Print

National Testing Agency

Question Paper Name :	BTECH E 3rd Sep 2020 Shift 2
Subject Name :	BTECH E
Creation Date :	2020-09-03 20:32:57
Duration :	180
Total Marks :	300
Display Marks:	Yes
Share Answer Key With Delivery Engine :	Yes
Actual Answer Key :	Yes

BTECH

Group Number :	1
Group Id :	405036120
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300
Is this Group for Examiner? :	No

Physics

Section Id :	405036400
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036767
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 40503611006 Question Type : MCQ Option Shuffling : Yes Display

ZOLLEGE

Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Amount of solar energy received on the earth's surface per unit area per unit time is defined a solar constant. Dimension of solar constant is :

Options :

40503640011. ML^2T^{-2}

40503640012. $M^2L^0T^{-1}$

40503640013. ML^0T^{-3}

40503640014. MLT^{-2}

Question Number : 1 Question Id : 40503611006 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पृथ्वी की सतह पर प्रति इकाई क्षेत्रफल पर प्रति इकाई समय में मिलने वाली सौर ऊर्जा को सौर स्थिरांक कहा जाता है। सौर स्थिरांक की विमाएँ होंगी :

Options :

40503640011. ML^2T^{-2}

40503640012. $M^2L^0T^{-1}$

40503640013. ML^0T^{-3}

40503640014. MLT^{-2}

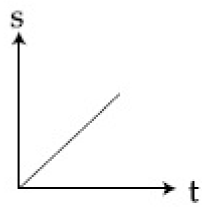
Question Number : 2 Question Id : 40503611007 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

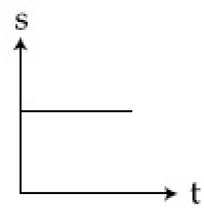
Correct Marks : 4 Wrong Marks : 1

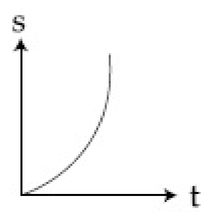
ZOLLEGE

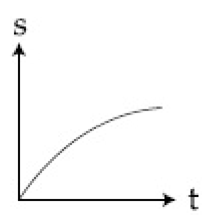
A particle is moving unidirectionally on a horizontal plane under the action of a constant power supplying energy source. The displacement (s) - time (t) graph that describes the motion of the particle is (graphs are drawn schematically and are not to scale) :

Options :

40503640015. 

40503640016. 

40503640017. 

40503640018. 

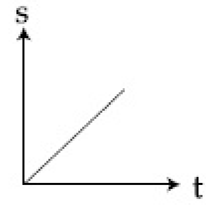
Question Number : 2 Question Id : 40503611007 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

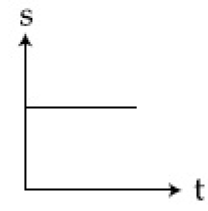
Correct Marks : 4 Wrong Marks : 1

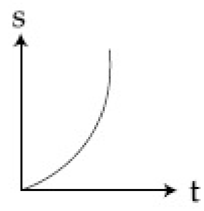
एक स्थिर शक्ति वाले स्रोत से ऊर्जा प्राप्त कर एक कण एक क्षैतिज समतल पर एक ही दिशा में चलायमान है। इस कण के लिये निम्न में से कौन सा विस्थापन (s) - समय (t) ग्राफ उपयुक्त है (ग्राफ संकेतात्मक है) :

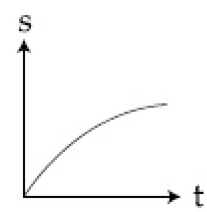
Options :

ZOLLEGE

40503640015. 

40503640016. 

40503640017. 

40503640018. 

Question Number : 3 Question Id : 40503611008 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A block of mass 1.9 kg is at rest at the edge of a table, of height 1 m. A bullet of mass 0.1 kg collides with the block and sticks to it. If the velocity of the bullet is 20 m/s in the horizontal direction just before the collision then the kinetic energy just before the combined system strikes the floor, is [Take $g = 10\ m/s^2$. Assume there is no rotational motion and loss of energy after the collision is negligable.]

Options :

40503640019. 20 J

ZOLLEGE

40503640020. 21 J

40503640021. 19 J

40503640022. 23 J

Question Number : 3 Question Id : 40503611008 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान 1.9 kg का एक गुटका एक 1 m ऊँची मेज़ के किनारे पर रखा हुआ है। द्रव्यमान 0.1 kg की एक गोली इस गुटके से टकराती है इससे चिपक जाती है। यदि टकराने से ठीक पहले गोली का वेग क्षैतिज दिशा में 20 m/s है तो धरातल पर टकराने से ठीक पहले गोली और गुटके के संयुक्त निकाय की गतिज ऊर्जा होगी : [$g = 10\ m/s^2$ लें। यह माने कि कोई घूर्णन गति नहीं है और टक्कर के बाद ऊर्जा की कोई क्षति नहीं होती है]

Options :

40503640019. 20 J

40503640020. 21 J

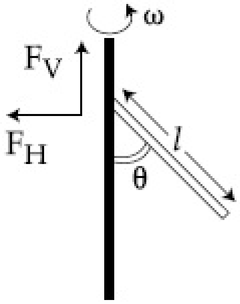
40503640021. 19 J

40503640022. 23 J

Question Number : 4 Question Id : 40503611009 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE



A uniform rod of length 'l' is pivoted at one of its ends on a vertical shaft of negligible radius. When the shaft rotates at angular speed ω the rod makes an angle θ with it (see figure). To find θ equate the rate of change of angular momentum (direction going into the paper) $\frac{ml^2}{12}\omega^2 \sin\theta \cos\theta$ about the centre of mass (CM) to the torque provided by the horizontal and vertical forces F_H and F_V about the CM. The value of θ is then such that :

Options :

40503640023. $\cos\theta = \frac{g}{2l\omega^2}$

40503640024. $\cos\theta = \frac{g}{l\omega^2}$

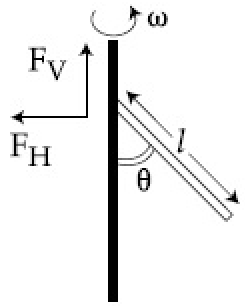
40503640025. $\cos\theta = \frac{3g}{2l\omega^2}$

40503640026. $\cos\theta = \frac{2g}{3l\omega^2}$

Question Number : 4 Question Id : 40503611009 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE



लम्बाई 'l' की एक एकसमान छड़ नगण्य त्रिज्या के एक ऊर्ध्वाधर डण्डे पर कीलकित (pivoted) है। जब यह डण्डा कोणीय गति ω से घूमता है तो छड़ इससे θ कोण बनाती है (चित्र देखें)। θ का मान ज्ञात करने के लिये हम छड़ के द्रव्यमान केन्द्र (CM) के सापेक्ष इसके कोणीय संवेग में होने वाले परिवर्तन (जिसका मान $\frac{ml^2}{12}\omega^2 \sin\theta \cos\theta$ है और जिसकी दिशा इस तल के अन्दर की ओर है) को इस पर लगने वाले क्षैतिज F_H व ऊर्ध्वाधर F_V बलों के CM के सापेक्ष आघूर्ण के बराबर लेते हैं। तब θ का मान ऐसा होगा कि :

Options :

40503640023. $\cos\theta = \frac{g}{2l\omega^2}$

40503640024. $\cos\theta = \frac{g}{l\omega^2}$

40503640025. $\cos\theta = \frac{3g}{2l\omega^2}$

40503640026. $\cos\theta = \frac{2g}{3l\omega^2}$

Question Number : 5 Question Id : 40503611010 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

The mass density of a planet of radius R varies with the distance r from its centre as $\rho(r) = \rho_0\left(1 - \frac{r^2}{R^2}\right)$. Then the gravitational field is maximum at :

Options :

40503640027. $r = R$

40503640028. $r = \sqrt{\frac{5}{9}}\, R$

40503640029. $r = \sqrt{\frac{3}{4}}\, R$

40503640030. $r = \frac{1}{\sqrt{3}}\, R$

Question Number : 5 Question Id : 40503611010 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

त्रिज्या R के एक ग्रह में इसका द्रव्यमान घनत्व $\rho(r) = \rho_0\left(1 - \frac{r^2}{R^2}\right)$ है जहाँ r इसके केन्द्र से दूरी है। इस ग्रह का गुरुत्वाकर्षण क्षेत्र r के किस मान पर अधिकतम होगा ?

Options :

40503640027. $r = R$

40503640028. $r = \sqrt{\frac{5}{9}}\, R$

40503640029. $r = \sqrt{\frac{3}{4}}\, R$

ZOLLEGE

40503640030. $r = \frac{1}{\sqrt{3}} R$

Question Number : 6 Question Id : 40503611011 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A metallic sphere cools from 50°C to 40°C in 300 s. If atmospheric temperature around is 20°C, then the sphere's temperature after the next 5 minutes will be close to :

Options :

40503640031. 28°C

40503640032. 31°C

40503640033. 33°C

40503640034. 35°C

Question Number : 6 Question Id : 40503611011 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक धातु का बना हुआ गोला 300 s में 50°C से 40°C तक ठंडा हो जाता है। यदि इसके आस-पास के वातावरण का तापमान 20°C हो अगले 5 मिनटों के बाद इस गोले का तापमान निम्न में से किसके निकटतम होगा ?

Options :

40503640031. 28°C

40503640032. 31°C

40503640033. 33°C

40503640034. 35°C

ZOLLEGE

Question Number : 7 Question Id : 40503611012 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A calorimeter of water equivalent 20 g contains 180 g of water at 25°C. 'm' grams of steam at 100°C is mixed in it till the temperature of the mixure is 31°C. The value of 'm' is close to (Latent heat of water $=540$ cal g^{-1}, specific heat of water $=1$ cal g^{-1} $°C^{-1}$)

Options :

40503640035. 2

40503640036. 2.6

40503640037. 3.2

40503640038. 4

Question Number : 7 Question Id : 40503611012 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक कैलोरीमापी (जल तुल्यांक 20 g) में 25°C पर 180 g पानी भरा हुआ है। इसमें 100°C तापमान की 'm' ग्राम वाष्प मिश्रित की जाती है जब तक तापमान 31°C न हो जाये। m का निकटतम मान है (वाष्प की गुप्त ऊष्मा $=540$ cal g^{-1}, पानी की विशिष्ट ऊष्मा $=1$ cal g^{-1} $°C^{-1}$)

Options :

40503640035. 2

40503640036. 2.6

40503640037. 3.2

40503640038. 4

ZOLLEGE

Question Number : 8 Question Id : 40503611013 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

To raise the temperature of a certain mass of gas by 50°C at a constant pressure, 160 calories of heat is required. When the same mass of gas is cooled by 100°C at constant volume, 240 calories of heat is released. How many degrees of freedom does each molecule of this gas have (assume gas to be ideal) ?

Options :

40503640039. 3

40503640040. 5

40503640041. 6

40503640042. 7

Question Number : 8 Question Id : 40503611013 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किसी दिये हुए द्रव्यमान की एक गैस का तापमान स्थिर दबाव पर 50°C से बढ़ाने के लिये 160 कैलोरी ऊष्मा की आवश्यकता पड़ती है। यदि इस गैस के इसी द्रव्यमान को 100°C से ठण्डा करा जाय तो स्थिर आयतन पर इस गैस से 240 कैलोरी ऊष्मा निष्कासित होती है। गैस के प्रत्येक अणु की स्वातंत्र्य कोटि (degrees of freedom) का मान है : (यह मानें कि गैस आदर्श है)

Options :

40503640039. 3

40503640040. 5

40503640041. 6

ZOLLEGE

40503640042. 7

Question Number : 9 Question Id : 40503611014 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A block of mass m attached to a massless spring is performing oscillatory motion of amplitude 'A' on a frictionless horizontal plane. If half of the mass of the block breaks off when it is passing through its equilibrium point, the amplitude of oscillation for the remaining system become fA. The value of f is :

Options :

40503640043. $\sqrt{2}$

40503640044. $\frac{1}{\sqrt{2}}$

40503640045. 1

40503640046. $\frac{1}{2}$

Question Number : 9 Question Id : 40503611014 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान m का एक गुटका एक द्रव्यमान रहित कमानी से जुड़ा हुआ है और एक घर्षणहीन क्षैतिज समतल पर आयाम A के सरल दोलन कर रहा है। यदि संतुलन बिन्दु से निकलते समय गुटका टूट जाये और इसका द्रव्यमान आधा रह जाय तो बचे हुए नये निकाय के दोलन का आयाम fA हो जाता है। f का मान है :

Options :

ZOLLEGE

40503640043. $\sqrt{2}$

40503640044. $\frac{1}{\sqrt{2}}$

40503640045. 1

40503640046. $\frac{1}{2}$

Question Number : 10 Question Id : 40503611015 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Hydrogen ion and singly ionized helium atom are accelerated, from rest, through the same potential difference. The ratio of final speeds of hydrogen and helium ions is close to :

Options :

40503640047. 5 : 7

40503640048. 10 : 7

40503640049. 1 : 2

40503640050. 2 : 1

Question Number : 10 Question Id : 40503611015 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन आयन और हीलियम के एकल आयनित परमाणु को स्थिर अवस्था से समान विभवान्तर लगाकर त्वरित करा जाता है। ऐसी अवस्था में हाइड्रोजन आयनों की अन्तिम गति और हीलियम आयनों की अन्तिम गतियों का अनुपात निम्न में से किसके निकटतम होगा ?

Options :

ZOLLEGE

40503640047. $5:7$

40503640048. $10:7$

40503640049. $1:2$

40503640050. $2:1$

Question Number : 11 Question Id : 40503611016 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Concentric metallic hollow spheres of radii R and 4R hold charges Q_1 and Q_2 respectively. Given that surface charge densities of the concentric spheres are equal, the potential difference $V(R) - V(4R)$ is :

Options :

40503640051. $\frac{3Q_1}{4\pi\varepsilon_0 R}$

40503640052. $\frac{3Q_1}{16\pi\varepsilon_0 R}$

40503640053. $\frac{3Q_2}{4\pi\varepsilon_0 R}$

40503640054. $\frac{Q_2}{4\pi\varepsilon_0 R}$

Question Number : 11 Question Id : 40503611016 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

धातुओं के बने हुए दो गोलाकार समकेन्द्रीय खोलों की त्रिज्या R और 4R है तथा इन पर क्रमशः Q_1 और Q_2 आवेश हैं। यदि दोनों खोलों पर सतहीय आवेश घनत्व (surface charge density) समान हो तो विभवान्तर $V(R) - V(4R)$ का मान है :

Options :

40503640051. $\frac{3Q_1}{4\pi\varepsilon_0 R}$

40503640052. $\frac{3Q_1}{16\pi\varepsilon_0 R}$

40503640053. $\frac{3Q_2}{4\pi\varepsilon_0 R}$

40503640054. $\frac{Q_2}{4\pi\varepsilon_0 R}$

Question Number : 12 Question Id : 40503611017 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two resistors 400Ω and 800Ω are connected in series across a 6 V battery. The potential difference measured by a voltmeter of 10 kΩ across 400Ω resistor is close to :

Options :

40503640055. 2 V

40503640056. 1.95 V

40503640057. 1.8 V

40503640058. 2.05 V

Question Number : 12 Question Id : 40503611017 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

ZOLLEGE

Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

दो प्रतिरोधकों का मान 400Ω और 800Ω है तथा इनको श्रेणीबद्ध संबंधन में 6 V की बैटरी से जोड़ा गया है। ऐसी स्थिति में 10 kΩ प्रतिरोध के एक वोल्टमापी द्वारा 400Ω प्रतिरोध पर नापे गये विभवान्तर का मान निम्न में से किसके निकटतम होगा ?

Options :

40503640055. 2 V

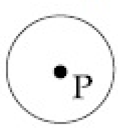
40503640056. 1.95 V

40503640057. 1.8 V

40503640058. 2.05 V

Question Number : 13 Question Id : 40503611018 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

A perfectly diamagnetic sphere has a small spherical cavity at its centre, which is filled with a paramagnetic substance. The whole system is placed in a uniform magnetic field $\vec{B}$. Then the field inside the paramagnetic substance is :



Options :

40503640059. much large than $|\vec{B}|$ and parallel to $\vec{B}$

40503640060. much large than $|\vec{B}|$ but opposite to $\vec{B}$

ZOLLEGE

40503640061. zero

40503640062. $\vec{B}$

Question Number : 13 Question Id : 40503611018 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रतिचुम्बकीय (diamagnetic) पदार्थ से बने एक गोले के केन्द्र पर एक छोटी गोलाकार गुहा बनायी गयी है जिसमें एक अनुचुम्बकीय (paramagnetic) पदार्थ भर दिया गया है। इस पूरे निकाय को एक एकसमान चुम्बकीय क्षेत्र $\vec{B}$ में रखा जाय तो अनुचुम्बकीय पदार्थ में चुम्बकीय क्षेत्र होगा :

Options :

40503640059. $|\vec{B}|$ से बहुत अधिक और $\vec{B}$ के समानान्तर

40503640060. $|\vec{B}|$ से बहुत अधिक और $\vec{B}$ के प्रति समानान्तर

40503640061. शून्य

40503640062. $\vec{B}$

Question Number : 14 Question Id : 40503611019 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

A uniform magnetic field B exists in a direction perpendicular to the plane of a square loop made of a metal wire. The wire has a diameter of 4 mm and a total length of 30 cm. The magnetic field changes with time at a steady rate $dB/dt = 0.032\ Ts^{-1}$. The induced current in the loop is close to (Resistivity of the metal wire is $1.23 \times 10^{-8}\ \Omega m$)

Options :

40503640063. 0.61 A

40503640064. 0.43 A

40503640065. 0.34 A

40503640066. 0.53 A

Question Number : 14 Question Id : 40503611019 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

धातु के तार से बने एक वर्गाकार लूप के समतल के लम्बवत् एक चुम्बकीय क्षेत्र B लगा हुआ है। तार का व्यास 4 mm है और इसकी कुल लम्बाई 30 cm है। यदि चुम्बकीय क्षेत्र एकसमान दर ($dB/dt = 0.032\ Ts^{-1}$) से परिवर्तित हो रहा हो तो लूप में उत्प्रेरित विद्युत धारा का मान निम्न में से किसके निकटतम होगा :

(तार की प्रतिरोधकता $= 1.23 \times 10^{-8}\ \Omega m$)

Options :

40503640063. 0.61 A

40503640064. 0.43 A

40503640065. 0.34 A

ZOLLEGE

40503640066. 0.53 A

Question Number : 15 Question Id : 40503611020 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The electric field of a plane electromagnetic wave propagating along the x direction in vacuum is $\vec{E} = E_0 \hat{j} \cos(\omega t - kx)$. The magnetic field $\vec{B}$, at the moment $t=0$ is :

Options :

40503640067. $\vec{B} = E_0 \sqrt{\mu_0 \epsilon_0} \cos(kx) \hat{k}$

40503640068. $\vec{B} = \frac{E_0}{\sqrt{\mu_0 \epsilon_0}} \cos(kx) \hat{k}$

40503640069. $\vec{B} = E_0 \sqrt{\mu_0 \epsilon_0} \cos(kx) \hat{j}$

40503640070. $\vec{B} = \frac{E_0}{\sqrt{\mu_0 \epsilon_0}} \cos(kx) \hat{j}$

Question Number : 15 Question Id : 40503611020 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समतल विद्युत चुम्बकीय तरंग, जो कि निर्वात में x दिशा में चल रही है, का विद्युत क्षेत्र $\vec{E} = E_0 \hat{j} \cos(\omega t - kx)$ है। समय $t=0$ पर इसका चुम्बकीय क्षेत्र होगा :

Options :

40503640067. $\vec{B} = E_0 \sqrt{\mu_0 \epsilon_0} \cos(kx) \hat{k}$

ZOLLEGE

40503640068. $\vec{B} = \frac{E_0}{\sqrt{\mu_0 \epsilon_0}} \cos(kx)\hat{k}$

40503640069. $\vec{B} = E_0 \sqrt{\mu_0 \epsilon_0} \cos(kx)\ \hat{j}$

40503640070. $\vec{B} = \frac{E_0}{\sqrt{\mu_0 \epsilon_0}} \cos(kx)\ \hat{j}$

Question Number : 16 Question Id : 40503611021 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two light waves having the same wavelength λ in vacuum are in phase initially. Then the first wave travels a path L_1 through a medium of refractive index n_1 while the second wave travels a path of length L_2 through a medium of refractive index n_2. After this the phase difference between the two waves is :

Options :

40503640071. $\frac{2\pi}{\lambda}\left(\frac{L_1}{n_1} - \frac{L_2}{n_2}\right)$

40503640072. $\frac{2\pi}{\lambda}(n_1L_1 - n_2L_2)$

40503640073. $\frac{2\pi}{\lambda}(n_2L_1 - n_1L_2)$

40503640074. $\frac{2\pi}{\lambda}\left(\frac{L_2}{n_1} - \frac{L_1}{n_2}\right)$

Question Number : 16 Question Id : 40503611021 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

ZOLLEGE

Correct Marks : 4 Wrong Marks : 1

दो प्रकाश की तरंगों, जिनका तरंगदैर्ध्य λ एक ही है, की आरम्भ में निर्वात में कलाएँ (phase) एक समान हैं। यदि एक तरंग को n_1 अपवर्तनांक के एक माध्यम से L_1 लम्बे एक पथ से चले और दूसरी तरंग n_2 अपवर्तनांक के एक माध्यम से L_2 लम्बे एक पथ से चले तो इसके बाद तरंगों के बीच में कलान्तर (phase difference) होगा :

Options :

40503640071. $\frac{2\pi}{\lambda}\left(\frac{L_1}{n_1} - \frac{L_2}{n_2}\right)$

40503640072. $\frac{2\pi}{\lambda}(n_1L_1 - n_2L_2)$

40503640073. $\frac{2\pi}{\lambda}(n_2L_1 - n_1L_2)$

40503640074. $\frac{2\pi}{\lambda}\left(\frac{L_2}{n_1} - \frac{L_1}{n_2}\right)$

Question Number : 17 Question Id : 40503611022 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two sources of light emit X-rays of wavelength 1 nm and visible light of wavelength 500 nm, respectively. Both the sources emit light of the same power 200 W. The ratio of the number density of photons of X-rays to the number density of photons of the visible light of the given wavelengths is :

Options :

40503640075. $\frac{1}{250}$

40503640076. 250

ZOLLEGE

40503640077. $\frac{1}{500}$

40503640078. 500

Question Number : 17 Question Id : 40503611022 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रकाश के दो स्रोत क्रमशः 1 nm तरंगदैर्ध्य की X-किरणें और 500 nm तरंगदैर्ध्य का दृश्य प्रकाश उत्सर्जित करते हैं। दोनो स्रोतों से उत्सर्जित प्रकाश की शक्ति 200 W है। तब इन स्रोतों से निकलने वाली X-किरणों में फोटोन का संख्या घनत्व और दृश्य प्रकाश में फोटोन के संख्या घनत्व का अनुपात होगा :

Options :

40503640075. $\frac{1}{250}$

40503640076. 250

40503640077. $\frac{1}{500}$

40503640078. 500

Question Number : 18 Question Id : 40503611023 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The radius R of a nucleus of mass number A can be estimated by the formula $R=(1.3\times10^{-15})A^{1/3}$ m. It follows that the mass density of a nucleus is of the order of : ($M_{prot.} \cong M_{neut.} \simeq 1.67\times10^{-27}$ kg)

Options :

ZOLLEGE

40503640079. 10^3 kg m^{-3}

40503640080. 10^{10} kg m^{-3}

40503640081. 10^{17} kg m^{-3}

40503640082. 10^{24} kg m^{-3}

Question Number : 18 Question Id : 40503611023 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान संख्या A के एक नाभिक की त्रिज्या R का अनुमान $R = (1.3 \times 10^{-15})A^{1/3}$ m सूत्र से लगाया जा सकता है। तब एक नाभिक के द्रव्यमान घनत्व की परिमाण कोटि (order of magnitude) होगी :
(प्रोटान का द्रव्यमान $\cong$ न्यूट्रॉन का द्रव्यमान $\simeq$ 1.67×10^{-27} kg)

Options :

40503640079. 10^3 kg m^{-3}

40503640080. 10^{10} kg m^{-3}

40503640081. 10^{17} kg m^{-3}

40503640082. 10^{24} kg m^{-3}

Question Number : 19 Question Id : 40503611024 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a semiconductor photodiode can detect a photon with a maximum wavelength of 400 nm, then its band gap energy is :

Planck's constant $h = 6.63 \times 10^{-34}$ J.s.

Speed of light $c = 3 \times 10^8$ m/s

ZOLLEGE

Options :

40503640083. 3.1 eV

40503640084. 1.1 eV

40503640085. 2.0 eV

40503640086. 1.5 eV

Question Number : 19 Question Id : 40503611024 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक अर्धचालक से बना एक फोटोडायोड अधिकतम 400 nm तरंगदैर्ध्य के फोटोन की पहचान कर सकता है। तब इस अर्धचालक की बैण्डगैप की ऊर्जा है :

प्लांक स्थिरांक $h = 6.63 \times 10^{-34}$ J.s.

प्रकाश की गति $c = 3 \times 10^{8}$ ms^{-1}

Options :

40503640083. 3.1 eV

40503640084. 1.1 eV

40503640085. 2.0 eV

40503640086. 1.5 eV

Question Number : 20 Question Id : 40503611025 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following will NOT be observed when a multimeter (operating in resistance measuring mode) probes connected across a component, are just reversed ?

Options :

ZOLLEGE

40503640087. Multimeter shows an equal deflection in both cases i.e. before and after reversing the probes if the chosen component is resistor.

40503640088. Multimeter shows NO deflection in both cases i.e. before and after reversing the probes if the chosen component is capacitor.

40503640089. Multimeter shows NO deflection in both cases i.e. before and after reversing the probes if the chosen component is metal wire.

40503640090. Multimeter shows a deflection, accompanied by a splash of light out of connected component in one direction and NO deflection on reversing the probes if the chosen component is LED.

Question Number : 20 Question Id : 40503611025 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से कौनसा दिखायी **नहीं** देगा, जब एक अवयव पर जोडे गये एक मल्टीमीटर (प्रतिरोध मापन मोड में प्रचालित) के प्रोब को एक दूसरे की जगह लगा दिया जाता है?

Options :

40503640087. यदि चुना गया अवयव प्रतिरोध है, तब प्रोब को पहले और बाद में एक दूसरे की जगह लगाने पर मल्टीमीटर दोनों अवस्था में एक समान विक्षेपण दर्शाता है।

ZOLLEGE

40503640088. यदि चुना गया अवयव संधारित्र है, तब प्रोब को पहले और बाद में एक दूसरे की जगह लगाने पर मल्टीमीटर दोनों अवस्था में कोई भी विक्षेपण नहीं दर्शाता है।

40503640089. यदि चुना गया अवयव धातु का तार है, तब प्रोब को पहले और बाद में एक दूसरे की जगह लगाने पर मल्टीमीटर दोनों अवस्था में एक समान विक्षेपण नहीं दर्शाता है।

40503640090. यदि चुना गया अवयव LED है, एक दिशा में मल्टीमीटर लगाने पर यह एक विक्षेपण दिखाता है और साथ में लगाये गये अवयव में एक चमक के साथ प्रकाश निकलता है और प्रोब को एक दूसरे की जगह लगाने पर कोई विक्षेपण नहीं दर्शाता है।

Sub-Section Number : 2
Sub-Section Id : 405036768
Question Shuffling Allowed : Yes

Question Number : 21 Question Id : 40503611026 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

A block starts moving up an inclined plane of inclination 30° with an initial velocity of v_0. It comes back to its initial position with velocity $\frac{v_0}{2}$. The value of the coefficient of kinetic friction between the block and the inclined plane is close to $\frac{I}{1000}$, The nearest integer to I is __________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

ZOLLEGE

5 to 5.002

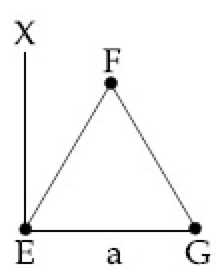
Question Number : 21 Question Id : 40503611026 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

30° कोण वाले एक आनत समतल पर एक गुटका प्रारम्भिक गति v_0 से ऊपर की ओर चलता है और वापस अपने प्रारम्भिक स्थान पर लौटने पर इसकी गति $\frac{v_0}{2}$ हो जाती है। यदि गुटके और समतल के बीच गतिज घर्षण का गुणांक $\frac{I}{1000}$ हो तो I के निकटतम पूर्णांक होगा :

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 22 Question Id : 40503611027 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

An massless equilateral triangle EFG of side 'a' (As shown in figure) has three particles of mass m situated at its vertices. The moment of inertia of the system about the line EX perpendicular to EG in the plane of EFG is $\frac{N}{20}ma^2$ where N is an integer. The value of N is ________.



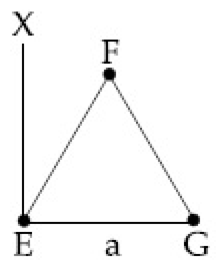
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes

ZOLLEGE

Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 22 Question Id : 40503611027 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

एक द्रव्यमान रहित समबाहु त्रिभुज EFG की एक भुजा की लम्बाई 'a' है (चित्र देखें)। इसके तीन शीर्ष बिन्दुओं पर द्रव्यमान m के एक-एक कण रखे हुए हैं। यदि EX रेखा (जो कि EFG के तल में है और EG के लम्बवत् है) के सापेक्ष EFG जड़त्व आघूर्ण $\frac{N}{20}ma^2$ हो और N एक पूर्णांक हो, तो N का मान ________ है।



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 23 Question Id : 40503611028 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

If minimum possible work is done by a refrigerator in converting 100 grams of water at 0°C to ice, how much heat (in calories) is released to the surroundings at temperature 27°C (Latent heat of ice = 80 Cal/gram) to the nearest integer ?

Response Type : Numeric
Evaluation Required For SA : Yes

ZOLLEGE

Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 23 Question Id : 40503611028 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

यदि एक रेफ्रिजरेटर 0°C तापमान के 100 ग्राम पानी को न्यूनतम कार्य करते हुए बर्फ़ में बदलता है तो इसके द्वारा वातावरण (तापमान 27°C) में छोड़ी गयी ऊष्मा का मान कैलोरी में कितना होगा (बर्फ़ की गुप्त ऊष्मा = 80 Cal/gram)? उत्तर निकटतम पूर्णांक में लिखें _________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 24 Question Id : 40503611029 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

A galvanometer coil has 500 turns and each turn has an average area of $3 \times 10^{-4}\ m^2$. If a torque of 1.5 Nm is required to keep this coil parallel to a magnetic field when a current of 0.5 A is flowing through it, the strength of the field (in T) is _________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 24 Question Id : 40503611029 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

ZOLLEGE

एक गैल्वेनोमापी की कुंडली में 500 घुमाव (turns) है और हर घुमाव का औसत क्षेत्रफल $3 \times 10^{-4}\ m^2$ है। यदि इस कुंडली में 0.5 A विद्युत धारा बह रही हो तो इसे एक चुम्बकीय क्षेत्र में उस क्षेत्र के समानान्तर रखने के लिये 1.5 Nm बल आघूर्ण की आवश्यकता पड़ती है। तब टेसला में चुम्बकीय क्षेत्र का मान है __________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

Question Number : 25 Question Id : 40503611030 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

When an object is kept at a distance of 30 cm from a concave mirror, the image is formed at a distance of 10 cm from the mirror. If the object is moved with a speed of 9 cms^{-1}, the speed (in cms^{-1}) with which image moves at that instant is ________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

Question Number : 25 Question Id : 40503611030 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

जब एक अवतल दर्पण से 30 cm दूरी पर एक वस्तु रखी जाती है तो इसका प्रतिबिम्ब दर्पण से 10 cm दूरी पर बनता है। यदि इस वस्तु को 9 cms^{-1} की गति से चलाया जाय तो उस क्षण प्रतिबिम्ब की गति (cms^{-1} में) कितनी होगी __________ ।

Response Type : Numeric

ZOLLEGE

Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

Chemistry

Section Id :	405036401
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036769
Question Shuffling Allowed :	Yes

Question Number : 26 Question Id : 40503611031 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

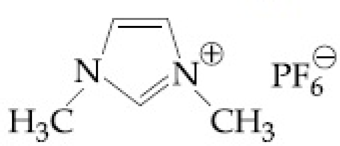
Correct Marks : 4 Wrong Marks : 1

An ionic micelle is formed on the addition of :

Options :

40503640096. liquid diethyl ether to aqueous NaCl solution

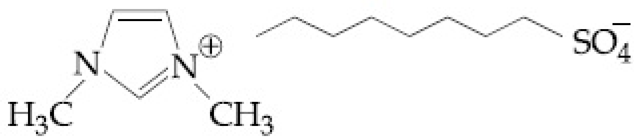
40503640097. excess water to liquid



40503640098. sodium stearate to pure toluene

ZOLLEGE

excess water to liquid



40503640099.

Question Number : 26 Question Id : 40503611031 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

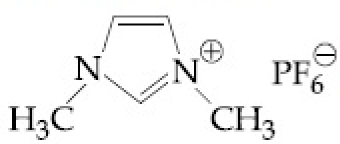
Correct Marks : 4 Wrong Marks : 1

एक आयनिक मिसेल बनता है :

Options :

40503640096. द्रव डाइएथिल ईथर को जलीय NaCl विलयन में डालने पर

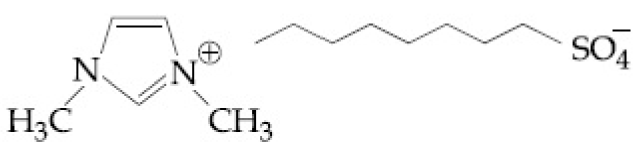
40503640097. जल-आधिक्य को द्रव



में डालने पर

40503640098. सोडियम स्टीएरेट को शुद्ध टालूईन में डालने पर

40503640099. जल-आधिक्य को द्रव



में डालने पर

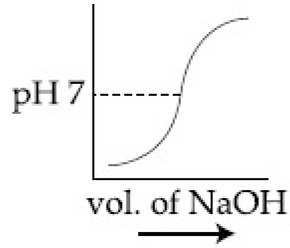
Question Number : 27 Question Id : 40503611032 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

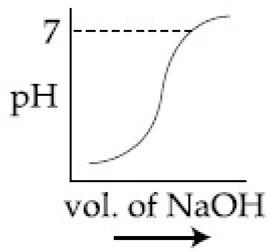
Correct Marks : 4 Wrong Marks : 1

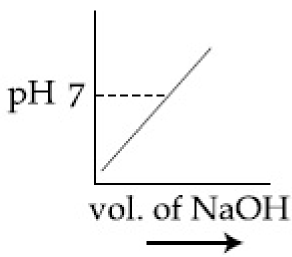
100 mL of 0.1 M HCl is taken in a beaker and to it 100 mL of 0.1 M NaOH is added in steps of 2 mL and the pH is continuously measured. Which of the following graphs correctly depicts the change in pH ?

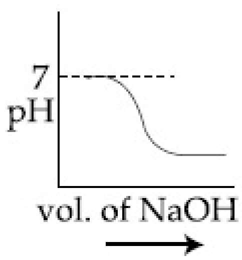
ZOLLEGE

Options :

40503640100. 

40503640101. 

40503640102. 

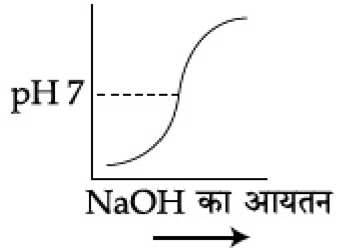
40503640103. 

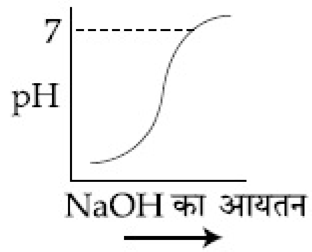
Question Number : 27 Question Id : 40503611032 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

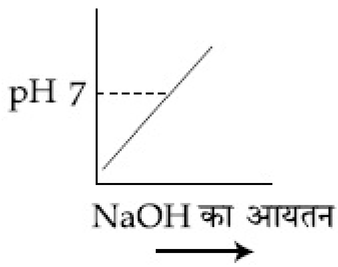
Correct Marks : 4 Wrong Marks : 1

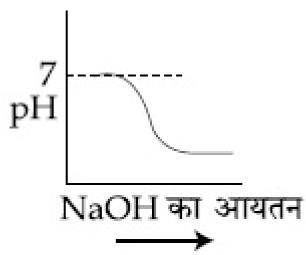
0.1 M HCl के 100 mL को एक बीकर में लिया जाता है तथा इसमें 0.1 M NaOH के 100 mL को 2 mL के पदों में डाला जाता है तथा इसका pH निरन्तर मापा जाता रहा। pH में परिवर्तन के चित्रण के लिए निम्नलिखित आलेखों में से कौन **सही** है?

Options :

40503640100. 

40503640101. 

40503640102. 

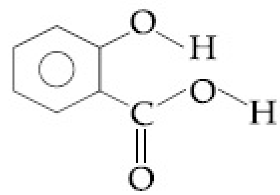
40503640103. 

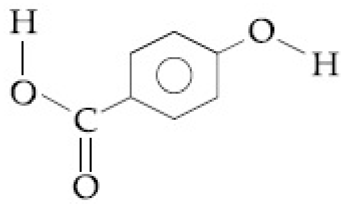
Question Number : 28 Question Id : 40503611033 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

Consider the following molecules and statements related to them :

(A) 

(B) 

(a) (B) is more likely to be crystalline than (A)

(b) (B) has higher boiling point than (A)

(c) (B) dissolves more readily than (A) in water

Identify the **correct** option from below :

Options :

40503640104. (a) and (b) are true

40503640105. only (a) is true

40503640106. (a) and (c) are true

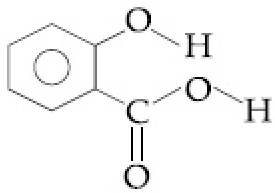
40503640107. (b) and (c) are true

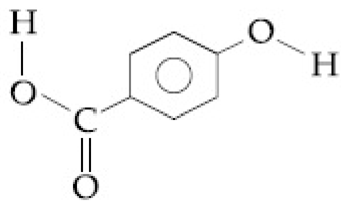
Question Number : 28 Question Id : 40503611033 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

निम्न अणुओं एवं उनसे सम्बन्धित कथनों पर विचार कीजिए :

(A) 

(B) 

(a) (A) की तुलना में (B) के क्रिस्टलित होने की ज्यादा सम्भावना है।

(b) (A) से (B) का क्वथनांक उच्च है।

(c) (A) की तुलना में (B) जल्दी से पानी में घुल जाता है।

निम्न में से **सही** विकल्प चुनिये :

Options :

40503640104. (a) तथा (b) सत्य हैं।

40503640105. मात्र (a) सत्य है।

40503640106. (a) तथा (c) सत्य हैं।

40503640107. (b) तथा (c) सत्य हैं।

Question Number : 29 Question Id : 40503611034 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the reaction $2A + 3B + \frac{3}{2}C \rightarrow 3P$,

which statement is correct ?

Options :

ZOLLEGE

40503640108. $\frac{dn_A}{dt} = \frac{3}{2}\frac{dn_B}{dt} = \frac{3}{4}\frac{dn_C}{dt}$

40503640109. $\frac{dn_A}{dt} = \frac{2}{3}\frac{dn_B}{dt} = \frac{3}{4}\frac{dn_C}{dt}$

40503640110. $\frac{dn_A}{dt} = \frac{2}{3}\frac{dn_B}{dt} = \frac{4}{3}\frac{dn_C}{dt}$

40503640111. $\frac{dn_A}{dt} = \frac{dn_B}{dt} = \frac{dn_C}{dt}$

Question Number : 29 Question Id : 40503611034 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिक्रिया $2A + 3B + \frac{3}{2}C \rightarrow 3P$ के लिए कौन सा कथन सही है?

Options :

40503640108. $\frac{dn_A}{dt} = \frac{3}{2}\frac{dn_B}{dt} = \frac{3}{4}\frac{dn_C}{dt}$

40503640109. $\frac{dn_A}{dt} = \frac{2}{3}\frac{dn_B}{dt} = \frac{3}{4}\frac{dn_C}{dt}$

40503640110. $\frac{dn_A}{dt} = \frac{2}{3}\frac{dn_B}{dt} = \frac{4}{3}\frac{dn_C}{dt}$

40503640111. $\frac{dn_A}{dt} = \frac{dn_B}{dt} = \frac{dn_C}{dt}$

Question Number : 30 Question Id : 40503611035 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

Consider the hypothetical situation where the azimuthal quantum number, l, takes values 0, 1, 2, ... n+1, where n is the principal quantum number. Then, the element with atomic number :

Options :

40503640112. 6 has a 2p-valence subshell

40503640113. 8 is the first noble gas

40503640114. 9 is the first alkali metal

40503640115. 13 has a half-filled valence subshell

Question Number : 30 Question Id : 40503611035 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परिकल्पित स्थिति में यदि एक दिये गये मुख्य क्वान्टम संख्या 'n' के लिए दिगंशीय क्वान्टम संख्या 'l' के मान 0, 1, 2, ... n, n+1 हों, तो तत्व, परमाणु संख्या

Options :

40503640112. 6 की एक 2p-संयोजकता उपकोशिका है।

40503640113. 8 प्रथम उत्कृष्ट गैस है।

40503640114. 9 प्रथम क्षारीय धातु है।

40503640115. 13 की अर्द्धपूरित संयोजकता उपकोशिका होगी।

Question Number : 31 Question Id : 40503611036 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

A mixture of one mole each of H_2, He and O_2 each are enclosed in a cylinder of volume V at temperature T. If the partial pressure of H_2 is 2 atm, the total pressure of the gases in the cylinder is :

Options :

40503640116. 22 atm

40503640117. 6 atm

40503640118. 14 atm

40503640119. 38 atm

Question Number : 31 Question Id : 40503611036 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

H_2, He तथा O_2 प्रत्येक के एक मोल के मिश्रण को ताप T पर आयतन V वाले सिलिन्डर में बन्द किया जाता है। यदि H_2 का आंशिक दाब 2 atm है, तो सिलिन्डर में गैसों का सम्पूर्ण दाब है :

Options :

40503640116. 22 atm

40503640117. 6 atm

40503640118. 14 atm

40503640119. 38 atm

Question Number : 32 Question Id : 40503611037 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The five successive ionization enthalpies of an element are 800, 2427, 3658, 25024 and 32824 kJ mol^{-1}. The number of valence electrons in the element is :

ZOLLEGE

Options :

40503640120. 4

40503640121. 2

40503640122. 3

40503640123. 5

Question Number : 32 Question Id : 40503611037 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक तत्व की पाँच उत्तरोत्तर आयनन एन्थैल्पियाँ 800, 2427, 3658, 25024 तथा 32824 $kJ\ mol^{-1}$ हैं। तत्व में संयोजकता इलैक्ट्रॉनों की संख्या है :

Options :

40503640120. 4

40503640121. 2

40503640122. 3

40503640123. 5

Question Number : 33 Question Id : 40503611038 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The strengths of 5.6 volume hydrogen peroxide (of density 1 g/mL) in terms of mass percentage and molarity (M), respectively, are :

(Take molar mass of hydrogen peroxide as 34 g/mol)

Options :

40503640124. 1.7 and 0.25

ZOLLEGE

40503640125. 0.85 and 0.5

40503640126. 0.85 and 0.25

40503640127. 1.7 and 0.5

Question Number : 33 Question Id : 40503611038 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

5.6 आयतन हाइड्रोजन पराक्साइड (घनत्व 1 g/mL) की प्रबलता, संहति प्रतिशतता तथा मोलारिटी (M) के रूप में, क्रमशः हैं :

(हाइड्रोजन पर-आक्साइड का मोलर द्रव्यमान 34 g/mol लें)

Options :

40503640124. 1.7 तथा 0.25

40503640125. 0.85 तथा 0.5

40503640126. 0.85 तथा 0.25

40503640127. 1.7 तथा 0.5

Question Number : 34 Question Id : 40503611039 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

Among the statements (I – IV), the **correct** ones are :

(I) Be has smaller atomic radius compared to Mg.

(II) Be has higher ionization enthalpy than Al.

(III) Charge/radius ratio of Be is greater than that of Al.

(IV) Both Be and Al form mainly covalent compounds.

Options :

40503640128. (I), (II) and (III)

40503640129. (I), (II) and (IV)

40503640130. (II), (III) and (IV)

40503640131. (I), (III) and (IV)

Question Number : 34 Question Id : 40503611039 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कथनों (I – IV) में से **सही** कथन हैं :

(I) Mg की तुलना में Be की परमाणु त्रिज्या छोटी है।

(II) Al की अपेक्षा Be की आयनन एन्थैल्पी अधिक है।

(III) Al की अपेक्षा Be का आवेश/त्रिज्या अनुपात अधिक है।

(IV) दोनों Be तथा Al मुख्यत: सहसंयोजक यौगिक बनाते हैं।

Options :

40503640128. (I), (II) तथा (III)

40503640129. (I), (II) तथा (IV)

ZOLLEGE

40503640130. (II), (III) तथा (IV)

40503640131. (I), (III) तथा (IV)

Question Number : 35 Question Id : 40503611040 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The incorrect statement is :

Options :

40503640132. Manganate and permanganate ions are tetrahedral

40503640133. Manganate and permanganate ions are paramagnetic

40503640134. In manganate and permanganate ions, the π-bonding takes place by overlap of p-orbitals of oxygen and d-orbitals of manganese

40503640135. Manganate ion is green in colour and permanganate ion is purple in colour

Question Number : 35 Question Id : 40503611040 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

गलत कथन है :

Options :

40503640132. मैंगनेट तथा परमैंगनेट आयन चतुष्फलकीय होते हैं।

40503640133. मैंगनेट तथा परमैंगनेट आयन अनुचुंबकीय होते हैं।

ZOLLEGE

40503640134. मैंगनेट तथा परमैंगनेट आयनों में ऑक्सीजन के p-कक्षकों तथा मैंगनीज के d-कक्षकों के अतिव्यापन के द्वारा π-आबंध बनते हैं।

40503640135. मैंगनेट आयन हरे रंग का है तथा परमैंगनेट आयन नीललोहित रंग का है।

Question Number : 36 Question Id : 40503611041 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Complex A has a composition of $H_{12}O_6Cl_3Cr$. If the complex on treatment with conc. H_2SO_4 loses 13.5% of its original mass, the correct molecular formula of A is :

[Given : atomic mass of Cr = 52 amu and Cl = 35 amu]

Options :

40503640136. $[Cr(H_2O)_5Cl]Cl_2 \cdot H_2O$

40503640137. $[Cr(H_2O)_4Cl_2]Cl \cdot 2H_2O$

40503640138. $[Cr(H_2O)_3Cl_3] \cdot 3H_2O$

40503640139. $[Cr(H_2O)_6]Cl_3$

Question Number : 36 Question Id : 40503611041 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

संकुल A का संघटन $H_{12}O_6Cl_3Cr$ है। यदि संकुल सान्द्र H_2SO_4 के साथ अभिक्रिया कराने पर अपनी मूल संहति का 13.5% खो देता है, तो A का सही आण्विक सूत्र है :

[दिया गया है : परमाणु संहति Cr = 52 amu तथा Cl = 35 amu]

ZOLLEGE

Options :

40503640136. $[Cr(H_2O)_5Cl]Cl_2 \cdot H_2O$

40503640137. $[Cr(H_2O)_4Cl_2]Cl \cdot 2H_2O$

40503640138. $[Cr(H_2O)_3Cl_3] \cdot 3H_2O$

40503640139. $[Cr(H_2O)_6]Cl_3$

Question Number : 37 Question Id : 40503611042 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The d-electron configuration of $[Ru(en)_3]Cl_2$ and $[Fe(H_2O)_6]Cl_2$, respectively are :

Options :

40503640140. $t_{2g}^4\ e_g^2$ and $t_{2g}^4\ e_g^2$

40503640141. $t_{2g}^6\ e_g^0$ and $t_{2g}^6\ e_g^0$

40503640142. $t_{2g}^4\ e_g^2$ and $t_{2g}^6\ e_g^0$

40503640143. $t_{2g}^6\ e_g^0$ and $t_{2g}^4\ e_g^2$

Question Number : 37 Question Id : 40503611042 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$[Ru(en)_3]Cl_2$ तथा $[Fe(H_2O)_6]Cl_2$ के d-इलैक्ट्रॉन विन्यास क्रमशः हैं :

Options :

40503640140. $t_{2g}^4\ e_g^2$ तथा $t_{2g}^4\ e_g^2$

ZOLLEGE

40503640141. $t_{2g}^6\ e_g^0$ तथा $t_{2g}^6\ e_g^0$

40503640142. $t_{2g}^4\ e_g^2$ तथा $t_{2g}^6\ e_g^0$

40503640143. $t_{2g}^6\ e_g^0$ तथा $t_{2g}^4\ e_g^2$

Question Number : 38 Question Id : 40503611043 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The incorrect statement(s) among (a) – (d) regarding acid rain is (are) :

(a) It can corrode water pipes.

(b) It can damage structures made up of stone.

(c) It cannot cause respiratory ailments in animals

(d) It is not harmful for trees

Options :

40503640144. (a), (b) and (d)

40503640145. (a), (c) and (d)

40503640146. (c) and (d)

40503640147. (c) only

Question Number : 38 Question Id : 40503611043 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

अम्लीय वर्षा के संबंध में कथन (a) – (d) में से **गलत** कथन है/हैं :

(a) यह जल के पाइपों को संक्षारित करता है।

(b) यह पत्थर की बनी संरचनाओं को क्षति पहुँचाता है।

(c) यह मवेशियों में श्वसन की बीमारी का कारण नहीं हो सकता है।

(d) यह पेड़ों के लिए हानिकारक नहीं है।

Options :

40503640144. (a), (b) तथा (d)

40503640145. (a), (c) तथा (d)

40503640146. (c) तथा (d)

40503640147. (c) मात्र

Question Number : 39 Question Id : 40503611044 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The increasing order of the reactivity of the following compounds in nucleophilic addition reaction is :

Propanal, Benzaldehyde, Propanone, Butanone

Options :

40503640148. Propanal < Propanone < Butanone < Benzaldehyde

40503640149. Benzaldehyde < Propanal < Propanone < Butanone

40503640150. Benzaldehyde < Butanone < Propanone < Propanal

ZOLLEGE

40503640151. Butanone < Propanone < Benzaldehyde < Propanal

Question Number : 39 Question Id : 40503611044 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित यौगिकों की नाभिकरागी योगज अभिक्रियाओं में अभिक्रियाशीलता का बढ़ता क्रम है :
प्रोपेनल, बेन्जाल्डिहाइड, प्रोपेनोन, ब्यूटेनोन

Options :

40503640148. प्रोपेनल < प्रोपेनोन < ब्यूटेनोन < बेन्जाल्डिहाइड

40503640149. बेन्जाल्डिहाइड < प्रोपेनल < प्रोपेनोन < ब्यूटेनोन

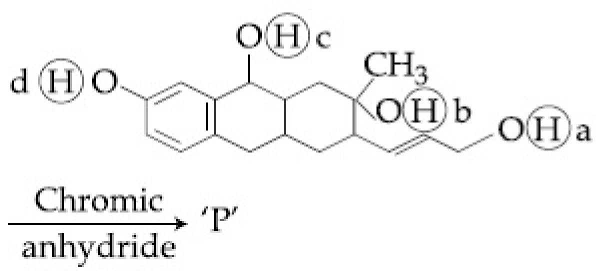
40503640150. बेन्जाल्डिहाइड < ब्यूटेनोन < प्रोपेनोन < प्रोपेनल

40503640151. ब्यूटेनोन < प्रोपेनोन < बेन्जाल्डिहाइड < प्रोपेनल

Question Number : 40 Question Id : 40503611045 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the following reaction :



The product 'P' gives positive ceric ammonium nitrate test. This is because of the presence of which of these –OH group(s) ?

Options :

40503640152. (c) and (d)

ZOLLEGE

40503640153. (b) and (d)

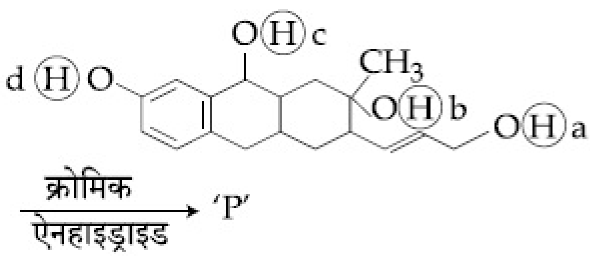
40503640154. (b) only

40503640155. (d) only

Question Number : 40 Question Id : 40503611045 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया पर विचार कीजिए :



उत्पाद 'P' सकारात्मक सेरिक अमोनियम नाइट्रेट परीक्षण देता है। यह इनमें से किस –OH समूह की उपस्थिति के कारण है?

Options :

40503640152. (c) तथा (d)

40503640153. (b) तथा (d)

40503640154. (b) मात्र

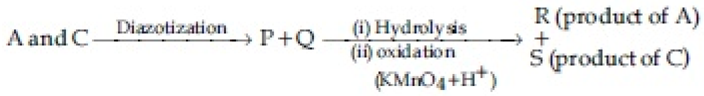
40503640155. (d) मात्र

Question Number : 41 Question Id : 40503611046 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

Three isomers A, B and C (mol. formula $C_8H_{11}N$) give the following results :

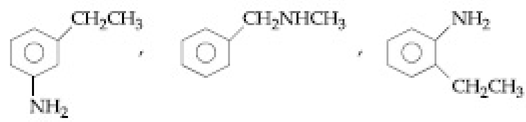


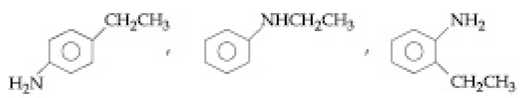
R has lower boiling point than S

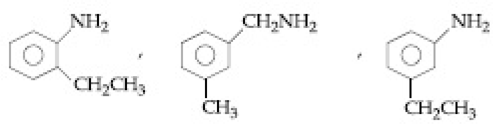
$$B \xrightarrow{C_6H_5SO_2Cl} \text{alkali-insoluble product}$$

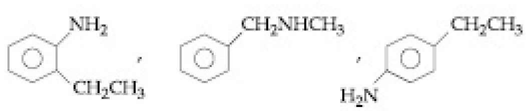
A, B and C, respectively are :

Options :

40503640156. 

40503640157. 

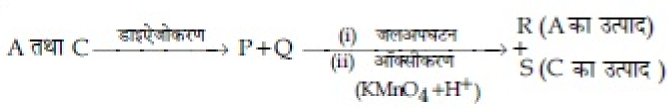
40503640158. 

40503640159. 

Question Number : 41 Question Id : 40503611046 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

तीन समावयवी A, B तथा C (अणुसूत्र $C_8H_{11}N$) निम्नलिखित परिणाम देते हैं :



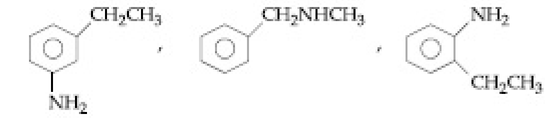
R का क्वथनांक S से कम है।

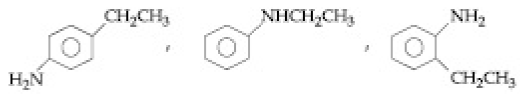
$$B \xrightarrow{C_6H_5SO_2Cl} \text{क्षार–अघुलनशील उत्पाद}$$

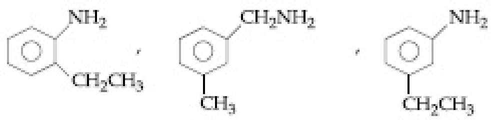
A, B तथा C क्रमशः हैं :

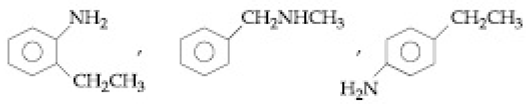
Options :

ZOLLEGE

40503640156. 

40503640157. 

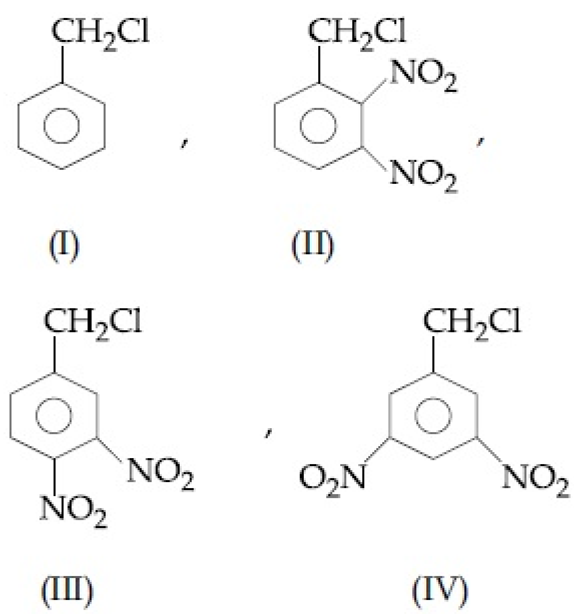
40503640158. 

40503640159. 

Question Number : 42 Question Id : 40503611047 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The decreasing order of reactivity of the following compounds towards nucleophilic substitution (S_N2) is :



Options :

40503640160. (III) > (II) > (IV) > (I)

40503640161. (IV) > (II) > (III) > (I)

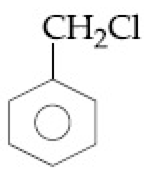
40503640162. (II) > (III) > (I) > (IV)

40503640163. (II) > (III) > (IV) > (I)

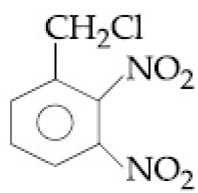
Question Number : 42 Question Id : 40503611047 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

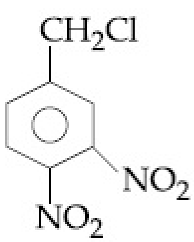
निम्नलिखित यौगिकों की नाभिकरागी प्रतिस्थापन (S_N2) के प्रति अभिक्रियाशीलता का घटता क्रम है :



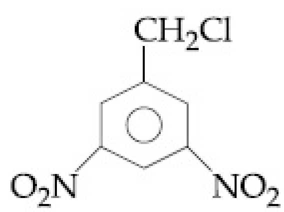
(I)



(II)



(III)



(IV)

Options :

40503640160. (III) > (II) > (IV) > (I)

40503640161. (IV) > (II) > (III) > (I)

40503640162. (II) > (III) > (I) > (IV)

40503640163. (II) > (III) > (IV) > (I)

Question Number : 43 Question Id : 40503611048 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

Match the following drugs with their therapeutic actions :

(i)	Ranitidine	(a)	Antidepressant
(ii)	Nardil (Phenelzine)	(b)	Antibiotic
(iii)	Chloramphenicol	(c)	Antihistamine
(iv)	Dimetane (Brompheniramine)	(d)	Antacid
		(e)	Analgesic

Options :

40503640164. (i)-(d); (ii)-(c); (iii)-(a); (iv)-(e)

40503640165. (i)-(d); (ii)-(a); (iii)-(b); (iv)-(c)

40503640166. (i)-(e); (ii)-(a); (iii)-(c); (iv)-(d)

40503640167. (i)-(a); (ii)-(c); (iii)-(b); (iv)-(e)

Question Number : 43 Question Id : 40503611048 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित औषधियों को उनके चिकित्सकीय क्रियाओं के साथ सुमेलित कीजिए :

(i)	रैनिटिडीन	(a)	प्रतिअवसादक
(ii)	नारडिल (फिनल्जिन)	(b)	प्रतिजैविक
(iii)	क्लोरैम्फेनिकॉल	(c)	प्रतिहिस्टैमिन
(iv)	डाइमेटेन (ब्रोमफेनिरामिन)	(d)	प्रति–अम्ल
		(e)	पीड़ाहारी

Options :

40503640164. (i)-(d); (ii)-(c); (iii)-(a); (iv)-(e)

40503640165. (i)-(d); (ii)-(a); (iii)-(b); (iv)-(c)

ZOLLEGE

40503640166. (i)-(e); (ii)-(a); (iii)-(c); (iv)-(d)

40503640167. (i)-(a); (ii)-(c); (iii)-(b); (iv)-(e)

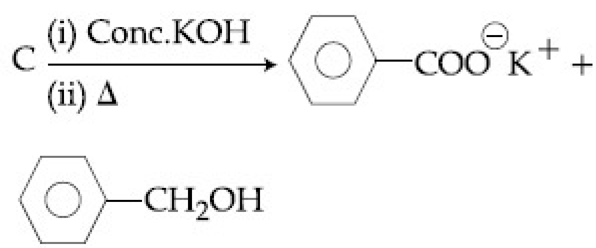
Question Number : 44 Question Id : 40503611049 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The compound A in the following reactions is :

$$A \xrightarrow[\text{(ii) Conc. } H_2SO_4/\Delta]{\text{(i) } CH_3MgBr/H_2O}$$

$$B \xrightarrow[\text{(ii) } Zn/H_2O]{\text{(i) } O_3} C + D$$



$$D \xrightarrow[\Delta]{Ba(OH)_2} H_3C-\overset{\overset{CH_3}{|}}{C}=CH-\overset{\overset{O}{\|}}{C}-CH_3$$

Options :

40503640168. $C_6H_5-\overset{\overset{O}{\|}}{C}-CH\begin{smallmatrix}CH_3\\CH_3\end{smallmatrix}$

40503640169. $C_6H_5-\overset{\overset{O}{\|}}{C}-CH_3$

40503640170. $C_6H_5-CH_2-\overset{\overset{O}{\|}}{C}-CH_3$

40503640171. $C_6H_5-\overset{\overset{O}{\|}}{C}-CH_2CH_3$

ZOLLEGE

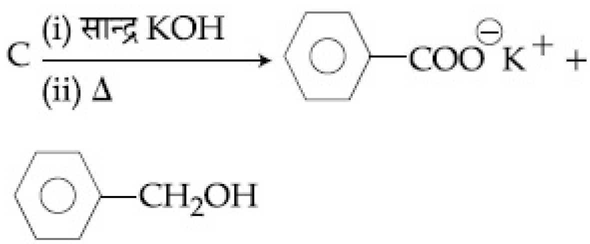
Question Number : 44 Question Id : 40503611049 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं में यौगिक A है :

$$A \xrightarrow[\text{(ii) सान्द्र } H_2SO_4/\Delta]{\text{(i) } CH_3MgBr/H_2O}$$

$$B \xrightarrow[\text{(ii) } Zn/H_2O]{\text{(i) } O_3} C + D$$



$$D \xrightarrow[\Delta]{Ba(OH)_2} H_3C-\underset{}{\overset{CH_3}{\overset{|}{C}}}=CH-\overset{O}{\overset{||}{C}}-CH_3$$

Options :

40503640168. $C_6H_5-\overset{O}{\overset{||}{C}}-CH\begin{matrix} CH_3 \\ CH_3 \end{matrix}$

40503640169. $C_6H_5-\overset{O}{\overset{||}{C}}-CH_3$

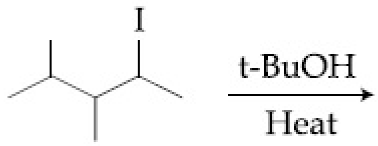
40503640170. $C_6H_5-CH_2-\overset{O}{\overset{||}{C}}-CH_3$

40503640171. $C_6H_5-\overset{O}{\overset{||}{C}}-CH_2CH_3$

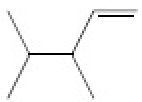
Question Number : 45 Question Id : 40503611050 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

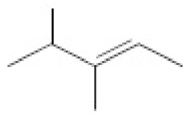
Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

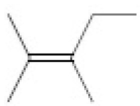
The major product in the following reaction is :

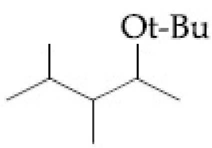


Options :

40503640172. 

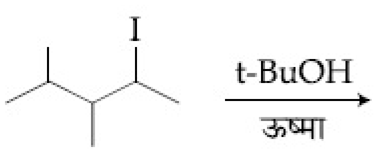
40503640173. 

40503640174. 

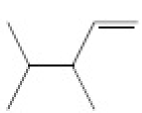
40503640175. 

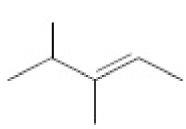
Question Number : 45 Question Id : 40503611050 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं में मुख्य उत्पाद है :

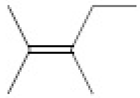


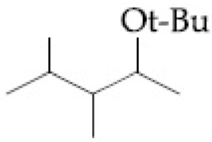
Options :

40503640172. 

40503640173. 

ZOLLEGE

40503640174. 

40503640175. 

Sub-Section Number : 2
Sub-Section Id : 405036770
Question Shuffling Allowed : Yes

Question Number : 46 Question Id : 40503611051 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

6.023×10^{22} molecules are present in 10 g of a substance 'x'. The molarity of a solution containing 5 g of substance 'x' in 2 L solution is ________ $\times 10^{-3}$.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 46 Question Id : 40503611051 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

एक पदार्थ 'x' के 10 g में 6.023×10^{22} अणु उपस्थित हैं। तो उस विलयन की मोलारिटी, जिसके 2 L विलयन में पदार्थ 'x' का 5 g है, होगी ________ $\times 10^{-3}$।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 47 Question Id : 40503611052 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

If 250 cm^3 of an aqueous solution containing 0.73 g of a protein A is isotonic with one litre of another aqueous solution containing 1.65 g of a protein B, at 298 K, the ratio of the molecular masses of A and B is __________ $\times 10^{-2}$ (to the nearest integer).

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 47 Question Id : 40503611052 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

यदि प्रोटीन A के एक जलीय विलयन का 250 cm^3 जिसमें A का 0.73 g है, प्रोटीन B के एक जलीय विलयन जिसके 1 लीटर में प्रोटीन का 1.65 g है, 298 K पर समपरासारी हैं A तथा B के आण्विक संहतियों का अनुपात है __________ $\times 10^{-2}$ (निकटतम पूर्णांक)।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 48 Question Id : 40503611053 Question Type : SA Display Question Number : Yes Correct Marks : 4 Wrong Marks : 0

ZOLLEGE

An acidic solution of dichromate is electrolyzed for 8 minutes using 2A current. As per the following equation

$$Cr_2O_7^{2-} + 14\,H^+ + 6\,e^- \rightarrow 2\,Cr^{3+} + 7\,H_2O$$

The amount of Cr^{3+} obtained was 0.104 g. The efficiency of the process(in%)is (Take : F=96000 C, At. mass of chromium=52) ________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 48 Question Id : 40503611053 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

डाइक्रोमेट के एक अम्लीय विलयन को 2A विद्युतधारा का उपयोग करके 8 मिनट तक वैद्युत अपघटित किया गया। निम्नलिखित समीकरण के आधार पर

$$Cr_2O_7^{2-} + 14\,H^+ + 6\,e^- \rightarrow 2\,Cr^{3+} + 7\,H_2O$$

बने Cr^{3+} की आकलित मात्रा 0.104 g पायी गई। प्रक्रम की दक्षता (% में) है (मानें : F=96000 C, क्रोमियम की परमाणु संहति=52) ________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 49 Question Id : 40503611054 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

ZOLLEGE

The volume (in mL) of 0.1 N NaOH required to neutralise 10 mL of 0.1 N phosphinic acid is __________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 49 Question Id : 40503611054 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

0.1 N फॉस्फिनिक अम्ल के 10 mL को उदासीन करने के लिए आवश्यक 0.1 N NaOH का आयतन (mL में) है __________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 50 Question Id : 40503611055 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

The number of $>C=O$ groups present in a tripeptide Asp – Glu – Lys is _________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 50 Question Id : 40503611055 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

ZOLLEGE

एक ट्राइपेप्टाइड, Asp – Glu – Lys में उपस्थित

$\rangle$C = O समूहों की संख्या है ________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

Mathematics

Section Id :	405036402
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036771
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 40503611056 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let R_1 and R_2 be two relations defined as follows :

$R_1 = \{(a, b) \in \mathbf{R}^2 : a^2 + b^2 \in Q\}$ and

$R_2 = \{(a, b) \in \mathbf{R}^2 : a^2 + b^2 \notin Q\}$, where Q is the set of all rational numbers. Then :

Options :

40503640181. R_1 and R_2 are both transitive.

40503640182. R_1 is transitive but R_2 is not transitive.

ZOLLEGE

40503640183. R_2 is transitive but R_1 is not transitive.

40503640184. Neither R_1 nor R_2 is transitive.

Question Number : 51 Question Id : 40503611056 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो सम्बन्ध R_1 तथा R_2 नीचे दिए गए हैं :

$R_1 = \{(a, b) \in \mathbf{R}^2 : a^2 + b^2 \in Q\}$ तथा

$R_2 = \{(a, b) \in \mathbf{R}^2 : a^2 + b^2 \notin Q\}$, जहाँ Q सभी परिमेय संख्याओं का समुच्चय है, तो :

Options :

40503640181. R_1 और R_2 दोनों संक्रामक हैं।

40503640182. R_1 संक्रामक है परन्तु R_2 संक्रामक नहीं है।

40503640183. R_2 संक्रामक है परन्तु R_1 संक्रामक नहीं है।

40503640184. R_1 तथा R_2 में से कोई भी संक्रामक नहीं है।

Question Number : 52 Question Id : 40503611057 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The set of all real values of λ for which the quadratic equations, $(\lambda^2 + 1)x^2 - 4\lambda x + 2 = 0$ always have exactly one root in the interval $(0, 1)$ is :

Options :

40503640185. $(-3, -1)$

40503640186. $(0, 2)$

40503640187. $(1, 3]$

ZOLLEGE

40503640188. $(2, 4]$

Question Number : 52 Question Id : 40503611057 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

λ की उन सभी वास्तविक संख्याओं का समुच्चय, जिनके लिए द्विघात समीकरणों, $(\lambda^2+1)x^2-4\lambda x+2=0$, का अंतराल $(0, 1)$ में सदैव मात्र एक ही मूल है, है :

Options :

40503640185. $(-3, -1)$

40503640186. $(0, 2)$

40503640187. $(1, 3]$

40503640188. $(2, 4]$

Question Number : 53 Question Id : 40503611058 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If z_1, z_2 are complex numbers such that $\text{Re}(z_1)=|z_1-1|$, $\text{Re}(z_2)=|z_2-1|$ and $\arg(z_1-z_2)=\frac{\pi}{6}$, then $\text{Im}(z_1+z_2)$ is equal to :

Options :

40503640189. $\frac{\sqrt{3}}{2}$

40503640190. $\frac{1}{\sqrt{3}}$

40503640191. $2\sqrt{3}$

ZOLLEGE

40503640192. $\frac{2}{\sqrt{3}}$

Question Number : 53 Question Id : 40503611058 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि z_1 तथा z_2 दो ऐसी सम्मिश्र संख्याएँ हैं, जिनके लिए $\text{Re}(z_1) = |z_1 - 1|$, $\text{Re}(z_2) = |z_2 - 1|$ तथा $\arg(z_1 - z_2) = \frac{\pi}{6}$ हैं, तो $\text{Im}(z_1 + z_2)$ बराबर है :

Options :

40503640189. $\frac{\sqrt{3}}{2}$

40503640190. $\frac{1}{\sqrt{3}}$

40503640191. $2\sqrt{3}$

40503640192. $\frac{2}{\sqrt{3}}$

Question Number : 54 Question Id : 40503611059 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let A be a 3×3 matrix such that

$$\text{adj } A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 0 & 2 \\ 1 & -2 & -1 \end{bmatrix} \text{ and}$$

$B = \text{adj}(\text{adj } A)$.

If $|A| = \lambda$ and $|(B^{-1})^T| = \mu$, then the ordered pair, $(|\lambda|, \mu)$ is equal to :

Options :

ZOLLEGE

40503640193. $\left(9, \frac{1}{81}\right)$

40503640194. $\left(3, \frac{1}{81}\right)$

40503640195. $(3, 81)$

40503640196. $\left(9, \frac{1}{9}\right)$

Question Number : 54 Question Id : 40503611059 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना A एक 3×3 आव्यूह है, जिसके लिए

$$\text{adj } A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 0 & 2 \\ 1 & -2 & -1 \end{bmatrix} \text{ तथा } B = \text{adj}(\text{adj } A)$$

हैं। यदि $|A| = \lambda$ तथा $|(B^{-1})^T| = \mu$ हैं, तो क्रमित युग्म, $(|\lambda|, \mu)$ बराबर है :

Options :

40503640193. $\left(9, \frac{1}{81}\right)$

40503640194. $\left(3, \frac{1}{81}\right)$

40503640195. $(3, 81)$

40503640196. $\left(9, \frac{1}{9}\right)$

Question Number : 55 Question Id : 40503611060 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

ZOLLEGE

Correct Marks : 4 Wrong Marks : 1

If the term independent of x in the expansion of $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^9$ is k, then 18 k is equal to :

Options :

40503640197. 7

40503640198. 5

40503640199. 9

40503640200. 11

Question Number : 55 Question Id : 40503611060 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^9$ के विस्तार में, x से स्वतंत्र पद k है, तो 18 k बराबर है :

Options :

40503640197. 7

40503640198. 5

40503640199. 9

40503640200. 11

Question Number : 56 Question Id : 40503611061 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

If the sum of the series

$20 + 19\frac{3}{5} + 19\frac{1}{5} + 18\frac{4}{5} + \dots$ upto n^{th} term is 488 and the n^{th} term is negative, then :

Options :

40503640201. $n = 60$

40503640202. $n = 41$

40503640203. n^{th} term is $-4\frac{2}{5}$

40503640204. n^{th} term is -4

Question Number : 56 Question Id : 40503611061 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि श्रेणी

$20 + 19\frac{3}{5} + 19\frac{1}{5} + 18\frac{4}{5} + \dots$ का n^{th} पद तक, योगफल 488 और n^{th} पद ऋणात्मक है, तो :

Options :

40503640201. $n = 60$

40503640202. $n = 41$

40503640203. n^{th} पद $-4\frac{2}{5}$ है

40503640204. n^{th} पद -4 है

Question Number : 57 Question Id : 40503611062 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

ZOLLEGE

Correct Marks : 4 Wrong Marks : 1

$$\lim_{x \to a} \frac{(a + 2x)^{\frac{1}{3}} - (3x)^{\frac{1}{3}}}{(3a + x)^{\frac{1}{3}} - (4x)^{\frac{1}{3}}}$$ (a ≠ 0) is equal to :

Options :

40503640205. $\left(\frac{2}{3}\right)^{\frac{4}{3}}$

40503640206. $\left(\frac{2}{9}\right)\left(\frac{2}{3}\right)^{\frac{1}{3}}$

40503640207. $\left(\frac{2}{9}\right)^{\frac{4}{3}}$

40503640208. $\left(\frac{2}{3}\right)\left(\frac{2}{9}\right)^{\frac{1}{3}}$

Question Number : 57 Question Id : 40503611062 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\lim_{x \to a} \frac{(a + 2x)^{\frac{1}{3}} - (3x)^{\frac{1}{3}}}{(3a + x)^{\frac{1}{3}} - (4x)^{\frac{1}{3}}}$$ (a ≠ 0) बराबर है :

Options :

40503640205. $\left(\frac{2}{3}\right)^{\frac{4}{3}}$

40503640206. $\left(\frac{2}{9}\right)\left(\frac{2}{3}\right)^{\frac{1}{3}}$

40503640207. $\left(\frac{2}{9}\right)^{\frac{4}{3}}$

ZOLLEGE

40503640208. $\left(\frac{2}{3}\right)\left(\frac{2}{9}\right)^{\frac{1}{3}}$

Question Number : 58 Question Id : 40503611063 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Suppose $f(x)$ is a polynomial of degree four, having critical points at $-1, 0, 1$. If $T=\{x \in \mathbf{R} \mid f(x)=f(0)\}$, then the sum of squares of all the elements of T is :

Options :

40503640209. 4

40503640210. 2

40503640211. 6

40503640212. 8

Question Number : 58 Question Id : 40503611063 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f(x)$, घात 4 का एक बहुपद है जिसके क्रान्तिक बिन्दु $-1, 0, 1$ हैं। यदि $T=\{x \in \mathbf{R} \mid f(x)=f(0)\}$, तो T के सभी अवयवों के वर्गों का योगफल है :

Options :

40503640209. 4

40503640210. 2

40503640211. 6

40503640212. 8

ZOLLEGE

Question Number : 59 Question Id : 40503611064 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the surface area of a cube is increasing at a rate of 3.6 cm^2/sec, retaining its shape; then the rate of change of its volume (in $cm^3/sec.$), when the length of a side of the cube is 10 cm, is :

Options :

40503640213. 10

40503640214. 9

40503640215. 18

40503640216. 20

Question Number : 59 Question Id : 40503611064 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि अपने रूप को बनाए रखते हुए, एक घन का पृष्ठ क्षेत्रफल 3.6 cm^2/sec की दर से बढ़ रहा है, तो इसके आयतन के परिवर्तन की दर (cm^3/sec में), जब घन की एक भुजा की लम्बाई 10 cm है, है :

Options :

40503640213. 10

40503640214. 9

40503640215. 18

40503640216. 20

Question Number : 60 Question Id : 40503611065 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

If $\int \sin^{-1}\left(\sqrt{\frac{x}{1+x}}\right) dx = A(x)\tan^{-1}(\sqrt{x}) + B(x) + C$, where C is a constant of integration, then the ordered pair $(A(x), B(x))$ can be :

Options :

40503640217. $\left(x+1, -\sqrt{x}\right)$

40503640218. $\left(x+1, \sqrt{x}\right)$

40503640219. $\left(x-1, -\sqrt{x}\right)$

40503640220. $\left(x-1, \sqrt{x}\right)$

Question Number : 60 Question Id : 40503611065 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि

$\int \sin^{-1}\left(\sqrt{\frac{x}{1+x}}\right) dx = A(x)\tan^{-1}(\sqrt{x}) + B(x) + C$ है, जहाँ C एक समाकलन अचर है, तो क्रमित युग्म $(A(x), B(x))$ हो सकता है :

Options :

40503640217. $\left(x+1, -\sqrt{x}\right)$

40503640218. $\left(x+1, \sqrt{x}\right)$

40503640219. $\left(x-1, -\sqrt{x}\right)$

40503640220. $\left(x-1, \sqrt{x}\right)$

ZOLLEGE

Question Number : 61 Question Id : 40503611066 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the value of the integral

$$\int_0^{1/2} \frac{x^2}{(1-x^2)^{3/2}}\,dx$$

is $\frac{k}{6}$, then k is equal to :

Options :

40503640221. $2\sqrt{3}+\pi$

40503640222. $2\sqrt{3}-\pi$

40503640223. $3\sqrt{2}-\pi$

40503640224. $3\sqrt{2}+\pi$

Question Number : 61 Question Id : 40503611066 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि समाकल $\int_0^{1/2} \frac{x^2}{(1-x^2)^{3/2}}\,dx$ का मान $\frac{k}{6}$ है, तो k बराबर है :

Options :

40503640221. $2\sqrt{3}+\pi$

40503640222. $2\sqrt{3}-\pi$

40503640223. $3\sqrt{2}-\pi$

40503640224. $3\sqrt{2}+\pi$

Question Number : 62 Question Id : 40503611067 Question Type : MCQ Option Shuffling : Yes

ZOLLEGE

Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $x^3 dy + xy\ dx = x^2 dy + 2y\ dx$; $y(2) = e$ and $x > 1$, then $y(4)$ is equal to :

Options :

40503640225. $\frac{3}{2} + \sqrt{e}$

40503640226. $\frac{1}{2} + \sqrt{e}$

40503640227. $\frac{\sqrt{e}}{2}$

40503640228. $\frac{3}{2}\sqrt{e}$

Question Number : 62 Question Id : 40503611067 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $x^3 dy + xy\ dx = x^2 dy + 2y\ dx$; $y(2) = e$ तथा $x > 1$, तो $y(4)$ बराबर है :

Options :

40503640225. $\frac{3}{2} + \sqrt{e}$

40503640226. $\frac{1}{2} + \sqrt{e}$

40503640227. $\frac{\sqrt{e}}{2}$

40503640228. $\frac{3}{2}\sqrt{e}$

ZOLLEGE

Question Number : 63 Question Id : 40503611068 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a ΔABC has vertices $A(-1, 7)$, $B(-7, 1)$ and $C(5, -5)$, then its orthocentre has coordinates :

Options :

40503640229. $\left(-\frac{3}{5}, \frac{3}{5}\right)$

40503640230. $\left(\frac{3}{5}, -\frac{3}{5}\right)$

40503640231. $(-3, 3)$

40503640232. $(3, -3)$

Question Number : 63 Question Id : 40503611068 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि एक त्रिभुज ABC के शीर्ष बिन्दु $A(-1, 7)$, $B(-7, 1)$ तथा $C(5, -5)$ हैं, तो इसके लम्ब-केन्द्र के निर्देशांक हैं :

Options :

40503640229. $\left(-\frac{3}{5}, \frac{3}{5}\right)$

40503640230. $\left(\frac{3}{5}, -\frac{3}{5}\right)$

40503640231. $(-3, 3)$

40503640232. $(3, -3)$

ZOLLEGE

Question Number : 64 Question Id : 40503611069 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let the latus ractum of the parabola $y^2 = 4x$ be the common chord to the circles C_1 and C_2 each of them having radius $2\sqrt{5}$. Then, the distance between the centres of the circles C_1 and C_2 is :

Options :

40503640233. $4\sqrt{5}$

40503640234. 8

40503640235. $8\sqrt{5}$

40503640236. 12

Question Number : 64 Question Id : 40503611069 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि परवलय $y^2 = 4x$ की नाभिलम्ब जीवा, दो वृत्तों, C_1 तथा C_2 की उभयनिष्ठ जीवा है, जबकि वृत्तों में से प्रत्येक का अर्धव्यास $2\sqrt{5}$ है, तो वृत्तों C_1 एवं C_2 के केन्द्र बिन्दुओं के बीच की दूरी है :

Options :

40503640233. $4\sqrt{5}$

40503640234. 8

40503640235. $8\sqrt{5}$

40503640236. 12

Question Number : 65 Question Id : 40503611070 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

ZOLLEGE

Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Let e_1 and e_2 be the eccentricities of the ellipse, $\frac{x^2}{25} + \frac{y^2}{b^2} = 1 \, (b < 5)$ and the hyperbola, $\frac{x^2}{16} - \frac{y^2}{b^2} = 1$ respectively satisfying $e_1 e_2 = 1$. If α and β are the distances between the foci of the ellipse and the foci of the hyperbola respectively, then the ordered pair (α, β) is equal to :

Options :

40503640237. $\left(\frac{24}{5}, 10\right)$

40503640238. $(8, 10)$

40503640239. $\left(\frac{20}{3}, 12\right)$

40503640240. $(8, 12)$

Question Number : 65 Question Id : 40503611070 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना दीर्घवृत्त, $\frac{x^2}{25} + \frac{y^2}{b^2} = 1 \, (b < 5)$ तथा अतिपरवलय $\frac{x^2}{16} - \frac{y^2}{b^2} = 1$ की उत्केन्द्रताएँ क्रमशः e_1 तथा e_2 हैं और $e_1 e_2 = 1$ है। यदि दीर्घवृत्त और अतिपरवलय के नाभिकेन्द्रों के बीच की दूरियाँ क्रमशः α तथा β हैं, तो क्रमित युग्म (α, β) बराबर है :

Options :

ZOLLEGE

40503640237. $\left(\frac{24}{5}, 10\right)$

40503640238. $(8, 10)$

40503640239. $\left(\frac{20}{3}, 12\right)$

40503640240. $(8, 12)$

Question Number : 66 Question Id : 40503611071 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The plane which bisects the line joining the points $(4, -2, 3)$ and $(2, 4, -1)$ at right angles also passes through the point :

Options :

40503640241. $(4, 0, 1)$

40503640242. $(4, 0, -1)$

40503640243. $(0, -1, 1)$

40503640244. $(0, 1, -1)$

Question Number : 66 Question Id : 40503611071 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह समतल, जो बिन्दुओं $(4, -2, 3)$ तथा $(2, 4, -1)$ को मिलाने वाली सरल रेखा को लम्ब समद्विभाजित करता है, निम्न में से किस बिन्दु से भी होकर जाता है?

Options :

40503640241. $(4, 0, 1)$

40503640242. $(4, 0, -1)$

ZOLLEGE

40503640243. $(0, -1, 1)$

40503640244. $(0, 1, -1)$

Question Number : 67 Question Id : 40503611072 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let x_i $(1 \leq i \leq 10)$ be ten observations of a random variable X. If $\sum_{i=1}^{10}(x_i - \text{p}) = 3$ and $\sum_{i=1}^{10}(x_i - \text{p})^2 = 9$ where $0 \neq \text{p} \in \mathbf{R}$, then the standard deviation of these observations is :

Options :

40503640245. $\frac{9}{10}$

40503640246. $\frac{7}{10}$

40503640247. $\frac{4}{5}$

40503640248. $\sqrt{\frac{3}{5}}$

Question Number : 67 Question Id : 40503611072 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

माना यादृच्छिक चर X के दस प्रेक्षण x_i $(1 \le i \le 10)$ हैं। यदि $\sum_{i=1}^{10}(x_i - p) = 3$ तथा $\sum_{i=1}^{10}(x_i - p)^2 = 9$, जबकि $0 \ne p \in \mathbf{R}$ है, तो इन प्रेक्षणों का मानक विचलन है :

Options :

40503640245. $\frac{9}{10}$

40503640246. $\frac{7}{10}$

40503640247. $\frac{4}{5}$

40503640248. $\sqrt{\frac{3}{5}}$

Question Number : 68 Question Id : 40503611073 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The probability that a randomly chosen 5-digit number is made from exactly two digits is :

Options :

40503640249. $\frac{121}{10^4}$

40503640250. $\frac{134}{10^4}$

40503640251. $\frac{150}{10^4}$

ZOLLEGE

40503640252. $\frac{135}{10^4}$

Question Number : 68 Question Id : 40503611073 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यादृच्छया चुनी गई पाँच अंकों की एक संख्या के मात्र दो अंकों से बनाई गई होने की प्रायिकता है :

Options :

40503640249. $\frac{121}{10^4}$

40503640250. $\frac{134}{10^4}$

40503640251. $\frac{150}{10^4}$

40503640252. $\frac{135}{10^4}$

Question Number : 69 Question Id : 40503611074 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let a, b, c $\in$ **R** be such that $a^2+b^2+c^2=1$. If

$a\cos\theta = b\cos\left(\theta+\frac{2\pi}{3}\right) = c\cos\left(\theta+\frac{4\pi}{3}\right)$,

where $\theta = \frac{\pi}{9}$, then the angle between the vectors $a\hat{i}+b\hat{j}+c\hat{k}$ and $b\hat{i}+c\hat{j}+a\hat{k}$ is :

Options :

ZOLLEGE

40503640253. $\frac{2\pi}{3}$

40503640254. 0

40503640255. $\frac{\pi}{2}$

40503640256. $\frac{\pi}{9}$

Question Number : 69 Question Id : 40503611074 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $a, b, c \in \mathbf{R}$, जिनके लिए $a^2+b^2+c^2=1$ है।

यदि $a\cos\theta = b\cos\left(\theta+\frac{2\pi}{3}\right) = c\cos\left(\theta+\frac{4\pi}{3}\right)$ है,

जबकि $\theta = \frac{\pi}{9}$ है, तो सदिशों $a\hat{i} + b\hat{j} + c\hat{k}$ तथा

$b\hat{i} + c\hat{j} + a\hat{k}$ के बीच का कोण है :

Options :

40503640253. $\frac{2\pi}{3}$

40503640254. 0

40503640255. $\frac{\pi}{2}$

40503640256. $\frac{\pi}{9}$

Question Number : 70 Question Id : 40503611075 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE

Let p, q, r be three statements such that the truth value of $(p \wedge q) \rightarrow (\sim q \vee r)$ is F. Then the truth values of p, q, r are respectively :

Options :

40503640257. T, T, T

40503640258. F, T, F

40503640259. T, T, F

40503640260. T, F, T

Question Number : 70 Question Id : 40503611075 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि p, q तथा r ऐसे तीन कथन हैं कि कथन $(p \wedge q) \rightarrow (\sim q \vee r)$ का सत्यमान F है, तो p, q, r के क्रमशः सत्यमान हैं :

Options :

40503640257. T, T, T

40503640258. F, T, F

40503640259. T, T, F

40503640260. T, F, T

Sub-Section Number :	2
Sub-Section Id :	405036772
Question Shuffling Allowed :	Yes

Question Number : 71 Question Id : 40503611076 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE

Let S be the set of all integer solutions, (x, y, z), of the system of equations

$$x - 2y + 5z = 0$$
$$-2x + 4y + z = 0$$
$$-7x + 14y + 9z = 0$$

such that $15 \leq x^2 + y^2 + z^2 \leq 150$. Then, the number of elements in the set S is equal to ________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 71 Question Id : 40503611076 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

यदि समीकरण निकाय

$$x - 2y + 5z = 0$$
$$-2x + 4y + z = 0$$
$$-7x + 14y + 9z = 0$$

के पूर्णांकीय हलों (x, y, z) का समुच्चय S है, जिनके लिए $15 \leq x^2 + y^2 + z^2 \leq 150$; तो S के अवयवों की संख्या है ________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 72 Question Id : 40503611077 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

The total number of 3 - digit numbers, whose sum of digits is 10, is ________.

Response Type : Numeric

ZOLLEGE

Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 72 Question Id : 40503611077 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

तीन अंकों की संख्याओं, जिनके अंकों का योगफल 10 है, की कुल संख्या है ________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 73 Question Id : 40503611078 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

If m arithmetic means (A.Ms) and three geometric means (G.Ms) are inserted between 3 and 243 such that 4^{th} A.M. is equal to 2^{nd} G.M., then m is equal to ________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 73 Question Id : 40503611078 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

यदि 3 तथा 243 के बीच m समान्तर माध्य तथा तीन गुणोत्तर माध्य इस प्रकार डाले गए हैं कि चौथा समान्तर माध्य दूसरे गुणोत्तर माध्य के बराबर है, तो m बराबर है ________ ।

ZOLLEGE

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 74 Question Id : 40503611079 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

If the tangent to the curve, $y = e^x$ at a point (c, e^c) and the normal to the parabola, $y^2 = 4x$ at the point (1, 2) intersect at the same point on the x-axis, then the value of c is __________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 74 Question Id : 40503611079 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

यदि वक्र, $y = e^x$ के बिन्दु (c, e^c) पर स्पर्श रेखा तथा परवलय $y^2 = 4x$ के बिन्दु (1, 2) पर अभिलम्ब दोनों x-अक्ष के एक ही बिन्दु से होकर जाते हैं, तो c का मान है __________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
5 to 5.002

Question Number : 75 Question Id : 40503611080 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

ZOLLEGE

Let a plane P contain two lines

$\vec{r} = \hat{i} + \lambda(\hat{i} + \hat{j}), \lambda \in \mathbf{R}$ and

$\vec{r} = -\hat{j} + \mu(\hat{j} - \hat{k}), \mu \in \mathbf{R}$.

If $Q(\alpha, \beta, \gamma)$ is the foot of the perpendicular drawn from the point $M(1, 0, 1)$ to P, then $3(\alpha+\beta+\gamma)$ equals ________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

Question Number : 75 Question Id : 40503611080 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

माना दो रेखाएँ

$\vec{r} = \hat{i} + \lambda(\hat{i} + \hat{j}), \lambda \in \mathbf{R}$ तथा

$\vec{r} = -\hat{j} + \mu(\hat{j} - \hat{k}), \mu \in \mathbf{R}$, एक समतल P पर स्थित हैं। यदि बिन्दु $M(1, 0, 1)$ से समतल P पर डाले गए लम्ब का पाद, बिन्दु $Q(\alpha, \beta, \gamma)$ है, तो $3(\alpha+\beta+\gamma)$ बराबर है ________ ।

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

5 to 5.002

ZOLLEGE