

National Testing Agency

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Paper I

Group Number :	1
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Break time:	0
Group Marks:	360

Physics

Section Id :	416529130
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:	416529139
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

दो परमाणुओं के मध्य अन्योन्यक्रिया बल सम्बन्ध

$$F = \alpha\beta \exp\left(-\frac{x^2}{\alpha kt}\right) \text{ से दिया जाता है जहाँ } x \text{ दूरी}$$

है, k बोल्ट्जमैन नियतांक तथा T तापमान है और α तथा β दो स्थिरांक हैं। β की विमा होगी :

Options :

1. MLT^{-2}
2. $M^2L^2T^{-2}$
3. $M^0L^2T^{-4}$
4. M^2LT^{-4}

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

Correct Marks : 4 Wrong Marks : 1

બે પરમાણુઓ વચ્ચેની અંતરક્રિયાના બળ ને

$$F = \alpha\beta \exp\left(-\frac{x^2}{\alpha kt}\right)$$

વડે આપવામાં આવે છે, જ્યાં

x એ અંતર, k બોલ્ટ્ઝમેન અચળાંક અને T તાપમાન છે. તથા α અને β એ અન્ય અચળાંકો છે. β નું પરિમાણ :

Options :

1. MLT^{-2}
2. $M^2L^2T^{-2}$
3. $M^0L^2T^{-4}$
4. M^2LT^{-4}

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

Correct Marks : 4 Wrong Marks : 1

The force of interaction between two atoms

$$\text{is given by } F = \alpha\beta \exp\left(-\frac{x^2}{\alpha kt}\right); \text{ where } x$$

is the distance, k is the Boltzmann constant and T is temperature and α and β are two constants. The dimension of β is :

Options :

1. MLT^{-2}
2. $M^2L^2T^{-2}$
3. $M^0L^2T^{-4}$

4. M^2LT^{-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

A particle is moving along a circular path with a constant speed of 10 ms^{-1} . What is the magnitude of the change in velocity of the particle, when it moves through an angle of 60° around the centre of the circle?

Options :

1. zero
2. $10\sqrt{3} \text{ m/s}$
3. $10\sqrt{2} \text{ m/s}$
4. 10 m/s

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

Correct Marks : 4 Wrong Marks : 1

एक कण एक वृत्ताकार पथ पर 10 ms^{-1} की नियत गति से चल रहा है। जब यह कण वृत्त के केन्द्र के परितः 60° चलता है तो इसके वेग में हुये परिवर्तन का परिमाण होगा :

Options :

1. शून्य
2. $10\sqrt{3} \text{ m/s}$
3. $10\sqrt{2} \text{ m/s}$
4. 10 m/s

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

એક કણ એક વર્તુળાકાર પથ પર 10 ms^{-1} જેટલી અચળ ઝડપથી ગતિ કરે છે. જ્યારે તે વર્તુળનાં કેન્દ્રને ફરતે 60° ના કોણે ભ્રમણ કરે ત્યારે તેના વેગના ફેરફારનું મૂલ્ય કેટલું થશે?

Options :

1. $2\sqrt{3}$
2. $10\sqrt{3}$ m/s
3. $10\sqrt{2}$ m/s
4. 10 m/s

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 body is projected at $t=0$ with a velocity 10 ms^{-1} at an angle of 60° with the horizontal. The radius of curvature of its trajectory at $t=1\text{s}$ is R . Neglecting air resistance and taking acceleration due to gravity $g = 10 \text{ ms}^{-2}$, the value of R is :

Options :

1. 2.5 m
2. 5.1 m
3. 2.8 m
4. 10.3 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

$t=0$ पर क्षैतिज से 60° के कोण पर 10 ms^{-1} के वेग से एक पिण्ड को प्रक्षेपित करते हैं। $t=1 \text{ s}$ पर प्रक्षेप पथ की वक्रता त्रिज्या R है। वायु प्रतिरोध को नगण्य मानकर तथा गुरुत्वीय त्वरण $g = 10 \text{ ms}^{-2}$ लेकर R का मान है :

Options :

1. 2.5 m
2. 5.1 m
3. 2.8 m
4. 10.3 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, સમક્ષિતિજ સાથે 60° ના ખૂણે એક પદાર્થને 10 ms^{-1} ગતિથી પ્રક્ષેપિત કરવામાં આવે છે. $t = 1 \text{ s}$ પર તેના ગતિપથની વક્રતા ત્રિજ્યા R છે. હવાનો અવરોધ અવગણતાં અને ગુરૂત્વપ્રવેગને $g = 10 \text{ ms}^{-2}$ લેતા R નું મૂલ્ય :

Options :

1. 2.5 m
2. 5.1 m
3. 2.8 m
4. 10.3 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

A liquid of density ρ is coming out of a hose pipe of radius a with horizontal speed v and hits a mesh. 50% of the liquid passes through the mesh unaffected. 25% loses all of its momentum and 25% comes back with the same speed. The resultant pressure on the mesh will be :

Options :

1. $\frac{1}{4} \rho v^2$
2. $\frac{1}{2} \rho v^2$
3. $\frac{3}{4} \rho v^2$
4. ρv^2

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

Correct Marks : 4 Wrong Marks : 1

ρ घनत्व का द्रव a त्रिज्या वाले होज पाईप में से क्षैतिज चाल v से निकल रहा है और एक जाल से टकराता है। 50% द्रव जाल से अप्रभावित निकल जाता है, 25% द्रव का संवेग शून्य हो जाता है तथा 25% द्रव उसी चाल से वापस आ जाता है। जाल पर परिणामी दाब होगा :

Options :

1. $\frac{1}{4} \rho v^2$

2. $\frac{1}{2} \rho v^2$

3. $\frac{3}{4} \rho v^2$

4. ρv^2

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

Correct Marks : 4 Wrong Marks : 1

a ત્રિજ્યાના એક હોસપાઇપમાંથી ρ ઘનતાનું પ્રવાહી v જેટલી સમક્ષિતિજ ઝડપથી બહાર આવે છે. અને તે એક જાળીને અથડાય છે. 50% પ્રવાહી આ જાળીમાંથી પસાર થાય છે, 25% વેગમાન ગુમાવે છે, અને 25% તેજ ઝડપથી પાછું આવે છે. આ જાળી પર પરિણામી દબાણ હશે :

Options :

1. $\frac{1}{4} \rho v^2$

2. $\frac{1}{2} \rho v^2$

3. $\frac{3}{4} \rho v^2$

4. ρv^2

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

Correct Marks : 4 Wrong Marks : 1

A body of mass 1 kg falls freely from a height of 100 m, on a platform of mass 3 kg which is mounted on a spring having spring constant $k = 1.25 \times 10^6$ N/m. The body sticks to the platform and the spring's maximum compression is found to be x . Given that $g = 10 \text{ ms}^{-2}$, the value of x will be close to :

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

Options :

1. 4 cm
2. 8 cm
3. 40 cm
4. 80 cm

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

1 kg द्रव्यमान का एक पिण्ड 100 m ऊँचाई से स्वतंत्र रूप से 3 kg द्रव्यमान के एक प्लेटफार्म पर गिरता है यह प्लेटफार्म एक स्प्रिंग नियतांक $k = 1.25 \times 10^6$ N/m की स्प्रिंग पर लगा है। पिण्ड प्लेटफार्म पर चिपक जाता है और स्प्रिंग का अधिकतम संपीडन x पाया जाता है। x का निकटतम मान होगा : ($g = 10 \text{ ms}^{-2}$)

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

Options :

1. 4 cm
2. 8 cm
3. 40 cm
4. 80 cm

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

100 m ઊંચાઈએ થી 1 kg દળ ધરાવતા પદાર્થને એક 3 kg દળ ધરાવતા આધાર (platform) , કે જે $k = 1.25 \times 10^6 \text{ N/m}$ જેટલા સ્પ્રિંગ અચળાંક ધરાવતી સ્પ્રિંગ પર સ્થાપેલ છે, તેના પર મુક્ત પતન કરાવવામાં આવે છે. પદાર્થ આધાર સાથે જોડાઈ જાય છે અને સ્પ્રિંગનું મહત્તમ સંકોચન x જેટલું માલુમ પડે છે. $g = 10 \text{ ms}^{-2}$ લઈ x નું મૂલ્ય :

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

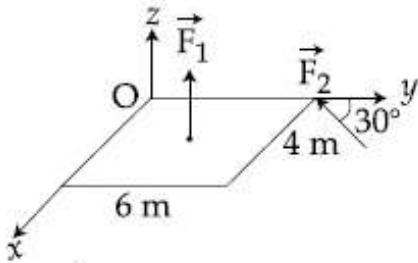
Options :

1. 4 cm
2. 8 cm
3. 40 cm
4. 80 cm

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 slab is subjected to two forces \vec{F}_1 and \vec{F}_2 of same magnitude F as shown in the figure. Force \vec{F}_2 is in XY-plane while force \vec{F}_1 acts along z-axis at the point $(2\vec{i} + 3\vec{j})$. The moment of these forces about point O will be :



Options :

1. $(3\hat{i} + 2\hat{j} - 3\hat{k})F$

2. $(3\hat{i}-2\hat{j}+3\hat{k})F$

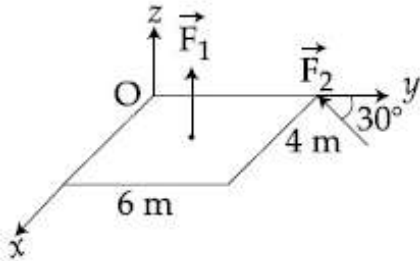
3. $(3\hat{i}+2\hat{j}+3\hat{k})F$

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

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

दिखाये गये चित्रानुसार एक तख्त पर समान परिमाण F के दो बल \vec{F}_1 तथा \vec{F}_2 लगाये गये हैं। बल \vec{F}_2 XY-समतल में है जबकि बल \vec{F}_1 z-दिशा के अनुदिश बिन्दु $(2\vec{i} + 3\vec{j})$ पर लगा है। बिन्दु O के सापेक्ष इन बलों का आघूर्ण होगा :



Options :

1. $(3\hat{i}+2\hat{j}-3\hat{k})F$

2. $(3\hat{i}-2\hat{j}+3\hat{k})F$

3. $(3\hat{i}+2\hat{j}+3\hat{k})F$

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

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

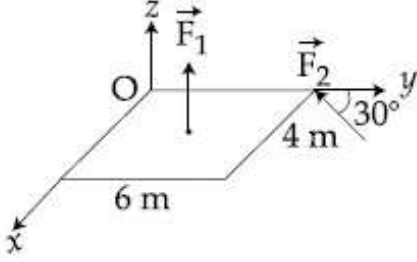
Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં બતાવ્યા પ્રમાણે એક ચોસલા પર સમાન માન

F ના બે બળો \vec{F}_1 અને \vec{F}_2 લગાડવામાં આવે છે. બિંદુ

$(2\vec{i} + 3\vec{j})$ આગળ બળ \vec{F}_2 XY- સમતલમાં છે

બ્યારે \vec{F}_1 z- દિશામાં લાગે છે. O બિંદુને સાપેક્ષે આ બળોની ચાકમાત્રા :



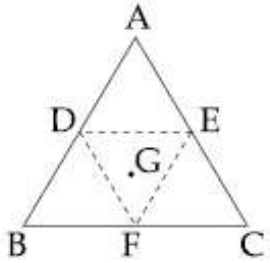
Options :

1. $(3\hat{i} + 2\hat{j} - 3\hat{k})F$
2. $(3\hat{i} - 2\hat{j} + 3\hat{k})F$
3. $(3\hat{i} + 2\hat{j} + 3\hat{k})F$
4. $(3\hat{i} - 2\hat{j} - 3\hat{k})F$

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

An equilateral triangle ABC is cut from a thin solid sheet of wood. (See figure) D, E and F are the mid-points of its sides as shown and G is the centre of the triangle. The moment of inertia of the triangle about an axis passing through G and perpendicular to the plane of the triangle is I_0 . If the smaller triangle DEF is removed from ABC, the moment of inertia of the remaining figure about the same axis is I. Then :



Options :

1. $I = \frac{I_0}{4}$

2. $I = \frac{3}{4}I_0$

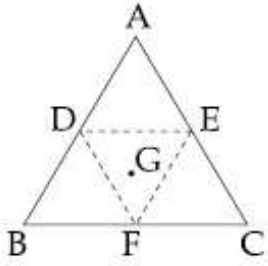
3. $I = \frac{9}{16}I_0$

4. $I = \frac{15}{16}I_0$

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

एक पतले ठोस लकड़ी के फलक से एक त्रिभुज ABC काटा गया है (चित्र देखिए)। दर्शाये गये अनुसार D, E तथा F इसकी भुजाओं के मध्य बिन्दु है तथा G त्रिभुज का केन्द्र है। G से गुजरने वाली तथा त्रिभुज के समतल के लम्बवत् अक्ष के सापेक्ष त्रिभुज का जड़त्व आघूर्ण I_0 है। यदि छोटा त्रिभुज DEF त्रिभुज ABC में से निकाल लिया जाये तो शेष बचे हुए भाग का उसी अक्ष के सापेक्ष जड़त्व आघूर्ण I है। तब :



Options :

1. $I = \frac{I_0}{4}$

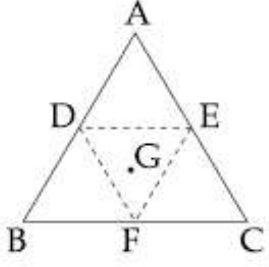
2. $I = \frac{3}{4}I_0$

3. $I = \frac{9}{16}I_0$

4. $I = \frac{15}{16}I_0$

Question Number : 7 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

એક પાતળી લાકડાની ઘન તકિતમાંથી ABC સમબાજુ ત્રિકોણ બનાવવામાં આવે છે (આકૃતિ જુઓ). D, E અને F એ આકૃતિમાં દર્શાવ્યા મુજબ તેની બાજુના મધ્યબિંદુઓ છે અને G એ ત્રિકોણનું કેન્દ્ર છે. ત્રિકોણના સમતલને લંબ અને G માંથી પસાર થતી અક્ષને અનુલક્ષીને ત્રિકોણની જડત્વની ચાકમાત્રા I_0 છે. જો ABC માંથી નાનો ત્રિકોણ DEF કાઢી નાખવામાં આવે તો બાકી રહેલ આકૃતિ માટે આ જ અક્ષને અનુલક્ષીને જડત્વની ચાકમાત્રા I છે તો :



Options :

1. $I = \frac{I_0}{4}$
2. $I = \frac{3}{4}I_0$
3. $I = \frac{9}{16}I_0$
4. $I = \frac{15}{16}I_0$

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

Correct Marks : 4 Wrong Marks : 1

A satellite is revolving in a circular orbit at a height h from the earth surface, such that $h \ll R$ where R is the radius of the earth. Assuming that the effect of earth's atmosphere can be neglected the minimum increase in the speed required so that the satellite could escape from the gravitational field of earth is :

Options :

1. \sqrt{gR}

2. $\sqrt{2gR}$

3. $\sqrt{gR}(\sqrt{2}-1)$

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

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

पृथ्वी की सतह से h ऊँचाई पर एक उपग्रह एक वृत्तीय कक्षा में इस प्रकार घूम रहा है कि $h \ll R$ जहाँ R पृथ्वी की त्रिज्या है। माना कि पृथ्वी के वायुमण्डल का प्रभाव नगण्य है। कक्षीय चाल में कितनी न्यूनतम वृद्धि होनी चाहिए जिससे कि उपग्रह पृथ्वी के गुरुत्वीय क्षेत्र से पलायन कर सके :

Options :

1. \sqrt{gR}

2. $\sqrt{2gR}$

3. $\sqrt{gR}(\sqrt{2}-1)$

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

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

पृथ्वीની સપાટીથી h ઊંચાઈ પર એક ઉપગ્રહ વર્તુળાકાર કક્ષામાં ભ્રમણ કરે છે કે જ્યાં $h \ll R$ અને R પૃથ્વીની ત્રિજ્યા છે. પૃથ્વીના વાતાવરણની અસરને અવગણતા, પૃથ્વીના ગુરૂત્વાકર્ષણ ક્ષેત્રમાંથી છટકવા ઝડપમાં જરૂરી લઘુત્તમ વધારો _____ છે.

Options :

1. \sqrt{gR}

2. $\sqrt{2gR}$

3. $\sqrt{gR}(\sqrt{2}-1)$

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

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

40°C પર 50 g પાણી મેં - 20°C પર રઘી બર્ફ મિલાતે હેં। જબ મિશ્રણ કા તાપમાન 0°C હો જાતા હે તો દેખા જાતા હે કિ 20 g બર્ફ અભી બી જમી હુઈ હે। પાણી મેં મિલાયી ગયી બર્ફ કી માત્રા કા સન્નિકટ માન થા :

(જલ કી વિશિષ્ટ ઝખ્મા = 4.2 J/g/°C

બર્ફ કી વિશિષ્ટ ઝખ્મા = 2.1 J/g/°C

0°C પર જલ કી સંગલન ઝખ્મા = 334 J/g)

Options :

1. 60 g

2. 40 g

3. 50 g

4. 100 g

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

40°C પર ના 50 g પાણીમાં - 20°C પર રહેલો બરફ ઉમેરવામાં આવે છે. આ મિશ્રણ જ્યારે 0°C પર પહોંચે છે ત્યારે એવું જોવા મળ્યું કે તેમાં હજી 20 g બરફ ઓગળ્યા વગરનો છે. પાણીમાં ઉમેરવામાં આવેલ બરફનો જથ્થો _____ ની નજીકનો હશે.

(પાણીની વિશિષ્ટ ઊષ્મા = 4.2 J/g/°C

બરફની વિશિષ્ટ ઊષ્મા = 2.1 J/g/°C

0°C પર બરફની ગલન ઊર્જા = 334 J/g)

Options :

1. 60 g

2. 40 g

3. 50 g

4. 100 g

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

Ice at -20°C is added to 50 g of water at 40°C . When the temperature of the mixture reaches 0°C , it is found that 20 g of ice is still unmelted. The amount of ice added to the water was close to

(Specific heat of water = $4.2 \text{ J/g/}^{\circ}\text{C}$

Specific heat of Ice = $2.1 \text{ J/g/}^{\circ}\text{C}$

Heat of fusion of water at 0°C = 334 J/g)

Options :

1. 60 g

2. 40 g

3. 50 g

4. 100 g

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

Correct Marks : 4 Wrong Marks : 1

A rigid diatomic ideal gas undergoes an adiabatic process at room temperature. The relation between temperature and volume for this process is $TV^x = \text{constant}$, then x is :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

कक्षीय तापमान पर एक दृढ़ द्विपरमाणुक आदर्श गैस एक रुद्धोष्म प्रक्रम से गुजरती है। इस प्रक्रम के लिए तापमान और आयतन में, $TV^x = \text{नियतांक सम्बन्ध}$ है तो x होगा :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

એક દૃઢ દ્વિપરમાણ્વીક આદર્શ વાયુ પૂરતા ઊંચા તાપમાને એક સમોષ્મી પ્રક્રિયામાંથી પસાર થાય છે. આ પ્રક્રિયામાંટે તાપમાન અને કદનો સબંધ $TV^x = \text{અચળ}$ છે, તો x હશે :

Options :

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

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

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

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

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

A gas mixture consists of 3 moles of oxygen and 5 moles of argon at temperature T . Considering only translational and rotational modes, the total internal energy of the system is :

Options :

1. $4 RT$
2. $12 RT$
3. $15 RT$
4. $20 RT$

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

गैस के एक मिश्रण में ऑक्सीजन के 3 मोल तथा आर्गन के 5 मोल तापमान T पर हैं। केवल स्थानांतरीय और घूर्णन विधा मानें तो संकाय की कुल आन्तरिक ऊर्जा होगी :

Options :

1. $4 RT$
2. $12 RT$
3. $15 RT$
4. $20 RT$

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

T तापमाने अेक वायुमिश्रण अे 3 मोल ऑक्सिजन अने 5 मोल आर्गन धरावे छे. स्थानांतरीय अने भ्रमणीय मोडने ध्यानमां लेता आ तंत्रनी कुल आंतरिक उर्जा हसे :

Options :

1. $4 RT$
2. $12 RT$
3. $15 RT$

4. 20 RT

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 undergoing simple harmonic motion has time dependent displacement

given by $x(t) = A \sin \frac{\pi t}{90}$. The ratio of kinetic to potential energy of this particle at $t = 210$ s will be :

Options :

1. 1

2. 3

3. $\frac{1}{9}$

4. 2

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

सरल आवर्त गति करते हुए एक कण का समय पर

निर्भर विस्थापन सम्बन्ध $x(t) = A \sin \frac{\pi t}{90}$ से दिया

गया है। $t = 210$ s पर इस कण की गतिज एवं स्थितिज ऊर्जाओं का अनुपात होगा :

Options :

1. 1

2. 3

3. $\frac{1}{9}$

4. 2

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

सरण आवर्त गति करता अेक कणनुं समय आधारित

स्थानांतर $x(t) = A \sin \frac{\pi t}{90}$ वडे आपवामां आवे छे.

$t = 210$ s पर आ कणमाटे गतिउिर्नथी स्थितिउिर्ननो गुणोत्तर :

Options :

1. 1

2. 3

3. $\frac{1}{9}$

4. 2

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

Equation of travelling wave on a stretched string of linear density 5 g/m is $y = 0.03 \sin(450 t - 9x)$ where distance and time are measured in SI units. The tension in the string is :

Options :

1. 5 N

2. 7.5 N

3. 10 N

4. 12.5 N

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

5 g/m रेखीय घनत्व वाली तनी हुई डोरी में प्रगामी तरंग का समीकरण निम्न है :

$y = 0.03 \sin(450 t - 9x)$ जहाँ दूरी और समय SI मात्रकों में हैं। डोरी में तनाव है :

Options :

1. 5 N

2. 7.5 N

3. 10 N

4. 12.5 N

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

5 g/m રેખીય ઘનતા ધરાવતા એક ખેંચાયેલ તાર પર ના પ્રગામી તરંગનું સમીકરણ

$y = 0.03 \sin(450t - 9x)$ છે જ્યાં અંતર અને સમય SI એકમોમાં માપવામાં આવે છે. આ તારમાં તણાવ _____ હશે.

Options :

1. 5 N

2. 7.5 N

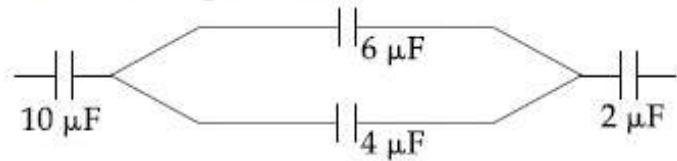
3. 10 N

4. 12.5 N

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

Correct Marks : 4 Wrong Marks : 1

In the figure shown below, the charge on the left plate of the $10 \mu\text{F}$ capacitor is $-30 \mu\text{C}$. The charge on the right plate of the $6 \mu\text{F}$ capacitor is :



Options :

1. $+18 \mu\text{C}$

2. $-18 \mu\text{C}$

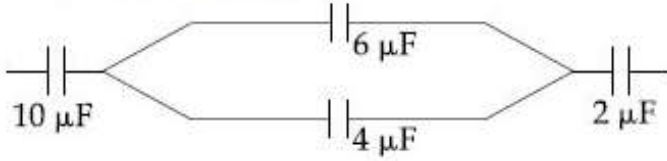
3. $+12 \mu\text{C}$

4. $-12 \mu\text{C}$

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

Correct Marks : 4 Wrong Marks : 1

दिखाये गये चित्र में $10 \mu\text{F}$ के संधारित्र की बाँयी प्लेट पर $-30 \mu\text{C}$ आवेश है। $6 \mu\text{F}$ के संधारित्र की दाँयी प्लेट पर आवेश होगा :



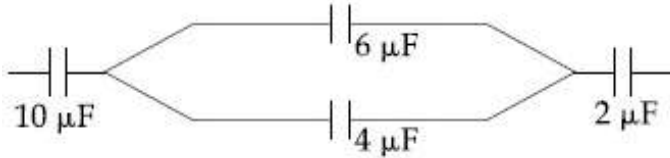
Options :

1. $+18 \mu\text{C}$
2. $-18 \mu\text{C}$
3. $+12 \mu\text{C}$
4. $-12 \mu\text{C}$

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

Correct Marks : 4 Wrong Marks : 1

નીચે દર્શાવેલ આકૃતિમાં $10 \mu\text{F}$ ના કેપેસિટરની ડાબી બાજુની પ્લેટ પર $-30 \mu\text{C}$ વિજભાર છે. $6 \mu\text{F}$ ના કેપેસિટરની જમણી બાજુની પ્લેટ પર નો વિજભાર :



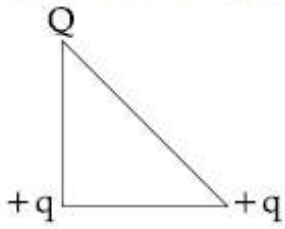
Options :

1. $+18 \mu\text{C}$
2. $-18 \mu\text{C}$
3. $+12 \mu\text{C}$
4. $-12 \mu\text{C}$

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

Correct Marks : 4 Wrong Marks : 1

Three charges Q , $+q$ and $+q$ are placed at the vertices of a right-angle isosceles triangle as shown below. The net electrostatic energy of the configuration is zero, if the value of Q is :



Options :

1. $\frac{-q}{1+\sqrt{2}}$

2. $\frac{-\sqrt{2}q}{\sqrt{2}+1}$

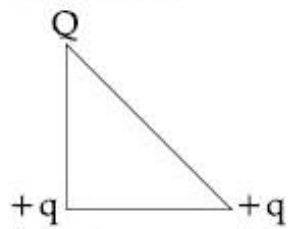
3. $-2q$

4. $+q$

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

दिखाये गये समकोणीय समद्विबाहु त्रिभुज के कोनों पर तीन आवेश Q , $+q$ तथा $+q$ रखे गये हैं। इस विन्यास की कुल विद्युत्स्थैतिक ऊर्जा शून्य होगी यदि Q का मान है :



Options :

1. $\frac{-q}{1+\sqrt{2}}$

2. $\frac{-\sqrt{2}q}{\sqrt{2}+1}$

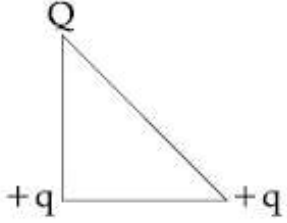
3. $-2q$

4. +q

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

એક સમદ્વિબાજુકાટકોણ ત્રિકોણના શિરોબિંદુઓ પર ત્રણ વિજભારો Q , $+q$ અને $+q$ ને નીચે આકૃતિમાં બતાવ્યા મુજબ ગોઠવેલ છે. આ સંરચનાની ચોખ્ખી સ્થિત વિદ્યુત ઊર્જા શૂન્ય છે કે જ્યારે Q નું મૂલ્ય _____ હશે.



Options :

1. $\frac{-q}{1+\sqrt{2}}$

2. $\frac{-\sqrt{2}q}{\sqrt{2}+1}$

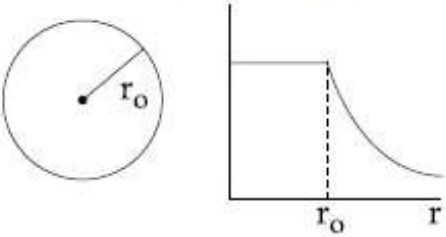
3. $-2q$

4. $+q$

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

Correct Marks : 4 Wrong Marks : 1

The given graph shows variation (with distance r from centre) of :



Options :

1. Potential of a uniformly charged spherical shell

2. Potential of a uniformly charged sphere

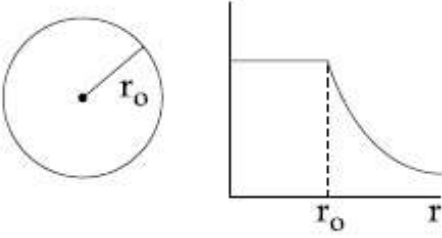
3. Electric field of a uniformly charged spherical shell

4. Electric field of a uniformly charged sphere

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

दिया गया ग्राफ (केन्द्र से दूरी r के साथ) बदलाव दिखाता है :



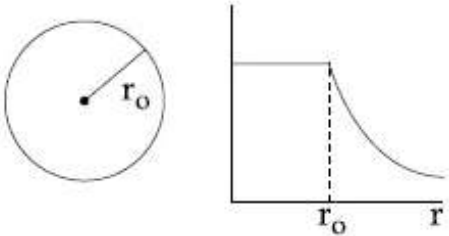
Options :

1. समावेशित गोलीय कोश का विभव
2. समावेशित गोले का विभव
3. समावेशित गोलीय कोश का विद्युत क्षेत्र
4. समावेशित गोले का विद्युत क्षेत्र

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

Correct Marks : 4 Wrong Marks : 1

आपेल आलेख _____ नो इंडेक्स (केन्द्रથી r अंतर साथे) दर्शावे छे.



Options :

1. समान विज्भारित गोलीय क्वचनुं स्थितिमान
2. समान विज्भारित गोणानुं स्थितिमान
3. समान विज्भारित गोलीय क्वचनुं विद्युतक्षेत्र

4. समान विज्वारित गोलानुं विद्युतक्षेत्र

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

Two equal resistances when connected in series to a battery, consume electric power of 60 W. If these resistances are now connected in parallel combination to the same battery, the electric power consumed will be :

Options :

1. 60 W
2. 240 W
3. 120 W
4. 30 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

दो बराबर प्रतिरोधों को जब श्रेणीक्रम में एक बैटरी से जोड़ते हैं तो ये 60 W विद्युत शक्ति का उपभोग करते हैं। यदि इन प्रतिरोधों को अब समान्तर क्रम में इसी बैटरी से जोड़ा जाये तो उपभोग की गयी शक्ति होगी :

Options :

1. 60 W
2. 240 W
3. 120 W
4. 30 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

दो समान अवरोधोने ज्यारे अेक बैटरी साथे श्रेणीमां जोडवामां आवे छे त्यारे ते 60 W पावर वापरे छे. हवे जो आब अवरोधोने समांतर जोडाणामां आब बैटरीसाथे जोडवामां आवे तो वपरतो विद्युत पावर हसे :

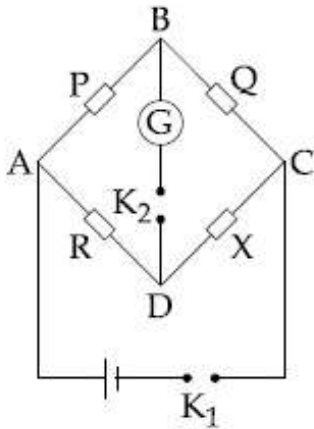
Options :

1. 60 W
2. 240 W
3. 120 W
4. 30 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

In a Wheatstone bridge(see fig.), Resistances P and Q are approximately equal. When $R = 400 \Omega$, the bridge is balanced. On interchanging P and Q, the value of R, for balance, is 405Ω . The value of X is close to :



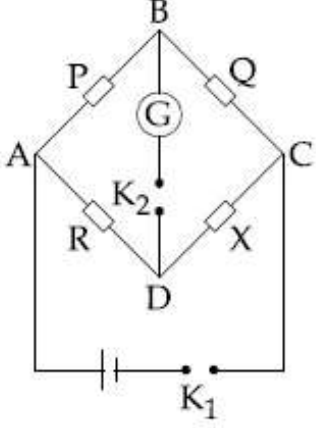
Options :

1. 401.5 ohm
2. 404.5 ohm
3. 402.5 ohm
4. 403.5 ohm

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

एक व्हीटस्टोन सेतु में (चित्र देखिये) प्रतिरोध P तथा Q लगभग बराबर है। जब $R = 400 \Omega$ है तो सेतु संतुलित है। P तथा Q को परस्पर बदलने पर, सेतु को संतुलित रखने के लिए R का मान 405Ω है। X का सन्निकट मान होगा :



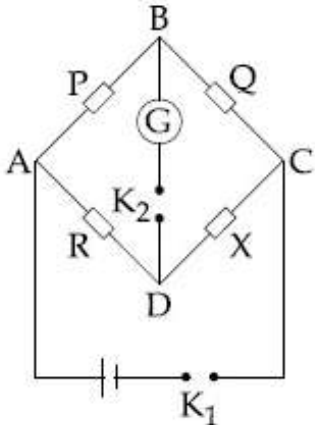
Options :

1. 401.5 ohm
2. 404.5 ohm
3. 402.5 ohm
4. 403.5 ohm

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

Correct Marks : 4 Wrong Marks : 1

એક વ્હીસ્ટોન ખિજમાં (આકૃતિ જુઓ) ભુજા P અને Q નો ગુણોત્તર લગભગ સરખો છે. જ્યારે $R = 400 \Omega$, ખિજ સંતુલન થાય છે. P અને Q ની અદલાબદલી કરતા સંતુલન માટે R નું મૂલ્ય 405Ω છે. X નું મૂલ્ય _____ ની નજીકનું હશે.



Options :

1. 401.5 ઓહ્મ

2. 404.5 ઓહ્મ

3. 402.5 ઓહ્મ

4. 403.5 ઓહ્મ

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

In an experiment, electrons are accelerated, from rest, by applying a voltage of 500 V. Calculate the radius of the path if a magnetic field 100 mT is then applied. [Charge of the electron = 1.6×10^{-19} C Mass of the electron = 9.1×10^{-31} kg]

Options :

1. 7.5 m

2. 7.5×10^{-2} m

3. 7.5×10^{-4} m

4. 7.5×10^{-3} m

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 પ્રયોગમાં, સ્થિર સ્થિતિમાંથી ઇલેક્ટ્રોનને 500 V લાગુ પાડીને પ્રવેગિત કરવામાં આવે છે. હવે જો 100 mT જેટલું ચુંબકીય ક્ષેત્ર લાગુ પાડવામાં આવે તો ગતિ પથની ત્રિજ્યા ગણો.

(ઇલેક્ટ્રોન પરનો વિદ્યુતભાર = 1.6×10^{-19} C, ઇલેક્ટ્રોનનું દળ = 9.1×10^{-31} kg)

Options :

1. 7.5 m

2. 7.5×10^{-2} m

3. 7.5×10^{-4} m

4. 7.5×10^{-3} m

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

एक प्रयोग में इलेक्ट्रॉन को विराम अवस्था से 500 V वोल्टेज लगाकर त्वरित करते हैं। पथ की त्रिज्या ज्ञात कीजिए यदि लगाया गया चुम्बकीय क्षेत्र 100 mT है। (इलेक्ट्रॉन का आवेश = 1.6×10^{-19} C, इलेक्ट्रॉन का द्रव्यमान = 9.1×10^{-31} kg)

Options :

1. 7.5 m
2. 7.5×10^{-2} m
3. 7.5×10^{-4} m
4. 7.5×10^{-3} m

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

There are two long co-axial solenoids of same length l . The inner and outer coils have radii r_1 and r_2 and number of turns per unit length n_1 and n_2 , respectively. The ratio of mutual inductance to the self-inductance of the inner-coil is :

Options :

1. $\frac{n_2}{n_1}$
2. $\frac{n_2}{n_1} \cdot \frac{r_2^2}{r_1^2}$
3. $\frac{n_2}{n_1} \cdot \frac{r_1}{r_2}$
4. $\frac{n_1}{n_2}$

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

Correct Marks : 4 Wrong Marks : 1

समान लम्बाई l की दो लम्बी सम-अक्षीय परिनालिकाये हैं। आन्तरिक एवं बाह्य कुण्डलियों की त्रिज्यायें क्रमशः r_1 तथा r_2 हैं और प्रति इकाई लम्बाई फेरों की संख्या क्रमशः n_1 तथा n_2 हैं। आन्तरिक कुण्डली के अन्योन्य प्रेरकत्व तथा स्व प्रेरकत्व का अनुपात होगा :

Options :

1. $\frac{n_2}{n_1}$
2. $\frac{n_2}{n_1} \cdot \frac{r_2^2}{r_1^2}$
3. $\frac{n_2}{n_1} \cdot \frac{r_1}{r_2}$
4. $\frac{n_1}{n_2}$

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

Correct Marks : 4 Wrong Marks : 1

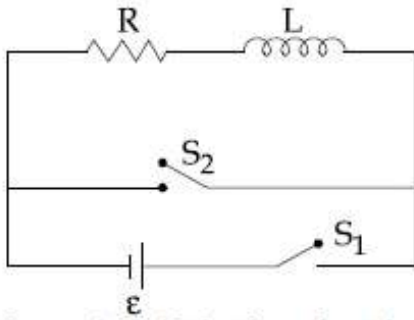
समान लंबाई l ना બે લાંબા સમકેન્દ્રીય સોલેનોઇડ છે. ક્રમશઃ અંદર અને બહારનાં ગુંચળાની ત્રિજ્યાઓ r_1 અને r_2 , અને પ્રતિ એકમ લંબાઈ આંટાવોની સંખ્યા n_1 અને n_2 છે. અંદરના ગુંચળાનો અન્યોન્યમ પ્રેરણ થી આત્મપ્રેરણનું ગુણોત્તર _____ છે.

Options :

1. $\frac{n_2}{n_1}$
2. $\frac{n_2}{n_1} \cdot \frac{r_2^2}{r_1^2}$
3. $\frac{n_2}{n_1} \cdot \frac{r_1}{r_2}$
4. $\frac{n_1}{n_2}$

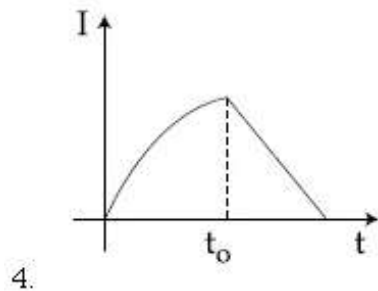
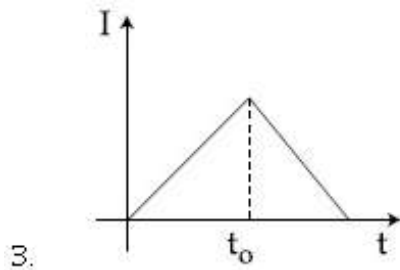
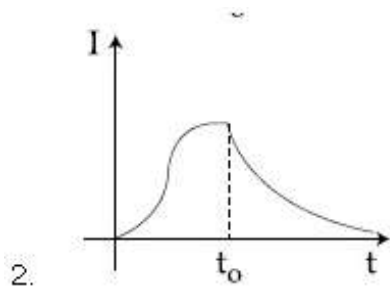
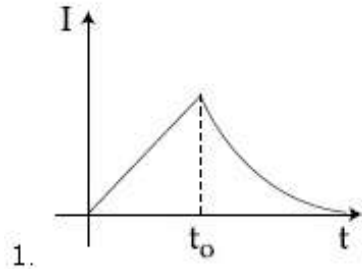
Correct Marks : 4 Wrong Marks : 1

In the circuit shown,



the switch S_1 is closed at time $t = 0$ and the switch S_2 is kept open. At some later time (t_0), the switch S_1 is opened and S_2 is closed. The behaviour of the current I as a function of time ' t ' is given by :

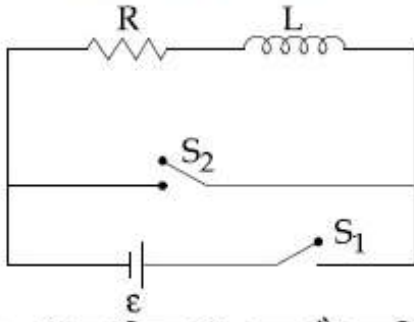
Options :



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

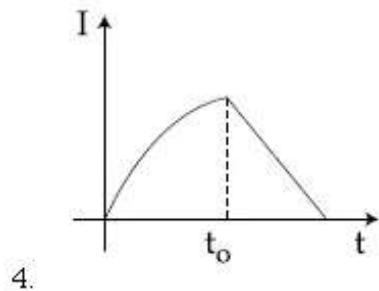
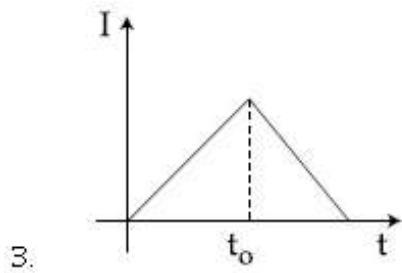
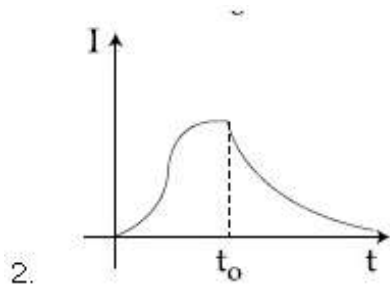
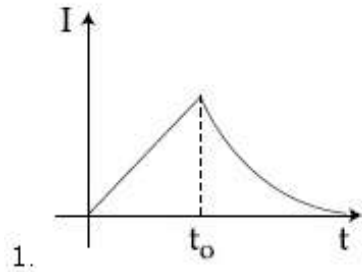
Correct Marks : 4 Wrong Marks : 1

एक परिपथ को निम्न चित्र में दिखाया गया है :



$t=0$ पर स्विच S_1 बन्द है जबकि स्विच S_2 खुला रहता है। किसी समय (t_0) के पश्चात् स्विच S_1 खुला है और S_2 बन्द है। धारा I में समय 't' के साथ परिवर्तन इससे दिखाया जा सकता है :

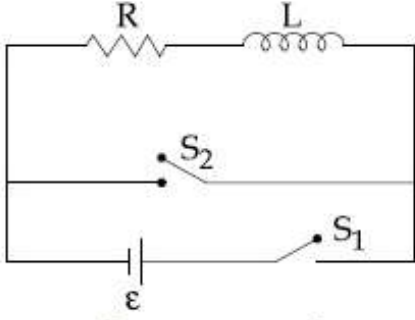
Options :



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

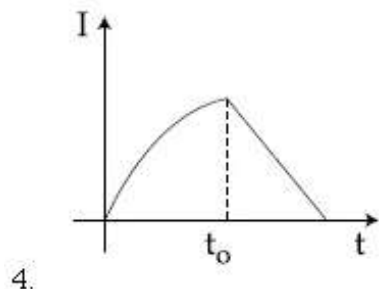
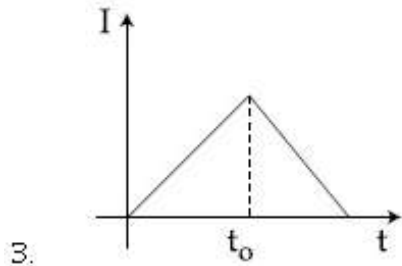
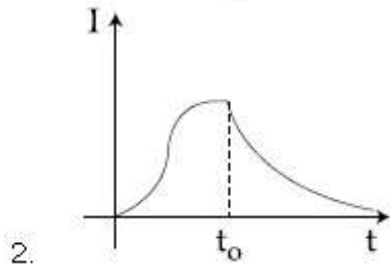
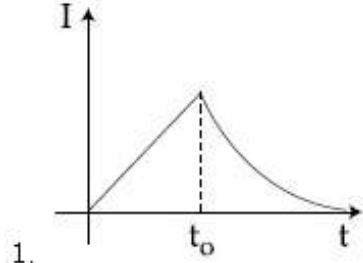
Correct Marks : 4 Wrong Marks : 1

આપેલ પરિપથમાં,



$t=0$ સમયે કળ S_1 બંધ જ્યારે કળ S_2 ને ખુલ્લી રાખવામાં આવે છે. કોઈ પછીના સમય (t_0) એ કળ S_1 ને ખુલ્લી અને કળ S_2 ને બંધ કરવામાં આવે છે. વહેતા પ્રવાહ I નું ' t ' ના વિધેય તરીકેની વર્તણૂક _____ વડે આપી શકાય.

Options :



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

50 Wm^{-2} तीव्रता की एक विद्युत चुम्बकीय तरंग 'n' अपवर्तनांक के एक माध्यम में बिना किसी क्षय के प्रवेश करती है। तरंग के माध्यम में प्रवेश करने के पूर्व तथा पश्चात् विद्युत क्षेत्रों का अनुपात तथा चुम्बकीय क्षेत्रों का अनुपात क्रमशः होंगे :

Options :

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

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

3. (\sqrt{n}, \sqrt{n})

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

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

n વક્રિભવનાંક ધરાવતા એક માધ્યમમાં 50 Wm^{-2} તીવ્રતાનું એક વિદ્યુતચુંબકીય તરંગ ક્ષય પામ્યા વગર પ્રવેશે છે. આ તરંગનો માધ્યમમાં પ્રવેશતા પહેલા અને પછીના વિદ્યુતક્ષેત્રોનો ગુણોત્તર અને ચુંબકીય ક્ષેત્રનો ગુણોત્તર ને ક્રમશઃ _____ વડે આપવામાં આવે છે.

Options :

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

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

3. (\sqrt{n}, \sqrt{n})

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

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

An electromagnetic wave of intensity 50 Wm^{-2} enters in a medium of refractive index 'n' without any loss. The ratio of the magnitudes of electric fields, and the ratio of the magnitudes of magnetic fields of the wave before and after entering into the medium are respectively, given by :

Options :

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

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

3. (\sqrt{n}, \sqrt{n})

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

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

Correct Marks : 4 Wrong Marks : 1

An object is at a distance of 20 m from a convex lens of focal length 0.3 m. The lens forms an image of the object. If the object moves away from the lens at a speed of 5 m/s, the speed and direction of the image will be :

Options :

1. $2.26 \times 10^{-3} \text{ m/s}$ away from the lens

2. $1.16 \times 10^{-3} \text{ m/s}$ towards the lens

3. $3.22 \times 10^{-3} \text{ m/s}$ towards the lens

4. $0.92 \times 10^{-3} \text{ m/s}$ away from the lens

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

0.3 m फोकस दूरी के एक उत्तल लेन्स से कोई वस्तु 20 m की दूरी पर है। लेन्स द्वारा वस्तु का प्रतिबिम्ब बनता है। यदि यह वस्तु लेन्स से दूर 5 m/s की चाल से जाती है तो प्रतिबिम्ब की चाल और दिशा होगी :

Options :

1. 2.26×10^{-3} m/s, लेन्स से दूर
2. 1.16×10^{-3} m/s, लेन्स की ओर
3. 3.22×10^{-3} m/s, लेन्स की ओर
4. 0.92×10^{-3} m/s, लेन्स से दूर

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

0.3 m કેન્દ્રલંબાઈના એક બહિર્ગોળ કાચથી 20 m ના અંતરે એક વસ્તુ મુકેલ છે. આ કાચ વસ્તુનું પ્રતિબિંબ રચે છે. જો આ વસ્તુ 5 m/s ની ઝડપ થી કાચથી દૂર તરફ ગતિ કરે, તો પ્રતિબિંબની ઝડપ અને દિશા _____ હશે.

Options :

1. 2.26×10^{-3} m/s, કાચથી દૂર
2. 1.16×10^{-3} m/s, કાચ તરફ
3. 3.22×10^{-3} m/s, કાચ તરફ
4. 0.92×10^{-3} m/s, કાચથી દૂર

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

In a Young's double slit experiment, the path difference, at a certain point on the screen, between two interfering waves is

$\frac{1}{8}$ th of wavelength. The ratio of the intensity at this point to that at the centre of a bright fringe is close to :

Options :

1. 0.74
2. 0.80
3. 0.85
4. 0.94

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

यंग के द्वि-झिरी प्रयोग में, पर्दे के एक बिन्दु पर व्यतिकरण करने वाली दो तरंगों का पथान्तर तरंगदैर्घ्य का $\frac{1}{8}$ गुना है। इस बिन्दु पर तीव्रता तथा दीप्त फ्रिन्ज के केन्द्र पर तीव्रता का अनुपात लगभग होगा :

Options :

1. 0.74
2. 0.80
3. 0.85
4. 0.94

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

यंगના બે સ્લિટના પ્રયોગમાં પડદા પરના કોઈ એક ચોક્કસ બિંદુ પર વ્યતિકરણ પામતાં બે તરંગો વચ્ચેનો પથ-તફાવત તરંગ લંબાઈના $\frac{1}{8}$ માં ભાગનો છે. આ બિંદુ અને પ્રકાશિત શલાકાના કેન્દ્ર પરની તીવ્રતાઓનો ગુણોત્તર _____ ની નજીકનો છે.

Options :

1. 0.74

2. 0.80
3. 0.85
4. 0.94

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

If the deBroglie wavelength of an electron is equal to 10^{-3} times the wavelength of a photon of frequency 6×10^{14} Hz, then the speed of electron is equal to :

(Speed of light = 3×10^8 m/s

Planck's constant = 6.63×10^{-34} J .s

Mass of electron = 9.1×10^{-31} kg)

Options :

1. 1.8×10^6 m/s
2. 1.45×10^6 m/s
3. 1.1×10^6 m/s
4. 1.7×10^6 m/s

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

यदि इलेक्ट्रॉन की डी-ब्रॉग्लि तरंगदैर्घ्य 6×10^{14} Hz आवृत्ति के फोटॉन की तरंगदैर्घ्य के 10^{-3} गुना है तो इलेक्ट्रॉन की चाल होगी :

(दिया है प्रकाश की चाल = 3×10^8 m/s

प्लांक नियतांक = 6.63×10^{-34} J .s

इलेक्ट्रॉन का द्रव्यमान = 9.1×10^{-31} kg)

Options :

1. 1.8×10^6 m/s
2. 1.45×10^6 m/s
3. 1.1×10^6 m/s
4. 1.7×10^6 m/s

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

જો એક ઇલેક્ટ્રોનની ડી-બ્રોગ્લી તરંગલંબાઈ એ 6×10^{14} Hz તરંગલંબાઈના ફોટોનની તરંગલંબાઈના 10^{-3} ગણી છે, તો ઇલેક્ટ્રોનની ઝડપ હશે :

(પ્રકાશની ઝડપ = 3×10^8 m/s

પ્લાંક અચળાંક = 6.63×10^{-34} J.s

ઇલેક્ટ્રોનનું દળ = 9.1×10^{-31} kg)

Options :

1. 1.8×10^6 m/s

2. 1.45×10^6 m/s

3. 1.1×10^6 m/s

4. 1.7×10^6 m/s

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

Correct Marks : 4 Wrong Marks : 1

A hydrogen atom, initially in the ground state is excited by absorbing a photon of wavelength 980 \AA . The radius of the atom in the excited state, in terms of Bohr radius a_0 , will be :

($hc = 12500 \text{ eV-}\text{\AA}$)

Options :

1. $4a_0$

2. $9a_0$

3. $16a_0$

4. $25a_0$

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

પ્રારંભમાં ઘરા-અવસ્થામાં રહેલ હાઇડ્રોજન પરમાણુ 980 \AA તરંગલંબાઈના ફોટોનનું શોષણ કરી ઉત્તેજિત થાય છે.

બોહર ત્રિજ્યા a_0 ના પદમાં, ઉત્તેજિત અવસ્થામાં રહેલ પરમાણુની ત્રિજ્યા _____ થશે.

($hc = 12500 \text{ eV-}\text{\AA}$)

Options :

1. $4a_0$
2. $9a_0$
3. $16a_0$
4. $25a_0$

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

आरम्भिक मूल अवस्था में हाइड्रोजन परमाणु 980\AA तरंगदैर्घ्य का फोटॉन अवशोषित कर उत्तेजित हो जाता है। इस उत्तेजित स्तर में परमाणु की त्रिज्या बोर त्रिज्या a_0 के मात्रक में होगी :
($hc = 12500 \text{ eV}\cdot\text{\AA}$)

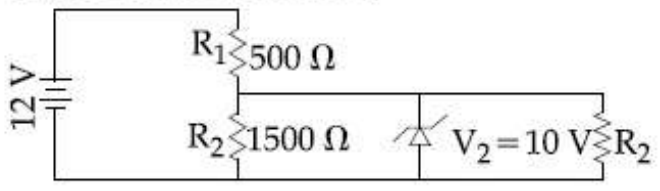
Options :

1. $4a_0$
2. $9a_0$
3. $16a_0$
4. $25a_0$

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

In the given circuit the current through Zener Diode is close to :



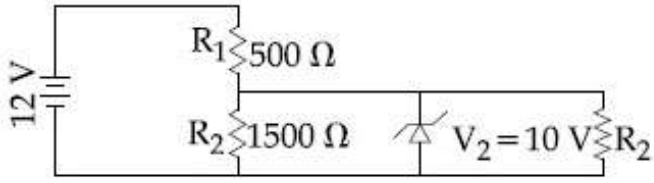
Options :

1. 6.7 mA
2. 4.0 mA
3. 0.0 mA
4. 6.0 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 जेनर डायोड में धारा का लगभग मान होगा :



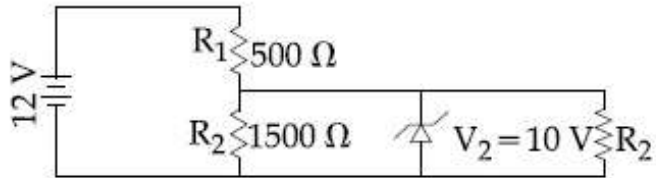
Options :

1. 6.7 mA
2. 4.0 mA
3. 0.0 mA
4. 6.0 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

આપેલ પરિપથમાં ઝેનર ડાયોડમાંનો પ્રવાહ _____ ની નજીકનો હશે.



Options :

1. 6.7 mA
2. 4.0 mA
3. 0.0 mA
4. 6.0 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

An amplitude modulated signal is given by $V(t) = 10[1 + 0.3\cos(2.2 \times 10^4 t)]\sin(5.5 \times 10^5 t)$. Here t is in seconds. The sideband frequencies (in kHz) are, [Given $\pi = 22/7$]

Options :

1. 892.5 and 857.5
2. 89.25 and 85.75
3. 178.5 and 171.5
4. 1785 and 1715

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 आयाम मॉडुलित सिग्नल निम्नवत् दिया गया है
 $V(t) = 10[1 + 0.3\cos(2.2 \times 10^4 t)]\sin(5.5 \times 10^5 t)$
 यहाँ t सेकण्ड में है। पार्श्व बैंड की आवृत्तियाँ
 (kHz में) होंगी : [दिया है $\pi = 22/7$]

Options :

1. 892.5 तथा 857.5
2. 89.25 तथा 85.75
3. 178.5 तथा 171.5
4. 1785 तथा 1715

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

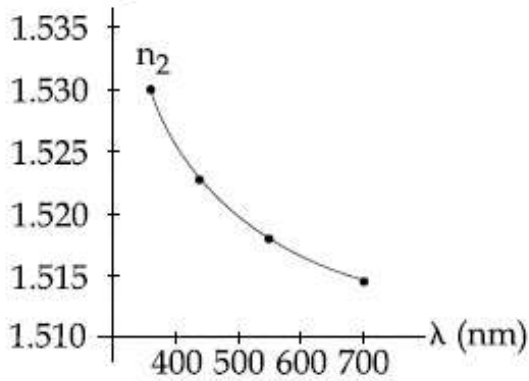
એક એમ્પલીટ્યૂડ મોડ્યુલેટેડ સિગ્નલને
 $V(t) = 10[1 + 0.3\cos(2.2 \times 10^4 t)]\sin(5.5 \times 10^5 t)$
 વડે આપવામાં આવે છે. અહીં t સેકન્ડમાં છે. સાઇડ
 બેન્ડ આવૃત્તિઓ (kHz માં) _____ હશે.
 [$\pi = 22/7$ આપેલ છે.]

Options :

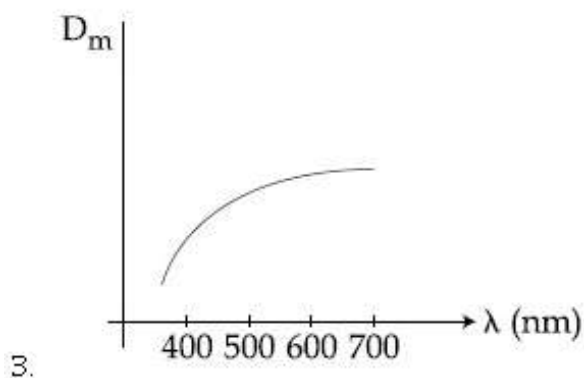
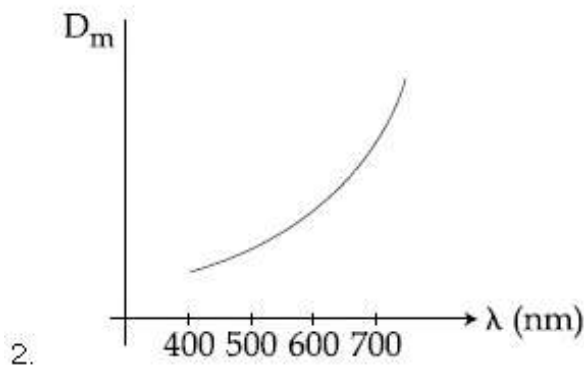
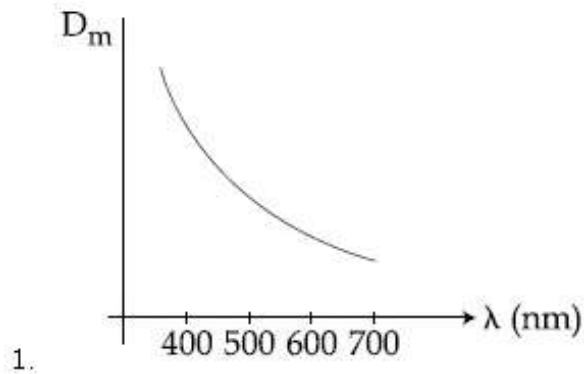
1. 892.5 અને 857.5
2. 89.25 અને 85.75
3. 178.5 અને 171.5
4. 1785 અને 1715

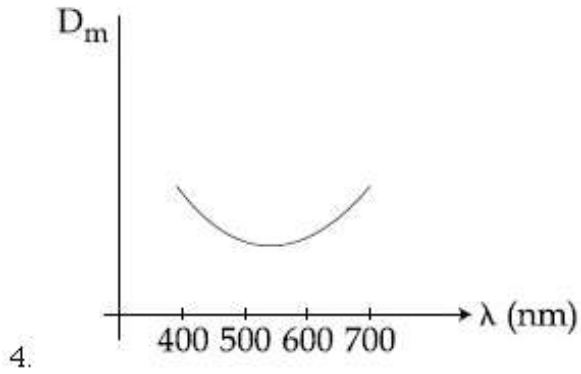
Correct Marks : 4 Wrong Marks : 1

The variation of refractive index of a crown glass thin prism with wavelength of the incident light is shown. Which of the following graphs is the correct one, if D_m is the angle of minimum deviation ?



Options :

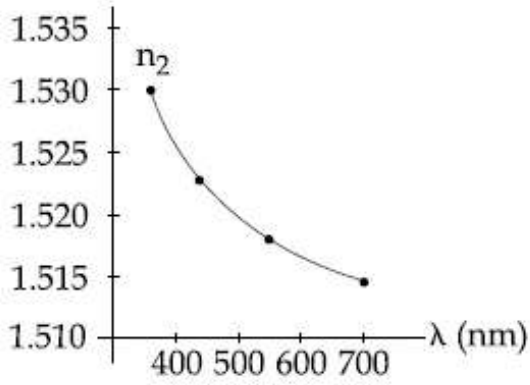




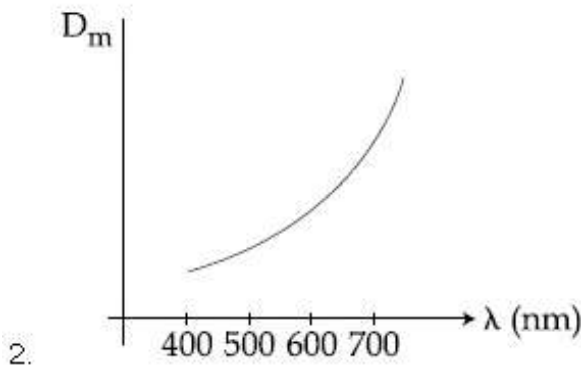
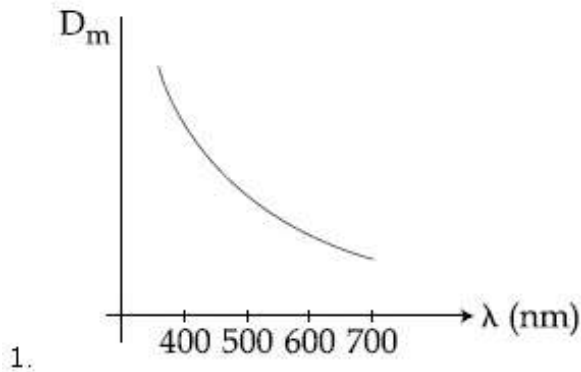
Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

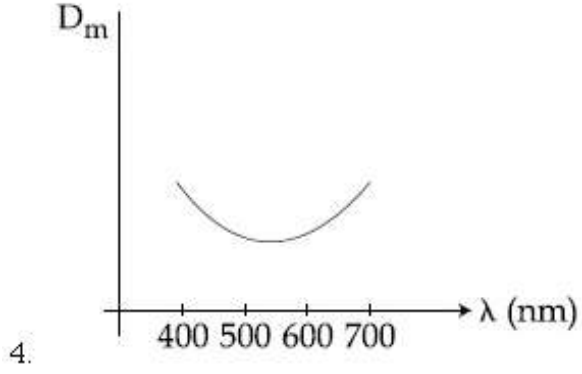
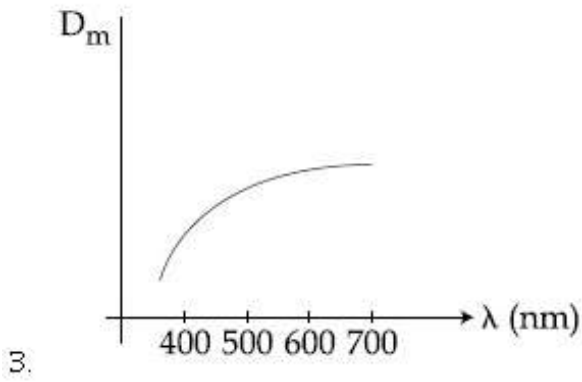
Correct Marks : 4 Wrong Marks : 1

क्राउन काँच के प्रिज्म के अपवर्तनांक परिवर्तन को आपतित प्रकाश की तरंगदैर्घ्य के साथ दिखाया गया है। यदि D_m न्यूनतम विचलन कोण है तो निम्न में से कौन सा ग्राफ सही है ?



Options :

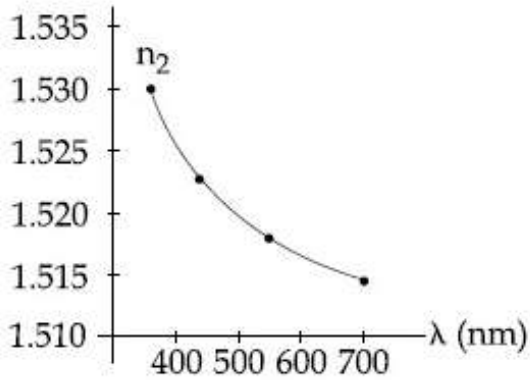




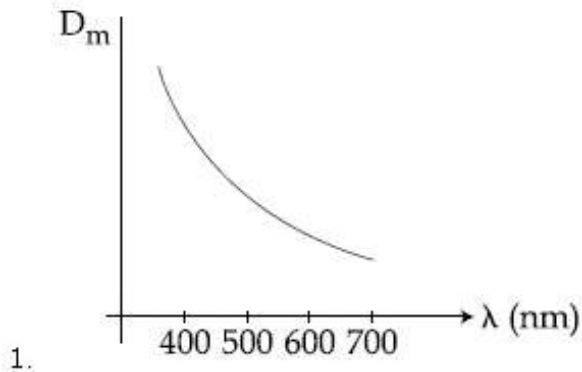
Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

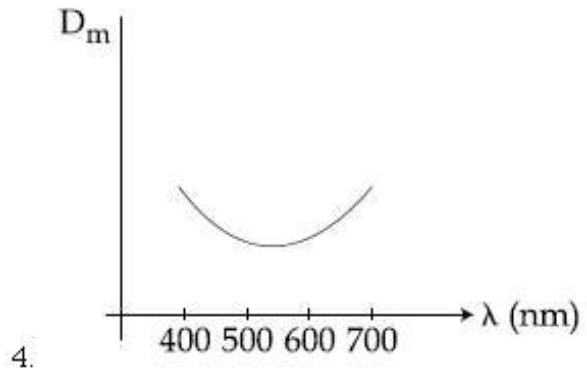
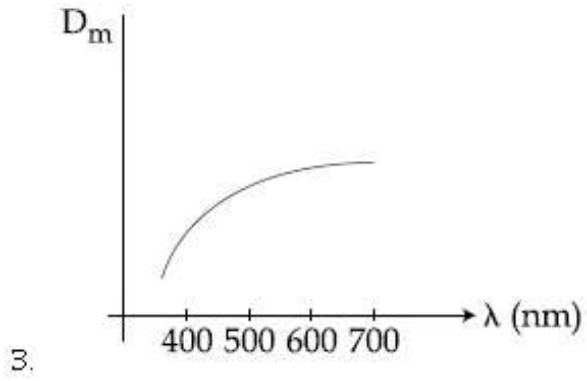
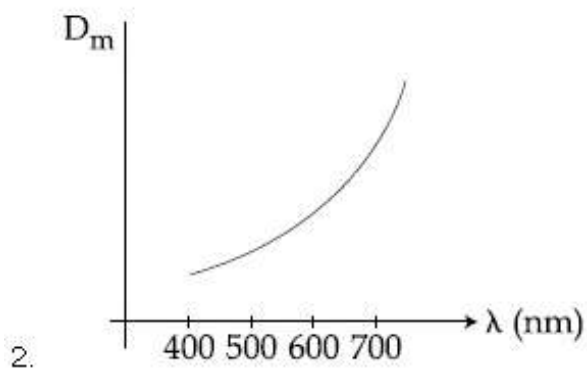
Correct Marks : 4 Wrong Marks : 1

કાંઈન જ્વાસના પાતળા પ્રિઝમના વક્રીભવનાંકનો આપાત પ્રકાશની તરંગલંબાઈ સાથેનો સંબંધ દર્શાવેલ છે. જો D_m એ લઘુત્તમ વિચલન છે, તો નીચેમાંથી કયો આલેખ સાચો છે?



Options :

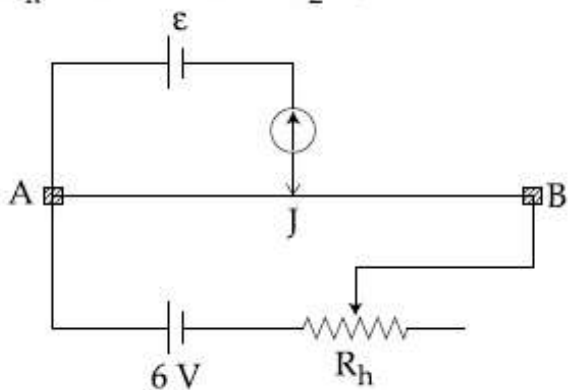




Question Number : 30 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The resistance of the meter bridge AB in given figure is 4Ω . With a cell of emf $\varepsilon = 0.5 \text{ V}$ and rheostat resistance $R_h = 2 \Omega$ the null point is obtained at some point J. When the cell is replaced by another one of emf $\varepsilon = \varepsilon_2$ the same null point J is found for $R_h = 6 \Omega$. The emf ε_2 is, :



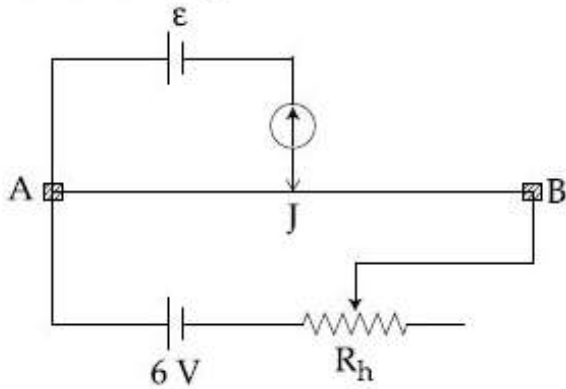
Options :

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

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

Correct Marks : 4 Wrong Marks : 1

दिये गये परिपथ में मीटर सेतु AB का प्रतिरोध $4\ \Omega$ है। वि.वा.बल $\varepsilon = 0.5\ \text{V}$ तथा धारा नियंत्रक के प्रतिरोध $R_h = 2\ \Omega$ के लिये शून्य बिन्दु J पर प्राप्त होता है। जब इस सेल को वि.वा.बल $\varepsilon = \varepsilon_2$ की सेल से बदल देते हैं तो $R_h = 6\ \Omega$ के लिये शून्य बिन्दु पुनः J पर मिलता है। वि.वा.बल ε_2 होगा :



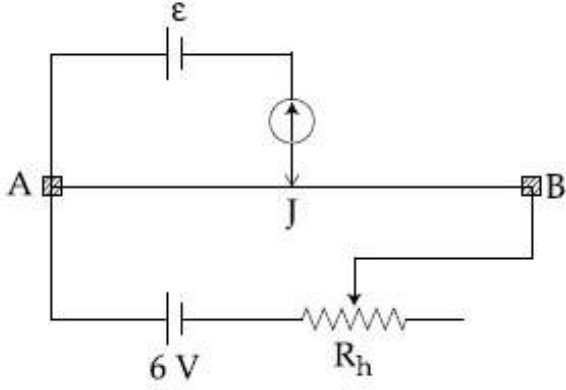
Options :

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

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

Correct Marks : 4 Wrong Marks : 1

આપેલ આકૃતિમાં મીટરબ્રીજ AB નો અવરોધ 4Ω છે. $\mathcal{E} = 0.5 \text{ V}$ જેટલું emf ધરાવતા કોષ અને $R_h = 2 \Omega$ ધરાવતા રિહ્યોસ્ટેટ સાથે કોઈક બિંદુ J પાસે તટસ્થ બિંદુ મળે છે. જ્યારે કોષને બીજા $\mathcal{E} = \mathcal{E}_2$ જેટલા emf ધરાવતા કોષથી બદલવામાં આવે છે ત્યારે $R_h = 6 \Omega$ માટે J બિંદુ આગળ જ તટસ્થ બિંદુ મળે છે \mathcal{E}_2 emf _____ થશે.



Options :

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

Section Id :

Section Number :

Section type :

Mandatory or Optional:

Number of Questions:

Number of Questions to be attempted:

Section Marks:

Display Number Panel:

Group All Questions:

Chemistry

416529131

2

Online

Mandatory

30

30

120

Yes

No

Sub-Section Number:

1

Sub-Section Id:

416529140

Question Shuffling Allowed :

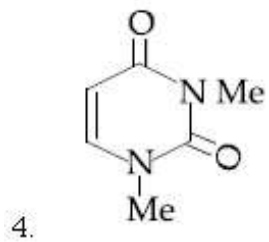
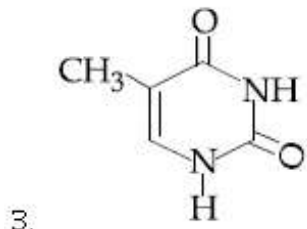
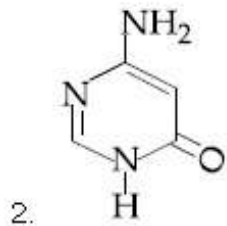
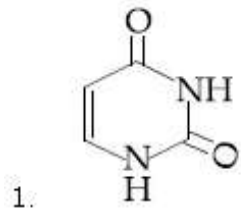
Yes

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

Among the following compounds, which one is found in RNA ?

Options :



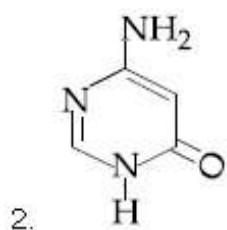
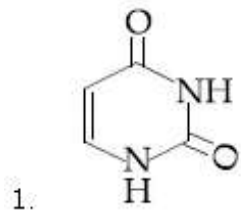
Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

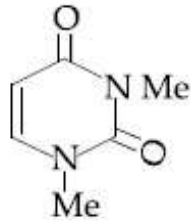
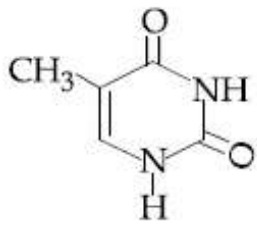
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંયોજનો પૈકી કયો RNA માં જોવા મળે

છે?

Options :



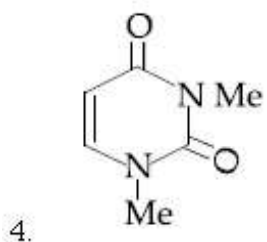
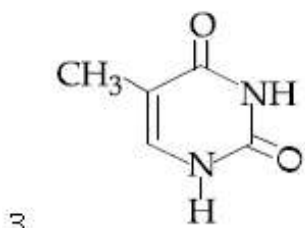
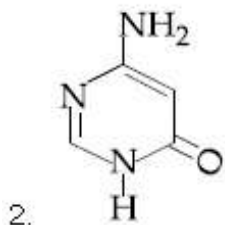
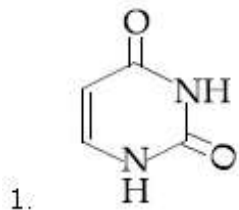


Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित यौगिकों में से कौन सा एक RNA में पाया जाता है?

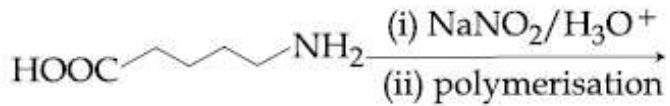
Options :



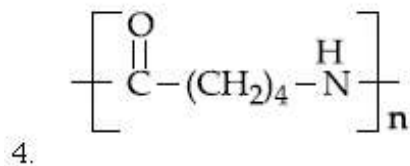
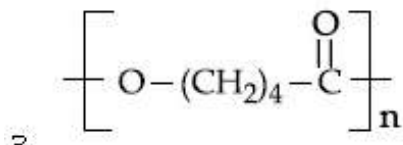
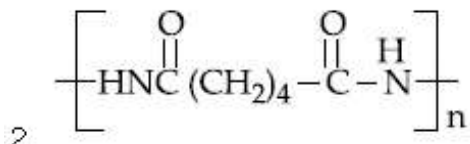
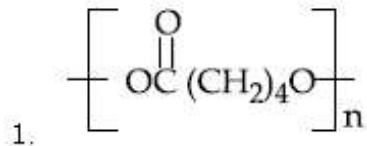
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The polymer obtained from the following reactions is :



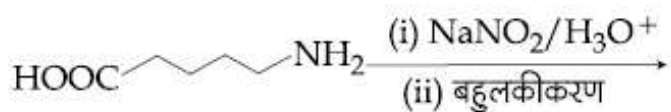
Options :



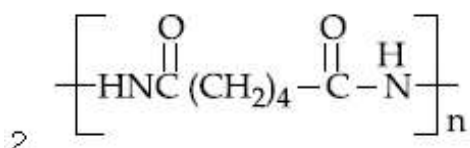
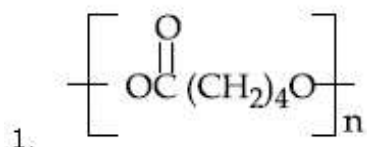
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

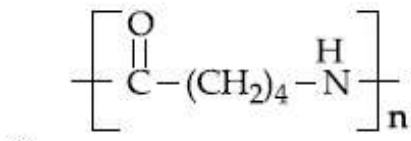
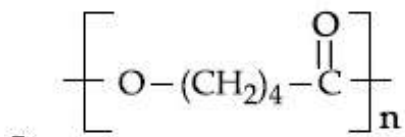
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं से प्राप्त होने वाला बहुलक है :



Options :

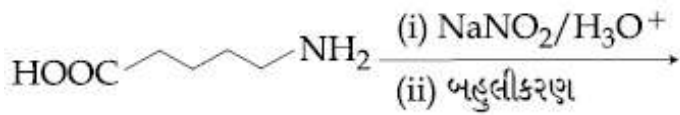




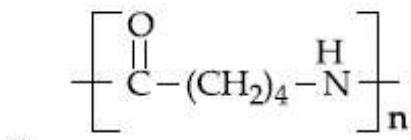
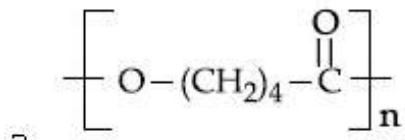
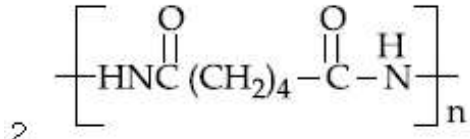
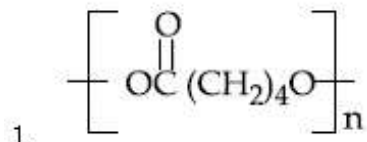
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયા બાદ મળતો બહુલક (polymer) શોધો :



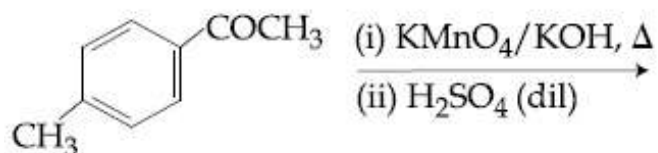
Options :



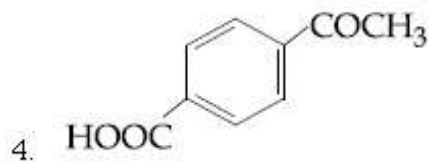
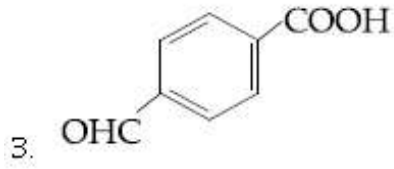
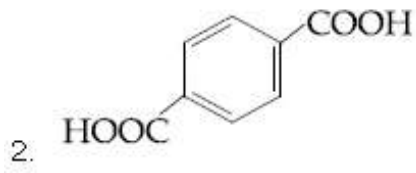
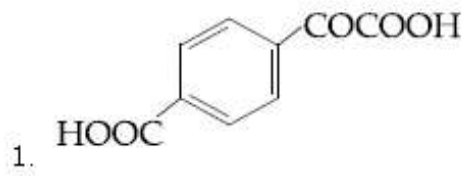
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is



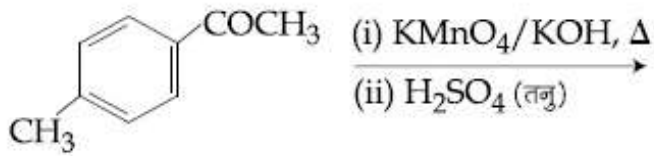
Options :



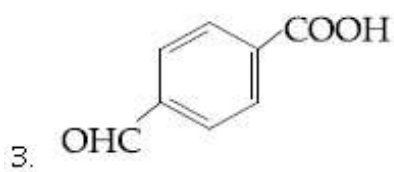
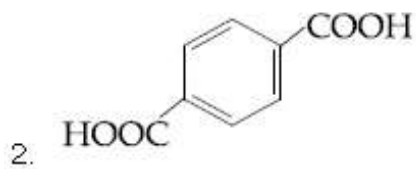
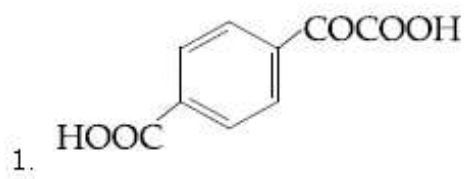
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



Options :

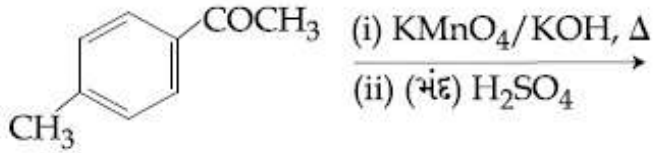




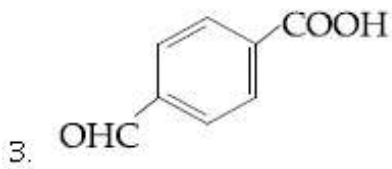
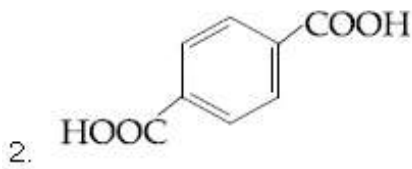
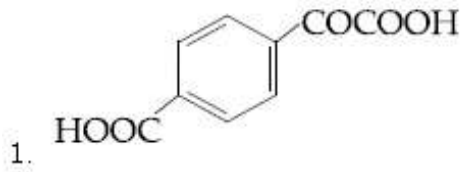
Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?



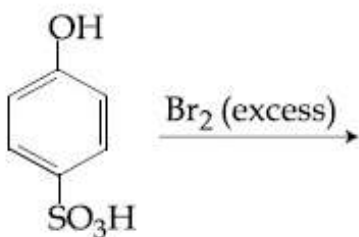
Options :



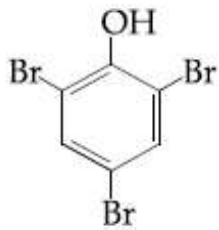
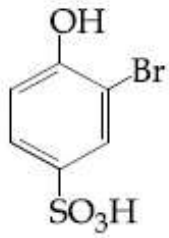
Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



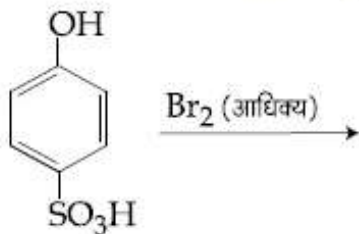
Options :



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 का मुख्य उत्पाद है :



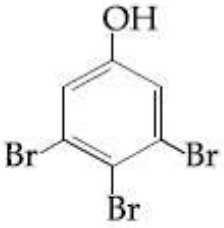
Options :



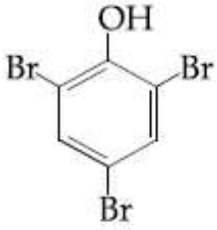
2.



3.



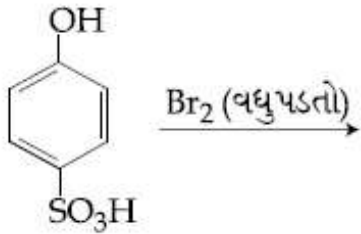
4.



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

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?

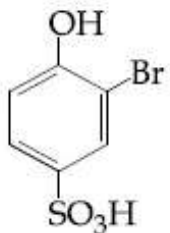


Options :

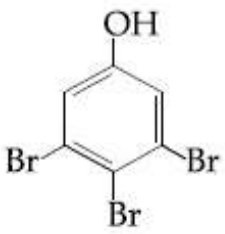
1.



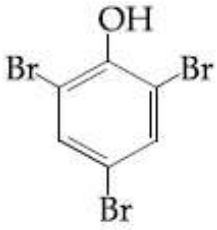
2.



3.



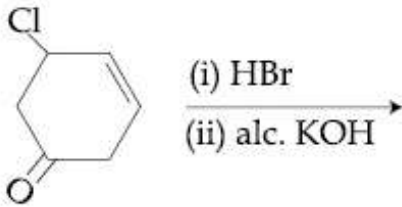
4.



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

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

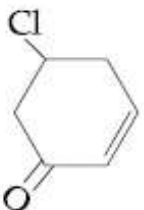


Options :

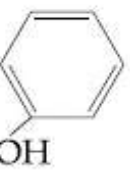
1.



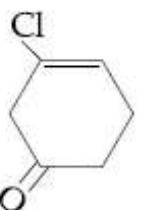
2.



3.



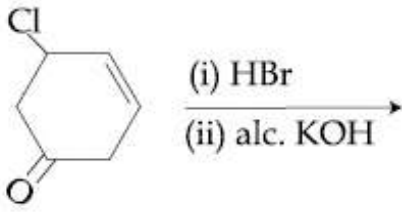
4.



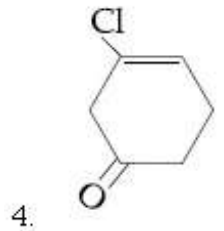
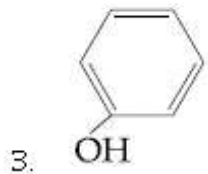
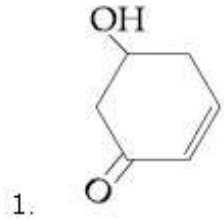
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



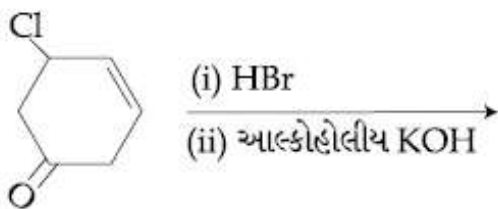
Options :



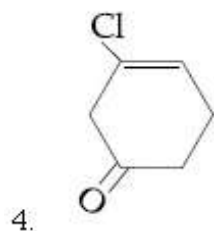
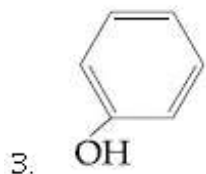
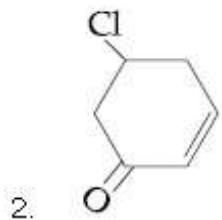
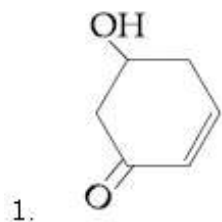
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे आपेती प्रक्रियानी मुख्य नीपण शोधो ?



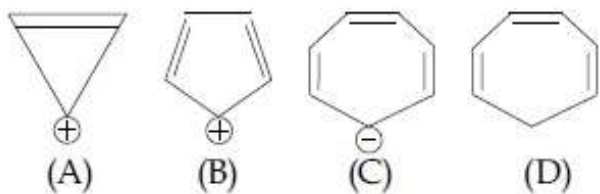
Options :



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

Which compound (s) out of the following is/are not aromatic ?



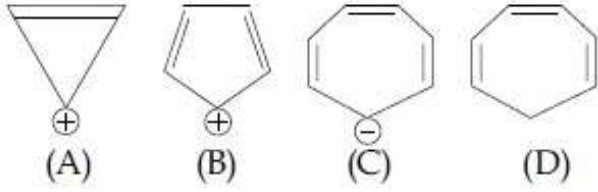
Options :

1. (B)
2. (A) and (C)
3. (B), (C) and (D)
4. (C) and (D)

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

निम्नलिखित में से कौन सा/से यौगिक ऐरोमैटिक नहीं है/हैं?



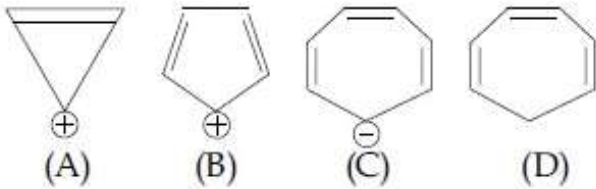
Options :

1. (B)
2. (A) तथा (C)
3. (B), (C) तथा (D)
4. (C) तथा (D)

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

नीचे आपेला संयोजन (नो) पैकी क्यो (या) ऐरोमैटिक नहीं?



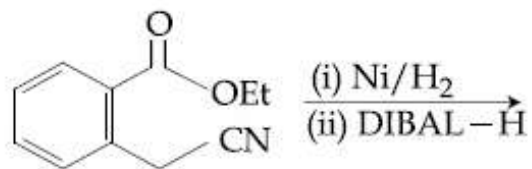
Options :

1. (B)
2. (A) अने (C)
3. (B), (C) अने (D)
4. (C) अने (D)

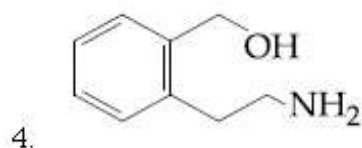
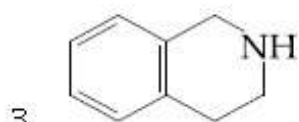
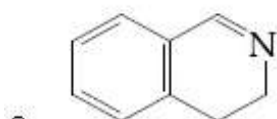
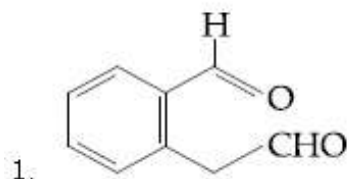
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



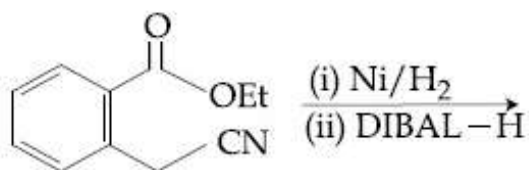
Options :



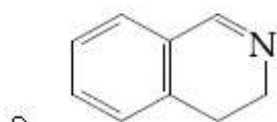
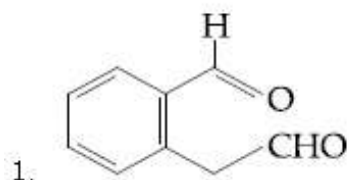
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

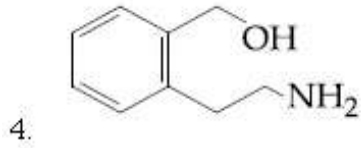
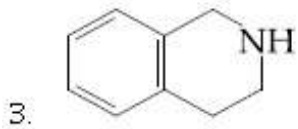
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया से प्राप्त होनेवाला मुख्य उत्पाद है :



Options :

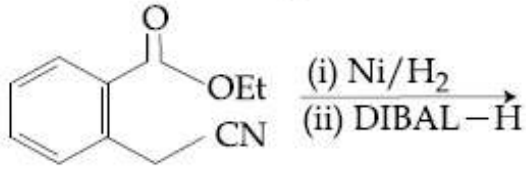




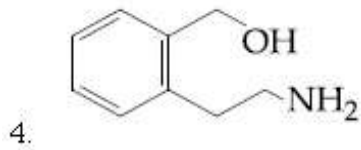
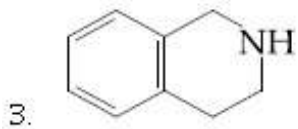
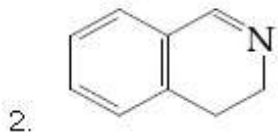
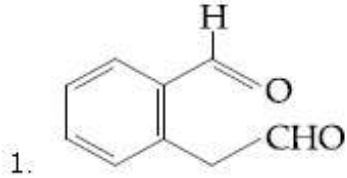
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો ?



Options :



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

Correct Marks : 4 Wrong Marks : 1

The correct match between items I and II is :

Item - I (Mixture)	Item - II (Separation method)
(A) H_2O : Sugar	(P) Sublimation
(B) H_2O : Aniline	(Q) Recrystallization
(C) H_2O : Toluene	(R) Steam distillation
	(S) Differential extraction

Options :

1. (A)→(R); (B)→(P); (C)→(S)
2. (A)→(S); (B)→(R); (C)→(P)
3. (A)→(Q); (B)→(R); (C)→(S)
4. (A)→(Q); (B)→(R); (C)→(P)

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

मदों I तथा II के बीच सही सुमेल है :

मद I (मिश्रण)	मद II (पृथक्करण विधि)
(A) H_2O : शर्करा	(P) ऊर्ध्वपातन
(B) H_2O : एनिलीन	(Q) पुनः क्रिस्टलन
(C) H_2O : टॉलूईन	(R) भाप आसवन
	(S) प्रभाजी आसवन

Options :

1. (A)→(R); (B)→(P); (C)→(S)
2. (A)→(S); (B)→(R); (C)→(P)
3. (A)→(Q); (B)→(R); (C)→(S)
4. (A)→(Q); (B)→(R); (C)→(P)

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

સુચિ (I) અને સુચિ (II) સાથે યોગ્ય રીતે જોડો

સુચિ I

સુચિ II

(મિશ્રણ)

(અલગીકરણ પદ્ધતી)

- | | |
|-----------------------|--------------------|
| (A) H_2O : શર્કરા | (P) ઊર્ધ્વચાતન |
| (B) H_2O : એનિલીન | (Q) સ્ફટિકીકરણ |
| (C) H_2O : ટોલ્યુઈન | (R) વરાળ નિસ્કંદન |
| | (S) વિકલ નિષ્કર્ષણ |

Options :

1. (A)→(R); (B)→(P); (C)→(S)
2. (A)→(S); (B)→(R); (C)→(P)
3. (A)→(Q); (B)→(R); (C)→(S)
4. (A)→(Q); (B)→(R); (C)→(P)

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

Correct Marks : 4 Wrong Marks : 1

The correct match between item (I) and item (II) is :

Item - I

Item - II

- | | |
|-------------------|--------------------|
| (A) Norethindrone | (P) Anti-biotic |
| (B) Ofloxacin | (Q) Anti-fertility |
| (C) Equanil | (R) Hypertension |
| | (S) Analgesics |

Options :

1. (A)→(R); (B)→(P); (C)→(S)
2. (A)→(R); (B)→(P); (C)→(R)
3. (A)→(Q); (B)→(R); (C)→(S)
4. (A)→(Q); (B)→(P); (C)→(R)

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

मदों (I) तथा (II) के बीच सही सुमेल है :

मद I	मद II
(A) नॉरएथिनड्रान	(P) प्रतिजैविक
(B) आफ्लोक्सासिन	(Q) प्रतिजनन क्षमता
(C) इक्वैनिल	(R) अतितनाव
	(S) पीड़ाहारी

Options :

1. (A)→(R); (B)→(P); (C)→(S)

2. (A)→(R); (B)→(P); (C)→(R)

3. (A)→(Q); (B)→(R); (C)→(S)

4. (A)→(Q); (B)→(P); (C)→(R)

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

सुधि (I) अने सुधि (II) साथे योग्य रीते जोडो

सुधि I	सुधि II
(A) नोरथिन्ड्रोन	(P) प्रतिजैव द्रव्यो
(B) ओक्लोकसासिन	(Q) गर्भनिरोधक
(C) थक्वानिल	(R) रक्तदाह रोधी
	(S) वेदनाहर

Options :

1. (A)→(R); (B)→(P); (C)→(S)

2. (A)→(R); (B)→(P); (C)→(R)

3. (A)→(Q); (B)→(R); (C)→(S)

4. (A)→(Q); (B)→(P); (C)→(R)

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

Correct Marks : 4 Wrong Marks : 1

An organic compound is estimated through Dumus method and was found to evolve 6 moles of CO_2 , 4 moles of H_2O and 1 mole of nitrogen gas. The formula of the compound is :

Options :

1. $C_{12}H_8N_2$
2. $C_{12}H_8N$
3. $C_6H_8N_2$
4. C_6H_8N

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

Correct Marks : 4 Wrong Marks : 1

एक कार्बनिक यौगिक का ड्यूमा विधि से आकलन करने पर पाया गया कि 6 मोल CO_2 , 4 मोल H_2O तथा 1 मोल नाइट्रोजन उत्सर्जित होते हैं। इस यौगिक का सूत्र है :

Options :

1. $C_{12}H_8N_2$
2. $C_{12}H_8N$
3. $C_6H_8N_2$
4. C_6H_8N

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

Correct Marks : 4 Wrong Marks : 1

એક કાર્બનિક પદાર્થનું ડ્યુમાસ પદ્ધતી વડે પરીમાપન કરતા 6 મોલ CO_2 , 4 મોલ H_2O અને 1 મોલ નાઇટ્રોજન વાયુ ઉદ્ભવે છે તેમ માલૂમ પડ્યું. તો સંયોજનું સૂત્ર શોધો

Options :

1. $C_{12}H_8N_2$
2. $C_{12}H_8N$
3. $C_6H_8N_2$
4. C_6H_8N

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 correct order of the atomic radii of C, Cs, Al, and S is :

Options :

1. $S < C < Cs < Al$
2. $C < S < Al < Cs$
3. $C < S < Cs < Al$
4. $S < C < Al < Cs$

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

C, Cs, Al एवं S के परमाण्वीय त्रिज्याओं का सही अनुक्रम है :

Options :

1. $S < C < Cs < Al$
2. $C < S < Al < Cs$
3. $C < S < Cs < Al$
4. $S < C < Al < Cs$

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

C, Cs, Al અને S ની પરમાણ્વિય ત્રિજ્યાનો સાચો ક્રમ શોધો?

Options :

1. $S < C < Cs < Al$
2. $C < S < Al < Cs$
3. $C < S < Cs < Al$
4. $S < C < Al < Cs$

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

Match the ores (column A) with the metals (column B) :

(Column A)	(Column B)
Ores	Metals
(I) Siderite	(a) Zinc
(II) Kaolinite	(b) Copper
(III) Malachite	(c) Iron
(IV) Calamine	(d) Aluminium

Options :

- (I) - (a); (II) - (b); (III) - (c); (IV) - (d)
- (I) - (c); (II) - (d); (III) - (b); (IV) - (a)
- (I) - (b); (II) - (c); (III) - (d); (IV) - (a)
- (I) - (c); (II) - (d); (III) - (a); (IV) - (b)

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

अयस्कों (कालम A) को धातुओं (कालम B) के साथ सुमेलित कीजिए :

(कालम A)	(कालम B)
अयस्क	धातु
(I) सिडेराइट	(a) जिंक
(II) केओलिनाइट	(b) कॉपर
(III) मैलेकाइट	(c) आयरन
(IV) कैलामाइन	(d) एल्यूमीनियम

Options :

- (I) - (a); (II) - (b); (III) - (c); (IV) - (d)
- (I) - (c); (II) - (d); (III) - (b); (IV) - (a)
- (I) - (b); (II) - (c); (III) - (d); (IV) - (a)
- (I) - (c); (II) - (d); (III) - (a); (IV) - (b)

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

સ્તંભ A માં આપેલા અયસ્કો ને સ્તંભ B માં આપેલી ધાતુ સાથે યોગ્ય રીતે જોડો :

(સ્તંભ A)	(સ્તંભ B)
અયસ્ક	ધાતુ
(I) સેડેરાઇટ	(a) ઝિંક
(II) કાઉલિનાઇટ	(b) કોપર
(III) મેલેચાઇટ	(c) આર્ચન
(IV) કેલેમાઇન	(d) એલ્યુમિનિયમ

Options :

- (I) - (a); (II) - (b); (III) - (c); (IV) - (d)
- (I) - (c); (II) - (d); (III) - (b); (IV) - (a)
- (I) - (b); (II) - (c); (III) - (d); (IV) - (a)
- (I) - (c); (II) - (d); (III) - (a); (IV) - (b)

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

NaH એક ઉદાહરણ છે :

Options :

- ધાત્વિક હાઇડ્રાઇડ કા
- આણ્વિક હાઇડ્રાઇડ કા
- લવણ હાઇડ્રાઇડ કા
- ઇલેક્ટ્રોન-ધની હાઇડ્રાઇડ કા

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

NaH એક કોનું ઉદાહરણ છે?

Options :

- ધાત્વીય હાઇડ્રાઇડ
- આણ્વીય હાઇડ્રાઇડ

3. ક્ષારીય હાઇડ્રાઇડ

4. ઇલેક્ટ્રોન સમૃદ્ધ હાઇડ્રાઇડ

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

NaH is an example of :

Options :

1. metallic hydride
2. molecular hydride
3. saline hydride
4. electron-rich hydride

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

Correct Marks : 4 Wrong Marks : 1

The correct statements among (a) to (d) regarding H_2 as a fuel are :

- (a) It produces less pollutants than petrol.
- (b) A cylinder of compressed dihydrogen weighs ~30 times more than a petrol tank producing the same amount of energy.
- (c) Dihydrogen is stored in tanks of metal alloys like $NaNi_5$.
- (d) On combustion, values of energy released per gram of liquid dihydrogen and LPG are 50 and 142 kJ, respectively.

Options :

1. (a) and (c) only
2. (b), (c) and (d) only
3. (b) and (d) only
4. (a), (b) and (c) only

Correct Marks : 4 Wrong Marks : 1

ईंधन के रूप में H_2 के बारे में, (a) से (d) में से सही कथन हैं :

- (a) यह पेट्रोल की अपेक्षा कम प्रदूषकों को बनाता है।
- (b) उसी मात्रा की ऊर्जा उत्पन्न करने के लिए एक पेट्रोल टैंक की तुलना में एक संपीडित डाइहाइड्रोजन का सिलिंडर ~30 गुना अधिक भारी होता है।
- (c) डाइहाइड्रोजन को $NaNi_5$ की तरह के धातु मिश्रण के टैंक में रखा जाता है।
- (d) दहन के उपरांत, प्रति ग्राम द्रवित डाइहाइड्रोजन तथा LPG से उत्सर्जित ऊर्जा के मान क्रमशः 50 तथा 142 kJ हैं।

Options :

- 1. (a) तथा (c) मात्र
- 2. (b), (c) तथा (d) मात्र
- 3. (b) तथा (d) मात्र
- 4. (a), (b) तथा (c) मात्र

Correct Marks : 4 Wrong Marks : 1

H_2 માટે એક બળતણ તરીકે નીચે આપેલા વિધાનો પૈકી

- (a) થી (d) પૈકી કયા વિધાનો સાચા છે?
- (a) પેટ્રોલ કરતા ઓછા પ્રદૂષકો પૈદા કરે છે.
- (b) સંકોચિત ડાયહાઇડ્રોજન નો એક બાટલો પેટ્રોલની ટાંકી કરતા વજનમાં ~30 ગણો વધારે હોય છે જે સરખા જથ્થાની શક્તિ ઉત્પન્ન કરે છે.
- (c) ડાયહાઇડ્રોજનને $NaNi_5$ જેવી મિશ્ર ધાતુની ટાંકીમાં સંગ્રહ કરવામાં આવે છે.
- (d) દહન કરતા, પ્રવાહી ડાયહાઇડ્રોજન અને LPG પ્રતિ ગ્રામે અનુક્રમે 50 અને 142 kJ શક્તિ મુક્ત કરે છે.

Options :

1. ફક્ત (a) અને (c)
2. ફક્ત (b), (c) અને (d)
3. ફક્ત (b) અને (d)
4. ફક્ત (a), (b) અને (c)

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 amphoteric hydroxide is :

Options :

1. $\text{Be}(\text{OH})_2$
2. $\text{Mg}(\text{OH})_2$
3. $\text{Ca}(\text{OH})_2$
4. $\text{Sr}(\text{OH})_2$

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

Correct Marks : 4 Wrong Marks : 1

उभयधर्मी हाइड्रॉक्साइड है :

Options :

1. $\text{Be}(\text{OH})_2$
2. $\text{Mg}(\text{OH})_2$
3. $\text{Ca}(\text{OH})_2$
4. $\text{Sr}(\text{OH})_2$

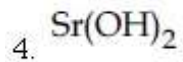
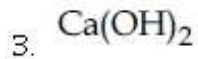
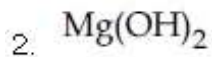
Question Number : 45 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

उभयगुणी हाइड્રોક્સાઇડ શોધો ?

Options :

1. $\text{Be}(\text{OH})_2$

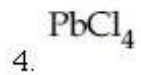
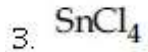
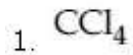


Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The chloride that CANNOT get hydrolysed is :

Options :

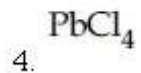


Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्लोराइड जिसका जल-अपघटन नहीं हो सकता है, वह है :

Options :

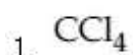


Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे आपसे पैकी कयो क्लोराइड जलविभाजन पामी शकतो नथी?

Options :



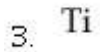
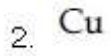


Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The element that usually does NOT show variable oxidation states is :

Options :

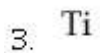
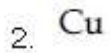


Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सामान्य रूप से परिवर्तनीय आक्सीकरण अवस्था नहीं प्रदर्शित करने वाला तत्व है :

Options :

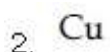


Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

तत्व जे साधारण रीते यलित ओक्सिडेशन अवस्था दर्शावतो नथी ते शोधो?

Options :



3. Ti

4. V

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

Match the metals (column I) with the coordination compound(s)/enzyme(s) (column II) :

(column I)	(column II)
Metals	Coordination compound(s)/enzyme(s)
(A) Co	(i) Wilkinson catalyst
(B) Zn	(ii) Chlorophyll
(C) Rh	(iii) Vitamin B ₁₂
(D) Mg	(iv) Carbonic anhydrase

Options :

1. (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)
2. (A)-(iv); (B)-(iii); (C)-(i); (D)-(ii)
3. (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)
4. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

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

धातुओं (कालम I) को उपसहसंयोजन यौगिकों/एन्जाइम (कालम II) के साथ सुमेलित कीजिए :

(कालम I)	(कालम II)
धातु	उपसहसंयोजन यौगिक/एन्जाइम
(A) Co	(i) विल्किंसन उत्प्रेरक
(B) Zn	(ii) क्लोरोफिल
(C) Rh	(iii) विटामिन B ₁₂
(D) Mg	(iv) कार्बोनिक एन्हाइड्रेज

Options :

1. (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)
2. (A)-(iv); (B)-(iii); (C)-(i); (D)-(ii)

3. (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)

4. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

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

સ્તંભ I માં આપેલી ધાતુઓને સ્તંભ II માં આપેલા સંકિર્ણ સંયોજન (નો)/ઉત્સેચક(કો) ને જોડો.

(સ્તંભ I)	(સ્તંભ II)
ધાતુ	સંકિર્ણ સંયોજન (નો) / ઉત્સેચક (કો)
(A) Co	(i) વિલ્કિનસન ઉદીપક
(B) Zn	(ii) ક્લોરોફિલ
(C) Rh	(iii) વિટામિન B ₁₂
(D) Mg	(iv) કાર્બોનિક એનાહાઇડ્રેસ

Options :

1. (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)

2. (A)-(iv); (B)-(iii); (C)-(i); (D)-(ii)

3. (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)

4. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

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

Correct Marks : 4 Wrong Marks : 1

The concentration of dissolved oxygen (DO) in cold water can go upto :

Options :

1. 8 ppm

2. 10 ppm

3. 14 ppm

4. 16 ppm

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

ठंडे जल में घुलित ऑक्सीजन (DO) के सांद्रता की ऊपरी सीमा हो सकती है :

Options :

1. 8 ppm
2. 10 ppm
3. 14 ppm
4. 16 ppm

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

ठंडा पाणीमां ओगाणेला ओक्सिजन (DO)नुं सांद्रता कया सुधी जई शके ते शोधो?

Options :

1. 8 ppm
2. 10 ppm
3. 14 ppm
4. 16 ppm

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

Correct Marks : 4 Wrong Marks : 1

Peroxyacetyl nitrate (PAN), an eye irritant is produced by :

Options :

1. acid rain
2. organic waste
3. photochemical smog
4. classical smog

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

पराक्सीएसीटाइल नाइट्रेट (PAN), एक नेत्र उत्तेजक, निम्नलिखित में से किससे उत्पन्न होता है?

Options :

1. अम्ल वर्षा
2. कार्बनिक अपशिष्ट
3. प्रकाश रासायनिक धूमकुहा
4. चिरसम्मत धूमकुहा

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

પરાઓક્સિએસીટાઇલ નાઇટ્રેટ (PAN)થી આંખોમા બળતરા થાય છે જે નીચે આપેલા કોના માંથી બને છે?

Options :

1. એસિડ વર્ષા
2. કાર્બનિક કચરો
3. પ્રકાશક્રિયાશીલ ધુમ-ધુમ્મસ
4. પારંપારિક (classical) ધુમ-ધુમ્મસ

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

A 10 mg effervescent tablet containing sodium bicarbonate and oxalic acid releases 0.25 ml of CO_2 at $T = 298.15 \text{ K}$ and $p = 1 \text{ bar}$. If molar volume of CO_2 is 25.0 L under such condition, what is the percentage of sodium bicarbonate in each tablet ?

[Molar mass of $\text{NaHCO}_3 = 84 \text{ g mol}^{-1}$]

Options :

1. 8.4
2. 0.84
3. 16.8

4. 33.6

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

સોડિયમ બાઇકાર્બોનેટ તથા આક્સલેલિક અમ્લ યુક્ત એક 10 mg કા બુદબુદાને વાલા ટૈબલેટ $T = 298.15 \text{ K}$ તથા $p = 1 \text{ bar}$ પર 0.25 ml CO_2 ઉત્સર્જિત કરતા હૈ। એસી દશા મેં, યદિ CO_2 કા મોલર આયતન 25.0 L હૈ, તો પ્રત્યેક ટૈબલેટ મેં સોડિયમ બાઇકાર્બોનેટ કા ક્યા પ્રતિશત હૈ? (NaHCO_3 કા મોલર દ્રવ્યમાન = 84 g mol^{-1})

Options :

1. 8.4

2. 0.84

3. 16.8

4. 33.6

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

298.15 K તાપમાને અને 1 બાર (bar) દબાણે, સોડિયમ બાયકાર્બોનેટ અને ઓક્ઝલિક એસિડ ધરાવતી 10 mg ની ઉભરો આપતી ગોળી 0.25 ml CO_2 ને મુક્ત કરે છે. જો CO_2 નું મોલર કદ 25.0 L હોય તો આ સ્થિતિમાં દરેક ગોળીમાં સોડિયમ કાર્બોનેટના ટકા શોધો? (NaHCO_3 નું મોલર દળ = 84 g mol^{-1})

Options :

1. 8.4

2. 0.84

3. 16.8

4. 33.6

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 solid having density of $9 \times 10^3 \text{ kg m}^{-3}$ forms face centred cubic crystals of edge length $200\sqrt{2} \text{ pm}$. What is the molar mass of the solid ?

[Avogadro constant $\cong 6 \times 10^{23} \text{ mol}^{-1}$, $\pi \cong 3$]

Options :

1. $0.0432 \text{ kg mol}^{-1}$
2. $0.4320 \text{ kg mol}^{-1}$
3. $0.0216 \text{ kg mol}^{-1}$
4. $0.0305 \text{ kg mol}^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

एक ठोस, जिसका घनत्व $9 \times 10^3 \text{ kg m}^{-3}$ है, फलक केन्द्रित घनीय क्रिस्टल बनाता है जिसके कोर की लम्बाई $200\sqrt{2} \text{ pm}$ है। ठोस का मोलर द्रव्यमान क्या है ?
[अवागाद्रो नियतांक $\cong 6 \times 10^{23} \text{ mol}^{-1}$, $\pi \cong 3$]

Options :

1. $0.0432 \text{ kg mol}^{-1}$
2. $0.4320 \text{ kg mol}^{-1}$
3. $0.0216 \text{ kg mol}^{-1}$
4. $0.0305 \text{ kg mol}^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

એક ઘન જેની ઘનતા $9 \times 10^3 \text{ kg m}^{-3}$ છે, તે $200\sqrt{2} \text{ pm}$ ધાર લંબાઈ ધરાવતો ફલક કેન્દ્રીત ઘન સફટિક બનાવે છે. આ ઘનનું મોલર દળ કેટલું ?
[એવોગેડ્રો અચળાંક $\cong 6 \times 10^{23} \text{ mol}^{-1}$, $\pi \cong 3$]

Options :

1. $0.0432 \text{ kg mol}^{-1}$
2. $0.4320 \text{ kg mol}^{-1}$

3. $0.0216 \text{ kg mol}^{-1}$

4. $0.0305 \text{ kg mol}^{-1}$

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

Correct Marks : 4 Wrong Marks : 1

Heat treatment of muscular pain involves radiation of wavelength of about 900 nm. Which spectral line of H-atom is suitable for this purpose ?

$$[R_H = 1 \times 10^5 \text{ cm}^{-1}, h = 6.6 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ ms}^{-1}]$$

Options :

1. Lyman, $\infty \rightarrow 1$

2. Balmer, $\infty \rightarrow 2$

3. Paschen, $5 \rightarrow 3$

4. Paschen, $\infty \rightarrow 3$

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

मांसपेशीय दर्द के ऊष्मा उपचार के लिए लगभग 900 nm के तरंगदैर्घ्य के विकिरण का उपयोग होता है। इसके लिए H-परमाणु की कौनसी स्पेक्ट्रल लाइन उपयुक्त है ?

$$[R_H = 1 \times 10^5 \text{ cm}^{-1}, h = 6.6 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ ms}^{-1}]$$

Options :

1. लाईमैन, $\infty \rightarrow 1$

2. बामर, $\infty \rightarrow 2$

3. पाशन, $5 \rightarrow 3$

4. पाशन, $\infty \rightarrow 3$

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

સ્નાયુઓની પીડાની ગરમીથી થતી સારવારમાં લગભગ 900 nm તરંગલંબાઈના કિરણો વપરાય છે. H-પરમાણુની કઈ વર્ણપટીય રેખા આ હેતુ માટે યોગ્ય છે?

$$[R_H = 1 \times 10^5 \text{ cm}^{-1}, h = 6.6 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ ms}^{-1}]$$

Options :

1. લાઈમન, $\infty \rightarrow 1$
2. બામર, $\infty \rightarrow 2$
3. પા²ચાન, $5 \rightarrow 3$
4. પા²ચાન, $\infty \rightarrow 3$

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

રાસાયનિક અભિક્રિયા $X \rightleftharpoons Y$ કે લિષ, માનક અભિક્રિયા ગિબ્સ ઝૂર્જા તાપ (K મેં) પર નિમ્નલિખિત કી તરહ આશ્રિત હોતી હૈ :

$$\Delta_r G^\circ (\text{in kJ mol}^{-1}) = 120 - \frac{3}{8} T$$

અભિક્રિયા મિશ્રણ કા મુખ્ય સંઘટક T પર હૈ :

Options :

1. X યદિ $T = 350 \text{ K}$
2. Y યદિ $T = 300 \text{ K}$
3. X યદિ $T = 315 \text{ K}$
4. Y યદિ $T = 280 \text{ K}$

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

આપેલી રાસાયણિક પ્રક્રિયા $X = Y$ માટે, પ્રમાણિત પ્રક્રિયા ગિબ્સ શક્તિ તાપમાન T (K માં) પર નીચે મુજબ આધારિત છે.

$$\Delta_r G^\circ \text{ (in kJ mol}^{-1}\text{)} = 120 - \frac{3}{8} T$$

તો T તાપમાને પ્રક્રિયા મિશ્રણનો મુખ્ય ઘટક કયો?

Options :

1. X જો $T = 350$ K
2. Y જો $T = 300$ K
3. X જો $T = 315$ K
4. Y જો $T = 280$ 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

For the chemical reaction $X = Y$, the standard reaction Gibbs energy depends on temperature T (in K) as

$$\Delta_r G^\circ \text{ (in kJ mol}^{-1}\text{)} = 120 - \frac{3}{8} T.$$

The major component of the reaction mixture at T is :

Options :

1. X if $T = 350$ K
2. Y if $T = 300$ K
3. X if $T = 315$ K
4. Y if $T = 280$ 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

Two blocks of the same metal having same mass and at temperature T_1 and T_2 , respectively, are brought in contact with each other and allowed to attain thermal equilibrium at constant pressure. The change in entropy, ΔS , for this process is :

Options :

1. $2C_p \ln \left(\frac{T_1 + T_2}{4T_1T_2} \right)$

2. $C_p \ln \left[\frac{(T_1 + T_2)^2}{4T_1T_2} \right]$

3. $2C_p \ln \left[\frac{T_1 + T_2}{2T_1T_2} \right]$

4. $2C_p \ln \left[\frac{(T_1 + T_2)^{\frac{1}{2}}}{T_1T_2} \right]$

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

Correct Marks : 4 Wrong Marks : 1

एक ही धातु के समान संहति वाले दो ब्लाकों को क्रमशः ताप T_1 तथा T_2 पर परस्पर एक दूसरे के सम्पर्क में लाया गया तथा नियत दाब पर ऊष्मीय साम्य प्राप्त करने दिया गया। इस प्रक्रम में, एन्ट्रॉपी परिवर्तन ΔS है :

Options :

1. $2C_p \ln \left(\frac{T_1 + T_2}{4T_1T_2} \right)$

2. $C_p \ln \left[\frac{(T_1 + T_2)^2}{4T_1T_2} \right]$

3. $2C_p \ln \left[\frac{T_1 + T_2}{2T_1T_2} \right]$

4. $2C_p \ln \left[\frac{(T_1 + T_2)^{\frac{1}{2}}}{T_1T_2} \right]$

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

સરખી ધાતુના સરખા દળ ધરાવતા બે ટુકડાઓનું (બ્લોક) તાપમાન અનુક્રમે T_1 અને T_2 છે, તેમને એક બીજાના સંપર્કમાં લાવવામાં આવે છે અને અચળ દબાણે ઊષ્મીય સંતુલન પ્રાપ્ત કરવા દેવામાં આવે છે આ પ્રક્રિયામાં એન્દ્રોપી ΔS માં થતો ફેરફાર છે.

Options :

1. $2C_p \ln \left(\frac{T_1 + T_2}{4T_1 T_2} \right)$

2. $C_p \ln \left[\frac{(T_1 + T_2)^2}{4T_1 T_2} \right]$

3. $2C_p \ln \left[\frac{T_1 + T_2}{2T_1 T_2} \right]$

4. $2C_p \ln \left[\frac{(T_1 + T_2)^{\frac{1}{2}}}{T_1 T_2} \right]$

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

Correct Marks : 4 Wrong Marks : 1

The freezing point of a diluted milk sample is found to be -0.2°C , while it should have been -0.5°C for pure milk. How much water has been added to pure milk to make the diluted sample ?

Options :

1. 1 cup of water to 2 cups of pure milk

2. 2 cups of water to 3 cups of pure milk

3. 3 cups of water to 2 cups of pure milk

4. 1 cup of water to 3 cups of pure milk

Correct Marks : 4 Wrong Marks : 1

एक तनुकृत दुग्ध प्रतिदर्श का हिमांक -0.2°C पाया गया, जबकि विशुद्ध दुग्ध का हिमांक -0.5°C होना चाहिए। तनुकृत दुग्ध प्रतिदर्श को बनाने के लिए विशुद्ध दुग्ध में कितना जल मिलाया गया है?

Options :

1. 2 कप विशुद्ध दुग्ध में 1 कप जल
2. 3 कप विशुद्ध दुग्ध में 2 कप जल
3. 2 कप विशुद्ध दुग्ध में 3 कप जल
4. 3 कप विशुद्ध दुग्ध में 1 कप जल

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

मंद करेला अेक दूधना नमूनांनुं ढर बिंदु -0.2°C मालुम पडेल छे, न्यारे शुद्ध दूध माटे ते -0.5°C छेवुं ओठतुं एतुं शुद्ध दूधनो मंद नमूनो बनाववा माटे तेमा केटलुं पाएली उभैयुं एतुं ?

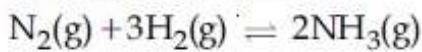
Options :

1. 2 प्याला शुद्ध दूधमां 1 प्यालो पाएलीनो
2. 3 प्याला शुद्ध दूधमां 2 प्यालो पाएलीनो
3. 2 प्याला शुद्ध दूधमां 3 प्यालो पाएलीनो
4. 3 प्याला शुद्ध दूधमां 1 प्यालो पाएलीनो

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

Consider the reaction



The equilibrium constant of the above reaction is K_p . If pure ammonia is left to dissociate, the partial pressure of ammonia at equilibrium is given by (Assume that

$P_{\text{NH}_3} \ll P_{\text{total}}$ at equilibrium)

Options :

1.
$$\frac{K_p^{1/2} P^2}{16}$$

2.
$$\frac{3^{3/2} K_p^{1/2} P^2}{4}$$

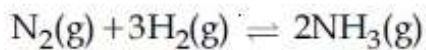
3.
$$\frac{K_p^{1/2} P^2}{4}$$

4.
$$\frac{3^{3/2} K_p^{1/2} P^2}{16}$$

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

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया पर विचार कीजिए :



उपर्युक्त अभिक्रिया का साम्य स्थिरांक K_p है। यदि विशुद्ध अमोनिया को वियोजित होने दिया जाता है, तो साम्यावस्था पर अमोनिया का आंशिक दाब है :

(मान लीजिए साम्यावस्था पर $P_{NH_3} \ll P_{\text{सम्पूर्ण}}$)

Options :

1.
$$\frac{K_p^{1/2} P^2}{16}$$

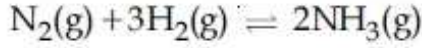
2.
$$\frac{3^{3/2} K_p^{1/2} P^2}{4}$$

3.
$$\frac{K_p^{1/2} P^2}{4}$$

4.
$$\frac{3^{3/2} K_p^{1/2} P^2}{16}$$

Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયા ધ્યાનમાં લો,



ઉપરની પ્રક્રિયાનો સંતુલન અચળાંક K_p છે. જો શુદ્ધ એમોનિયાને વિયોજન માટે છોડવામાં આવે તો સંતુલને એમોનિયાનું આંશિક દબાણ કેટલું ?

(સંતુલને $P_{\text{NH}_3} \ll P_{\text{કુલ}}$ એવું ધારો)

Options :

1. $\frac{K_p^{1/2} P^2}{16}$

2. $\frac{3^{3/2} K_p^{1/2} P^2}{4}$

3. $\frac{K_p^{1/2} P^2}{4}$

4. $\frac{3^{3/2} K_p^{1/2} P^2}{16}$

Correct Marks : 4 Wrong Marks : 1

For the cell $\text{Zn}(\text{s})|\text{Zn}^{2+}(\text{aq})||\text{M}^{x+}(\text{aq})|\text{M}(\text{s})$, different half cells and their standard electrode potentials are given below :

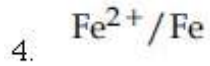
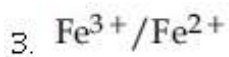
$\text{M}^{x+}(\text{aq})/\text{M}(\text{s})$	$\text{Au}^{3+}(\text{aq})/\text{Au}(\text{s})$	$\text{Ag}^+(\text{aq})/\text{Ag}(\text{s})$	$\text{Fe}^{3+}(\text{aq})/\text{Fe}^{2+}(\text{aq})$	$\text{Fe}^{2+}(\text{aq})/\text{Fe}(\text{s})$
$E^\circ_{\text{M}^{x+}/\text{M}}(\text{V})$	1.40	0.80	0.77	-0.44

If $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$, which cathode will give a maximum value of E°_{cell} per electron transferred ?

Options :

1. Au^{3+}/Au

2. Ag^+/Ag



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

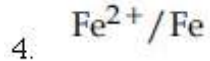
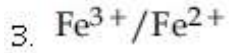
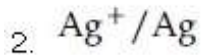
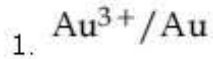
Correct Marks : 4 Wrong Marks : 1

सेल $\text{Zn(s)}|\text{Zn}^{2+}(\text{aq})||\text{M}^{x+}(\text{aq})|\text{M(s)}$ के लिए विभिन्न अर्द्ध-सेल तथा उनके मानक इलेक्ट्रोड विभव नीचे दिये गये हैं

$\text{M}^{x+}(\text{aq})/\text{M(s)}$	$\text{Au}^{3+}(\text{aq})/\text{Au(s)}$	$\text{Ag}^+(\text{aq})/\text{Ag(s)}$	$\text{Fe}^{3+}(\text{aq})/\text{Fe}^{2+}(\text{aq})$	$\text{Fe}^{2+}(\text{aq})/\text{Fe(s)}$
$E^\circ_{\text{M}^{x+}/\text{M}}(\text{V})$	1.40	0.80	0.77	-0.44

यदि $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$, तो प्रति इलेक्ट्रॉन स्थानांतरण के लिए कौन से कैथोड का E°_{cell} सर्वाधिक होगा :

Options :



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

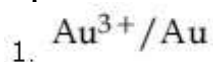
Correct Marks : 4 Wrong Marks : 1

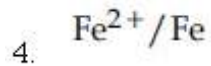
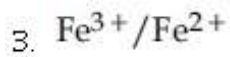
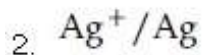
आपेल कोष $\text{Zn(s)}|\text{Zn}^{2+}(\text{aq})||\text{M}^{x+}(\text{aq})|\text{M(s)}$ माटे बुद्धा-बुद्ध अर्धकोषो अने तेमना प्रमाणिता ध्रुव पोटेन्शियल नीचे मुजुय छे.

$\text{M}^{x+}(\text{aq})/\text{M(s)}$	$\text{Au}^{3+}(\text{aq})/\text{Au(s)}$	$\text{Ag}^+(\text{aq})/\text{Ag(s)}$	$\text{Fe}^{3+}(\text{aq})/\text{Fe}^{2+}(\text{aq})$	$\text{Fe}^{2+}(\text{aq})/\text{Fe(s)}$
$E^\circ_{\text{M}^{x+}/\text{M}}(\text{V})$	1.40	0.80	0.77	-0.44

जे $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$ होय तो, क्यो कैथोड प्रति इलेक्ट्रॉन ट्रेन्सर माटे E°_{cell} नुं महत्तम मूल्य आपरो.

Options :



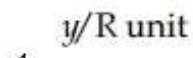
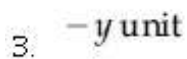
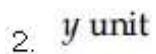
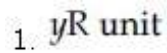


Question Number : 59 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a reaction follows the Arrhenius equation, the plot $\ln k$ vs $1/(RT)$ gives straight line with a gradient $(-y)$ unit. The energy required to activate the reactant is :

Options :

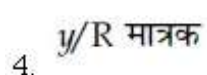
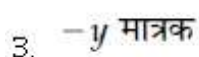
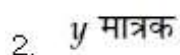
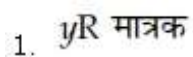


Question Number : 59 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि एक अभिक्रिया आर्हेनियस समीकरण का अनुसरण करती है, तो प्लॉट $\ln k$ vs $1/(RT)$, तो प्रवणता $(-y)$ मात्रक के साथ एक सीधी रेखा देता है। अभिकारकों को सक्रिय करने के लिए आवश्यक ऊर्जा है :

Options :



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

જો એક પ્રક્રિયા આર્હેનિયસના સમીકરણને અનુસરતી હોય તો $\ln k$ વિરુદ્ધ $1/(RT)$ નો આલેખ સીધી રેખા આપશે, જેનો ઢાળ $(-y)$ એકમ હશે પ્રક્રિયકને સક્રિય કરવા જરૂરી શક્તિ કેટલી ?

Options :

1. yR એકમ
2. y એકમ
3. $-y$ એકમ
4. y/R એકમ

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

An example of solid sol is :

Options :

1. Gem stones
2. Paint
3. Butter
4. Hair cream

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

ઠોસ સૉલ કિસકા એક ઉદાહરણ હૈ ?

Options :

1. જેમ સ્ટોન
2. પેન્ટ
3. મલ્ખન
4. હેયર ક્રીમ

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

ધન સોલનું ઉદાહરણ :

Options :

1. મણિ રત્નો
2. રંગો
3. માખણ
4. વાળ માટેની ક્રિમ

Mathematics

Section Id :	416529132
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529141
Question Shuffling Allowed :	Yes

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

Correct Marks : 4 Wrong Marks : 1

Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = \frac{x}{1+x^2}$,

$x \in \mathbb{R}$. Then the range of f is :

Options :

1. $\mathbb{R} - \left[-\frac{1}{2}, \frac{1}{2}\right]$
2. $\mathbb{R} - [-1, 1]$
3. $(-1, 1) - \{0\}$

$$\left[-\frac{1}{2}, \frac{1}{2}\right]$$

4.

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 $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = \frac{x}{1+x^2}$, $x \in \mathbb{R}$ द्वारा परिभाषित

किया गया है, तो f का परिसर है :

Options :

1. $\mathbb{R} - \left[-\frac{1}{2}, \frac{1}{2}\right]$

2. $\mathbb{R} - [-1, 1]$

3. $(-1, 1) - \{0\}$

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

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

जे $f: \mathbb{R} \rightarrow \mathbb{R}$ जे $f(x) = \frac{x}{1+x^2}$, $x \in \mathbb{R}$ द्वारा

व्याख्यायित विधेय छेय तो f नो विस्तार _____ छे.

Options :

1. $\mathbb{R} - \left[-\frac{1}{2}, \frac{1}{2}\right]$

2. $\mathbb{R} - [-1, 1]$

3. $(-1, 1) - \{0\}$

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

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

Correct Marks : 4 Wrong Marks : 1

If one real root of the quadratic equation $81x^2 + kx + 256 = 0$ is cube of the other root, then a value of k is :

Options :

1. -300
2. 100
3. 144
4. -81

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

Correct Marks : 4 Wrong Marks : 1

यदि द्विघात समीकरण $81x^2 + kx + 256 = 0$ का एक मूल दूसरे मूल का घन (cube) है, तो k का एक मान है :

Options :

1. -300
2. 100
3. 144
4. -81

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

Correct Marks : 4 Wrong Marks : 1

જો દ્વિઘાત સમીકરણ $81x^2 + kx + 256 = 0$ નું એક વાસ્તવિક બીજ બીજા બીજના ઘન જેટલું હોય, તો k ની કિંમત _____ છે.

Options :

1. -300
2. 100
3. 144

4. -81

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

$$\text{Let } \left(-2 - \frac{1}{3}i\right)^3 = \frac{x+iy}{27} \quad (i = \sqrt{-1}), \text{ where}$$

x and y are real numbers, then $y - x$ equals :

Options :

1. 91

2. 85

3. -91

4. -85

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

$$\text{माना } \left(-2 - \frac{1}{3}i\right)^3 = \frac{x+iy}{27} \quad (i = \sqrt{-1}), \text{ जहाँ}$$

x तथा y वास्तविक संख्यायें हैं, तो $y - x$ बराबर है :

Options :

1. 91

2. 85

3. -91

4. -85

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

$$\text{જો } \left(-2 - \frac{1}{3}i\right)^3 = \frac{x+iy}{27} \quad (i = \sqrt{-1}) \text{ જ્યાં } x \text{ અને}$$

y એ વાસ્તવિક સંખ્યાઓ હોય, તો $y - x$
= _____.

Options :

1. 91

2. 85

3. -91

4. -85

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

$$\text{Let } A = \begin{pmatrix} 0 & 2q & r \\ p & q & -r \\ p & -q & r \end{pmatrix}. \text{ If } AA^T = I_3, \text{ then}$$

$|P|$ is :

Options :

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

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

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

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

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

$$\text{माना } A = \begin{pmatrix} 0 & 2q & r \\ p & q & -r \\ p & -q & r \end{pmatrix}. \text{ यदि } AA^T = I_3, \text{ तो}$$

$|P|$ बराबर है :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

ધારોકે $A = \begin{pmatrix} 0 & 2q & r \\ p & q & -r \\ p & -q & r \end{pmatrix}$ છે. જો $AA^T = I_3$

હોય, તો $|p| =$ _____.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

If the system of linear equations

$$2x + 2y + 3z = a$$

$$3x - y + 5z = b$$

$$x - 3y + 2z = c$$

where a, b, c are non-zero real numbers, has more than one solution, then :

Options :

1. $b + c - a = 0$

2. $b - c + a = 0$

3. $b - c - a = 0$

4. $a + b + c = 0$

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

Correct Marks : 4 Wrong Marks : 1

यदि रैखिक समीकरण निकाय

$$2x + 2y + 3z = a$$

$$3x - y + 5z = b$$

$$x - 3y + 2z = c$$

जहाँ a, b, c शून्येतर वास्तविक संख्यायें हैं, के एक से अधिक हल हैं, तो :

Options :

1. $b + c - a = 0$

2. $b - c + a = 0$

3. $b - c - a = 0$

4. $a + b + c = 0$

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

Correct Marks : 4 Wrong Marks : 1

જો સુરેખ સમીકરણ સંહિતિ

$$2x + 2y + 3z = a$$

$$3x - y + 5z = b$$

$$x - 3y + 2z = c$$

જ્યાં a, b, c શૂન્યેતર વાસ્તવિક સંખ્યાઓ છે, ને એક થી વધુ ઉકેલ હોય તો :

Options :

1. $b + c - a = 0$

2. $b - c + a = 0$

3. $b - c - a = 0$

4. $a + b + c = 0$

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

Correct Marks : 4 Wrong Marks : 1

The sum of the real values of x for which the middle term in the binomial expansion

of $\left(\frac{x^3}{3} + \frac{3}{x}\right)^8$ equals 5670 is :

Options :

1. 0
2. 4
3. 6
4. 8

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

x के उन वास्तविक मानों जिनके लिए $\left(\frac{x^3}{3} + \frac{3}{x}\right)^8$ के

द्विपद प्रसार का मध्य पद 5670 है, का योग है :

Options :

1. 0
2. 4
3. 6
4. 8

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

$\left(\frac{x^3}{3} + \frac{3}{x}\right)^8$ ना द्विपदी विस्तारणामां मध्यमपद अराबर

5670 थाय तेवी x नी वास्तविक किमतोनो सर्वाणो _____ छे.

Options :

1. 0

2. 4

3. 6

4. 8

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

Let a_1, a_2, \dots, a_{10} be a G.P. If $\frac{a_3}{a_1} = 25$, then

$\frac{a_9}{a_5}$ equals :

Options :

1. $2(5^2)$

2. $4(5^2)$

3. 5^3

4. 5^4

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

माना a_1, a_2, \dots, a_{10} एक गुणोत्तर श्रेणी है। यदि

$\frac{a_3}{a_1} = 25$, तो $\frac{a_9}{a_5}$ बराबर है :

Options :

1. $2(5^2)$

2. $4(5^2)$

3. 5^3

4. 5^4

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

धरोके a_1, a_2, \dots, a_{10} अे सभगुणोत्तर श्रेणी (G.P.)

छे. अे $\frac{a_3}{a_1} = 25$ होय, तो $\frac{a_9}{a_5} = \underline{\hspace{2cm}}$.

Options :

1. $2(5^2)$
2. $4(5^2)$
3. 5^3
4. 5^4

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

The sum of an infinite geometric series with positive terms is 3 and the sum of the cubes

of its terms is $\frac{27}{19}$. Then the common ratio

of this series is :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

धन पदों की एक अनन्त गुणोत्तर श्रेणी का योग 3 है

तथा इसके पदों के घनों (cubes) का योग $\frac{27}{19}$ है, तो

इस श्रेणी का सार्व अनुपात है :

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

જો ધન પદોવાળી એક અનંત સમગુણોત્તર શ્રેણીનો સરવાળો

3 અને તેના પદોના ધનોનો સરવાળો $\frac{27}{19}$ હોય, તો આ

શ્રેણીનો સામાન્ય ગુણોત્તર _____ છે.

Options :

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

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

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

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

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 r for which
 ${}^{20}C_0 {}^{20}C_0 + {}^{20}C_{r-1} {}^{20}C_1 + {}^{20}C_{r-2} {}^{20}C_2 + \dots$
 $+ {}^{20}C_0 {}^{20}C_r$

is maximum, is :

Options :

1. 11

2. 15

3. 10

4. 20

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

r का वह मान, जिसके लिए
 ${}^{20}C_r {}^{20}C_0 + {}^{20}C_{r-1} {}^{20}C_1 + {}^{20}C_{r-2} {}^{20}C_2 + \dots + {}^{20}C_0 {}^{20}C_r$

अधिकतम है, है :

Options :

1. 11

2. 15

3. 10

4. 20

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

r की कौन सी किंमत माटे
 ${}^{20}C_r {}^{20}C_0 + {}^{20}C_{r-1} {}^{20}C_1 + {}^{20}C_{r-2} {}^{20}C_2 + \dots + {}^{20}C_0 {}^{20}C_r$ अधिकतम थाय?

Options :

1. 11

2. 15

3. 10

4. 20

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 $[x]$ denote the greatest integer less than or equal to x . Then :

$$\lim_{x \rightarrow 0} \frac{\tan(\pi \sin^2 x) + (|x| - \sin(x[x]))^2}{x^2} :$$

Options :

1. equals π
2. equals 0
3. equals $\pi + 1$
4. does not exist

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 $[x], x$ के समान या उससे कम महत्तम पूर्णांक को दर्शाता है, तो

$$\lim_{x \rightarrow 0} \frac{\tan(\pi \sin^2 x) + (|x| - \sin(x[x]))^2}{x^2} :$$

Options :

1. π के बराबर है
2. 0 के बराबर है
3. $\pi + 1$ के बराबर है
4. का अस्तित्व नहीं 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

जे $[x]$ એ x થી નાના અથવા x ને સમાન તમામ પૂર્ણાંકોમાં સૌથી મોટો પૂર્ણાંક દર્શાવે તો

$$\lim_{x \rightarrow 0} \frac{\tan(\pi \sin^2 x) + (|x| - \sin(x[x]))^2}{x^2} :$$

Options :

1. બરાબર π છે.
2. બરાબર 0 છે.
3. બરાબર $\pi + 1$ છે.
4. નું અસ્તિત્વ નથી

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

ચદિ $x \log_e (\log_e x) - x^2 + y^2 = 4$ ($y > 0$), તો

$x = e$ પર $\frac{dy}{dx}$ વરાબર છે :

Options :

1. $\frac{(2e-1)}{2\sqrt{4+e^2}}$

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

3. $\frac{(1+2e)}{2\sqrt{4+e^2}}$

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

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

Correct Marks : 4 Wrong Marks : 1

જો $x \log_e (\log_e x) - x^2 + y^2 = 4$ ($y > 0$) હોય, તો

$x = e$ આગળ $\frac{dy}{dx} = \underline{\hspace{2cm}}$.

Options :

1. $\frac{(2e-1)}{2\sqrt{4+e^2}}$

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

3. $\frac{(1+2e)}{2\sqrt{4+e^2}}$

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

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

Correct Marks : 4 Wrong Marks : 1

If $x \log_e (\log_e x) - x^2 + y^2 = 4$ ($y > 0$), then

$\frac{dy}{dx}$ at $x=e$ is equal to :

Options :

1. $\frac{(2e-1)}{2\sqrt{4+e^2}}$

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

3. $\frac{(1+2e)}{2\sqrt{4+e^2}}$

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

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

Correct Marks : 4 Wrong Marks : 1

Let $f(x) = \begin{cases} -1, & -2 \leq x < 0 \\ x^2 - 1, & 0 \leq x \leq 2 \end{cases}$ and

$g(x) = |f(x)| + f(|x|)$. Then, in the interval $(-2, 2)$, g is :

Options :

1. not continuous

2. not differentiable at one point
3. not differentiable at two points
4. differentiable at all points

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

Correct Marks : 4 Wrong Marks : 1

$$\text{माना } f(x) = \begin{cases} -1, & -2 \leq x < 0 \\ x^2 - 1, & 0 \leq x \leq 2 \end{cases} \text{ तथा}$$

$g(x) = |f(x)| + f(|x|)$, तो अंतराल $(-2, 2)$ में g :

Options :

1. संतत नहीं है
2. एक बिन्दु पर अवकलनीय नहीं है
3. दो बिन्दुओं पर अवकलनीय नहीं है
4. सभी बिन्दुओं पर अवकलनीय है

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

$$\text{धारोके } f(x) = \begin{cases} -1, & -2 \leq x < 0 \\ x^2 - 1, & 0 \leq x \leq 2 \end{cases} \text{ અને}$$

$g(x) = |f(x)| + f(|x|)$ છે. તો અંતરાલ $(-2, 2)$ માં g એ _____

Options :

1. સતત નથી.
2. એક બિંદુ આગળ વિકલનીય નથી
3. બે બિંદુઓ આગળ વિકલનીય નથી
4. બધાજ બિંદુઓ આગળ વિકલનીય છે.

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

Correct Marks : 4 Wrong Marks : 1

The maximum value of the function

$$f(x) = 3x^3 - 18x^2 + 27x - 40 \text{ on the set}$$

$$S = \{x \in \mathbf{R} : x^2 + 30 \leq 11x\} \text{ is :}$$

Options :

1. 122
2. -122
3. 222
4. -222

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

समुच्चय $S = \{x \in \mathbf{R} : x^2 + 30 \leq 11x\}$ पर फलन

$$f(x) = 3x^3 - 18x^2 + 27x - 40 \text{ का अधिकतम मान}$$

है :

Options :

1. 122
2. -122
3. 222
4. -222

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

गणना $S = \{x \in \mathbf{R} : x^2 + 30 \leq 11x\}$ पर विधेय

$$f(x) = 3x^3 - 18x^2 + 27x - 40 \text{ नी महत्तम किंमत}$$

_____ छे.

Options :

1. 122
2. -122

3. 222

4. -222

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

$$\text{If } \int \frac{\sqrt{1-x^2}}{x^4} dx = A(x) \left(\sqrt{1-x^2} \right)^m + C ,$$

for a suitable chosen integer m and a function $A(x)$, where C is a constant of integration, then $(A(x))^m$ equals :

Options :

1. $\frac{1}{9x^4}$

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

3. $\frac{-1}{27x^9}$

4. $\frac{1}{27x^6}$

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

Correct Marks : 4 Wrong Marks : 1

उपयुक्त पूर्णांक m तथा एक फलन $A(x)$ के लिए यदि

$$\int \frac{\sqrt{1-x^2}}{x^4} dx = A(x) \left(\sqrt{1-x^2} \right)^m + C ,$$

जहाँ C एक समाकलन अचर है, तो $(A(x))^m$ बराबर है :

Options :

1. $\frac{1}{9x^4}$

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

3. $\frac{-1}{27x^9}$

4. $\frac{1}{27x^6}$

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

Correct Marks : 4 Wrong Marks : 1

યોગ્ય રીતે પસંદ કરેલ પૂર્ણાંક m અને વિધેય $A(x)$ માટે

$$\int \frac{\sqrt{1-x^2}}{x^4} dx = A(x) \left(\sqrt{1-x^2} \right)^m + C,$$

જ્યાં C એ સંકલનનો અચળાંક હોય, તો $(A(x))^m =$ _____.

Options :

1. $\frac{1}{9x^4}$

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

3. $\frac{-1}{27x^9}$

4. $\frac{1}{27x^6}$

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 the integral $\int_{-2\left[\frac{x}{\pi}\right] + \frac{1}{2}}^2 \frac{\sin^2 x}{\left[\frac{x}{\pi}\right] + \frac{1}{2}} dx$

(where $[x]$ denotes the greatest integer less than or equal to x) is :

Options :

1. $4 - \sin 4$
2. 0
3. 4
4. $\sin 4$

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

समाकल $\int_{-2\left[\frac{x}{\pi}\right] + \frac{1}{2}}^2 \frac{\sin^2 x}{\left[\frac{x}{\pi}\right] + \frac{1}{2}} dx$

(जहाँ $[x]$, x के समान या उससे कम महत्तम पूर्णांक को दर्शाता है) का मान है :

Options :

1. $4 - \sin 4$
2. 0
3. 4
4. $\sin 4$

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

संकलित $\int_{-2\left[\frac{x}{\pi}\right] + \frac{1}{2}}^2 \frac{\sin^2 x}{\left[\frac{x}{\pi}\right] + \frac{1}{2}} dx$ नी किमत _____

छे.

(ज्यां $[x]$ अे x थी नाना अथवा x ने समान तमाम पूर्णांकीमां सौथी भोटो पूर्णांक द्दर्शावे छे.)

Options :

1. $4 - \sin 4$
2. 0

3. 4

4. $\sin 4$

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

Correct Marks : 4 Wrong Marks : 1

The area (in sq.units) of the region bounded by the curve $x^2=4y$ and the straight line $x=4y-2$ is :

Options :

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

2. $\frac{9}{8}$

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

4. $\frac{7}{8}$

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

वक्र $x^2=4y$ तथा सरल रेखा $x=4y-2$ द्वारा घिरे क्षेत्र का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

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

2. $\frac{9}{8}$

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

4. $\frac{7}{8}$

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

વક્ર $x^2 = 4y$ અને રેખા $x = 4y - 2$ વડે આવૃત્ત પ્રદેશનું ક્ષેત્રફળ (ચો. એકમમાં) _____ છે.

Options :

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

2. $\frac{9}{8}$

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

4. $\frac{7}{8}$

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

If $y(x)$ is the solution of the differential

equation $\frac{dy}{dx} + \left(\frac{2x+1}{x}\right)y = e^{-2x}$, $x > 0$,

where $y(1) = \frac{1}{2}e^{-2}$, then :

Options :

1. $y(\log_e 2) = \frac{\log_e 2}{4}$

2. $y(\log_e 2) = \log_e 4$

3. $y(x)$ is decreasing in $(0, 1)$

4. $y(x)$ is decreasing in $\left(\frac{1}{2}, 1\right)$

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

यदि अवकल समीकरण

$$\frac{dy}{dx} + \left(\frac{2x+1}{x}\right)y = e^{-2x}, x > 0 \text{ का हल } y(x)$$

है, जहाँ $y(1) = \frac{1}{2}e^{-2}$, तो :

Options :

1. $y(\log_e 2) = \frac{\log_e 2}{4}$

2. $y(\log_e 2) = \log_e 4$

3. $(0, 1)$ में $y(x)$ ह्रासमान है।

4. $\left(\frac{1}{2}, 1\right)$ में $y(x)$ ह्रासमान 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

જો $y(x)$ એ વિકલ સમીકરણ

$$\frac{dy}{dx} + \left(\frac{2x+1}{x}\right)y = e^{-2x}, x > 0 \text{ નો ઉકેલ}$$

લેય, જ્યાં $y(1) = \frac{1}{2}e^{-2}$ તો _____.

Options :

1. $y(\log_e 2) = \frac{\log_e 2}{4}$

2. $y(\log_e 2) = \log_e 4$

3. $y(x)$ એ $(0, 1)$ માં ઘટતું વિધેય છે.

4. $y(x)$ એ $\left(\frac{1}{2}, 1\right)$ માં ઘટતું વિધેય 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 circles with equal radii are intersecting at the points $(0, 1)$ and $(0, -1)$. The tangent at the point $(0, 1)$ to one of the circles passes through the centre of the other circle. Then the distance between the centres of these circles is :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

बराबर त्रिज्या के दो वृत्त, बिन्दुओं $(0, 1)$ तथा $(0, -1)$ पर काटते हैं। इनमें से एक वृत्त के बिन्दु $(0, 1)$ पर स्पर्श रेखा दूसरे वृत्त के केन्द्र से होकर जाती है, तो इन वृत्तों के केन्द्रों के बीच की दूरी है :

Options :

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

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

Correct Marks : 4 Wrong Marks : 1

समान त्रिज्या वाળા બે વર્તુળો એકબીજાને $(0, 1)$ અને $(0, -1)$ બિંદુઓ આગળ છેદે છે. આમાંના એક વર્તુળનો બિંદુ $(0, 1)$ આગળ નો સ્પર્શક, બીજા વર્તુળના કેન્દ્રમાંથી પસાર થાય છે. તો આ વર્તુળોના કેન્દ્રો વચ્ચેનું અંતર _____ છે.

Options :

1. $2\sqrt{2}$

2. 1

3. 2

4. $\sqrt{2}$

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

The straight line $x + 2y = 1$ meets the coordinate axes at A and B. A circle is drawn through A, B and the origin. Then the sum of perpendicular distances from A and B on the tangent to the circle at the origin is :

Options :

1. $4\sqrt{5}$

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

3. $2\sqrt{5}$

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

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

सरल रेखा $x + 2y = 1$ निदेशांक अक्षों को A तथा B पर काटती है। मूल बिन्दु, A तथा B से होकर जाने वाला वृत्त खींचा गया है, तो मूल बिन्दु पर वृत्त की स्पर्श रेखा की A तथा B से लम्बवत दूरियों का योग है :

Options :

1. $4\sqrt{5}$

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

3. $2\sqrt{5}$

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

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

રેખા $x + 2y = 1$ એ યામાક્ષોને A અને B બિંદુએ મળે છે. A, B અને ઉગમબિંદુ માંથી એક વર્તુળ દોરેલ છે. તો A અને B થી આ વર્તુળને ઉગમબિંદુએ દોરેલ સ્પર્શકનાં લંબ અંતરોનો સરવાળો _____ છે.

Options :

1. $4\sqrt{5}$

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

3. $2\sqrt{5}$

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

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

Correct Marks : 4 Wrong Marks : 1

A square is inscribed in the circle $x^2 + y^2 - 6x + 8y - 103 = 0$ with its sides parallel to the coordinate axes. Then the distance of the vertex of this square which is nearest to the origin is :

Options :

1. 6

2. $\sqrt{41}$

3. 13

4. $\sqrt{137}$

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

निदेशांक अक्षों के समान्तर भुजाओं का एक वर्ग, वृत्त $x^2 + y^2 - 6x + 8y - 103 = 0$ के अंतर्गत है, तो इस वर्ग का वह शीर्ष जो मूल बिन्दु के सबसे निकट है, की दूरी है :

Options :

1. 6
2. $\sqrt{41}$
3. 13
4. $\sqrt{137}$

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

જેની બાજુઓ યામાક્ષોને સમાંતર હોય તેવો એક ચોરસ, વર્તુળ $x^2 + y^2 - 6x + 8y - 103 = 0$ માં અંતર્ગત છે. તો ઉગમબિંદુથી આ ચોરસના સૌથી નજીકના શિરોબિંદુનું અંતર _____ છે.

Options :

1. 6
2. $\sqrt{41}$
3. 13
4. $\sqrt{137}$

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

परवलय $y^2 = 4x$ तथा अतिपरवलय $xy = 2$ की एक उभयनिष्ठ स्पर्श रेखा का समीकरण है :

Options :

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

2. $x + y + 1 = 0$

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

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

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

Correct Marks : 4 Wrong Marks : 1

પરવલય $y^2 = 4x$ અને અતિવલય $xy = 2$ ના એક સામાન્ય સ્પર્શકનું સમીકરણ _____ છે.

Options :

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

2. $x + y + 1 = 0$

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

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

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

Correct Marks : 4 Wrong Marks : 1

Equation of a common tangent to the parabola $y^2 = 4x$ and the hyperbola $xy = 2$ is :

Options :

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

2. $x + y + 1 = 0$

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

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

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

Correct Marks : 4 Wrong Marks : 1

If tangents are drawn to the ellipse $x^2 + 2y^2 = 2$ at all points on the ellipse other than its four vertices then the mid points of the tangents intercepted between the coordinate axes lie on the curve :

Options :

1. $\frac{1}{2x^2} + \frac{1}{4y^2} = 1$

2. $\frac{1}{4x^2} + \frac{1}{2y^2} = 1$

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

4. $\frac{x^2}{4} + \frac{y^2}{2} = 1$

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

Correct Marks : 4 Wrong Marks : 1

यदि दीर्घवृत्त $x^2 + 2y^2 = 2$ के चार शीर्षों के अतिरिक्त इसके सभी बिन्दुओं पर स्पर्श रेखायें खींची गई हैं, तो इन स्पर्श रेखाओं के निदेशांक अक्षों के बीच के अंतःखंडों के मध्य बिन्दु निम्न में से किस वक्र पर हैं?

Options :

1. $\frac{1}{2x^2} + \frac{1}{4y^2} = 1$

2. $\frac{1}{4x^2} + \frac{1}{2y^2} = 1$

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

4. $\frac{x^2}{4} + \frac{y^2}{2} = 1$

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

Correct Marks : 4 Wrong Marks : 1

જો ઊપવલય $x^2 + 2y^2 = 2$ ના ચાર શિરોબિંદુઓ સિવાયના તમામ બિંદુઓ આગળ સ્પર્શકો દોરવામાં આવે તો આ સ્પર્શકોના યામાક્ષો વચ્ચે અંતરાયેલ ભાગના મધ્યબિંદુઓ _____ વક્ર પર આવેલ છે.

Options :

1. $\frac{1}{2x^2} + \frac{1}{4y^2} = 1$

2. $\frac{1}{4x^2} + \frac{1}{2y^2} = 1$

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

4. $\frac{x^2}{4} + \frac{y^2}{2} = 1$

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

Correct Marks : 4 Wrong Marks : 1

The direction ratios of normal to the plane through the points $(0, -1, 0)$ and $(0, 0, 1)$

and making an angle $\frac{\pi}{4}$ with the plane

$y - z + 5 = 0$ are :

Options :

1. $\sqrt{2}, 1, -1$

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

3. $2, -1, 1$

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

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

Question Number : 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

बिन्दुओं $(0, -1, 0)$ तथा $(0, 0, 1)$ से होकर जाने वाले तथा समतल $y - z + 5 = 0$ के साथ $\frac{\pi}{4}$ का कोण बनाने वाले समतल के अभिलम्ब के दिक् अनुपात (direction ratios) हैं :

Options :

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

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

Question Number : 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

बिन्दुओं $(0, -1, 0)$ અને $(0, 0, 1)$ માંથી પસાર થતા અને સમતલ $y - z + 5 = 0$ સાથે $\frac{\pi}{4}$ નો ખૂણો બનાવતા સમતલના અભિલંબના દિક્ ગુણોત્તરો _____ છે.

Options :

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

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

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

Correct Marks : 4 Wrong Marks : 1

The plane containing the line

$$\frac{x-3}{2} = \frac{y+2}{-1} = \frac{z-1}{3} \text{ and also}$$

containing its projection on the plane $2x+3y-z=5$, contains which one of the following points ?

Options :

1. $(0, -2, 2)$
2. $(2, 0, -2)$
3. $(2, 2, 0)$
4. $(-2, 2, 2)$

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

समतल, जिसमें रेखा

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

अन्तर्विष्ट है तथा इस रेखा का समतल $2x+3y-z=5$ पर प्रक्षेप (projection) भी अन्तर्विष्ट है, पर निम्न में से कौन सा बिन्दु स्थित है ?

Options :

1. $(0, -2, 2)$
2. $(2, 0, -2)$
3. $(2, 2, 0)$
4. $(-2, 2, 2)$

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

तेमळ समतल $2x+3y-z=5$ परना तेना प्रक्षेपने समावतुं समतल, अे नीयेना पैकी कुं बिंदु समावे छे ?

Options :

1. $(0, -2, 2)$

2. $(2, 0, -2)$

3. $(2, 2, 0)$

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

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

Correct Marks : 4 Wrong Marks : 1

Let $\vec{a} = \hat{i} + 2\hat{j} + 4\hat{k}$, $\vec{b} = \hat{i} + \lambda\hat{j} + 4\hat{k}$ and

$\vec{c} = 2\hat{i} + 4\hat{j} + (\lambda^2 - 1)\hat{k}$ be coplanar

vectors. Then the non-zero vector $\vec{a} \times \vec{c}$ is :

Options :

1. $-10\hat{i} - 5\hat{j}$

2. $-14\hat{i} - 5\hat{j}$

3. $-10\hat{i} + 5\hat{j}$

4. $-14\hat{i} + 5\hat{j}$

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

Correct Marks : 4 Wrong Marks : 1

माना $\vec{a} = \hat{i} + 2\hat{j} + 4\hat{k}$, $\vec{b} = \hat{i} + \lambda\hat{j} + 4\hat{k}$ तथा

$\vec{c} = 2\hat{i} + 4\hat{j} + (\lambda^2 - 1)\hat{k}$ समतलीय सदिश हैं, तो

शून्येतर सदिश $\vec{a} \times \vec{c}$ है :

Options :

1. $-10\hat{i}-5\hat{j}$

2. $-14\hat{i}-5\hat{j}$

3. $-10\hat{i}+5\hat{j}$

4. $-14\hat{i}+5\hat{j}$

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

જો $\vec{a} = \hat{i} + 2\hat{j} + 4\hat{k}$, $\vec{b} = \hat{i} + \lambda\hat{j} + 4\hat{k}$ અને

$\vec{c} = 2\hat{i} + 4\hat{j} + (\lambda^2 - 1)\hat{k}$ એ સમતલીય સદિશો

હોય, તો શૂન્યેતર સદિશ $\vec{a} \times \vec{c} = \underline{\hspace{2cm}}$.

Options :

1. $-10\hat{i}-5\hat{j}$

2. $-14\hat{i}-5\hat{j}$

3. $-10\hat{i}+5\hat{j}$

4. $-14\hat{i}+5\hat{j}$

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

The outcome of each of 30 items was observed ; 10 items gave an outcome

$\frac{1}{2} - d$ each, 10 items gave outcome

$\frac{1}{2}$ each and the remaining 10 items gave

outcome $\frac{1}{2} + d$ each. If the variance of this

outcome data is $\frac{4}{3}$ then $|d|$ equals :

Options :

1. $\sqrt{2}$

2. 2

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

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

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

Correct Marks : 4 Wrong Marks : 1

30 आइटम (items) का परिणाम देखा गया; इनमें से

10 आइटम में प्रत्येक ने परिणाम $\frac{1}{2} - d$ दिया,

10 आइटम में प्रत्येक ने परिणाम $\frac{1}{2}$ दिया तथा बाकी

10 आइटम में प्रत्येक ने परिणाम $\frac{1}{2} + d$ दिया। यदि

इन आँकड़ों का प्रसरण $\frac{4}{3}$ है, तो $|d|$ बराबर है :

Options :

1. $\sqrt{2}$

2. 2

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

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

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

Correct Marks : 4 Wrong Marks : 1

30 વસ્તુઓ માંથી પ્રત્યેક ના પરિણામ નું અવલોકન કરતાં; 10 વસ્તુઓમાં પ્રત્યેકનું પરિણામ $\frac{1}{2} - d$, 10 વસ્તુઓમાં પ્રત્યેકનું પરિણામ $\frac{1}{2}$ અને બાકીની 10 વસ્તુઓમાં પ્રત્યેકનું પરિણામ $\frac{1}{2} + d$ જેવા મળ્યું. જો આ પરિણામોની માહિતી નું વિચરણ $\frac{4}{3}$ હોય, તો $|d| = \underline{\hspace{2cm}}$.

Options :

1. $\sqrt{2}$

2. 2

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

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

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

Correct Marks : 4 Wrong Marks : 1

Two integers are selected at random from the set $\{1, 2, \dots, 11\}$. Given that the sum of selected numbers is even, the conditional probability that both the numbers are even is :

Options :

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

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

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

4. $\frac{7}{10}$

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

સમુચ્ચય $\{1, 2, \dots, 11\}$ સે દો પૂર્ણાંક યાદૃચ્છિક લિષે ગયે હૈં. દિયા હૈ કિ લી ગઈ સંખ્યાઓં કા યોગ સમ હૈ, દોનોં સંખ્યાઓં કે સમ હોને કી સપ્રતિબંધ (conditional) પ્રાયિકતા હૈ :

Options :

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

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

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

4. $\frac{7}{10}$

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

ગણ $\{1, 2, \dots, 11\}$ માંથી બે પૂર્ણાંકો યાદૃચ્છિક રીતે પસંદ કરવામાં આવે છે. જો પસંદ થયેલ સંખ્યાઓનો સરવાળો યુગ્મ છે તેમ આપેલ હોય, તો આ બંને સંખ્યાઓ યુગ્મ હોય તેની શરતી સંભાવના _____ છે.

Options :

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

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

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

4. $\frac{7}{10}$

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

Correct Marks : 4 Wrong Marks : 1

Let $f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$ for

$k = 1, 2, 3, \dots$ Then for all $x \in \mathbb{R}$, the value of $f_4(x) - f_6(x)$ is equal to :

Options :

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

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

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

4. $\frac{5}{12}$

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

Correct Marks : 4 Wrong Marks : 1

माना $k = 1, 2, 3, \dots$ के लिए

$$f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$$

तो सभी $x \in \mathbb{R}$ के लिए, $f_4(x) - f_6(x)$ का मान बराबर है :

Options :

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

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

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

4. $\frac{5}{12}$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$ જ્યાં

$k = 1, 2, 3, \dots$ છે. તો પ્રત્યેક $x \in \mathbb{R}$ માટે

$f_4(x) - f_6(x)$ ની કિંમત _____ છે.

Options :

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

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

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

4. $\frac{5}{12}$

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

In a triangle, the sum of lengths of two sides is x and the product of the lengths of the same two sides is y . If $x^2 - c^2 = y$, where c is the length of the third side of the triangle, then the circumradius of the triangle is :

Options :

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

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

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

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

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

एक त्रिभुज की दो भुजाओं की लम्बाई का योग x है और इन्हीं दो भुजाओं की लम्बाई का गुणनफल y है। यदि $x^2 - c^2 = y$, जहाँ c त्रिभुज की तीसरी भुजा की लम्बाई है, तब त्रिभुज के परिवृत्त की त्रिज्या है :

Options :

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

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

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

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

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

એક ત્રિકોણમાં તેની બે બાજુઓની લંબાઈઓનો સરવાળો x અને તેજ બે બાજુઓ ની લંબાઈઓનો ગુણાકાર y છે. જો $x^2 - c^2 = y$, જ્યાં c એ આ ત્રિકોણની ત્રીજી બાજુની લંબાઈ હોય, તો આ ત્રિકોણની પરિત્રિજ્યા _____ છે.

Options :

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

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

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

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

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

Correct Marks : 4 Wrong Marks : 1

If q is false and $p \wedge q \leftrightarrow r$ is true, then which one of the following statements is a tautology?

Options :

1. $p \wedge r$

2. $p \vee r$

3. $(p \wedge r) \rightarrow (p \vee r)$

4. $(p \vee r) \rightarrow (p \wedge r)$

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

यदि q असत्य है तथा $p \wedge q \leftrightarrow r$ सत्य है, तो निम्न में से कौन सा कथन एक पुनरुक्ति (tautology) है?

Options :

1. $p \wedge r$

2. $p \vee r$

3. $(p \wedge r) \rightarrow (p \vee r)$

4. $(p \vee r) \rightarrow (p \wedge r)$

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

જો q એ અસત્ય અને $p \wedge q \leftrightarrow r$ એ સત્ય હોય, તો નીચેના પૈકી કયું વિધાન નિત્યસત્ય છે?

Options :

1. $p \wedge r$

2. $p \vee r$

3. $(p \wedge r) \rightarrow (p \vee r)$

4. $(p \vee r) \rightarrow (p \wedge r)$