

**Question Paper Name:** Paper I EHG 10th Jan 2019 Shift 1 Set 2  
**Subject Name:** Paper I EHG  
**Creation Date:** 2019-01-10 19:29:46  
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**Total Marks:** 360  
**Display Marks:** Yes

## Paper I

**Group Number :** 1  
**Group Id :** 416529130  
**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 :** 416529172  
**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:** 416529181  
**Question Shuffling Allowed :** Yes

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

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

The diameter and height of a cylinder are measured by a meter scale to be  $12.6 \pm 0.1$  cm and  $34.2 \pm 0.1$  cm, respectively. What will be the value of its volume in appropriate significant figures ?

**Options :**

1.  $4264.4 \pm 81.0 \text{ cm}^3$

2.  $4260 \pm 80 \text{ cm}^3$
3.  $4264 \pm 81 \text{ cm}^3$
4.  $4300 \pm 80 \text{ cm}^3$

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

Correct Marks : 4 Wrong Marks : 1

एक मीटर स्केल द्वारा नापने पर किसी बेलन का व्यास और ऊँचाई क्रमशः  $12.6 \pm 0.1 \text{ cm}$  और  $34.2 \pm 0.1 \text{ cm}$  आते हैं। उपयुक्त सार्थक अंकों में इसके आयतन का मान क्या होगा ?

Options :

1.  $4264.4 \pm 81.0 \text{ cm}^3$
2.  $4260 \pm 80 \text{ cm}^3$
3.  $4264 \pm 81 \text{ cm}^3$
4.  $4300 \pm 80 \text{ cm}^3$

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

Correct Marks : 4 Wrong Marks : 1

એક માપપટ્ટીથી એક નળાકારનો વ્યાસ અને ઊંચાઈ માપતા તે અનુક્રમે  $12.6 \pm 0.1 \text{ cm}$  અને  $34.2 \pm 0.1 \text{ cm}$  છે. તો તેને અનુરૂપ સાર્થક અંકોમાં તેનું કદ કેટલું હશે ?

Options :

1.  $4264.4 \pm 81.0 \text{ cm}^3$
2.  $4260 \pm 80 \text{ cm}^3$
3.  $4264 \pm 81 \text{ cm}^3$
4.  $4300 \pm 80 \text{ cm}^3$

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

Correct Marks : 4 Wrong Marks : 1

Two vectors  $\vec{A}$  and  $\vec{B}$  have equal magnitudes. The magnitude of  $(\vec{A} + \vec{B})$  is 'n' times the magnitude of  $(\vec{A} - \vec{B})$ . The angle between  $\vec{A}$  and  $\vec{B}$  is :

Options :

1.  $\cos^{-1} \left[ \frac{n^2 - 1}{n^2 + 1} \right]$

2.  $\cos^{-1} \left[ \frac{n - 1}{n + 1} \right]$

3.  $\sin^{-1} \left[ \frac{n^2 - 1}{n^2 + 1} \right]$

4.  $\sin^{-1} \left[ \frac{n - 1}{n + 1} \right]$

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

दो सदिशों  $\vec{A}$  तथा  $\vec{B}$  के परिमाण बराबर हैं।

$(\vec{A} + \vec{B})$  का परिमाण  $(\vec{A} - \vec{B})$  के परिमाण का

'n' गुना है।  $\vec{A}$  तथा  $\vec{B}$  के बीच का कोण है :

Options :

1.  $\cos^{-1} \left[ \frac{n^2 - 1}{n^2 + 1} \right]$

2.  $\cos^{-1} \left[ \frac{n - 1}{n + 1} \right]$

3.  $\sin^{-1} \left[ \frac{n^2 - 1}{n^2 + 1} \right]$

$$\sin^{-1} \left[ \frac{n-1}{n+1} \right]$$

4.

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

બે સદિશો  $\vec{A}$  અને  $\vec{B}$  સમાન માન ધરાવે છે.

$(\vec{A} + \vec{B})$  નું માન એ  $(\vec{A} - \vec{B})$  ના માન કરતા 'n' ગણું છે.  $\vec{A}$  અને  $\vec{B}$  વચ્ચેનો કોણ :

Options :

$$\cos^{-1} \left[ \frac{n^2 - 1}{n^2 + 1} \right]$$

1.

$$\cos^{-1} \left[ \frac{n-1}{n+1} \right]$$

2.

$$\sin^{-1} \left[ \frac{n^2 - 1}{n^2 + 1} \right]$$

3.

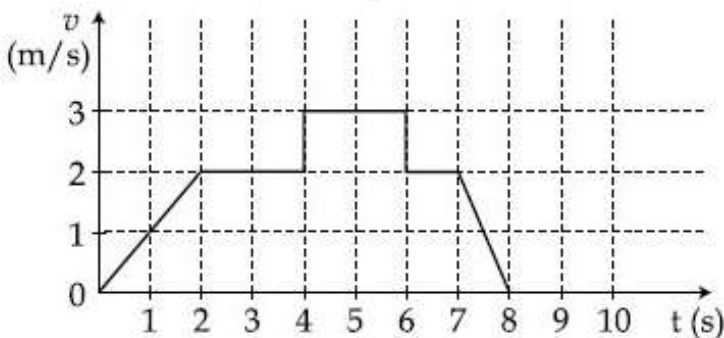
$$\sin^{-1} \left[ \frac{n-1}{n+1} \right]$$

4.

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

Correct Marks : 4 Wrong Marks : 1

A particle starts from the origin at time  $t=0$  and moves along the positive  $x$ -axis. The graph of velocity with respect to time is shown in figure. What is the position of the particle at time  $t=5s$  ?



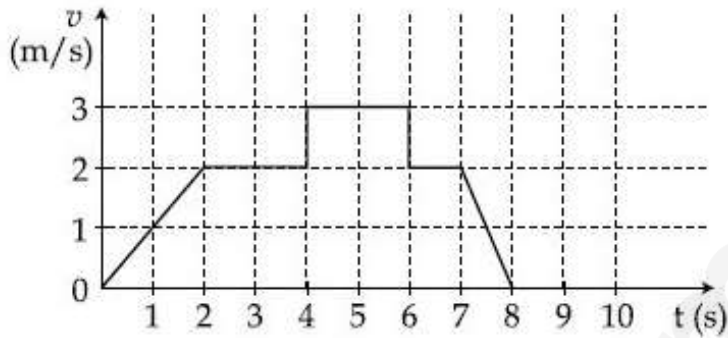
Options :

1. 3 m
2. 6 m
3. 10 m
4. 9 m

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 कण  $t=0$  पर मूल बिन्दु से चलना आरम्भ करता है और धनात्मक  $x$ -अक्ष की दिशा में गति करता है। चित्र में वेग का समय के सापेक्ष ग्राफ दिखाया गया है।  $t=5s$  पर कण की स्थिति क्या होगी ?



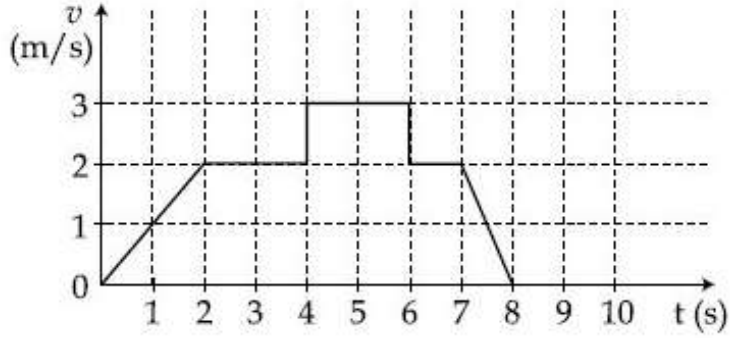
Options :

1. 3 m
2. 6 m
3. 10 m
4. 9 m

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

$t=0$  સમયે એક કણ ઉદ્ગમ પરથી ધન  $x$ -અક્ષ તરફ ગતિ કરવાનું શરૂ કરે છે. વેગનો સમય સાપેક્ષે આલેખ આકૃતિમાં બતાવેલ છે. સમય  $t=5s$  પર કણનું સ્થાન શું હશે?



Options :

1. 3 m
2. 6 m
3. 10 m
4. 9 m

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

Correct Marks : 4 Wrong Marks : 1

Two forces P and Q, of magnitude  $2F$  and  $3F$ , respectively, are at an angle  $\theta$  with each other. If the force Q is doubled, then their resultant also gets doubled. Then, the angle  $\theta$  is :

Options :

1.  $30^\circ$
2.  $60^\circ$
3.  $90^\circ$
4.  $120^\circ$

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

दो बल P और Q जिनके परिमाण क्रमशः 2F और 3F हैं, परस्पर  $\theta$  कोण बनाते हैं। यदि बल Q को दोगुना कर दें तो इनका परिणामी बल भी दोगुना हो जाता है। तब कोण  $\theta$  होगा :

Options :

1.  $30^\circ$
2.  $60^\circ$
3.  $90^\circ$
4.  $120^\circ$

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

અનુક્રમે 2F અને 3F માનના બે બળો P અને Q એક બીજા સાથે  $\theta$  કોણ બનાવે છે. જો બળ Q ને બમણો કરીએ તો તેમનું પરિણામી પણ બમણું થાય છે. તો આ ખૂણો  $\theta$  \_\_\_\_\_ હશે.

Options :

1.  $30^\circ$
2.  $60^\circ$
3.  $90^\circ$
4.  $120^\circ$

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 particle which is experiencing a force,

given by  $\vec{F} = 3\vec{i} - 12\vec{j}$ , undergoes a

displacement of  $\vec{d} = 4\vec{i}$ . If the particle had a kinetic energy of 3 J at the beginning of the displacement, what is its kinetic energy at the end of the displacement?

Options :

1. 15 J

2. 12 J
3. 9 J
4. 10 J

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

Correct Marks : 4 Wrong Marks : 1

एक कण किसी एक बल  $\vec{F} = 3\vec{i} - 12\vec{j}$  के

अन्तर्गत  $\vec{d} = 4\vec{i}$  से विस्थापित होता है। यदि कण की विस्थापन से पूर्व गतिज ऊर्जा 3 J थी तो विस्थापन के बाद उसकी गतिज ऊर्जा का मान होगा :

Options :

1. 15 J
2. 12 J
3. 9 J
4. 10 J

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

Correct Marks : 4 Wrong Marks : 1

એક કણ કે જે  $\vec{F} = 3\vec{i} - 12\vec{j}$  બળ અનુભવે છે તેનું

$\vec{d} = 4\vec{i}$  સ્થાનાંતર થાય છે. સ્થાનાંતરની શરૂઆતમાં જે આ કણની ગતિ ઊર્જા 3 J હોય તો સ્થાનાંતરના અંતે તેની ગતિ ઊર્જા શું હશે?

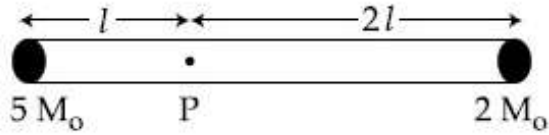
Options :

1. 15 J
2. 12 J
3. 9 J
4. 10 J

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 rigid massless rod of length  $3l$  has two masses attached at each end as shown in the figure. The rod is pivoted at point  $P$  on the horizontal axis (see figure). When released from initial horizontal position, its instantaneous angular acceleration will be :



Options :

1.  $\frac{g}{2l}$
2.  $\frac{g}{3l}$
3.  $\frac{7g}{3l}$
4.  $\frac{g}{13l}$

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

एक द्रव्यमान रहित तथा  $3l$  लम्बाई की छड़ पर दो द्रव्यमान चित्रानुसार उसके सिरों पर लगाये हैं तथा उसे एक क्षैतिज अक्ष पर बिन्दु  $P$  से कीलकित किया जाता है। जब इस छड़ को क्षैतिज अवस्था से छोड़ा जाता है तो उसका तात्क्षणिक कोणीय त्वरण होगा :



Options :

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

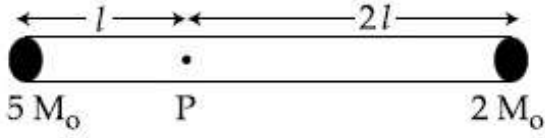
3.  $\frac{7g}{3l}$

4.  $\frac{g}{13l}$

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

3l લંબાઈ ધરાવતા એક દૃઢ અને દળરહિત સળીયાના બે છેડા આગળ આકૃતિમાં દર્શાવ્યા પ્રમાણે બે દળો લગાડવામાં આવ્યા છે. એક સમક્ષિતિજ અક્ષના P બિંદુ આગળથી કિલ્કિત કરવામાં આવેલ છે (આકૃતિ જુઓ). જ્યારે તેને પ્રારંભિક સમક્ષિતિજ સ્થિતિમાંથી મુક્ત કરવામાં આવે છે ત્યારે તેનો તત્કાલિક કોણીય પ્રવેગ \_\_\_\_\_ થશે.



Options :

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

2.  $\frac{g}{3l}$

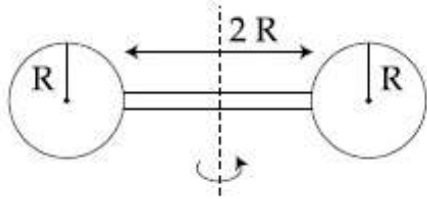
3.  $\frac{7g}{3l}$

4.  $\frac{g}{13l}$

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

Two identical spherical balls of mass  $M$  and radius  $R$  each are stuck on two ends of a rod of length  $2R$  and mass  $M$  (see figure). The moment of inertia of the system about the axis passing perpendicularly through the centre of the rod is :



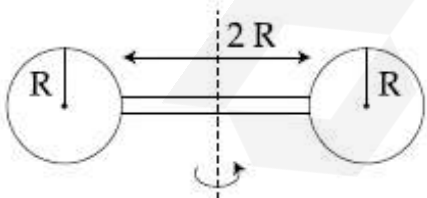
Options :

1.  $\frac{17}{15} MR^2$
2.  $\frac{137}{15} MR^2$
3.  $\frac{152}{15} MR^2$
4.  $\frac{209}{15} MR^2$

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

द्रव्यमान  $M$  तथा त्रिज्या  $R$  की दो एकसमान गोलाकार गेंदों को  $2R$  लम्बाई तथा द्रव्यमान  $M$  की एक छड़ के सिरों पर चित्रानुसार जोड़ा गया है। इस संयोजन का छड़ के केन्द्र से जाने वाली तथा छड़ के लम्बवत् अक्ष के परितः जड़त्व आघूर्ण का मान होगा :



Options :

1.  $\frac{17}{15} MR^2$
2.  $\frac{137}{15} MR^2$

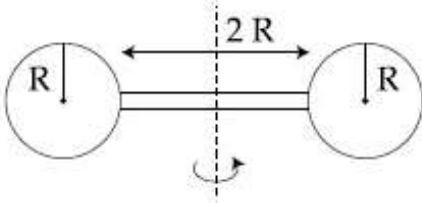
3.  $\frac{152}{15} MR^2$

4.  $\frac{209}{15} MR^2$

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

2R લંબાઈના અને M દ્રવ્યમાનના એક સળીયાના બે છેડા પર M દ્રવ્યમાન અને R ત્રિજ્યાના બે સમાન ગોલીય બોલ લગાડેલ છે (આકૃતિ જુઓ). આ સળીયાની મધ્યમાંથી લંબરૂપે પસાર થતી અક્ષને સાપેક્ષે આ તંત્રની જડત્વની ચાકમાત્રા \_\_\_\_\_ છે.



Options :

1.  $\frac{17}{15} MR^2$

2.  $\frac{137}{15} MR^2$

3.  $\frac{152}{15} MR^2$

4.  $\frac{209}{15} MR^2$

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

Two stars of masses  $3 \times 10^{31}$  kg each, and at distance  $2 \times 10^{11}$  m rotate in a plane about their common centre of mass O. A meteorite passes through O moving perpendicular to the star's rotation plane. In order to escape from the gravitational field of this double star, the minimum speed that meteorite should have at O is :

(Take Gravitational constant  $G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$ )

Options :

1.  $2.8 \times 10^5$  m/s
2.  $3.8 \times 10^4$  m/s
3.  $1.4 \times 10^5$  m/s
4.  $2.4 \times 10^4$  m/s

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

दो तारे, जिनमें प्रत्येक का द्रव्यमान  $3 \times 10^{31}$  kg है तथा उनके बीच की दूरी  $2 \times 10^{11}$  m है, अपने उभयनिष्ठ द्रव्यमान केन्द्र O के परितः किसी समतल में घूम रहे हैं। एक उल्कापिण्ड O से तथा उनके घूर्णन समतल के लम्बवत् दिशा से गुजरता है। इन दो तारों के गुरुत्वाकर्षण से पलायन करने के लिए उल्कापिण्ड की बिन्दु O पर न्यूनतम गति का मान होगा :

(सार्वत्रिक गुरुत्वीय स्थिरांक  $G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$ )

Options :

1.  $2.8 \times 10^5$  m/s
2.  $3.8 \times 10^4$  m/s
3.  $1.4 \times 10^5$  m/s
4.  $2.4 \times 10^4$  m/s

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

જે દરેકનું દ્રવ્યમાન  $3 \times 10^{31}$  kg છે તેવા બે તારાઓ તેમનાથી  $2 \times 10^{11}$  m દુર એવા એકબીજા (સામાન્ય) દ્રવ્યમાન કેન્દ્રની આસપાસ ભ્રમણ કરવાનું શરૂ કરે છે. જો કોઈ એક ઉલ્કા આ દ્રવ્યમાન કેન્દ્રમાંથી બે તારાઓને જોડતી રેખાને લંબ પસાર થઈ O તરફ ગતિ કરે છે, તો આ બે તારાના ગુરૂત્વાકર્ષણ ક્ષેત્રમાંથી છટકવામાટે આ ઉલ્કાને O પર જરૂરી લઘુત્તમ ઝડપ \_\_\_\_\_ છે.

(સાર્વત્રિક ગુરૂત્વાકર્ષી અચળાંક

$$G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2})$$

Options :

1.  $2.8 \times 10^5$  m/s
2.  $3.8 \times 10^4$  m/s
3.  $1.4 \times 10^5$  m/s
4.  $2.4 \times 10^4$  m/s

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

Correct Marks : 4 Wrong Marks : 1

A cylindrical plastic bottle of negligible mass is filled with 310 ml of water and left floating in a pond with still water. If pressed downward slightly and released, it starts performing simple harmonic motion at angular frequency  $\omega$ . If the radius of the bottle is 2.5 cm then  $\omega$  is close to: (density of water =  $10^3$  kg/m<sup>3</sup>)

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

Options :

1.  $1.25 \text{ rad s}^{-1}$
2.  $2.50 \text{ rad s}^{-1}$
3.  $3.75 \text{ rad s}^{-1}$
4.  $5.00 \text{ rad s}^{-1}$

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

અવગણ્ય દ્રવ્યમાન ધરાવતી એક પ્લાસ્ટિકની બોટલમાં 310 ml પાણી ભરેલ છે અને તેને શાંત પાણી ભરેલ તલાબમાં તરતી મુકવામાં આવે છે. જો થોડુંક નીચે તરફ દબાવીને છોડી દેવામાં આવે તો તે  $\omega$  જેટલી કોણીય આવૃત્તિથી સરળ આવર્ત ગતિ શરૂ કરે છે. આ બોટલની ત્રિજ્યા 2.5 cm છે, તો  $\omega$  \_\_\_\_\_ ની નજીકની હશે.

(પાણીની ઘનતા =  $10^3 \text{ kg/m}^3$  આપેલ છે.)

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

Options :

1.  $1.25 \text{ rad s}^{-1}$
2.  $2.50 \text{ rad s}^{-1}$
3.  $3.75 \text{ rad s}^{-1}$
4.  $5.00 \text{ rad s}^{-1}$

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

નગણ્ય દ્રવ્યમાન કી પ્લાસ્ટિક કી એક બેલનાકાર બોટલ મેં 310 ml પાની ભરા હૈ તથા યહ બોટલ શાંત પાની કે તાલાબ મેં તૈરતી હૈ। યદિ ઇસે થોડા નીચે કો દબા કર છોડતે હૈં તો યહ કોણીય આવૃત્તિ  $\omega$  સે સરલ આવર્ત ગતિ કરતી હૈ। યદિ બોટલ કી ત્રિજ્યા 2.5 cm હૈ, તો  $\omega$  કા માન હોગા :

(દિયા હૈ : પાની કા ઘનત્વ =  $10^3 \text{ kg/m}^3$ )

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

Options :

1.  $1.25 \text{ rad s}^{-1}$
2.  $2.50 \text{ rad s}^{-1}$
3.  $3.75 \text{ rad s}^{-1}$
4.  $5.00 \text{ rad s}^{-1}$

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

Half mole of an ideal monoatomic gas is heated at constant pressure of 1 atm from 20°C to 90°C. Work done by gas is close to : (Gas constant  $R=8.31 \text{ J/mol}\cdot\text{K}$ )

Options :

1. 581 J
2. 291 J
3. 146 J
4. 73 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

एकपरमाणुक आदर्श गैस के आधे मोल को 1 atm के नियत दाब पर 20°C से 90°C तक गर्म करते हैं। इस गैस द्वारा किये गये कार्य का सन्निकट मान होगा : (दिया है :  $R=8.31 \text{ J/mol}\cdot\text{K}$ )

Options :

1. 581 J
2. 291 J
3. 146 J
4. 73 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

અડધામોલ એક પરમાણ્વીય આદર્શ વાયુને 1 atm અચળ દબાણે 20°C થી 90°C સુધી ગરમ કરવામાં આવે છે. વાયુ વડે થતું કાર્ય \_\_\_\_\_ ની નજીકનું છે. (વાયુ અચળાંક  $R=8.31 \text{ J/mol}\cdot\text{K}$ )

Options :

1. 581 J
2. 291 J

3. 146 J

4. 73 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 kg of a monoatomic gas is at a pressure of  $4 \times 10^4 \text{ N/m}^2$ . The density of the gas is  $8 \text{ kg/m}^3$ . What is the order of energy of the gas due to its thermal motion ?

Options :

1.  $10^3 \text{ J}$

2.  $10^4 \text{ J}$

3.  $10^5 \text{ J}$

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

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

Correct Marks : 4 Wrong Marks : 1

दो kg एकपरमाणुक गैस  $4 \times 10^4 \text{ N/m}^2$  के दाब पर है। गैस का घनत्व  $8 \text{ kg/m}^3$  है। इस गैस में ऊष्मीय गति के कारण ऊर्जा की परिमाण कोटि होगी :

Options :

1.  $10^3 \text{ J}$

2.  $10^4 \text{ J}$

3.  $10^5 \text{ J}$

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

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

Correct Marks : 4 Wrong Marks : 1

2 kg એક પરમાણ્વીય વાયુ એ  $4 \times 10^4 \text{ N/m}^2$  દબાણ પર છે. આ વાયુની ઘનતા  $8 \text{ kg/m}^3$  છે. ઉષ્મીય ગતિને લીધે આ વાયુની ઊર્જાનો ક્રમ શું હશે?

Options :

1.  $10^3$  J
2.  $10^4$  J
3.  $10^5$  J
4.  $10^6$  J

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

Correct Marks : 4 Wrong Marks : 1

A particle executes simple harmonic motion with an amplitude of 5 cm. When the particle is at 4 cm from the mean position, the magnitude of its velocity in SI units is equal to that of its acceleration. Then, its periodic time in seconds is :

Options :

1.  $\frac{4\pi}{3}$
2.  $\frac{8\pi}{3}$
3.  $\frac{3}{8}\pi$
4.  $\frac{7}{3}\pi$

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

Correct Marks : 4 Wrong Marks : 1

एक कण 5 cm आयाम से सरल आवर्त गति कर रहा है। जब कण अपनी मध्य स्थिति से 4 cm दूरी पर है तब इसके वेग का परिमाण SI मानकों में इसके त्वरण में परिमाण के बराबर है। तो कण का सेकण्ड में आवर्तकाल होगा :

Options :

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

2.  $\frac{8\pi}{3}$

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

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

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

એક કણ 5 cm કંપવિસ્તારની રેખીય સરળ આવર્ત ગતિ કરે છે. જ્યારે આ કણ મધ્યમાન સ્થિતિથી 4 cm પર છે ત્યારે તેના SI એકમમાં વેગનું માન તેના પ્રેવગ જેટલું છે. તો તેનો સેકન્ડમાં આવર્તકાળ \_\_\_\_\_ હશે.

Options :

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

2.  $\frac{8\pi}{3}$

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

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

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 closed organ pipe has a fundamental frequency of 1.5 kHz. The number of overtones that can be distinctly heard by a person with this organ pipe will be : (Assume that the highest frequency a person can hear is 20,000 Hz)

Options :

1. 6

2. 7

3. 4

4. 5

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

Correct Marks : 4 Wrong Marks : 1

एक बंद ऑर्गन - पाईप की मूलभूत आवृत्ति 1.5 kHz है। इस ऑर्गन - पाईप से एक व्यक्ति को स्पष्ट सुनाई देने वाले अधिस्वरों की संख्या होगी : (व्यक्ति अधिकतम 20,000 Hz आवृत्ति की ध्वनि सुन सकता है)

Options :

1. 6

2. 7

3. 4

4. 5

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 બંધ ધ્વનિ (ઓર્ગન) નળીની મૂળભૂત આવૃત્તિ 1.5 kHz છે. આ ધ્વનિ-નળી વડે એક વ્યક્તિ દ્વારા સ્પષ્ટપણે સાંભળી શકતા અધિસ્વરોની સંખ્યા \_\_\_\_\_ છે. (વ્યક્તિદ્વારા સાંભળી શકાતી મહત્તમ આવૃત્તિ 20,000 Hz છે તેમ ધારો.)

Options :

1. 6

2. 7

3. 4

4. 5

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

Correct Marks : 4 Wrong Marks : 1

A parallel plate capacitor having capacitance  $12 \text{ pF}$  is charged by a battery to a potential difference of  $10 \text{ V}$  between its plates. The charging battery is now disconnected and a porcelain slab of dielectric constant  $6.5$  is slipped between the plates. The work done by the capacitor on the slab is :

Options :

1.  $508 \text{ pJ}$
2.  $600 \text{ pJ}$
3.  $692 \text{ pJ}$
4.  $560 \text{ pJ}$

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

$12 \text{ pF}$  धारिता के एक समानांतर पट्ट संधारित्र को  $10 \text{ V}$  विभवांतर की सेल से आवेशित किया जाता है। सेल को हटाने के पश्चात उसमें परावैद्युतांक  $6.5$  की एक पोर्सिलीन पट्टी को प्लेटों के ठीक बीच में डाल दिया जाता है। संधारित्र द्वारा पट्टी पर किया गया कार्य होगा :

Options :

1.  $508 \text{ pJ}$
2.  $600 \text{ pJ}$
3.  $692 \text{ pJ}$
4.  $560 \text{ pJ}$

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

12 pF કેપેસિટન્સ ધરાવતા એક સમાંતર પ્લેટ કેપેસિટરને એક બેટરી વડે તેની બે પ્લેટો વચ્ચે 10 V વિજસ્થિતિમાનના તફાવત સુધી ચાર્જ કરવામાં આવે છે. આ ચાર્જિંગ બેટરીને દૂર કરીને એક પોર્સેલિનના ચોસલા કે જેનો પરાવૈદ્યતાંક 6.5 છે તેને આ બે પ્લેટો વચ્ચે સરકાવવામાં આવે છે. આ કેપેસિટર વડે ચોસલા પર થતું કાર્ય \_\_\_\_\_ છે.

Options :

1. 508 pJ
2. 600 pJ
3. 692 pJ
4. 560 pJ

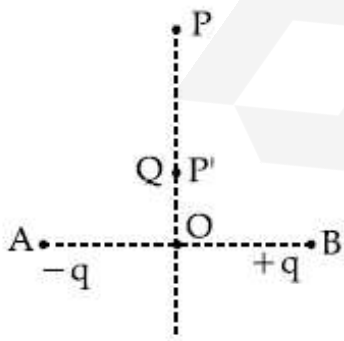
Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Charges  $-q$  and  $+q$  located at A and B, respectively, constitute an electric dipole. Distance  $AB = 2a$ , O is the mid point of the dipole and OP is perpendicular to AB. A charge Q is placed at P where  $OP = y$  and  $y \gg 2a$ . The charge Q experiences an electrostatic force F. If Q is now moved along the equatorial line to P' such that

$OP' = \left(\frac{y}{3}\right)$ , the force on Q will be close

to:  $\left(\frac{y}{3} \gg 2a\right)$



Options :

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

2. 3F
3. 9F
4. 27F

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

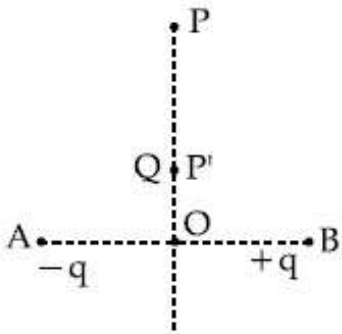
Correct Marks : 4 Wrong Marks : 1

A तथा B पर रखे हुये आवेश, क्रमशः  $-q$  और  $+q$  एक विद्युत द्विध्रुव बनाते हैं। दूरी  $AB = 2a$  है तथा AB का मध्य बिन्दु O है। OP रेखा AB के लम्बवत् है तथा  $OP = y$  है, जहाँ  $y \gg 2a$ , P पर रखे एक Q आवेश पर F विद्युत बल द्विध्रुव द्वारा लगता है। यदि Q को P

से OP की दिशा में P' पर ले जाते हैं जहाँ  $OP' = \left(\frac{y}{3}\right)$ ,

तो इस पर लगे बल का सन्निकट मान होगा :

( दिया है:  $\frac{y}{2} \gg 2a$  )



Options :

1.  $\frac{F}{3}$
2. 3F
3. 9F
4. 27F

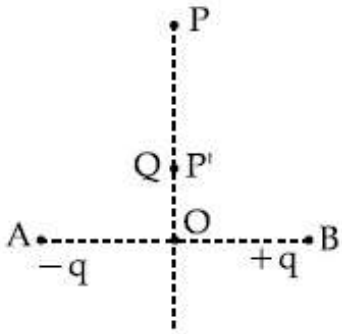
Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

વિદ્યુતભારો  $-q$  અને  $+q$  એ અનુક્રમે A અને B પર સ્થિત છે જે વિદ્યુતદ્વિધ્રુવી રચે છે. અંતર  $AB=2a$  અને O એ આ દ્વિધ્રુવી AB નું મધ્યબિંદુ છે. OP એ આ દ્વિધ્રુવી વિષુવ-રેખા અને OP એ AB લંબ છે. એક વિદ્યુતભાર Q ને P પર મુકવામાં આવે છે, જ્યાં  $OP=y$  અને  $y \gg 2a$ . આ વિદ્યુતભાર, F જેટલું સ્થિત વિદ્યુત બળ અનુભવે છે. હવે જો Q ને વિષુવરેખા પર P' કે

જેથી  $OP' = \left(\frac{y}{3}\right)$  સુધી ખસેડવામાં આવે તો Q પરનું બળ \_\_\_\_\_ ની નજીકનું હશે.

( $\frac{y}{3} \gg 2a$  આપેલ છે.)



Options :

1.  $\frac{F}{3}$
2.  $3F$
3.  $9F$
4.  $27F$

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

Four equal point charges Q each are placed in the  $xy$  plane at  $(0, 2)$ ,  $(4, 2)$ ,  $(4, -2)$  and  $(0, -2)$ . The work required to put a fifth charge Q at the origin of the coordinate system will be :

Options :

1.  $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{5}}\right)$

2.  $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

3.  $\frac{Q^2}{4\pi\epsilon_0}$

4.  $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{3}}\right)$

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

चार बराबर बिन्दु आवेशों Q को xy समतल में बिन्दु (0, 2), (4, 2), (4, -2) तथा (0, -2) पर रखा है। एक पाँचवे आवेश Q को मूल बिन्दु पर रखने में किया गया कार्य होगा :

Options :

1.  $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{5}}\right)$

2.  $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

3.  $\frac{Q^2}{4\pi\epsilon_0}$

4.  $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{3}}\right)$

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

चार समान विद्युतભારો Q ને xy સમતલમાં (0, 2), (4, 2), (4, -2) અને (0, -2) બિંદુઓ પર મુકવામાં આવેલ છે. આ તંત્રના ઉગમ બિંદુ પર પાંચમા વિદ્યુતભાર Q ને મુકવા જરૂરી કાર્ય \_\_\_\_\_ છે.

Options :

1.  $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{5}}\right)$

2.  $\frac{Q^2}{2\sqrt{2}\pi\epsilon_0}$

3.  $\frac{Q^2}{4\pi\epsilon_0}$

4.  $\frac{Q^2}{4\pi\epsilon_0} \left(1 + \frac{1}{\sqrt{3}}\right)$

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

Correct Marks : 4 Wrong Marks : 1

A current of 2 mA was passed through an unknown resistor which dissipated a power of 4.4 W. Dissipated power when an ideal power supply of 11 V is connected across it is :

Options :

1.  $11 \times 10^{-3} \text{ W}$

2.  $11 \times 10^{-4} \text{ W}$

3.  $11 \times 10^{-5} \text{ W}$

4.  $11 \times 10^5 \text{ W}$

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

एक अज्ञात प्रतिरोध से जब 2 mA की धारा बहती है तो 4.4 W शक्ति का क्षय होता है। यदि इस प्रतिरोध को 11 V की एक आदर्श बैटरी से जोड़ा जाये तो शक्ति क्षय का मान होगा :

Options :

1.  $11 \times 10^{-3} \text{ W}$

2.  $11 \times 10^{-4} \text{ W}$

3.  $11 \times 10^{-5} \text{ W}$

4.  $11 \times 10^5 \text{ W}$

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

એક અજ્ઞાત અવરોધમાંથી 2 mA પ્રવાહ પસાર કરતા તે 4.4 W પાવર વિખેરત કરે છે. જ્યારે તેને 11 V ના આદર્શ પાવર સપ્લાય સાથે જોડવામાં આવે ત્યારે વિખેરત થતો પાવર \_\_\_\_\_ છે.

Options :

1.  $11 \times 10^{-3} \text{ W}$

2.  $11 \times 10^{-4} \text{ W}$

3.  $11 \times 10^{-5} \text{ W}$

4.  $11 \times 10^5 \text{ W}$

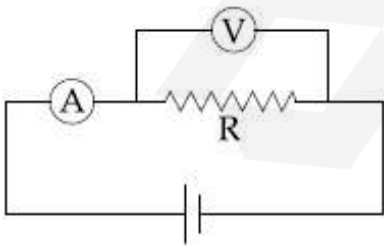
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The actual value of resistance  $R$ , shown in the figure is  $30 \Omega$ . This is measured in an experiment as shown using the standard

formula  $R = \frac{V}{I}$ , where  $V$  and  $I$  are the

readings of the voltmeter and ammeter, respectively. If the measured value of  $R$  is 5% less, then the internal resistance of the voltmeter is :



Options :

1.  $35 \Omega$

2.  $570 \Omega$

3.  $350 \Omega$

4.  $600 \Omega$

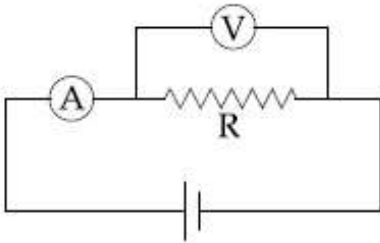
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में दिखाये गये प्रतिरोध R का वास्तविक मान

$30 \Omega$  है। इसे एक मानक सूत्र  $R = \frac{V}{I}$  का उपयोग

करके मापा जाता है। यहाँ V तथा I, क्रमशः वोल्टमीटर तथा ऐमीटर की रीडिंग हैं। यदि R का मापा गया मान 5% कम आता है तो वोल्टमीटर के आंतरिक प्रतिरोध का मान होगा :



Options :

1.  $35 \Omega$

2.  $570 \Omega$

3.  $350 \Omega$

4.  $600 \Omega$

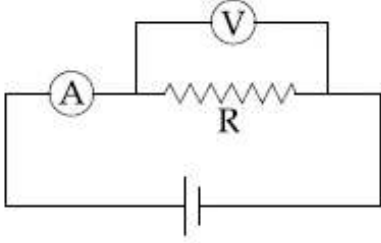
Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવેલ અવરોધ  $R$  નું વાસ્તવિક મૂલ્ય

$30 \Omega$  છે. આનું માપન એક પ્રયોગ દ્વારા  $R = \frac{V}{I}$  ના

પ્રમાણિત સંબંધથી માપવામાં આવે છે, જ્યાં  $V$  અને  $I$  એ અનુક્રમે વોલ્ટમીટર અને એમીટરના વાંચનો છે. જો માપવામાં આવેલ  $R$  નું મૂલ્ય 5% ઓછું હોય, તો આ વોલ્ટમીટરનો આંતરિક અવરોધ \_\_\_\_\_ છે.



Options :

1.  $35 \Omega$
2.  $570 \Omega$
3.  $350 \Omega$
4.  $600 \Omega$

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 hoop and a solid cylinder of same mass and radius are made of a permanent magnetic material with their magnetic moment parallel to their respective axes. But the magnetic moment of hoop is twice of solid cylinder. They are placed in a uniform magnetic field in such a manner that their magnetic moments make a small angle with the field. If the oscillation periods of hoop and cylinder are  $T_h$  and  $T_c$  respectively, then :

Options :

1.  $T_h = 0.5T_c$
2.  $T_h = 2T_c$
3.  $T_h = T_c$

4.  $T_h = 1.5T_c$

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

સ્થાયી ચુમ્બકીય પદાર્થ સે બને હુએ એક છલ્લે તથા એક ઠોસ બેલન કા દ્રવ્યમાન તથા ત્રિજ્યા બરાબર હૈં. ઇનકે ચુમ્બકીય આઘૂર્ણ ડનકી અપની અક્ષ કે સમાન્તર હૈં, લેકિન છલ્લે કા ચુમ્બકીય આઘૂર્ણ બેલન સે ડો ગુના હૈં. ઇન ડોનોં કો એક હી, એકસમાન ચુમ્બકીય ક્ષેત્ર મેં ઇસ તરહ છોડા જાતા હૈં કિ ઇનકા ચુમ્બકીય આઘૂર્ણ, ચુમ્બકીય ક્ષેત્ર કી ડિશા સે એક છોટા સા કોણ બનાતા હૈં. યદિ છલ્લે એવં બેલન કે ડોલન કા આવર્તકાલ ક્રમશઃ  $T_h$  તથા  $T_c$  હૈં તો :

Options :

1.  $T_h = 0.5T_c$

2.  $T_h = 2T_c$

3.  $T_h = T_c$

4.  $T_h = 1.5T_c$

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

એક ચુંબકીય દ્રવ્યમાંથી સમાન દ્રવ્યમાન અને સમાન ત્રિજ્યાનો એક પાટો (Hoop) અને એક ઘન નળાકાર બનાવેલ છે. ઘન નળાકાર કરતા આ પાટા (Hoop) ની ચુંબકીય ચાકમાત્રા બમણી છે. તેને સમાન ચુંબકીય ક્ષેત્રમાં એવી રીતે મુકવામાં આવે છે કે તેમની મધ્ય અક્ષ આ ક્ષેત્ર સાથે નાનો કોણ બનાવે. જો પાટા (Hoop) અને નળાકારના ઢોલનનો આવર્તકાળ અનુક્રમે  $T_h$  અને  $T_c$  હોય તો :

Options :

1.  $T_h = 0.5T_c$

2.  $T_h = 2T_c$

3.  $T_h = T_c$

4.  $T_h = 1.5T_c$

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

At some location on earth the horizontal component of earth's magnetic field is  $18 \times 10^{-6}$  T. At this location, magnetic needle of length 0.12 m and pole strength 1.8 Am is suspended from its mid-point using a thread, it makes  $45^\circ$  angle with horizontal in equilibrium. To keep this needle horizontal, the vertical force that should be applied at one of its ends is :

Options :

1.  $6.5 \times 10^{-5}$  N
2.  $1.8 \times 10^{-5}$  N
3.  $1.3 \times 10^{-5}$  N
4.  $3.6 \times 10^{-5}$  N

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 स्थान पर पृथ्वी के चुम्बकीय क्षेत्र का क्षैतिज घटक  $18 \times 10^{-6}$  T है। इस स्थान पर 0.12 m लम्बाई तथा 1.8 Am ध्रुव की तीव्रता वाली एक चुम्बकीय सुई को उसके मध्य बिन्दु से एक धागे द्वारा लटकाया जाता है। साम्यावस्था में यह सुई क्षैतिज से  $45^\circ$  का कोण बनाती है। सुई को क्षैतिज रखने हेतु इसके कोई एक सिरे पर ऊर्ध्वाधर बल लगाना चाहिये :

Options :

1.  $6.5 \times 10^{-5}$  N
2.  $1.8 \times 10^{-5}$  N
3.  $1.3 \times 10^{-5}$  N
4.  $3.6 \times 10^{-5}$  N

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

0.12 m લંબાઈની એક ચુંબકીય સોયને તેના મધ્યબિંદુમાંથી એક દોરી વડે એ રીતે લટકાવામાં આવે છે કે જેથી તે સમક્ષિતિજ સાથે  $45^\circ$  કોણ બનાવે છે. પૃથ્વીના ચુંબકીય ક્ષેત્રનો સમક્ષિતિજ ઘટક  $18 \times 10^{-6}$  T છે. જો આ સોયના ધ્રુવની પ્રબળતા 1.8 Am હોય તો આ સોયને તેના મધ્યબિંદુથી સમક્ષિતિજ સ્થિતિમાં લટકાવવામાં આવે છે. તેને સમક્ષિતિજ રાખવા તેના છેડા પર લગાડવું પડતું ઊર્ધ્વબળ \_\_\_\_\_ છે.

Options :

1.  $6.5 \times 10^{-5}$  N
2.  $1.8 \times 10^{-5}$  N
3.  $1.3 \times 10^{-5}$  N
4.  $3.6 \times 10^{-5}$  N

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

The self induced emf of a coil is 25 volts. When the current in it is changed at uniform rate from 10 A to 25 A in 1 s, the change in the energy of the inductance is :

Options :

1. 437.5 J
2. 540 J
3. 637.5 J
4. 740 J

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

Correct Marks : 4 Wrong Marks : 1

એક ગુંચળાનું આત્મપ્રેરિત emf 25 V છે, જ્યારે તેમાનો પ્રવાહ સમાન દરથી 1 s માં 10 A થી 25 A કરવામાં આવે છે. ઊર્જામાં થતો ફેરફાર \_\_\_\_\_ છે.

Options :

1. 437.5 J

2. 540 J
3. 637.5 J
4. 740 J

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

Correct Marks : 4 Wrong Marks : 1

जब एक कुंडली में धारा को 1 s में एकसमान दर से 10 A से 25 A बढ़ाते हैं तो कुण्डली में स्वप्रेरित विद्युत वाहक बल 25 V है। कुण्डली की ऊर्जा में परिवर्तन का मान होगा :

Options :

1. 437.5 J
2. 540 J
3. 637.5 J
4. 740 J

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

Correct Marks : 4 Wrong Marks : 1

The electric field of a plane polarized electromagnetic wave in free space at time  $t=0$  is given by an expression

$$\vec{E}(x, y) = 10 \hat{j} \cos [(6x + 8z)]$$

The magnetic field  $\vec{B}(x, z, t)$  is given by : (c is the velocity of light)

Options :

1.  $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z - 10ct)]$
2.  $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x - 8z + 10ct)]$

3.  $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x + 8z - 10ct)]$

4.  $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z + 10ct)]$

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

Correct Marks : 4 Wrong Marks : 1

एक मुक्त आकाश में समतल ध्रुवित विद्युत चुम्बकीय तरंग का  $t=0$  पर विद्युत क्षेत्र निम्न है,

$$\vec{E}(x, y) = 10 \hat{j} \cos [(6x + 8z)]$$

इसका चुम्बकीय क्षेत्र  $\vec{B}(x, z, t)$  होगा : ( $c$ , प्रकाश की चाल है)

Options :

1.  $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z - 10ct)]$

2.  $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x - 8z + 10ct)]$

3.  $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x + 8z - 10ct)]$

4.  $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z + 10ct)]$

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

मुक्त अवकाशમાં  $t=0$  સમયે એક સમતલ ધ્રુવીભૂત વિદ્યુતચુંબકીય તરંગના વિદ્યુતક્ષેત્રને

$$\vec{E}(x, y) = 10 \hat{j} \cos [(6x + 8z)]$$

વડે આપવામાં આવે છે. ચુંબકીય ક્ષેત્ર  $\vec{B}(x, z, t)$ ને આપવામાં આવે છે : ( $c$  એ પ્રકાશનો વેગ છે.)

Options :

1.  $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z - 10ct)]$

2.  $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x - 8z + 10ct)]$

3.  $\frac{1}{c} (6\hat{k} + 8\hat{i}) \cos [(6x + 8z - 10ct)]$

4.  $\frac{1}{c} (6\hat{k} - 8\hat{i}) \cos [(6x + 8z + 10ct)]$

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

The eye can be regarded as a single refracting surface. The radius of curvature of this surface is equal to that of cornea (7.8 mm). This surface separates two media of refractive indices 1 and 1.34. Calculate the distance from the refracting surface at which a parallel beam of light will come to focus.

Options :

1. 2 cm
2. 1 cm
3. 3.1 cm
4. 4.0 cm

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

Correct Marks : 4 Wrong Marks : 1

माना कि आँख एक एकल अपवर्तक पृष्ठ है। इस पृष्ठ की वक्रता त्रिज्या कॉर्निया की वक्रता त्रिज्या (7.8 mm)के बराबर है। यह पृष्ठ अपवर्तनांक 1 तथा 1.34 के माध्यमों को पृथक करता है। इस अपवर्तक पृष्ठ से वह दूरी जिस पर प्रकाश की समान्तर किरणें फोकस में आयेंगी, होगी :

Options :

1. 2 cm
2. 1 cm
3. 3.1 cm
4. 4.0 cm

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

Correct Marks : 4 Wrong Marks : 1

આંખને 7.8 mm વક્તા ત્રિજ્યાના પડદા (cornea) થી એક વક્રીભૂત સપાટી તરીકે લઈ શકાય કે જે 1 અને 1.34 વક્રીભવનાંક ધરાવતા બે માધ્યમોને જુદા પાડે છે. એક સમાંતર પ્રકાશપૂંજ આ વક્રીભૂત સપાટીથી જે અંતર પર કેન્દ્રિત થાય તે અંતર ગણો :

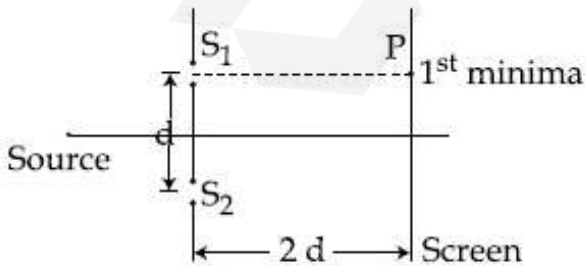
Options :

1. 2 cm
2. 1 cm
3. 3.1 cm
4. 4.0 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

Consider a Young's double slit experiment as shown in figure. What should be the slit separation  $d$  in terms of wavelength  $\lambda$  such that the first minima occurs directly in front of the slit ( $S_1$ ) ?



Options :

1.  $\frac{\lambda}{(\sqrt{5} - 2)}$

2.  $\frac{\lambda}{2(\sqrt{5} - 2)}$

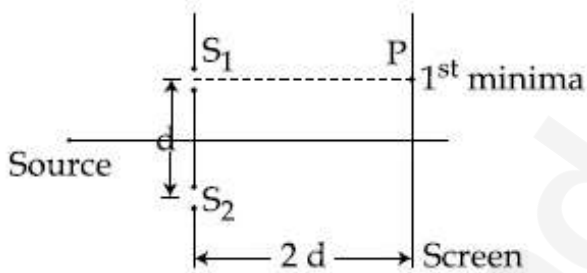
3.  $\frac{\lambda}{(5 - \sqrt{2})}$

4.  $\frac{\lambda}{2(5 - \sqrt{2})}$

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

चित्र में दिखाये गये यंग के द्विझिरी प्रयोग के अनुसार तरंगदैर्घ्य  $\lambda$  के रूप में झिरियों के बीच की वह दूरी  $d$  क्या होगी जिससे प्रथम निम्निष्ठ झिरी  $S_1$  के ठीक सामने बनता है?



Options :

1.  $\frac{\lambda}{(\sqrt{5} - 2)}$

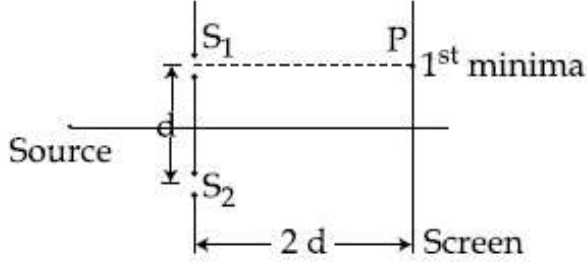
2.  $\frac{\lambda}{2(\sqrt{5} - 2)}$

3.  $\frac{\lambda}{(5 - \sqrt{2})}$

4.  $\frac{\lambda}{2(5 - \sqrt{2})}$

Correct Marks : 4 Wrong Marks : 1

आकृतिमा अताव्या प्रमाणेनो अेक यंगनो डबल स्लिटनो प्रयोग ध्यानमा लो प्रथम लघुत्तम स्लिट  $S_1$  नी सामे आवे ते माटे तरंग लंबाई  $\lambda$  ना पदमा आ स्लिते वच्येनुं अंतर  $d$  केटलुं हरे ?



Options :

1.  $\frac{\lambda}{(\sqrt{5} - 2)}$

2.  $\frac{\lambda}{2(\sqrt{5} - 2)}$

3.  $\frac{\lambda}{(5 - \sqrt{2})}$

4.  $\frac{\lambda}{2(5 - \sqrt{2})}$

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

Correct Marks : 4 Wrong Marks : 1

A metal plate of area  $1 \times 10^{-4} \text{ m}^2$  is illuminated by a radiation of intensity  $16 \text{ mW/m}^2$ . The work function of the metal is  $5 \text{ eV}$ . The energy of the incident photons is  $10 \text{ eV}$  and only  $10\%$  of it produces photo electrons. The number of emitted photo electrons per second and their maximum energy, respectively, will be ;  
[ $1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$ ]

Options :

1.  $10^{10}$  and  $5 \text{ eV}$

2.  $10^{11}$  and  $5 \text{ eV}$

3.  $10^{12}$  and 5 eV

4.  $10^{14}$  and 10 eV

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

$1 \times 10^{-4} \text{ m}^2$  क्षेत्रफल की धातु की एक प्लेट को  $16 \text{ mW/m}^2$  तीव्रता के प्रकाश से प्रकाशित किया जाता है। धातु का कार्यफलन 5 eV है। आपतित फोटॉनों की ऊर्जा 10 eV है तथा केवल 10% फोटॉनों से इलेक्ट्रॉन उत्सर्जित होते हैं। प्रति सेकण्ड उत्सर्जित हुए कुल फोटोइलेक्ट्रॉन तथा उनकी अधिकतम ऊर्जा, क्रमशः होगी :

[दिया है :  $1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$ ]

Options :

1.  $10^{10}$  तथा 5 eV

2.  $10^{11}$  तथा 5 eV

3.  $10^{12}$  तथा 5 eV

4.  $10^{14}$  तथा 10 eV

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

$1 \times 10^{-4} \text{ m}^2$  क्षेत्रफलની ધાતુની એક પ્લેટને  $16 \text{ mW/m}^2$  તીવ્રતાના વિકિરણ વડે પ્રકાશિત કરવામાં આવે છે. આ ધાતુનું કાર્યવિધેય 5 eV છે. આપાત ફોટોનની ઊર્જા 10 eV છે અને તેના ફક્ત 10% જ ફોટો ઇલેક્ટ્રોન ઉત્પન્ન કરે છે. પ્રતિ સેકન્ડ ઉત્સર્જિત ફોટોઇલેક્ટ્રોનની સંખ્યા અને તેની મહત્તમ ઊર્જા ગણો.

[ $1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$  આપેલ છે.]

Options :

1.  $10^{10}$  અને 5 eV

2.  $10^{11}$  અને 5 eV

3.  $10^{12}$  અને 5 eV

4.  $10^{14}$  અને  $10 \text{ eV}$

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

Consider the nuclear fission



Given that the binding energy/nucleon of  $\text{Ne}^{20}$ ,  $\text{He}^4$  and  $\text{C}^{12}$  are, respectively, 8.03 MeV, 7.07 MeV and 7.86 MeV, identify the correct statement :

Options :

1. energy of 11.9 MeV has to be supplied
2. energy of 3.6 MeV will be released
3. energy of 12.4 MeV will be supplied
4. 8.3 MeV energy will be released

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 नाभिकीय विघटन है,



यदि  $\text{Ne}^{20}$ ,  $\text{He}^4$  तथा  $\text{C}^{12}$  की प्रति न्यूक्लिऑन बन्धन ऊर्जा क्रमशः 8.03 MeV, 7.07 MeV तथा 7.86 MeV हैं तो निम्न में कौन-सा कथन सत्य है?

Options :

1. 11.9 MeV ऊर्जा को बाहर से देना पड़ेगा
2. 3.6 MeV ऊर्जा उत्सर्जित होगी
3. 12.4 MeV ऊर्जा को बाहर से देना पड़ेगा
4. 8.3 MeV ऊर्जा उत्सर्जित होगी

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



વિખંડન ધ્યાનમાં લો. જો  $\text{Ne}^{20}$ ,  $\text{He}^4$  અને  $\text{C}^{12}$  ની બંધનઊર્જા/નાબીકરણ ક્રમશઃ 8.03 MeV, 7.07 MeV અને 7.86 MeV આપેલ છે. સાચુ વિધાન પસંદ કરો :

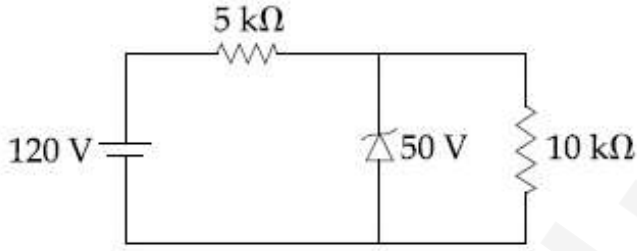
Options :

1. 11.9 MeV ઊર્જા આપવી પડે છે.
2. 3.6 MeV ઊર્જા મુક્ત થાય છે.
3. 12.4 MeV ઊર્જા આપવી પડે છે.
4. 8.3 MeV ઊર્જા મુક્ત થાય છે.

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

For the circuit shown below, the current through the Zener diode is :



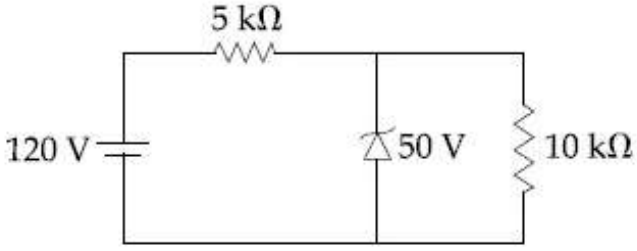
Options :

1. Zero
2. 5 mA
3. 14 mA
4. 9 mA

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

Correct Marks : 4 Wrong Marks : 1

दिये गये परिपथ में ज़ीनर डायोड में धारा का मान होगा :



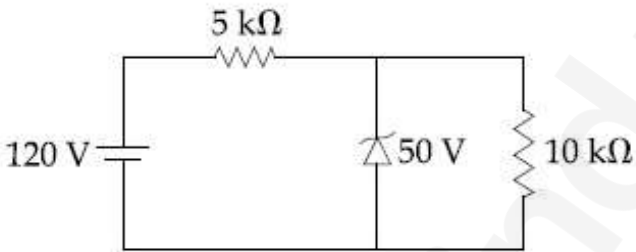
Options :

1. Zero
2. 5 mA
3. 14 mA
4. 9 mA

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ પરિપથમાં ઝેનર ડાયોડમાંથી પસાર થતો પ્રવાહ \_\_\_\_\_ છે.



Options :

1. શૂન્ય
2. 5 mA
3. 14 mA
4. 9 mA

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

Correct Marks : 4 Wrong Marks : 1

The modulation frequency of an AM radio station is 250 kHz, which is 10% of the carrier wave. If another AM station approaches you for license what broadcast frequency will you allot ?

Options :

1. 2000 kHz
2. 2250 kHz
3. 2750 kHz
4. 2900 kHz

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

Correct Marks : 4 Wrong Marks : 1

एक AM रेडियो स्टेशन की माड्युलेशन आवृत्ति 250 kHz है, जो कि उसकी वाहक तरंग आवृत्ति की 10% है। यदि एक और रेडियो स्टेशन लाइसेंस के लिए आता है तो आप कौन-सी प्रसार आवृत्ति आवंटित करेंगे ?

Options :

1. 2000 kHz
2. 2250 kHz
3. 2750 kHz
4. 2900 kHz

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

Correct Marks : 4 Wrong Marks : 1

એક AM રેડિયો સ્ટેશનની મોડ્યુલેશન આવૃત્તિ 250 kHz છે, જે કેરિયર તરંગની 10% છે. જો કોઈ બીજો AM રેડિયો સ્ટેશન લાયસન્સ માટે તમારો સંપર્ક કરે છે, તો તમે કઈ પ્રસારણ આવૃત્તિ ફાળવશો ?

Options :

1. 2000 kHz
2. 2250 kHz

3. 2750 kHz

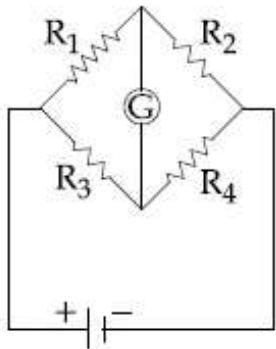
4. 2900 kHz

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

Correct Marks : 4 Wrong Marks : 1

The Wheatstone bridge shown in Fig. here, gets balanced when the carbon resistor used as  $R_1$  has the colour code (Orange, Red, Brown). The resistors  $R_2$  and  $R_4$  are  $80 \Omega$  and  $40 \Omega$ , respectively.

Assuming that the colour code for the carbon resistors gives their accurate values, the colour code for the carbon resistor, used as  $R_3$ , would be :



Options :

1. Grey, Black, Brown

2. Red, Green, Brown

3. Brown, Blue, Black

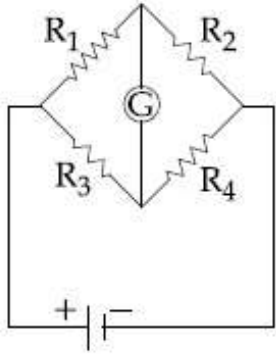
4. Brown, Blue, Brown

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

दिखाये गया चित्र में व्हीटस्टोन सेतु संतुलित होता है जब कार्बन प्रतिरोध  $R_1$  का कलर कोड नारंगी, लाल तथा भूरा है। प्रतिरोध  $R_2$  व  $R_4$  क्रमशः  $80 \Omega$  तथा  $40 \Omega$  हैं।

यह मानते हुये कि कलर कोड कार्बन प्रतिरोध का यथार्थ मान देता है,  $R_3$  को कार्बन प्रतिरोध मानते हुए उसका कलर कोड होगा :



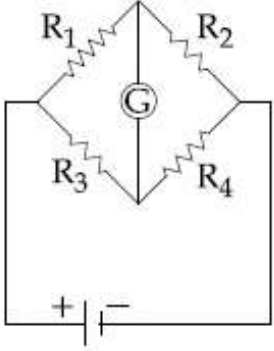
Options :

1. सलेटी, काला, भूरा
2. लाल, हरा, भूरा
3. भूरा, नीला, काला
4. भूरा, नीला, भूरा

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

આકૃતિમાંનો વ્હીસ્ટોન બ્રીજ ત્યારે સંતુલિત થાય છે કે જ્યારે ઉપયોગમાં લેવાયેલ કાર્બન અવરોધ  $R_1$  ના વર્ણ સંકેત (નારંગી, લાલ, કથથઇ) છે. અવરોધો  $R_2$  અને  $R_4$  અનુક્રમે  $80 \Omega$  અને  $40 \Omega$  છે. આ વર્ણ સંકેત કાર્બન અવરોધોનો સચોટ મૂલ્ય આપે છે એમ ધારતા,  $R_3$  તરીકે વાપરેલ કાર્બન અવરોધનો વર્ણ સંકેત \_\_\_\_\_ હશે.



Options :

1. ભૂખરો, કાળો, કથથઇ
2. લાલ, લીલો, કથથઇ
3. કથથઇ, વાદળી, કાળો
4. કથથઇ, વાદળી, કથથઇ

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

An unknown metal of mass  $192 \text{ g}$  heated to a temperature of  $100^\circ\text{C}$  was immersed into a brass calorimeter of mass  $128 \text{ g}$  containing  $240 \text{ g}$  of water at a temperature of  $8.4^\circ\text{C}$ . Calculate the specific heat of the unknown metal if water temperature stabilizes at  $21.5^\circ\text{C}$ . (Specific heat of brass is  $394 \text{ J kg}^{-1} \text{ K}^{-1}$ )

Options :

1.  $916 \text{ J kg}^{-1} \text{ K}^{-1}$
2.  $458 \text{ J kg}^{-1} \text{ K}^{-1}$
3.  $654 \text{ J kg}^{-1} \text{ K}^{-1}$
4.  $1232 \text{ J kg}^{-1} \text{ K}^{-1}$

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

192 g દ્રવ્યમાન કી એક અજ્ઞાત ધાતુ કો 100°C તક ગર્મ કરકે ઉસે પીતલ કે એક કૈલોરીમીટર મેં, જિસકા દ્રવ્યમાન 128 g હૈ તથા ઇસમેં 240 g પાની 8.4°C પર ભરા હૈ, ડાલતે હૈં। યદિ પાની કા તાપમાન 21.5°C પર સ્થાયી હો જાતા હૈ તો અજ્ઞાત ધાતુ કી વિશિષ્ટ ઊષ્મા હોગી : (પીતલ કી વિશિષ્ટ ઊષ્મા 394 J kg<sup>-1</sup> K<sup>-1</sup> હૈ)

Options :

1. 916 J kg<sup>-1</sup> K<sup>-1</sup>
2. 458 J kg<sup>-1</sup> K<sup>-1</sup>
3. 654 J kg<sup>-1</sup> K<sup>-1</sup>
4. 1232 J kg<sup>-1</sup> K<sup>-1</sup>

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

100°C એ તપાવેલ એક 192 g અજ્ઞાત ધાતુને 8.4°C તાપમાન ધરાવતા 240 g પાણી ભરેલ 128 g પિત્તળના કેલોરિમીટરમાં ડુબાડવામાં આવે છે. જો પાણીનું તાપમાન 21.5°C પર સ્થિર થતું હોય તો અજ્ઞાત ધાતુની વિશિષ્ટ ઉષ્મા ગણો. (પિત્તળની વિશિષ્ટ ઉષ્મા 394 J kg<sup>-1</sup> K<sup>-1</sup> છે.)

Options :

1. 916 J kg<sup>-1</sup> K<sup>-1</sup>
2. 458 J kg<sup>-1</sup> K<sup>-1</sup>
3. 654 J kg<sup>-1</sup> K<sup>-1</sup>
4. 1232 J kg<sup>-1</sup> K<sup>-1</sup>

Chemistry

416529173

2

Online

Section Id :

Section Number :

Section type :

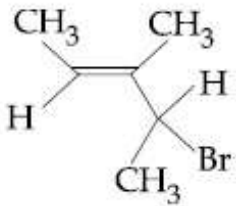
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529182
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

निम्नलिखित यौगिक का IUPAC नाम क्या है ?



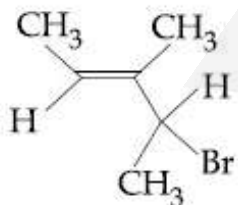
Options :

1. 3-ब्रोमो-3-मेथिल-1,2-डाइमेथिलप्रोप-1-ईन
2. 3-ब्रोमो-1, 2-डाइमेथिलब्यूट-1-ईन
3. 4-ब्रोमो-3-मेथिलपेन्ट-2-ईन
4. 2-ब्रोमो-3-मेथिलपेन्ट-3-ईन

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

What is the IUPAC name of the following compound ?



Options :

1. 3-Bromo-3-methyl-1, 2-dimethylprop-1-ene
2. 3-Bromo-1, 2-dimethylbut-1-ene

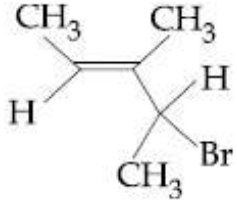
3. 4-Bromo-3-methylpent-2-ene

4. 2-Bromo-3-methylpent-3-ene

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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંયોજનું IUPAC નામ આપો?



Options :

1. 3-બ્રોમો-3-મિથાઈલ-1,2-ડાયમિથાઈલપ્રોપ-1-ઈન

2. 3-બ્રોમો-1,2-ડાયમિથાઈલબ્યુટ-1-ઈન

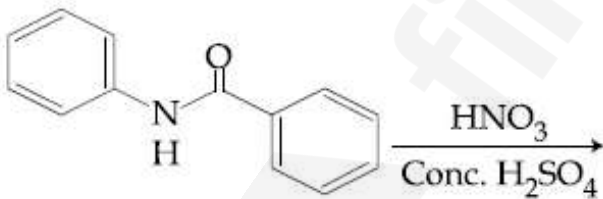
3. 4-બ્રોમો-3-મિથાઈલપેન્ટ-2-ઈન

4. 2-બ્રોમો-3-મિથાઈલપેન્ટ-3-ઈન

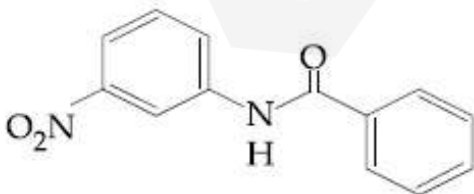
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

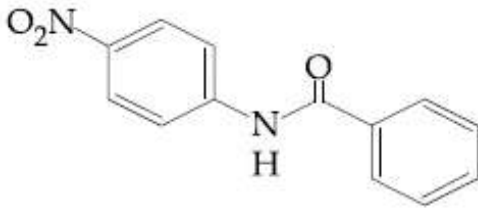
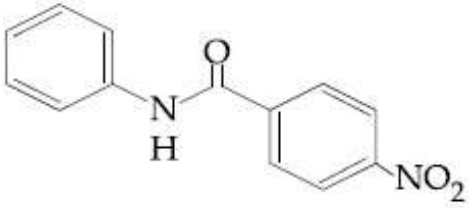
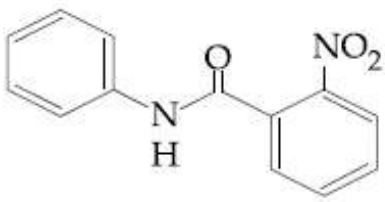
What will be the major product in the following mononitration reaction ?



Options :



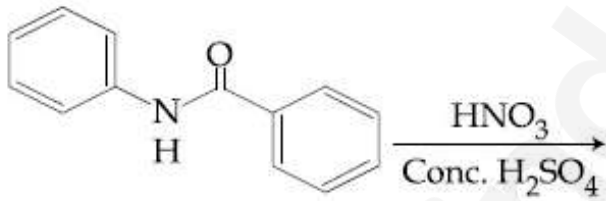
1.



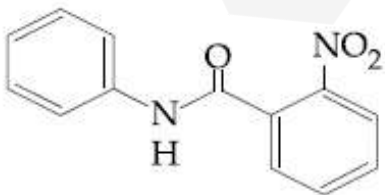
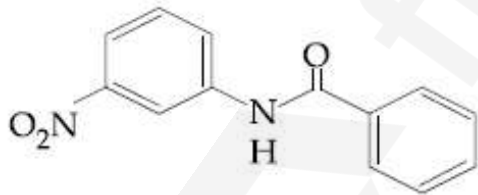
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

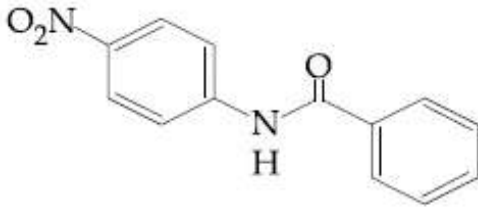
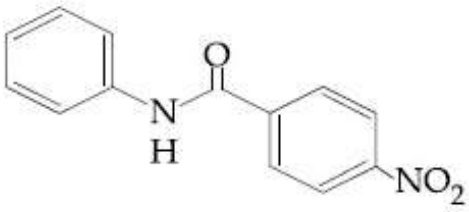
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित मोनोनाइट्रेशन अभिक्रिया में कौन सा मुख्य उत्पाद होगा ?



Options :

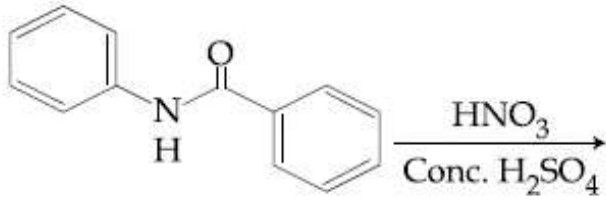




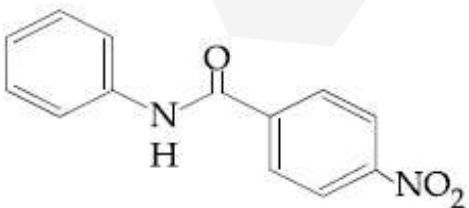
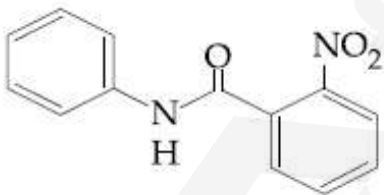
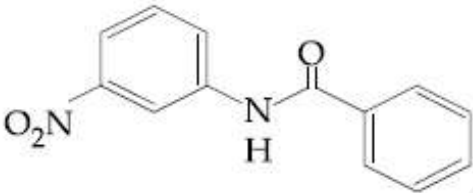
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

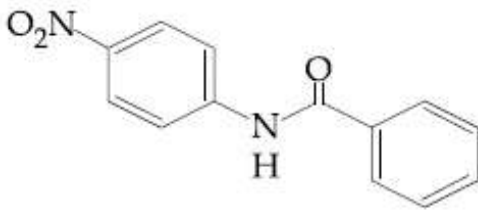
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયામાં મોનોનાઈટ્રેશન કરતા મળતી મુખ્ય નીપજ શોધો?



Options :





4.

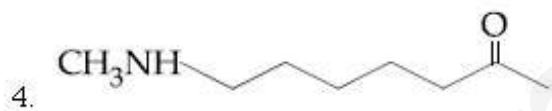
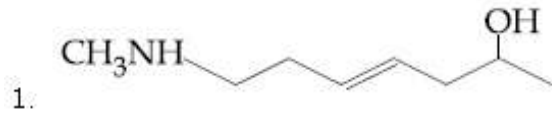
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



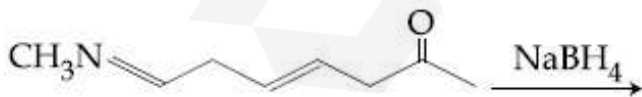
Options :



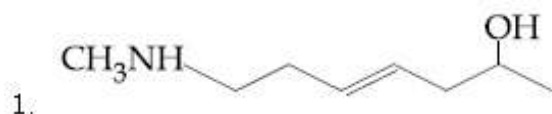
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

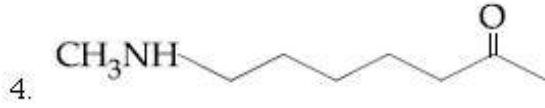
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



Options :





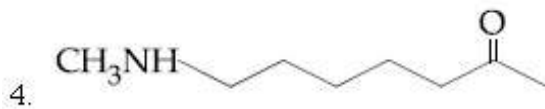
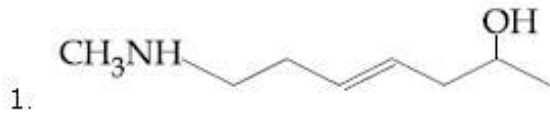
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे आपेली प्रक्रियानी मुख्य नीपज शोधो ?



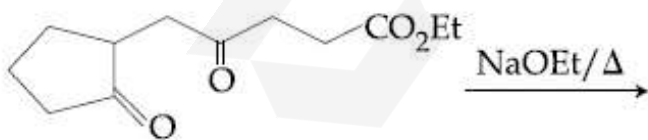
Options :



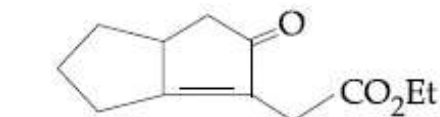
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

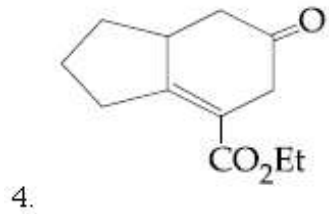
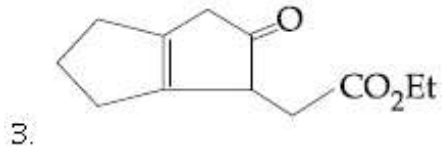
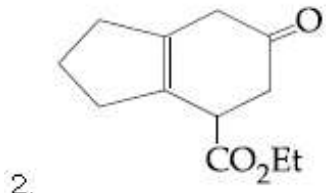
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया में प्राप्त होने वाला मुख्य उत्पाद है :



Options :

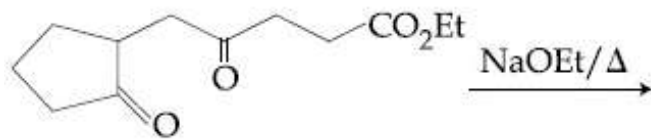




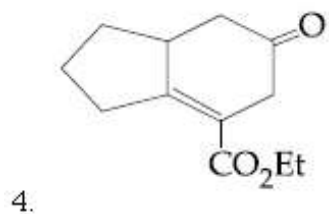
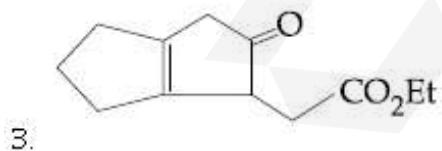
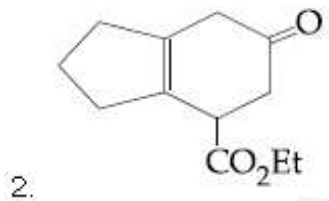
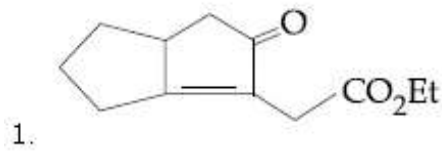
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?

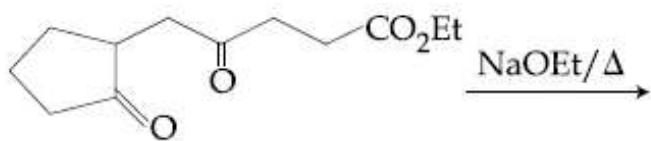


Options :

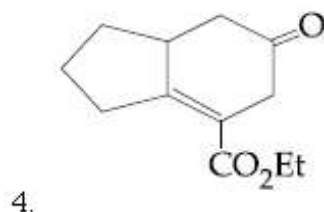
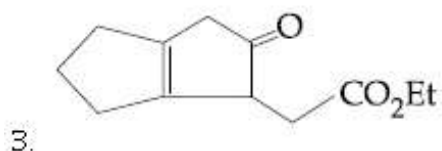
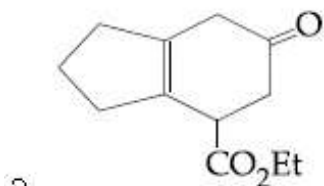
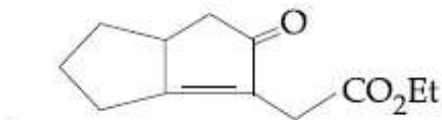


Correct Marks : 4 Wrong Marks : 1

The major product obtained in the following reaction is :



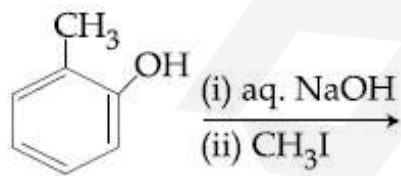
Options :



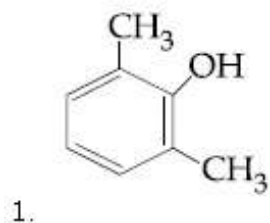
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

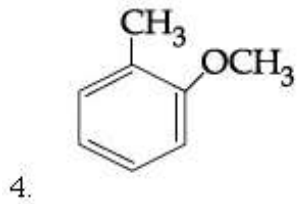
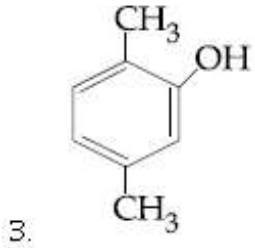
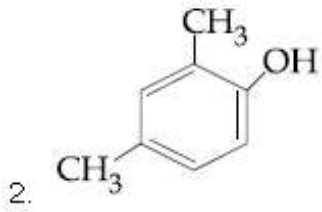
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



Options :

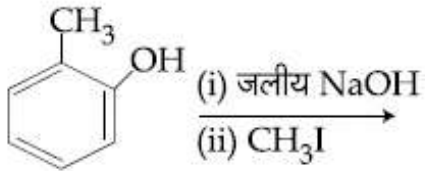




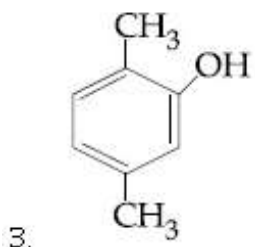
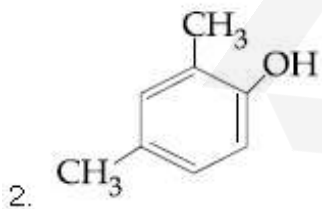
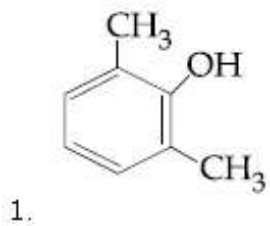
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

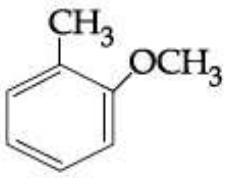
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया का मुख्य उत्पाद है :



Options :



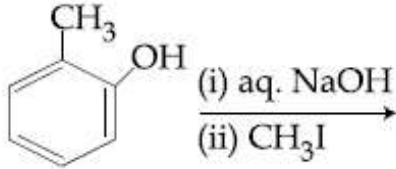


4.

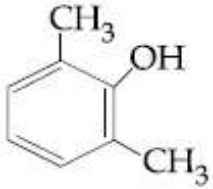
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

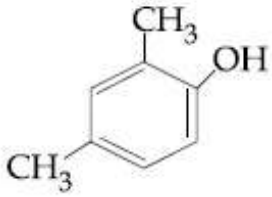
નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો?



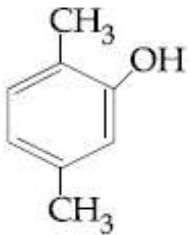
Options :



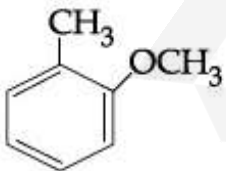
1.



2.



3.



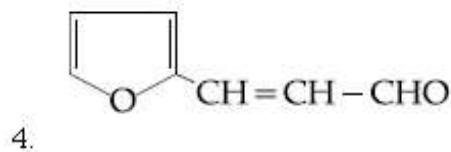
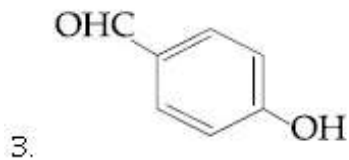
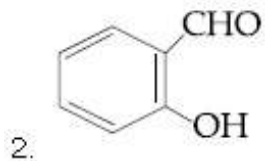
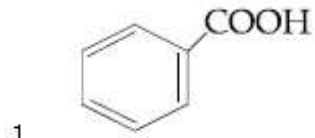
4.

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

An aromatic compound 'A' having molecular formula  $C_7H_6O_2$  on treating with aqueous ammonia and heating forms compound 'B'. The compound 'B' on reaction with molecular bromine and potassium hydroxide provides compound 'C' having molecular formula  $C_6H_7N$ . The structure of 'A' is :

Options :

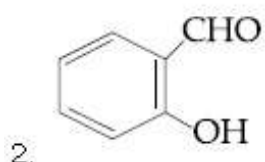
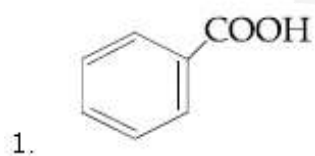


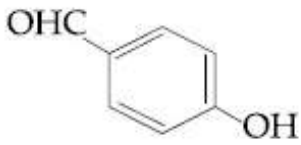
Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक कार्बनिक यौगिक 'A' जिसका आण्विक सूत्र  $C_7H_6O_2$  है, जलीय अमोनिया के साथ गर्म करने पर यौगिक 'B' बनाता है। यौगिक 'B' आण्विक ब्रोमीन तथा पोटेशियम हाइड्राक्साइड के साथ अभिक्रिया करके यौगिक 'C' देता है जिसका आण्विक सूत्र  $C_6H_7N$  है। 'A' की संरचना है :

Options :



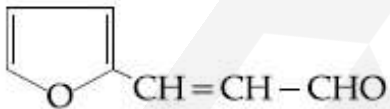
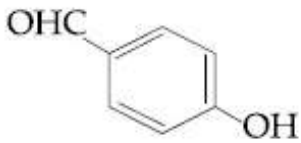
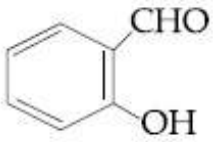
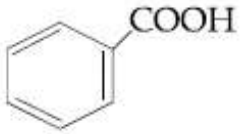


Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક એરોમેટિક સંયોજન 'A' જેનું અણુસૂત્ર  $C_7H_6O_2$  છે તેને જલીય એમોનિયા સાથે પ્રક્રિયા કરી અને ગરમ કરતા સંયોજન 'B' આપે છે. સંયોજન 'B' બ્રોમિન અણુ અને પોટેશિયમ લાઈટ્ડ્રોક્સાઈડ સાથે પ્રક્રિયા કરી સંયોજન 'C' આપે છે જેનું અણુસૂત્ર  $C_6H_7N$  છે. તો 'A' નું બંધારણ શોધો ?

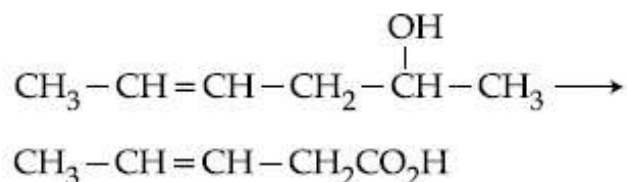
Options :



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

Correct Marks : 4 Wrong Marks : 1

Which is the most suitable reagent for the following transformation ?



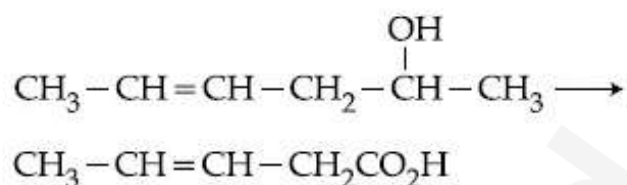
Options :

1. Tollen's reagent
2.  $\text{I}_2/\text{NaOH}$
3. alkaline  $\text{KMnO}_4$
4.  $\text{CrO}_2\text{Cl}_2/\text{CS}_2$

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

निम्नलिखित रूपान्तरण के लिए सर्वाधिक उपयुक्त अभिकर्मक क्या है ?



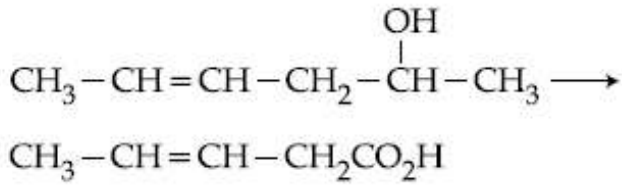
Options :

1. टॉलेन अभिकर्मक
2.  $\text{I}_2/\text{NaOH}$
3. क्षारीय  $\text{KMnO}_4$
4.  $\text{CrO}_2\text{Cl}_2/\text{CS}_2$

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

નીચેના રૂપાંતરણ માટે સૌથી યોગ્ય પ્રક્રિયક શોધો?



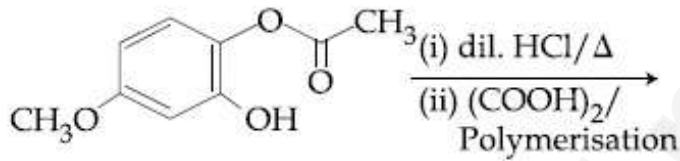
Options :

1. ટેલાન્સ પ્રક્રિયક
2.  $\text{I}_2/\text{NaOH}$
3. આલ્કલાઈન  $\text{KMnO}_4$
4.  $\text{CrO}_2\text{Cl}_2/\text{CS}_2$

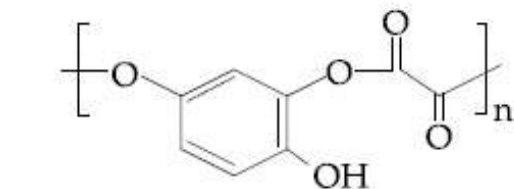
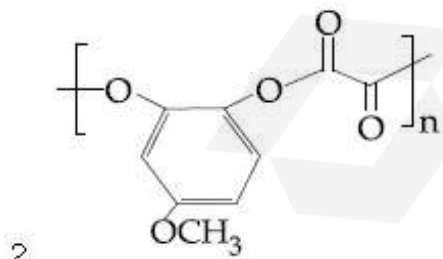
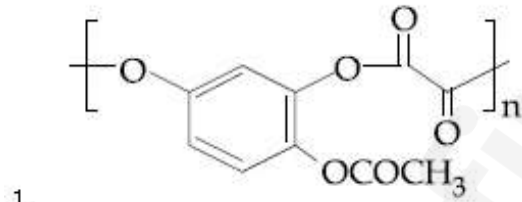
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

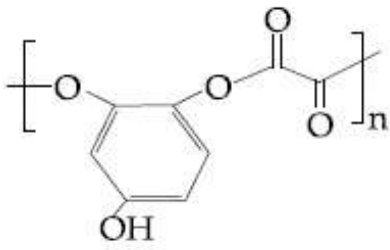
Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



Options :



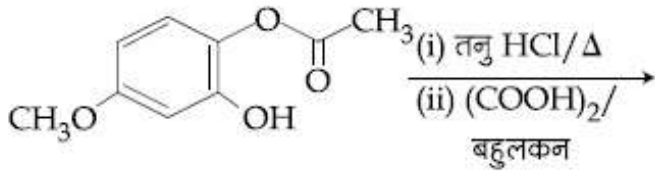


4.

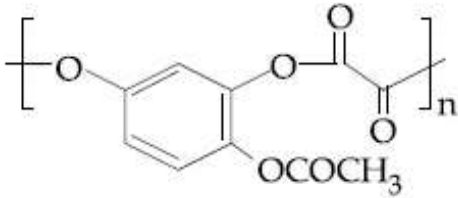
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

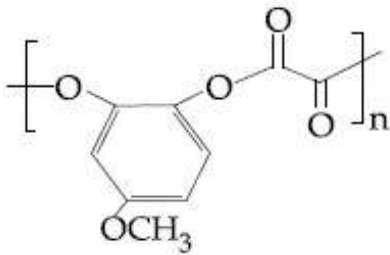
निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



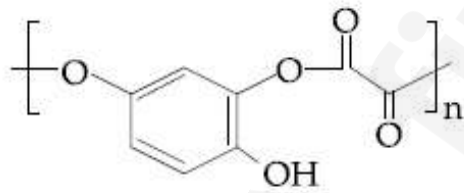
Options :



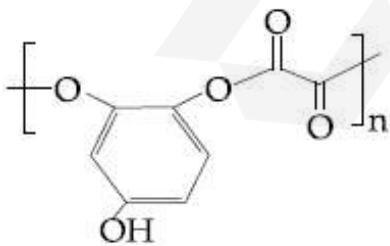
1.



2.



3.

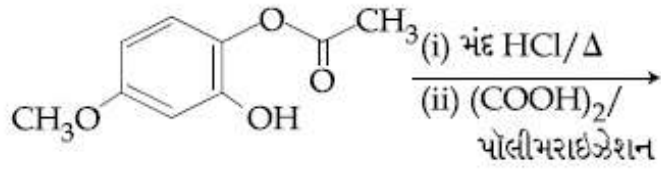


4.

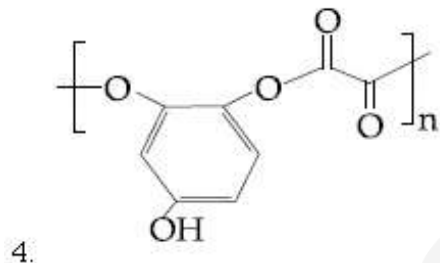
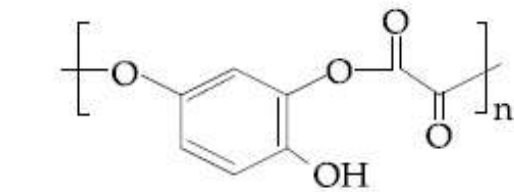
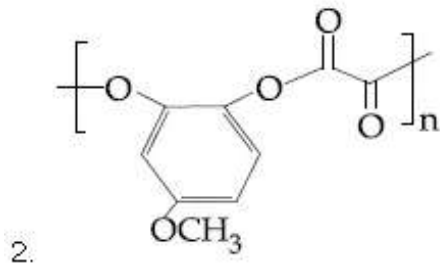
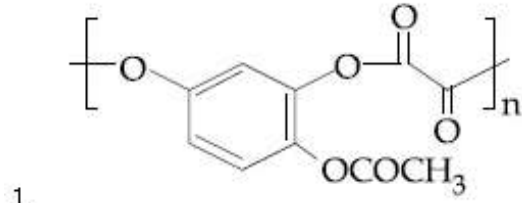
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો?



Options :



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

Correct Marks : 4 Wrong Marks : 1

Which of the following tests cannot be used for identifying amino acids ?

Options :

1. Xanthoproteic test
2. Barfoed test
3. Biuret test

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

ऐमीनो अम्लों को पहचानने के लिए निम्नलिखित में से कौन से परीक्षण का उपयोग नहीं कर सकते हैं ?

Options :

1. जैन्थोप्रोटीइक परीक्षण
2. बाफोर्ड परीक्षण
3. बाइयूरेट परीक्षण
4. निनहाइड्रिन परीक्षण

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

ऐमीनो एसिड ने पारभवा नीचेना मांथी कर्छ कसोटी उपयोगी नथी ?

Options :

1. जैन्थोप्रोटीक कसोटी
2. बाफोर्ड कसोटी
3. बाययूरेट कसोटी
4. निनहाइड्रिन कसोटी

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

The correct match between item 'I' and item 'II' is :

Item 'I' (compound)	Item 'II' (reagent)
(A) Lysine	(P) 1-naphthol
(B) Furfural	(Q) ninhydrin
(C) Benzyl alcohol	(R) $\text{KMnO}_4$
(D) Styrene	(S) Ceric ammonium nitrate

Options :

- (A) → (Q); (B) → (P); (C) → (R); (D) → (S)
- (A) → (R); (B) → (P); (C) → (Q); (D) → (S)
- (A) → (Q); (B) → (P); (C) → (S); (D) → (R)
- (A) → (Q); (B) → (R); (C) → (S); (D) → (P)

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

मदों 'I' तथा 'II' के मध्य सही सुमेल है :

मद 'I' ( यौगिक )	मद 'II' ( अभिकर्मक )
(A) लाइसीन	(P) 1-नैफ्थॉल
(B) फरफ्यूरल	(Q) निनहाइड्रिन
(C) बिन्ज़िल एल्कोहल	(R) $\text{KMnO}_4$
(D) स्टाइरीन	(S) सेरिक अमोनियम नाइट्रेट

Options :

- (A) → (Q); (B) → (P); (C) → (R); (D) → (S)
- (A) → (R); (B) → (P); (C) → (Q); (D) → (S)
- (A) → (Q); (B) → (P); (C) → (S); (D) → (R)
- (A) → (Q); (B) → (R); (C) → (S); (D) → (P)

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

सुची - I ने सुची - II साथे योज्य रीते जोडो.

सुची - I (संयोजन)	सुची - II (प्रक्रियक)
(A) लायसीन	(P) 1-नेफ्थोल
(B) इरुयुराल	(Q) नीनहाईड्रीन
(C) बेन्जाईल आल्कोहोल	(R) $KMnO_4$
(D) स्टायरिन	(S) सेरीक अभोनियम नाईट्रेट

Options :

- (A) → (Q); (B) → (P); (C) → (R); (D) → (S)
- (A) → (R); (B) → (P); (C) → (Q); (D) → (S)
- (A) → (Q); (B) → (P); (C) → (S); (D) → (R)
- (A) → (Q); (B) → (R); (C) → (S); (D) → (P)

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 71<sup>st</sup> electron of an element X with an atomic number of 71 enters into the orbital :

Options :

- 6s
- 4f
- 5d
- 6p

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

एक तत्व X, जिसकी परमाणु संख्या 71 है, उसका 71वाँ इलेक्ट्रॉन जिस कक्षक में प्रवेश करता है, वह है :

Options :

- 6s

2. 4f

3. 5d

4. 6p

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

परमाण्विय क्रमांक 71 धरायतो तत्त्व X नो 71मो एलेक्ट्रोन  
नीचे आपेला मांथी कर्छ कक्षकमां दाअल थथे?

Options :

1. 6s

2. 4f

3. 5d

4. 6p

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 electrolytes usually used in the electroplating of gold and silver, respectively, are :

Options :

1.  $[\text{Au}(\text{CN})_2]^-$  and  $[\text{Ag}(\text{CN})_2]^-$

2.  $[\text{Au}(\text{NH}_3)_2]^+$  and  $[\text{Ag}(\text{CN})_2]^-$

3.  $[\text{Au}(\text{CN})_2]^-$  and  $[\text{AgCl}_2]^-$

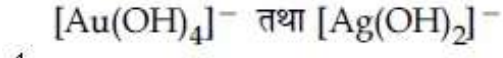
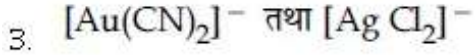
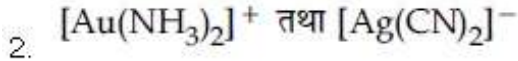
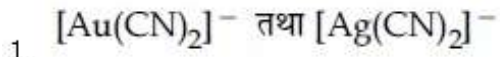
4.  $[\text{Au}(\text{OH})_4]^-$  and  $[\text{Ag}(\text{OH})_2]^-$

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

सोना तथा चाँदी के वैद्युत लेपन में उपयोग होने वाले  
वैद्युत अपघट्य क्रमशः हैं :

Options :

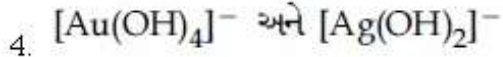
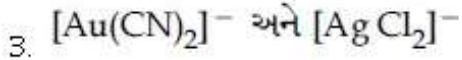
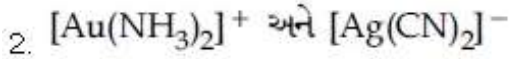
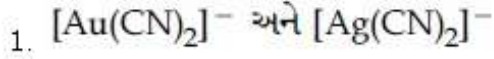


Question Number : 42 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

સોના અને ચાંદીનો ઢોળ ચઢાવવા માટે નીચેના માંથી અનુક્રમે કયા વિદ્યુત વિભાજ્યો નો ઊપયોગ થાય છે?

Options :

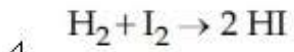
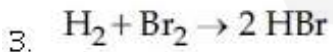
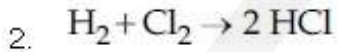
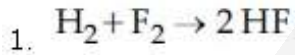


Question Number : 43 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Among the following reactions of hydrogen with halogens, the one that requires a catalyst is :

Options :



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

हैलोजन के साथ हाइड्रोजन की निम्नलिखित अभिक्रियाओं में से जिसमें एक उत्प्रेरक की आवश्यकता होती है, वह है :

Options :

1.  $H_2 + F_2 \rightarrow 2 HF$
2.  $H_2 + Cl_2 \rightarrow 2 HCl$
3.  $H_2 + Br_2 \rightarrow 2 HBr$
4.  $H_2 + I_2 \rightarrow 2 HI$

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

हाइड्रोजन साथे हैलोजननी नीचे आपेती प्रक्रियाओ पैडी  
कई अेकमां उद्दीपकनी जरूर पडशे?

Options :

1.  $H_2 + F_2 \rightarrow 2 HF$
2.  $H_2 + Cl_2 \rightarrow 2 HCl$
3.  $H_2 + Br_2 \rightarrow 2 HBr$
4.  $H_2 + I_2 \rightarrow 2 HI$

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

Sodium metal on dissolution in liquid ammonia gives a deep blue solution due to the formation of :

Options :

1. sodamide
2. sodium-ammonia complex
3. sodium ion-ammonia complex
4. ammoniated electrons

Correct Marks : 4 Wrong Marks : 1

द्रव अमोनिया में सोडियम धातु को विलयित करने पर एक गहरे नीले रंग का विलयन देता है, इसका कारण है :

Options :

1. सोडामाइड का बनना
2. सोडियम-अमोनिया संकुल का बनना
3. सोडियम आयन-अमोनिया संकुल का बनना
4. अमोनियित इलेक्ट्रॉनों का बनना

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

સોડિયમ ધાતુને પ્રવાહી એમોનિયામાં ઓગાળતા ઘેરા ભુરા રંગનું દ્રાવણ બને છે જે નીચેનામાંથી કોને આભારી છે?

Options :

1. સોડામાઇડ
2. સોડિયમ-એમોનિયા સંક્રિણ
3. સોડિયમ-આયન-એમોનિયા સંક્રિણ
4. એમોનિયામય ઈલેક્ટ્રોનસ્

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 pair that contains two P–H bonds in each of the oxoacids is :

Options :

1.  $H_3PO_3$  and  $H_3PO_2$
2.  $H_4P_2O_5$  and  $H_3PO_3$
3.  $H_3PO_2$  and  $H_4P_2O_5$

4.  $H_4P_2O_5$  and  $H_4P_2O_6$

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 युग्मों में से जिस युग्म के प्रत्येक आक्सोअम्लों में दो P-H आबंध हैं, वह है :

Options :

1.  $H_3PO_3$  तथा  $H_3PO_2$
2.  $H_4P_2O_5$  तथा  $H_3PO_3$
3.  $H_3PO_2$  तथा  $H_4P_2O_5$
4.  $H_4P_2O_5$  तथा  $H_4P_2O_6$

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

દરેક ઓક્સોએસિડ્સમાં નીચે આપેલી કઈ જોડ બે P-H બંધો ધરાવે છે?

Options :

1.  $H_3PO_3$  અને  $H_3PO_2$
2.  $H_4P_2O_5$  અને  $H_3PO_3$
3.  $H_3PO_2$  અને  $H_4P_2O_5$
4.  $H_4P_2O_5$  અને  $H_4P_2O_6$

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

Correct Marks : 4 Wrong Marks : 1

The number of 2-centre-2-electron and 3-centre-2-electron bonds in  $B_2H_6$ , respectively, are :

Options :

1. 2 and 2
2. 4 and 2

3. 2 and 4

4. 2 and 1

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

$B_2H_6$  में 2-केन्द्र-2-इलेक्ट्रॉन तथा 3-केन्द्र-2-इलेक्ट्रॉन  
आबंधों की संख्या क्रमशः हैं :

Options :

1. 2 तथा 2

2. 4 तथा 2

3. 2 तथा 4

4. 2 तथा 1

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

$B_2H_6$  માં 2-કેન્દ્ર-2-ઇલેક્ટ્રોન અને 3-કેન્દ્ર-2-ઇલેક્ટ્રોન  
બંધોની સંખ્યા અનુક્રમે કઈ હશે તે શોધો?

Options :

1. 2 અને 2

2. 4 અને 2

3. 2 અને 4

4. 2 અને 1

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

In the reaction of oxalate with permanganate in acidic medium, the number of electrons involved in producing one molecule of  $CO_2$  is :

Options :

1. 5

2. 1
3. 2
4. 10

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

अम्लीय माध्यम में आक्सैलेट की परमैंगनेट के साथ अभिक्रिया में,  $\text{CO}_2$  के एक अणु को बनाने में निहित इलेक्ट्रॉनों की संख्या है :

Options :

1. 5
2. 1
3. 2
4. 10

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

ओक्सैलेटनी परमेनेट साथे एसिडिक माध्यममां यती प्रक्रियामां अक मोल  $\text{CO}_2$  ना उत्पादन माटे केटला इलेक्ट्रोन शाभेल छे ते शोधो ?

Options :

1. 5
2. 1
3. 2
4. 10

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 difference in the number of unpaired electrons of a metal ion in its high-spin and low-spin octahedral complexes is two. The metal ion is :

Options :

1.  $\text{Ni}^{2+}$
2.  $\text{Mn}^{2+}$
3.  $\text{Co}^{2+}$
4.  $\text{Fe}^{2+}$

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

एक धातु आयन के उच्च-प्रचक्रण तथा निम्न-प्रचक्रण वाले अष्टफलकीय संकुलों के अयुग्मित इलेक्ट्रॉनों की संख्याओं में दो का अन्तर है। धातु आयन है :

Options :

1.  $\text{Ni}^{2+}$
2.  $\text{Mn}^{2+}$
3.  $\text{Co}^{2+}$
4.  $\text{Fe}^{2+}$

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

એક ધાતુ આયનના તેના ઊંચી-સ્પીન અને નીચી-સ્પીન ધરાવતા અષ્ટફલકીય સંકુલોમાં અયુગ્મિત ઇલેક્ટ્રોન ની સંખ્યાનો તફાવત બે છે. તો ધાતુ આયન શોધો?

Options :

1.  $\text{Ni}^{2+}$
2.  $\text{Mn}^{2+}$
3.  $\text{Co}^{2+}$
4.  $\text{Fe}^{2+}$

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

A reaction of cobalt(III) chloride and ethylenediamine in a 1 : 2 mole ratio generates two isomeric products A (violet coloured) and B (green coloured). A can show optical activity, but, B is optically inactive. What type of isomers does A and B represent ?

Options :

1. Coordination isomers
2. Geometrical isomers
3. Ionisation isomers
4. Linkage isomers

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

कोबाल्ट (III) क्लोराइड तथा ऐथिलीनडाइऐमीन की 1 : 2 मोल अनुपात में अभिक्रिया से दो समावयवी उत्पाद A (बैंगनी रंग का) तथा उत्पाद B (हरे रंग का) उत्पन्न होते हैं। A ध्रुवण घूर्णकता प्रदर्शित करता है, परन्तु B ध्रुवण घूर्णक नहीं है। किस प्रकार की समावयता A तथा B निरूपित करते हैं ?

Options :

1. उपसहसंयोजन समावयता
2. ज्यामितीय समावयता
3. आयनन समावयता
4. बंधनी समावयता

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

कोबाल्ट (III) क्लोराइड અને ઈથિલીનડાયએમાઈન 1 : 2 મોલ ગુણોત્તર માં બે સમઘટક પદાર્થો A (જાંબલી રંગનો) અને B (લીલા રંગનો) આપે છે. A પ્રકાશ ક્રિયાશીલતા બતાવી શકે, જ્યારે B પ્રકાશ અક્રિયાશીલ છે. તો A અને B કયા પ્રકારના સમઘટકે છે તે શોધો ?

Options :

1. संयुग् (Coordination) समघटको
2. लौभितिक समघटको
3. आयनीकरण समघटको
4. बन्धन (Linkage) समघटको

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 reaction that is NOT involved in the ozone layer depletion mechanism in the stratosphere is :

Options :

1.  $\text{HOCl(g)} \xrightarrow{h\nu} \dot{\text{O}}\text{H(g)} + \dot{\text{Cl}}\text{(g)}$
2.  $\text{Cl}\dot{\text{O}}\text{(g)} + \text{O(g)} \rightarrow \dot{\text{Cl}}\text{(g)} + \text{O}_2\text{(g)}$
3.  $\text{CH}_4 + 2 \text{O}_3 \rightarrow 3 \text{CH}_2 = \text{O} + 3 \text{H}_2\text{O}$
4.  $\text{CF}_2\text{Cl}_2\text{(g)} \xrightarrow{uv} \dot{\text{Cl}}\text{(g)} + \dot{\text{C}}\text{F}_2\text{Cl(g)}$

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

समतापमंडल में ओजोन परतों के अवक्षय में जो अभिक्रिया नहीं सम्मिलित होती है, वह है :

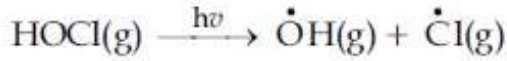
Options :

1.  $\text{HOCl(g)} \xrightarrow{h\nu} \dot{\text{O}}\text{H(g)} + \dot{\text{Cl}}\text{(g)}$
2.  $\text{Cl}\dot{\text{O}}\text{(g)} + \text{O(g)} \rightarrow \dot{\text{Cl}}\text{(g)} + \text{O}_2\text{(g)}$
3.  $\text{CH}_4 + 2 \text{O}_3 \rightarrow 3 \text{CH}_2 = \text{O} + 3 \text{H}_2\text{O}$
4.  $\text{CF}_2\text{Cl}_2\text{(g)} \xrightarrow{uv} \dot{\text{Cl}}\text{(g)} + \dot{\text{C}}\text{F}_2\text{Cl(g)}$

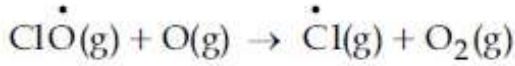
Correct Marks : 4 Wrong Marks : 1

नीचे आपेसी प्रक्रिया पैकी कर्ई अके सभताप वातावरणमां ओजोन स्तरनुं गाबुं पाडवा माटे जवाबदार नथी

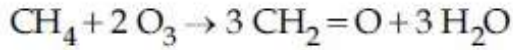
Options :



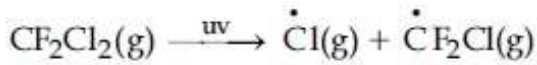
1.



2.



3.



4.

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

Correct Marks : 4 Wrong Marks : 1

The amount of sugar ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ ) required to prepare 2 L of its 0.1 M aqueous solution is :

Options :

1. 34.2 g

2. 68.4 g

3. 17.1 g

4. 136.8 g

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

Correct Marks : 4 Wrong Marks : 1

शर्करा के दो लीटर 0.1 M जलीय विलयन को बनाने के लिए शर्करा ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ ) की आवश्यक मात्रा है :

Options :

1. 34.2 g

2. 68.4 g

3. 17.1 g

4. 136.8 g

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

Correct Marks : 4 Wrong Marks : 1

શર્કરાનું ( $C_{12}H_{22}O_{11}$ ) 2 L, 0.1 M જલીય દ્રાવણ બનાવવા કેટલી માત્રા જરૂરી?

Options :

1. 34.2 g

2. 68.4 g

3. 17.1 g

4. 136.8 g

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

Correct Marks : 4 Wrong Marks : 1

A compound of formula  $A_2B_3$  has the hcp lattice. Which atom forms the hcp lattice and what fraction of tetrahedral voids is occupied by the other atoms :

Options :

1. hcp lattice - A,  $\frac{2}{3}$  Tetrahedral voids - B

2. hcp lattice - B,  $\frac{2}{3}$  Tetrahedral voids - A

3. hcp lattice - A,  $\frac{1}{3}$  Tetrahedral voids - B

4. hcp lattice - B,  $\frac{1}{3}$  Tetrahedral voids - 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

$A_2B_3$  સૂત્ર વાલે ઁક યૌગિક મેં hcp જાલક હૈ। કૌન સા પરમાણુ hcp જાલક બનાતા હૈ તથા ચતુષ્ફલકીય રિક્તિયૌં કા કૌન સા અંશ દૂસરે પરમાણુ દ્વારા અધ્યાસિત હોતા હૈ?

Options :

1. hcp જાલક - A,  $\frac{2}{3}$  ચતુષ્ફલકીય રિક્તિયૌં - B

2. hcp જાલક - B,  $\frac{2}{3}$  ચતુષ્ફલકીય રિક્તિયૌં - A

3. hcp જાલક - A,  $\frac{1}{3}$  ચતુષ્ફલકીય રિક્તિયૌં - B

4. hcp જાલક - B,  $\frac{1}{3}$  ચતુષ્ફલકીય રિક્તિયૌં - 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 સંયોજન જેનું સુત્ર  $A_2B_3$  છે તે hcp સ્ફટિક છે. કયો પરમાણુ hcp સ્ફટિક બનાવે છે અને ચતુષ્ફલકીય છિદ્રો નો કેટલામો ભાગ ખીજા પરમાણુ ના કબજા માં હશે તે શોધો?

Options :

1. hcp સ્ફટિક - A,  $\frac{2}{3}$  ચતુષ્ફલકીય છિદ્રો - B

2. hcp સ્ફટિક - B,  $\frac{2}{3}$  ચતુષ્ફલકીય છિદ્રો - A

3. hcp સ્ફટિક - A,  $\frac{1}{3}$  ચતુષ્ફલકીય છિદ્રો - B

4. hcp સફટિક - B,  $\frac{1}{3}$  ચતુષ્ફલકિય છિદ્રો - 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 ground state energy of hydrogen atom is  $-13.6$  eV. The energy of second excited state of  $\text{He}^+$  ion in eV is :

Options :

1.  $-54.4$
2.  $-27.2$
3.  $-3.4$
4.  $-6.04$

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

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन परमाणु की मूल अवस्था ऊर्जा  $-13.6$  eV है।  $\text{He}^+$  आयन की द्वितीय उत्तेजित अवस्था की ऊर्जा, eV में, है :

Options :

1.  $-54.4$
2.  $-27.2$
3.  $-3.4$
4.  $-6.04$

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

Correct Marks : 4 Wrong Marks : 1

હાઈડ્રોજન પરમાણુની ધરા અવસ્થામાં ઊર્જા  $-13.6$  eV છે.  $\text{He}^+$  આયનની દ્વિતીય ઉત્તેજિત અવસ્થાની ઊર્જા eV માં શોધો?

Options :

1.  $-54.4$

2. -27.2

3. -3.4

4. -6.04

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

An ideal gas undergoes isothermal compression from  $5 \text{ m}^3$  to  $1 \text{ m}^3$  against a constant external pressure of  $4 \text{ Nm}^{-2}$ . Heat released in this process is used to increase the temperature of 1 mole of Al. If molar heat capacity of Al is  $24 \text{ J mol}^{-1}\text{K}^{-1}$ , the temperature of Al increases by :

Options :

1. 1 K

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

3. 2 K

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

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

$4 \text{ Nm}^{-2}$  के स्थिर बाह्य दाब के विरुद्ध, एक आदर्श गैस का समतापी संपीड़न  $5 \text{ m}^3$  से  $1 \text{ m}^3$  तक किया जाता है। इस प्रक्रम में उत्सर्जित ऊष्मा का प्रयोग 1 मोल Al के ताप को बढ़ाने के लिए किया जाता है। यदि Al की मोलर ऊष्मा धारिता  $24 \text{ J mol}^{-1}\text{K}^{-1}$  है तो Al का ताप जितना बढ़ता है, वह है :

Options :

1. 1 K

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

3. 2 K

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

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

4 Nm<sup>-2</sup> ના અચળ બાહ્ય દબાણે, એક આદર્શ વાયુ 5 m<sup>3</sup> થી 1 m<sup>3</sup> સુધી સમતાપી સંકોચન પામે છે. આ પ્રક્રિયામાં ઊર્ત્સંજીત ઊષ્માનો ઊપયોગ 1 મોલ AI ને ગરમ કરવા માટે આવે છે. જો AI ની મોલર ઊષ્મા ક્ષમતા 24 J mol<sup>-1</sup>K<sup>-1</sup> હોય તો, AI નું તાપમાન કેટલું વધશે?

Options :

1. 1 K

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

3. 2 K

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

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

The process with negative entropy change is :

Options :

1. Sublimation of dry ice

2. Dissolution of iodine in water

3. Dissociation of CaSO<sub>4</sub>(s) to CaO(s) and SO<sub>3</sub>(g)

4. Synthesis of ammonia from N<sub>2</sub> and H<sub>2</sub>

Correct Marks : 4 Wrong Marks : 1

ऋणात्मक एन्ट्रॉपी परिवर्तन वाला प्रक्रम है :

Options :

1. शुष्क बर्फ का ऊर्ध्वपातन

2. आयोडीन का जल में विलयन

3.  $\text{CaSO}_4(\text{s})$  का  $\text{CaO}(\text{s})$  तथा  $\text{SO}_3(\text{g})$  में वियोजन

4.  $\text{N}_2$  तथा  $\text{H}_2$  से अमोनिया का संश्लेषण

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

પ્રક્રમ જેમાં એન્ટ્રોપી માં થતો ફેરફાર ઋણ છે તે :

Options :

1. શુષ્ક બરફનું ઉર્ધ્વપાતન

2. આયોડિન નું પાણીમાં વલયન

3.  $\text{CaSO}_4(\text{s})$  નું  $\text{CaO}(\text{s})$  અને  $\text{SO}_3(\text{g})$  માં વલયન.

4. અમોનલા નું  $\text{N}_2$  અને  $\text{H}_2$  માંથી સંશ્લેષણ

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

Elevation in the boiling point for 1 molal solution of glucose is 2 K. The depression in the freezing point for 2 molal solution of glucose in the same solvent is 2 K. The relation between  $K_b$  and  $K_f$  is :

Options :

1.  $K_b = 1.5 K_f$

2.  $K_b = 0.5 K_f$

3.  $K_b = K_f$

4.  $K_b = 2 K_f$

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

ग्लूकोस के 1 मोलल विलयन के क्वथनांक में उन्नयन  $2 K$  है। ग्लूकोस के उसी विलायक में 2 मोलल विलयन के हिमांक में अवनमन  $2 K$  है।  $K_b$  तथा  $K_f$  में संबंध है :

Options :

1.  $K_b = 1.5 K_f$

2.  $K_b = 0.5 K_f$

3.  $K_b = K_f$

4.  $K_b = 2 K_f$

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

1 मोलल ग्लूकोजના દ્રાવણ માટે તેના ઉત્કલન બિંદુમાં ધતો વધારો  $2 K$  છે. એ જે દ્રાવકમાં, 2 મોલલ ગ્લુકોઝના દ્રાવણ માટે તેના ઠારબિંદુ નું અવનયન  $2 K$  છે. તો  $K_b$  અને  $K_f$  વચ્ચેનો સંબંધ?

Options :

1.  $K_b = 1.5 K_f$

2.  $K_b = 0.5 K_f$

3.  $K_b = K_f$

4.  $K_b = 2 K_f$

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

5.1 g  $\text{NH}_4\text{SH}$  is introduced in 3.0 L evacuated flask at  $327^\circ\text{C}$ . 30% of the solid  $\text{NH}_4\text{SH}$  decomposed to  $\text{NH}_3$  and  $\text{H}_2\text{S}$  as gases. The  $K_p$  of the reaction at  $327^\circ\text{C}$  is ( $R = 0.082 \text{ L atm mol}^{-1}\text{K}^{-1}$ , Molar mass of  $\text{S} = 32 \text{ g mol}^{-1}$ , molar mass of  $\text{N} = 14 \text{ g mol}^{-1}$ )

Options :

1.  $1 \times 10^{-4} \text{ atm}^2$
2.  $4.9 \times 10^{-3} \text{ atm}^2$
3.  $0.242 \text{ atm}^2$
4.  $0.242 \times 10^{-4} \text{ atm}^2$

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

5.1 g  $\text{NH}_4\text{SH}$  को  $327^\circ\text{C}$  पर 3.0 L के एक रिक्त किये गये फ्लास्क में डाला जाता है। 30% ठोस  $\text{NH}_4\text{SH}$ ,  $\text{NH}_3$  तथा  $\text{H}_2\text{S}$  गैसों में अपघटित हो जाता है।  $327^\circ\text{C}$  पर इस अभिक्रिया का  $K_p$  है : ( $R = 0.082 \text{ L atm mol}^{-1}\text{K}^{-1}$ , मोलर द्रव्यमान  $\text{S} = 32 \text{ g mol}^{-1}$ , मोलर द्रव्यमान  $\text{N} = 14 \text{ g mol}^{-1}$ )

Options :

1.  $1 \times 10^{-4} \text{ atm}^2$
2.  $4.9 \times 10^{-3} \text{ atm}^2$
3.  $0.242 \text{ atm}^2$
4.  $0.242 \times 10^{-4} \text{ atm}^2$

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

5.1 g  $\text{NH}_4\text{SH}$  ने  $327^\circ\text{C}$  पर એક 3.0 L (નિર્વાતિત) ખાલી કરેલા ફ્લાસ્કમાં નાખવામાં આવે છે. 30% જેટલા ઘન  $\text{NH}_4\text{SH}$  નું  $\text{NH}_3$  અને  $\text{H}_2\text{S}$  વાયું સ્વરૂપે વિઘટન થાય છે. તો  $327^\circ\text{C}$  પર પ્રક્રિયાનો  $K_p$  શોધો? ( $R = 0.082 \text{ L atm mol}^{-1}\text{K}^{-1}$  મોલાર દળ  $\text{S} = 32 \text{ g mol}^{-1}$  મોલાર દળ  $\text{N} = 14 \text{ g mol}^{-1}$ )

Options :

1.  $1 \times 10^{-4} \text{ atm}^2$
2.  $4.9 \times 10^{-3} \text{ atm}^2$
3.  $0.242 \text{ atm}^2$
4.  $0.242 \times 10^{-4} \text{ atm}^2$

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

જ્યારે  $10^{-6}$  મોલલ HCl ના દ્રાવણનો ઉપયોગ કરવામાં આવે ત્યારે એક કોષ,

$\text{Pt(s)}|\text{H}_2(\text{g}, 1\text{bar})|\text{HCl}(\text{aq})|\text{AgCl}(\text{s})|\text{Ag}(\text{s})|\text{Pt}(\text{s})$   
માટે કોષ પોટેન્શિયલ  $0.92 \text{ V}$  છે. તો  $(\text{AgCl}/\text{Ag}, \text{Cl}^-)$  ઈલેક્ટ્રોડનો પ્રમાણિત ઈલેક્ટ્રોડ પોટેન્શિયલ શોધો?

$$\left\{ \text{આપેલ } \frac{2.303RT}{F} = 0.06 \text{ V, } 298 \text{ K એ} \right\}$$

Options :

1.  $0.40 \text{ V}$
2.  $0.76 \text{ V}$
3.  $0.20 \text{ V}$
4.  $0.94 \text{ V}$

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

निम्नलिखित सेल में

$\text{Pt}(\text{s})|\text{H}_2(\text{g}, 1\text{bar})|\text{HCl}(\text{aq})|\text{AgCl}(\text{s})|\text{Ag}(\text{s})|\text{Pt}(\text{s})$   
यदि  $10^{-6}$  molal HCl विलयन का उपयोग होता है तो सेल का विभव  $0.92 \text{ V}$  है।  $(\text{AgCl}/\text{Ag}, \text{Cl}^-)$  इलेक्ट्रोड का मानक इलेक्ट्रोड विभव है : दिया गया है,

$$\left\{ \text{दिया गया है, } \frac{2.303RT}{F} = 0.06 \text{ V, } 298 \text{ K पर} \right\}$$

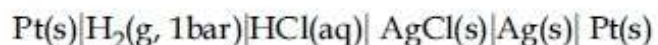
Options :

1. 0.40 V
2. 0.76 V
3. 0.20 V
4. 0.94 V

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

In the cell



the cell potential is 0.92 V when a  $10^{-6}$  molal HCl solution is used. The standard electrode potential of  $(\text{AgCl}/\text{Ag}, \text{Cl}^-)$  electrode is :

$$\left\{ \text{Given, } \frac{2.303RT}{F} = 0.06 \text{ V at } 298 \text{ K} \right\}$$

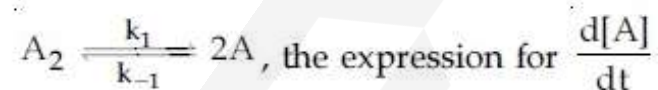
Options :

1. 0.40 V
2. 0.76 V
3. 0.20 V
4. 0.94 V

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

Correct Marks : 4 Wrong Marks : 1

For an elementary chemical reaction,



is :

Options :

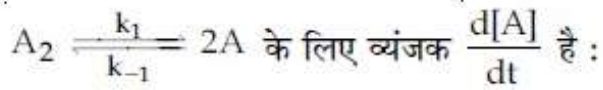
1.  $k_1[\text{A}_2] - k_{-1}[\text{A}]^2$
2.  $2k_1[\text{A}_2] - 2k_{-1}[\text{A}]^2$
3.  $2k_1[\text{A}_2] - k_{-1}[\text{A}]^2$

4.  $k_1[A_2] + k_{-1}[A]^2$

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

एक प्रारम्भिक रासायनिक अभिक्रिया



Options :

1.  $k_1[A_2] - k_{-1}[A]^2$

2.  $2k_1[A_2] - 2k_{-1}[A]^2$

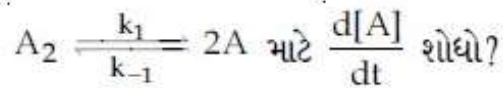
3.  $2k_1[A_2] - k_{-1}[A]^2$

4.  $k_1[A_2] + k_{-1}[A]^2$

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

आपेली प्राथमिक रासायनिक प्रक्रिया,



Options :

1.  $k_1[A_2] - k_{-1}[A]^2$

2.  $2k_1[A_2] - 2k_{-1}[A]^2$

3.  $2k_1[A_2] - k_{-1}[A]^2$

4.  $k_1[A_2] + k_{-1}[A]^2$

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

Haemoglobin and gold sol are examples of :

Options :

1. positively charged sols

2. negatively charged sols

positively and negatively charged  
sols, respectively

3.

negatively and positively charged  
sols, respectively

4.

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

हीमोग्लोबिन तथा गोल्ड सॉल उदाहरण हैं :

Options :

1. धनात्मक आवेशित सॉलों के

2. ऋणात्मक आवेशित सॉलों के

3. क्रमशः धनात्मक तथा ऋणात्मक आवेशित सॉलों के

4. क्रमशः ऋणात्मक तथा धनात्मक आवेशित सॉलों के

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

हिमोग्लोबिन અને સોનાના સોલ નીચેના માંથી કોના  
ઉદાહરણ છે ?

Options :

1. ધન ભારીત સોલ

2. ઋણ ભારીત સોલ

3. અનુક્રમે, ધન અને ઋણ ભારીત સોલ

4. અનુક્રમે, ઋણ અને ધન ભારીત સોલ

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:	416529183
Question Shuffling Allowed :	Yes

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

Correct Marks : 4 Wrong Marks : 1

Let  $N$  be the set of natural numbers and two functions  $f$  and  $g$  be defined as  $f, g : N \rightarrow N$  such that

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{if } n \text{ is odd} \\ \frac{n}{2} & \text{if } n \text{ is even} \end{cases}$$

and  $g(n) = n - (-1)^n$ . Then  $f \circ g$  is :

Options :

1. both one-one and onto.
2. one-one but not onto.
3. onto but not one-one.
4. neither one-one nor onto.

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

Correct Marks : 4 Wrong Marks : 1

माना समुच्चय  $N$  प्राकृत संख्याओं को दर्शाता है तथा दो फलन  $f$  और  $g$  निम्न तरीके से परिभाषित है :

$$f, g : N \rightarrow N$$

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{जब } n \text{ विषम है} \\ \frac{n}{2} & \text{जब } n \text{ सम है} \end{cases}$$

तथा  $g(n) = n - (-1)^n$ ; तो फलन  $f \circ g$

Options :

1. एकैकी तथा आच्छादी दोनों हैं।
2. एकैकी है परन्तु आच्छादी नहीं है।
3. आच्छादी है परन्तु एकैकी नहीं है।
4. न आच्छादी है और न ही एकैकी है।

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $N$  એ પ્રાકૃતિક સંખ્યાઓનો ગણ છે તથા બે વિધેયો  $f$  અને  $g$  એવી રીતે વ્યાખ્યાયિત કરેલ છે કે જેથી

$f, g : N \rightarrow N$  જ્યાં

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{જો } n \text{ અચુગ્મ હોય} \\ \frac{n}{2} & \text{જો } n \text{ યુગ્મ હોય} \end{cases}$$

તથા  $g(n) = n - (-1)^n$ . તો  $f \circ g$  એ \_\_\_\_\_.

Options :

1. એક-એક અને વ્યાપ્ત બંને છે.
2. એક-એક છે પણ વ્યાપ્ત નથી.
3. વ્યાપ્ત છે પણ એક-એક નથી.
4. એક-એક પણ નથી અને વ્યાપ્ત પણ નથી.

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

The value of  $\lambda$  such that sum of the squares of the roots of the quadratic equation,  $x^2 + (3 - \lambda)x + 2 = \lambda$  has the least value is :

Options :

1.  $\frac{4}{9}$
2. 2

3. 1

$\frac{15}{8}$

4.

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

$\lambda$  का वह मान जिसके लिए द्विघात समीकरण  $x^2 + (3 - \lambda)x + 2 = \lambda$  के मूलों के वर्गों के योग का मान न्यूनतम है, है :

Options :

$\frac{4}{9}$

1.

2

2.

1

3.

$\frac{15}{8}$

4.

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

द्विघात समीकरण  $x^2 + (3 - \lambda)x + 2 = \lambda$  निम्नलिखित  
ना वर्गों-नो सरवाणो न्यूनतम थाय तेवी  $\lambda$  नी किमत  
\_\_\_\_\_ छे.

Options :

$\frac{4}{9}$

1.

2

2.

1

3.

$\frac{15}{8}$

4.

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

Let  $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$ . If  $R(z)$

and  $I(z)$  respectively denote the real and imaginary parts of  $z$ , then :

Options :

1.  $R(z) > 0$  and  $I(z) > 0$
2.  $R(z) < 0$  and  $I(z) > 0$
3.  $R(z) = -3$
4.  $I(z) = 0$

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

Correct Marks : 4 Wrong Marks : 1

माना  $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$  है।

यदि  $R(z)$  तथा  $I(z)$  क्रमशः  $z$  के वास्तविक तथा काल्पनिक भागों को दर्शाता है, तो :

Options :

1.  $R(z) > 0$  तथा  $I(z) > 0$
2.  $R(z) < 0$  तथा  $I(z) > 0$
3.  $R(z) = -3$
4.  $I(z) = 0$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$  છે.

જો  $R(z)$  અને  $I(z)$  અનુક્રમે  $z$  ના વાસ્તવિક ભાગ અને કાલ્પનિક ભાગ હોય, તો

Options :

1.  $R(z) > 0$  અને  $I(z) > 0$

2.  $R(z) < 0$  અને  $I(z) > 0$

3.  $R(z) = -3$

4.  $I(z) = 0$

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

માના  $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2 + 1 & b \\ 1 & b & 2 \end{bmatrix}$  જ્યાં  $b > 0$  છે. તો

$\frac{\det(A)}{b}$  નો ન્યૂનતમ મૂલ્ય છે :

Options :

1.  $-2\sqrt{3}$

2.  $-\sqrt{3}$

3.  $\sqrt{3}$

4.  $2\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

જો  $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2 + 1 & b \\ 1 & b & 2 \end{bmatrix}$  જ્યાં  $b > 0$  હોય, તો

$\frac{\det(A)}{b}$  નો ન્યૂનતમ મૂલ્ય \_\_\_\_\_ છે.

Options :

1.  $-2\sqrt{3}$

2.  $-\sqrt{3}$

3.  $\sqrt{3}$

4.  $2\sqrt{3}$

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

Correct Marks : 4 Wrong Marks : 1

Let  $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2 + 1 & b \\ 1 & b & 2 \end{bmatrix}$  where  $b > 0$ . Then

the minimum value of  $\frac{\det(A)}{b}$  is :

Options :

1.  $-2\sqrt{3}$

2.  $-\sqrt{3}$

3.  $\sqrt{3}$

4.  $2\sqrt{3}$

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

The number of values of  $\theta \in (0, \pi)$  for which the system of linear equations

$$x + 3y + 7z = 0$$

$$-x + 4y + 7z = 0$$

$$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$$

has a non-trivial solution, is :

Options :

1. four

2. three

3. two

4. one

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

$\theta \in (0, \pi)$  के ऐसे मानों की संख्या, जिनके लिए निम्न

रैखिक समीकरण निकाय

$$x + 3y + 7z = 0$$

$$-x + 4y + 7z = 0$$

$$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$$

का एक अतुच्छ हल है, है :

Options :

1. चार
2. तीन
3. दो
4. एक

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

Correct Marks : 4 Wrong Marks : 1

सुरेभ समीकरण संघति

$$x + 3y + 7z = 0$$

$$-x + 4y + 7z = 0$$

$$(\sin 3\theta)x + (\cos 2\theta)y + 2z = 0$$

ने योग्य विकलो (non-trivial solution) होय तेवी

$\theta \in (0, \pi)$  नी किंमतोनी संख्या \_\_\_\_\_ छे.

Options :

1. चार
2. त्रण
3. दो
4. अेक

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

$$\text{If } \sum_{r=0}^{25} \left\{ {}^{50}C_r \cdot {}^{50-r}C_{25-r} \right\} = K \left( {}^{50}C_{25} \right),$$

then K is equal to :

Options :

1.  $(25)^2$
2.  $2^{24}$
3.  $2^{25} - 1$
4.  $2^{25}$

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

$$\text{यदि } \sum_{r=0}^{25} \left\{ {}^{50}C_r \cdot {}^{50-r}C_{25-r} \right\} = K \left( {}^{50}C_{25} \right)$$

है, तो K बराबर है :

Options :

1.  $(25)^2$
2.  $2^{24}$
3.  $2^{25} - 1$
4.  $2^{25}$

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

$$\text{यदि } \sum_{r=0}^{25} \left\{ {}^{50}C_r \cdot {}^{50-r}C_{25-r} \right\} = K \left( {}^{50}C_{25} \right)$$

है, तो K = \_\_\_\_\_.

Options :

1.  $(25)^2$
2.  $2^{24}$
3.  $2^{25} - 1$
4.  $2^{25}$

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 positive value of  $\lambda$  for which the co-efficient of  $x^2$  in the expression

$$x^2 \left( \sqrt{x} + \frac{\lambda}{x^2} \right)^{10} \text{ is } 720, \text{ is :}$$

Options :

1.  $\sqrt{5}$
2.  $2\sqrt{2}$
3. 3
4. 4

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

$\lambda$  का वह धनात्मक मान जिसके लिए व्यंजक

$$x^2 \left( \sqrt{x} + \frac{\lambda}{x^2} \right)^{10} \text{ में } x^2 \text{ का गुणांक } 720 \text{ है, है :}$$

Options :

1.  $\sqrt{5}$
2.  $2\sqrt{2}$
3. 3
4. 4

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

$$x^2 \left( \sqrt{x} + \frac{\lambda}{x^2} \right)^{10} \text{ ના વિસ્તરણમાં } x^2 \text{ નો સહગુણક}$$

720 હોય, તો  $\lambda$  ની ધન કિંમત \_\_\_\_\_ છે.

Options :

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

3. 3

4. 4

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

Correct Marks : 4 Wrong Marks : 1

Let  $a_1, a_2, a_3, \dots, a_{10}$  be in G.P. with  $a_i > 0$  for  $i=1, 2, \dots, 10$  and  $S$  be the set of pairs  $(r, k)$ ,  $r, k \in \mathbb{N}$  (the set of natural numbers) for which

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

Then the number of elements in  $S$ , is :

Options :

1. 2
2. 4
3. 10
4. infinitely many

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  $a_1, a_2, a_3, \dots, a_{10}$  गुणोत्तर श्रेणी में हैं तथा  $i=1, 2, \dots, 10$  के लिए  $a_i > 0$  है और  $S$ , ऐसे युग्मों  $(r, k)$ ,  $r, k \in \mathbb{N}$  (प्राकृत संख्याओं का समुच्चय) का समुच्चय है जिनके लिए

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

तो  $S$  के अवयवों की संख्या है :

Options :

1. 2
2. 4

3. 10

4. अनन्त

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $a_1, a_2, a_3, \dots, a_{10}$  એ સમગુણોત્તર શ્રેણીમાં છે જ્યાં  $a_i > 0, i = 1, 2, \dots, 10$  અને  $S$  એ એવી ક્રમચક્રિત જોડો  $(r, k), r, k \in \mathbb{N}$  (પ્રાકૃતિક સંખ્યાઓનો ગણ) નો ગણ છે કે જેથી

$$\begin{vmatrix} \log_e a_1^r a_2^k & \log_e a_2^r a_3^k & \log_e a_3^r a_4^k \\ \log_e a_4^r a_5^k & \log_e a_5^r a_6^k & \log_e a_6^r a_7^k \\ \log_e a_7^r a_8^k & \log_e a_8^r a_9^k & \log_e a_9^r a_{10}^k \end{vmatrix} = 0$$

થાય. તો  $S$  માં સભ્યોની સંખ્યા \_\_\_\_\_ છે.

Options :

1. 2

2. 4

3. 10

4. અનંત

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

$$\cot \left( \sum_{n=1}^{19} \cot^{-1} \left( 1 + \sum_{p=1}^n 2p \right) \right) \text{ का मान है :}$$

Options :

1.  $\frac{22}{23}$

2.  $\frac{23}{22}$

3.  $\frac{21}{19}$

4.  $\frac{19}{21}$

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

$$\cot \left( \sum_{n=1}^{19} \cot^{-1} \left( 1 + \sum_{p=1}^n 2p \right) \right) \text{ ની કિંમત}$$

\_\_\_\_\_ છે.

Options :

1.  $\frac{22}{23}$

2.  $\frac{23}{22}$

3.  $\frac{21}{19}$

4.  $\frac{19}{21}$

Question Number : 69 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The value of  $\cot \left( \sum_{n=1}^{19} \cot^{-1} \left( 1 + \sum_{p=1}^n 2p \right) \right)$

is :

Options :

1.  $\frac{22}{23}$

2.  $\frac{23}{22}$

3.  $\frac{21}{19}$

4.  $\frac{19}{21}$

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  $f$  be a differentiable function such that

$$f'(x) = 7 - \frac{3}{4} \frac{f(x)}{x}, (x > 0) \quad \text{and}$$

$$f(1) \neq 4. \text{ Then } \lim_{x \rightarrow 0^+} x f\left(\frac{1}{x}\right):$$

Options :

1. does not exist.
2. exists and equals 4.
3. exists and equals  $\frac{4}{7}$ .
4. exists and equals 0.

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  $f$  एक ऐसा अवकलनीय फलन है कि

$$f'(x) = 7 - \frac{3}{4} \frac{f(x)}{x}, (x > 0) \quad \text{तथा}$$

$$f(1) \neq 4 \text{ है। तो } \lim_{x \rightarrow 0^+} x f\left(\frac{1}{x}\right)$$

Options :

1. का अस्तित्व नहीं है ।
2. का अस्तित्व है तथा 4 के समान है।
3. का अस्तित्व है तथा  $\frac{4}{7}$  के समान है।
4. का अस्तित्व है तथा 0 के समान है।

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  $f$  એ એવું વિકલનીય વિધેય છે કે જેથી

$$f'(x) = 7 - \frac{3}{4} \frac{f(x)}{x}, (x > 0) \text{ અને}$$

$$f(1) \neq 4 \text{ થાય. તો } \lim_{x \rightarrow 0^+} x f\left(\frac{1}{x}\right) \text{ નું}$$

Options :

1. અસ્તિત્વ નથી.
2. અસ્તિત્વ છે અને તે 4 છે.
3. અસ્તિત્વ છે અને તે  $\frac{4}{7}$  છે.
4. અસ્તિત્વ છે અને તે 0 છે.

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

Correct Marks : 4 Wrong Marks : 1

Let  $f: (-1, 1) \rightarrow \mathbb{R}$  be a function defined by

$$f(x) = \max \left\{ -|x|, -\sqrt{1-x^2} \right\}. \text{ If } K \text{ be}$$

the set of all points at which  $f$  is not differentiable, then  $K$  has exactly :

Options :

1. one element
2. two elements
3. three elements
4. five elements

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

માના  $f: (-1, 1) \rightarrow \mathbb{R}$  એક ફલન છે જો

$$f(x) = \max \left\{ -|x|, -\sqrt{1-x^2} \right\} \text{ દ્વારા}$$

પરિભાષિત છે. યદિ  $K$  એક સમૂહ બિંદુઓનો છે જેમાં  $f$  અવકલનીય નથી, તો  $K$  માં માત્ર (exactly) :

Options :

1. एक अवयव है।
2. दो अवयव हैं।
3. तीन अवयव हैं।
4. पाँच अवयव हैं।

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

ધારો કે  $f: (-1, 1) \rightarrow \mathbb{R}$  એ

$$f(x) = \max \left\{ -|x|, -\sqrt{1-x^2} \right\} \quad \text{દ્વારા}$$

વ્યાખ્યાયિત વિધેય છે. જો  $K$  એ એવા તમામ બિંદુઓનો ગણ છે કે જ્યાં  $f$  વિકલનીય ન હોય તો  $K$  માં બરાબર

Options :

1. એક જ સભ્ય છે.
2. બે જ સભ્યો છે.
3. ત્રણ જ સભ્યો છે.
4. પાંચ જ સભ્યો છે.

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

Correct Marks : 4 Wrong Marks : 1

The tangent to the curve,  $y = xe^{x^2}$  passing through the point  $(1, e)$  also passes through the point :

Options :

1.  $(2, 3e)$
2.  $(3, 6e)$
3.  $\left(\frac{4}{3}, 2e\right)$

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

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

वक्र  $y = xe^{x^2}$  की वह स्पर्श रेखा जो बिंदु  $(1, e)$  से होकर जाती है, निम्न में से किस बिंदु से भी होकर जाती है?

Options :

1.  $(2, 3e)$

2.  $(3, 6e)$

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

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

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

Correct Marks : 4 Wrong Marks : 1

વક્ર  $y = xe^{x^2}$  નો, બિંદુ  $(1, e)$  માંથી પસાર થતો સ્પર્શક એ બિંદુ \_\_\_\_\_ માંથી પણ પસાર થાય છે.

Options :

1.  $(2, 3e)$

2.  $(3, 6e)$

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

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

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

Correct Marks : 4 Wrong Marks : 1

A helicopter is flying along the curve given

by  $y - x^{3/2} = 7, (x \geq 0)$ . A soldier

positioned at the point  $\left(\frac{1}{2}, 7\right)$  wants to

shoot down the helicopter when it is nearest to him. Then this nearest distance is :

Options :

1.  $\frac{\sqrt{5}}{6}$
2.  $\frac{1}{2}$
3.  $\frac{1}{3}\sqrt{\frac{7}{3}}$
4.  $\frac{1}{6}\sqrt{\frac{7}{3}}$

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

Correct Marks : 4 Wrong Marks : 1

एक हेलीकॉप्टर वक्र  $y - x^{3/2} = 7, (x \geq 0)$  के

अनुदिश उड़ रहा है। एक सैनिक बिंदु  $\left(\frac{1}{2}, 7\right)$  पर है

तथा हेलीकॉप्टर को उस समय गोली मार कर गिराना चाहता है जब यह उसके निकटतम है। तो यह निकटतम दूरी है :

Options :

1.  $\frac{\sqrt{5}}{6}$
2.  $\frac{1}{2}$
3.  $\frac{1}{3}\sqrt{\frac{7}{3}}$

4.  $\frac{1}{6}\sqrt{\frac{7}{3}}$

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

એક હેલિકોપ્ટર વક્ર  $y - x^{3/2} = 7, (x \geq 0)$  પર

ઉડે છે. બિન્દુ  $(\frac{1}{2}, 7)$  આગળ ઉભેલો એક સૈનિક,

જ્યારે હેલિકોપ્ટર તેનાથી લઘુત્તમ અંતરે હોય ત્યારે તેને તોડી પાડવા ઇચ્છે છે. તો આ લઘુત્તમ અંતર \_\_\_\_\_ છે.

Options :

1.  $\frac{\sqrt{5}}{6}$

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

3.  $\frac{1}{3}\sqrt{\frac{7}{3}}$

4.  $\frac{1}{6}\sqrt{\frac{7}{3}}$

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

If  $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C,$

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

Options :

1.  $-2x^3 - 1$

2.  $-4x^3 - 1$

3.  $4x^3 + 1$

4.  $-2x^3 + 1$

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

Correct Marks : 4 Wrong Marks : 1

यदि  $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C$  है,

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

Options :

1.  $-2x^3 - 1$
2.  $-4x^3 - 1$
3.  $4x^3 + 1$
4.  $-2x^3 + 1$

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

Correct Marks : 4 Wrong Marks : 1

જો  $\int x^5 e^{-4x^3} dx = \frac{1}{48} e^{-4x^3} f(x) + C$ , જ્યાં

C એ સંકલનનો અચળાંક છે, તો  $f(x) = \underline{\hspace{2cm}}$ .

Options :

1.  $-2x^3 - 1$
2.  $-4x^3 - 1$
3.  $4x^3 + 1$
4.  $-2x^3 + 1$

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

Correct Marks : 4 Wrong Marks : 1

The value of  $\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4}$ , where

$[t]$  denotes the greatest integer less than or equal to  $t$ , is :

Options :

1.  $\frac{3}{20} (4\pi - 3)$

2.  $\frac{3}{10} (4\pi - 3)$

3.  $\frac{1}{12} (7\pi + 5)$

4.  $\frac{1}{12} (7\pi - 5)$

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

Correct Marks : 4 Wrong Marks : 1

$$\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4}$$
 का मान, जहाँ  $[t]$  वह

महत्तम पूर्णांक है जो  $t$  से कम या उसके बराबर है, है :

Options :

1.  $\frac{3}{20} (4\pi - 3)$

2.  $\frac{3}{10} (4\pi - 3)$

3.  $\frac{1}{12} (7\pi + 5)$

4.  $\frac{1}{12} (7\pi - 5)$

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

Correct Marks : 4 Wrong Marks : 1

$$\int_{-\pi/2}^{\pi/2} \frac{dx}{[x] + [\sin x] + 4} \text{ ની કિંમત } \dots \text{ છે,}$$

જ્યાં  $[t]$  એ  $t$  થી નાના અથવા  $t$  ને સમાન તમામ પૂર્ણાંકોમાં મોટામાં મોટો પૂર્ણાંક દર્શાવે છે.

Options :

1.  $\frac{3}{20} (4\pi - 3)$

2.  $\frac{3}{10} (4\pi - 3)$

3.  $\frac{1}{12} (7\pi + 5)$

4.  $\frac{1}{12} (7\pi - 5)$

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

$$\text{If } \int_0^x f(t) dt = x^2 + \int_x^1 t^2 f(t) dt, \text{ then}$$

$f'(1/2)$  is :

Options :

1.  $\frac{18}{25}$

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

3.  $\frac{24}{25}$

4.  $\frac{6}{25}$

Correct Marks : 4 Wrong Marks : 1

यदि  $\int_0^x f(t) dt = x^2 + \int_x^1 t^2 f(t) dt$  है, तो

$f'(1/2)$  है :

Options :

1.  $\frac{18}{25}$

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

3.  $\frac{24}{25}$

4.  $\frac{6}{25}$

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  $\int_0^x f(t) dt = x^2 + \int_x^1 t^2 f(t) dt$ , तो

$f'(1/2) =$  \_\_\_\_\_

Options :

1.  $\frac{18}{25}$

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

3.  $\frac{24}{25}$

4.  $\frac{6}{25}$

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

Correct Marks : 4 Wrong Marks : 1

The curve amongst the family of curves represented by the differential equation,  $(x^2 - y^2)dx + 2xy dy = 0$  which passes through  $(1, 1)$ , is :

Options :

1. a circle with centre on the  $x$ -axis.
2. a circle with centre on the  $y$ -axis.
3. an ellipse with major axis along the  $y$ -axis.
4. a hyperbola with transverse axis along the  $x$ -axis.

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  $(x^2 - y^2)dx + 2xy dy = 0$  द्वारा निरूपित वक्रों के कुल (family) का वह वक्र जो  $(1, 1)$  से होकर जाता है, है :

Options :

1. एक वृत्त जिसका केंद्र  $x$ -अक्ष पर है।
2. एक वृत्त जिसका केंद्र  $y$ -अक्ष पर है।
3. एक दीर्घवृत्त जिसका दीर्घ अक्ष  $y$ -अक्ष की दिशा में है।
4. एक अतिपरवलय जिसका अनुप्रस्थ-अक्ष  $x$ -अक्ष की दिशा में है।

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

विकल समीकरण  $(x^2 - y^2)dx + 2xy dy = 0$  द्वारा दर्शावाती वक्रों की संलतिमानों,  $(1, 1)$  मांथी पसार थत्तो वक्र अे \_\_\_\_\_.

Options :

1.  $x$ -अक्ष पर केन्द्र छीय तेषुं वर्तुण छे.

2.  $y$ -અક્ષ પર કેન્દ્ર હોય તેવું વર્તુળ છે.
3. પ્રધાન અક્ષ  $y$ -અક્ષ હોય તેવો ઉપવલય છે.
4. મુખ્ય અક્ષ  $x$ - અક્ષ હોય તેવો અતિવલય છે.

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

Two vertices of a triangle are  $(0, 2)$  and  $(4, 3)$ . If its orthocentre is at the origin, then its third vertex lies in which quadrant ?

Options :

1. first
2. second
3. third
4. fourth

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

एक त्रिभुज के दो शीर्ष  $(0, 2)$  तथा  $(4, 3)$  हैं। यदि इसका लंबकेन्द्र मूलबिंदु पर है, तो इसका तीसरा शीर्ष किस चतुर्थांश में है ?

Options :

1. प्रथम
2. दूसरा
3. तीसरा
4. चौथा

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

એક ત્રિકોણના બે શિરોબિંદુઓ  $(0, 2)$  અને  $(4, 3)$  છે. જો તેનું લંબકેન્દ્ર, ઊગમબિંદુ પર હોય, તો તેનું ત્રીજું શિરોબિંદુ કયા ચરણમાં આવેલ છે ?

Options :

1. प्रथम
2. द्वितीय
3. तृतीय
4. चतुर्थ

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

Two sides of a parallelogram are along the lines,  $x + y = 3$  and  $x - y + 3 = 0$ . If its diagonals intersect at  $(2, 4)$ , then one of its vertex is :

Options :

1.  $(2, 6)$
2.  $(2, 1)$
3.  $(3, 6)$
4.  $(3, 5)$

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

एक समांतर चतुर्भुज की दो भुजाएँ, रेखाओं  $x + y = 3$  तथा  $x - y + 3 = 0$  के अनुदिश हैं। यदि इसके विकर्ण  $(2, 4)$  पर प्रतिच्छेद करते हैं, तो इसका एक शीर्ष है :

Options :

1.  $(2, 6)$
2.  $(2, 1)$
3.  $(3, 6)$
4.  $(3, 5)$

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

એક સમાંતરબાજુ ચતુષ્કોણની બે બાજુઓ, રેખાઓ  $x+y=3$  અને  $x-y+3=0$  પર છે. જો તેના વિકર્ણો  $(2, 4)$  બિંદુએ છેદે તો તેનું કોઈ એક શિરોબિંદુ \_\_\_\_\_ છે.

Options :

1.  $(2, 6)$
2.  $(2, 1)$
3.  $(3, 6)$
4.  $(3, 5)$

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 area of an equilateral triangle inscribed in the circle,  $x^2+y^2+10x+12y+c=0$  is  $27\sqrt{3}$  sq. units then c is equal to :

Options :

1. 13
2. 20
3. 25
4. -25

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

एक वृत्त  $x^2+y^2+10x+12y+c=0$  के अंतर्गत एक समबाहु त्रिभुज का क्षेत्रफल  $27\sqrt{3}$  वर्ग इकाई है, तो c बराबर है :

Options :

1. 13
2. 20
3. 25

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 વર્તુળ  $x^2 + y^2 + 10x + 12y + c = 0$  માં અંતર્ગત એક સમબાજુ ત્રિકોણનું ક્ષેત્રફળ  $27\sqrt{3}$  થો. એકમ હોય, તો  $c =$  \_\_\_\_\_.

Options :

1. 13
2. 20
3. 25
4. -25

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

$$S = \left\{ (x, y) \in \mathbb{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1 \right\},$$

where  $r \neq \pm 1$ . Then S represents :

Options :

an ellipse whose eccentricity is

1.  $\sqrt{\frac{2}{r+1}}$ , when  $r > 1$ .

an ellipse whose eccentricity is

2.  $\frac{1}{\sqrt{r+1}}$ , when  $r > 1$ .

a hyperbola whose eccentricity is

3.  $\frac{2}{\sqrt{r+1}}$ , when  $0 < r < 1$ .

a hyperbola whose eccentricity is

4.  $\frac{2}{\sqrt{1-r}}$ , when  $0 < r < 1$ .

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

$$S = \left\{ (x, y) \in \mathbb{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1 \right\},$$

जहाँ  $r \neq \pm 1$  है, तो S जिसे निरूपित करता है, वह है :

Options :

एक दीर्घवृत्त जिसकी उत्केन्द्रता  $\sqrt{\frac{2}{r+1}}$  है,

जबकि  $r > 1$  है।

1.

एक दीर्घवृत्त जिसकी उत्केन्द्रता  $\frac{1}{\sqrt{r+1}}$  है,

जबकि  $r > 1$  है।

2.

एक अतिपरवलय जिसकी उत्केन्द्रता  $\frac{2}{\sqrt{r+1}}$

है, जबकि  $0 < r < 1$  है।

3.

एक अतिपरवलय जिसकी उत्केन्द्रता  $\frac{2}{\sqrt{1-r}}$

है, जबकि  $0 < r < 1$  है।

4.

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

$$\text{એ } S = \left\{ (x, y) \in \mathbb{R}^2 : \frac{y^2}{1+r} - \frac{x^2}{1-r} = 1 \right\} \text{ જ્યાં}$$

$r \neq \pm 1$ , તો S એ \_\_\_\_\_ દર્શાવે છે.

Options :

જેની ઉત્કેન્દ્રતા  $\sqrt{\frac{2}{r+1}}$ , જ્યારે  $r > 1$ , હોય

1. તેવો ઉપવલય

જેની ઉત્કેન્દ્રતા  $\frac{1}{\sqrt{r+1}}$ , જ્યારે  $r > 1$ , હોય

2. તેવો ઉપવલય

જેની ઉત્કેન્દ્રતા  $\frac{2}{\sqrt{r+1}}$ , જ્યારે  $0 < r < 1$ ,

3. હોય તેવો અતિવલય

જેની ઉત્કેન્દ્રતા  $\frac{2}{\sqrt{1-r}}$ , જ્યારે  $0 < r < 1$ ,

4. હોય તેવો અતિવલય

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

The length of the chord of the parabola

$x^2 = 4y$  having equation

$x - \sqrt{2}y + 4\sqrt{2} = 0$  is :

Options :

1.  $3\sqrt{2}$

2.  $2\sqrt{11}$

3.  $6\sqrt{3}$

4.  $8\sqrt{2}$

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

Correct Marks : 4 Wrong Marks : 1

પરવલય  $x^2 = 4y$  કોી ઉસ જીવા, જિસકા સમીકરણ

$x - \sqrt{2}y + 4\sqrt{2} = 0$  હૈ, કોી લંબાઈ હૈ :

Options :

1.  $3\sqrt{2}$

2.  $2\sqrt{11}$

3.  $6\sqrt{3}$

4.  $8\sqrt{2}$ 

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

Correct Marks : 4 Wrong Marks : 1

જેનું સમીકરણ  $x - \sqrt{2}y + 4\sqrt{2} = 0$  હોય તેવી,  
પરવલય  $x^2 = 4y$  ની જીવાની લંબાઈ \_\_\_\_\_ છે.

Options :

1.  $3\sqrt{2}$ 2.  $2\sqrt{11}$ 3.  $6\sqrt{3}$ 4.  $8\sqrt{2}$ 

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

Correct Marks : 4 Wrong Marks : 1

The plane which bisects the line segment joining the points  $(-3, -3, 4)$  and  $(3, 7, 6)$  at right angles, passes through which one of the following points ?

Options :

1.  $(4, -1, 7)$ 2.  $(4, 1, -2)$ 3.  $(2, 1, 3)$ 4.  $(-2, 3, 5)$ 

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

वह समतल जो बिंदुओं  $(-3, -3, 4)$  तथा  $(3, 7, 6)$  को मिलाने वाले रेखाखण्ड का लंबसमद्विभाजन करता है, निम्न में से किस एक बिंदु से हो कर जाता है ?

Options :

1.  $(4, -1, 7)$

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

3.  $(2, 1, 3)$

4.  $(-2, 3, 5)$

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

બિંદુઓ  $(-3, -3, 4)$  અને  $(3, 7, 6)$  ને જોડતા રેખાખંડનું લંબદ્વિભાજક સમતલ, નીચેના પૈકી કયું બિંદુ સમાવે છે?

Options :

1.  $(4, -1, 7)$

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

3.  $(2, 1, 3)$

4.  $(-2, 3, 5)$

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

On which of the following lines lies the point of intersection of the line,

$$\frac{x-4}{2} = \frac{y-5}{2} = \frac{z-3}{1}$$

$$x+y+z=2?$$

Options :

1.  $\frac{x-1}{1} = \frac{y-3}{2} = \frac{z+4}{-5}$

2.  $\frac{x-4}{1} = \frac{y-5}{1} = \frac{z-5}{-1}$

3.  $\frac{x-2}{2} = \frac{y-3}{2} = \frac{z+3}{3}$

4.  $\frac{x+3}{3} = \frac{4-y}{3} = \frac{z+1}{-2}$

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

रेखा  $\frac{x-4}{2} = \frac{y-5}{2} = \frac{z-3}{1}$  तथा समतल

$x+y+z=2$  का प्रतिच्छेदन बिंदु निम्न में से किस रेखा पर स्थित है?

Options :

1.  $\frac{x-1}{1} = \frac{y-3}{2} = \frac{z+4}{-5}$

2.  $\frac{x-4}{1} = \frac{y-5}{1} = \frac{z-5}{-1}$

3.  $\frac{x-2}{2} = \frac{y-3}{2} = \frac{z+3}{3}$

4.  $\frac{x+3}{3} = \frac{4-y}{3} = \frac{z+1}{-2}$

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

रेखा  $\frac{x-4}{2} = \frac{y-5}{2} = \frac{z-3}{1}$  અને સમતલ

$x+y+z=2$  નું છેદબિંદુ, નીચેનામાંથી કઈ રેખા પર આવેલું છે?

Options :

1.  $\frac{x-1}{1} = \frac{y-3}{2} = \frac{z+4}{-5}$

2.  $\frac{x-4}{1} = \frac{y-5}{1} = \frac{z-5}{-1}$

3.  $\frac{x-2}{2} = \frac{y-3}{2} = \frac{z+3}{3}$

4.  $\frac{x+3}{3} = \frac{4-y}{3} = \frac{z+1}{-2}$

Correct Marks : 4 Wrong Marks : 1

Let  $\vec{\alpha} = (\lambda - 2) \vec{a} + \vec{b}$  and

$\vec{\beta} = (4\lambda - 2) \vec{a} + 3\vec{b}$  be two given

vectors where vectors  $\vec{a}$  and  $\vec{b}$  are non-collinear. The value of  $\lambda$  for which

vectors  $\vec{\alpha}$  and  $\vec{\beta}$  are collinear, is :

Options :

1. -3
2. 3
3. 4
4. -4

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

Correct Marks : 4 Wrong Marks : 1

यदि  $\vec{\alpha} = (\lambda - 2) \vec{a} + \vec{b}$  तथा

$\vec{\beta} = (4\lambda - 2) \vec{a} + 3\vec{b}$  दो दिए गए सदिश

हैं, जहाँ सदिश  $\vec{a}$  तथा  $\vec{b}$  संरेख नहीं हैं।  $\lambda$  का वह

मान जिसके लिए  $\vec{\alpha}$  तथा  $\vec{\beta}$  संरेख हैं, है :

Options :

1. -3
2. 3
3. 4
4. -4

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે  $\vec{\alpha} = (\lambda - 2) \vec{a} + \vec{b}$  અને

$\vec{\beta} = (4\lambda - 2) \vec{a} + 3 \vec{b}$  એ બે આપેલ સદિશો છે

જ્યાં  $\vec{a}$  અને  $\vec{b}$  એ સમરેખ સદિશો નથી. તો સદિશો

$\vec{\alpha}$  અને  $\vec{\beta}$  સમરેખ થાય તે માટે  $\lambda$  ની કિંમત \_\_\_\_\_ છે.

Options :

1. -3
2. 3
3. 4
4. -4

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

Correct Marks : 4 Wrong Marks : 1

If mean and standard deviation of 5 observations  $x_1, x_2, x_3, x_4, x_5$  are 10 and 3, respectively, then the variance of 6 observations  $x_1, x_2, \dots, x_5$  and  $-50$  is equal to :

Options :

1. 507.5
2. 582.5
3. 509.5
4. 586.5

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 पाँच प्रेक्षणों  $x_1, x_2, x_3, x_4, x_5$  का माध्य तथा मानक विचलन क्रमशः 10 तथा 3 है, तो 6 प्रेक्षणों  $x_1, x_2, \dots, x_5$  तथा  $-50$  का प्रसरण है :

Options :

1. 507.5

2. 582.5

3. 509.5

4. 586.5

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

Correct Marks : 4 Wrong Marks : 1

જો 5 અવલોકનો  $x_1, x_2, x_3, x_4, x_5$  નો મધ્યક અને પ્રમાણિત વિચલન અનુક્રમે 10 અને 3 હોય, તો 6 અવલોકનો  $x_1, x_2, \dots, x_5$  અને  $-50$  નું વિચરણ \_\_\_\_\_ છે.

Options :

1. 507.5

2. 582.5

3. 509.5

4. 586.5

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

Correct Marks : 4 Wrong Marks : 1

If the probability of hitting a target by a shooter, in any shot, is  $\frac{1}{3}$ , then the minimum number of independent shots at the target required by him so that the probability of hitting the target at least once is greater than  $\frac{5}{6}$ , is :

Options :

1. 3

2. 4

3. 5

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

Correct Marks : 4 Wrong Marks : 1

एक गोली चलाने वाले द्वारा एक लक्ष्य को किसी प्रयास में भेदने की प्रायिकता  $\frac{1}{3}$  है, तो लक्ष्य को कम से कम बार भेदने की प्रायिकता  $\frac{5}{6}$  से अधिक होने के लिए उसे लक्ष्य भेदने के कम से कम कितने स्वतंत्र प्रयासों की आवश्यकता है?

Options :

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

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

धारो के अेक निशानभाज कोठपण प्रयत्नमां निशान वेधी शके तेनी संभावना  $\frac{1}{3}$  छे. निशानभाज ओछामां ओछुं अेक वार निशान वेधी शके तेनी संभावना  $\frac{5}{6}$  थी वधु थाय ते माटे तेणे निशान ताकवाना ओछामां ओछा केटला प्रयत्न करवा पडे?

Options :

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

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

The value of

$$\cos \frac{\pi}{2^2} \cdot \cos \frac{\pi}{2^3} \cdot \dots \cdot \cos \frac{\pi}{2^{10}} \cdot \sin \frac{\pi}{2^{10}}$$

is :

Options :

1.  $\frac{1}{1024}$

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

3.  $\frac{1}{512}$

4.  $\frac{1}{256}$

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

$$\cos \frac{\pi}{2^2} \cdot \cos \frac{\pi}{2^3} \cdot \dots \cdot \cos \frac{\pi}{2^{10}} \cdot \sin \frac{\pi}{2^{10}}$$

का मान है :

Options :

1.  $\frac{1}{1024}$

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

3.  $\frac{1}{512}$

4.  $\frac{1}{256}$

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

$$\cos \frac{\pi}{2^2} \cdot \cos \frac{\pi}{2^3} \cdot \dots \cdot \cos \frac{\pi}{2^{10}} \cdot \sin \frac{\pi}{2^{10}} \text{ ની}$$

કિંમત \_\_\_\_\_ છે.

Options :

1.  $\frac{1}{1024}$

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

3.  $\frac{1}{512}$

4.  $\frac{1}{256}$

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

With the usual notation, in  $\Delta ABC$ , if

$$\angle A + \angle B = 120^\circ, \quad a = \sqrt{3} + 1 \quad \text{and}$$

$$b = \sqrt{3} - 1, \text{ then the ratio } \angle A : \angle B, \text{ is:}$$

Options :

1. 5:3

2. 3:1

3. 9:7

4. 7:1

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

સામાન્ય સંકેતોં મેં  $\Delta ABC$  મેં યદિ  $\angle A + \angle B = 120^\circ$ ,

$$a = \sqrt{3} + 1 \text{ તથા } b = \sqrt{3} - 1 \text{ હૈ, તો અનુપાત}$$

$\angle A : \angle B$  બરાબર હૈ :

Options :

1. 5:3

2. 3:1
3. 9:7
4. 7:1

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

પ્રચલિત સંકેતો મુજબ,  $\Delta ABC$  માં જો

$$\angle A + \angle B = 120^\circ, a = \sqrt{3} + 1 \text{ અને}$$

$$b = \sqrt{3} - 1 \text{ હોય, તો ગુણોત્તર } \angle A : \angle B \\ = \underline{\hspace{2cm}}.$$

Options :

1. 5:3
2. 3:1
3. 9:7
4. 7:1

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

Consider the following three statements :

P : 5 is a prime number.

Q : 7 is a factor of 192.

R : L.C.M. of 5 and 7 is 35.

Then the truth value of which one of the following statements is true ?

Options :

1.  $(P \wedge Q) \vee (\sim R)$
2.  $(\sim P) \wedge (\sim Q \wedge R)$
3.  $P \vee (\sim Q \wedge R)$
4.  $(\sim P) \vee (Q \wedge R)$

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

निम्न तीन कथनों पर विचार कीजिए :

P : 5 एक अभाज्य संख्या है।

Q : सात 192 का एक गुणनखण्ड है।

R : 5 तथा 7 का L.C.M. 35 है।

तो निम्न में से कौन से एक कथन का सत्यमान (truth value) सत्य (T) है?

Options :

1.  $(P \wedge Q) \vee (\sim R)$

2.  $(\sim P) \wedge (\sim Q \wedge R)$

3.  $P \vee (\sim Q \wedge R)$

4.  $(\sim P) \vee (Q \wedge R)$

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

Correct Marks : 4 Wrong Marks : 1

નીચેના ત્રણ વિધાનો ધ્યાને લો.

P : 5 એ એક અવિભાજ્ય સંખ્યા છે.

Q : 7 એ 192 નો એક અવયવ છે.

R : 5 અને 7 નો લ.સા.અ. (L.C.M.) 35 છે.

તો નીચેના પૈકી કયા વિધાનું સત્યાર્થતા મૂલ્ય 'સત્ય' છે?

Options :

1.  $(P \wedge Q) \vee (\sim R)$

2.  $(\sim P) \wedge (\sim Q \wedge R)$

3.  $P \vee (\sim Q \wedge R)$

4.  $(\sim P) \vee (Q \wedge R)$