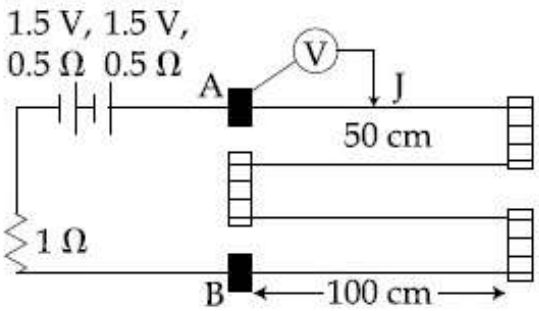
2. 0.20 V

3. 0.50 V

4. 0.75 V

Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

A અને B વચ્ચે 400 cm ની કુલ લંબાઈ ધરાવતા ચાર તાર વાળો પોટેન્શિયોમીટર આકૃતિમાં દર્શાવેલ છે. પોટેન્શિયોમીટર તારનો પ્રતિ એકમ લંબાઇએ અવરોધ $r = 0.01\ \Omega/cm$ છે. જ્યારે આદર્શ વોલ્ટમીટર ને બિંદુ A થી 50 cm દૂર જોકી J સાથે જોડવામાં આવે ત્યારે વોલ્ટમીટરનું સંભવિત રિડિંગ _____ થશે.



Options :

1. 0.25 V

3. 0.50 V

4. 0.75 V

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

In a simple pendulum experiment for determination of acceleration due to gravity (g), time taken for 20 oscillations is measured by using a watch of 1 second least count. The mean value of time taken comes out to be 30 s. The length of pendulum is measured by using a meter scale of least count 1 mm and the value obtained is 55.0 cm. The percentage error in the determination of g is close to :

Options :

1. 0.2 %

2. 0.7 %

3. 3.5 %

4. 6.8 %

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

एक सरल दोलक के प्रयोग, जिसमें गुरुत्वीय त्वरण (g) मापना है, में 20 दोलनों का समय एक 1 sec अल्पतमांक वाली एक विराम घड़ी से मापते हैं। इस समय का माध्य मान 30 s आता है। दोलक की लम्बाई को 1 mm अल्पतमांक के पैमाने से मापने पर 55.0 cm आती है। g के मापन में प्रतिशत त्रुटि का सन्निकट मान होगा :

Options :

1. 0.2 %

2. 0.7 %

4. 6.8 %

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

ગુરુત્વપ્રવેગ (g) શોધવાના સાદા લોલકના પ્રયોગમાં 1 સેકન્ડ લઘુત્તમ માપ શક્તિ ધરાવતી ઘડિયાળ વડે 20 દોલનનો સમય માપવામાં આવે છે. સયમનું સરેરાશ મૂલ્ય 30 s મળે છે. 1 mm લઘુત્તમ માપશક્તિ ધરાવતી માપપટ્ટી વડે લોલકની લંબાઈ માપવામાં આવે છે અને તેનું મૂલ્ય 55.0 cm મળે છે. g નું મૂલ્ય શોધવામાં પ્રતિશત ત્રૂટી _____ ની નજીક હશે. ?

Options :

1. 0.2 %

2. 0.7 %

3. 3.5 %

4. 6.8 %

Chemistry

Section Id :	416529320
Section Number :	2
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:	416529460
Question Shuffling Allowed :	Yes

Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The structure of Nylon-6 is :

Options :

1. $\left[C-(CH_2)_5-\overset{H}{\underset{|}{N}}\right]_n$

2. $\left[\overset{O}{\overset{\|}{C}}-(CH_2)_6-\overset{H}{\underset{|}{N}}\right]_n$

3. $\left[(CH_2)_4-\overset{O}{\overset{\|}{C}}-\overset{H}{\underset{|}{N}}\right]_n$

4. $\left[(CH_2)_6-\overset{O}{\overset{\|}{C}}-\overset{H}{\underset{|}{N}}\right]_n$

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

नाइलॉन-6 की संरचना है :

Options :

1. $\left[\overset{O}{\overset{\|}{C}}-(CH_2)_5-\overset{H}{\underset{|}{N}}\right]_n$

2. $\left[\overset{O}{\overset{\|}{C}}-(CH_2)_6-\overset{H}{\underset{|}{N}}\right]_n$

3. $\left[(CH_2)_4-\overset{O}{\overset{\|}{C}}-\overset{H}{\underset{|}{N}}\right]_n$

4. $\left[(CH_2)_6-\overset{O}{\overset{\|}{C}}-\overset{H}{\underset{|}{N}}\right]_n$

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

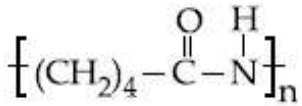
Correct Marks : 4 Wrong Marks : 1

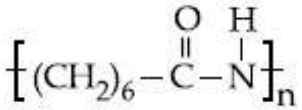
નાયલોન-6 નુ બંધારણ શોધો -

Options :

1. $\left[\overset{O}{\overset{\|}{C}}-(CH_2)_5-\overset{H}{\underset{|}{N}}\right]_n$

2. 

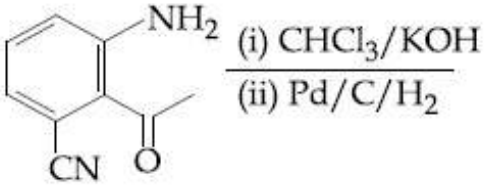
3. 

4. 

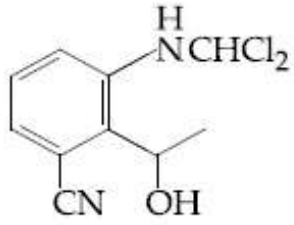
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

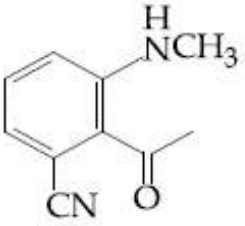
Correct Marks : 4 Wrong Marks : 1

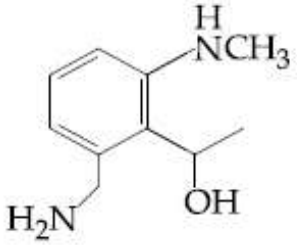
The major product obtained in the following reaction is :

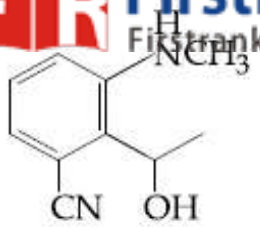


Options :

1. 

2. 

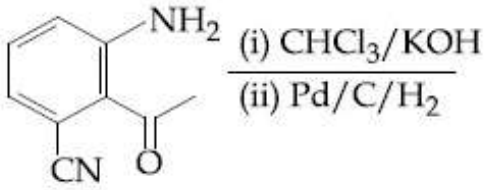
3. 

4. 

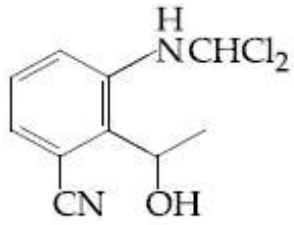
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

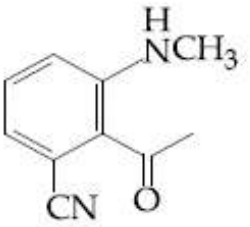
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में प्राप्त होने वाला मुख्य उत्पाद है :

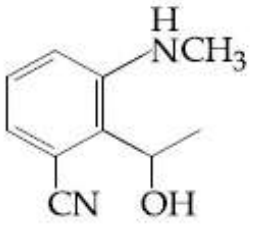


Options :

1. 

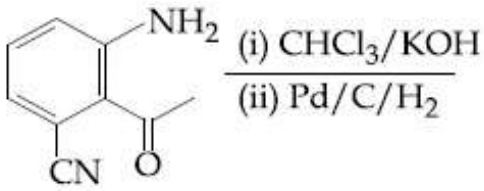
2. 

3. 

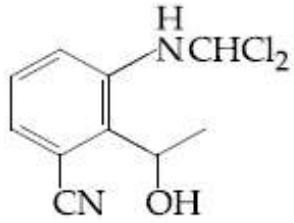
4. 

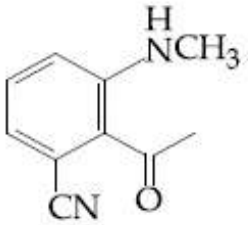
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

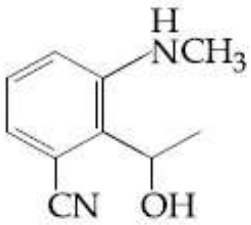


Options :

1. 

2. 

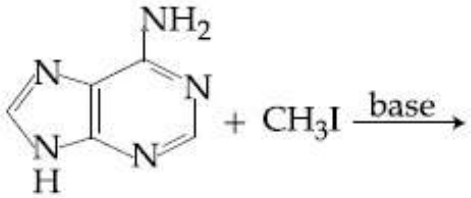
3. 

4. 

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

Correct Marks : 4 Wrong Marks : 1

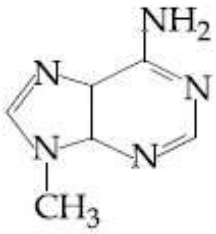
The major product in the following reaction is :

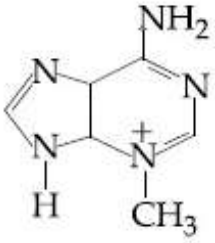


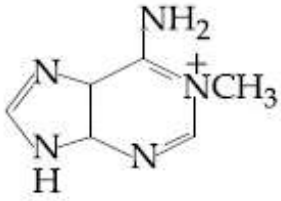
Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 

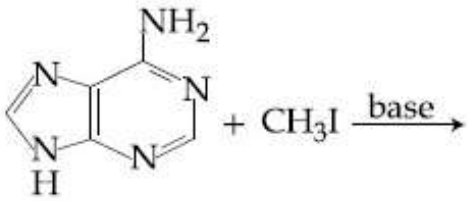
2. 

3. 

4. 

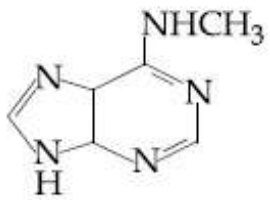
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में मुख्य उत्पाद है :

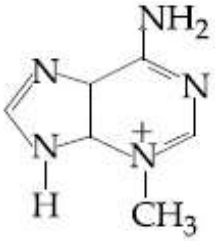


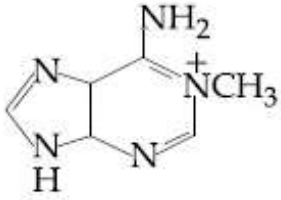
Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 

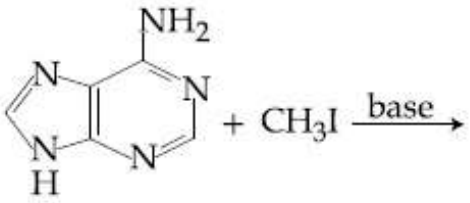
2. 

3. 

4. 

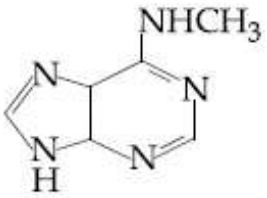
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

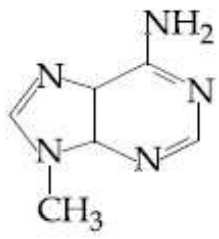
નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો



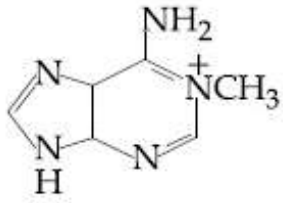
Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 

2. 

3. 

4. 

Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Polysubstitution is a major drawback in :

Options :

1. Friedel Craft's alkylation

2. Friedel Craft's acylation

3. Acetylation of aniline

4. Reimer Tiemann reaction

Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्न में से किसमें बहुप्रतिस्थापन एक मुख्य कमी है?

Options :

1. फ्रीडल-क्राफ्ट ऐल्किलेशन

2. फ्रीडल-क्राफ्ट ऐसाइलेशन (एसिलीकरण)

3. ऐनिलीन का ऐसिटिलेशन

4. राइमर टीमन अभिक्रिया

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

પ્યૂન (Polysubstitution) નીચે આપેલા
પૈકી ક્યા એકમાં મુખ્ય ખામી તરીકે જોવા મળે છે?

Options :

1. ફ્રીડલ-ક્રાફ્ટસ્ આલ્કાઈલેશન

2. ફ્રીડલ-ક્રાફ્ટસ્ એસાઇલેશન

3. એનીલીનનું એસીટીલેશન

4. રાઇમર ટાઇમન પ્રક્રિયા

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

Fructose and glucose can be distinguished by :

Options :

1. Fehling's test

2. Benedict's test

3. Barfoed's test

4. Seliwanoff's test

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

फ्रक्टोज़ तथा ग्लुकोज़ निम्न किसके द्वारा पहचाने जा सकते हैं?

Options :

1. फेहलिंग परीक्षण

2. बेनिडिक्ट परीक्षण

3. बार्फोड परीक्षण

4. सेलिवानॉफ परीक्षण

ફ્રુક્ટોઝ અને ગ્લુકોઝ નો ભેદ પારખવા માટે નીચેના માંથી કઈ કસોટી કરશો?

Options :

1. ફેહલિંગ કસોટી

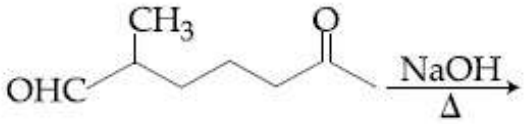
2. બેનિડિક્ટ કસોટી

3. બાર્ફોડ કસોટી

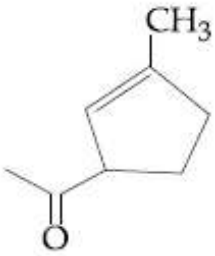
4. સેલ્વિનોફ કસોટી (Seliwanoff's test)

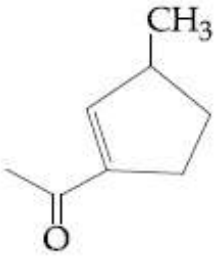
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

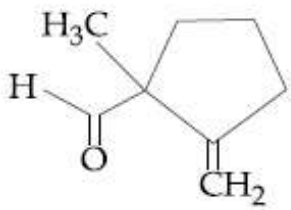
The major product obtained in the following reaction is :

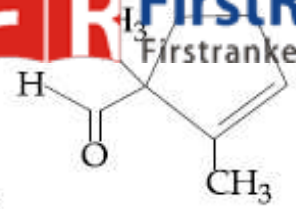


Options :

1. 

2. 

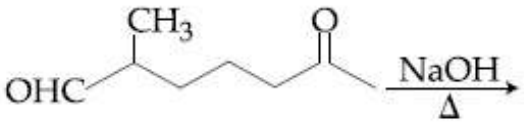
3. 

4. 

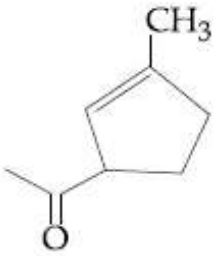
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

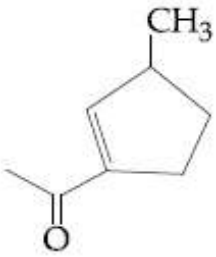
Correct Marks : 4 Wrong Marks : 1

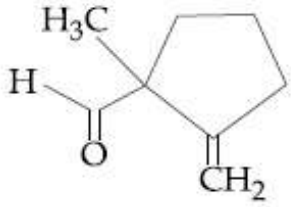
निम्न अभिक्रिया में प्राप्त होने वाला मुख्य उत्पाद है :

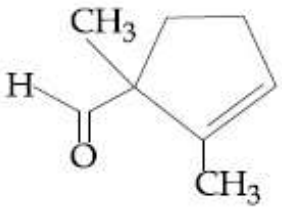


Options :

1. 

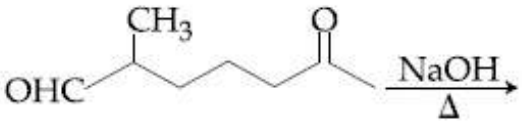
2. 

3. 

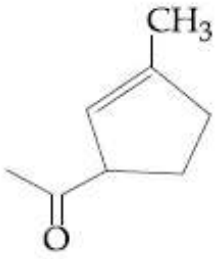
4. 

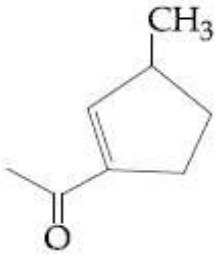
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

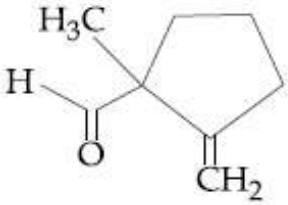
Correct Marks : 4 Wrong Marks : 1

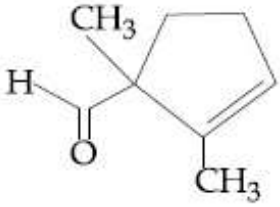


Options :

1. 

2. 

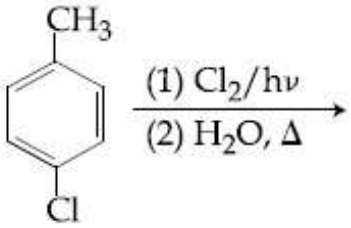
3. 

4. 

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

Correct Marks : 4 Wrong Marks : 1

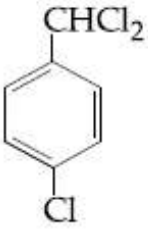
The major product of the following reaction is :

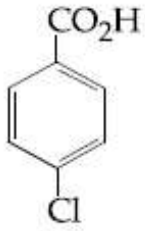


Options :

1. 

2. 

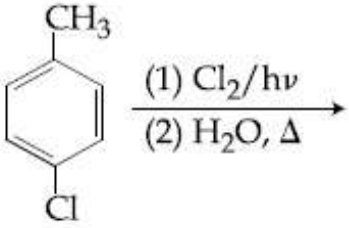
3. 

4. 

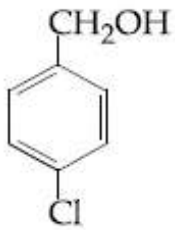
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

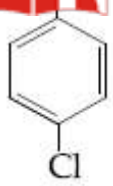
Correct Marks : 4 Wrong Marks : 1

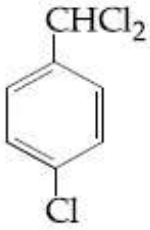
निम्न अभिक्रिया का मुख्य उत्पाद है :

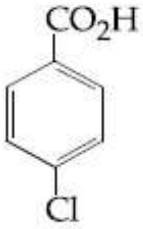


Options :

1. 

2. 

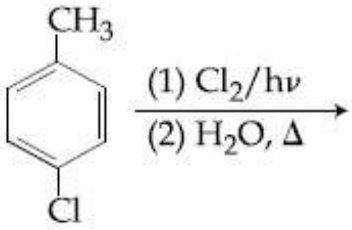
3. 

4. 

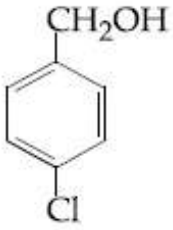
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

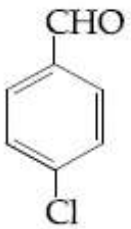
Correct Marks : 4 Wrong Marks : 1

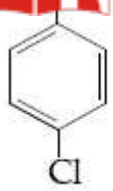
આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો

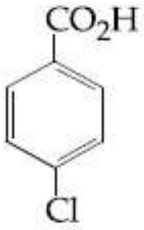


Options :

1. 

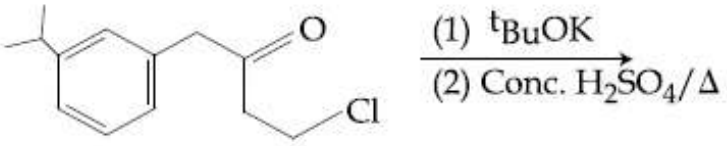
2. 

3. 

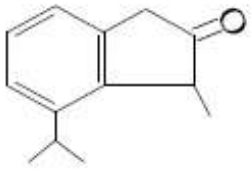
4. 

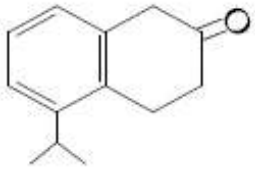
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

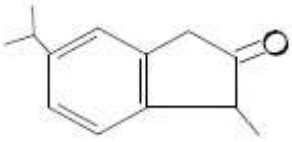
The major product of the following reaction is :

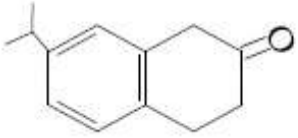


Options :

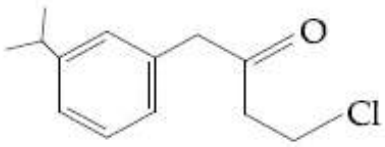
1. 

2. 

3. 

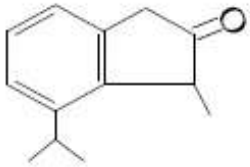
4. 

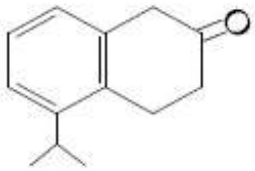
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

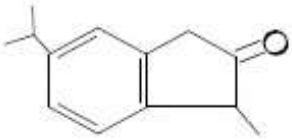


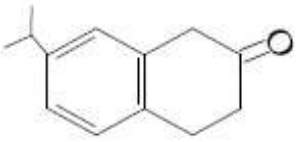
$\xrightarrow[(2)\ \text{Conc. } H_2SO_4/\Delta]{(1)\ {}^tBuOK}$

Options :

1. 

2. 

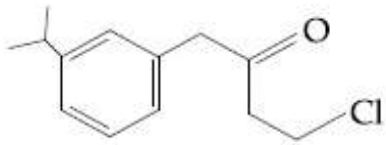
3. 

4. 

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

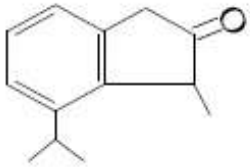
Correct Marks : 4 Wrong Marks : 1

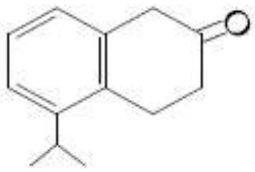
આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો



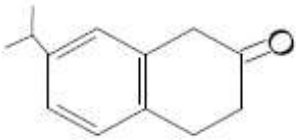
$\xrightarrow[(2)\ \text{સાંદ્ર } H_2SO_4/\Delta]{(1)\ {}^tBuOK}$

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

Which of the following compounds will show the maximum 'enol' content ?

Options :

1. $CH_3COCH_2COCH_3$

2. $CH_3COCH_2COOC_2H_5$

3. CH_3COCH_3

4. $CH_3COCH_2CONH_2$

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

Correct Marks : 4 Wrong Marks : 1

निम्न यौगिकों में से कौन-सा 'ईनॉल' की अधिकतम मात्रा प्रदर्शित करेगा ?

Options :

1. $CH_3COCH_2COCH_3$

2. $CH_3COCH_2COOC_2H_5$

3. CH_3COCH_3

4. $CH_3COCH_2CONH_2$

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 આપેલ સંયોજન પૈકી કયુ એક મહત્તમ ઈનોલ ધરાવે છે ?

Options :

2. $CH_3COCH_2COOC_2H_5$

3. CH_3COCH_3

4. $CH_3COCH_2CONH_2$

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 alkenes when treated with HCl yields majorly an anti Markovnikov product ?

Options :

1. $CH_3O-CH=CH_2$

2. $F_3C-CH=CH_2$

3. $Cl-CH=CH_2$

4. $H_2N-CH=CH_2$

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

निम्नलिखित ऐल्कीनों में से कौन-सा एक HCl के साथ अभिक्रिया करके मुख्यत: एक प्रति मार्कोनीकॉफ उत्पाद देता है?

Options :

1. $CH_3O-CH=CH_2$

2. $F_3C-CH=CH_2$

3. $Cl-CH=CH_2$

4. $H_2N-CH=CH_2$

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

આ આલ્કીનો પૈકી કયો એક જ્યારે HCl ની સાથે પ્રક્રિયા કરતા મુખ્યત્વે એન્ટિમાર્કોનીકોફ નીપજ આપશે?

Options :

1. $CH_3O-CH=CH_2$

2. $F_3C-CH=CH_2$

3. $Cl-CH=CH_2$

4. $H_2N-CH=CH_2$

Question Number : 41 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The IUPAC symbol for the element with atomic number 119 would be :

Options :

1. une

2. uun

3. unh

4. uue

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

119 परमाणु क्रमांक वाले तत्व के लिए आई.यू.पी.ए.सी. प्रतीक होगा :

Options :

1. une

2. uun

3. unh

4. uue

પરમાણ્વિય ક્રમાંક 119 ધરાવતા તત્વની IUPAC સંજ્ઞા શોધો

Options :

1. une
2. uun
3. unh
4. uue

The Mond process is used for the :

Options :

1. extraction of Zn
2. extraction of Mo
3. purification of Ni
4. purification of Zr and Ti

मॉन्ड प्रक्रम प्रयुक्त होता है :

Options :

1. Zn के निष्कर्षण के लिए
2. Mo के निष्कर्षण के लिए
3. Ni के शोधन के लिए
4. Zr तथा Ti के शोधन के लिए

મોન્ડ પ્રક્રમનો ઉપયોગ શેનો માટે થાય છે?

Options :

1. Zn ના નિષ્કર્ણ માટે

2. Mo ના નિષ્કર્ણ માટે

3. Ni ના શુદ્ધીકરણ માટે

4. Zr અને Ti શુદ્ધીકરણ માટે

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 strength of 11.2 volume solution of H_2O_2 is : [Given that molar mass of $H = 1\ g\ mol^{-1}$ and $O = 16\ g\ mol^{-1}$]

Options :

1. 13.6%

2. 3.4%

3. 1.7%

4. 34%

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

H_2O_2 के 11.2 आयतन विलयन की सामर्थ्य है,
(दिया गया है : मोलर द्रव्यमान $H = 1\ g\ mol^{-1}$ तथा $O = 16\ g\ mol^{-1}$)

Options :

1. 13.6%

2. 3.4%

3. 1.7%

4. 34%

11.2 ના કદ દ્રાવણ ધરાવતા H_2O_2 ની પ્રબળતા શોધો

(મોલર દળ $H = 1\ g\ mol^{-1}$ અને

$O = 16\ g\ mol^{-1}$)

Options :

1. 13.6%

2. 3.4%

3. 1.7%

4. 34%

The covalent alkaline earth metal halide ($X = Cl, Br, I$) is :

Options :

1. BeX_2

2. MgX_2

3. CaX_2

4. SrX_2

सहसंयोजी क्षारीय मृदा धातु हैलाइड ($X = Cl, Br, I$) है :

Options :

1. BeX_2

2. MgX_2

3. CaX_2

Question Number : 44 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

સહસંયોજક આલ્કલાઇન અર્થ ધાતુ હેલાઇડો $(X = Cl, Br, I)$ ક્યા?

Options :

1. BeX_2

2. MgX_2

3. CaX_2

4. SrX_2

Question Number : 45 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The correct statement about ICl_5 and ICl_4^- is :

Options :

1. both are isostructural.

2. ICl_5 is trigonal bipyramidal and ICl_4^- is tetrahedral.

3. ICl_5 is square pyramidal and ICl_4^- is square planar.

4. ICl_5 is square pyramidal and ICl_4^- is tetrahedral.

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

ICl_5 तथा ICl_4^- के लिए सत्य कथन है :

Options :

1. दोनों ही समसंरचनात्मक हैं।

2. त्रिसमनतीक्ष द्विपिरामिडी तथा ICl_4^- चतुष्फलकीय है।

3. ICl_5 वर्ग पिरामिडी तथा ICl_4^- वर्ग समतलीय है।

4. ICl_5 वर्ग पिरामिडी तथा ICl_4^- चतुष्फलकीय है।

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

ICl_5 અને ICl_4^- માટે સાચું વિધાન શું છે?

Options :

1. બન્ને સમબંધારણીય છે.

2. ICl_5 ત્રિકોણીય દ્વિપિરામિડ છે અને ICl_4^- ચતુષ્ફલકીય છે.

3. ICl_5 સમચોરસ પિરામિડલ છે અને ICl_4^- સમતલીય સમચોરસ છે.

4. ICl_5 સમચોરસ પિરામિડલ છે અને જ્યારે ICl_4^- ચતુષ્ફલકીય છે.

Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The ion that has sp^3d^2 hybridization for the central atom, is :

Options :

1. $[BrF_2]^-$

2. $[ICl_4]^-$

3. $[IF_6]^-$

4. $[ICl_2]^-$

निम्न में से किस आयन में केन्द्रीय परमाणु का संकरण sp^3d^2 है?

Options :

1. $[BrF_2]^-$

2. $[ICl_4]^-$

3. $[IF_6]^-$

4. $[ICl_2]^-$

નીચે આપેલા આયનોપૈકી કયામાં મધ્યસ્ત પરમાણુનું સંકરણ sp^3d^2 છે તે શોધો?

Options :

1. $[BrF_2]^-$

2. $[ICl_4]^-$

3. $[IF_6]^-$

4. $[ICl_2]^-$

The statement that is INCORRECT about the interstitial compounds is :

Options :

1. they have high melting points.

2. they are very hard.

3. they have metallic conductivity.

re chemically reactive.

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

अंतराली यौगिकों के बारे में जो कथन असत्य होगा, वह है :

Options :

1. उनके गलनांक उच्च होते हैं

2. वे बहुत कठोर होते हैं

3. उनमें धात्विक चालकता होती है

4. वे रासायनिक रूप से अभिक्रियाशील होते हैं

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

આંતરલીય સંયોજનો માટે નીચેના માંથી ક્યું વિધાન સાચું નથી?

Options :

1. તેઓના ગલન બિંદુ બહુ ઊંચા હોય છે.

2. તેઓ ખુબ કઠણ હોય છે.

3. તેઓ ધાત્વીય વાહકતા ધરાવે છે.

4. તેઓ રાસાયણિક રીતે સક્રીય હોય છે.

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

The compound that inhibits the growth of tumors is :

Options :

1. *cis*-$[Pt(Cl)_2(NH_3)_2]$

2. *trans*-$[Pt(Cl)_2(NH_3)_2]$

4. *trans*-$[Pd(Cl)_2(NH_3)_2]$

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

वह यौगिक जो ट्यूमर की वृद्धि को रोकता है, है :

Options :

1. *सिस*-$[Pt(Cl)_2(NH_3)_2]$

2. *ट्रांस*-$[Pt(Cl)_2(NH_3)_2]$

3. *सिस*-$[Pd(Cl)_2(NH_3)_2]$

4. *ट्रांस*-$[Pd(Cl)_2(NH_3)_2]$

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

સંયોજન જે ગાંઠ (tumors) ની વૃધ્ધિ અટકાવે છે તો શોધો?

Options :

1. *સિસ* -$[Pt(Cl)_2(NH_3)_2]$

2. *ટ્રાંસ*-$[Pt(Cl)_2(NH_3)_2]$

3. *સિસ*-$[Pd(Cl)_2(NH_3)_2]$

4. *ટ્રાંસ*-$[Pd(Cl)_2(NH_3)_2]$

Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The calculated spin-only magnetic moments (BM) of the anionic and cationic species of $[Fe(H_2O)_6]_2$ and $[Fe(CN)_6]$, respectively, are :

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

Options :

2. 0 and 5.92

3. 0 and 4.9

4. 2.84 and 5.92

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

$[Fe(H_2O)_6]_2$ तथा $[Fe(CN)_6]$ के ऋणायनिक तथा धनायनिक स्पीशीज के परिकलित प्रचक्रण – मात्र चुम्बकीय आघूर्ण (B.M. में) क्रमश: हैं :

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

Options :

1. 4.9 तथा 0

2. 0 तथा 5.92

3. 0 तथा 4.9

4. 2.84 तथा 5.92

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

$[Fe(H_2O)_6]_2$ અને $[Fe(CN)_6]$ માટેની ધન આયનિક (કેશ આયનિક) અને ઋણ આયનિક (એનાયનિક) સ્પીશીઝોમાટેની ગણિતીય ફક્ત સ્પીન ચુંબકીય ચાકમાત્રા (B.M.) અનુક્રમે છે :

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

Options :

1. 4.9 અને 0

2. 0 અને 5.92

3. 0 અને 4.9

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 maximum prescribed concentration of copper in drinking water is :

Options :

1. 0.5 ppm

2. 0.05 ppm

3. 3 ppm

4. 5 ppm

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

Correct Marks : 4 Wrong Marks : 1

पीने के जल में कॉपर (तांबें) की निर्धारित अधिकतम सान्द्रता है :

Options :

1. 0.5 ppm

2. 0.05 ppm

3. 3 ppm

4. 5 ppm

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

Correct Marks : 4 Wrong Marks : 1

કોપરની પીવાના પાણીમાં નિર્ધારિત મહત્તમ સાંદ્રતા કેટલી?

Options :

1. 0.5 ppm

2. 0.05 ppm

3. 3 ppm

Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The percentage composition of carbon by mole in methane is :

Options :

1. 25%

2. 75%

3. 20%

4. 80%

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

मोल के आधार पर मिथेन में कार्बन की प्रतिशतता संघटन है :

Options :

1. 25%

2. 75%

3. 20%

4. 80%

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

મીથેનમાં કાર્બનું ટકાવારી પ્રમાણ મોલમાં શોધો?

Options :

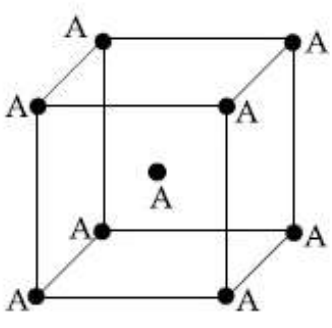
1. 25%

2. 75%

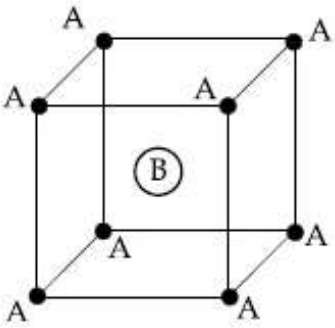
3. 20%

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

Consider the bcc unit cells of the solids 1 and 2 with the position of atoms as shown below. The radius of atom B is twice that of atom A. The unit cell edge length is 50% more in solid 2 than in 1. What is the approximate packing efficiency in solid 2?



Solid 1



Solid 2

Options :

1. 90%

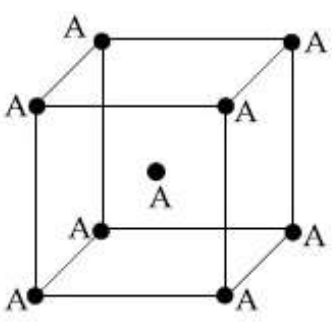
2. 75%

3. 65%

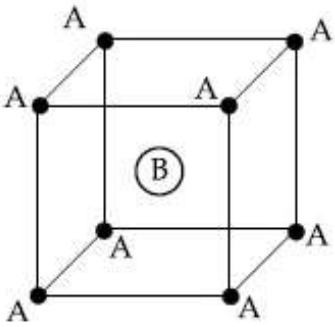
4. 45%

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

तथा 2 परमाणुओं का स्थिति के साथ, जैसा कि नीचे दर्शाया गया है, की बी.सी.सी. (का.कं.घ.) एकक कोष्ठिका पर विचार कीजिए। परमाणु B की त्रिज्या परमाणु A की त्रिज्या की दूनी है। ठोस 1 की एकक कोष्ठिका की कोर लम्बाई से ठोस 2 की एकक कोष्ठिका की कोर लम्बाई 50% ज्यादा है। ठोस 2 में लगभग सुसंकुलन दक्षता क्या है?



Solid 1



Solid 2

Options :

1. 90%

2. 75%

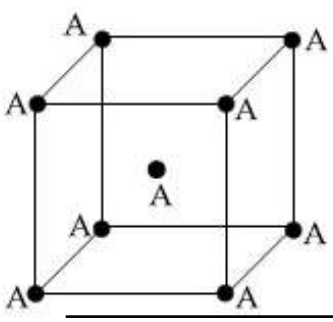
3. 65%

4. 45%

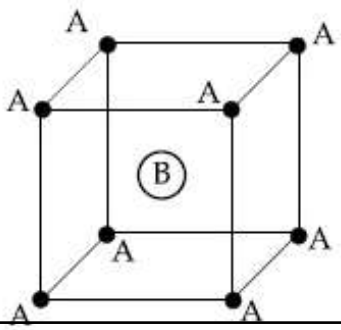
Question Number : 52 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે દર્શાવ્યા મુજબ પરમાણુની ગોઠવણી સાથે ઘન 1 અને 2 ના bcc એકમ કોષને ધ્યાનમાં લો પરમાણુ B ની ત્રિજ્યા પરમાણુ A કરતા બમણી છે. ઘન 2 ની એકમ કોશ ધાર લંબાઈ ઘન 1 કરતા 50% વધુ છે. તો ઘન 2 ની અંદાજીત પેકિંગ ક્ષમતા શોધો?



ઘન 1



ઘન 2

1. 90%

2. 75%

3. 65%

4. 45%

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

If p is the momentum of the fastest electron ejected from a metal surface after the irradiation of light having wavelength λ, then for 1.5 p momentum of the photoelectron, the wavelength of the light should be :

(Assume kinetic energy of ejected photoelectron to be very high in comparison to work function) :

Options :

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

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

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

4. $\frac{4}{9}\lambda$

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

गहरूय के प्रकाश से किरणित होने पर एक धातु की सतह से निकले हुए तीव्रतम इलेक्ट्रॉन की संवेग p है तो प्रकाशिक इलेक्ट्रॉन के 1.5 p संवेग के लिए प्रकाश का तरंगदैर्घ्य होगा :

(मान लीजिये कि निष्कासित प्रकाशिक इलेक्ट्रॉन की K.E. (गतिज ऊर्जा) उसके कार्यफलन की तुलना में बहुत उच्च है)

Options :

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

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

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

4. $\frac{4}{9}\lambda$

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

જો λ તરંગલંબાઈ ધરાવતા પ્રકાશને ધાતુની સપાટી ઊપર કિરણન્ કરતા સૌથી ઝડપથી ઉત્સર્જિત થતા ઇલેક્ટ્રોનનું વેગમાંન p હોય તો 1.5 p વેગમાન ધરાવતા ફોટોઇલેક્ટ્રોની તરંગલંબાઈ શોધો.

(કાર્ય વિધેયની સરખામણીમાં ઉત્સર્જિત થતા ફોટોઇલેક્ટ્રોનની ગતિકી ઊર્જા ઘણીજ વધારે છે.- એવું ધારો)

Options :

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

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

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

4. 9

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

Among the following molecules/ions,

$C_2^{2-}, N_2^{2-}, O_2^{2-}, O_2$

which one is diamagnetic and has the shortest bond length ?

Options :

1. O_2^{2-}

2. C_2^{2-}

3. N_2^{2-}

4. O_2

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

Correct Marks : 4 Wrong Marks : 1

निम्न अणुओं/आयनों में

$C_2^{2-}, N_2^{2-}, O_2^{2-}, O_2$

कौन प्रतिचुम्बकीय है और उसकी आबन्ध लम्बाई सबसे कम है?

Options :

1. O_2^{2-}

2. C_2^{2-}

3. N_2^{2-}

4. O_2

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

Correct Marks : 4 Wrong Marks : 1

$C_2^{2-}, N_2^{2-}, O_2^{2-}, O_2$

પૈકી ક્યો એક પ્રતિચુંબકીય છે? અને તેની બંધ લંબાઈ ટુકામાં ટુકી હશે?

Options :

1. O_2^{2-}

2. C_2^{2-}

3. N_2^{2-}

4. O_2

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

Correct Marks : 4 Wrong Marks : 1

5 moles of an ideal gas at 100 K are allowed to undergo reversible compression till its temperature becomes 200 K. If $C_V = 28\ J\ K^{-1}\ mol^{-1}$, calculate ΔU and ΔpV for this process. $(R = 8.0\ J\ K^{-1}\ mol^{-1})$

Options :

1. $\Delta U = 14\ kJ; \Delta(pV) = 18\ kJ$

2. $\Delta U = 14\ J; \Delta(pV) = 0.8\ J$

3. $\Delta U = 14\ kJ; \Delta(pV) = 4\ kJ$

4. $\Delta U = 2.8\ kJ; \Delta(pV) = 0.8\ kJ$

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

100 K पर, एक आदर्श गैस के 5 मोल का उत्क्रमणीय संपीडन तब तक किया जाता है जब तक की उसका ताप 200 K नहीं हो जाता। यदि $C_V = 28\ J\ K^{-1} mol^{-1}$, तो इस प्रक्रम के लिए ΔU तथा ΔpV की गणना कीजिए $(R = 8.0\ J\ K^{-1}\ mol^{-1})$

Options :

1. 4 kJ; $\Delta(pV) = 18$ kJ

2. $\Delta U = 14$ J; $\Delta(pV) = 0.8$ J

3. $\Delta U = 14$ kJ; $\Delta(pV) = 4$ kJ

4. $\Delta U = 2.8$ kJ; $\Delta(pV) = 0.8$ kJ

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

100 K ને એક આદર્શ વાયુના 5 મોલને 200 K તાપમાન થાય ત્યાં સુધી પ્રતિવર્તી સંકોચન કરવા દેવામાં આવે છે જો $C_V = 28\ J\ K^{-1} mol^{-1}$ હોય, તો આ પ્રક્રિયા માટે ΔU અને ΔpV શોધો. $(R = 8.0\ J\ K^{-1}\ mol^{-1})$

Options :

1. $\Delta U = 14$ kJ; $\Delta(pV) = 18$ kJ

2. $\Delta U = 14$ J; $\Delta(pV) = 0.8$ J

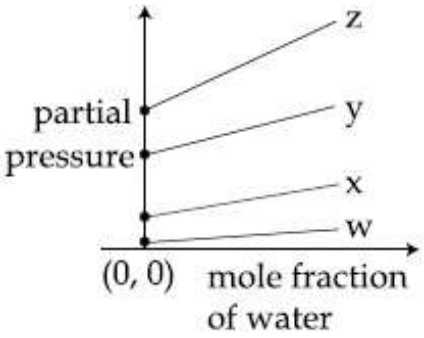
3. $\Delta U = 14$ kJ; $\Delta(pV) = 4$ kJ

4. $\Delta U = 2.8$ kJ; $\Delta(pV) = 0.8$ kJ

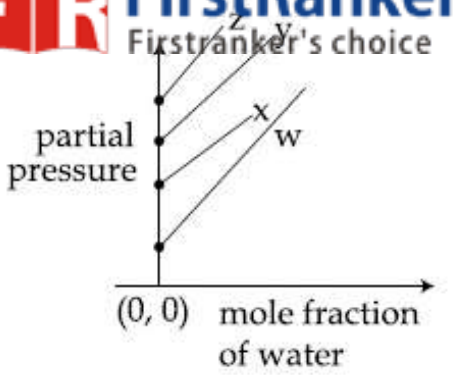
Question Number : 56 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

For the solution of the gases w, x, y and z in water at 298 K, the Henrys law constants (K_H) are 0.5, 2, 35 and 40 kbar, respectively. The correct plot for the given data is :

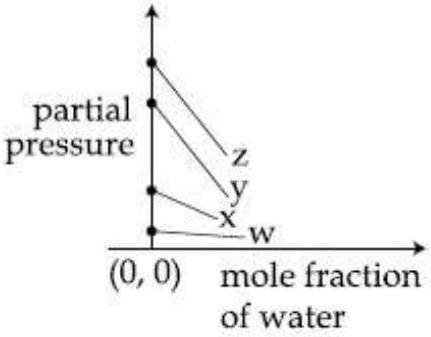
Options :

1.


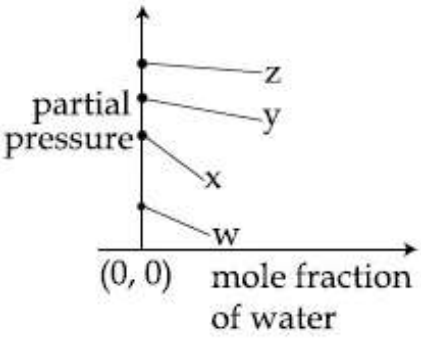
2.



3.



4.



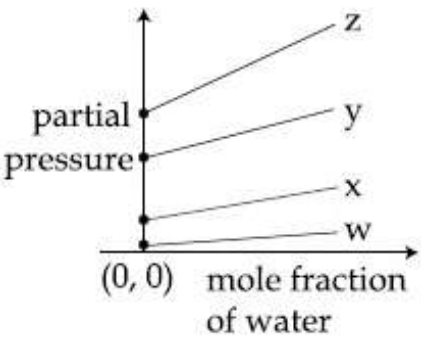
Question Number : 56 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

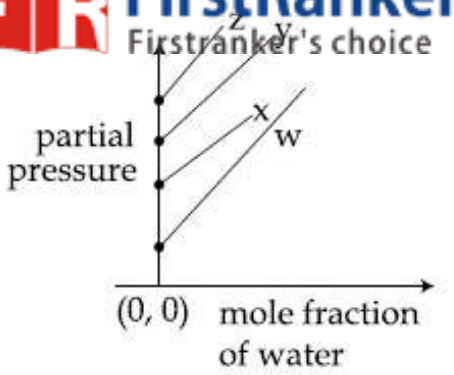
298 K पर जल में गैस w, x, y तथा z के विलयन के लिए हेनरी नियम स्थिरांक (K_H) क्रमश: 0.5, 2, 35 तथा 40 kbar हैं। दिये आँकड़ों के लिये सही प्लाट है :

Options :

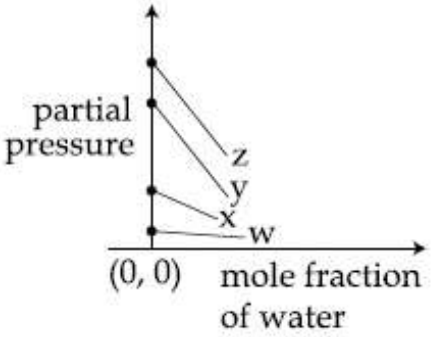
1.



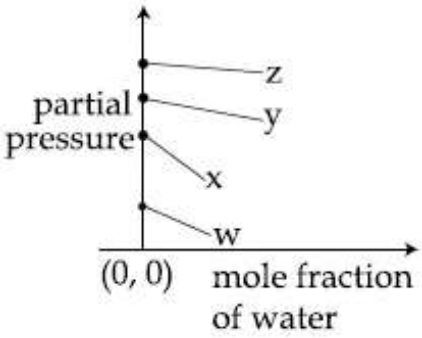
2.



3.



4.



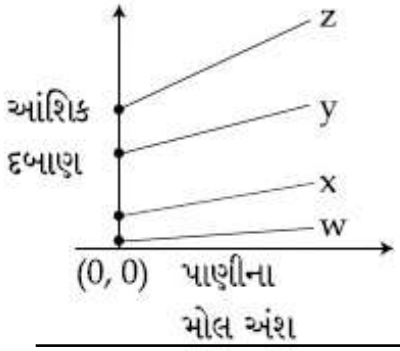
Question Number : 56 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

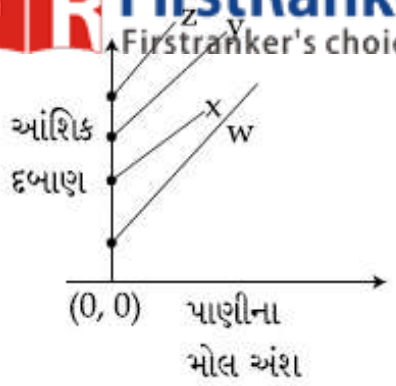
298 K ને આપેલા વાયુ w, x, y અને z નું પાણીમાં દ્રાવણ બનાવતા તેઓનો હેન્રી નિયમ અચળાંક (K_H) અનુક્રમે 0.5, 2, 35 અને 40 kbar છે. આ આંકડા (માહિતી) માટેનો સાચો આલેખ કયો ?

Options :

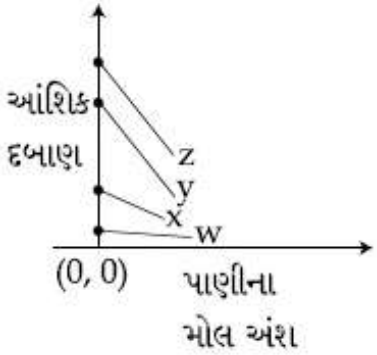
1.



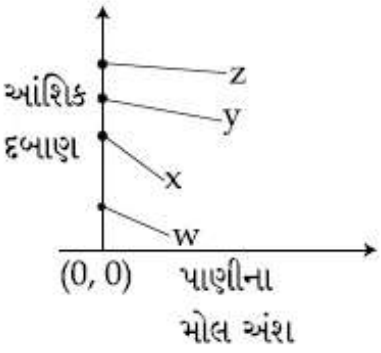
2.



3.



4.



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

Correct Marks : 4 Wrong Marks : 1

For the following reactions, equilibrium constants are given :

$S(s) + O_2(g) \rightleftharpoons SO_2(g)$; $K_1 = 10^{52}$

$2S(s) + 3O_2(g) \rightleftharpoons 2SO_3(g)$; $K_2 = 10^{129}$

The equilibrium constant for the reaction,

$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ is :

Options :

1. 10^{77}

2. 10^{181}

3. 10^{154}

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

नीचे दी गई अभिक्रियाओं के लिये साम्य स्थिरांक दिये गये हैं :

$S(s)+O_2(g) \rightleftharpoons SO_2(g);\ K_1 = 10^{52}$

$2S(s)+3O_2(g) \rightleftharpoons 2SO_3(g);\ K_2 = 10^{129}$

अभिक्रिया

$2SO_2(g)+O_2(g) \rightleftharpoons 2SO_3(g)$ का साम्य स्थिरांक होगा :

Options :

1. 10^{77}

2. 10^{181}

3. 10^{154}

4. 10^{25}

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

આપેલી પ્રક્રિયાઓ માટે સંતુલન અચળાંકો આપેલા છે

$S(s)+O_2(g) \rightleftharpoons SO_2(g);\ K_1 = 10^{52}$

$2S(s)+3O_2(g) \rightleftharpoons 2SO_3(g);\ K_2 = 10^{129}$ તો આપેલ પ્રક્રિયા માટેનો સંતુલન અચળાંક શોધો

$2SO_2(g)+O_2(g) \rightleftharpoons 2SO_3(g)$

Options :

1. 10^{77}

2. 10^{181}

3. 10^{154}

4. 10^{25}

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

Calculate the standard cell potential (in V) of the cell in which following reaction takes place :

$Fe^{2+}(aq) + Ag^{+}(aq) \rightarrow Fe^{3+}(aq) + Ag(s)$

Given that

$E^{o}_{Ag^{+}/Ag} = x\,V$

$E^{o}_{Fe^{2+}/Fe} = y\,V$

$E^{o}_{Fe^{3+}/Fe} = z\,V$

Options :

1. $x - y$
2. $x - z$
3. $x + y - z$
4. $x + 2y - 3z$

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

उस सेल के मानक सेल विभव (V में) की गणना कीजिए जिसमें निम्न अभिक्रिया होती है :

$Fe^{2+}(aq) + Ag^{+}(aq) \rightarrow Fe^{3+}(aq) + Ag(s)$

दिया गया है :

$E^{o}_{Ag^{+}/Ag} = x\,V$

$E^{o}_{Fe^{2+}/Fe} = y\,V$

$E^{o}_{Fe^{3+}/Fe} = z\,V$

Options :

1. $x - y$
2. $x - z$
3. $x + y - z$

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

કોશ જેમાં નીચે આપેલી પ્રક્રિયા થાય છે

$Fe^{2+}(aq) + Ag^{+}(aq) \rightarrow Fe^{3+}(aq) + Ag(s)$

તો કોશનો પ્રમાણિત કોશ પોટેન્શિયલ (V માં)શોધો

$E^{o}_{Ag^{+}/Ag} = x\,V$

$E^{o}_{Fe^{2+}/Fe} = y\,V$

$E^{o}_{Fe^{3+}/Fe} = z\,V$

Options :

1. $x - y$

2. $x - z$

3. $x + y - z$

4. $x + 2y - 3z$

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

Correct Marks : 4 Wrong Marks : 1

For a reaction scheme $A \xrightarrow{k_1} B \xrightarrow{k_2} C$, if the rate of formation of B is set to be zero then the concentration of B is given by :

Options :

1. $\left(\frac{k_1}{k_2}\right)[A]$

2. $(k_1 + k_2)\,[A]$

3. $(k_1 - k_2)\,[A]$

4. $k_1 k_2\,[A]$

अभिक्रिया योजना $A \xrightarrow{k_1} B \xrightarrow{k_2} C$ के लिए, यदि B के बनने की दर शून्य कर दी जाय तो B की सान्द्रता निम्न के द्वारा दी जायेगी :

Options :

1. $\left(\frac{k_1}{k_2}\right)[A]$

2. $(k_1 + k_2)\,[A]$

3. $(k_1 - k_2)\,[A]$

4. $k_1 k_2\,[A]$

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

આપેલી પ્રક્રિયા રૂપરેખા $A \xrightarrow{k_1} B \xrightarrow{k_2} C$ માટે જો B બનવાનો દર શૂન્ય કરેલ હોય તો B ની સાંદ્રતા શોધો

Options :

1. $\left(\frac{k_1}{k_2}\right)[A]$

2. $(k_1 + k_2)\,[A]$

3. $(k_1 - k_2)\,[A]$

4. $k_1 k_2\,[A]$

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

0.27 g of a long chain fatty acid was dissolved in 100 cm^3 of hexane. 10 mL of this solution was added dropwise to the surface of water in a round watch glass. Hexane evaporates and a monolayer is formed. The distance from edge to centre of the watch glass is 10 cm. What is the height of the monolayer ?

[Density of fatty acid = 0.9 g cm^{-3}; $\pi = 3$]

1. 10^{-4} m

2. 10^{-6} m

3. 10^{-2} m

4. 10^{-8} m

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

दीर्घ शृंखला वाले फैटी एसिड के 0.27 g को $100\ cm^3$ हेक्सेन में घोला गया। इस विलयन के 10 mL को एक गोलाकार वाच ग्लास में रखे जल की सतह पर बूँद बूँद करके गिराया गया। हेक्सेन वाष्पीकृत हो गई और एक एकल पर्त बन गई। वाच ग्लास के किनारे से उसके केन्द्र तक की दूरी 10 cm है। उस एकल परत की ऊँचाई क्या होगी?

(फैटी एसिड का घनत्व $=0.9\ g\ cm^{-3}$, $\pi=3$)

Options :

1. 10^{-4} m

2. 10^{-6} m

3. 10^{-2} m

4. 10^{-8} m

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

0.27 g લાંબી શૃંખલા ધરાવતા ફેટી એસિડને $100\ cm^3$ હેક્ઝેનમાં ઓગાળવામાં આવ્યો. આના 10 mL દ્રાવણ ને ટીંપે ટીંપે ગોળાકાર વોચ ગ્લાસમાં પાણીની સપાટી ઉપર નાખવામાં આવ્યું. હેક્ઝેનું બાષ્પીભવન થયું અને એક સ્તર (મોનોલેયર) બન્યું. જો ધારીથી વોચ ગ્લાસ ના કેન્દ્રનું અંતર 10 cm હોય તો એક સ્તર (મોનોલેયર) ની ઊંચાઈ શોધો ?

(ફેટી એસિડની ઘનતા $=0.9\ g\ cm^{-3}$, $\pi=3$)

Options :

2. 10^{-6} m

3. 10^{-2} m

4. 10^{-8} m

Mathematics

Section Id :	416529321
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:	416529461
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 $f(x) = a^x$ $(a>0)$ be written as $f(x) = f_1(x) + f_2(x)$, where $f_1(x)$ is an even function and $f_2(x)$ is an odd function. Then $f_1(x+y) + f_1(x-y)$ equals :

Options :

1. $2f_1(x)f_1(y)$

2. $2f_1(x+y)f_1(x-y)$

3. $2f_1(x)f_2(y)$

4. $2f_1(x+y)f_2(x-y)$

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

$f(x)=a^x\ (a>0)$ को $f(x)=f_1(x)+f_2(x)$ के रूप में लिखा गया है जबकि $f_1(x)$ एक सम फलन है और $f_2(x)$ एक विषम फलन है, तो $f_1(x+y)+f_1(x-y)$ बराबर है :

Options :

1. $2f_1(x)f_1(y)$

2. $2f_1(x+y)f_1(x-y)$

3. $2f_1(x)f_2(y)$

4. $2f_1(x+y)f_2(x-y)$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f(x)=a^x\ (a>0)$ ને $f(x)=f_1(x)+f_2(x)$ તરીકે લખવામાં આવે છે જ્યાં $f_1(x)$ એ યુગ્મ વિધેય છે અને $f_2(x)$ એ અયુગ્મ વિધેય છે. તો વિધેય $f_1(x+y)+f_1(x-y)$ બરાબર _____ છે.

Options :

1. $2f_1(x)f_1(y)$

2. $2f_1(x+y)f_1(x-y)$

3. $2f_1(x)f_2(y)$

4. $2f_1(x+y)f_2(x-y)$

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

Correct Marks : 4 Wrong Marks : 1

If $z=\frac{\sqrt{3}}{2}+\frac{i}{2}\ (i=\sqrt{-1})$, then $(1+iz+z^5+iz^8)^9$ is equal to :

Options :

1. 1

2. -1

$2i)^9$

4. 0

Question Number : 62 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

यदि $z=\frac{\sqrt{3}}{2}+\frac{i}{2}$ $(i=\sqrt{-1})$, तो

$(1+iz+z^5+iz^8)^9$ बराबर है :

Options :

1. 1

2. -1

3. $(-1+2i)^9$

4. 0

Question Number : 62 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

જો $z=\frac{\sqrt{3}}{2}+\frac{i}{2}$ $(i=\sqrt{-1})$ તો $(1+iz+z^5+iz^8)^9$

બરાબર _____ છે.

Options :

1. 1

2. -1

3. $(-1+2i)^9$

4. 0

Question Number : 63 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The number of integral values of m for which the equation $(1+m^2)x^2-2(1+3m)x+(1+8m)=0$ has no real root is :

Options :

2. 3

3. infinitely many

4. 1

Question Number : 63 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

m के उन पूर्णांक मानों की संख्या, जिनके लिए समीकरण, $(1+m^2)x^2-2(1+3m)x+(1+8m)=0$ के कोई भी वास्तविक मूल नहीं हैं, है :

Options :

1. 2

2. 3

3. अनन्त

4. 1

Question Number : 63 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

સમીકરણ $(1+m^2)x^2-2(1+3m)x+(1+8m)=0$ ને એક પણ વાસ્તવિક બીજ ન હોય તે માટેની m ની પૂર્ણાંક કિંમતોની સંખ્યા _____ છે.

Options :

1. 2

2. 3

3. અનંત

4. 1

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

Let the numbers 2, b, c be in an A.P. and $A=\begin{bmatrix}1 & 1 & 1\\ 2 & b & c\\ 4 & b^2 & c^2\end{bmatrix}$. If $\det(A) \in [2, 16]$, then c lies in the interval :

Options :

1. $[3, 2+2^{3/4}]$
2. $[4, 6]$
3. $[2, 3)$
4. $(2+2^{3/4}, 4)$

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

माना संख्याएं 2, b, c एक समान्तर श्रेढ़ी में हैं तथा $A=\begin{bmatrix}1 & 1 & 1\\ 2 & b & c\\ 4 & b^2 & c^2\end{bmatrix}$. यदि $\det(A) \in [2, 16]$, तो c निम्न में से किस अन्तराल में है :

Options :

1. $[3, 2+2^{3/4}]$
2. $[4, 6]$
3. $[2, 3)$
4. $(2+2^{3/4}, 4)$

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

a, b, c એ સમાંતર શ્રેણી (A.P.) માં છે, અને $A=\begin{bmatrix}1 & 1 & 1\\ 2 & b & c\\ 4 & b^2 & c^2\end{bmatrix}$. જો $\det(A)\in[2,16]$, તો c એ _____ અંતરાલમાં આવેલ છે.

Options :

1. $[3, 2+2^{3/4}]$

2. $[4, 6]$

3. $[2, 3)$

4. $(2+2^{3/4}, 4)$

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

If the system of linear equations

$x-2y+kz=1$

$2x+y+z=2$

$3x-y-kz=3$

has a solution (x, y, z), $z\neq 0$, then (x, y) lies on the straight line whose equation is :

Options :

1. $4x-3y-1=0$

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

3. $3x-4y-4=0$

4. $4x-3y-4=0$

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

Correct Marks : 4 Wrong Marks : 1

$x-2y+kz=1$
$2x+y+z=2$
$3x-y-kz=3$

का एक हल (x, y, z), $z \neq 0$ है, तो (x, y) जिस रेखा पर स्थित है, उसका समीकरण है :

Options :

1. $4x-3y-1=0$

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

3. $3x-4y-4=0$

4. $4x-3y-4=0$

Question Number : 65 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

જો સુરેખ સમીકરણ સંહતિ

$x-2y+kz=1$
$2x+y+z=2$
$3x-y-kz=3$

ને એક ઉકેલ (x, y, z), $z \neq 0$, હોય, તો (x, y) જે રેખા પર આવે તેનું સમીકરણ _____ છે.

Options :

1. $4x-3y-1=0$

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

3. $3x-4y-4=0$

4. $4x-3y-4=0$

Question Number : 66 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The number of four-digit numbers strictly greater than 4321 that can be formed using the digits 0, 1, 2, 3, 4, 5 (repetition of digits is allowed) is :

Options :

2. 360

3. 288

4. 306

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

अंकों 0, 1, 2, 3, 4, 5 को प्रयोग करके (जहाँ अंकों को दोहराया जा सकता है) बनाई जा सकने वाली चार अंकों की संख्याओं, जो 4321 से अधिक (strictly greater) हों, की संख्या है :

Options :

1. 310

2. 360

3. 288

4. 306

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

Correct Marks : 4 Wrong Marks : 1

અંકો 0, 1, 2, 3, 4, 5 નો ઉપયોગ કરી 4321 થી મોટી ચાર અંકોની કેટલી સંખ્યાઓ બનાવી શકાય? (અંકોનું પુનરાવર્તન કરવાની છૂટ છે).

Options :

1. 310

2. 360

3. 288

4. 306

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

If the fourth term in the binomial expansion of $\left(\sqrt{\frac{1}{x^{1+\log_{10}x}}}+x^{\frac{1}{12}}\right)^6$ is equal to 200, and $x > 1$, then the value of x is :

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

Options :

1. 100

2. 10

3. 10^4

4. 10^3

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

Correct Marks : 4 Wrong Marks : 1

यदि $\left(\sqrt{\frac{1}{x^{1+\log_{10}x}}}+x^{\frac{1}{12}}\right)^6$ के द्विपद प्रसार का चौथा पद 200 है तथा $x > 1$ है, तो x का मान है :

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

Options :

1. 100

2. 10

3. 10^4

4. 10^3

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

Correct Marks : 4 Wrong Marks : 1

જો $\left(\sqrt{x^{1+\log_{10} x}}+x^{\frac{1}{12}}\right)^{6}$ ના દ્વિપદી વિસ્તરણમાં

ચોથું પદ 200 હોય અને $x > 1$, તો x ની કિંમત _____ છે.

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

Options :

1. 100

2. 10

3. 10^4

4. 10^3

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

Correct Marks : 4 Wrong Marks : 1

If three distinct numbers a, b, c are in G.P. and the equations $ax^2+2bx+c=0$ and $dx^2+2ex+f=0$ have a common root, then which one of the following statements is correct ?

Options :

1. d, e, f are in G.P.

2. d, e, f are in A.P.

3. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ are in G.P.

4. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ are in A.P.

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 तीन भिन्न संख्याएं a, b, c गुणोत्तर श्रेढ़ी में हैं तथा समीकरण $ax^2+2bx+c=0$ और $dx^2+2ex+f=0$ का एक उभयनिष्ठ मूल है, तो निम्न में से कौन-सा एक कथन सत्य है?

Options :

2. d, e, f समांतर श्रेढ़ी में हैं।

3. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ गुणोत्तर श्रेढ़ी में हैं।

4. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ समांतर श्रेढ़ी में हैं।

Question Number : 68 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

જો ત્રણ ભિન્ન સંખ્યાઓ a, b, c સમુગુણોત્તર શ્રેણી (G.P.) માં હોય અને સમીકરણો $ax^2+2bx+c=0$ અને $dx^2+2ex+f=0$ ને કોઈ એક સામાન્ય બીજ હોય, તો નીચેના પૈકી કયું વિધાન સાચું છે?

Options :

1. d, e, f સમગુણોત્તર શ્રેણી (G.P.) માં છે.

2. d, e, f સમાંતર શ્રેણી (A.P.) માં છે.

3. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ સમગુણોત્તર શ્રેણી (G.P.) માં છે.

4. $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ સમાંતર શ્રેણી (A.P.) માં છે.

Question Number : 69 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

The sum $\sum_{k=1}^{20} k\frac{1}{2^k}$ is equal to :

Options :

1. $2-\frac{11}{2^{19}}$

2. $2-\frac{21}{2^{20}}$

3. 2^{20}

4. $2-\frac{3}{2^{17}}$

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

योग $\sum_{k=1}^{20} k\frac{1}{2^k}$ बराबर है :

Options :

1. $2-\frac{11}{2^{19}}$

2. $2-\frac{21}{2^{20}}$

3. $1-\frac{11}{2^{20}}$

4. $2-\frac{3}{2^{17}}$

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

સરવાળો $\sum_{k=1}^{20} k\frac{1}{2^k}$ બરાબર _____ છે.

Options :

1. $2-\frac{11}{2^{19}}$

2. $2-\frac{21}{2^{20}}$

3. $1-\frac{11}{2^{20}}$

4. $2-\frac{3}{2^{17}}$

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

Let $f : \mathbf{R} \to \mathbf{R}$ be a differentiable function satisfying $f'(3) + f'(2) = 0$. Then

$\lim\limits_{x \to 0} \left(\dfrac{1 + f(3+x) - f(3)}{1 + f(2-x) - f(2)} \right)^{\frac{1}{x}}$ is equal to :

Options :

1. e

2. 1

3. e^{-1}

4. e^2

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

माना $f : \mathbf{R} \to \mathbf{R}$ एक अवकलनीय फलन है जो कि $f'(3) + f'(2) = 0$ को संतुष्ट करता है, तो

$\lim\limits_{x \to 0} \left(\dfrac{1 + f(3+x) - f(3)}{1 + f(2-x) - f(2)} \right)^{\frac{1}{x}}$ बराबर है :

Options :

1. e

2. 1

3. e^{-1}

4. e^2

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

: $R \to R$ એ વિકલનીય વિધેય છે અને $f'(3)+f'(2)=0$ છે. તો

$$\lim_{x\to 0}\left(\frac{1+f(3+x)-f(3)}{1+f(2-x)-f(2)}\right)^{\frac{1}{x}}$$

બરાબર _____ છે.

Options :

1. e

2. 1

3. e^{-1}

4. e^2

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

Correct Marks : 4 Wrong Marks : 1

If $f(1)=1, f'(1)=3$, then the derivative of $f(f(f(x)))+(f(x))^2$ at $x=1$ is :

Options :

1. 9

2. 12

3. 15

4. 33

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

Correct Marks : 4 Wrong Marks : 1

यदि $f(1)=1, f'(1)=3$ है, तो $f(f(f(x)))+(f(x))^2$ का $x=1$ पर अवकलज है :

Options :

1. 9

2. 12

3. 15

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

જો $f(1)=1, f'(1)=3$, તો
$f(f(f(x)))+(f(x))^2$ નું $x=1$ આગળ વિકલિત
_____ છે.

Options :

1. 9

2. 12

3. 15

4. 33

Question Number : 72 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Let $f:[-1,3]\to$ R be defined as

$$f(x)=\begin{cases}|x|+[x], & -1\le x<1\\ x+|x|, & 1\le x<2\\ x+[x], & 2\le x\le 3,\end{cases}$$

where [t] denotes the greatest integer less than or equal to t. Then, f is discontinuous at :

Options :

1. only one point

2. only two points

3. only three points

4. four or more points

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

$[-1,3] \to \mathbb{R}$ इस प्रकार परिभाषित है कि

$$f(x)=\begin{cases}|x|+[x], & -1\le x<1\\ x+|x|, & 1\le x<2\\ x+[x], & 2\le x\le 3,\end{cases}$$

जहाँ $[t]$, t या उससे कम अधिकतम पूर्णांक को दर्शाता है। तो, f असंतत है :

Options :

1. केवल एक बिंदु पर

2. केवल दो बिंदुओं पर

3. केवल तीन बिंदुओं पर

4. चार अथवा उससे अधिक बिंदुओं पर

Question Number : 72 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

ધારો કે $f:[-1,3] \to \mathbf{R}$ એ

$$f(x)=\begin{cases}|x|+[x] & -1\le x<1\\ x+|x| & 1\le x<2\\ x+[x] & 2\le x\le 3,\end{cases}$$

થી વ્યાખ્યાયિત છે, જ્યાં $[t]$ એ t થી નાના અથવા t ને સમાન તમામ પૂર્ણાંકોમાં સૌથી મોટો પૂર્ણાંક દર્શાવે છે. તો f એ _____ આગળ અસતત છે.

Options :

1. ફક્ત એક બિંદુ

2. ફક્ત બે બિંદુઓ

3. ફક્ત ત્રણ બિંદુઓ

4. ચાર અથવા વધારે બિંદુઓ

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

ght of a right circular cylinder of maximum volume inscribed in a sphere of radius 3 is :

Options :

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

2. $2\sqrt{3}$

3. $\sqrt{6}$

4. $\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

एक गोले जिसकी त्रिज्या 3 है, के अन्तर्गत बने अधिकतम आयतन के लंबवृत्तीय बेलन की ऊँचाई है :

Options :

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

2. $2\sqrt{3}$

3. $\sqrt{6}$

4. $\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

3 ત્રિજ્યાવાળ ગોલકમાં અંતર્ગત મહત્તમ ઘનફળવાળા લંબવૃત્તીય નળાકારની ઊંચાઈ _____ છે.

Options :

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

2. $2\sqrt{3}$

3. $\sqrt{6}$

Question Number : 74 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

If

$$\int \frac{dx}{x^3(1+x^6)^{2/3}} = xf(x)(1+x^6)^{\frac{1}{3}} + C$$

where C is a constant of integration, then the function $f(x)$ is equal to :

Options :

1. $-\frac{1}{6x^3}$

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

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

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

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

यदि

$$\int \frac{dx}{x^3(1+x^6)^{2/3}} = xf(x)(1+x^6)^{\frac{1}{3}} + C$$

जहाँ C एक समाकलन अचर है, तो फलन $f(x)$ बराबर है :

Options :

1. $-\frac{1}{6x^3}$

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

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

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

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

જો

$$\int \frac{dx}{x^3(1+x^6)^{2/3}} = xf(x)(1+x^6)^{\frac{1}{3}} + C$$

જ્યાં C એ સંકલનનો અચળાંક છે, તો વિધેય $f(x)$ બરાબર _____ છે.

Options :

1. $-\frac{1}{6x^3}$

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

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

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

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

Let $f(x) = \int_0^x g(t)dt$, where g is a non-zero even function. If $f(x+5) = g(x)$, then $\int_0^x f(t)dt$ equals :

Options :

1. $\int_{x+5}^{5} g(t)dt$

2. $\int_{5}^{} g(t)dt$

3. $2\int_{5}^{x+5} g(t)dt$

4. $5\int_{x+5}^{5} g(t)dt$

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

Correct Marks : 4 Wrong Marks : 1

माना $f(x)=\int_{0}^{x} g(t)dt$ है, जहाँ g एक शून्येत्तर सम फलन

है। यदि $f(x+5)=g(x)$ है, तो $\int_{0}^{x} f(t)dt$ बराबर है :

Options :

1. $\int_{x+5}^{5} g(t)dt$

2. $\int_{5}^{x+5} g(t)dt$

3. $2\int_{5}^{x+5} g(t)dt$

4. $5\int_{x+5}^{5} g(t)dt$

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

$\int_0^x g(t)dt$, જ્યાં g એ શૂન્યેતર યુગ્મ વિધેય

છે. જો $f(x+5)=g(x)$, તો $\int_0^x f(t)dt$ બરાબર

_____ છે.

Options :

1. $\int_{x+5}^{5} g(t)dt$

2. $\int_{5}^{x+5} g(t)dt$

3. $2\int_{5}^{x+5} g(t)dt$

4. $5\int_{x+5}^{5} g(t)dt$

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

Let $S(\alpha)=\{(x,y): y^2\le x,\ 0\le x\le\alpha\}$ and $A(\alpha)$ is area of the region $S(\alpha)$. If for a $\lambda, 0<\lambda<4$, $A(\lambda): A(4)=2:5$, then λ equals :

Options :

1. $4\left(\frac{4}{25}\right)^{\frac{1}{3}}$

2. $4\left(\frac{2}{5}\right)^{\frac{1}{3}}$

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

4. $2\left(\frac{4}{25}\right)^{\frac{1}{3}}$

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

Correct Marks : 4 Wrong Marks : 1

माना $S(\alpha)=\{(x,y): y^2 \le x, 0 \le x \le \alpha\}$ तथा $A(\alpha)$, क्षेत्र $S(\alpha)$ का क्षेत्रफल है। यदि किसी $\lambda, 0<\lambda<4$ के लिए $A(\lambda) : A(4) = 2:5$ है, तो λ बराबर है :

Options :

1. $4\left(\frac{4}{25}\right)^{\frac{1}{3}}$

2. $4\left(\frac{2}{5}\right)^{\frac{1}{3}}$

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

4. $2\left(\frac{4}{25}\right)^{\frac{1}{3}}$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $S(\alpha)=\{(x,y): y^2 \le x, 0 \le x \le \alpha\}$ અને $A(\alpha)$ એ પ્રદેશ $S(\alpha)$ નું ક્ષેત્રફળ છે. જો $0<\lambda<4$ માટે, $A(\lambda) : A(4) = 2:5$, તો λ બરાબર _____ છે.

Options :

1. $4\left(\frac{4}{25}\right)^{\frac{1}{3}}$

2. $4\left(\frac{2}{5}\right)^{\frac{1}{3}}$

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

4. $2\frac{1}{25}$

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

Given that the slope of the tangent to a curve $y=y(x)$ at any point (x,y) is $\frac{2y}{x^2}$. If the curve passes through the centre of the circle $x^2+y^2-2x-2y=0$, then its equation is :

Options :

1. $x\log_e|y|=2(x-1)$

2. $x\log_e|y|=x-1$

3. $x\log_e|y|=-2(x-1)$

4. $x^2\log_e|y|=-2(x-1)$

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

दिया है कि वक्र $y=y(x)$ के किसी बिंदु (x,y) पर खींची गई स्पर्श रेखा की ढाल (slope) $\frac{2y}{x^2}$ है। यदि यह वक्र, वृत्त $x^2+y^2-2x-2y=0$ के केंद्र से होकर जाता है, तो इसका समीकरण है :

Options :

1. $x\log_e|y|=2(x-1)$

2. $x\log_e|y|=x-1$

3. $x\log_e|y|=-2(x-1)$

4. $x^2\log_e|y|=-2(x-1)$

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

y = y(x) ના બિંદુ (x, y) આગળના તેના સ્પર્શકનો ઢાળ $\frac{2y}{x^2}$ આપેલ છે. જો આ વક્ર વર્તુળ $x^2+y^2-2x-2y=0$ ના કેન્દ્ર માંથી પસાર થતો હોય, તો તેનું સમીકરણ _____ છે.

Options :

1. $x \log_e |y| = 2(x-1)$

2. $x \log_e |y| = x-1$

3. $x \log_e |y| = -2(x-1)$

4. $x^2 \log_e |y| = -2(x-1)$

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

The tangent and the normal lines at the point $(\sqrt{3}, 1)$ to the circle $x^2+y^2=4$ and the x-axis form a triangle. The area of this triangle (in square units) is :

Options :

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

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

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

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

Question Number : 78 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

वृत्त $x^2+y^2=4$ के बिंदु $(\sqrt{3}, 1)$ पर खींची गई स्पर्श रेखा और अभिलंब तथा x-अक्ष एक त्रिभुज बनाते हैं। इस त्रिभुज का (वर्ग इकाइयों में) क्षेत्रफल है :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

વર્તુળ $x^2+y^2=4$ ના બિંદુ $(\sqrt{3}, 1)$ આગળની સ્પર્શ અને અભિલંબ રેખાઓ તથા x-અક્ષ એક ત્રિકોણ રચે છે. તો આ ત્રિકોણનું ક્ષેત્રફળ (ચો. એકમમાં) _____ છે.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

Suppose that the points (h, k), (1, 2) and $(-3, 4)$ lie on the line L_1. If a line L_2 passing through the points (h, k) and (4, 3) is perpendicular to L_1, then $\frac{k}{h}$ equals :

Options :

1. 3

2. 3

3. 0

4. $-\frac{1}{7}$

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

Correct Marks : 4 Wrong Marks : 1

माना बिंदु (h, k), (1, 2) तथा (−3, 4) एक रेखा L_1 पर स्थित हैं। यदि बिंदुओं (h, k) तथा (4, 3) से होकर जाने वाली रेखा L_2, रेखा L_1 के लंबवत है, तो $\frac{k}{h}$ बराबर है :

Options :

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

2. 3

3. 0

4. $-\frac{1}{7}$

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

ધારો કે બિંદુઓ (h, k), (1, 2) અને (−3, 4) રેખા L_1 પર આવેલા છે. જો રેખા L_2 એ બિંદુઓ (h, k) અને (4, 3) માંથી પસાર થતી હોય અને રેખા L_1 ને લંબ હોય, તો $\frac{k}{h}$ બરાબર _____ છે.

Options :

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

3. 0

4. $-\frac{1}{7}$

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

The tangent to the parabola $y^2=4x$ at the point where it intersects the circle $x^2+y^2=5$ in the first quadrant, passes through the point :

Options :

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

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

3. $\left(\frac{3}{4}, \frac{7}{4}\right)$

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

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

परवलय $y^2=4x$ के उस बिंदु, जहाँ यह वृत्त $x^2+y^2=5$ को प्रथम चतुर्थांश में काटता है, पर खींची गई स्पर्श रेखा जिस बिंदु से होकर जाती है, वह है :

Options :

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

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

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

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

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

વર્તુળ $x^2+y^2=5$ ને પ્રથમ ચરણમાં પરવલય $y^2=4x$ જ્યાં છેદે તે બિંદુ આગળનો આ પરવલયનો સ્પર્શક _____ બિંદુમાંથી પસાર થાય છે.

Options :

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

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

3. $\left(\frac{3}{4}, \frac{7}{4}\right)$

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

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

Correct Marks : 4 Wrong Marks : 1

In an ellipse, with centre at the origin, if the difference of the lengths of major axis and minor axis is 10 and one of the foci is at $(0, 5\sqrt{3})$, then the length of its latus rectum is :

Options :

1. 8

2. 10

3. 5

Question Number : 81 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

यदि एक दीर्घवृत्त जिसका केंद्र मूलबिंदु पर है, के दीर्घ अक्ष तथा लघु अक्ष की लंबाइयों का अंतर 10 है तथा एक नाभिकेंद्र $(0, 5\sqrt{3})$ पर है, तो इसके नाभिलंब की लंबाई है :

Options :

1. 8

2. 10

3. 5

4. 6

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

ઉગમબિંદુ આગળ કેન્દ્ર હોય તેવા કોઈ ઉપવલયના પ્રધાન અક્ષ અને ગૌણ અક્ષની લંબાઈઓનો તફાવત 10 હોય અને જો તેની કોઈ એક નાભિ $(0, 5\sqrt{3})$ આગળ હોય, તો તેના નાભિલંબની લંબાઈ _____ છે.

Options :

1. 8

2. 10

3. 5

4. 6

Question Number : 82 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

If the eccentricity of the standard hyperbola passing through the point (4, 6) is 2, then the equation of the tangent to the hyperbola at (4, 6) is :

1. $3x-2y=0$

2. $2x-y-2=0$

3. $2x-3y+10=0$

4. $x-2y+8=0$

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

यदि बिंदु (4, 6) से होकर जाने वाले मानक अतिपरवलय की उत्केंद्रता 2 है, तो (4, 6) पर अतिपरवलय पर खींची गई स्पर्श रेखा का समीकरण है :

Options :

1. $3x-2y=0$

2. $2x-y-2=0$

3. $2x-3y+10=0$

4. $x-2y+8=0$

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

જો બિંદુ (4, 6) માંથી પસાર થતા પ્રમાણિત અતિવલયની ઉત્કેન્દ્રતા 2 હોય, તો આ અતિવલયના બિંદુ (4, 6) આગળના સ્પર્શકનું સમીકરણ _____ છે.

Options :

1. $3x-2y=0$

2. $2x-y-2=0$

3. $2x-3y+10=0$

4. $x-2y+8=0$

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

The vector equation of the plane through the line of intersection of the planes $x+y+z=1$ and $2x+3y+4z=5$ which is perpendicular to the plane $x-y+z=0$ is :

Options :

1. $\vec{r}\times(\hat{i}+\hat{k})+2=0$

2. $\vec{r}\times(\hat{i}-\hat{k})+2=0$

3. $\vec{r}\cdot(\hat{i}-\hat{k})-2=0$

4. $\vec{r}\cdot(\hat{i}-\hat{k})+2=0$

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

Correct Marks : 4 Wrong Marks : 1

समतलों $x+y+z=1$ तथा $2x+3y+4z=5$ की प्रतिच्छेदन रेखा से हो कर जाने वाले तथा समतल $x-y+z=0$ के लंबवत समतल का सदिश समीकरण है :

Options :

1. $\vec{r}\times(\hat{i}+\hat{k})+2=0$

2. $\vec{r}\times(\hat{i}-\hat{k})+2=0$

3. $\vec{r}\cdot(\hat{i}-\hat{k})-2=0$

4. $\vec{r}\cdot(\hat{i}-\hat{k})+2=0$

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

Correct Marks : 4 Wrong Marks : 1

સમતલો $x+y+z=1$ અને $2x+3y+4z=5$ ની છેદરેખામાંથી પસાર થતું હોય અને સમતલ $x-y+z=0$ ને લંબ હોય તેવા સમતલનું સદિશ સમીકરણ _____ છે.

Options :

1. $\vec{r}\cdot(\hat{i}-\hat{k})+2=0$

2. $\vec{r}\times(\hat{i}-\hat{k})+2=0$

3. $\vec{r}\cdot(\hat{i}-\hat{k})-2=0$

4. $\vec{r}\cdot(\hat{i}-\hat{k})+2=0$

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

Correct Marks : 4 Wrong Marks : 1

If a point R(4, y, z) lies on the line segment joining the points P(2, -3, 4) and Q(8, 0, 10), then the distance of R from the origin is :

Options :

1. $\sqrt{53}$

2. $2\sqrt{14}$

3. $2\sqrt{21}$

4. 6

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

यदि एक बिंदु R(4, y, z), बिंदुओं P(2, -3, 4) तथा Q(8, 0, 10) को मिलाने वाले रेखाखण्ड पर स्थित है, तो R की मूलबिंदु से दूरी है :

Options :

1. $\sqrt{53}$

2. $2\sqrt{14}$

3. $2\sqrt{21}$

4. 6

જો બિંદુ R(4, y, z) એ બિંદુઓ P(2, -3, 4) અને Q(8, 0, 10) ને જોડતા રેખાખંડ પર આવેલું હોય, તો R નું ઉગમબિંદુથી અંતર _____ છે.

Options :

1. $\sqrt{53}$

2. $2\sqrt{14}$

3. $2\sqrt{21}$

4. 6

Let $\vec{a} = 3\hat{i} + 2\hat{j} + x\hat{k}$ and $\vec{b} = \hat{i} - \hat{j} + \hat{k}$, for some real x. Then $\left|\vec{a} \times \vec{b}\right| = r$ is possible if :

Options :

1. $0 < r \leq \sqrt{\frac{3}{2}}$

2. $\sqrt{\frac{3}{2}} < r \leq 3\sqrt{\frac{3}{2}}$

3. $3\sqrt{\frac{3}{2}} < r < 5\sqrt{\frac{3}{2}}$

4. $r \geq 5\sqrt{\frac{3}{2}}$

किसी वास्तविक संख्या x के लिए $\vec{a}=3\hat{i}+2\hat{j}+x\hat{k}$ तथा $\vec{b}=\hat{i}-\hat{j}+\hat{k}$ है। तो $\left|\vec{a}\times\vec{b}\right|=r$ तभी सम्भव है, जब :

Options :

1. $0<r\leq\sqrt{\frac{3}{2}}$

2. $\sqrt{\frac{3}{2}}<r\leq 3\sqrt{\frac{3}{2}}$

3. $3\sqrt{\frac{3}{2}}<r<5\sqrt{\frac{3}{2}}$

4. $r\geqslant 5\sqrt{\frac{3}{2}}$

Question Number : 85 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

કોઈક વાસ્તવિક x માટે, ધારો કે $\vec{a}=3\hat{i}+2\hat{j}+x\hat{k}$ અને $\vec{b}=\hat{i}-\hat{j}+\hat{k}$ છે. તો $\left|\vec{a}\times\vec{b}\right|=r$ એ _____ હોય ત્યારે શક્ય બને.

Options :

1. $0<r\leq\sqrt{\frac{3}{2}}$

2. $\sqrt{\frac{3}{2}}<r\leq 3\sqrt{\frac{3}{2}}$

3. $3\sqrt{\frac{3}{2}}<r<5\sqrt{\frac{3}{2}}$

4. $r\geqslant 5\sqrt{\frac{3}{2}}$

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

Marks : 4 Wrong Marks : 1

A student scores the following marks in five tests : 45, 54, 41, 57, 43. His score is not known for the sixth test. If the mean score is 48 in the six tests, then the standard deviation of the marks in six tests is :

Options :

1. $\frac{100}{3}$

2. $\frac{10}{3}$

3. $\frac{10}{\sqrt{3}}$

4. $\frac{100}{\sqrt{3}}$

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

Correct Marks : 4 Wrong Marks : 1

एक विद्यार्थी पाँच परीक्षाओं में निम्न अंक प्राप्त करता है : 45, 54, 41, 57, 43. उसके द्वारा छटी परीक्षा में प्राप्त अंक ज्ञात नहीं हैं। यदि छः परीक्षाओं में प्राप्त अंकों का माध्य 48 है तो छः परीक्षाओं में प्राप्त अंकों का मानक विचलन है :

Options :

1. $\frac{100}{3}$

2. $\frac{10}{3}$

3. $\frac{10}{\sqrt{3}}$

4. $\frac{100}{\sqrt{3}}$

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

Correct Marks : 4 Wrong Marks : 1

વિદ્યાર્થી પાંચ પરીક્ષાઓમાં નીચે પ્રમાણે ગુણ મેળવે છે : 45, 54, 41, 57, 43. છઠ્ઠી પરીક્ષાના તેના ગુણની જાણ નથી. જો છ પરીક્ષાઓના તેના સરેરાશ ગુણ 48 હોય, તો છ પરીક્ષાઓના ગુણનું પ્રમાણિત વિચલન _____ છે.

Options :

1. $\frac{100}{3}$

2. $\frac{10}{3}$

3. $\frac{10}{\sqrt{3}}$

4. $\frac{100}{\sqrt{3}}$

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

The minimum number of times one has to toss a fair coin so that the probability of observing at least one head is at least 90% is :

Options :

1. 2

2. 3

3. 4

4. 5

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

Correct Marks : 4 Wrong Marks : 1

एक अनभिनत सिक्के को कम से कम कितनी बार उछाला जाए ताकि कम से कम एक चित्त आने की प्रायिकता, कम से कम 90% हो ?

Options :

1. 2

3. 4

4. 5

Question Number : 87 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

કોઈ એક સમતોલ સિક્કાને ઓછામાં ઓછી કેટલી વખત ઉછાળવો પડે કે જેથી ઓછામાં ઓછી એક છાપ મળે તેની સંભાવના ઓછામાં ઓછી 90% થાય?

Options :

1. 2

2. 3

3. 4

4. 5

Question Number : 88 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

If the lengths of the sides of a triangle are in A.P. and the greatest angle is double the smallest, then a ratio of lengths of the sides of this triangle is :

Options :

1. 5 : 6 : 7

2. 5 : 9 : 13

3. 4 : 5 : 6

4. 3 : 4 : 5

Question Number : 88 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

त्रिभुज की भुजाओं की लंबाइयाँ समांतर श्रेढ़ी में हैं तथा इसका सबसे बड़ा कोण सबसे छोटे कोण का दुगुना है, तो त्रिभुज की भुजाओं की लंबाइयों का एक अनुपात है :

Options :

1. 5 : 6 : 7

2. 5 : 9 : 13

3. 4 : 5 : 6

4. 3 : 4 : 5

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

Correct Marks : 4 Wrong Marks : 1

જે કોઈ ત્રિકોણની બાજુઓની લંબાઈઓ સમાંતર શ્રેણી (A.P.) માં હોય અને તેનો મોટામાં મોટો ખૂણો તેના નાનામાં નાના ખૂણા કરતાં બમણો હોય, તો આ ત્રિકોણની બાજુઓની લંબાઈઓનો ગુણોત્તર _____ છે.

Options :

1. 5 : 6 : 7

2. 5 : 9 : 13

3. 4 : 5 : 6

4. 3 : 4 : 5

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

Two vertical poles of heights, 20 m and 80 m stand apart on a horizontal plane. The height (in meters) of the point of intersection of the lines joining the top of each pole to the foot of the other, from this horizontal plane is :

Options :

1. 12

3. 16

4. 18

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

20 मी. तथा 80 मी. ऊँचाई वाले दो खंभे, एक क्षैतिज समतल पर सीधे खड़े हैं। प्रत्येक खंभे के शिखर को दूसरे खंभे के पाद से मिलाने वाली रेखाओं के प्रतिच्छेदन बिंदु की इस समतल से ऊँचाई (मीटरों में) है :

Options :

1. 12

2. 15

3. 16

4. 18

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

20 m અને 80 m ઊંચા બે શિરોલંબ થાંભલાઓ એક સીધી લીટીમાં અલગ ઉભા છે. પ્રત્યેક થાંભલાની ટોચને અન્ય થાંભલાના તળીયા સાથે જોડતી રેખાઓના છેદબિંદુની ઊંચાઈ (મીટરમાં) _____ છે.

Options :

1. 12

2. 15

3. 16

4. 18

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

ine of the following statements is not a tautology?

Options :

1. $(p \wedge q) \rightarrow p$

2. $p \rightarrow (p \vee q)$

3. $(p \vee q) \rightarrow (p \vee (\sim q))$

4. $(p \wedge q) \rightarrow (\sim p) \vee q$

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

निम्न कथनों में से कौन-सा एक, एक पुनरुक्ति (tautology) **नहीं** है?

Options :

1. $(p \wedge q) \rightarrow p$

2. $p \rightarrow (p \vee q)$

3. $(p \vee q) \rightarrow (p \vee (\sim q))$

4. $(p \wedge q) \rightarrow (\sim p) \vee q$

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

નીચેના પૈકી કયું વિધાન એ નિત્યસત્ય નથી?

Options :

1. $(p \wedge q) \rightarrow p$

2. $p \rightarrow (p \vee q)$

3. $(p \vee q) \rightarrow (p \vee (\sim q))$

4. $(p \wedge q) \rightarrow (\sim p) \vee q$