National Testing Agency

Question Paper Name:	Paper I EHG 12th April 2019 Shift 1 S2
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Duration:	180
Total Marks:	360
Display Marks:	Yes

Paper I

Group Number :	1
Group Id :	416529177
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 :	416529325
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:	416529465
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

Which of the following combinations has the dimension of electrical resistance (ϵ_0 is the permittivity of vacuum and μ_0 is the permeability of vacuum) ?

Options :

1. $\frac{\mu_0}{\epsilon_0}$

2. $\frac{\epsilon_0}{\mu_0}$

3. $\sqrt{\frac{\mu_0}{\epsilon_0}}$

4. $\sqrt{\frac{\epsilon_0}{\mu_0}}$

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

निम्नांकित में से किस संयोजन की विमा वही है, जो, विद्युत प्रतिरोध की है (यहाँ, ϵ_0, निर्वात की विद्युतशीलता (परावैद्युतांक) तथा μ_0, निर्वात की चुम्बकशीलता है)?

Options :

1. $\frac{\mu_0}{\epsilon_0}$

2. $\frac{\epsilon_0}{\mu_0}$

3. $\sqrt{\frac{\mu_0}{\epsilon_0}}$

4. $\sqrt{\frac{\epsilon_0}{\mu_0}}$

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

શૂન્ય અવકાશની વિદ્યુતશીલતા (પરમિટિવિટી) ϵ_0 અને શૂન્ય અવકાશની પારગમ્યતા (પરમિયાબિલિટી) μ_0 માટે નીચેનામાંથી કયા સંયોજનનું પરિમાણ વિદ્યુત અવરોધને સમાન છે?

Options :

1. $\frac{\mu_0}{\epsilon_0}$

2. $\frac{\epsilon_0}{\mu_0}$

3. $\sqrt{\frac{\mu_0}{\epsilon_0}}$

4. $\sqrt{\frac{\epsilon_0}{\mu_0}}$

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

The trajectory of a projectile near the surface of the earth is given as $y = 2x - 9x^2$. If it were launched at an angle θ_0 with speed v_0 then $(g = 10\ ms^{-2})$:

Options :

1. $\theta_0 = \sin^{-1}\left(\frac{1}{\sqrt{5}}\right)$ and $v_0 = \frac{5}{3}\ ms^{-1}$

2. $\theta_0 = \cos^{-1}\left(\frac{1}{\sqrt{5}}\right)$ and $v_0 = \frac{5}{3}\ ms^{-1}$

3. $\theta_0 = \sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$ and $v_0 = \frac{3}{5}\ ms^{-1}$

4. $\theta_0 = \cos^{-1}\left(\frac{2}{\sqrt{5}}\right)$ and $v_0 = \frac{3}{5}\ ms^{-1}$

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

किसी प्रक्षेप्य के प्रक्षेप-पथ को, भू पृष्ठ पर $y = 2x - 9x^2$, से निरूपित किया जाता है। यदि, इसे v_0 चाल द्वारा θ_0 कोण पर प्रमोचित किया गया होता तो, $(g = 10\ ms^{-2})$:

Options :

1. $\theta_0 = \sin^{-1}\left(\frac{1}{\sqrt{5}}\right)$ तथा $v_0 = \frac{5}{3}\ ms^{-1}$

2. $\theta_0 = \cos^{-1}\left(\frac{1}{\sqrt{5}}\right)$ तथा $v_0 = \frac{5}{3}\,\text{ms}^{-1}$

3. $\theta_0 = \sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$ तथा $v_0 = \frac{3}{5}\,\text{ms}^{-1}$

4. $\theta_0 = \cos^{-1}\left(\frac{2}{\sqrt{5}}\right)$ तथा $v_0 = \frac{3}{5}\,\text{ms}^{-1}$

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

પૃથ્વીની સપાટી પર કોઇ એક પ્રક્ષેપકનો ગતિપથ $y = 2x - 9x^2$ વડે આપવામાં આવે છે. જો તેને θ_0 કોણે v_0 ઝડપથી છોડવામાં આવ્યું હતું તો $(g = 10\,\text{ms}^{-2})$:

Options :

1. $\theta_0 = \sin^{-1}\left(\frac{1}{\sqrt{5}}\right)$ અને $v_0 = \frac{5}{3}\,\text{ms}^{-1}$

2. $\theta_0 = \cos^{-1}\left(\frac{1}{\sqrt{5}}\right)$ અને $v_0 = \frac{5}{3}\,\text{ms}^{-1}$

3. $\theta_0 = \sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$ અને $v_0 = \frac{3}{5}\,\text{ms}^{-1}$

4. $\theta_0 = \cos^{-1}\left(\frac{2}{\sqrt{5}}\right)$ અને $v_0 = \frac{3}{5}\,\text{ms}^{-1}$

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 man (mass = 50 kg) and his son (mass = 20 kg) are standing on a frictionless surface facing each other. The man pushes his son so that he starts moving at a speed of $0.70\,\text{ms}^{-1}$ with respect to the man. The speed of the man with respect to the surface is :

Options :

1. $0.20\,\text{ms}^{-1}$

2. $0.28\ ms^{-1}$

3. $0.47\ ms^{-1}$

4. $0.14\ ms^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

एक व्यक्ति (द्रव्यमान = 50 kg) तथा उसका बेटा (द्रव्यमान = 20 kg), किसी घर्षणरहित पृष्ठ पर, एक दूसरे के सामने खड़े हैं। वह व्यक्ति अपने बेटे को धकेलता है। जिससे, वह, उस व्यक्ति के सापेक्ष $0.70\ ms^{-1}$ की चाल से गति करने लगता है। तो, उस व्यक्ति की पृष्ठ के सापेक्ष चाल होगी :

Options :

1. $0.20\ ms^{-1}$

2. $0.28\ ms^{-1}$

3. $0.47\ ms^{-1}$

4. $0.14\ ms^{-1}$

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

એક વ્યક્તિ (દળ = 50 kg) અને તેની દિકરી (દળ = 20 kg) એ એક ઘર્ષરહિત સપાટી પર એકબીજાની સામે ઉભા છે. આ વ્યક્તિ તેની દિકરીને ધક્કો મારે છે કે જેથી તેણી $0.70\ ms^{-1}$ ની ઝડપથી વ્યક્તિની સાપેક્ષે ગતિ કરે છે. આ વ્યક્તિની ઝડપ હશે :

Options :

1. $0.20\ ms^{-1}$

2. $0.28\ ms^{-1}$

3. $0.47\ ms^{-1}$

4. $0.14\ ms^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

A person of mass M is, sitting on a swing of length L and swinging with an angular amplitude θ_0. If the person stands up when the swing passes through its lowest point, the work done by him, assuming that his centre of mass moves by a distance l (l<<L), is close to :

Options :

1. Mgl

2. $Mgl\ (1-\theta_0^2)$

3. $Mgl\left(1+\frac{\theta_0^2}{2}\right)$

4. $Mgl\ (1+\theta_0^2)$

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

Correct Marks : 4 Wrong Marks : 1

एक व्यक्ति (द्रव्यमान = M), L लम्बाई के एक झूले पर झूल रहा है। झूले का कोणीय आयाम θ_0 है। झूले के अपने निम्नतम बिन्दु से गुजरते समय, वह व्यक्ति झूले पर खड़ा हो जाता है। यदि खड़े होने से उस व्यक्ति का द्रव्यमान केन्द्र l(l<<L) दूरी से विस्थापित हो जाता है, तो, व्यक्ति द्वारा किया गया कार्य होगा :

Options :

1. Mgl

2. $Mgl\ (1-\theta_0^2)$

3. $Mgl\left(1+\frac{\theta_0^2}{2}\right)$

4. $Mgl\ (1+\theta_0^2)$

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

Correct Marks : 4 Wrong Marks : 1

M દ્રવ્યમાનની એક વ્યક્તિ L લંબાઈના હિંચકા પર બેઠી છે. અને કોણીય કંપવિસ્તાર θ_0 થી ઝુલે છે. આ હિંચકો જ્યારે તેના ન્યૂનતમ બિંદુમાંથી પસાર થાય ત્યારે આ વ્યક્તિ જો ઉભો થાય અને જો ઉભા થતાં તેનું દ્રવ્યમાન કેન્દ્ર $l (l<<L)$ જેટલું અંતર ખસે તો તેના દ્વારા થતું કાર્ય _____ ની નજીકનું હશે.

Options :

1. Mgl

2. $Mgl\,(1-\theta_0^2)$

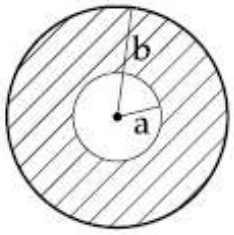
3. $Mgl\left(1+\frac{\theta_0^2}{2}\right)$

4. $Mgl\,(1+\theta_0^2)$

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

Correct Marks : 4 Wrong Marks : 1

A circular disc of radius b has a hole of radius a at its centre (see figure). If the mass per unit area of the disc varies as $\left(\frac{\sigma_0}{r}\right)$, then the radius of gyration of the disc about its axis passing through the centre is :



Options :

1. $\frac{a+b}{2}$

2. $\sqrt{\frac{a^2+b^2+ab}{2}}$

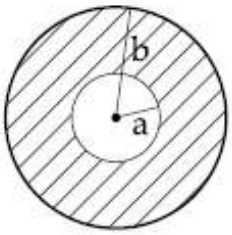
3. $\frac{a+b}{3}$

4. $\sqrt{\frac{a^2 + b^2 + ab}{3}}$

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

किसी वृत्ताकार डिस्क की त्रिज्या b है। इसमें एक छिद्र इसके केन्द्र पर बना है, जिसकी त्रिज्या a है, चित्र देखिए। यदि डिस्क के प्रति-एकांक-क्षेत्रफल का द्रव्यमान, $\left(\frac{\sigma_0}{r}\right)$ के अनुसार परिवर्तित होता है तो, इसके केन्द्र से गुजरने वाली अक्ष के परित:, डिस्क की परिभ्रमण त्रिज्या होगी :



Options :

1. $\frac{a + b}{2}$

2. $\sqrt{\frac{a^2 + b^2 + ab}{2}}$

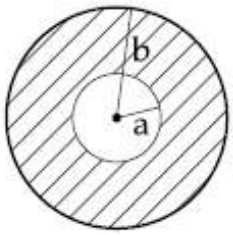
3. $\frac{a + b}{3}$

4. $\sqrt{\frac{a^2 + b^2 + ab}{3}}$

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

b - ત્રિજ્યાની એક વર્તુળાકાર તકતીમાં a-ત્રિજ્યાનું એક કાણું છે (આકૃતિ જુઓ). જો આ તકતીનું દ્રવ્યમાન પ્રતિ એકમ ક્ષેત્રફળ $\left(\frac{\sigma_0}{r}\right)$ થી બદલાતું હોય, તો તકતી તેના અક્ષ (તેના કેન્દ્રમાંથી પસાર થતી) ની સાપેક્ષે વિધુર્ણન (gyration) ત્રિજ્યા _____ છે.



Options :

1. $\frac{a+b}{2}$

2. $\sqrt{\frac{a^2+b^2+ab}{2}}$

3. $\frac{a+b}{3}$

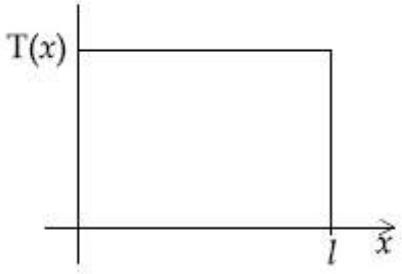
4. $\sqrt{\frac{a^2+b^2+ab}{3}}$

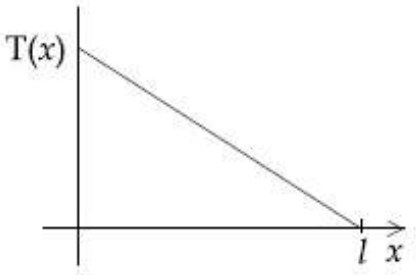
Question Number : 6 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

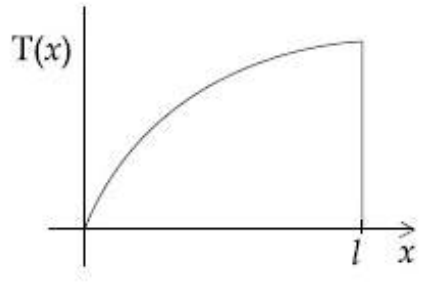
Correct Marks : 4 Wrong Marks : 1

A uniform rod of length l is being rotated in a horizontal plane with a constant angular speed about an axis passing through one of its ends. If the tension generated in the rod due to rotation is $T(x)$ at a distance x from the axis, then which of the following graphs depicts it most closely ?

Options :

1. 

2.


3.


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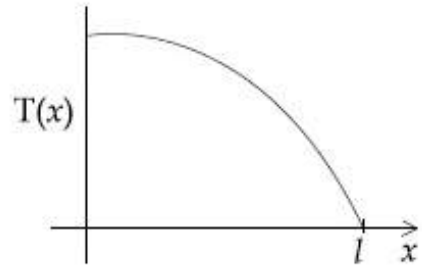
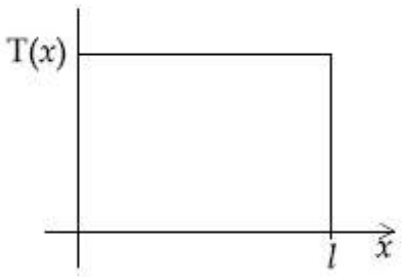


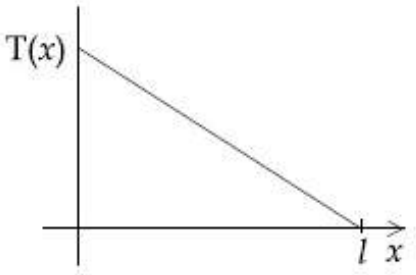
Question Number : 6 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

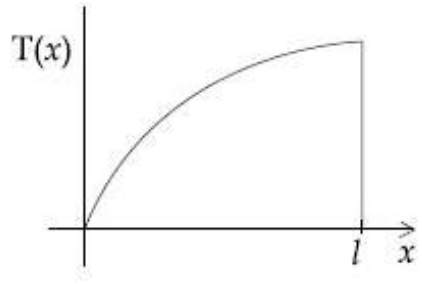
Correct Marks : 4 Wrong Marks : 1

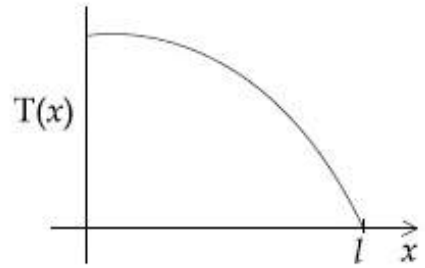
l लम्बाई की, किसी एकसमान छड़ को, क्षैतिज समतल में, एक स्थिर कोणीय चाल से घुमाया जा रहा है। घूर्णन-अक्ष छड़ के एक सिरे से गुजरती है। यदि, इस घूर्णन के कारण, छड़ में उत्पन्न तनाव, अक्ष से x दूरी पर $T(x)$ है तो, निम्नांकित में से कौन सा ग्राफ इसे सर्वाधिक निकट रूप से दर्शाता है?

Options :

1.


2. 

3. 

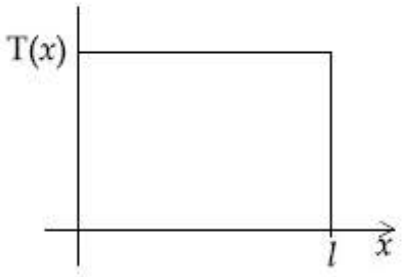
4. 

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

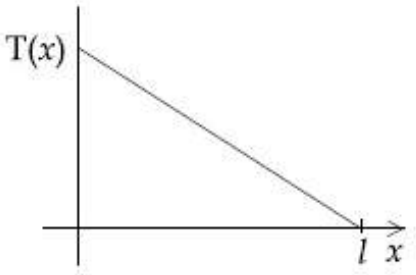
Correct Marks : 4 Wrong Marks : 1

l લંબાઇના એક સમાન સળીયાને તેના કોઈ એક છેડામાંથી પસાર થતી અક્ષને અનુલક્ષીને સમક્ષિતિજ સમતલમાં કોઈ અચળ કોણીય ઝડપથી ફેરવવામાં આવે છે. આ અક્ષથી x અંતર પર સળીયામાં ઉદ્‌ભવતું તણાવ જો $T(x)$ હોય, તો નીચેનામાંથી ક્યો આલેખ તેને સચોટ રીતે રજુ કરે છે?

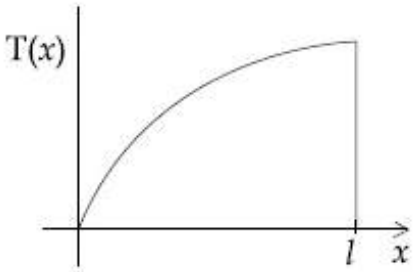
Options :

1. 

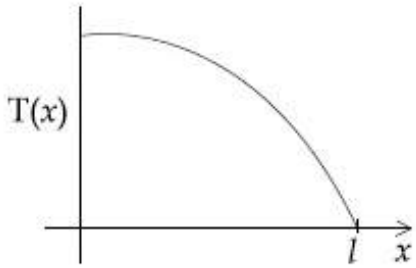
2.



3.



4.



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 shell is fired from a fixed artillery gun with an initial speed u such that it hits the target on the ground at a distance R from it. If t_1 and t_2 are the values of the time taken by it to hit the target in two possible ways, the product t_1t_2 is :

Options :

1. $R/2g$

2. R/g

3. $2R/g$

4. $R/4g$

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

किसी स्थिर तोप से एक गोला, प्रारंभिक चाल u से ऐसे कोण पर, दागा जाता है कि गोला भूतल पर अपने लक्ष्य पर लगता है। लक्ष्य की तोप से दूरी R है। यदि गोले द्वारा लक्ष्य पर लगने के दो संभव मार्ग हैं, और इन में लगे समय क्रमशः t_1 तथा t_2 हैं तो, गुणनफल t_1t_2 होगा :

Options :

1. $R/2g$

2. R/g

3. $2R/g$

4. $R/4g$

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

એક તોપમાંથી એક કોષ (ગોળા)ને પ્રારંભિક ઝડપ u થી એ રીતે છોડવામાં આવે છે કે તે લક્ષને ભેદાન પર R અંતરે અફળાય છે. બે જુદી રીતે લક્ષને સાધવાના સમયનું મૂલ્ય જો t_1 અને t_2 હોય, તો t_1t_2 ગુણાકાર _____ છે.

Options :

1. $R/2g$

2. R/g

3. $2R/g$

4. $R/4g$

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

At 40°C, a brass wire of 1 mm radius is hung from the ceiling. A small mass, M is hung from the free end of the wire. When the wire is cooled down from 40°C to 20°C it regains its original length of 0.2 m. The value of M is close to :

(Coefficient of linear expansion and Young's modulus of brass are $10^{-5}/°C$ and 10^{11} N/m^2, respectively ; g = 10 ms^{-2})

Options :

1. 9 kg

2. 1.5 kg

3. 0.9 kg

4. 0.5 kg

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

40°C तापमान पर 1 mm त्रिज्या का पीतल का एक तार छत से लटकाया गया है। तार के मुक्त सिरे से M द्रव्यमान के एक छोटे पिण्ड को लटकाया गया है। जब तार को 40°C से 20°C पर ठंडा करते हैं तो वह वापस अपनी पुरानी लंबाई 0.2 m को प्राप्त कर लेता है। M का निकटतम मान होगा :

(पीतल का रेखीय प्रसार गुणांक तथा यंग प्रत्यास्था गुणांक क्रमश: हैं $10^{-5}/°C$ तथा 10^{11} N/m^2, एवं g = 10 ms^{-2})

Options :

1. 9 kg

2. 1.5 kg

3. 0.9 kg

4. 0.5 kg

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

40°C તાપમાને એક 1 mm ત્રિજ્યા ધરાવતા પીત્તળના તારના છતથી લટકાવવામાં આવે છે. એક નાના M દળને તેના મુક્ત છેડા પર લટકાવવામાં આવે છે. જ્યારે તારને 40°C થી 20°C ઠંડો પાડવામાં આવે છે ત્યારે તે તેની મુળ લંબાઈ 0.2 m પ્રાપ્ત કરે છે. M નું મૂલ્ય _____ની નજીકનું હશે.

(પીત્તળ માટે રેખીય પ્રસરણાંક અને યંગ મોડ્યુલસ અનુક્રમે $10^{-5}/°C$ અને $10^{11}\ N/m^2$, અને $g = 10\ ms^{-2}$)

Options :

1. 9 kg

2. 1.5 kg

3. 0.9 kg

4. 0.5 kg

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

When M_1 gram of ice at $-10°C$ (specific heat = 0.5 cal $g^{-1}°C^{-1}$) is added to M_2 gram of water at 50°C, finally no ice is left and the water is at 0°C. The value of latent heat of ice, in cal g^{-1} is :

Options :

1. $\frac{5M_1}{M_2} - 50$

2. $\frac{50M_2}{M_1}$

3. $\frac{5M_2}{M_1} - 5$

4. $\frac{50M_2}{M_1} - 5$

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

Correct Marks : 4 Wrong Marks : 1

$-10°C$ तापमान के M_1 ग्राम बर्फ (विशिष्ट ऊष्मा $= 0.5$ cal $g^{-1}°C^{-1}$) को, $50°C$ तापमान के M_2 ग्राम जल में डालने पर, पूरी बर्फ पिघल जाती है और जल का तापमान $0°C$ हो जाता है, तो बर्फ की गुप्त ऊष्मा का मान cal g^{-1} में है :

Options :

1. $\frac{5M_1}{M_2} - 50$

2. $\frac{50M_2}{M_1}$

3. $\frac{5M_2}{M_1} - 5$

4. $\frac{50M_2}{M_1} - 5$

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

Correct Marks : 4 Wrong Marks : 1

જ્યારે $50°C$ પર રહેલ M_2 ગ્રામ પાણીમાં $-10°C$ પરનો M_1 ગ્રામ બરફ (વિશિષ્ટઊષ્મા $= 0.5$ cal $g^{-1}°C^{-1}$) ઉમેરવામાં આવે તો અંતમાં કોઇજ બરફ રહેતો નથી અને પાણી $0°C$ પર છે. તો બરફની ગલન ગુપ્ત ઊષ્મા cal g^{-1} માં _____ છે.

Options :

1. $\frac{5M_1}{M_2} - 50$

2. $\frac{50M_2}{M_1}$

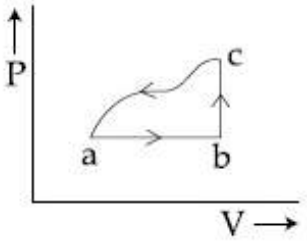
3. $\frac{5M_2}{M_1} - 5$

4. $\frac{50M_2}{M_1} - 5$

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

Correct Marks : 4 Wrong Marks : 1

A sample of an ideal gas is taken through the cyclic process abca as shown in the figure. The change in the internal energy of the gas along the path ca is -180 J. The gas absorbs 250 J of heat along the path ab and 60 J along the path bc. The work done by the gas along the path abc is :



Options :

1. 100 J

2. 120 J

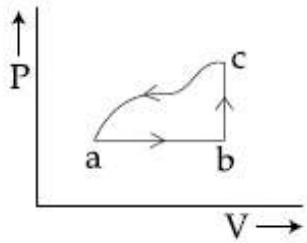
3. 130 J

4. 140 J

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

Correct Marks : 4 Wrong Marks : 1

एक आदर्श गैस को, चित्र में दर्शाये गये अनुसार चक्रीय प्रक्रम abca से गुजारा जाता है। ca पथ के अनुदिश गैस की आन्तरिक ऊर्जा में परिवर्तन -180 J है। ab पथ के अनुदिश, गैस 250 J ऊष्मा अवशोषित करती है तथा bc पथ के अनुदिश, गैस 60 J ऊष्मा अवशोषित करती है तो, पथ abc के अनुदिश, गैस द्वारा किया गया कार्य है :



Options :

1. 100 J

2. 120 J

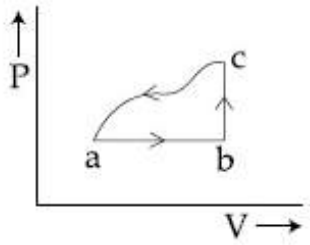
3. 130 J

4. 140 J

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

Correct Marks : 4 Wrong Marks : 1

અહીં દર્શાવ્યા પ્રમાણે એક આદર્શ વાયુના નમુનાને abca ચક્રીય પ્રક્રિયા પર લઇ જવામાં આવે છે ca પથ પર આ વાયુની આંતરિક ઊર્જામાં થતો બદલાવ -180 J છે. આ વાયુ ab પથ પર 250 J ઊર્જા શોષે છે અને bc પથ પર 60 J ઊર્જા શોષાય છે. પથ abc પર વાયુ વડે થતું કાર્ય _____ છે.



Options :

1. 100 J

2. 120 J

3. 130 J

4. 140 J

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

Correct Marks : 4 Wrong Marks : 1

Two moles of helium gas is mixed with three moles of hydrogen molecules (taken to be rigid). What is the molar specific heat of mixture at constant volume ?
(R = 8.3 J/mol K)

Options :

1. 15.7 J/mol K

2. 17.4 J/mol K

3. 19.7 J/mol K

4. 21.6 J/mol K

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

Correct Marks : 4 Wrong Marks : 1

हीलियम गैस के दो मोल को, हाइड्रोजन के तीन मोल अणुओं (जो कि दृढ़ माने गये हैं) के साथ मिलाया जाता है। स्थिर आयतन पर इस मिश्रण की मोलर विशिष्ट ऊष्मा क्या होगी? ($R = 8.3\ J/mol\ K$)

Options :

1. 15.7 J/ mol K

2. 17.4 J/ mol K

3. 19.7 J/ mol K

4. 21.6 J/ mol K

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

Correct Marks : 4 Wrong Marks : 1

બે મોલ હીલિયમ વાયુને ત્રણ મોલ હાઇડ્રોજન અણુઓ (જેમને દઢ ધારવામાં આવે છે) સાથે મિશ્રિત કરવામાં આવે છે. તો મિશ્રણ માટે અચળ કદે મોલર વિશિષ્ટ ઊષ્મા કેટલી હશે? ($R = 8.3\ J/mol\ K$)

Options :

1. 15.7 J/ mol K

2. 17.4 J/ mol K

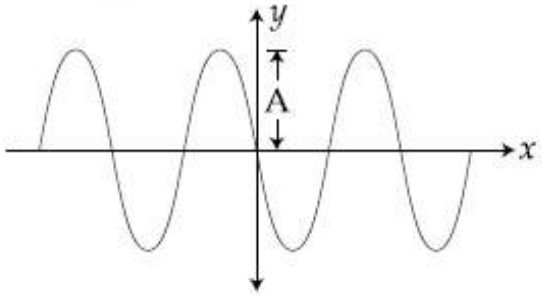
3. 19.7 J/ mol K

4. 21.6 J/ mol 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 progressive wave travelling along the positive x-direction is represented by $y(x,t) = A\sin(kx - \omega t + \phi)$. Its snapshot at $t = 0$ is given in the figure.



For this wave, the phase ϕ is :

Options :

1. 0

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

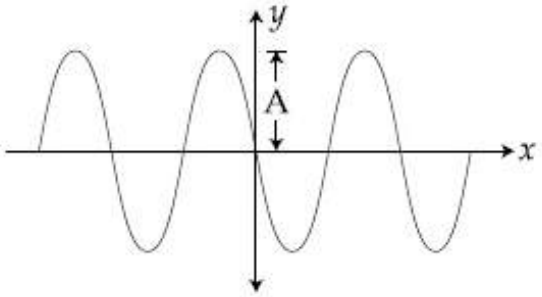
3. $\frac{\pi}{2}$

4. π

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

धनात्मक x-दिशा में गमन करती हुई किसी प्रगामी तरंग को, $y(x,t) = A\sin(kx - \omega t + \phi)$, से निरूपित किया जाता है। $t = 0$ पर खींचा गया आशु चित्र निम्न से दिया जाता है :



इस तरंग के लिए, कला ϕ का मान होगा :

Options :

1. 0

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

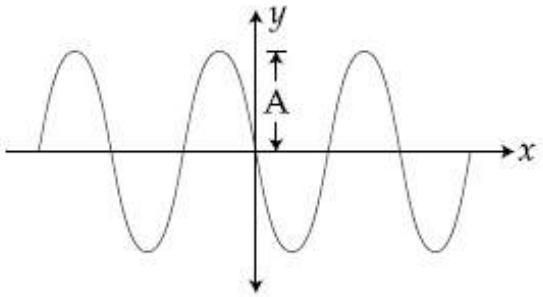
3. $\frac{\pi}{2}$

4. π

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

ધન x-દિશામાં ગતિ કરતા એક પ્રગામી તરંગ ને $y(x,t)=A\sin(kx-\omega t+\phi)$ વડે દર્શાવવામાં આવે છે.
$t=0$ સમયની તેની છબી આકૃતિમાં આપેલ છે.



આ તરંગમાટે કળા ϕ _____ છે.

Options :

1. 0

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

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

4. π

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

Correct Marks : 4 Wrong Marks : 1

A submarine (A) travelling at 18 km/hr is being chased along the line of its velocity by another submarine (B) travelling at 27 km/hr. B sends a sonar signal of 500 Hz to detect A and receives a reflected sound of frequency ν. The value of ν is close to :
(Speed of sound in water $=1500\ ms^{-1}$)

Options :

1. 502 Hz

2. 499 Hz

3. 504 Hz

4. 507 Hz

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

Correct Marks : 4 Wrong Marks : 1

18 km/hr की चाल से गतिशील एक पनडुब्बी (A) का पीछा, उसकी गति के अनुदिश 27 km/hr की चाल से गतिशील दूसरी पनडुब्बी (B), करती है। A को खोजने के लिए, B 500 Hz का एक ध्वनि सिग्नल भेजती है तो, आवृत्ति ν की परावर्तित ध्वनि प्राप्त होती है। ν का मान होगा, लगभग

(पानी में ध्वनि की चाल $= 1500\ ms^{-1}$)

Options :

1. 502 Hz

2. 499 Hz

3. 504 Hz

4. 507 Hz

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

Correct Marks : 4 Wrong Marks : 1

એક સબમરીન-(A) એ 18 km/કલાકથી ગતિ કરે છે. જેના ગતિ પથને સમાંતર બીજી સબમરીન-(B) કે જે 27 km/કલાક વડે ગતિ કરે છે અને તેના દ્વારા પીછો કરવામાં આવે છે. A ને શોધવા B એ 500 Hz નું સોનાર સિગ્નલ મોકલે છે અને ν ફ્રીક્વન્સીનું પરાવર્તિત સિગ્નલ સાંભળે છે. ν નું મૂલ્ય _____ ની નજીકનું હશે.

(પાણીમાં ધ્વનિની ઝડપ $= 1500\ ms^{-1}$)

Options :

1. 502 Hz

2. 499 Hz

3. 504 Hz

4. 507 Hz

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

Correct Marks : 4 Wrong Marks : 1

A point dipole $\vec{p} = -p_0 \hat{x}$ is kept at the origin. The potential and electric field due to this dipole on the y-axis at a distance d are, respectively : (Take $V = 0$ at infinity)

Options :

1. $0, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

2. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

3. $0, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

4. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

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 बिन्दु द्वि-ध्रुव $\vec{p} = -p_0 \hat{x}$, मूल बिन्दु पर स्थित है। तो, इस द्विध्रुव के कारण, y-अक्ष पर d दूरी पर, विभव तथा विद्युत क्षेत्र होंगे क्रमशः (मानो अनंत पर $V = 0$ है)

Options :

1. $0, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

2. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

3. $0, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

4. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

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

Correct Marks : 4 Wrong Marks : 1

એક બિંદુવત્ત દ્વિધ્રુવી $\vec{p} = -p_0 \hat{x}$ ને ઉદ્‌ગમ પર મુકેલ છે. આ દ્વિધ્રુવી વડે y-અક્ષ પર d અંતરે સ્થિતિમાન અને વિદ્યુતક્ષેત્ર અનુક્રમે _____ છે. (અનંત એ $V=0$ લો)

Options :

1. $0, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

2. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

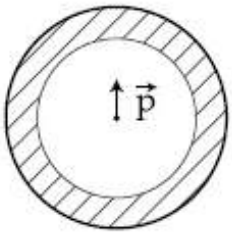
3. $0, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

4. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

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

Shown in the figure is a shell made of a conductor. It has inner radius a and outer radius b, and carries charge Q. At its centre is a dipole $\vec{p}$ as shown. In this case :



Options :

1. surface charge density on the inner surface of the shell is zero everywhere

2. surface charge density on the outer surface depends on $|\vec{p}|$

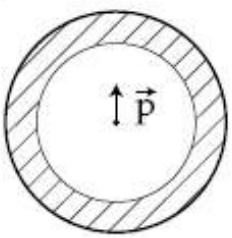
3. surface charge density on the inner surface is uniform and equal to $\frac{(Q/2)}{4\pi a^2}$

4. electric field outside the shell is the same as that of a point charge at the centre of the shell

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

यहाँ आरेख में एक चालक-कोश (शेल) को दर्शाया गया है। इसकी आन्तरिक व बाह्य त्रिज्यायें क्रमश: a तथा b हैं। इस कोश पर Q आवेश है। इसके केन्द्र पर एक द्विध्रुव $\vec{p}$ है (आरेख देखिये)। इस स्थिति में :



Options :

1. कोश के आंतरिक पृष्ठ पर पृष्ठ-आवेश-घनत्व शून्य होगा।

2. इसके बाह्य पृष्ठ पर पृष्ठ-आवेश घनत्व $\left|\vec{p}\right|$ पर निर्भर होगा।

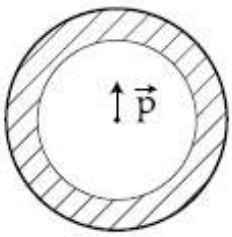
3. इसके आन्तरिक पृष्ठ पर पृष्ठ-आवेश घनत्व, एकसमान तथा $\frac{(Q/2)}{4\pi a^2}$ के बराबर है।

4. कोश के बाहर विद्युत क्षेत्र का मान वही होगा, जो, इसके केन्द्र पर स्थित किसी बिन्दु आवेश के कारण होता है।

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

આકૃતિમાં એક વાહકમાંથી બનેલા કોષ (શેલ) ને બતાવેલ છે. તેની અંદરની ત્રિજ્યા a અને બહારની ત્રિજ્યા b છે તથા Q વિજભાર ધારિત છે. બતાવ્યા પ્રમાણે તેના કેન્દ્રમાં દ્વિધ્રુવી $\vec{p}$ છે. આ કિસ્સામાં :



Options :

1. અંદરની સપાટી પર દરેક જગ્યાએ પૃષ્ઠ વિજઘનતા શૂન્ય છે.

2. બહારની સપાટી પર પૃષ્ઠ વિજઘનતા $\left|\vec{p}\right|$ પર આધારિત છે.

3. અંદરની સપાટી પર પૃષ્ઠ વિજઘનતા સમાન છે અને તે $\frac{(Q/2)}{4\pi a^2}$ બરાબર છે.

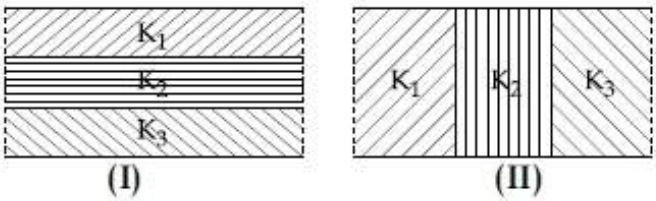
4. આ કોષની બહારનું વિદ્યુતક્ષેત્ર એ કોષના કેન્દ્ર પર રહેલ બિંદુવત્ત વિજભાર જેટલું છે.

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

Correct Marks : 4 Wrong Marks : 1

Two identical parallel plate capacitors, of capacitance C each, have plates of area A, separated by a distance d. The space between the plates of the two capacitors, is filled with three dielectrics, of equal thickness and dielectric constants K_1, K_2 and K_3. The first capacitor is filled as shown in fig. I, and the second one is filled as shown in fig II.

If these two modified capacitors are charged by the same potential V, the ratio of the energy stored in the two, would be (E_1 refers to capacitor (I) and E_2 to capacitor (II)) :



(I) (II)

Options :

1. $\frac{E_1}{E_2}=\frac{9K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

2. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{9K_1K_2K_3}$

3. $\frac{E_1}{E_2}=\frac{K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

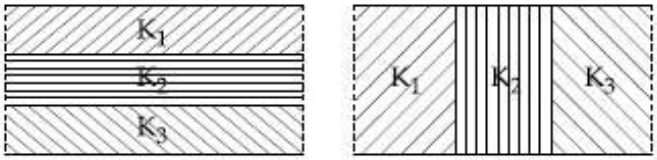
4. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{K_1K_2K_3}$

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

Correct Marks : 4 Wrong Marks : 1

दो सर्वसम समान्तर पट्टिका संधारित्रों में, प्रत्येक की, धारिता C है, उनकी प्लेटों (पट्टिकाओं) का क्षेत्रफल A है और पट्टिकाओं के बीच की दूरी d है। दोनों प्लेटों के बीच के स्थान को K_1, K_2 तथा K_3 परावैद्युतांक के तीन परावैद्युत स्लैब से भर दिया है। सभी स्लैबों की मोटाई समान है। किन्तु, पहले संधारित्र में उन्हें, आरेख I के अनुसार तथा दूसरे में आरेख II के अनुसार रखा गया है। (E_1 तथा E_2 क्रमशः प्रथम तथा द्वितीय संधारित्र से सम्बन्धित है)

यदि इन नये संधारित्रों में प्रत्येक को समान विभव V से आवेशित किया जाये तो, उनमें संचित ऊर्जाओं का अनुपात होगा :



(I) (II)

Options :

1. $\frac{E_1}{E_2}=\frac{9K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

2. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{9K_1K_2K_3}$

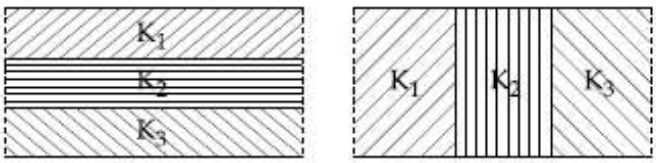
3. $\frac{E_1}{E_2}=\frac{K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

4. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{K_1K_2K_3}$

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

C કેપેસિટીના બે સમાન (શૂન્યાવકાશ) સમાંતર પ્લેટ કેપેસિટર્સ કે જેમની પ્લેટોનું ક્ષેત્રફળ A છે તથા તેમની વચ્ચેનું અંતર d છે. K_1, K_2 અને K_3 પરાવૈદ્યુતાંક (ડાયઇલેક્ટ્રિક) અચળાંક ધરાવતા ત્રણ સમાન જાડાઇના ડાયઇલેક્ટ્રિકથી આ પ્લેટો વચ્ચેની જગ્યાને બતાવ્યા પ્રમાણે ક્રમશઃ બે રીત I અને II વડે ભરેલ છે. જો આ સુધારેલ બન્ને કેપેસિટરોને સમાન સ્થિતિમાન V વડે વિજભારિત કરવામાં આવે, તો આ બન્નેમાં સંગ્રાહાતી ઊર્જાનો ગુણોત્તર હશે : (E_1 કેપેસિટર (I) ને અને E_2 એ કેપેસિટર (II) ને અનુલક્ષીને છે.)



(I) (II)

Options :

1. $\frac{E_1}{E_2}=\frac{9K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

2. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{9K_1K_2K_3}$

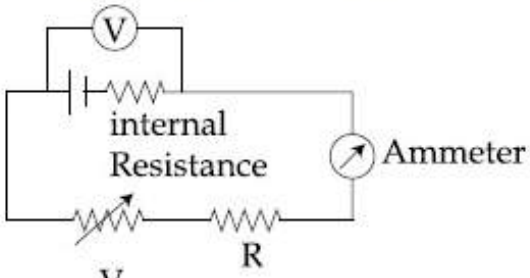
3. $\frac{E_1}{E_2}=\frac{K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

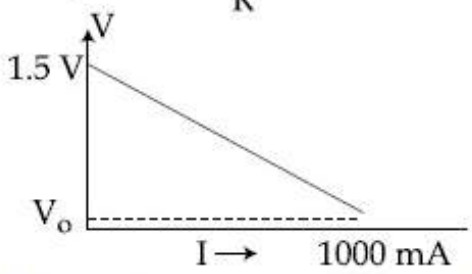
4. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{K_1K_2K_3}$

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

To verify Ohm's law, a student connects the voltmeter across the battery as, shown in the figure. The measured voltage is plotted as a function of the current, and the following graph is obtained :





If V_o is almost zero, identify the correct statement :

Options :

1. The value of the resistance R is 1.5 Ω

2. The emf of the battery is 1.5 V and its internal resistance is 1.5 Ω

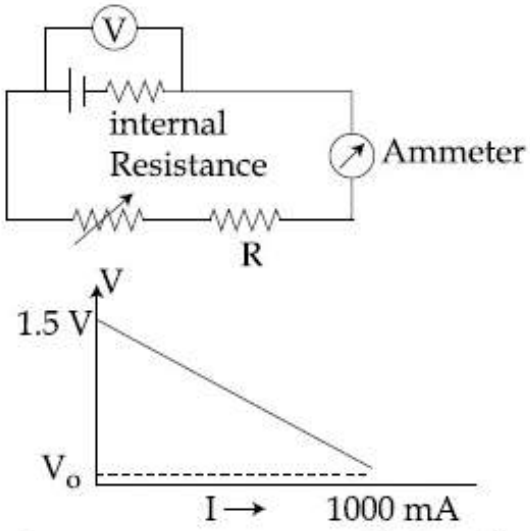
3. The potential difference across the battery is 1.5 V when it sends a current of 1000 mA

4. The emf of the battery is 1.5 V and the value of R is 1.5 Ω

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

ओम के नियम का सत्यापन करने के लिये, एक छात्रा वोल्टमीटर को एक बैटरी के सिरों के बीच जोड़ती है, और परिपथ में वोल्टता (V) तथा विद्युत धारा (I) के विभिन्न मान प्राप्त कर, निम्नांकित ग्राफ बनाती है।



यदि V_o का मान लगभग शून्य है तो, सही कथन का चयन कीजिए :

Options :

1. दिये गये प्रतिरोधक R का प्रतिरोध 1.5 Ω

2. बैटरी का ई.एम.एफ. = 1.5 V और इसका आन्तरिक प्रतिरोध = 1.5 Ω

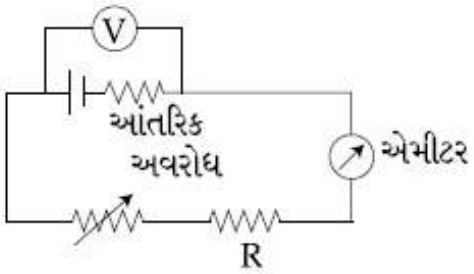
3. बैटरी के सिरों के बीच विभवान्तर = 1.5 V, जब यह 1000 mA धारा प्रवाहित करती है।

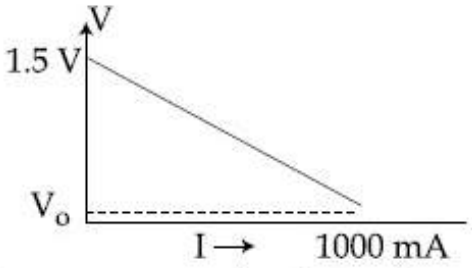
4. बैटरी का ई.एम.एफ. 1.5 V तथा R का मान 1.5 Ω है।

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

ઓહ્મ નો નિયમ ચકાસવા માટે એક વિદ્યાર્થી આકૃતિમાં બતાવ્યા પ્રમાણે બેટરીને સમાંતર એક વોલ્ટમીટર જોડે છે. પ્રવાહના વિધેય તરીકે માપવામાં આવેલ વોલ્ટેજને દોરવામાં આવેલ છે અને નીચે પ્રમાણનું આલેખ મળે છે.





જો V_o લગભગ શૂન્ય હોય તો સાચું વિધાન પસંદ કરો.

Options :

1. અવરોધ R નું મૂલ્ય 1.5 Ω ઓહ્મ છે.

2. બેટરીનું emf 1.5 V છે અને તેનો આંતરિક અવરોધ 1.5 Ω છે.

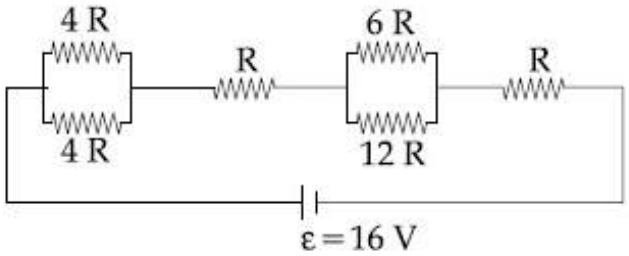
3. બેટરી જ્યારે 1000 mA પ્રવાહ આપે છે ત્યારે આ બેટરીને સમાંતર સ્થિતિમાનનો તફાવત 1.5 V છે.

4. આ બેટરીનું emf 1.5 V છે અને અવરોધ R નું મૂલ્ય 1.5 Ω છે.

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

Correct Marks : 4 Wrong Marks : 1

The resistive network shown below is connected to a D.C. source of 16 V. The power consumed by the network is 4 Watt. The value of R is :



Options :

1. $6\ \Omega$

2. $8\ \Omega$

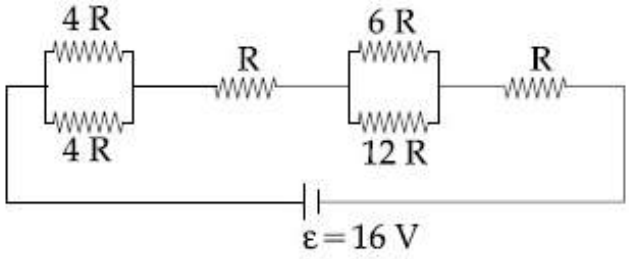
3. $1\ \Omega$

4. $16\ \Omega$

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

Correct Marks : 4 Wrong Marks : 1

दर्शाये गये प्रतिरोधकों के परिपथ को, 16 V के एक डी.सी.(D.C.) स्त्रोत से जोड़ा गया है। परिपथ द्वारा उपभुक्त शक्ति 4 वॉट है तो, R का मान होगा :



Options :

1. $6\ \Omega$

2. $8\ \Omega$

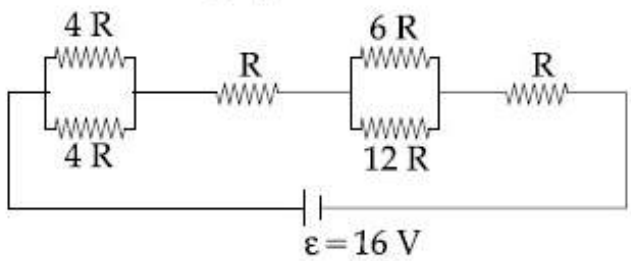
3. $1\ \Omega$

4. $16\ \Omega$

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

Correct Marks : 4 Wrong Marks : 1

નીચે દર્શાવેલ એક અવરોધીય નેટવર્કને 16 V ના D.C. ઉદ્ગમ સાથે જોડેલ છે. આ નેટવર્ક દ્વારા વપરાતો પાવર 4 Watt છે. R નું મૂલ્ય :



Options :

1. $6\,\Omega$

2. $8\,\Omega$

3. $1\,\Omega$

4. $16\,\Omega$

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

Correct Marks : 4 Wrong Marks : 1

A thin ring of 10 cm radius carries a uniformly distributed charge. The ring rotates at a constant angular speed of $40\,\pi$ rad s^{-1} about its axis, perpendicular to its plane. If the magnetic field at its centre is 3.8×10^{-9} T, then the charge carried by the ring is close to ($\mu_0=4\pi\times10^{-7}\,N/A^2$).

Options :

1. $4\times10^{-5}C$

2. $2\times10^{-6}C$

3. $7\times10^{-6}C$

4. $3\times10^{-5}C$

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

10 cm त्रिज्या की एक रिंग पर आवेश एकसमान रूप से वितरित है। यह रिंग, $40\,\pi$ rad s^{-1} की एकसमान दर से अपने अक्ष के परित: घूर्णन कर रही है। जो रिंग के समतल के लम्बवत् है। यदि इसके केन्द्र पर चुम्बकीय क्षेत्र 3.8×10^{-9} T है तो, रिंग पर आवेश लगभग होगा : ($\mu_0=4\pi\times10^{-7}\,N/A^2$).

Options :

1. $4\times10^{-5}C$

2. $2\times10^{-6}C$

3. $7\times10^{-6}C$

4. $3\times10^{-5}\,C$

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

10 cm ત્રિજ્યાનું એક પાતળું વલય સમાન રીતે વહેંચાયેલ વીજભાર ધરાવે છે. આ વલય $40\ \pi\ rad\ s^{-1}$ ની અચળ કોણીય ઝડપથી તેના સમતલ ને લંબ તેની અક્ષને સાપેક્ષે ભ્રમણ કરે છે. જો તેના કેન્દ્રપર $3.8\times10^{-9}\,T$ ચુંબકીય ક્ષેત્રનું પ્રેરણ છે, તો આ વલય દ્વારા વહન થતો વિજભાર _____ ની નજીકનો છે.

$(\mu_0=4\pi\times10^{-7}\,N/A^2)$

Options :

1. $4\times10^{-5}\,C$

2. $2\times10^{-6}\,C$

3. $7\times10^{-6}\,C$

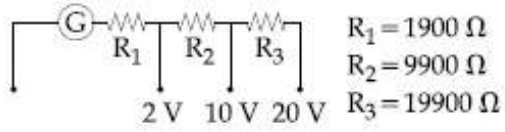
4. $3\times10^{-5}\,C$

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

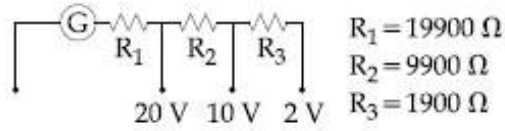
Correct Marks : 4 Wrong Marks : 1

A galvanometer of resistance 100 Ω has 50 divisions on its scale and has sensitivity of 20 μA/division. It is to be converted to a voltmeter with three ranges, of 0-2V, 0-10 V and 0-20 V. The appropriate circuit to do so is :

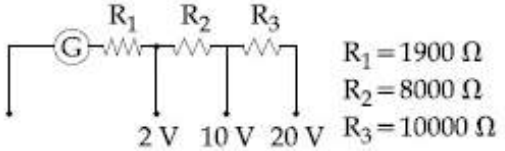
Options :

1. 

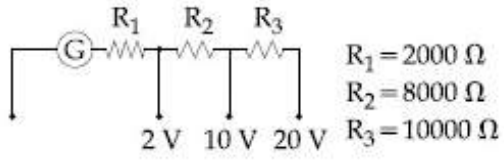
$R_1=1900\ \Omega$
$R_2=9900\ \Omega$
$R_3=19900\ \Omega$

2. 

$R_1=19900\ \Omega$
$R_2=9900\ \Omega$
$R_3=1900\ \Omega$

3. 

$R_1=1900\ \Omega$
$R_2=8000\ \Omega$
$R_3=10000\ \Omega$

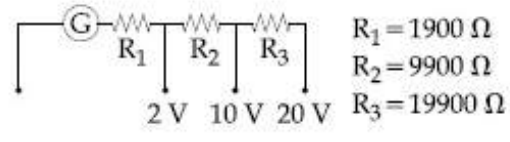
4. 

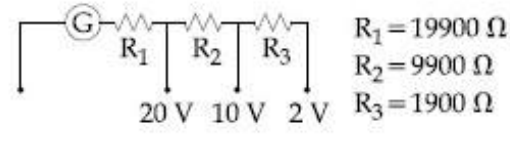
Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

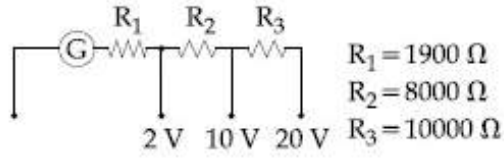
Correct Marks : 4 Wrong Marks : 1

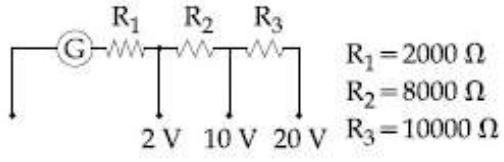
किसी गैल्वेनोमीटर का प्रतिरोध 100 Ω है। इसके स्केल पर 50 भाग है और इसकी सुग्राहिता 20 μA/ भाग है। इसे एक ऐसे वोल्टमीटर में परिवर्तित करना है, जिसके तीन परास 0-2V, 0-10 V तथा 0-20 V हैं। इसके लिए लगभग उपयुक्त परिपथ होगा :

Options :

1. 

2. 

3. 

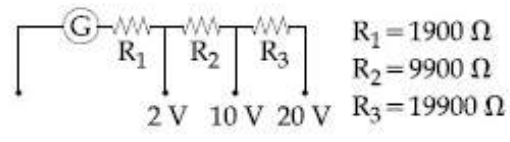
4. 

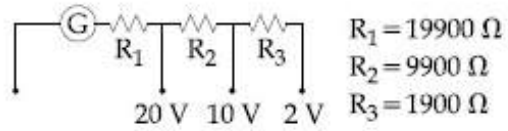
Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

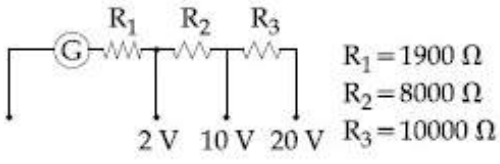
Correct Marks : 4 Wrong Marks : 1

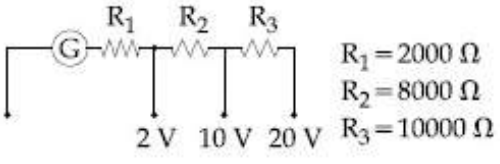
100 Ω ના એક ગેલ્વેનોમીટરની માપપટ્ટી પર 50 કાપાઓ છે તથા તેની સંવેદીતા 20 μA/કાપા છે. તેને 0 - 2V, 0 - 10 V અને 0 - 20 V ની ત્રણ અવધીના વોલ્ટમીટરમાં બદલવાનું છે. આમ કરવા માટેનો યોગ્ય પરિપથ હશે :

Options :

1. 

2. 

3. 

4. 

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 magnetic compass needle oscillates 30 times per minute at a place where the dip is 45°, and 40 times per minute where the dip is 30°. If B_1 and B_2 are respectively the total magnetic field due to the earth at the two places, then the ratio B_1/B_2 is best given by :

Options :

1. 0.7

2. 1.8

3. 2.2

4. 3.6

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

दो स्थानों पर नमन कोणों का मान क्रमशः 45° तथा 30° है। इन स्थानों पर एक चुम्बकीय सुई एक मिनट में क्रमशः 30 तथा 40 दोलन करती है। यदि, इन दो स्थानों पर पृथ्वी के कुल चुम्बकीय क्षेत्र की तीव्रता क्रमशः B_1 तथा B_2 है तो, अनुपात B_1/B_2 का निकटतम मान होगा :

Options :

1. 0.7

2. 1.8

3. 2.2

4. 3.6

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 હોકાયંત્રની સોય જ્યાં નમન 45° છે ત્યાં પ્રતિ મિનીટ 30 વખત દોલનો કરે છે અને જ્યાં નમન 30° છે ત્યાં પ્રતિ મિનીટ 40 વખત દોલન કરે છે. જો આ બે સ્થળો પર પૃથ્વીનું કુલ ચુંબકીય ક્ષેત્ર ક્રમશઃ B_1 અને B_2 હોય, તો આ બે ક્ષેત્રોનો ગુણોત્તર B_1/B_2 ને _____ વડે સારી રીતે અપાય.

Options :

1. 0.7

2. 1.8

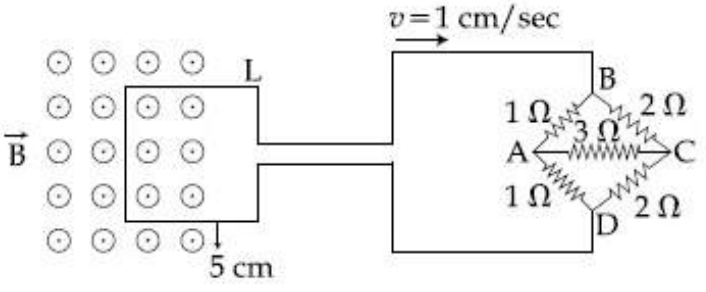
3. 2.2

4. 3.6

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 figure shows a square loop L of side 5 cm which is connected to a network of resistances. The whole setup is moving towards right with a constant speed of $1\ \text{cm s}^{-1}$. At some instant, a part of L is in a uniform magnetic field of 1 T, perpendicular to the plane of the loop. If the resistance of L is 1.7 Ω, the current in the loop at that instant will be close to :



Options :

1. 60 μA

2. 115 μA

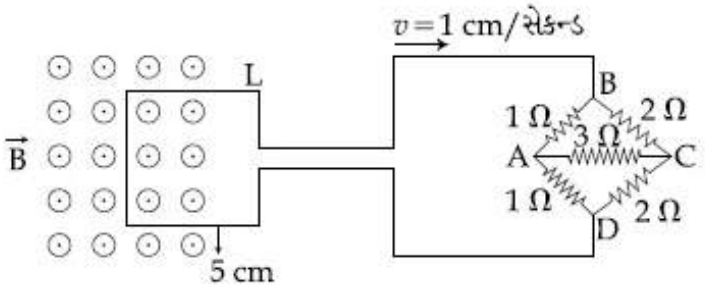
3. 150 μA

4. 170 μA

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

આકૃતિમાં 5 cm બાજુ ધરાવતી એક ચોરસ લુપ L ને $1\ \text{cm s}^{-1}$ ની અચળ ઝડપથી જમણી બાજુ ગતિ કરતા એક અવરોધીય નેટવર્ક સાથે જોડેલ બતાવેલ છે. કોઇક ક્ષણે આ લુપ L ના સમતલને લંબ 1 T ના સમાન ચુંબકીય ક્ષેત્રમાં આ લુપની ડાબી ભુજા રહેલ છે. જો આ લુપ L નો અવરોધ 1.7 Ω છે, તો આ લુપમાં સ્થિર-અવસ્થા પ્રવાહ _____ ની નજીકનો હશે.



Options :

1. 60 μA

2. 115 μA

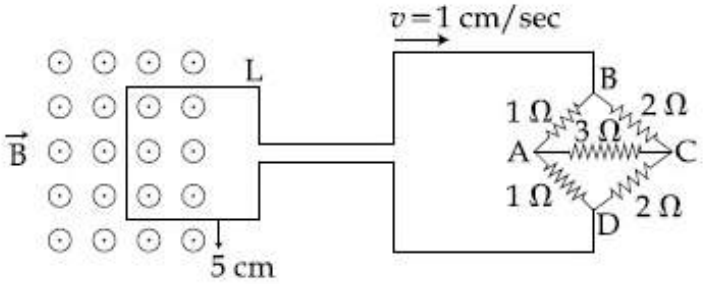
3. 150 μA

4. 170 μA

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

यहाँ आरेख में 5 cm भुजा का एक वर्गाकार पाश L दर्शाया गया है, जो, प्रतिरोधों के एक परिपथ से जुड़ा है । यह संयोजन 1 cm s^{-1} की एक समान चाल से, दायीं ओर गति कर रहा है। किसी क्षण L का एक भाग 1 T तीव्रता के एकसमान चुम्बकीय क्षेत्र में है। यह क्षेत्र पाश L के समतल के लम्बवत् है। यदि, इस पाश का प्रतिरोध 1.7 Ω है तो , इस क्षण इसमें धारा का निकट मान होगा :



Options :

1. 60 μA

2. 115 μA

3. 150 μA

4. 170 μA

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

An electromagnetic wave is represented by the electric field

$\vec{E} = E_0 \hat{n} \sin[\omega t + (6y - 8z)]$. Taking unit vectors in x, y and z directions to be $\hat{i}$, $\hat{j}$, $\hat{k}$, the direction of propogation $\hat{s}$, is :

Options :

1. $\hat{s} = \frac{3\hat{i} - 4\hat{j}}{5}$

2. $\hat{s} = \left(\frac{-3\hat{j} + 4\hat{k}}{5}\right)$

3. $\hat{s} = \frac{-4\hat{k} + 3\hat{j}}{5}$

4. $\hat{s} = \frac{4\hat{j} - 3\hat{k}}{5}$

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 विद्युत चुम्बकीय तरंग को, विद्युत क्षेत्र, $\vec{E} = E_0 \hat{n} \sin[\omega t + (6y - 8z)]$, से निरूपित किया जाता है। यदि x, y तथा z दिशा में इकाई सदिश क्रमशः $\hat{i}$, $\hat{j}$ तथा $\hat{k}$ हैं, संचरण की दिशा $\hat{s}$ के लिये, सही विकल्प है :

Options :

1. $\hat{s} = \frac{3\hat{i} - 4\hat{j}}{5}$

2. $\hat{s} = \left(\frac{-3\hat{j} + 4\hat{k}}{5}\right)$

3. $\hat{s} = \frac{-4\hat{k} + 3\hat{j}}{5}$

4. $\hat{s} = \frac{4\hat{j} - 3\hat{k}}{5}$

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

એક વિદ્યુતચુંબકીય તરંગનો વિદ્યુતક્ષેત્ર $\vec{E} = E_0 \hat{n} \sin[\omega t + (6y - 8z)]$ છે. $\hat{i}$, $\hat{j}$ અને $\hat{k}$ ને અનુક્રમે x, y અને z દિશામાં પ્રસરણની દિશામાં લેતાં, $\hat{s}$ માટેનું સાચું જોડકું _____ છે.

Options :

1. $\hat{s} = \frac{3\hat{i} - 4\hat{j}}{5}$

2. $\hat{s} = \left(\frac{-3\hat{j} + 4\hat{k}}{5}\right)$

3. $\hat{s} = \frac{-4\hat{k} + 3\hat{j}}{5}$

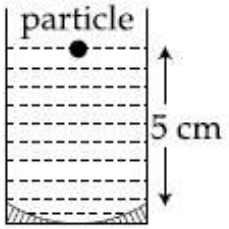
4. $\hat{s} = \frac{4\hat{j} - 3\hat{k}}{5}$

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

Correct Marks : 4 Wrong Marks : 1

A concave mirror has radius of curvature of 40 cm. It is at the bottom of a glass that has water filled up to 5 cm (see figure). If a small particle is floating on the surface of water, its image as seen, from directly above the glass, is at a distance d from the surface of water. The value of d is close to :

(Refractive index of water $= 1.33$)



Options :

1. 11.7 cm

2. 8.8 cm

3. 6.7 cm

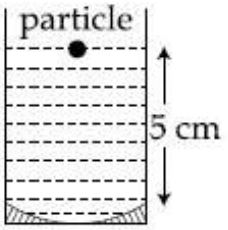
4. 13.4 cm

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

40 cm वक्रता त्रिज्या का एक अवतल दर्पण, आरेख (चित्र) में दर्शाये गये अनुसार, एक गिलास की तली में रखा है। गिलास में 5 cm ऊँचाई तक जल भरा है। एक छोटा सा कण जल की सतह पर तैर रहा है। गिलास के ठीक ऊपर से देखने पर, इस का प्रतिबिम्ब जल की सतह से d दूरी पर है। तो, d का निकट मान होगा :

(पानी का अपवर्तनांक =1.33)



Options :

1. 11.7 cm

2. 8.8 cm

3. 6.7 cm

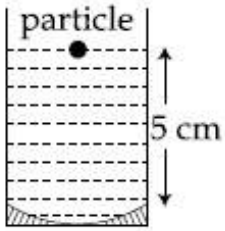
4. 13.4 cm

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

એક અંતર્ગોળ અરિસાની વક્રતા ત્રિજ્યા 40 cm છે. તે 5 cm પાણી ભરેલા ગ્લાસના તળીયે છે (આકૃતિ જુઓ). જો એક નાનો કણ પાણીની સપાટી પર તરતો હોય, તો આ ગ્લાસની તદ્દન ઉપરથી જોતા તેનું પ્રતિબિંબ પાણીની સપાટીથી d અંતરે દેખાય છે. તો d નું મૂલ્ય _____ ની નજીકનું હશે.

(પાણીનો વક્રીભવનાંક = 1.33)



Options :

1. 11.7 cm

2. 8.8 cm

3. 6.7 cm

4. 13.4 cm

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

Correct Marks : 4 Wrong Marks : 1

In a double slit experiment, when a thin film of thickness t having refractive index μ is introduced in front of one of the slits, the maximum at the centre of the fringe pattern shifts by one fringe width. The value of t is (λ is the wavelength of the light used) :

Options :

1. $\frac{\lambda}{2(\mu-1)}$

2. $\frac{2\lambda}{(\mu-1)}$

3. $\frac{\lambda}{(\mu-1)}$

4. $\frac{\lambda}{(2\mu-1)}$

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

Correct Marks : 4 Wrong Marks : 1

एक द्वि-झिरी प्रयोग में, किसी एक झिरी के सामने, t मोटाई तथा μ अपवर्तनांक की एक पतली फिल्म रख देने से, फ्रिंज पैटर्न के केन्द्रीय उच्चिष्ठ, एक फ्रिंज की चौड़ाई के बराबर विस्थापित हो जाता है। तो t का मान है : (λ प्रकाश की तरंगदैर्घ्य है)

Options :

1. $\frac{\lambda}{2(\mu-1)}$

2. $\frac{2\lambda}{(\mu-1)}$

3. $\frac{\lambda}{(\mu-1)}$

4. $\frac{\lambda}{(2\mu-1)}$

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

Correct Marks : 4 Wrong Marks : 1

એક બે સ્લિટના પ્રયોગમાં જ્યારે કોઇ એક સ્લિટ સામે μ વક્રીભવનાંક અને t જાડાઈ ધરાવતી એક પાતળી કપોટી મુકવામાં આવે, તો શલાકા-ભાતની મધ્યમાં રહેલ મહત્તમ એક શલાકાની જાડાઇ જેટલી ખસે છે. આ t નું મૂલ્ય _____ છે. (λ એ વપરાશમાં લેવાતાં પ્રકાશની તરંગલંબાઈ છે.)

Options :

1. $\frac{\lambda}{2(\mu-1)}$

2. $\frac{2\lambda}{(\mu-1)}$

3. $\frac{\lambda}{(\mu-1)}$

4. $\frac{\lambda}{(2\mu-1)}$

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

The value of numerical aperature of the objective lens of a microscope is 1.25. If light of wavelength 5000 Å is used, the minimum separation between two points, to be seen as distinct, will be :

Options :

1. 0.48 μm

2. 0.12 μm

3. 0.38 μm

4. 0.24 μm

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

एक सूक्ष्मदर्शी के अभिदृश्यक लेन्स की संख्यात्मक द्वारक (numerical aperature) का मान 1.25 है। यदि 5000 Å तरंगदैर्ध्य का प्रकाश प्रयोग करें तो, दो बिन्दुओं को अलग-अलग देखने के लिये उनके बीच की न्यूनतम दूरी होगी :

Options :

1. 0.48 μm

2. 0.12 μm

3. 0.38 μm

4. 0.24 μm

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

એક સૂક્ષ્મદર્શકના વસ્તુ કાચ પર 1.25 સંખ્યાત્મક દ્વારક (Numerical aperature) લખેલ છે. જો 5000 Å તરંગલંબાઇનો પ્રકાશ વાપરવામાં આવે, તો બે બિંદુઓને સ્પષ્ટ જોઇ શકાય તેવું તે બન્ને વચ્ચેનું લઘુત્તમ અંતર _____ હશે.

Options :

1. 0.48 μm

2. 0.12 μm

3. 0.38 μm

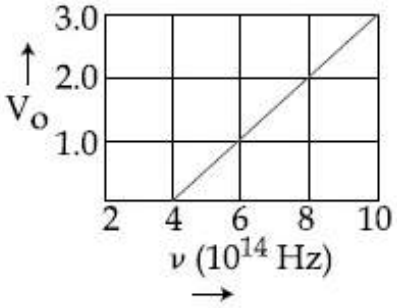
4. 0.24 μm

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

Correct Marks : 4 Wrong Marks : 1

The stopping potential V_o (in volt) as a function of frequency (ν) for a sodium emitter, is shown in the figure. The work function of sodium, from the data plotted in the figure, will be :

(Given : Planck's constant (h) $= 6.63 \times 10^{-34}$ Js, electron charge e $= 1.6 \times 10^{-19}$ C)



Options :

1. 1.66 eV

2. 1.82 eV

3. 1.95 eV

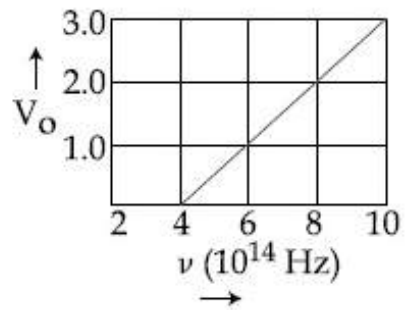
4. 2.12 eV

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

यहाँ आरेख में, एक सोडियम-उत्सर्जक के लिये, आवृत्ति (ν) के फलन के रूप में, निरोधी विभव V_o (वोल्ट में) के परिवर्तन को दर्शाया गया है। इस ग्राफ से सोडियम का कार्य-फलन प्राप्त होगा :

(प्लाँक स्थिरांक (h) $= 6.63 \times 10^{-34}$ Js इलेक्ट्रॉन आवेश e $= 1.6 \times 10^{-19}$ C)



Options :

1. 1.66 eV

2. 1.82 eV

3. 1.95 eV

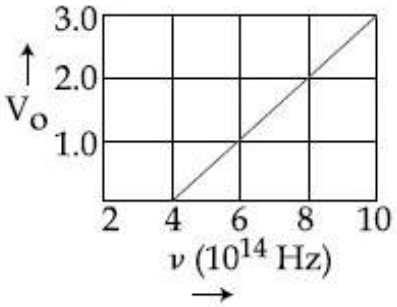
4. 2.12 eV

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

એક સોડિયમ ટાર્ગેટ માટે આવૃત્તિ (ν) ના વિધેય તરીકે સ્ટોપિંગ પોટેન્શિયલ V_o (વોલ્ટમાં) આકૃતિમાં દર્શાવેલ છે. આકૃતિમાં દોરેલ માહિતી પરથી, સોડિયમનું કાર્યવિધેય _____ હશે.

(પ્લાંકનો અચળાંક (h) = 6.63×10^{-34} Js, ઇલેક્ટ્રોનનો વિજભાર $e = 1.6 \times 10^{-19}$ C આપેલ છે.)



Options :

1. 1.66 eV

2. 1.82 eV

3. 1.95 eV

4. 2.12 eV

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

An excited He^+ ion emits two photons in succession, with wavelengths 108.5 nm and 30.4 nm, in making a transition to ground state. The quantum number n, corresponding to its initial excited state is (for photon of wavelength λ, energy $E = \frac{1240 \text{ eV}}{\lambda(\text{in nm})}$) :

Options :

1. $n = 7$

2. $n=6$

3. $n=5$

4. $n=4$

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

Correct Marks : 4 Wrong Marks : 1

एक उत्तेजित He^+ आयन, अपनी न्यूनतम ऊर्जा अवस्था में संक्रमण होने तक दो क्रमागत फोटॉन, जिनके तरंगदैर्ध्य 108.5 nm तथा 30.4 nm हैं, उत्सर्जित करता है। प्रारंभिक उत्तेजित अवस्था के संगत क्वॉन्टम संख्या n है : (λ तरंगदैर्घ्य के लिये फोटॉन की ऊर्जा $= \frac{1240\ \text{eV}}{\lambda(\text{in nm})}$) :

Options :

1. $n=7$

2. $n=6$

3. $n=5$

4. $n=4$

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

Correct Marks : 4 Wrong Marks : 1

એક ઉત્તેજિત He^+ આયન ધરાઅવસ્થામાં સંક્રાંતિ દરમ્યાન ક્રમિક 108.5 nm અને 30.4 nm તરંગલંબાઇના બે ફોટોન્સનું ઉત્સર્જન કરે છે. પ્રારંભિક ઉત્તેજિત અવસ્થાને અનુરૂપ ક્વોન્ટમ અંક n _____ હશે.

(λ તરંગલંબાઇના ફોટોનની ઊર્જા $= \frac{1240\ \text{eV}}{\lambda(\text{in nm})}$.)

Options :

1. $n=7$

2. $n=6$

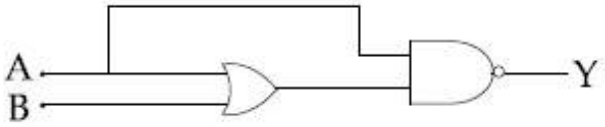
3. $n=5$

4. $n=4$

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

Correct Marks : 4 Wrong Marks : 1

The truth table for the circuit given in the fig. is :



Options :

1.

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

2.

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

3.

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

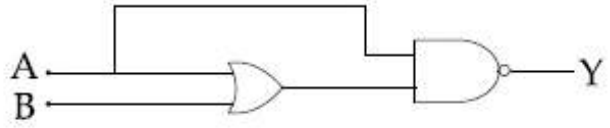
4.

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

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

Correct Marks : 4 Wrong Marks : 1

दिये गये परिपथ के लिये सत्यमान सारणी है :



Options :

1.

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

2.

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

3.

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

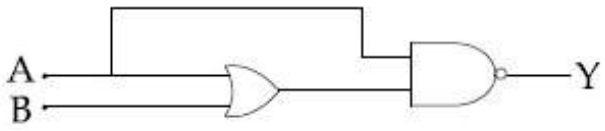
4.

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

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

Correct Marks : 4 Wrong Marks : 1

આપેલ પરિપથ માટે સત્ય-સારણી (truth table) છે :



Options :

1.

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

2.

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

3.

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

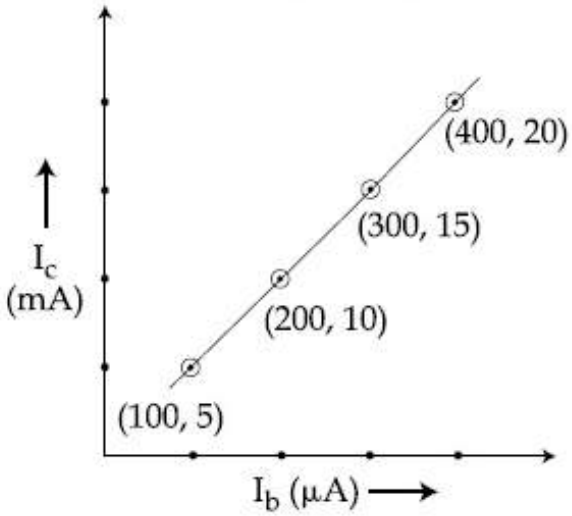
4.

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

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

Correct Marks : 4 Wrong Marks : 1

The transfer characteristic curve of a transistor, having input and output resistance 100 Ω and 100 kΩ respectively, is shown in the figure. The Voltage and Power gain, are respectively :



Options :

1. $5\times10^4,\ 5\times10^6$

2. $5\times10^4,\ 2.5\times10^6$

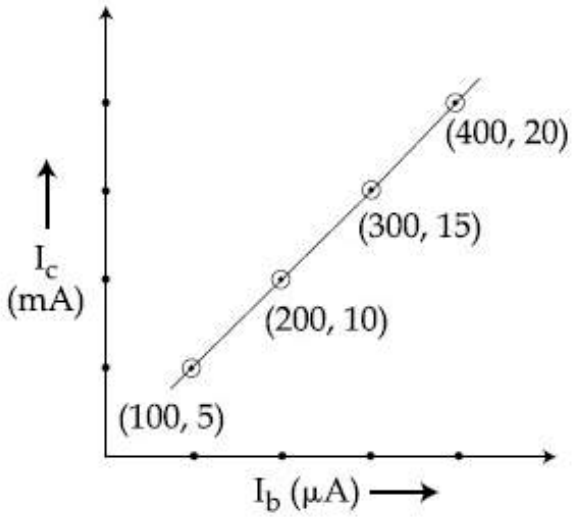
3. $5\times10^4,\ 5\times10^5$

4. $2.5\times10^4,\ 2.5\times10^6$

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

किसी ट्रांजिस्टर के, निवेश तथा निर्गम प्रतिरोध क्रमश: $100\,\Omega$ तथा $100\,k\Omega$ हैं। इसके लिये अंतरण अभिलक्षण वक्र यहाँ दर्शाया गया है। तो, वोल्टता तथा शक्ति लब्धि हैं क्रमश:



Options :

1. 5×10^4 तथा 5×10^6

2. 5×10^4 तथा 2.5×10^6

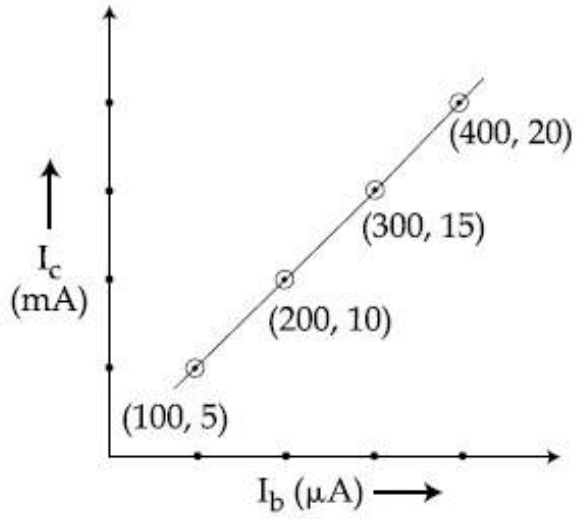
3. 5×10^4 तथा 5×10^5

4. 2.5×10^4 तथा 2.5×10^6

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

અનુક્રમે 100 Ω અને 100 kΩ ઇનપૂટ અને આઉટપૂટ અવરોધ ધરાવતા એક ટ્રાન્ઝિસ્ટરની ટ્રાન્સફર લાક્ષણિકતા આકૃતિમાં બતાવેલ છે. વોલ્ટેજ અને પાવર ગેઇન અનુક્રમે _____ છે.



Options :

1. 5×10^4 અને 5×10^6

2. 5×10^4 અને 2.5×10^6

3. 5×10^4 અને 5×10^5

4. 2.5×10^4 અને 2.5×10^6

Chemistry

Section Id :	416529326
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:	416529466
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

Which of the following statements is not true about RNA ?

Options :

1. It is present in the nucleus of the cell

2. It has always double stranded α-helix structure

3. It controls the synthesis of protein

4. It usually does not replicate

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

RNA के लिए निम्न कथनों में से कौन सा सत्य **नहीं** है?

Options :

1. यह कोशिका के नाभिक (न्यूक्लियस) में उपस्थित रहता है।

2. इसकी सदैव द्विकुंडलनीय α-हेलीक्स संरचना होती है।

3. यह प्रोटीन के संश्लेषण को नियन्त्रित करता है।

4. यह आमतौर से प्रतिकरण नहीं करता है।

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

RNA માટે નીચેના વિધાનો પૈકી કયુ સાચુ નથી?

Options :

1. એ કોશના ન્યુક્લિયસમાં હાજર હોય છે.

2. જેનુ હંમેશા દ્વિસર્પિલ α-હેલીક્સ બંધારણ હોય છે.

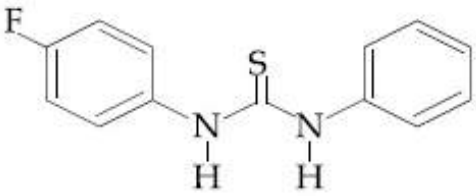
3. તે પ્રોટીનના સંશ્લેષણને નિયંત્રિત કરે છે.

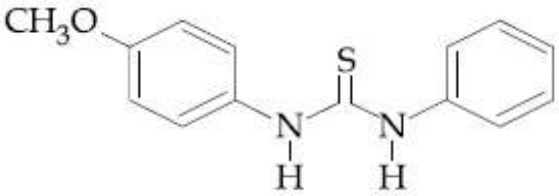
4. જે સામાન્ય રીતે પુનરાવર્તિત થતો નથી.

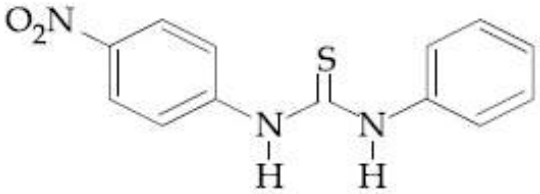
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

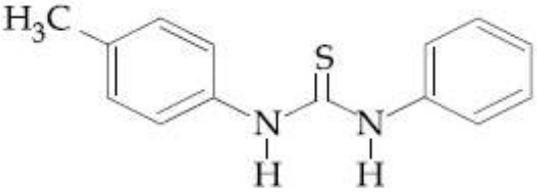
Correct Marks : 4 Wrong Marks : 1

The increasing order of the pK_b of the following compound is :

(A) 

(B) 

(C) 

(D) 

Options :

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

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

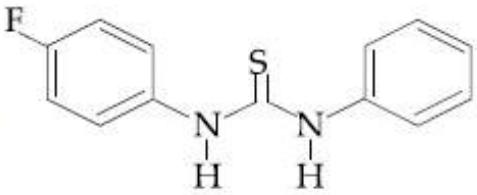
3. (B) < (D) < (A) < (C)

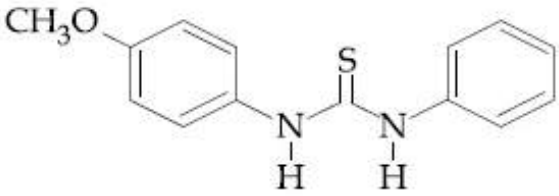
4. (C) < (A) < (D) < (B)

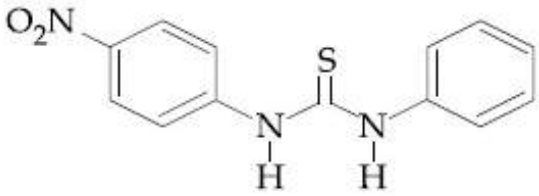
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

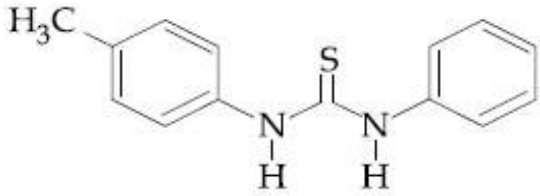
Correct Marks : 4 Wrong Marks : 1

निम्न यौगिकों के pK_b का बढ़ता क्रम है :

(A) 

(B) 

(C) 

(D) 

Options :

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

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

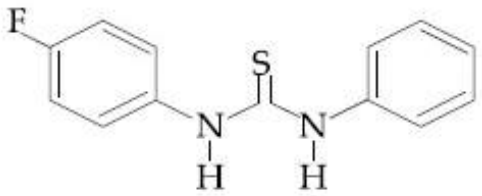
3. (B) < (D) < (A) < (C)

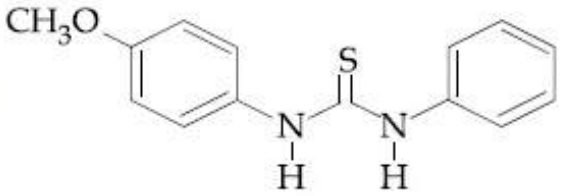
4. (C) < (A) < (D) < (B)

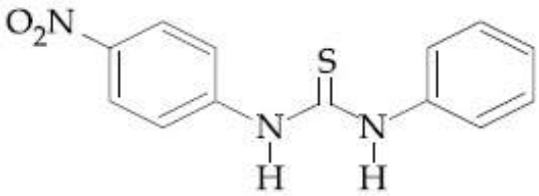
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

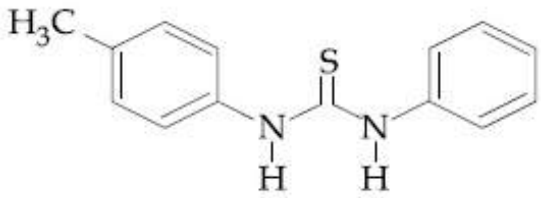
Correct Marks : 4 Wrong Marks : 1

નીચે સંયોજનો નો pK_b માટેનો ચઢતો ક્રમ :

(A) 

(B) 

(C) 

(D) 

Options :

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

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

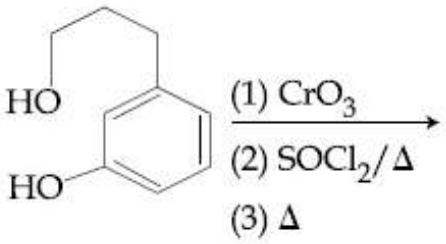
3. (B) < (D) < (A) < (C)

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

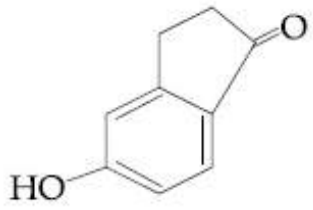
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

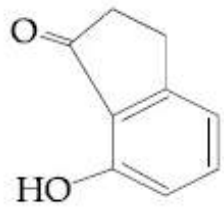
Correct Marks : 4 Wrong Marks : 1

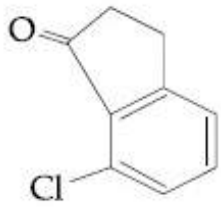
The major product of the following reaction is :

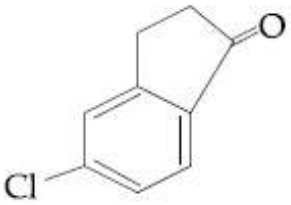


Options :

1. 

2. 

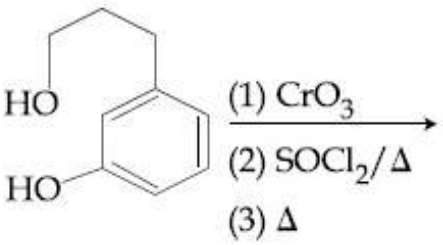
3. 

4. 

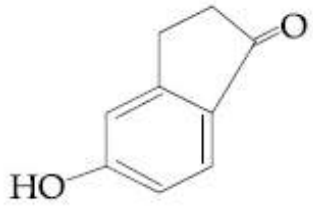
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

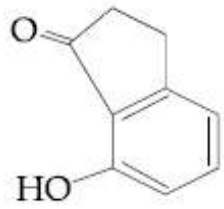
Correct Marks : 4 Wrong Marks : 1

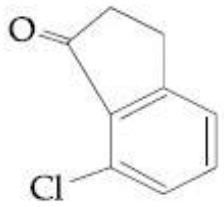
निम्न अभिक्रिया का मुख्य उत्पाद है :

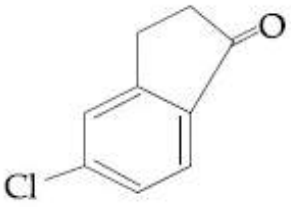


Options :

1. 

2. 

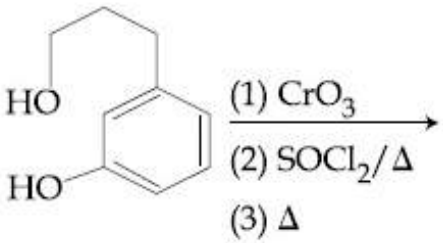
3. 

4. 

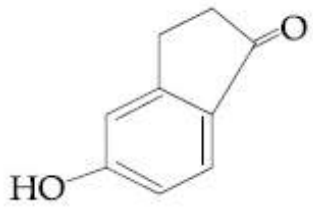
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

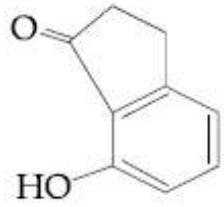
Correct Marks : 4 Wrong Marks : 1

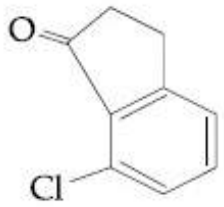
નીચેની આપેલી પ્રક્રિયાની મુખ્ય નીપજ કઈ ?

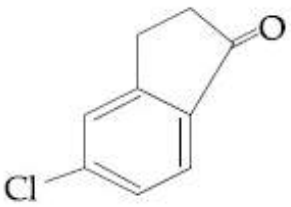


Options :

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

Glucose and Galactose are having identical configuration in all the positions except position.

Options :

1. C – 2

2. C – 3

3. C – 4

4. C – 5

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

Correct Marks : 4 Wrong Marks : 1

ग्लुकोज तथा गैलक्टोज के विन्यास निम्न के अतिरिक्त सभी स्थानों पर एक जैसे हैं :

Options :

1. C – 2

2. C – 3

3. C – 4

4. C – 5

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

Correct Marks : 4 Wrong Marks : 1

ગ્લુકોઝ અને ગેલેક્ટોઝની સંરચના એક સ્થાનને બાદ કરતા બધા સ્થાન ઊપર એક સરખી જોવા મળે છે આ સ્થાન શોધો?

Options :

1. C – 2

2. C – 3

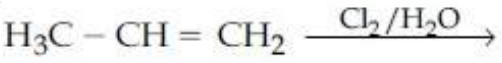
3. C – 4

4. C−5

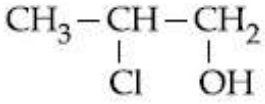
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

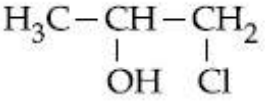
Correct Marks : 4 Wrong Marks : 1

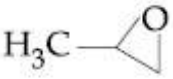
The major product of the following addition reaction is

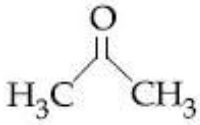


Options :

1. 

2. 

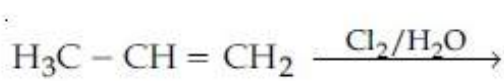
3. 

4. 

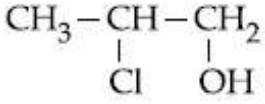
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

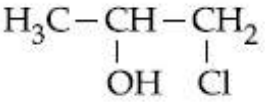
Correct Marks : 4 Wrong Marks : 1

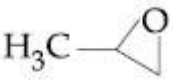
निम्नलिखित योगात्मक अभिक्रिया का मुख्य उत्पाद है :

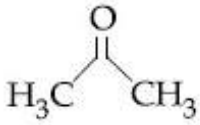


Options :

1. 

2. 

3. 

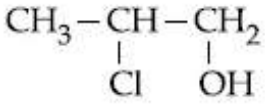
4. 

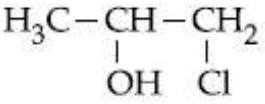
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

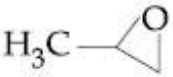
Correct Marks : 4 Wrong Marks : 1

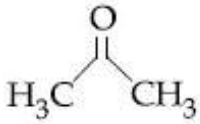
આપેલ યોગશીલ પ્રક્રિયાની મુખ્ય નીપજ શોધો?

Options :

1. 

2. 

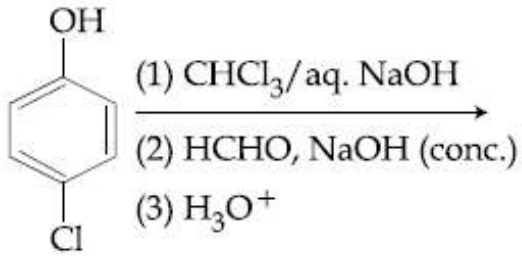
3. 

4. 

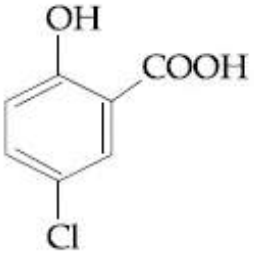
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

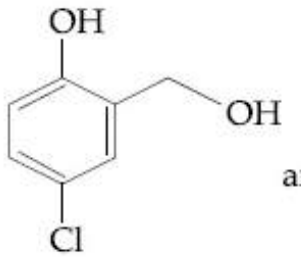
Correct Marks : 4 Wrong Marks : 1

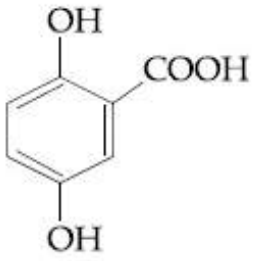
The major products of the following reaction are :

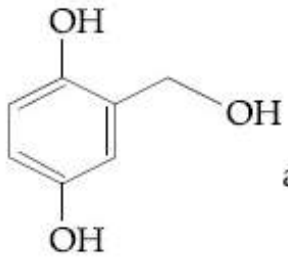


Options :

1.  and Methanol

2.  and Formic acid

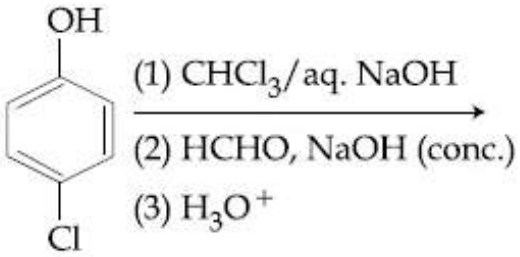
3.  and Methanol

4.  and Formic acid

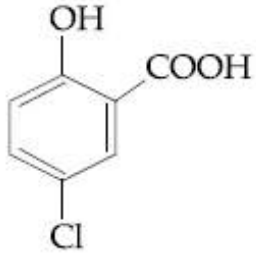
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

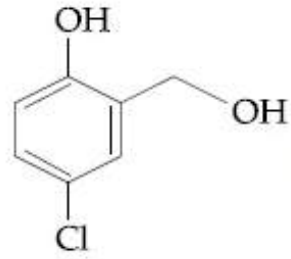
Correct Marks : 4 Wrong Marks : 1

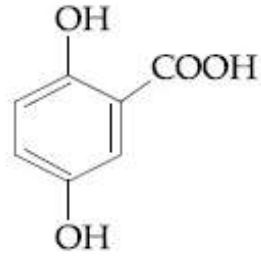
निम्न अभिक्रिया के मुख्य उत्पाद हैं :

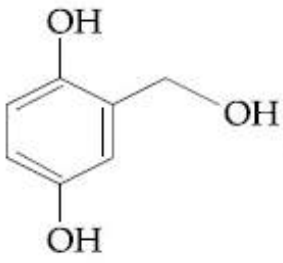


Options :

1.  तथा मेथेनॉल

2.  तथा फार्मिक एसिड

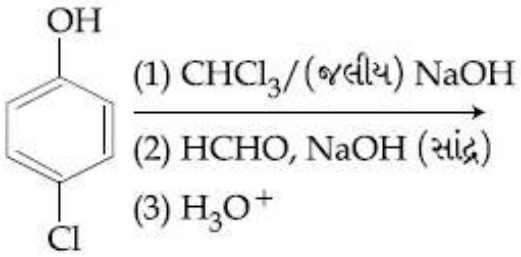
3.  तथा मेथेनॉल

4.  तथा फार्मिक एसिड

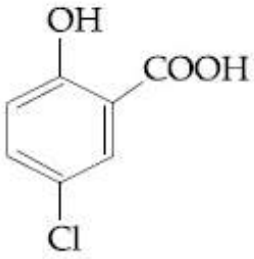
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

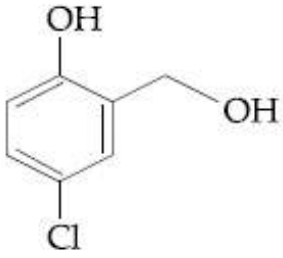
Correct Marks : 4 Wrong Marks : 1

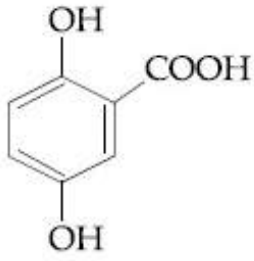
નીચેની પ્રક્રિયાની મુખ્ય નીપજ શોધો ?

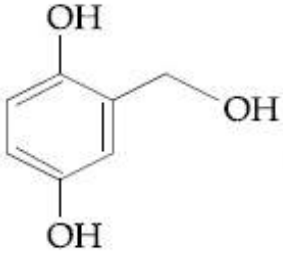


Options :

1.  અને મિથેનોલ

2.  અને ફાર્મિક એસિડ

3.  અને મિથેનોલ

4.  અને ફોર્મિક એસિડ

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

Which of the following is a thermosetting polymer ?

Options :

1. PVC

2. Bakelite

3. Nylon 6

4. Buna-N

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 में से कौन सा तापदृढ़ बहुलक है?

Options :

1. पी.वी.सी.

2. बेकेलाइट

3. नाईलॉन 6

4. ब्यूना-N

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

નીચેનામાંથી ક્યો થર્મોસેટિંગ બહુલક છે?

Options :

1. પીવીસી

2. બેકેલાઇટ

3. નાયલોન 6

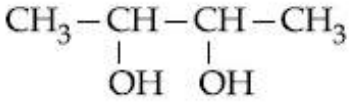
4. બ્યૂના-N

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

But-2-ene on reaction with alkaline $KMnO_4$ at elevated temperature followed by acidification will give :

Options :

1. 

2. 2 molecules of CH_3CHO

3. one molecule of CH_3CHO and one molecule of CH_3COOH

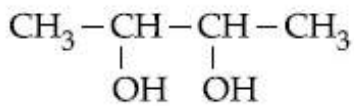
4. 2 molecules of CH_3COOH

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

ब्यूट-2-ईन के क्षारीय $KMnO_4$ के साथ अभिक्रिया करने तत्पश्चात् उच्च ताप पर अम्लीकृत करने पर प्राप्त होता है :

Options :

1. 

2. CH_3CHO के दो अणु

3. CH_3CHO का एक अणु तथा CH_3COOH का एक अणु

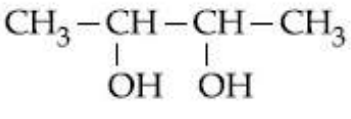
4. CH_3COOH के दो अणु

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

બ્યુટ-2-ઇનની આલ્કલાઇન $KMnO_4$ સાથે ઊંચા તાપમાને પ્રક્રિયા કર્યા બાદ એસિડીકરણ કરતા મળતી નીપજ :

Options :

1. 

2. CH_3CHO ના બે અણુઓ

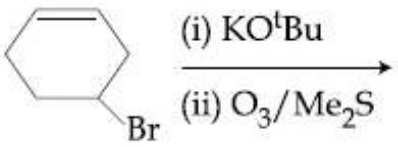
3. CH_3CHO નો એક અણુ અને CH_3COOH નો એક અણુ

4. CH_3COOH ના બે અણુ

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

Correct Marks : 4 Wrong Marks : 1

The major product(s) obtained in the following reaction is/are :

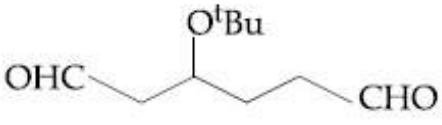


Options :

1. 

2. 

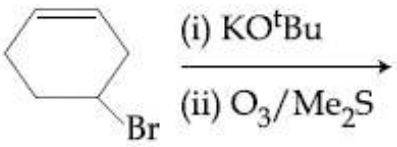
3. 

4. 

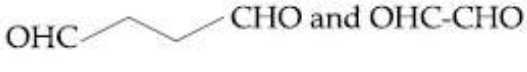
Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया से प्राप्त मुख्य उत्पाद है/हैं :

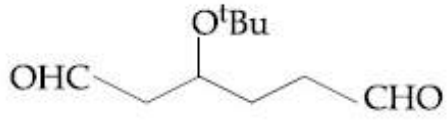


Options :

1. 

2. 

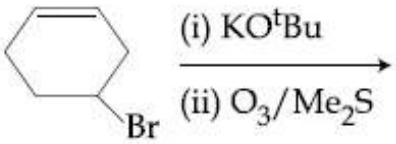
3. 

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

નીચે આપેલી પ્રક્રિયાની મુખ્ય નિપજ(જો) શોધો?

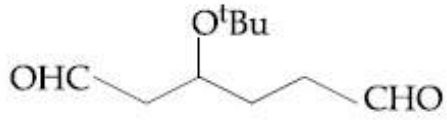


Options :

1. 

2. 

3. 

4. 

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

Correct Marks : 4 Wrong Marks : 1

An organic compound 'A' is oxidized with Na_2O_2 followed by boiling with HNO_3. The resultant solution is then treated with ammonium molybdate to yield a yellow precipitate.

Based on above observation, the element present in the given compound is :

Options :

1. Sulphur

2. Nitrogen

3. Fluorine

4. Phosphorus

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

एक कार्बनिक यौगिक 'A' को Na_2O_2 के साथ आक्सीकृत किया जाता है, तत्पश्चात् उसे HNO_3 के साथ उबाला जाता है। फिर परिणामी विलयन को अमोनियम मालीब्डेट के साथ अभिकृत किया जाता है जो पीला अवक्षेप देता है।

उपरोक्त प्रेक्षणों के आधार पर यौगिक में उपस्थित तत्व है :

Options :

1. सल्फर

2. नाइट्रोजन

3. फ्लोरीन

4. फास्फोरस

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

એક કાર્બનિક સંયોજન 'A' ને Na_2O_2 વડે ઑક્સીડેશન કર્યા બાદ HNO_3 ની સાથે ઉકાળવામાં આવે છે. મળતા પરિણામી દ્રાવણને એમોનિયમ મોલિબ્લેડ સાથે પ્રક્રિયા કરતા પીળા રંગના અવક્ષેપ મળે છે. ઊપરના નીરીક્ષણ પરથી આપેલ સંયોજનમાં રહેલું તત્વ :

Options :

1. સલ્ફર

2. નાઇટ્રોજન

3. ફ્લોરીન

4. ફૉસ્ફૉરસ

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 group number, number of valence electrons, and valency of an element with atomic number 15, respectively, are :

Options :

1. 15, 6 and 2

2. 16, 6 and 3

3. 15, 5 and 3

4. 16, 5 and 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

जिस तत्व की परमाणु संख्या 15 है उसकी ग्रुप संख्या, उसके संयोजकता इलेक्ट्रॉनों की संख्या तथा उसकी संयोजकता क्रमशः होगी :

Options :

1. 15, 6 तथा 2

2. 16, 6 तथा 3

3. 15, 5 तथा 3

4. 16, 5 तथा 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

એક તત્વ જેનો અણુક્રમાંક 15 છે તેનો સમુહ ક્રમાંક સંયોજકતા ઇલેક્ટ્રોનની સંખ્યા અને સંયોજકતા અનુક્રમે :

Options :

1. 15, 6 અને 2

2. 16, 6 અને 3

3. 15, 5 અને 3

4. 16, 5 અને 2

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

Correct Marks : 4 Wrong Marks : 1

The idea of froth floatation method came from a person X and this method is related to the process Y of ores. X and Y, respectively, are :

Options :

1. washer man and reduction

2. washer woman and concentration

3. fisher woman and concentration

4. fisher man and reduction

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

Correct Marks : 4 Wrong Marks : 1

झाग प्लवन विधि के लिये विचार एक व्यक्ति X से आया था तथा यह विधि अयस्क के प्रक्रम Y से सम्बन्धित है। X तथा Y क्रमश: हैं :

Options :

1. धोबी तथा अपचयन

2. धोबिन तथा सान्द्रता

3. मछुआरिन तथा सान्द्रता

4. मछुआरा तथा अपचयन

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

Correct Marks : 4 Wrong Marks : 1

ફીણપ્લવન પધ્ધતી નો વિચાર એક વ્યક્તિ X થી આવેલો અને આ પધ્ધતી Y ની કાચી ધાતુ (અયસ્ક) સંબંધીત છે,તો આ X અને Y અનુક્રમે :

Options :

1. એક ધોબી અને રિડક્શન

2. એક ધોબણ અને સાંદ્રતા

3. એક માછીમાર સ્ત્રી અને સાંદ્રતા

4. માછીમાર અને રિડક્શન

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 metal that gives hydrogen gas upon treatment with both acid as well as base is :

Options :

1. magnesium

2. iron

3. zinc

4. mercury

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

वह धातु जो अम्ल एवं क्षारक दोनों के ही साथ अभिकृत करने पर हाइड्रोजन देता है, होगी :

Options :

1. मैग्नीशियम

2. आयरन

3. जिंक

4. मर्करी

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

એક ધાતુ કે જે એસિડ બેઇઝ બન્નેની સાથે પ્રક્રિયા કરતા હાઇડ્રોજન વાયુ આપે છે.

Options :

1. મેગ્નેશીયમ

2. આયરન

3. ઝિંક

4. પારો

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

Correct Marks : 4 Wrong Marks : 1

The correct sequence of thermal stability of the following carbonates is :

Options :

1. $MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

2. $MgCO_3 < SrCO_3 < CaCO_3 < BaCO_3$

3. $BaCO_3 < CaCO_3 < SrCO_3 < MgCO_3$

4. $BaCO_3 < SrCO_3 < CaCO_3 < MgCO_3$

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

निम्न कार्बोनेटों के तापीय स्थायित्व का **सही** क्रम है :

Options :

1. $MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

2. $MgCO_3 < SrCO_3 < CaCO_3 < BaCO_3$

3. $BaCO_3 < CaCO_3 < SrCO_3 < MgCO_3$

4. $BaCO_3 < SrCO_3 < CaCO_3 < MgCO_3$

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

નીચેના કાર્બોનેટસની ઊષ્મીય સ્થિરતાનો સાચો ક્રમ :

Options :

1. $MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

2. $MgCO_3 < SrCO_3 < CaCO_3 < BaCO_3$

3. $BaCO_3 < CaCO_3 < SrCO_3 < MgCO_3$

4. $BaCO_3 < SrCO_3 < CaCO_3 < MgCO_3$

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 among the following is :

Options :

1. $(SiH_3)_3N$ is pyramidal and more basic than $(CH_3)_3N$.

2. $(SiH_3)_3N$ is pyramidal and less basic than $(CH_3)_3N$.

3. $(SiH_3)_3N$ is planar and more basic than $(CH_3)_3N$.

4. $(SiH_3)_3N$ is planar and less basic than $(CH_3)_3N$.

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

निम्नलिखित में से **सही** कथन है :

Options :

1. $(SiH_3)_3N$ पिरामिडी है तथा $(CH_3)_3N$ से ज्यादा क्षारीय है

2. $(SiH_3)_3N$ पिरामिडी है तथा $(CH_3)_3N$ से कम क्षारीय है

3. $(SiH_3)_3N$ समतली है तथा $(CH_3)_3N$ से ज्यादा क्षारीय है

4. $(SiH_3)_3N$ समतली है तथा $(CH_3)_3N$ से कम क्षारीय 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

સાચુ વિધાન પસંદ કરો :

Options :

1. $(SiH_3)_3N$ એ પિરામીડલ છે અને $(CH_3)_3N$ કરતાં વધુ બેઝિક છે.

2. $(SiH_3)_3N$ એ પિરામીડલ છે અને $(CH_3)_3N$ કરતાં ઓછુ બેઝિક છે.

3. $(SiH_3)_3N$ એ સમતલીય છે અને $(CH_3)_3N$ કરતાં વધુ બેઝિક છે.

4. $(SiH_3)_3N$ એ સમતલીય છે અને $(CH_3)_3N$ કરતાં ઓછો બેઝિક 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 basic structural unit of feldspar, zeolites, mica, and asbestos is :

Options :

1. SiO_2

2. $-\left(\begin{matrix}R\\|\\Si-O\\|\\R\end{matrix}\right)_n$ $(R = Me)$

3. $(SiO_3)^{2-}$

4. $(SiO_4)^{4-}$

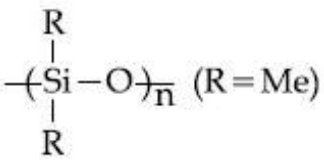
Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

फेल्डस्पार, ज़िओलाइट, माइका तथा एस्बेस्टॉस की मूल संरचना इकाई है :

Options :

1. SiO_2

2. 

3. $(SiO_3)^{2-}$

4. $(SiO_4)^{4-}$

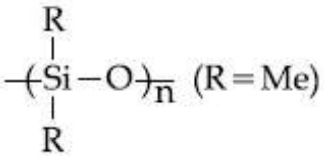
Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ફેલ્સપાર, ઝીઓલાઇટ, માઈકા અને એસ્બેસ્ટોસ નો પાયાનો બંધારણીય એકમ કયો?

Options :

1. SiO_2

2. 

3. $(SiO_3)^{2-}$

4. $(SiO_4)^{4-}$

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

Correct Marks : 4 Wrong Marks : 1

An example of a disproportionation reaction is :

Options :

1. $2\,MnO_4^- + 10\,I^- + 16\,H^+ \rightarrow 2\,Mn^{2+} + 5\,I_2 + 8\,H_2O$

2. $2\,KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

3. $2\,CuBr \rightarrow CuBr_2 + Cu$

4. $2\,NaBr + Cl_2 \rightarrow 2\,NaCl + Br_2$

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

Correct Marks : 4 Wrong Marks : 1

एक असमानुपातन अभिक्रिया का उदाहरण है :

Options :

1. $2\,MnO_4^- + 10\,I^- + 16\,H^+ \rightarrow 2\,Mn^{2+} + 5\,I_2 + 8\,H_2O$

2. $2\,KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

3. $2\,CuBr \rightarrow CuBr_2 + Cu$

4. $2\,NaBr + Cl_2 \rightarrow 2\,NaCl + Br_2$

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

Correct Marks : 4 Wrong Marks : 1

વિષમીકરણ પ્રક્રિયાનું ઉદાહરણ :

Options :

1. $2\,MnO_4^- + 10\,I^- + 16\,H^+ \rightarrow 2\,Mn^{2+} + 5\,I_2 + 8\,H_2O$

2. $2\,KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

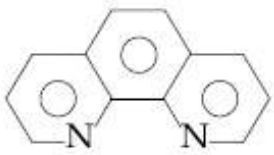
3. $2\,CuBr \rightarrow CuBr_2 + Cu$

4. $2\,NaBr + Cl_2 \rightarrow 2\,NaCl + Br_2$

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

The complex ion that will lose its crystal field stabilization energy upon oxidation of its metal to +3 state is :

(Phen = 

and
ignore pairing energy)

Options :

1. $[Co(phen)_3]^{2+}$

2. $[Ni(phen)_3]^{2+}$

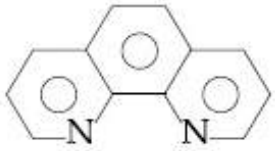
3. $[Fe(phen)_3]^{2+}$

4. $[Zn(phen)_3]^{2+}$

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 संकुल आयन जो अपनी धातु को +3 अवस्था में उपचयित करने पर अपनी क्रिस्टल क्षेत्र स्थायीकरण ऊर्जा खो देता है, होगा :

(Phen = 

तथा
युग्मन ऊर्जा को छोड़ दें)

Options :

1. $[Co(phen)_3]^{2+}$

2. $[Ni(phen)_3]^{2+}$

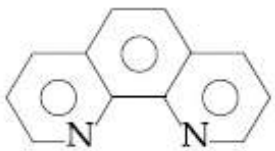
3. $[Fe(phen)_3]^{2+}$

4. $[Zn(phen)_3]^{2+}$

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

સંકીર્ણ આયન કે જે તેની ધાતુને ઓક્સિડેશન દ્વારા +3 સ્થિતિમાં લઈ જતા તેની સ્ફટિક ક્ષેત્ર સ્થિરીકરણ શક્તિ ગુમાવે છે તે શોધો?

(Phen = 

અને
યુગ્મન ઊર્જાને અવગણો)

Options :

1. $[Co(phen)_3]^{2+}$

2. $[Ni(phen)_3]^{2+}$

3. $[Fe(phen)_3]^{2+}$

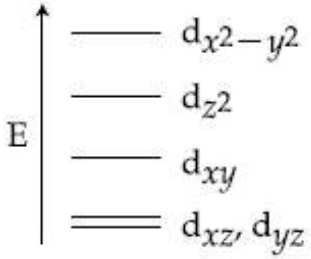
4. $[Zn(phen)_3]^{2+}$

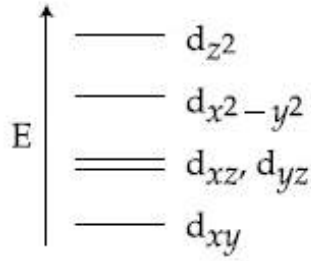
Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

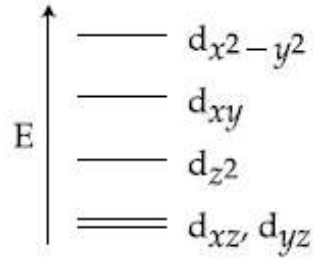
Correct Marks : 4 Wrong Marks : 1

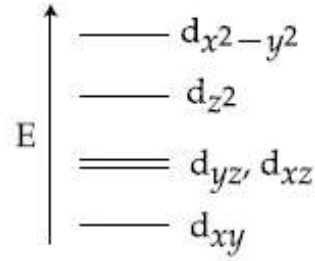
Complete removal of both the axial ligands (along the z-axis) from an octahedral complex leads to which of the following splitting patterns? (relative orbital energies not on scale).

Options :

1.


2.


3.


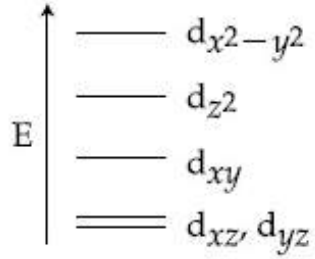
4.


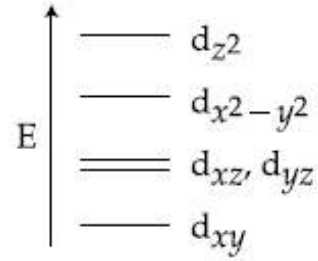
Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

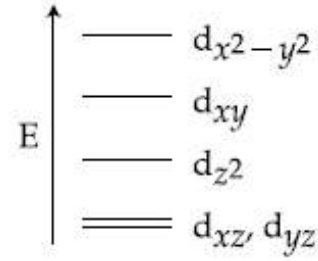
Correct Marks : 4 Wrong Marks : 1

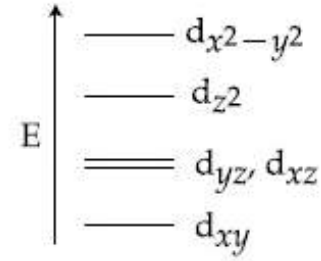
अष्टफलकीय संकर से (z-अक्ष के साथ) दोनों अक्षीय लिगण्ड के पूर्ण रूप से हटाने से किस विपाटन पैटर्न में परिवर्तन होता है?

Options :

1. 

2. 

3. 

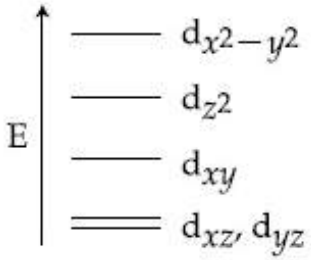
4. 

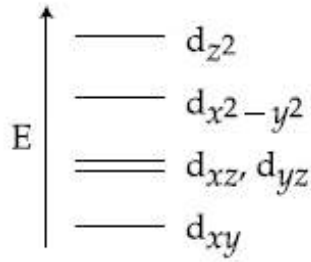
Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

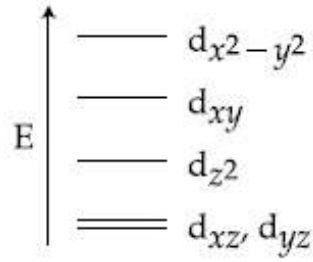
Correct Marks : 4 Wrong Marks : 1

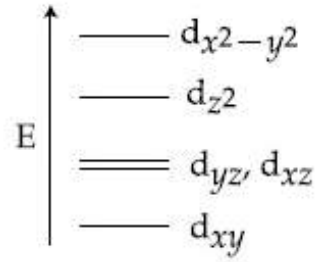
એક અષ્ટફલકીય સંકીર્ણમાં તેના બન્ને અક્ષીય લીગાન્ડ (z- અક્ષ પરના) ને દુર કરતા તેની વિભાજનની ગોઠવણીમાં થતો ફેરફાર નોચેનામાંથી શોધો? (સંબંધિત કક્ષીય ઊર્જા માપદંડમાં નથી)

Options :

1. 

2. 

3. 

4. 

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

Correct Marks : 4 Wrong Marks : 1

The correct set of species responsible for the photochemical smog is :

Options :

1. N_2, O_2, O_3 and hydrocarbons

2. N_2, NO_2 and hydrocarbons

3. NO, NO_2, O_3 and hydrocarbons

4. CO_2, NO_2, SO_2 and hydrocarbons

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

प्रकाश रसायनिक धूमकुहा के लिये उत्तरदायी स्पीशीज़ का **सही** सेट है :

Options :

1. N_2, O_2, O_3 तथा हाइड्रोकार्बन

2. N_2, NO_2 तथा हाइड्रोकार्बन

3. NO, NO_2, O_3 तथा हाइड्रोकार्बन

4. CO_2, NO_2, SO_2 तथा हाइड्रोकार्बन

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

પ્રકાશ રાસાયણિક ધ્રુમ-ધુમ્મસ માટે જવાબદાર સાચી સ્પીશીઝોનો સમુહ :

Options :

1. N_2, O_2, O_3 અને હાઇડ્રોકાર્બન

2. N_2, NO_2 અને હાઇડ્રોકાર્બન

3. NO, NO_2, O_3 અને હાઇડ્રોકાર્બન

4. CO_2, NO_2, SO_2 અને હાઇડ્રોકાર્બન

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

5 moles of AB_2 weigh 125×10^{-3} kg and 10 moles of A_2B_2 weigh 300×10^{-3} kg. The molar mass of A (M_A) and molar mass of B (M_B) in kg mol^{-1} are :

Options :

1. $M_A = 5 \times 10^{-3}$ and $M_B = 10 \times 10^{-3}$

2. $M_A = 10 \times 10^{-3}$ and $M_B = 5 \times 10^{-3}$

3. $M_A = 25 \times 10^{-3}$ and $M_B = 50 \times 10^{-3}$

4. $M_A = 50 \times 10^{-3}$ and $M_B = 25 \times 10^{-3}$

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

AB_2 के 5 मोल का भार 125×10^{-3} kg तथा A_2B_2 के 10 मोल का भार 300×10^{-3} kg है। A का मोलर द्रव्यमान (M_A) तथा B का मोलर द्रव्यमान (M_B) ($kg\ mol^{-1}$ में) होंगे :

Options :

1. $M_A=5\times10^{-3}$ तथा $M_B=10\times10^{-3}$

2. $M_A=10\times10^{-3}$ तथा $M_B=5\times10^{-3}$

3. $M_A=25\times10^{-3}$ तथा $M_B=50\times10^{-3}$

4. $M_A=50\times10^{-3}$ तथा $M_B=25\times10^{-3}$

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

AB_2 ના 5 મોલુનું વજન 125×10^{-3} kg અને 10 મોલ A_2B_2 નું વજન 300×10^{-3} kg છે. A નું મોલર દળ (M_A) અને B નું મોલર દળ (M_B) ($kg\ mol^{-1}$ માં) અનુક્રમે :

Options :

1. $M_A=5\times10^{-3}$ અને $M_B=10\times10^{-3}$

2. $M_A=10\times10^{-3}$ અને $M_B=5\times10^{-3}$

3. $M_A=25\times10^{-3}$ અને $M_B=50\times10^{-3}$

4. $M_A=50\times10^{-3}$ અને $M_B=25\times10^{-3}$

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

Correct Marks : 4 Wrong Marks : 1

An element has a face-centred cubic (fcc) structure with a cell edge of a. The distance between the centres of two nearest tetrahedral voids in the lattice is :

Options :

1. a

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

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

4. $\sqrt{2}a$

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

एक तत्व की फलकेन्द्रस्थ घनीय (एफसीसी) संरचना है जिसके सेल का कोर a है। लैटिस में दो निकटतम चतुष्फलकीय रिक्तियों के केन्द्रों के बीच की दूरी होगी :

Options :

1. a

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

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

4. $\sqrt{2}a$

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

એક તત્વ કે જેનું ફલક કેન્દ્રીત ઘન મા (fcc) બંધારણ છે. તેની કોષ ધાર a છે. આ સ્ફટિકના સૌથી નજીકમાં ચતુષ્ફલકીય છિદ્રોના કેન્દ્ર વચ્ચેનું અંતર કેટલું?

Options :

1. a

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

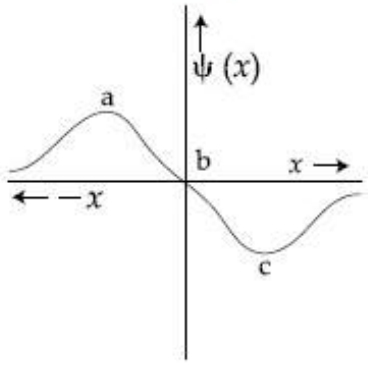
3. $\frac{a}{2}$

4. $\sqrt{2}a$

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

Correct Marks : 4 Wrong Marks : 1

The electrons are more likely to be found :



Options :

1. only in the region a

2. in the region a and b

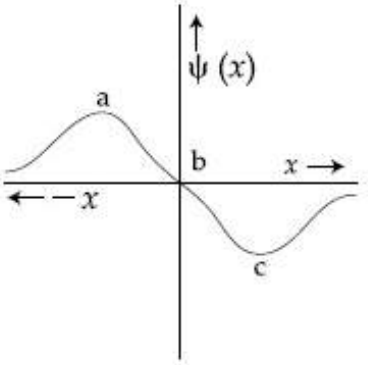
3. only in the region c

4. in the region a and c

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

इलेक्ट्रॉनों के पाये जाने की ज्यादा संभावना है :



Options :

1. मात्र a क्षेत्र में

2. a तथा b क्षेत्र में

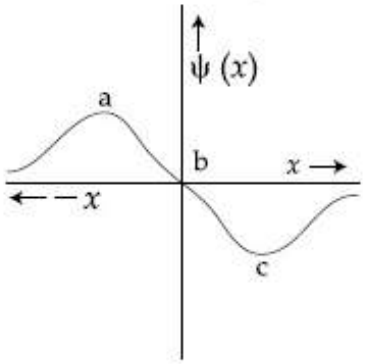
3. मात्र c क्षेत्र में

4. a तथा c क्षेत्र में

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

ઈલેક્ટ્રોન મળવાની વધુ શક્યતા :



Options :

1. ફક્ત a વિસ્તારમાં

2. a અને b વિસ્તારમાં

3. ફક્ત c વિસ્તારમાં

4. a અને c વિસ્તારમાં

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

Enthalpy of sublimation of iodine is 24 cal g^{-1} at 200 °C. If specific heat of $I_2(s)$ and $I_2(vap)$ are 0.055 and 0.031 cal $g^{-1}K^{-1}$ respectively, then enthalpy of sublimation of iodine at 250 °C in cal g^{-1} is :

Options :

1. 22.8

2. 11.4

3. 5.7

4. 2.85

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

200 °C पर, आयोडीन की ऊर्ध्वपातन एन्थैल्पी 24 cal g^{-1} है। यदि $I_2(s)$ तथा $I_2(vap)$ की विशिष्ट ऊष्मायें क्रमश: 0.055 तथा 0.031 cal $g^{-1}K^{-1}$ हों तो 250 °C पर आयोडीन की ऊर्ध्वपातन एन्थैल्पी (cal g^{-1} में) होगी :

Options :

1. 22.8

2. 11.4

3. 5.7

4. 2.85

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

200 °C એ આયોડિનની ઊર્ધ્વપાતનની એન્થાલ્પી 24 cal g^{-1} છે. જો $I_2(s)$ અને $I_2(vap)$ ની વિશિષ્ટ ઊષ્મા અનુક્રમે 0.055 અને 0.031 cal $g^{-1}K^{-1}$ હોય તો, 250 °C એ આયોડિનની ઊર્ધ્વપાતન એન્થાલ્પી (cal g^{-1} માં) કેટલી ?

Options :

1. 22.8

2. 11.4

3. 5.7

4. 2.85

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

An ideal gas is allowed to expand from 1 L to 10 L against a constant external pressure of 1 bar. The work done in kJ is :

Options :

1. -0.9

2. -2.0

3. $+10.0$

4. -9.0

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

Correct Marks : 4 Wrong Marks : 1

एक आदर्श गैस को स्थिर बाह्य दाब 1 बार के विरुद्ध 1 L से 10 L तक प्रसारित होने दिया जाता है। किया गया कार्य (kJ में) होगा :

Options :

1. -0.9

2. -2.0

3. $+10.0$

4. -9.0

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

Correct Marks : 4 Wrong Marks : 1

એક બાર અચળ બાહ્ય દબાણે એક આદર્શ વાયુનું 1 L થી 10 L સુધી વિસ્તરણ કરવામાં આવે છે. થયેલુ કાર્ય (kJ માં) શોધો

Options :

1. -0.9

2. -2.0

3. $+10.0$

4. -9.0

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

The mole fraction of a solvent in aqueous solution of a solute is 0.8. The molality (in mol kg^{-1}) of the aqueous solution is :

Options :

1. 13.88

2. 13.88×10^{-1}

3. 13.88×10^{-2}

4. 13.88×10^{-3}

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

Correct Marks : 4 Wrong Marks : 1

एक विलेय के जलीय विलयन में विलायक का मोल अंश 0.8 है। जलीय विलयन की मोललता ($mol\ kg^{-1}$ में) होगी :

Options :

1. 13.88

2. 13.88×10^{-1}

3. 13.88×10^{-2}

4. 13.88×10^{-3}

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

એક દ્રાવ્યના જલીય દ્રાવણમાં, દ્રાવકના મોલ અંશ 0.8 છે. જલીય દ્રાવણની મોલાલિટી ($mol\ kg^{-1}$ માં) કેટલી?

Options :

1. 13.88

2. 13.88×10^{-1}

3. 13.88×10^{-2}

4. 13.88×10^{-3}

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

Correct Marks : 4 Wrong Marks : 1

What is the molar solubility of $Al(OH)_3$ in 0.2 M NaOH solution ? Given that, solubility product of $Al(OH)_3 = 2.4 \times 10^{-24}$:

Options :

1. 3×10^{-22}

2. 3×10^{-19}

3. 12×10^{-23}

4. 12×10^{-21}

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

Correct Marks : 4 Wrong Marks : 1

0.2 M NaOH विलयन में $Al(OH)_3$ की मोलर विलेयता क्या होगी? दिया गया है : $Al(OH)_3$ का विलेयता स्थिरांक 2.4×10^{-24}

Options :

1. 3×10^{-22}

2. 3×10^{-19}

3. 12×10^{-23}

4. 12×10^{-21}

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

Correct Marks : 4 Wrong Marks : 1

0.2 M NaOH દ્રાવણમાં $Al(OH)_3$ ની મોલર દ્રાવ્યતા કેટલી ?

($Al(OH)_3$નો દ્રાવ્યતા ગુણાકાર 2.4×10^{-24})

Options :

1. 3×10^{-22}

2. 3×10^{-19}

3. 12×10^{-23}

4. 12×10^{-21}

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

Given :

$Co^{3+} + e^- \rightarrow Co^{2+}$; $E^\circ = +1.81$ V

$Pb^{4+} + 2e^- \rightarrow Pb^{2+}$; $E^\circ = +1.67$ V

$Ce^{4+} + e^- \rightarrow Ce^{3+}$; $E^\circ = +1.61$ V

$Bi^{3+} + 3e^- \rightarrow Bi$; $E^\circ = +0.20$ V

Oxidizing power of the species will increase in the order :

Options :

1. $Co^{3+} < Ce^{4+} < Bi^{3+} < Pb^{4+}$

2. $Co^{3+} < Pb^{4+} < Ce^{4+} < Bi^{3+}$

3. $Bi^{3+} < Ce^{4+} < Pb^{4+} < Co^{3+}$

4. $Ce^{4+} < Pb^{4+} < Bi^{3+} < Co^{3+}$

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

Correct Marks : 4 Wrong Marks : 1

दिया गया है

$Co^{3+} + e^- \rightarrow Co^{2+}; E^\circ = +1.81\ V$

$Pb^{4+} + 2e^- \rightarrow Pb^{2+}; E^\circ = +1.67\ V$

$Ce^{4+} + e^- \rightarrow Ce^{3+}; E^\circ = +1.61\ V$

$Bi^{3+} + 3e^- \rightarrow Bi; E^\circ = +0.20\ V$

स्पीशीज़ की उपचायक सामर्थ्य इस क्रम में बढ़ेगी :

Options :

1. $Co^{3+} < Ce^{4+} < Bi^{3+} < Pb^{4+}$

2. $Co^{3+} < Pb^{4+} < Ce^{4+} < Bi^{3+}$

3. $Bi^{3+} < Ce^{4+} < Pb^{4+} < Co^{3+}$

4. $Ce^{4+} < Pb^{4+} < Bi^{3+} < Co^{3+}$

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

Correct Marks : 4 Wrong Marks : 1

આપેલ :

$Co^{3+} + e^- \rightarrow Co^{2+}; E^\circ = +1.81\ V$

$Pb^{4+} + 2e^- \rightarrow Pb^{2+}; E^\circ = +1.67\ V$

$Ce^{4+} + e^- \rightarrow Ce^{3+}; E^\circ = +1.61\ V$

$Bi^{3+} + 3e^- \rightarrow Bi; E^\circ = +0.20\ V$

સ્પીશીઝ ની ઑક્સીડેશન કર્તા શક્તિનો ચઢતો ક્રમ આપો

Options :

1. $Co^{3+} < Ce^{4+} < Bi^{3+} < Pb^{4+}$

2. $Co^{3+} < Pb^{4+} < Ce^{4+} < Bi^{3+}$

3. $Bi^{3+} < Ce^{4+} < Pb^{4+} < Co^{3+}$

4. $Ce^{4+} < Pb^{4+} < Bi^{3+} < Co^{3+}$

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

In the following reaction; $xA \rightarrow yB$

$$\log_{10}\left[-\frac{d[A]}{dt}\right] = \log_{10}\left[\frac{d[B]}{dt}\right] + 0.3010$$

'A' and 'B' respectively can be :

Options :

1. C_2H_2 and C_6H_6

2. n-Butane and Iso-butane

3. C_2H_4 and C_4H_8

4. N_2O_4 and NO_2

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

निम्न अभिक्रिया में, $xA \rightarrow yB$

$$\log_{10}\left[-\frac{d[A]}{dt}\right] = \log_{10}\left[\frac{d[B]}{dt}\right] + 0.3010$$

'A' तथा 'B' क्रमश: हो सकते हैं :

Options :

1. C_2H_2 तथा C_6H_6

2. n-ब्यूटेन तथा आइसोब्यूटेन

3. C_2H_4 तथा C_4H_8

4. N_2O_4 तथा NO_2

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયા

$xA \rightarrow yB$

$$\log_{10}\left[-\frac{d[A]}{dt}\right] = \log_{10}\left[\frac{d[B]}{dt}\right] + 0.3010$$

'A' અને 'B' અનુક્રમે શું છે?

Options :

1. C_2H_2 અને C_6H_6

2. n-બ્યુટેન અને આઈસોબ્યુટેન

3. C_2H_4 અને C_4H_8

4. N_2O_4 અને NO_2

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

Peptization is a :

Options :

1. process of converting a colloidal solution into precipitate

2. process of converting precipitate into colloidal solution

3. process of converting soluble particles to form colloidal solution

4. process of bringing colloidal molecule into solution

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

पेप्टाइजेशन है :

Options :

1. कोलाइडी विलयन को अवक्षेप में बदलने का प्रक्रम

2. अवक्षेप को कोलाइडी विलयन में बदलने का प्रक्रम

3. विलेय कणों को कोलाइडी विलयन में बदलने का प्रक्रम

4. कोलाइडी अणुओं को विलयन में लाने का प्रक्रम

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

પેપ્ટાઇઝેશન એ :

Options :

1. કલિલી દ્રાવણને અવક્ષેપમાં રૂપાંતર કરવાની પ્રક્રિયા

2. અવક્ષેપને કલિલી દ્રાવણમાં રૂપાંતર કરવાની પ્રક્રિયા

3. દ્રાવ્ય કણોને કલિલી દ્રાવણમાં રૂપાંતર કરવાની પ્રક્રિયા

4. કલિલી અણુને દ્રાવણમાં લાવવાની પ્રક્રિયા

Mathematics

Section Id :	416529327
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:	416529467
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

For $x \in \left(0, \frac{3}{2}\right)$, let $f(x) = \sqrt{x}$, $g(x) = \tan x$

and $h(x) = \frac{1 - x^2}{1 + x^2}$. If $\phi(x) = ((hof)og)(x)$,

then $\phi\left(\frac{\pi}{3}\right)$ is equal to :

Options :

1. $\tan\frac{\pi}{12}$

2. $\tan\frac{5\pi}{12}$

3. $\tan\frac{7\pi}{12}$

4. $\tan\frac{11\pi}{12}$

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

$x \in \left(0, \frac{3}{2}\right)$ के लिए माना $f(x) = \sqrt{x}$,

$g(x) = \tan x$ तथा $h(x) = \frac{1 - x^2}{1 + x^2}$. यदि

$\phi(x) = ((hof)og)(x)$, तो $\phi\left(\frac{\pi}{3}\right)$ बराबर है :

Options :

1. $\tan\frac{\pi}{12}$

2. $\tan\frac{5\pi}{12}$

3. $\tan\frac{7\pi}{12}$

4. $\tan\frac{11\pi}{12}$

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

$x \in \left(0, \frac{3}{2}\right)$ માટે, ધારો કે $f(x) = \sqrt{x}$,

$g(x) = \tan x$ અને $h(x) = \frac{1 - x^2}{1 + x^2}$. જો

$\phi(x) = ((hof)og)(x)$, તો $\phi\left(\frac{\pi}{3}\right)$ બરાબર

_____ છે.

Options :

1. $\tan\frac{\pi}{12}$

2. $\tan\frac{5\pi}{12}$

3. $\tan\frac{7\pi}{12}$

4. $\tan\frac{11\pi}{12}$

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 α and β are the roots of the equation $375x^2 - 25x - 2 = 0$, then

$\lim\limits_{n\to\infty} \sum\limits_{r=1}^{n} \alpha^r + \lim\limits_{n\to\infty} \sum\limits_{r=1}^{n} \beta^r$ is equal to :

Options :

1. $\frac{7}{116}$

2. $\frac{1}{12}$

3. $\frac{29}{358}$

4. $\frac{21}{346}$

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 समीकरण $375x^2-25x-2=0$ के मूल α तथा

β हैं, तो $\lim_{n\to\infty}\sum_{r=1}^{n}\alpha^r+\lim_{n\to\infty}\sum_{r=1}^{n}\beta^r$ बराबर है :

Options :

1. $\frac{7}{116}$

2. $\frac{1}{12}$

3. $\frac{29}{358}$

4. $\frac{21}{346}$

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 α અને β એ સમીકરણ $375x^2-25x-2=0$ નાં

બીજ હોય, તો $\lim_{n\to\infty}\sum_{r=1}^{n}\alpha^r+\lim_{n\to\infty}\sum_{r=1}^{n}\beta^r$ બરાબર

_____ છે.

Options :

1. $\frac{7}{116}$

2. $\frac{1}{12}$

3. $\frac{29}{358}$

4. $\frac{21}{346}$

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 equation $|z-i|=|z-1|$, $i=\sqrt{-1}$,

represents :

Options :

1. a circle of radius 1.

2. a circle of radius $\frac{1}{2}$.

3. the line through the origin with slope -1.

4. the line through the origin with slope 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

समीकरण $|z-i|=|z-1|$, $i=\sqrt{-1}$, निम्न में से किसको निरूपित करती है?

Options :

1. त्रिज्या 1 का एक वृत्त।

2. त्रिज्या $\frac{1}{2}$ का एक वृत्त।

3. मूलबिन्दु से होकर जाने वाली रेखा जिसका ढाल -1 है।

4. मूलबिन्दु से होकर जाने वाली रेखा जिसका ढाल 1 है।

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 $|z-i|=|z-1|$, $i=\sqrt{-1}$, એ _____ દર્શાવે છે.

Options :

1. 1 ત્રિજ્યાવાળું કોઈ એક વર્તુળ

2. $\frac{1}{2}$ ત્રિજ્યાવાળું કોઈ એક વર્તુળ

3. ઊગમબિંદુમાંથી પસાર થતી અને -1 ઢાળવાળી રેખા

4. ઊગમબિંદુમાંથી પસાર થતી અને 1 ઢાળવાળી રેખા

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

Correct Marks : 4 Wrong Marks : 1

If $B=\begin{bmatrix}5 & 2\alpha & 1\\ 0 & 2 & 1\\ \alpha & 3 & -1\end{bmatrix}$ is the inverse of a 3×3 matrix A, then the sum of all values of α for which $\det(A)+1=0$, is :

Options :

1. 2

2. 1

3. 0

4. -1

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

Correct Marks : 4 Wrong Marks : 1

यदि एक 3×3 के आव्यूह A का व्युत्क्रम (inverse) $B=\begin{bmatrix}5 & 2\alpha & 1\\ 0 & 2 & 1\\ \alpha & 3 & -1\end{bmatrix}$ है, तो α के उन सभी मानों का योग, जिनके लिए $\det(A)+1=0$ है, है :

Options :

1. 2

2. 1

3. 0

4. -1

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

કોઈ એક 3×3 શ્રેણિક A નો વ્યસ્ત જો

$B=\begin{bmatrix}5 & 2\alpha & 1\\ 0 & 2 & 1\\ \alpha & 3 & -1\end{bmatrix}$ હોય, તો $(A)+1=0$ થાય તેવી

α ની તમામ કિંમતોનો સરવાળો _____ છે.

Options :

1. 2

2. 1

3. 0

4. -1

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 A is a symmetric matrix and B is a skew-symmetrix matrix such that

$A+B=\begin{bmatrix}2 & 3\\ 5 & -1\end{bmatrix}$, then AB is equal to :

Options :

1. $\begin{bmatrix}-4 & 2\\ 1 & 4\end{bmatrix}$

2. $\begin{bmatrix}4 & -2\\ 1 & -4\end{bmatrix}$

3. $\begin{bmatrix}4 & -2\\ -1 & -4\end{bmatrix}$

4. $\begin{bmatrix}-4 & -2\\ -1 & 4\end{bmatrix}$

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

Correct Marks : 4 Wrong Marks : 1

यदि एक सममित (symmetric) आव्यूह A तथा एक विषम सममित (skew-symmetrix) आव्यूह B इस प्रकार हैं कि

$A + B = \begin{bmatrix} 2 & 3 \\ 5 & -1 \end{bmatrix}$, तो AB बराबर है :

Options :

1. $\begin{bmatrix} -4 & 2 \\ 1 & 4 \end{bmatrix}$

2. $\begin{bmatrix} 4 & -2 \\ 1 & -4 \end{bmatrix}$

3. $\begin{bmatrix} 4 & -2 \\ -1 & -4 \end{bmatrix}$

4. $\begin{bmatrix} -4 & -2 \\ -1 & 4 \end{bmatrix}$

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 A એ સંમિત શ્રેણિક હોય અને B એ વિસંમિત શ્રેણિક હોય કે જેથી $A + B = \begin{bmatrix} 2 & 3 \\ 5 & -1 \end{bmatrix}$ થાય, તો AB બરાબર _____ છે.

Options :

1. $\begin{bmatrix} -4 & 2 \\ 1 & 4 \end{bmatrix}$

2. $\begin{bmatrix} 4 & -2 \\ 1 & -4 \end{bmatrix}$

3. $\begin{bmatrix} 4 & -2 \\ -1 & -4 \end{bmatrix}$

4. $\begin{bmatrix} -4 & -2 \\ -1 & 4 \end{bmatrix}$

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 ways of choosing 10 objects out of 31 objects of which 10 are identical and the remaining 21 are distinct, is :

Options :

1. $2^{20}-1$

2. 2^{20}

3. $2^{20}+1$

4. 2^{21}

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

31 वस्तुओं, जिनमें 10 समरूप (identical) हैं तथा 21 भिन्न हैं, में से 10 वस्तुओं के चुने जाने के तरीकों की संख्या है :

Options :

1. $2^{20}-1$

2. 2^{20}

3. $2^{20}+1$

4. 2^{21}

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

જો 31 વસ્તુઓમાં 10 સમસ્વરૂપ હોય અને બાકીની 21 વસ્તુઓ ભિન્ન હોય તો આ 31 વસ્તુઓમાંથી 10 વસ્તુઓ કેટલી રીતે પસંદ કરી શકાય?

Options :

1. $2^{20}-1$

2. 2^{20}

3. $2^{20}+1$

4. 2^{21}

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

Correct Marks : 4 Wrong Marks : 1

The coefficient of x^{18} in the product $(1+x)(1-x)^{10}(1+x+x^2)^9$ is :

Options :

1. 84

2. 126

3. -126

4. -84

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

गुणनफल $(1+x)(1-x)^{10}(1+x+x^2)^9$ में x^{18} का गुणांक है :

Options :

1. 84

2. 126

3. -126

4. -84

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

$(1+x)(1-x)^{10}(1+x+x^2)^9$ ના વિસ્તરણમાં x^{18} નો સહગુણક _____ છે.

Options :

1. 84

2. 126

3. -126

4. -84

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

Correct Marks : 4 Wrong Marks : 1

Let S_n denote the sum of the first n terms of an A.P.. If $S_4 = 16$ and $S_6 = -48$, then S_{10} is equal to :

Options :

1. -260

2. -320

3. -380

4. -410

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

Correct Marks : 4 Wrong Marks : 1

माना S_n एक समान्तर श्रेढ़ी के प्रथम n पदों के योग को दर्शाता है। यदि $S_4 = 16$ तथा $S_6 = -48$ है, तो S_{10} बराबर है :

Options :

1. -260

2. -320

3. -380

4. -410

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

કોઈએક સમાંતર શ્રેણી (A.P.) ના પ્રથમ n પદોનો સરવાળો ધારોકે S_n છે. જો $S_4 = 16$ અને $S_6 = -48$, તો S_{10} બરાબર _____ છે.

Options :

1. -260

2. -320

3. -380

4. -410

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

For $x \in \mathbf{R}$, let $[x]$ denote the greatest integer $\leq x$, then the sum of the series

$$\left[-\frac{1}{3}\right]+\left[-\frac{1}{3}-\frac{1}{100}\right]+\left[-\frac{1}{3}-\frac{2}{100}\right]+\cdots\cdots+\left[-\frac{1}{3}-\frac{99}{100}\right]$$

is :

Options :

1. -135

2. -153

3. -131

4. -133

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

$x \in \mathbf{R}$ के लिए माना $[x]$, x के समान या उससे कम महत्तम पूर्णांक को दर्शाता है, तो श्रेणी

$$\left[-\frac{1}{3}\right]+\left[-\frac{1}{3}-\frac{1}{100}\right]+\left[-\frac{1}{3}-\frac{2}{100}\right]+\cdots\cdots+\left[-\frac{1}{3}-\frac{99}{100}\right]$$

का योग है :

Options :

1. -135

2. -153

3. -131

4. -133

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

$x \in \mathbf{R}$ માટે, ધારો કે $[x]$ એ x થી નાના અથવા x ને સમાન તમામ પૂર્ણાંકોમાં સૌથી મોટો પૂર્ણાંક દર્શાવે, તો શ્રેઢી

$$\left[-\frac{1}{3}\right]+\left[-\frac{1}{3}-\frac{1}{100}\right]+\left[-\frac{1}{3}-\frac{2}{100}\right]+\cdots\cdots+\left[-\frac{1}{3}-\frac{99}{100}\right]$$

નો સરવાળો _____ છે.

Options :

1. -135

2. -153

3. -131

4. -133

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 continuously differentiable function such that $f(2) = 6$ and $f'(2) = \frac{1}{48}$. If $\int_6^{f(x)} 4t^3 dt = (x-2)g(x)$, then $\lim\limits_{x \to 2} g(x)$ is equal to :

Options :

1. 12

2. 18

3. 24

4. 36

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 संततत: अवकलनीय (continuously differentiable) फलन इस प्रकार है कि $f(2)=6$ तथा $f'(2)=\frac{1}{48}$. यदि $\int_6^{f(x)} 4t^3 dt = (x-2)g(x)$, तो $\lim_{x\to 2} g(x)$ बराबर है :

Options :

1. 12

2. 18

3. 24

4. 36

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

ધારો કે $f : \mathbf{R} \to \mathbf{R}$ વિકલનીય વિધેય છે અને તેનું વિકલિત સતત વિધેય છે તથા $f(2)=6$ અને $f'(2)=\frac{1}{48}$ છે. જો $\int_6^{f(x)} 4t^3 dt = (x-2)g(x)$ તો $\lim_{x\to 2} g(x)$ બરાબર _____ છે.

Options :

1. 12

2. 18

3. 24

4. 36

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 $e^y + xy = e$, the ordered pair $\left(\frac{dy}{dx}, \frac{d^2y}{dx^2}\right)$ at $x=0$ is equal to :

Options :

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

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

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

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

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 $e^y + xy = e$, तो $x = 0$ पर क्रमित युग्म

$\left(\frac{dy}{dx}, \frac{d^2y}{dx^2}\right)$ बराबर है :

Options :

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

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

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

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

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 $e^y + xy = e$, તો $x = 0$ આગળ ક્રમયુક્ત જોડ

$\left(\frac{dy}{dx}, \frac{d^2y}{dx^2}\right)$ બરાબર _____ છે.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

A 2 m ladder leans against a vertical wall. If the top of the ladder begins to slide down the wall at the rate 25 cm/sec., then the rate (in cm/sec.) at which the bottom of the ladder slides away from the wall on the horizontal ground when the top of the ladder is 1 m above the ground is :

Options :

1. $\frac{25}{3}$

2. $\frac{25}{\sqrt{3}}$

3. 25

4. $25\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

दो मीटर लम्बी एक सीढ़ी एक ऊर्ध्वाधर दीवार के साथ झुकी हुई है। यदि सीढ़ी का शिखर 25 cm/sec. की दर से दीवार के साथ नीचे की ओर फिसलना शुरू करता है, तो वह दर (cm/sec में), जिस से सीढ़ी का पाद, क्षैतिज धरातल पर, दीवार से दूर फिसलता है जब सीढ़ी का शिखर धरातल से 1 मीटर की ऊँचाई पर है, है :

Options :

1. $\frac{25}{3}$

2. $\frac{25}{\sqrt{3}}$

3. 25

4. $25\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

એક 2 m લાંબી નિસરણી શિરોલંબ દિવાલે ટેકવી છે. જો આ નિસરણીની ટોચ 25 સે.મી./સે. ના દરે દિવાલથી નીચે સરકવાનું શરૂ કરે, તો આ નિસરણીની ટોચ જ્યારે જમીનથી 1 મી ઊપર હોય ત્યારે આ નિસરણીનો નીચેનો છેડો સમક્ષિતિજ જમીન પર દિવાલથી દૂર કેટલા દરે (સે.મી./સે.માં) સરકે છે?

Options :

1. $\frac{25}{3}$

2. $\frac{25}{\sqrt{3}}$

3. 25

4. $25\sqrt{3}$

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

If m is the minimum value of k for which the function $f(x) = x\sqrt{kx - x^2}$ is increasing in the interval $[0,3]$ and M is the maximum value of f in $[0, 3]$ when $k = m$, then the ordered pair (m, M) is equal to :

Options :

1. $(4, 3\sqrt{2})$

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

3. $(4, 3\sqrt{3})$

4. $(3, 3\sqrt{3})$

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

यदि k का न्यूनतम मान, जिसके लिए फलन $f(x) = x\sqrt{kx - x^2}$ अंतराल $[0, 3]$ में वर्धमान है, m है तथा $[0, 3]$ में f का अधिकतम मान जब $k = m$ है, M है, तो क्रमित युग्म (m, M) बराबर है :

Options :

1. $(4, 3\sqrt{2})$

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

3. $(4, 3\sqrt{3})$

4. $(3, 3\sqrt{3})$

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

વિધેય $f(x) = x\sqrt{kx - x^2}$ અંતરાલ $[0,3]$ માં વધતું હોય તે માટેની k ની ન્યૂનતમ કિંમત જો m હોય તથા જ્યારે $k = m$ હોય ત્યારે f ની અંતરાલ $[0,3]$ માં મહત્તમ કિંમત M હોય, તો ક્રમયુક્ત જોડ (m, M) બરાબર _____ છે.

Options :

1. $(4, 3\sqrt{2})$

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

3. $(4, 3\sqrt{3})$

4. $(3, 3\sqrt{3})$

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

Correct Marks : 4 Wrong Marks : 1

The integral $\int \frac{2x^3 - 1}{x^4 + x}\, dx$ is equal to :

(Here C is a constant of integration)

Options :

1. $\log_e \left| \frac{x^3 + 1}{x} \right| + C$

2. $\frac{1}{2} \log_e \frac{(x^3 + 1)^2}{|x^3|} + C$

3. $\log_e \frac{|x^3 + 1|}{x^2} + C$

4. $\frac{1}{2} \log_e \frac{|x^3 + 1|}{x^2} + C$

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

Correct Marks : 4 Wrong Marks : 1

समाकल $\int \frac{2x^3 - 1}{x^4 + x}\, dx$ बराबर है :

(यहाँ C समाकलन अचर है)

Options :

1. $\log_e \left| \frac{x^3 + 1}{x} \right| + C$

2. $\frac{1}{2}\log_e \frac{(x^3+1)^2}{|x^3|} + C$

3. $\log_e \frac{|x^3+1|}{x^2} + C$

4. $\frac{1}{2}\log_e \frac{|x^3+1|}{x^2} + C$

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

Correct Marks : 4 Wrong Marks : 1

સંકલિત $\int \frac{2x^3-1}{x^4+x}\,dx$ બરાબર _____ છે.

(અહીં C એ સંકલનનો અચળાંક છે)

Options :

1. $\log_e \left|\frac{x^3+1}{x}\right| + C$

2. $\frac{1}{2}\log_e \frac{(x^3+1)^2}{|x^3|} + C$

3. $\log_e \frac{|x^3+1|}{x^2} + C$

4. $\frac{1}{2}\log_e \frac{|x^3+1|}{x^2} + C$

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

Correct Marks : 4 Wrong Marks : 1

If $\int_0^{\frac{\pi}{2}} \frac{\cot x}{\cot x + \operatorname{cosec} x}\,dx = m(\pi + n)$, then

$m \cdot n$ is equal to :

Options :

1. 1

2. -1

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

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

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

Correct Marks : 4 Wrong Marks : 1

यदि $\int_0^{\frac{\pi}{2}} \frac{\cot x}{\cot x + \operatorname{cosec} x}\, dx = m(\pi + n)$, तो

$m \cdot n$ बराबर है :

Options :

1. 1

2. -1

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

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

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

Correct Marks : 4 Wrong Marks : 1

જો $\int_0^{\frac{\pi}{2}} \frac{\cot x}{\cot x + \operatorname{cosec} x}\, dx = m(\pi + n)$, તો

$m \cdot n$ બરાબર _____ છે.

Options :

1. 1

2. -1

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

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

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

Correct Marks : 4 Wrong Marks : 1

If the area (in sq. units) of the region $\{(x, y) : y^2 \leq 4x, x+y \leq 1, x \geq 0, y \geq 0\}$ is $a\sqrt{2} + b$, then $a - b$ is equal to :

Options :

1. $\frac{8}{3}$

2. 6

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

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

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

यदि क्षेत्र

$\{(x, y) : y^2 \leq 4x, x+y \leq 1, x \geq 0, y \geq 0\}$ का

क्षेत्रफल (वर्ग इकाइयों में) $a\sqrt{2} + b$ है, तो $a - b$

बराबर है :

Options :

1. $\frac{8}{3}$

2. 6

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

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

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

જો પ્રદેશ
$\{(x, y) : y^2 \leq 4x, x+y \leq 1, x \geq 0, y \geq 0\}$ નું
ક્ષેત્રફળ (ચો.એકમમાં) $a\sqrt{2} + b$ હોય, તો $a-b$
બરાબર _____ છે.

Options :

1. $\frac{8}{3}$

2. 6

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

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

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

Consider the differential equation, $y^2dx + \left(x - \frac{1}{y}\right)dy = 0$. If value of y is 1 when $x=1$, then the value of x for which $y=2$, is :

Options :

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

2. $\frac{5}{2} + \frac{1}{\sqrt{e}}$

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

4. $\frac{1}{2} + \frac{1}{\sqrt{e}}$

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

अवकल समीकरण $y^2dx + \left(x - \frac{1}{y}\right)dy = 0$ पर विचार कीजिए। यदि $x=1$ पर y का मान 1 है, तो x का मान, जिसके लिए $y=2$ है, है :

Options :

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

2. $\frac{5}{2} + \frac{1}{\sqrt{e}}$

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

4. $\frac{1}{2} + \frac{1}{\sqrt{e}}$

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

Correct Marks : 4 Wrong Marks : 1

વિકલ સમીકરણ $y^2dx + \left(x - \frac{1}{y}\right)dy = 0$ વિચારો. જ્યારે $x=1$ હોય ત્યારે y ની કિંમત જો 1 હોય તો $y=2$ માટેની x ની કિંમત _____ છે.

Options :

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

2. $\frac{5}{2} + \frac{1}{\sqrt{e}}$

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

4. $\frac{1}{2} + \frac{1}{\sqrt{e}}$

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 equation $y = \sin x \sin(x+2) - \sin^2(x+1)$
represents a straight line lying in :

Options :

1. first, second and fourth quadrants

2. second and third quadrants only

3. third and fourth quadrants only

4. first, third and fourth quadrants

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

समीकरण $y = \sin x \sin(x+2) - \sin^2(x+1)$ एक
सरल रेखा को निरूपित करता है, जो स्थित है :

Options :

1. पहले, दूसरे तथा चौथे चतुर्थांश में।

2. मात्र दूसरे तथा तीसरे चतुर्थांश में।

3. मात्र तीसरे तथा चौथे चतुर्थांश में।

4. पहले, तीसरे तथा चौथे चतुर्थांश में।

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

સમીકરણ $y = \sin x \sin(x+2) - \sin^2(x+1)$ એવી
એક રેખા દર્શાવે છે કે જે :

Options :

1. પહેલા, બીજા અને ચોથા ચરણમાં આવેલી છે.

2. ફક્ત બીજા અને ત્રીજા ચરણમાં આવેલી છે.

3. ફક્ત ત્રીજા અને ચોથા ચરણમાં આવેલી છે.

4. પહેલા, ત્રીજા અને ચોથા ચરણમાં આવેલી છે.

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

Correct Marks : 4 Wrong Marks : 1

If the angle of intersection at a point where the two circles with radii 5 cm and 12 cm intersect is 90°, then the length (in cm) of their common chord is :

Options :

1. $\frac{120}{13}$

2. $\frac{13}{2}$

3. $\frac{60}{13}$

4. $\frac{13}{5}$

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

Correct Marks : 4 Wrong Marks : 1

यदि एक बिन्दु, जहाँ 5 cm तथा 12 cm त्रिज्या के दो वृत्त एक दूसरे को काटते हैं, पर प्रतिच्छेदन कोण 90° है, तो उनकी उभयनिष्ठ जीवा की लम्बाई (cm में) है :

Options :

1. $\frac{120}{13}$

2. $\frac{13}{2}$

3. $\frac{60}{13}$

4. $\frac{13}{5}$

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

5 cm અને 12 cm ત્રિજ્યાઓવાળા બે વર્તુળો છેદે તે બિંદુ આગળનો છેદકોણ જો 90° હોય, તો તેઓની સામાન્ય જીવાની લંબાઈ (cm માં) _____ છે.

Options :

1. $\frac{120}{13}$

2. $\frac{13}{2}$

3. $\frac{60}{13}$

4. $\frac{13}{5}$

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

Correct Marks : 4 Wrong Marks : 1

If the normal to the ellipse $3x^2 + 4y^2 = 12$ at a point P on it is parallel to the line, $2x + y = 4$ and the tangent to the ellipse at P passes through Q(4, 4) then PQ is equal to:

Options :

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

2. $\frac{\sqrt{157}}{2}$

3. $\frac{\sqrt{61}}{2}$

4. $\frac{\sqrt{221}}{2}$

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

Correct Marks : 4 Wrong Marks : 1

यदि दीर्घवृत्त $3x^2+4y^2=12$ के एक बिन्दु P पर अभिलम्ब, रेखा $2x+y=4$ के समान्तर है तथा P पर दीर्घवृत्त की स्पर्श रेखा Q(4, 4) से होकर जाती है, तो PQ बराबर है :

Options :

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

2. $\frac{\sqrt{157}}{2}$

3. $\frac{\sqrt{61}}{2}$

4. $\frac{\sqrt{221}}{2}$

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

Correct Marks : 4 Wrong Marks : 1

જો ઉપવલય $3x^2+4y^2=12$ ના બિંદુ P આગળનો અભિલંબ, રેખા $2x+y=4$ ને સમાંતર હોય અને P આગળના આ ઉપવલયનો સ્પર્શક Q(4, 4) માંથી પસાર થતો હોય, તો PQ બરાબર _____ છે.

Options :

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

2. $\frac{\sqrt{157}}{2}$

3. $\frac{\sqrt{61}}{2}$

4. $\frac{\sqrt{221}}{2}$

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

Correct Marks : 4 Wrong Marks : 1

Let P be the point of intersection of the common tangents to the parabola $y^2=12x$ and the hyperbola $8x^2-y^2=8$. If S and S' denote the foci of the hyperbola where S lies on the positive x-axis then P divides SS' in a ratio :

Options :

1. 14 : 13

2. 13 : 11

3. 5 : 4

4. 2 : 1

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

Correct Marks : 4 Wrong Marks : 1

माना परवलय $y^2=12x$ तथा अतिपरवलय $8x^2-y^2=8$ की उभयनिष्ठ स्पर्श रेखाओं का प्रतिच्छेदन बिन्दु P है। यदि S तथा S' अतिपरवलय की नाभियाँ हैं, जहाँ S धनात्मक x-अक्ष पर स्थित है, तो P, SS' को निम्न में से किस अनुपात में विभाजित करता है?

Options :

1. 14 : 13

2. 13 : 11

3. 5 : 4

4. 2 : 1

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

ધારો કે P એ પરવલય $y^2=12x$ અને અતિવલય $8x^2-y^2=8$ ના સામાન્ય સ્પર્શકોનું છેદબિંદુ છે. જો S અને S' આ અતિવલયની નાભિઓ દર્શાવે, જ્યાં S ધન x- અક્ષ પર આવેલ છે, તો P એ SS' નું _____ ગુણોત્તર વિભાજન કરે છે.

Options :

1. $14:13$

2. $13:11$

3. $5:4$

4. $2:1$

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 line $\frac{x-2}{3}=\frac{y+1}{2}=\frac{z-1}{-1}$ intersects the plane $2x+3y-z+13=0$ at a point P and the plane $3x+y+4z=16$ at a point Q, then PQ is equal to :

Options :

1. $\sqrt{14}$

2. $2\sqrt{14}$

3. 14

4. $2\sqrt{7}$

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 रेखा $\frac{x-2}{3}=\frac{y+1}{2}=\frac{z-1}{-1}$, समतल $2x+3y-z+13=0$ को बिन्दु P पर काटती है तथा समतल $3x+y+4z=16$ को बिन्दु Q पर काटती है, तो PQ बराबर है :

Options :

1. $\sqrt{14}$

2. $2\sqrt{14}$

3. 14

4. $2\sqrt{7}$

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 રેખા $\frac{x-2}{3}=\frac{y+1}{2}=\frac{z-1}{-1}$ સમતલ $2x+3y-z+13=0$ ને P બિંદુ આગળ છેદે અને સમતલ $3x+y+4z=16$ ને Q બિંદુ આગળ છેદે, તો PQ બરાબર _____ છે.

Options :

1. $\sqrt{14}$

2. $2\sqrt{14}$

3. 14

4. $2\sqrt{7}$

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

Correct Marks : 4 Wrong Marks : 1

If the volume of parallelopiped formed by the vectors $\hat{i}+\lambda\hat{j}+\hat{k}$, $\hat{j}+\lambda\hat{k}$ and $\lambda\hat{i}+\hat{k}$ is minimum, then λ is equal to :

Options :

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

2. $-\sqrt{3}$

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

4. $\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

यदि सदिशों $\hat{i} + \lambda\hat{j} + \hat{k}$, $\hat{j} + \lambda\hat{k}$ तथा $\lambda\hat{i} + \hat{k}$ द्वारा बनाये गये समान्तर षट्फलक (parallelopiped) का आयतन न्यूनतम है, तो λ बराबर है :

Options :

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

2. $-\sqrt{3}$

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

4. $\sqrt{3}$

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

સદિશો $\hat{i} + \lambda\hat{j} + \hat{k}$, $\hat{j} + \lambda\hat{k}$ અને $\lambda\hat{i} + \hat{k}$ થી રચાતા સમાંતરફલકનું ઘનફળ જો ન્યૂનતમ હોય, તો λ બરાબર _____ છે.

Options :

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

2. $-\sqrt{3}$

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

4. $\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

Let $\vec{a} = 3\hat{i} + 2\hat{j} + 2\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 2\hat{k}$ be two vectors. If a vector perpendicular to both the vectors $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$ has the magnitude 12 then one such vector is :

Options :

1. $4\left(2\hat{i} + 2\hat{j} + \hat{k}\right)$

2. $4\left(2\hat{i} + 2\hat{j} - \hat{k}\right)$

3. $4\left(2\hat{i} - 2\hat{j} - \hat{k}\right)$

4. $4\left(-2\hat{i} - 2\hat{j} + \hat{k}\right)$

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

Correct Marks : 4 Wrong Marks : 1

माना $\vec{a} = 3\hat{i} + 2\hat{j} + 2\hat{k}$ तथा $\vec{b} = \hat{i} + 2\hat{j} - 2\hat{k}$ दो सदिश हैं। यदि दोनों सदिशों $\vec{a} + \vec{b}$ तथा $\vec{a} - \vec{b}$ के लम्बवत एक सदिश का परिमाण 12 है, तो एक ऐसा सदिश है :

Options :

1. $4\left(2\hat{i} + 2\hat{j} + \hat{k}\right)$

2. $4\left(2\hat{i} + 2\hat{j} - \hat{k}\right)$

3. $4\left(2\hat{i} - 2\hat{j} - \hat{k}\right)$

4. $4\left(-2\hat{i} - 2\hat{j} + \hat{k}\right)$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $\vec{a} = 3\hat{i} + 2\hat{j} + 2\hat{k}$ અને

$\vec{b} = \hat{i} + 2\hat{j} - 2\hat{k}$ એ બે સદિશો છે. જો

$\vec{a} + \vec{b}$ અને $\vec{a} - \vec{b}$ બન્ને સદિશોને લંબ હોય તેવા કોઈ સદિશનો માન 12 હોય, તો આવો કોઈ એક સદિશ _____ થાય.

Options :

1. $4\left(2\hat{i} + 2\hat{j} + \hat{k}\right)$

2. $4\left(2\hat{i} + 2\hat{j} - \hat{k}\right)$

3. $4\left(2\hat{i} - 2\hat{j} - \hat{k}\right)$

4. $4\left(-2\hat{i} - 2\hat{j} + \hat{k}\right)$

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

Correct Marks : 4 Wrong Marks : 1

Let a random variable X have a binomial distribution with mean 8 and variance 4.

If $P(X \leq 2) = \frac{k}{2^{16}}$, then k is equal to :

Options :

1. 1

2. 17

3. 121

4. 137

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

माना एक यादृच्छिक चर X के द्विपद बंटन का माध्य 8 तथा प्रसरण 4 है। यदि $P(X \leq 2) = \frac{k}{2^{16}}$ है, तो k बराबर है :

Options :

1. 1

2. 17

3. 121

4. 137

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે કોઈ યાદચ્છિક ચલ X ના દ્વિપદી વિતરણનો મધ્યક 8 અને વિચરણ 4 છે. જો $P(X \leq 2) = \frac{k}{2^{16}}$, તો k બરાબર _____ છે.

Options :

1. 1

2. 17

3. 121

4. 137

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

Correct Marks : 4 Wrong Marks : 1

If three of the six vertices of a regular hexagon are chosen at random, then the probability that the triangle formed with these chosen vertices is equilateral is :

Options :

1. $\frac{1}{10}$

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

यदि एक नियमित षड्भुज के छः शीर्षों में से तीन यादृच्छिक चुने जाते हैं, तो इन चुने गए शीर्षों द्वारा बने त्रिभुज के समबाहु होने की प्रायिकता है :

Options :

1. $\frac{1}{10}$

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

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

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

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

કોઈ એક નિયમિત ષટ્કોણના છ શિરોબિંદુઓ પૈકી ત્રણ શિરોબિંદુઓ જો યાદચ્છિક રીતે પસંદ કરવામાં આવે, તો આ પસંદ કરેલ શિરોબિંદુઓથી રચાતો ત્રિકોણ, સમબાજુ હોય તેની સંભાવના _____ છે.

Options :

1. $\frac{1}{10}$

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

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

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

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

If the data $x_1, x_2, ..., x_{10}$ is such that the mean of first four of these is 11, the mean of the remaining six is 16 and the sum of squares of all of these is 2,000 ; then the standard deviation of this data is :

Options :

1. 4

2. 2

3. $2\sqrt{2}$

4. $\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

यदि आँकड़ें $x_1, x_2, ..., x_{10}$ इस प्रकार हैं कि इनमें से प्रथम चार का माध्य 11 है, बाकी छः का माध्य 16 है तथा इन सभी के वर्गों का योग 2,000 है, तो इन आँकड़ों का मानक विचलन है :

Options :

1. 4

2. 2

3. $2\sqrt{2}$

4. $\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

જો કોઈ માહિતી $x_1, x_2, ..., x_{10}$ ના પ્રથમ ચાર અવલોકનોનો મધ્યક 11 હોય તથા બાકીના છ નો મધ્યક 16 હોય અને આ તમામ અવલોકનોના વર્ગોનો સરવાળો 2,000 હોય; તો આ માહિતીનું પ્રમાણિત વિચલન _____ છે.

Options :

1. 4

2. 2

3. $2\sqrt{2}$

4. $\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

The number of solutions of the equation

$1+\sin^4 x=\cos^2 3x,\ x \in \left[-\frac{5\pi}{2}, \frac{5\pi}{2}\right]$ is :

Options :

1. 7

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

समीकरण $1+\sin^4 x=\cos^2 3x,$

$x \in \left[-\frac{5\pi}{2}, \frac{5\pi}{2}\right]$ के हलों की संख्या है :

Options :

1. 7

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

સમીકરણ $1+\sin^4 x=\cos^2 3x, x \in \left[-\frac{5\pi}{2}, \frac{5\pi}{2}\right]$

ના ઉકેલોની સંખ્યા _____ છે.

Options :

1. 7

2. 3

3. 4

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

The value of $\sin^{-1}\left(\frac{12}{13}\right) - \sin^{-1}\left(\frac{3}{5}\right)$ is

equal to :

Options :

1. $\frac{\pi}{2} - \cos^{-1}\left(\frac{9}{65}\right)$

2. $\pi - \sin^{-1}\left(\frac{63}{65}\right)$

3. $\pi - \cos^{-1}\left(\frac{33}{65}\right)$

4. $\frac{\pi}{2} - \sin^{-1}\left(\frac{56}{65}\right)$

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

$\sin^{-1}\left(\frac{12}{13}\right) - \sin^{-1}\left(\frac{3}{5}\right)$ का मान है :

Options :

1. $\frac{\pi}{2} - \cos^{-1}\left(\frac{9}{65}\right)$

2. $\pi - \sin^{-1}\left(\frac{63}{65}\right)$

3. $\pi - \cos^{-1}\left(\frac{33}{65}\right)$

4. $\frac{\pi}{2} - \sin^{-1}\left(\frac{56}{65}\right)$

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

$\sin^{-1}\left(\frac{12}{13}\right) - \sin^{-1}\left(\frac{3}{5}\right)$ ની કિંમત _____

છે.

Options :

1. $\frac{\pi}{2} - \cos^{-1}\left(\frac{9}{65}\right)$

2. $\pi - \sin^{-1}\left(\frac{63}{65}\right)$

3. $\pi - \cos^{-1}\left(\frac{33}{65}\right)$

4. $\frac{\pi}{2} - \sin^{-1}\left(\frac{56}{65}\right)$

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

If the truth value of the statement $p \rightarrow (\sim q \vee r)$ is false(F), then the truth values of the statements p, q, r are respectively :

Options :

1. T, T, F

2. T, F, T

3. T, F, F

4. F, T, T

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

यदि कथन $p \rightarrow (\sim q \vee r)$ का सत्य मान असत्य(F) है, तो कथनों p, q, r के सत्यमान क्रमशः हैं :

Options :

1. T, T, F

2. T, F, T

3. T, F, F

4. F, T, T

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

જો વિધાન $p \rightarrow (\sim q \vee r)$ નું સત્યાર્થતા મૂલ્ય અસત્ય (F) હોય, તો વિધાનો p, q, r ના સત્યાર્થતા મૂલ્યો અનુક્રમે _____ છે.

Options :

1. T, T, F

2. T, F, T

3. T, F, F

4. F, T, T