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B TECH EG

Group Number :	1
Group Id :	708191219
Group Maximum Duration :	0
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Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300
Is this Group for Examiner? :	No

Physics Section A

Section Id :	708191892
Section Number :	1
Section type :	Online

Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911172
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 70819120284 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In a typical combustion engine the workdone by a gas molecule is given by $W = \alpha^2 \beta e^{\frac{-\beta x^2}{kT}}$, where x is the displacement, k is the Boltzmann constant and T is the temperature. If α and β are constants, dimensions of α will be :

Options :

70819166001. $[M L T^{-2}]$

70819166002. $[M^0 L T^0]$

70819166003. $[M L T^{-1}]$

70819166004. $[M^2 L T^{-2}]$

Question Number : 1 Question Id : 70819120284 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક લાક્ષણિક દહનશીલ એન્જીન (કંબશન્ એન્જીન) માં વાયુનાં અણુ દ્વારા થયેલ કાર્યને $W = \alpha^2 \beta e^{\frac{-\beta x^2}{kT}}$ દ્વારા આપવામાં આવે છે જ્યાં x સ્થાનાંતર, k બોલ્ટ્ઝમેન અચળાંક અને T તાપમાન દર્શાવે છે. જો α અને β અચળાંકો હોય તો α નું પરિમાણ _____ હશે.

Options :

70819166001. $[M L T^{-2}]$

70819166002. $[M^0 L T^0]$

70819166003. $[M L T^{-1}]$

70819166004. $[M^2 L T^{-2}]$

Question Number : 2 Question Id : 70819120285 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Body 'P' having mass M moving with speed 'u' has head-on collision elastically with another body 'Q' having mass 'm' initially at rest. If m << M, body 'Q' will have a maximum speed equal to '2u' after collision.

Reason R : During elastic collision, the momentum and kinetic energy are both conserved.

In the light of the above statements, choose the most appropriate answer from the options given below :

Options :

70819166005. Both **A** and **R** are correct and **R** is the correct explanation of **A**.

70819166006. Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**.

70819166007. **A** is correct but **R** is not correct.

70819166008. **A** is not correct but **R** is correct.

Question Number : 2 Question Id : 70819120285 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે. એક ને કથન A અને બીજાને કારણ R દ્વારા દર્શાવવામાં આવ્યા છે.

કથન A : M દળ ધરાવતો તેમજ 'u' ઝડપથી ગતિ કરતો પદાર્થ 'P' પ્રારંભમાં વિરામ સ્થિતીમાં છે અને 'm' દળ ધરાવતાં 'Q' પદાર્થ સાથે તે સીધો સ્થિતિસ્થાપક સંઘાત કરે છે. જો m << M હોય તો પદાર્થ 'Q' ની સંઘાત પછી મહત્તમ ઝડપ '2u' હોય છે.

કારણ R : સ્થિતિસ્થાપક સંઘાત દરમ્યાન વેગમાન અને ગતિઊર્જા બંનેનું સંરક્ષણ થાય છે.

ઉપરોક્ત જણાવેલ કથન અને કારણને અનુલક્ષીને નીચે આપેલ વિકલ્પોમાંથી સૌથી યોગ્ય જવાબ પસંદ કરો.

Options :

70819166005. બંને A અને R સાચાં છે તેમજ A નું સાચું સ્પષ્ટીકરણ R છે.

70819166006. બંને A અને R સાચાં છે પરંતુ A નું સાચું સ્પષ્ટીકરણ R નથી.

70819166007. A સાચું છે પરંતુ R ખોટું છે.

70819166008. A ખોટું છે પરંતુ R સાચું છે.

Question Number : 3 Question Id : 70819120286 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A planet revolving in elliptical orbit has :

A. a constant velocity of revolution.

B. has the least velocity when it is nearest to the sun.

C. its areal velocity is directly proportional to its velocity.

D. areal velocity is inversely proportional to its velocity.

E. to follow a trajectory such that the areal velocity is constant.

Choose the correct answer from the options given below :

Options :

70819166009. A only

70819166010. C only

70819166011. D only

70819166012. E only

Question Number : 3 Question Id : 70819120286 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

દીર્ઘવૃત્તીય કક્ષામાં પરિભ્રમણ કરતા ગ્રહ માટે :

A. પરિભ્રમણ ને અચળ વેગ હોય છે.

B. તે સૂર્યની નજીક હશે ત્યારે ન્યુનત્તમ વેગ ધરાવે છે.

C. તેનો ક્ષેત્રીય વેગ તેના વેગ ને સમપ્રમાણ છે.

D. ક્ષેત્રીય વેગ તેના વેગનાં વ્યસ્ત પ્રમાણમાં છે.

E. તે એવા ગતિ પથને અનુસરે છે કે જેથી તેનો ક્ષેત્રીય વેગ અચળ રહે.

નીચે દર્શાવેલ વિકલ્પોમાંથી સાચો જવાબ આપો :

Options :

70819166009. માત્ર A

70819166010. માત્ર C

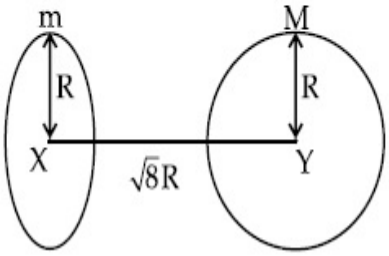
70819166011. માત્ર D

70819166012. માત્ર E

Question Number : 4 Question Id : 70819120287 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Find the gravitational force of attraction between the ring and sphere as shown in the diagram, where the plane of the ring is perpendicular to the line joining the centres. If $\sqrt{8}R$ is the distance between the centres of a ring (of mass 'm') and a sphere (mass 'M') where both have equal radius 'R'.



Options :

70819166013. $\frac{\sqrt{8}}{27} \cdot \frac{GmM}{R^2}$

70819166014. $\frac{\sqrt{8}}{9} \cdot \frac{GmM}{R}$

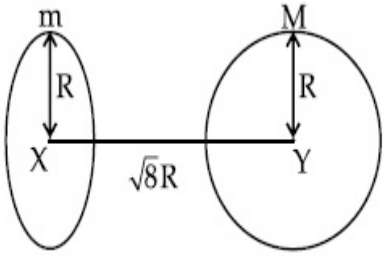
70819166015. $\frac{1}{3\sqrt{8}} \cdot \frac{GMm}{R^2}$

70819166016. $\frac{2\sqrt{2}}{3} \cdot \frac{GMm}{R^2}$

Question Number : 4 Question Id : 70819120287 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવેલ ગોળા અને વલય (રીંગ) વચ્ચે આકર્ષણ બળ શોધો, જ્યાં રીંગનું સમતલ કેન્દ્રોને જોડતી રેખાને લંબરૂપે છે. બે રિંગ ('m' દળ) નાં કેન્દ્ર થી ગોળા ('M' દળ)નાં કેન્દ્ર વચ્ચેનું અંતર $\sqrt{8}R$ હોય તેમજ બંને એકસરખી ત્રિજ્યા 'R' ધરાવે છે.



Options :

70819166013. $\frac{\sqrt{8}}{27} \cdot \frac{GmM}{R^2}$

70819166014. $\frac{\sqrt{8}}{9} \cdot \frac{GmM}{R}$

70819166015. $\frac{1}{3\sqrt{8}} \cdot \frac{GMm}{R^2}$

70819166016. $\frac{2\sqrt{2}}{3} \cdot \frac{GMm}{R^2}$

Question Number : 5 Question Id : 70819120288 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Four identical solid spheres each of mass 'm' and radius 'a' are placed with their centres on the four corners of a square of side 'b'. The moment of inertia of the system about one side of square where the axis of rotation is parallel to the plane of the square is :

Options :

70819166017. $\frac{4}{5}ma^2 + 2mb^2$

70819166018. $\frac{8}{5}ma^2 + 2mb^2$

70819166019. $\frac{8}{5}ma^2 + mb^2$

70819166020. $\frac{4}{5}ma^2$

Question Number : 5 Question Id : 70819120288 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બાજું 'b' ધરાવતાં ચોરસનાં ચાર ખૂણાઓ ઊપર 'm' દળ ધરાવતાં અને 'a' ત્રિજ્યા ધરાવતાં ચાર એક સરખા ઘન ગોળા ગોઠવેલા છે. ચોરસની એક બાજું કે જ્યાં પરિભ્રમણ અક્ષ ચોરસના સમતલને લંબ હોય તેને સાપેક્ષ જડત્વની ચાકમાત્રા _____ હશે.

Options :

70819166017. $\frac{4}{5}ma^2+2mb^2$

70819166018. $\frac{8}{5}ma^2+2mb^2$

70819166019. $\frac{8}{5}ma^2+mb^2$

70819166020. $\frac{4}{5}ma^2$

Question Number : 6 Question Id : 70819120289 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A large number of water drops, each of radius r, combine to have a drop of radius R. If the surface tension is T and mechanical equivalent of heat is J, the rise in heat energy per unit volume will be :

Options :

70819166021. $\frac{2T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819166022. $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819166023.

$\frac{3T}{rJ}$

70819166024. $\frac{2T}{rJ}$

Question Number : 6 Question Id : 70819120289 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

r ત્રિજ્યા ધરાવતાં મોટી સંખ્યામાં પાણીનાં ટીપા સંયોજાઈને R ત્રિજ્યા ધરાવતું ટીપું સર્જે છે. જો પૃષ્ઠતાણ T અને ઉષ્માનો યાંત્રિક સમતુલ્યાંક J હોય તો પ્રતિ એકમ કદમાં ઉષ્મા ઊર્જામાં થતો વધારો _____ છે.

Options :

70819166021. $\frac{2T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819166022. $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819166023. $\frac{3T}{rJ}$

70819166024. $\frac{2T}{rJ}$

Question Number : 7 Question Id : 70819120290 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The normal density of a material is ρ and its bulk modulus of elasticity is K. The magnitude of increase in density of material, when a pressure P is applied uniformly on all sides, will be :

Options :

70819166025. $\frac{\rho P}{K}$

70819166026. $\frac{K}{\rho P}$

70819166027. $\frac{\rho K}{P}$

70819166028. $\frac{PK}{\rho}$

Question Number : 7 Question Id : 70819120290 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

દ્રવ્યની સામાન્ય ઘનતા ρ અને સ્થિતિસ્થાપકતાનો આયતન માપાંક (bulk modulus of elasticity) K છે. જ્યારે બધીજ બાજુંએથી પદાર્થ પર એક સમાન દબાણ P લાગૂ પાડવામાં આવે ત્યારે દ્રવ્યની ઘનતામાં થતાં વધારાનો માનાંક _____ છે.

Options :

70819166025. $\frac{\rho P}{K}$

70819166026. $\frac{K}{\rho P}$

70819166027. $\frac{\rho K}{P}$

70819166028. $\frac{PK}{\rho}$

Question Number : 8 Question Id : 70819120291 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Assume that a tunnel is dug along a chord of the earth, at a perpendicular distance (R/2) from the earth's centre, where 'R' is the radius of the Earth. The wall of the tunnel is frictionless. If a particle is released in this tunnel, it will execute a simple harmonic motion with a time period :

Options :

70819166029. $\frac{2\pi R}{g}$

70819166030. $2\pi\sqrt{\frac{R}{g}}$

70819166031. $\frac{1}{2\pi}\sqrt{\frac{g}{R}}$

70819166032. $\frac{g}{2\pi R}$

Question Number : 8 Question Id : 70819120291 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારો કે પૃથ્વીની જીવા ને સમાંતર, પૃથ્વીનાં કેન્દ્ર થી લંબ (R/2) અંતરે બખોલ (ટનલ) ખોદવામાં આવી છે જ્યાં 'R' પૃથ્વીની ત્રિજ્યા છે. બખોલની દિવાલો ઘર્ષણરહિત છે. જો એક કણને બખોલમાં મુક્ત કરવામાં આવે તો તેના દ્વારા કરાતા સરળ આવર્ત દોલનોનો આવર્તકાળ _____ છે.

Options :

70819166029. $\frac{2\pi R}{g}$

70819166030. $2\pi\sqrt{\frac{R}{g}}$

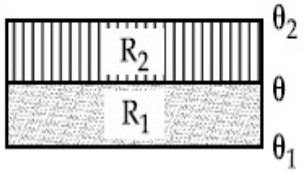
70819166031. $\frac{1}{2\pi}\sqrt{\frac{g}{R}}$

70819166032. $\frac{g}{2\pi R}$

Question Number : 9 Question Id : 70819120292 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The temperature θ at the junction of two insulating sheets, having thermal resistances R_1 and R_2 as well as top and bottom temperatures θ_1 and θ_2 (as shown in figure) is given by :



Options :

70819166033. $\frac{\theta_1 R_2 + \theta_2 R_1}{R_1 + R_2}$

70819166034. $\frac{\theta_1 R_1 + \theta_2 R_2}{R_1 + R_2}$

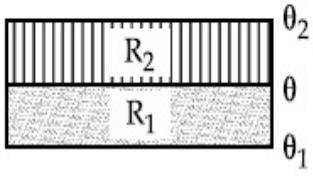
70819166035. $\frac{\theta_1 R_2 - \theta_2 R_1}{R_2 - R_1}$

70819166036. $\frac{\theta_2 R_2 - \theta_1 R_1}{R_2 - R_1}$

Question Number : 9 Question Id : 70819120292 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા મુજબ અવરોધ R_1 અને R_2 ધરાવતાં બે પતરાનાં જંક્શનનું તાપમાન θ તેમજ ઉ[illegible] અને નીચેનાં તાપમાન θ_1 અને θ_2 _____ દ્વારા આપવામાં આવે છે.



Options :

70819166033. $\frac{\theta_1 R_2 + \theta_2 R_1}{R_1 + R_2}$

70819166034. $\frac{\theta_1 R_1 + \theta_2 R_2}{R_1 + R_2}$

70819166035. $\frac{\theta_1 R_2 - \theta_2 R_1}{R_2 - R_1}$

70819166036. $\frac{\theta_2 R_2 - \theta_1 R_1}{R_2 - R_1}$

Question Number : 10 Question Id : 70819120293 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A particle is moving with uniform speed along the circumference of a circle of radius R under the action of a central fictitious force F which is inversely proportional to R^3. Its time period of revolution will be given by :

Options :

70819166037. $T \propto R^{\frac{3}{2}}$

70819166038. $T \propto R^{\frac{4}{3}}$

70819166039. $T \propto R^2$

70819166040. $T \propto R^{\frac{5}{2}}$

Question Number : 10 Question Id : 70819120293 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

R^3 નાં વ્યસ્ત પ્રમાણમાં ચલિત કેન્દ્રીય આભાસી બળ F ની અસર હેઠળ એક કણ અચળ ઝડપથી R ત્રિજ્યા ધરાવતાં વર્તુળનાં પરીઘ પર ગતિ કરે છે. તેનાં પરિભ્રમણનો આવર્તકાળ _____ દ્વારા દર્શાવવામાં આવે છે.

Options :

70819166037. $T \propto R^{\frac{3}{2}}$

70819166038. $T \propto R^{\frac{4}{3}}$

70819166039. $T \propto R^2$

70819166040. $T \propto R^{\frac{5}{2}}$

Question Number : 11 Question Id : 70819120294 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If two similar springs each of spring constant K_1 are joined in series, the new spring constant and time period would be changed by a factor :

Options :

70819166041. $\frac{1}{2}, \sqrt{2}$

70819166042. $\frac{1}{4}, 2\sqrt{2}$

70819166043. $\frac{1}{2}, 2\sqrt{2}$

70819166044. $\frac{1}{4}, \sqrt{2}$

Question Number : 11 Question Id : 70819120294 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો દરેક સ્પ્રિંગ અચળાંક K_1 ધરાવતી બે એક સરખી સ્પ્રિંગ ને શ્રેણીમાં જોડવામાં આવે તો તેમનો નવો સ્પ્રિંગ અચળાંક અને આવર્તકાળ _____ ના અંશ થી બદલાશે.

Options :

70819166041. $\frac{1}{2}, \sqrt{2}$

70819166042. $\frac{1}{4}, 2\sqrt{2}$

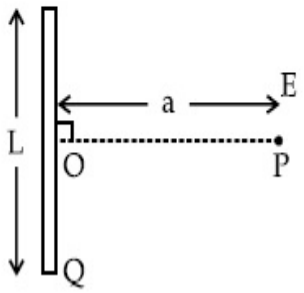
70819166043. $\frac{1}{2}, 2\sqrt{2}$

70819166044. $\frac{1}{4}, \sqrt{2}$

Question Number : 12 Question Id : 70819120295 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Find the electric field at point P (as shown in figure) on the perpendicular bisector of a uniformly charged thin wire of length L carrying a charge Q. The distance of the point P from the centre of the rod is $a = \frac{\sqrt{3}}{2} L$.



Options :

70819166045. $\frac{Q}{3\pi\varepsilon_0 L^2}$

70819166046. $\frac{Q}{4\pi\varepsilon_0 L^2}$

70819166047. $\frac{\sqrt{3}Q}{4\pi\varepsilon_0 L^2}$

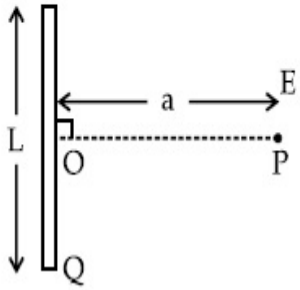
70819166048. $\frac{Q}{2\sqrt{3}\pi\varepsilon_0 L^2}$

Question Number : 12 Question Id : 70819120295 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા મુજબ Q વિજભાર ધરાવતાં L લંબાઈ અને એક સમાન વીજભારિત પાતળા તારના દ્વિભાજક પર આવેલ બિંદુ P પરનું વીજક્ષેત્ર શોધો. બિંદુ P નું સળિયાનાં કેન્દ્ર થી અંતર $a = \frac{\sqrt{3}}{2} L$ છે.



Options :

70819166045. $\frac{Q}{3\pi\varepsilon_0 L^2}$

70819166046. $\frac{Q}{4\pi\varepsilon_0 L^2}$

70819166047. $\frac{\sqrt{3}Q}{4\pi\varepsilon_0 L^2}$

70819166048. $\frac{Q}{2\sqrt{3}\pi\varepsilon_0 L^2}$

Question Number : 13 Question Id : 70819120296 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the combination of 2 capacitors C_1 and C_2, with $C_2 > C_1$, when connected in parallel, the equivalent capacitance is $\frac{15}{4}$ times the equivalent capacitance of the same connected in series. Calculate the ratio of capacitors, $\frac{C_2}{C_1}$.

Options :

70819166049. $\frac{29}{15}$

70819166050. $\frac{15}{11}$

70819166051. $\frac{15}{4}$

70819166052. $\frac{111}{80}$

Question Number : 13 Question Id : 70819120296 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારો કે બે સંધારકોનાં સંયોજન C_1 અને C_2 માટે $C_2 > C_1$ છે, જ્યારે તેમને સમાંતર જોડવામાં આવે છે ત્યારે તેમની સમતુલ્ય સંધારકતાં શ્રેણી જોડાણની સમતુલ્ય સંધારકતાં કરતાં $\frac{15}{4}$ ગણી છે. સંધારકોનો ગુણોત્તર $\frac{C_2}{C_1}$ ગણો.

Options :

70819166049. $\frac{29}{15}$

70819166050. $\frac{15}{11}$

70819166051. $\frac{15}{4}$

70819166052. $\frac{111}{80}$

Question Number : 14 Question Id : 70819120297 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An alternating current is given by the equation $i = i_1 \sin \omega t + i_2 \cos \omega t$. The rms current will be :

Options :

70819166053. $\frac{1}{\sqrt{2}}(i_1 + i_2)$

70819166054. $\frac{1}{\sqrt{2}}(i_1 + i_2)^2$

70819166055. $\frac{1}{\sqrt{2}}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

70819166056. $\frac{1}{2}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

Question Number : 14 Question Id : 70819120297 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક ઊલટસુલટ પ્રવાહ માટેનું સમીકરણ $i = i_1 \sin \omega t + i_2 \cos \omega t$ આપેલ છે. તેમનો rms પ્રવાહ _____ હશે.

Options :

70819166053. $\frac{1}{\sqrt{2}}(i_1 + i_2)$

70819166054. $\frac{1}{\sqrt{2}}(i_1 + i_2)^2$

70819166055. $\frac{1}{\sqrt{2}}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

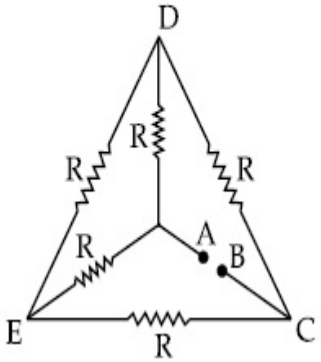
70819166056.

$\frac{1}{2}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

Question Number : 15 Question Id : 70819120298 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Five equal resistances are connected in a network as shown in figure. The net resistance between the points A and B is :



Options :

70819166057. $2R$

70819166058. $\frac{R}{2}$

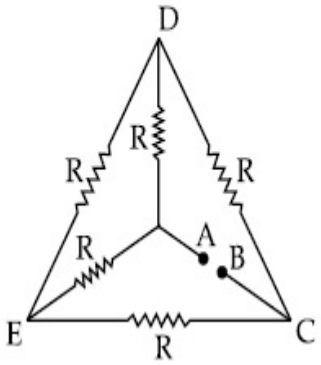
70819166059. R

70819166060. $\frac{3R}{2}$

Question Number : 15 Question Id : 70819120298 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

પાંચ એક સરખા અવરોધ આકૃતિમાં દર્શાવ્યા મુજબ જાળતંત્ર (નેટવર્ક) માં જોડાયેલ છે. બિંદુ A અને [illegible]ચેનો તુલ્ય અવરોધ _____ છે.



Options :

70819166057. $2R$

70819166058. $\frac{R}{2}$

70819166059. R

70819166060. $\frac{3R}{2}$

Question Number : 16 Question Id : 70819120299 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A short straight object of height 100 cm lies before the central axis of a spherical mirror whose focal length has absolute value $|f| = 40$ cm. The image of object produced by the mirror is of height 25 cm and has the same orientation of the object. One may conclude from the information :

Options :

70819166061. Image is virtual, opposite side of concave mirror.

70819166062. Image is real, same side of concave mirror.

70819166063. Image is virtual, opposite side of convex mirror.

70819166064. Image is real, same side of convex mirror.

Question Number : 16 Question Id : 70819120299 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જેની કેન્દ્ર લંબાઈનું નિરપેક્ષ મુલ્ય $|f| = 40$ cm હોય તેવા ગોલીય અરીસાની કેન્દ્રીય અક્ષની સામે (આગળ) 100 cm ઊંચાઈ ધરાવતી ટૂંકી સીધી વસ્તુ ગોઠવાયેલી છે. અરીસા દ્વારા રચાયેલ વસ્તુનું પ્રતિબિંબની ઊંચાઈ 25 cm છે અને તેનું અનુસ્થાપન (ઓરીએન્ટેશન) વસ્તુનાં અનુસ્થાપન જેવું જ છે. આ માહિતી પરથી તારણ મેળવી શકાય કે :

Options :

70819166061. પ્રતિબિંબ આભાસી, અંતર્ગોળ અરીસાની વિરૂધ્ધ બાજું

70819166062. પ્રતિબિંબ વાસ્તવિક, અંતર્ગોળ અરીસાની એકજ બાજું

70819166063. પ્રતિબિંબ આભાસી, બહિર્ગોળ અરીસાની વિરૂધ્ધ બાજું

70819166064. પ્રતિબિંબ વાસ્તવિક, બહિર્ગોળ અરીસાની એકજ બાજું

Question Number : 17 Question Id : 70819120300 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In a Young's double slit experiment two slits are separated by 2 mm and the screen is placed one meter away. When a light of wavelength 500 nm is used, the fringe separation will be :

Options :

70819166065. 1 mm

70819166066. 0.75 mm

70819166067. 0.50 mm

70819166068. 0.25 mm

Question Number : 17 Question Id : 70819120300 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

યંગનાં બે સ્લિટ (ડબલ સ્લિટ પ્રયોગ) માં 2 mm અંતરે આવેલી બે સ્લિટ થી એક મીટર અંતરે પડદો ગોઠવવામાં આવ્યો છે. જ્યારે 500 nm તરંગલંબાઈ વાળા પ્રકાશનો ઉપયોગ કરવામાં આવે ત્યારે શલાકાઓ વચ્ચેનું અંતર _____ હશે.

Options :

70819166065. 1 mm

70819166066. 0.75 mm

70819166067. 0.50 mm

70819166068. 0.25 mm

Question Number : 18 Question Id : 70819120301 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : An electron microscope can achieve better resolving power than an optical microscope.

Reason R : The de Broglie's wavelength of the electrons emitted from an electron gun is much less than wavelength of visible light.

In the light of the above statements, choose the correct answer from the options given below :

Options :

70819166069. Both A and R are true and R is the correct explanation of A.

70819166070. Both A and R are true but R is NOT the correct explanation of A.

70819166071. A is true but R is false.

70819166072. A is false but R is true.

Question Number : 18 Question Id : 70819120301 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે. એક ને કથન A તેમજ બીજાને કારણ R દ્વારા દર્શાવવામાં આવ્યા છે.

કથન A : પ્રકાશીય સૂક્ષ્મદર્શક કરતાં ઈલેક્ટ્રોન સૂક્ષ્મદર્શક વધુ સારી વિભેદન શક્તિ મેળવી શકે છે.

કારણ R : ઈલેક્ટ્રોન ગનમાંથી ઉત્સર્જનયેલા ઈલેક્ટ્રોનની ડી બ્રોગ્લી તરંગલંબાઈ, દૃષ્ય પ્રકાશની તરંગલંબાઈ કરતાં ઘણી ઓછી હોય છે.

ઉપરોક્ત આપેલ વિધાન અનુસાર આપેલ વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819166069. બંને, A અને R સાચાં છે અને A નું સાચું સ્પષ્ટીકરણ R છે.

70819166070. બંને, A અને R સાચાં છે પરંતુ A નું સાચું સ્પષ્ટીકરણ R નથી.

70819166071. A સાચું છે પરંતુ R ખોટું છે.

70819166072. A ખોટું છે પરંતુ R સાચું છે.

Question Number : 19 Question Id : 70819120302 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If λ_1 and λ_2 are the wavelengths of the third member of Lyman and first member of the Paschen series respectively, then the value of $\lambda_1 : \lambda_2$ is :

Options :

70819166073. 7 : 108

70819166074. $7 : 135$

70819166075. $1 : 3$

70819166076. $1 : 9$

Question Number : 19 Question Id : 70819120302 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

લાયમન ના તૃતિય ઘટક (member) અને પાશ્ચન શ્રેણીના પ્રથમ ઘટક (member) ની તરંગલંબાઈ અનુક્રમે λ_1 અને λ_2 હોય તો $\lambda_1 : \lambda_2$ નું મૂલ્ય _____ છે.

Options :

70819166073. $7 : 108$

70819166074. $7 : 135$

70819166075. $1 : 3$

70819166076. $1 : 9$

Question Number : 20 Question Id : 70819120303 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

LED is constructed from Ga-As-P semiconducting material. The energy gap of this LED is 1.9 eV. Calculate the wavelength of light emitted and its colour.
[$h = 6.63 \times 10^{-34}$ Js and $c = 3 \times 10^{8}$ ms^{-1}]

Options :

70819166077. 654 nm and red colour

70819166078. 654 nm and orange colour

70819166079. 1046 nm and blue colour

70819166080. 1046 nm and red colour

Question Number : 20 Question Id : 70819120303 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો Ga–As–P અર્ધવાહક દ્રવ્યમાંથી LED ની રચનાં કરવામાં આવી છે. આ LED ની એનર્જી ગેપ 1.9 eV છે. ઉત્સર્જીત પ્રકાશની તરંગલંબાઈ તેમજ તેનાં રંગ મેળવો.

[$h = 6.63 \times 10^{-34}$ Js અને $c = 3 \times 10^{8}$ ms^{-1}]

Options :

70819166077. 654 nm અને લાલ રંગ

70819166078. 654 nm અને નારંગી રંગ

70819166079. 1046 nm અને વાદળી રંગ

70819166080. 1046 nm અને લાલ રંગ

Physics Section B

Section Id :	708191893
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10

Number of Questions to be attempted : 5

Section Marks : 20

Mark As Answered Required? : Yes

Sub-Section Number : 1

Sub-Section Id : 7081911173

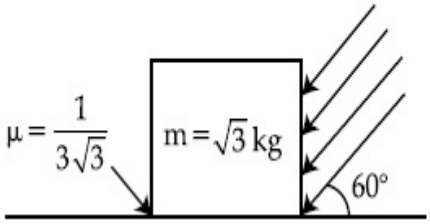
Question Shuffling Allowed : Yes

Question Number : 21 Question Id : 70819120304 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

As shown in the figure, a block of mass $\sqrt{3}$ kg is kept on a horizontal rough surface of coefficient of friction $\frac{1}{3\sqrt{3}}$. The critical force to be applied on the vertical surface as shown at an angle 60° with horizontal such that it does not move, will be $3x$. The value of x will be _____.

$[g = 10\ m/s^2 ; \sin 60° = \frac{\sqrt{3}}{2}; \cos 60° = \frac{1}{2}]$



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

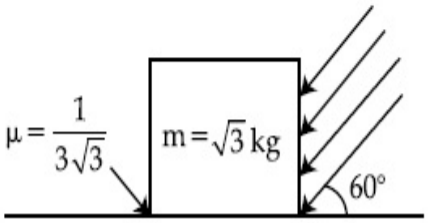
5 to 5.001

Question Number : 21 Question Id : 70819120304 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$\frac{1}{3\sqrt{3}}$ જેટલા ઘર્ષણાંક ધરાવતી સમક્ષિતીજ ખરબચડી સપાટી પર $\sqrt{3}$ kg દળ ધરાવતાં ચોસલાને આકૃતિમાં દર્શાવ્યા મુજબ ગોઠવવામાં આવ્યો છે. દર્શાવ્યા અનુસાર સમક્ષિતીજ સાથે 60° કોણ રચતા ઉર્ધ્વ સપાટી પર જરૂરી બળનું ઓછામાં ઓછું મૂલ્ય $3x$ છે કે જેથી તે ચોસલું ખસી ના શકે. x નું મૂલ્ય _____ હશે.

$[g = 10\ m/s^2\ ;\ \sin 60° = \frac{\sqrt{3}}{2};\ \cos 60° = \frac{1}{2}]$



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 22 Question Id : 70819120305 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A boy pushes a box of mass 2 kg with a force $\vec{F} = \left(20\hat{i} + 10\hat{j}\right)$ N on a frictionless surface.

If the box was initially at rest, then _____ m is displacement along the x-axis after 10 s.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 22 Question Id : 70819120305 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક છોકરો ઘર્ષણરહિત સપાટી પર 2 kg દળ ધરાવતી પેટી (બોક્સ) ને $\vec{F} = \left(20\hat{i} + 10\hat{j}\right)$ N બળથી ધક્કો મારે છે.

જો પેટી પ્રારંભમાં વિરામ સ્થાને હોય તો x-દિશામાં t=10 s સમય બાદ ચોસલાનું સ્થાનાંતર _____ m હશે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 Question Id : 70819120306 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A person standing on a spring balance inside a stationary lift measures 60 kg. The weight of that person if the lift descends with uniform downward acceleration of 1.8 m/s^2 will be _____ N. [g = 10 m/s^2]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 Question Id : 70819120306 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

સ્થિર લિફ્ટની અંદર સ્પ્રિંગ તુલામાં ઉભેલા માણસનું દળ 60 kg છે. જો 1.8 m/s^2 અચળ પ્રવેગ થી લિફ્ટ નીચે ઉતરે તો માણસનું વજન _____ N હશે.
[g = 10 m/s^2]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 24 Question Id : 70819120307 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The mass per unit length of a uniform wire is 0.135 g/cm. A transverse wave of the form $y = -0.21 \sin(x + 30t)$ is produced in it, where x is in meter and t is in second. Then, the expected value of tension in the wire is $x \times 10^{-2}$ N. Value of x is _____. (Round-off 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 5.001

Question Number : 24 Question Id : 70819120307 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક સમાન તારનું એકમ લંબાઈ દીઠ દળ 0.135 g/cm છે. ઉત્પન્ન થતાં લંબગત્ તરંગ ને $y = -0.21 \sin(x + 30t)$ દ્વારા દર્શાવવામાં આવે છે જ્યાં x મીટર અને t સેકન્ડમાં છે. તારમાં ઉત્પન્ન થતી તણાવનું અપેક્ષિત મૂલ્ય $x \times 10^{-2}$ N છે. x નું મૂલ્ય _____ છે. (નજીકનાં પૂર્ણાંક માટે શૂન્યાંત મેળવો (Round-off))

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 25 Question Id : 70819120308 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A container is divided into two chambers by a partition. The volume of first chamber is 4.5 litre and second chamber is 5.5 litre. The first chamber contain 3.0 moles of gas at pressure 2.0 atm and second chamber contain 4.0 moles of gas at pressure 3.0 atm. After the partition is removed and the mixture attains equilibrium, then, the common equilibrium pressure existing in the mixture is $x \times 10^{-1}$ atm. Value of x is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 25 Question Id : 70819120308 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક પાત્રને બે ચેમ્બરમાં વિભાજીત કરવામાં આવે છે જ્યાં પ્રથમ ચેમ્બરનું કદ 4.5 લીટર અને બીજા ચેમ્બરનું કદ 5.5 લીટર છે. પ્રથમ ચેમ્બર 2.0 atm દબાણે 3.0 મોલ વાયુ ધરાવે છે તેમજ 3.0 atm દબાણે બીજો ચેમ્બર 4.0 મોલ વાયું ધરાવે છે. જ્યારે બે ચેમ્બર વચ્ચે થી વિભાજન (પાર્ટીશન) ને દૂર કરવામાં આવે ત્યારે મિશ્રણ સંતુલન પ્રાપ્ત કરે છે. આ મિશ્રણમાં ઉદ્ભવતા દબાણનું મૂલ્ય $x \times 10^{-1}$ atm છે. x નું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 26 Question Id : 70819120309 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A radiation is emitted by 1000 W bulb and it generates an electric field and magnetic field at P, placed at a distance of 2 m. The efficiency of the bulb is 1.25%. The value of peak electric field at P is $x \times 10^{-1}$ V/m. Value of x is _____. (Rounded-off to the nearest integer)
[Take $\varepsilon_0 = 8.85 \times 10^{-12}\ C^2\ N^{-1}\ m^{-2}$, $c = 3 \times 10^8\ ms^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 26 Question Id : 70819120309 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1000 W પ્રકાશનાં ગોળા દ્વારા ઉત્સર્જાયેલા વિકીરણ થી 2 m અંતરે આવેલા બિંદુ P પાસે વિદ્યુત ક્ષેત્ર તેમજ ચુંબકીય ક્ષેત્ર ઉત્પન્ન થાય છે. પ્રકાશનાં ગોળાની કાર્યક્ષમતાં 1.25% છે. બિંદુ P પાસે મહત્તમ વીજક્ષેત્રનું મૂલ્ય $x \times 10^{-1}$ V/m. x નું મૂલ્ય _____ છે. (નજીકનાં પૂર્ણાંક માટે શૂન્યાંત (Round-off) મેળવો.)
[$\varepsilon_0 = 8.85 \times 10^{-12}\ C^2\ N^{-1}\ m^{-2}$, $c = 3 \times 10^8\ ms^{-1}$ લો.]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 27 Question Id : 70819120310 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In an electrical circuit, a battery is connected to pass 20 C of charge through in a certain given time. The potential difference between two plates of the battery is maintained at 15 V. The workdone by the battery is _____ J.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 27 Question Id : 70819120310 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક વીજ પરિપથમાં 20 C વીજભારનું નિશ્ચિત સમયમાં વહન કરવા માટે બેટરી જોડવામાં આવે છે. બેટરીની પ્લેટ વચ્ચે 15 V વીજ સ્થિતીમાનનો તફાવત જાળવી રાખવામાં આવે છે. બેટરી દ્વારા થયેલ કાર્ય _____ J છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

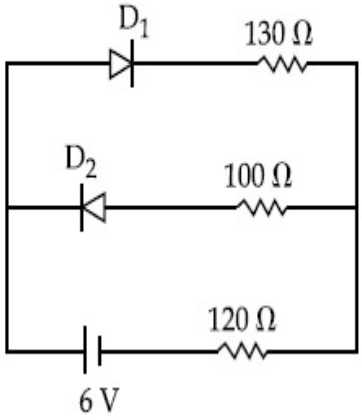
Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819120311 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The circuit contains two diodes each with a forward resistance of 50 Ω and [illegible] reverse resistance. If the battery voltage is 6 V, the current through the 120 Ω resistance is _____ mA.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

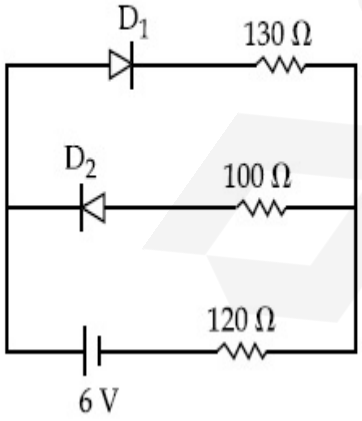
Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819120311 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

સીધો (ફોરવર્ડ) અવરોધ 50 Ω તેમજ અનંત ઉલટ (રિવર્સ) અવરોધ ધરાવતાં બે ડાયોડ પરિપથમાં દર્શાવ્યા છે. જો બેટરીનો વોલ્ટેજ 6 V હોય તો 120 Ω અવરોધમાંથી પસાર થતો પ્રવાહ _____ mA હશે.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 29 Question Id : 70819120312 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The maximum and minimum amplitude of an amplitude modulated wave is 16 V and 8 V respectively. The modulation index for this amplitude modulated wave is $x \times 10^{-2}$. The value of x is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 29 Question Id : 70819120312 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

કંપવિસ્તાર અધિમિશ્રીત તરંગ માટે મહત્તમ અને લઘુત્તમ કંપવિસ્તાર અનુક્રમે 16 V અને 8 V છે. આ કંપવિસ્તાર અધિમિશ્રીત તરંગ માટે અધિમિશ્રીત આંક $x \times 10^{-2}$ છે. x નું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819120313 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In a series LCR resonant circuit, the quality factor is measured as 100. If the inductance is increased by two fold and resistance is decreased by two fold, then the quality factor after this change will be _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819120313 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

શ્રેણી જોડાણ ધરાવતો LCR અનુનાદ પરિપથ માટે ગુણવત્તા અંક 100 માપવામાં આવે છે. જો પ્રેરણને બે ગણો વધારવામાં આવે અને અવરોધને બે ગણો ઘટાડવામાં આવે તો આ ફેરફાર પછીનો ગુણવત્તા અંક _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Chemistry Section A

Section Id :	708191894
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911174
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 70819120314 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The orbital having two radial as well as two angular nodes is :

Options :

70819166091. $3p$

70819166092. $4d$

70819166093. $4f$

70819166094. $5d$

Question Number : 31 Question Id : 70819120314 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બે ત્રિજ્યાકીય (radial) તેમજ બે કોણીય નોડ્સ ધરાવતી કક્ષક શોધો.

Options :

70819166091. $3p$

70819166092. $4d$

70819166093. 4f

70819166094. 5d

Question Number : 32 Question Id : 70819120315 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A : Dipole-dipole interactions are the only non-covalent interactions, resulting in hydrogen bond formation.

Reason R : Fluorine is the most electronegative element and hydrogen bonds in HF are symmetrical.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

Options :

70819166095. Both **A** and **R** are true and **R** is the correct explanation of **A**

70819166096. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

70819166097. **A** is true but **R** is false

70819166098. **A** is false but **R** is true

Question Number : 32 Question Id : 70819120315 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે : એકને **કથન A** વડે લેબલ કરેલ છે જ્યારે બીજાને **કારણ R** વડે લેબલ કરેલ છે.

કથન A : દ્વિધ્રુવ-દ્વિધ્રુવ આંતરક્રિયાઓ જ ફક્ત ગેર-સહસંયોજક (નોન-સહસંયોજક) આંતરક્રિયાઓ, જે હાઈડ્રોજન બંધના સર્જનમાં પરિણમે છે.

કારણ R : ફ્લોરીન એ સૌથી વધારે વિદ્યુત ઋણમય તત્વ છે અને HF માં હાઈડ્રોજન બંધો સંમિત (symmetrical) છે.

ઉપરનાં વિધાનોનાં સંદર્ભમાં, નીચે આપેલા વિકલ્પોમાંથી સાચો ઉત્તર પસંદ કરો.

Options :

70819166095. બંને, A અને R સાચાં છે અને R એ A ની સાચી સમજૂતી છે.

70819166096. બંને, A અને R સાચાં છે પણ R એ A ની સાચી સમજૂતી નથી.

70819166097. A સાચું છે પણ R ખોટું છે.

70819166098. A ખોટું છે પણ R સાચું છે.

Question Number : 33 Question Id : 70819120316 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List-I with List-II.

	List-I Electronic configuration of elements		List-II Δ_iH in kJ mol^{-1}
(a)	$1s^2\ 2s^2$	(i)	801
(b)	$1s^2\ 2s^2\ 2p^4$	(ii)	899
(c)	$1s^2\ 2s^2\ 2p^3$	(iii)	1314
(d)	$1s^2\ 2s^2\ 2p^1$	(iv)	1402

Choose the most appropriate answer from the options given below :

Options :

70819166099. (a) → (i), (b) → (iv), (c) → (iii), (d) → (ii)

70819166100. (a) → (iv), (b) → (i), (c) → (ii), (d) → (iii)

70819166101. (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)

70819166102. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 33 Question Id : 70819120316 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સૂચી - I સાથે સૂચી - II ને જોડો :

	સૂચી - I (તત્વોની ઈલેક્ટ્રોન સંરચના)		સૂચી - II (Δ_iH kJ mol^{-1} માં)
(a)	$1s^2\ 2s^2$	(i)	801
(b)	$1s^2\ 2s^2\ 2p^4$	(ii)	899
(c)	$1s^2\ 2s^2\ 2p^3$	(iii)	1314
(d)	$1s^2\ 2s^2\ 2p^1$	(iv)	1402

નીચે આપેલ વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819166099. (a) → (i), (b) → (iv), (c) → (iii), (d) → (ii)

70819166100. (a) → (iv), (b) → (i), (c) → (ii), (d) → (iii)

70819166101. (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)

70819166102. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 34 Question Id : 70819120317 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List-I with List-II.

	List-I (Ore)		List-II (Element Present)
(a)	Kernite	(i)	Tin
(b)	Cassiterite	(ii)	Boron
(c)	Calamine	(iii)	Fluorine
(d)	Cryolite	(iv)	Zinc

Choose the most appropriate answer from the options given below :

Options :

70819166103. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819166104. (a) → (iii), (b) → (i), (c) → (ii), (d) → (iv)

70819166105. (a) → (ii), (b) → (iv), (c) → (i), (d) → (iii)

70819166106. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 34 Question Id : 70819120317 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સૂચી - I સાથે સૂચી - II ને જોડો :

	સૂચી - I (અયસ્ક)		સૂચી - II (હાજર તત્વ)
(a)	કેર્નાઈટ	(i)	ટીન
(b)	કેશીટેરાઈટ (Cassiterite)	(ii)	બોરોન
(c)	કેલેમાઈન	(iii)	ફ્લોરિન
(d)	કાયોલાઈટ	(iv)	ઝિંક

નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819166103. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819166104. (a) → (iii), (b) → (i), (c) → (ii), (d) → (iv)

70819166105. (a) → (ii), (b) → (iv), (c) → (i), (d) → (iii)

70819166106. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 35 Question Id : 70819120318 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Statements about heavy water are given below.

A. Heavy water is used in exchange reactions for the study of reaction mechanisms.

B. Heavy water is prepared by exhaustive electrolysis of water.

C. Heavy water has higher boiling point than ordinary water.

D. Viscosity of H_2O is greater than D_2O.

Choose the **most appropriate** answer from the options given below :

Options :

70819166107. A and B only

70819166108. A and C only

70819166109. A and D only

70819166110. A, B and C only

Question Number : 35 Question Id : 70819120318 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ભારે પાણીના સંદર્ભમાં વિધાનો નીચે આપેલા છે.

A. પ્રક્રિયાઓની ક્રિયાવિધીનો અભ્યાસ કરવા માટે, ભારે પાણીનો ઉપયોગ ફેરબદલ પ્રક્રિયાઓમાં કરવામાં આવે છે.

B. ભારે પાણીને પાણીનાં નિર્વાતીત (exhaustive) વિદ્યુતવિભાજન થી બનાવવામાં આવે છે.

C. ભારે પાણી એ સામાન્ય પાણી કરતાં ઊંચું ઉત્કલનબિંદુ ધરાવે છે.

D. H_2O ની સ્નિગ્ધતા એ D_2O કરતાં ખૂબ વધારે હોય છે.

નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819166107. ફક્ત A અને B

70819166108. ફક્ત A અને C

70819166109. ફક્ત A અને D

70819166110. ફક્ત A, B અને C

Question Number : 36 Question Id : 70819120319 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Find A, B and C in the following reactions :

$NH_3 + A + CO_2 \rightarrow (NH_4)_2CO_3$

$(NH_4)_2CO_3 + H_2O + B \rightarrow NH_4HCO_3$

$NH_4HCO_3 + NaCl \rightarrow NH_4Cl + C$

Options :

70819166111. $A - H_2O\ ;\ B - O_2\ ;\ C - Na_2CO_3$

70819166112. $A - H_2O\ ;\ B - O_2\ ;\ C - NaHCO_3$

70819166113. $A - H_2O\ ;\ B - CO_2\ ;\ C - NaHCO_3$

70819166114. $A - O_2\ ;\ B - CO_2\ ;\ C - Na_2CO_3$

Question Number : 36 Question Id : 70819120319 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ પ્રક્રિયાઓમાં A, B અને C શોધો.

$NH_3 + A + CO_2 \rightarrow (NH_4)_2CO_3$

$(NH_4)_2CO_3 + H_2O + B \rightarrow NH_4HCO_3$

$NH_4HCO_3 + NaCl \rightarrow NH_4Cl + C$

Options :

70819166111. $A - H_2O\ ;\ B - O_2\ ;\ C - Na_2CO_3$

70819166112. $A - H_2O\ ;\ B - O_2\ ;\ C - NaHCO_3$

70819166113. $A-H_2O$; $B-CO_2$; $C-NaHCO_3$

70819166114. $A-O_2$; $B-CO_2$; $C-Na_2CO_3$

Question Number : 37 Question Id : 70819120320 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Compound A used as a strong oxidizing agent is amphoteric in nature. It is the part of lead storage batteries. Compound A is :

Options :

70819166115. PbO

70819166116. PbO_2

70819166117. Pb_3O_4

70819166118. $PbSO_4$

Question Number : 37 Question Id : 70819120320 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સંયોજન A નો ઉપયોગ પ્રબળ ઓક્સિડેશનકર્તા તરીકે થાય છે અને તેની પ્રકૃતિ ઉભયગુણી છે. તે લેડ સંગ્રાહક બેટરીઓનો એક ભાગ છે. સંયોજન A શોધો.

Options :

70819166115. PbO

70819166116. PbO_2

70819166117. Pb_3O_4

70819166118. $PbSO_4$

Question Number : 38 Question Id : 70819120321 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following lanthanoids does not form MO_2 ?
[M is lanthanoid metal]

Options :

70819166119. Nd

70819166120. Dy

70819166121. Pr

70819166122. Yb

Question Number : 38 Question Id : 70819120321 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા લેન્થેનોઈડ્સ પૈકી કયો એક MO_2 બનાવશે નહીં ?
[M એ લેન્થેનોઈડ ધાતુ છે.]

Options :

70819166119. Nd

70819166120. Dy

70819166121. Pr

70819166122. Yb

Question Number : 39 Question Id : 70819120322 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The presence of ozone in troposphere :

Options :

70819166123. protects us from the UV radiation

70819166124. protects us from the X-ray radiation

70819166125. generates photochemical smog

70819166126. protects us from greenhouse effect

Question Number : 39 Question Id : 70819120322 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ટ્રોપોસ્ફિયરમાં ઓઝોનની હાજરી _____.

Options :

70819166123. તે આપણું UV વિકિરણ થી રક્ષણ કરે છે.

70819166124. તે આપણું X-કિરણ (ray) વિકિરણથી રક્ષણ કરે છે.

70819166125. તે પ્રકાશરાસાયણિક ધૂમ્રધુમ્મસ ઉત્પન્ન કરે છે.

70819166126. ગ્રીન હાઉસ અસર થી આપણું રક્ષણ કરે છે.

Question Number : 40 Question Id : 70819120323 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : A mixture of chloroform and aniline can be separated by simple distillation.

Statement II : When separating aniline from a mixture of aniline and water by steam distillation aniline boils below its boiling point.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

Options :

70819166127. Both Statement I and Statement II are true

70819166128. Both Statement I and Statement II are false

70819166129. Statement I is true but Statement II is false

70819166130. Statement I is false but Statement II is true

Question Number : 40 Question Id : 70819120323 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : ક્લોરોફોર્મ અને એનિલિનનાં મિશ્રણને સાદા નિસ્યંદન થી અલગ પાડી શકાય છે.

વિધાન II : જ્યારે એનિલિનને, એનિલિન અને પાણીનાં મિશ્રણમાંથી વરાળ નિસ્યંદન દ્વારા અલગ પાડવામાં આવે ત્યારે એનિલિન તે તેના ઉત્કલન બિંદુએ થી નીચે ઉકળે છે.

ઉપરનાં વિધાનોનાં સંદર્ભમાં, નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819166127. બંને, વિધાન I અને વિધાન II સાચાં છે.

70819166128. બંને, વિધાન I અને વિધાન II ખોટાં છે.

70819166129. વિધાન I સાચું છે પણ વિધાન II ખોટું છે.

70819166130. વિધાન I ખોટું પણ વિધાન II સાચું છે.

Question Number : 41 Question Id : 70819120324 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following is 'a' FALSE statement ?

Options :

70819166131. Carius tube is used in the estimation of sulphur in an organic compound.

70819166132. Carius method is used for the estimation of nitrogen in an organic compound.

70819166133. Kjeldahl's method is used for the estimation of nitrogen in an organic compound.

70819166134. Phosphoric acid produced on oxidation of phosphorus present in an organic compound is precipitated as $Mg_2P_2O_7$ by adding magnesia mixture.

Question Number : 41 Question Id : 70819120324 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલામાંથી કયું વિધાન ખોટું છે ?

Options :

70819166131. કાર્બનિક સંયોજનમાં સલ્ફરનાં પરિમાપન માટે કેરિયસ નળીનો ઉપયોગ થાય છે.

70819166132. કાર્બનિક સંયોજનમાં નાઈટ્રોજનનાં પરિમાપન માટે કેરિયસ નળીનો ઉપયોગ થાય છે.

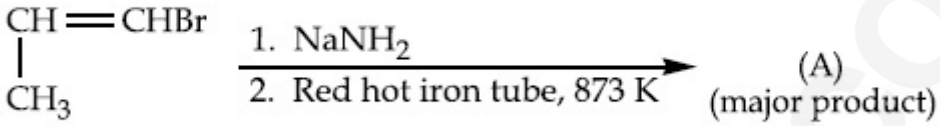
70819166133. કાર્બનિક સંયોજનમાં નાઈટ્રોજનનાં પરિમાપન માટે જેલ્ડાહલ પધ્ધતિનો ઉપયોગ થાય છે.

70819166134. કાર્બનિક સંયોજનમાં હાજર ફોસ્ફરસનાં ઓક્સિડેશન થી ફોસ્ફોરિક એસિડ ઉત્પન્ન થાય છે જેમાં મેગ્નેશિઆ મિશ્રણ ઉમેરતાં $Mg_2P_2O_7$ અવક્ષેપિત થાય છે.

Question Number : 42 Question Id : 70819120325 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

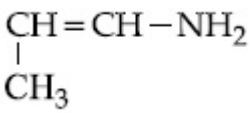
Correct Marks : 4 Wrong Marks : 1

For the given reaction :



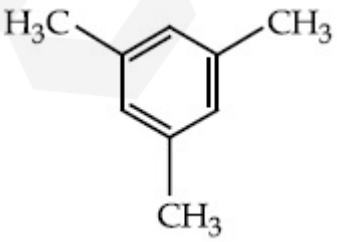
What is 'A' ?

Options :

70819166135. 

70819166136. $CH_3CH_2CH_2NH_2$

70819166137. 

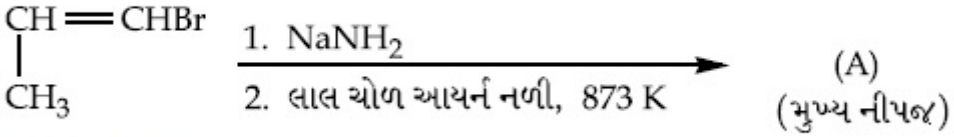
70819166138. 

Question Number : 42 Question Id : 70819120325 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

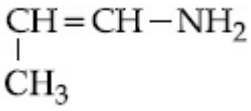
Correct Marks : 4 Wrong Marks : 1

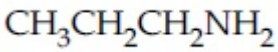
આપેલ પ્રક્રિયા માટે :



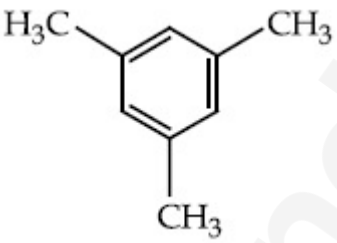
તો 'A' શું છે ?

Options :

70819166135. 

70819166136. 

70819166137. 

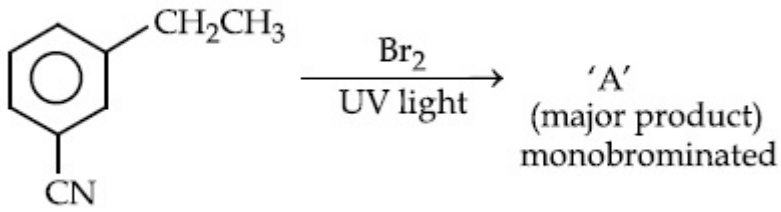
70819166138. 

Question Number : 43 Question Id : 70819120326 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

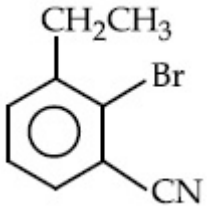
Correct Marks : 4 Wrong Marks : 1

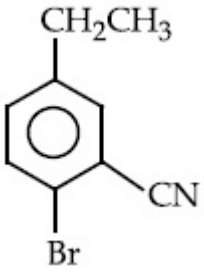
For the given reaction :

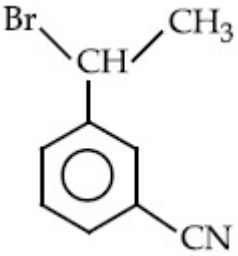


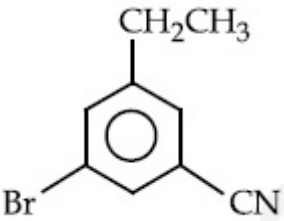
What is 'A'?

Options :

70819166139. 

70819166140. 

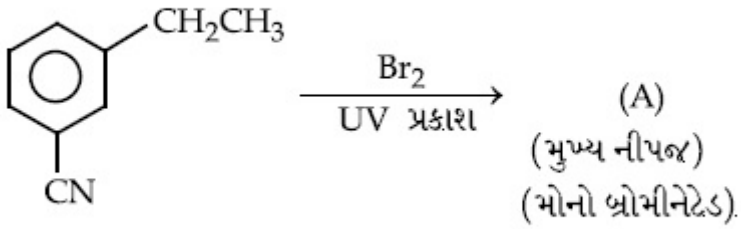
70819166141. 

70819166142. 

Question Number : 43 Question Id : 70819120326 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

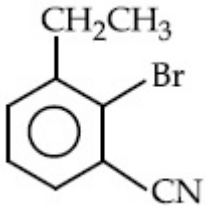
Correct Marks : 4 Wrong Marks : 1

આપેલ પ્રક્રિયા માટે :

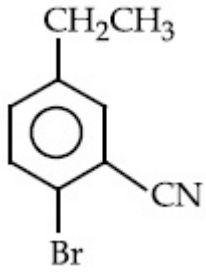


તો 'A' શું છે ?

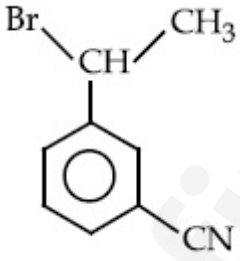
Options :



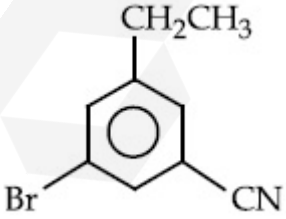
70819166139.



70819166140.



70819166141.



70819166142.

Question Number : 44 Question Id : 70819120327 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\underset{(C_4H_8Cl_2)}{A} \xrightarrow[373\ K]{\text{Hydrolysis}} \underset{(C_4H_8O)}{B}$$

B reacts with Hydroxyl amine but does not give Tollen's test. Identify A and B.

Options :

70819166143. 1,1-Dichlorobutane and Butanal

70819166144. 2,2-Dichlorobutane and Butanal

70819166145. 1,1-Dichlorobutane and 2-Butanone

70819166146. 2,2-Dichlorobutane and Butan-2-one

Question Number : 44 Question Id : 70819120327 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\underset{(C_4H_8Cl_2)}{A} \xrightarrow[373\ K]{\text{જળવિભાજન}} \underset{(C_4H_8O)}{B}$$

B એ હાઈડ્રોક્સિલ એમાઈન સાથે પ્રક્રિયા કરે છે પણ ટોલેન્સ કસોટી આપતો નથી. A અને B ને ઓળખો.

Options :

70819166143. 1,1-ડાયક્લોરોબ્યૂટેન અને બ્યૂટેનાલ

70819166144. 2,2-ડાયક્લોરોબ્યૂટેન અને બ્યૂટેનાલ

70819166145. 1,1-ડાયક્લોરોબ્યૂટેન અને 2-બ્યૂટેનોન

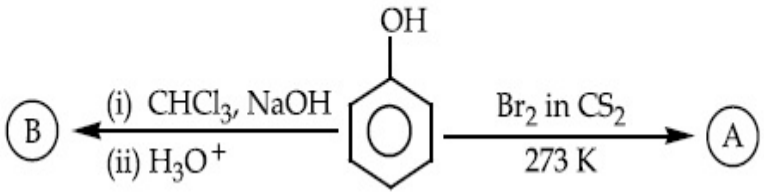
70819166146. 2,2-ડાયક્લોરોબ્યૂટેન અને બ્યૂટેન-2-ઓન

Question Number : 45 Question Id : 70819120328 Question Type : MCQ Option Shuffling : Yes

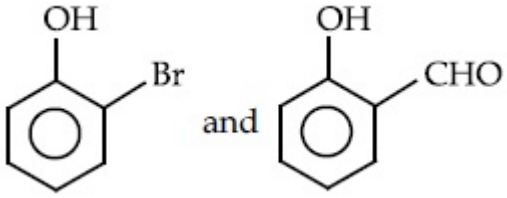
Is Question Mandatory : No

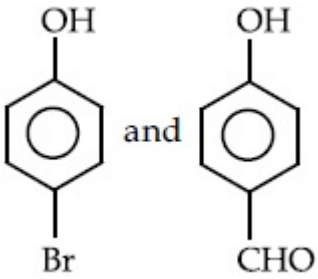
Correct Marks : 4 Wrong Marks : 1

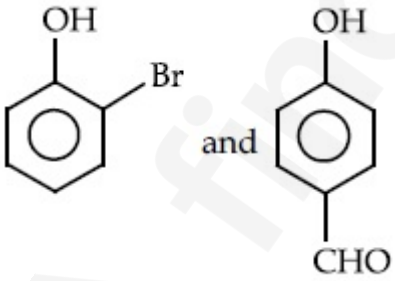
Identify the major products A and B respectively in the following reactions of phenol :

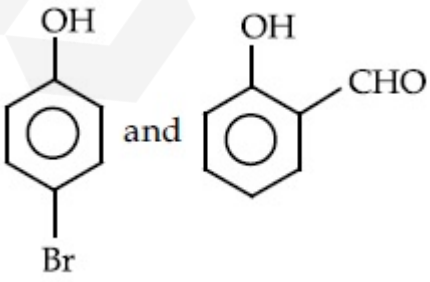


Options :

70819166147. 

70819166148. 

70819166149. 

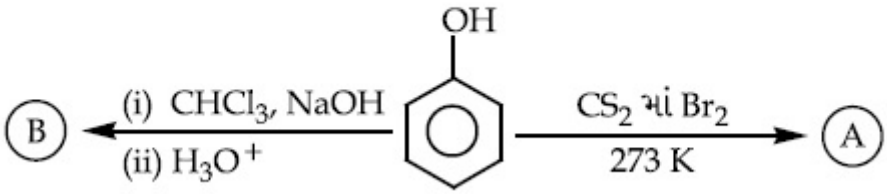
70819166150. 

Question Number : 45 Question Id : 70819120328 Question Type : MCQ Option Shuffling : Yes

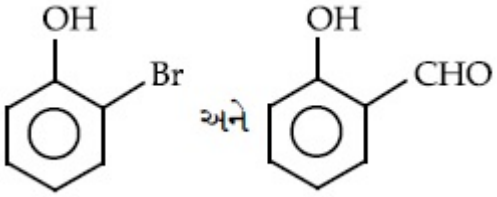
Is Question Mandatory : No

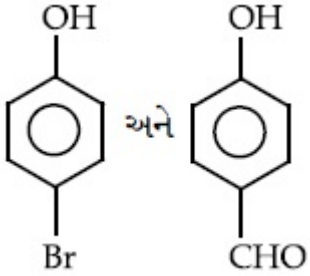
Correct Marks : 4 Wrong Marks : 1

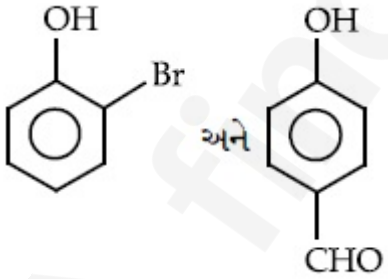
નીચે આપેલ ફિનોલની પ્રક્રિયાઓમાં મુખ્ય નીપજો અનુક્રમે A અને B ઓળખો :

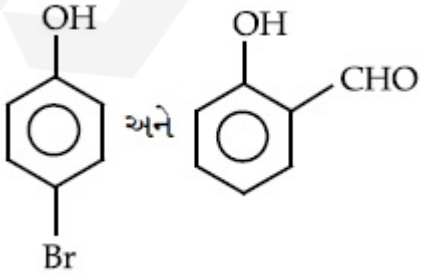


Options :

70819166147. 

70819166148. 

70819166149. 

70819166150. 

Question Number : 46 Question Id : 70819120329 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : *o*-Nitrophenol is steam volatile due to intramolecular hydrogen bonding.

Statement II : *o*-Nitrophenol has high melting due to hydrogen bonding.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

Options :

70819166151. **Both Statement I and Statement II are true**

70819166152. **Both Statement I and Statement II are false**

70819166153. **Statement I is true but Statement II is false**

70819166154. **Statement I is false but Statement II is true**

Question Number : 46 Question Id : 70819120329 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બે વિધાનો નીચે આપેલા છે :

વિધાન I : *o*-નાઈટ્રોફિનોલ એ આંતઃઆણ્વીય હાઈડ્રોજન બંધનને કારણે વરાળ બાષ્પશીલ છે.

વિધાન II : *o*-નાઈટ્રોફિનોલ એ હાઈડ્રોજન બંધનને કારણે ઊંચું ગલનબિંદુ ધરાવે છે.

ઉપરનાં વિધાનોનાં સંદર્ભમાં, નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819166151. **બંને, વિધાન I અને વિધાન II સાચાં છે.**

70819166152. **બંને, વિધાન I અને વિધાન II ખોટાં છે.**

70819166153. **વિધાન I સાચું છે પણ વિધાન II ખોટું છે.**

70819166154. વિધાન I ખોટું છે પણ વિધાન II સાચું છે.

Question Number : 47 Question Id : 70819120330 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

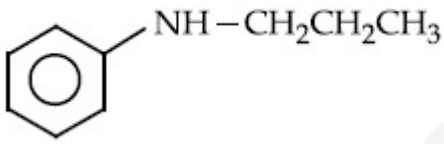
Correct Marks : 4 Wrong Marks : 1

An amine on reaction with benzenesulphonyl chloride produces a compound insoluble in alkaline solution. This amine can be prepared by ammonolysis of ethyl chloride. The correct structure of amine is :

Options :

70819166155. $CH_3CH_2CH_2NHCH_3$

70819166156. $CH_3CH_2CH_2\overset{H}{N}-CH_2CH_3$

70819166157. 

70819166158. $CH_3CH_2NH_2$

Question Number : 47 Question Id : 70819120330 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

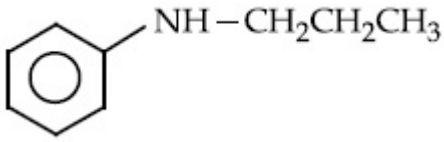
Correct Marks : 4 Wrong Marks : 1

એક એમાઈનની બેન્ઝિનસલ્ફોનાઈલ ક્લોરાઈડ સાથે પ્રક્રિયા કરતાં બનતું સંયોજન આલ્કલાઈન દ્રાવણમાં અદ્રાવ્ય છે. આ એમાઈન એ ઈથાઈલ ક્લોરાઈડના એમોનોલિસિસ દ્વારા બનાવી શકાય છે. તો એમાઈનનું સાચું બંધારણ શોધો .

Options :

70819166155. $CH_3CH_2CH_2NHCH_3$

70819166156. $CH_3CH_2CH_2\overset{H}{N}-CH_2CH_3$

70819166157. 

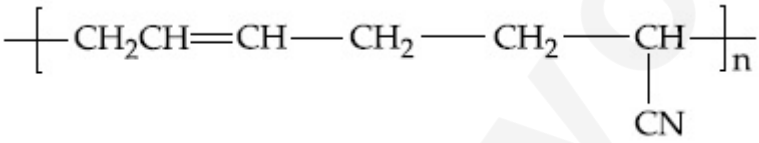
70819166158. $CH_3CH_2NH_2$

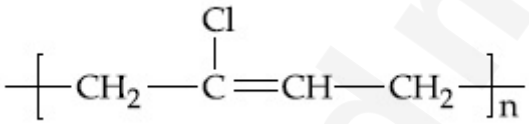
Question Number : 48 Question Id : 70819120331 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

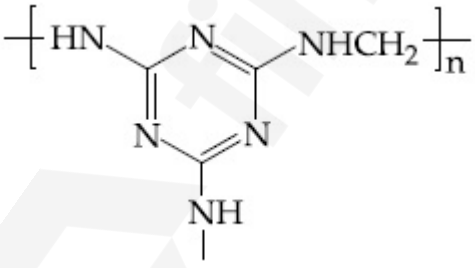
Correct Marks : 4 Wrong Marks : 1

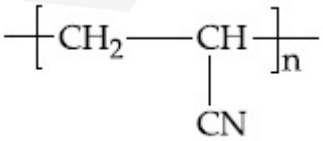
The structure of Neoprene is :

Options :

70819166159. 

70819166160. 

70819166161. 

70819166162. 

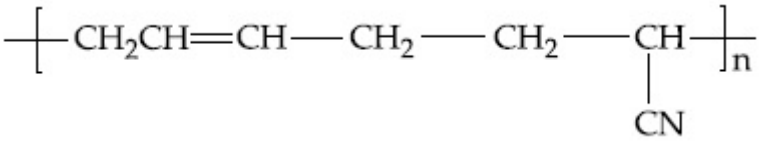
Question Number : 48 Question Id : 70819120331 Question Type : MCQ Option Shuffling : Yes

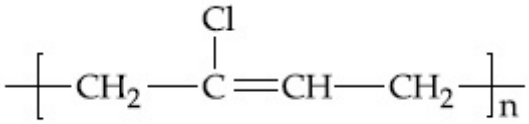
Is Question Mandatory : No

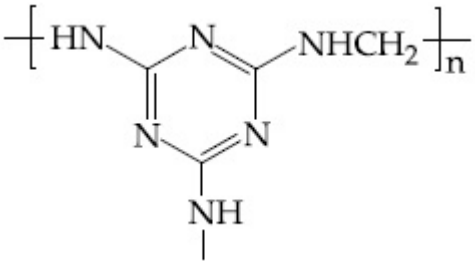
Correct Marks : 4 Wrong Marks : 1

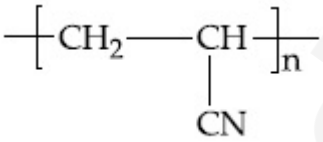
નિયોપ્રિનનું બંધારણ શોધો :

Options :

70819166159. 

70819166160. 

70819166161. 

70819166162. 

Question Number : 49 Question Id : 70819120332 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following vitamin is helpful in delaying the blood clotting ?

Options :

70819166163. Vitamin B

70819166164. Vitamin C

70819166165. Vitamin E

70819166166. Vitamin K

Question Number : 49 Question Id : 70819120332 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલામાંથી કયો વિટામીન લોહીને ગંઠાઈ જવામાં મોડું કરી (delaying) મદદ કરે છે ?

Options :

70819166163. વિટામીન B

70819166164. વિટામીન C

70819166165. વિટામીન E

70819166166. વિટામીન K

Question Number : 50 Question Id : 70819120333 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

On treating a compound with warm dil. H_2SO_4, gas X is evolved which turns $K_2Cr_2O_7$ paper acidified with dil. H_2SO_4 to a green compound Y. X and Y respectively are :

Options :

70819166167. $X = SO_3,\ Y = Cr_2(SO_4)_3$

70819166168. $X = SO_2,\ Y = Cr_2O_3$

70819166169. $X = SO_3,\ Y = Cr_2O_3$

70819166170. $X=SO_2,\ Y=Cr_2(SO_4)_3$

Question Number : 50 Question Id : 70819120333 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક સંયોજનને ગરમ મંદ H_2SO_4 સાથે પ્રક્રિયા કરતાં, વાયુ X ઉત્પન્ન થાય છે કે જે મંદ H_2SO_4 વડે એસિડિક કરેલ $K_2Cr_2O_7$ પત્રને લીલું કરી સંયોજન Y માં ફેરવે છે. તો X અને Y અનુક્રમે શોધો

Options :

70819166167. $X=SO_3,\ Y=Cr_2(SO_4)_3$

70819166168. $X=SO_2,\ Y=Cr_2O_3$

70819166169. $X=SO_3,\ Y=Cr_2O_3$

70819166170. $X=SO_2,\ Y=Cr_2(SO_4)_3$

Chemistry Section B

Section Id :	708191895
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes

Sub-Section Number : 1

Sub-Section Id : 7081911175

Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 70819120334 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of significant figures in 50000.020×10^{-3} is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 51 Question Id : 70819120334 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

50000.020×10^{-3} માં અર્થસૂચક આંકડાઓની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819120335 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A certain gas obeys $P(V_m - b) = RT$. The value of $\left(\frac{\partial Z}{\partial P}\right)_T$ is $\frac{xb}{RT}$. The value of x is _____.

(Integer answer) (Z : compressibility factor)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819120335 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક નિશ્ચિત વાયુ $P(V_m - b) = RT$ નું પાલન કરે છે. $\left(\frac{\partial Z}{\partial P}\right)_T$ નું મૂલ્ય $\frac{xb}{RT}$ છે. તો x નું મૂલ્ય _____. છે.

(પૂર્ણાંકમાં જવાબ) : (Z : દબનીય અવયવ)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819120336 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

For a chemical reaction $A + B \rightleftharpoons C + D$

($\Delta_r H^\Theta = 80$ kJ mol^{-1}) the entropy change $\Delta_r S^\Theta$ depends on the temperature T(in K) as $\Delta_r S^\Theta = 2T$ (J $K^{-1} mol^{-1}$).

Minimum temperature at which it will become spontaneous is _____ K. (Integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819120336 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક રાસાયણિક પ્રક્રિયા $A + B \rightleftharpoons C + D$ માટે, $(\Delta_r H^\Theta = 80\ kJ\ mol^{-1})$ એન્ટ્રોપીમાં થતો ફેરફાર $\Delta_r S^\Theta$ એ તાપમાન T (K માં) પર આધારિત છે જે $\Delta_r S^\Theta = 2T\ (J\ K^{-1} mol^{-1})$ તરીકે છે.

કયા ન્યૂન્નતમ તાપમાને તે સ્વયંભૂ (આપ મેળે) થશે તે _____ K માં છે. (પૂર્ણાંક)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 Question Id : 70819120337 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

224 mL of $SO_{2(g)}$ at 298 K and 1 atm is passed through 100 mL of 0.1 M NaOH solution. The non-volatile solute produced is dissolved in 36 g of water. The lowering of vapour pressure of solution (assuming the solution is dilute) $\left(P^\circ_{(H_2O)} = 24\ mm\ of\ Hg\right)$ is $x \times 10^{-2}$ mm of Hg, the value of x is _____. (Integer answer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 Question Id : 70819120337 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

298 K અને 1 atm પર, 224 mL $SO_{2(g)}$ ને 100 mL 0.1 M NaOH નાં દ્રાવણમાંથી પસાર કરવામાં આવે છે. ઉત્પન્ન થતો અબાષ્પશીલ દ્રાવ્ય ને 36 g પાણીમાં દ્રાવ્ય કરવામાં આવે છે. દ્રાવણનાં બાષ્પદબાણમાં થતો ઘટાડો (lowering), (ધારી લો કે દ્રાવણ મંદ છે) $\left(P^{\circ}_{(H_2O)} = 24 \text{ mm of Hg}\right)$ $x \times 10^{-2}$ mm of Hg છે. તો x નું મૂલ્ય _____ છે. (પૂર્ણાંક જવાબ)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 Question Id : 70819120338 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A homogeneous ideal gaseous reaction $AB_{2(g)} \rightleftharpoons A_{(g)} + 2B_{(g)}$ is carried out in a 25 litre flask at 27°C. The initial amount of AB_2 was 1 mole and the equilibrium pressure was 1.9 atm. The value of K_p is $x \times 10^{-2}$. The value of x is _____. (Integer answer)
$[R = 0.08206 \text{ dm}^3\text{atm K}^{-1}\text{ mol}^{-1}]$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 Question Id : 70819120338 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

27°C પર, એક સમરૂપ (સમાંગી) આદર્શ વાયુઓની પ્રક્રિયા $AB_{2(g)} \rightleftharpoons A_{(g)} + 2B_{(g)}$ ને 25 લિટર ફ્લાસ્કમાં કરવામાં આવે છે. AB_2 નો શરૂઆતનો જથ્થો 1 મોલ હતો અને સંતુલને દબાણ 1.9 atm હતું. તો K_p નું મૂલ્ય $x \times 10^{-2}$ છે. તો x નું મૂલ્ય _____ છે. (પૂર્ણાંક જવાબ) $[R = 0.08206\ dm^3 atm\ K^{-1}\ mol^{-1}]$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 56 Question Id : 70819120339 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Consider the following reaction

$$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{+2} + 4H_2O,\ E^o = 1.51\ V.$$

The quantity of electricity required in Faraday to reduce five moles of MnO_4^- is _____.
(Integer answer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 56 Question Id : 70819120339 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

નીચે આપેલ પ્રક્રિયાને ધ્યાનમાં લો.

$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{+2} + 4H_2O$, $E^\circ = 1.51$ V.

MnO_4^- નાં પાંચ મોલનું રિડક્શન કરવા માટે વિદ્યુતનો જરૂરી જથ્થો ફેરાડે માં _____ છે. (પૂર્ણાંક જવાબ)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819120340 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

An exothermic reaction $X \rightarrow Y$ has an activation energy 30 kJ mol^{-1}. If energy change ΔE during the reaction is -20 kJ, then the activation energy for the reverse reaction in kJ is _____. (Integer answer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819120340 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક ઉષ્માક્ષેપક પ્રક્રિયા $X \rightarrow Y$ 30 kJ mol^{-1} સક્રિયકરણ શક્તિ ધરાવે છે. પ્રક્રિયા દરમ્યાન જો (શક્તિ) ઊર્જાનો ફેરફાર ΔE -20 kJ હોય તો, પ્રતિવર્તી પ્રક્રિયા માટે સક્રિયકરણ શક્તિ kJ માં _____ છે. (પૂર્ણાંક જવાબ)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819120341 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

3.12 g of oxygen is adsorbed on 1.2 g of platinum metal. The volume of oxygen adsorbed per gram of the adsorbent at 1 atm and 300 K in L is _____.
[$R = 0.0821$ L atm K^{-1} mol^{-1}]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819120341 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1.2 g પ્લેટીનમ ધાતુ પર 3.12 g ઓક્સિજનનું અધિશોષણ થાય છે. 300 K અને 1 atm પર, અધિશોષકનાં પર ગ્રામ ઉપર અધિશોષિત થતા ઓક્સિજનનું કદ L માં _____ છે.
[$R = 0.0821$ L atm K^{-1} mol^{-1}]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819120342 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Dichromate ion is treated with base, the oxidation number of Cr in the product formed is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819120342 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ડાયક્રોમેટ આયનની બેઈઝ સાથે પ્રક્રિયા કરવામાં આવે છે. તો બનતી નીપજમાં Cr નો ઓક્સિડેશન આંક _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 60 Question Id : 70819120343 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Number of bridging CO ligands in $[Mn_2(CO)_{10}]$ is _____ .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 60 Question Id : 70819120343 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$[Mn_2(CO)_{10}]$ માં સેતુમય CO લિગાન્ડ્સ ની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Mathematics Section A

Section Id :	708191896
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911176
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 70819120344 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $\vec{a}$ and $\vec{b}$ are perpendicular, then $\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \vec{b}\right)\right)\right)$ is equal to :

Options :

70819166181. $\vec{0}$

70819166182. $\frac{1}{2}\left|\vec{a}\right|^4 \vec{b}$

70819166183. $\left|\vec{a}\right|^4 \vec{b}$

70819166184. $\vec{a} \times \vec{b}$

Question Number : 61 Question Id : 70819120344 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો $\vec{a}$ અને $\vec{b}$ લંબહોય, તો $\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \vec{b}\right)\right)\right)$ =_____.

Options :

70819166181. $\vec{0}$

70819166182. $\frac{1}{2}\left|\vec{a}\right|^4 \vec{b}$

70819166183. $\left|\vec{a}\right|^4 \vec{b}$

70819166184. $\vec{a} \times \vec{b}$

Question Number : 62 Question Id : 70819120345 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $(1, 5, 35)$, $(7, 5, 5)$, $(1, \lambda, 7)$ and $(2\lambda, 1, 2)$ are coplanar, then the sum of all possible values of λ is :

Options :

70819166185. $\frac{39}{5}$

70819166186. $-\frac{39}{5}$

70819166187. $-\frac{44}{5}$

70819166188. $\frac{44}{5}$

Question Number : 62 Question Id : 70819120345 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો બિંદુઓ $(1, 5, 35)$, $(7, 5, 5)$, $(1, \lambda, 7)$ અને $(2\lambda, 1, 2)$ સમતલીય હોય, તો λ ની શક્ય તમામ કિંમતોનો સરવાળો _____ થાય.

Options :

70819166185. $\frac{39}{5}$

70819166186. $-\frac{39}{5}$

70819166187. $-\frac{44}{5}$

70819166188. $\frac{44}{5}$

Question Number : 63 Question Id : 70819120346 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The intersection of three lines $x-y=0$, $x+2y=3$ and $2x+y=6$ is a :

Options :

70819166189. Right angled triangle

70819166190. Isosceles triangle

70819166191. Equilateral triangle

70819166192. None of the above

Question Number : 63 Question Id : 70819120346 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ત્રણ રેખાઓ $x-y=0$, $x+2y=3$ અને $2x+y=6$ નો છેદ

Options :

70819166189. કાટકોણ ત્રિકોણ છે.

70819166190. સમદ્વિબાજુ ત્રિકોણ છે.

70819166191. સમબાજુ ત્રિકોણ છે.

70819166192. ઉપરનાં પૈકી એક પણ નહિ.

Question Number : 64 Question Id : 70819120347 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\begin{vmatrix}(a+1)(a+2) & a+2 & 1\\(a+2)(a+3) & a+3 & 1\\(a+3)(a+4) & a+4 & 1\end{vmatrix}$ is :

Options :

70819166193. $(a+1)(a+2)(a+3)$

70819166194. $(a+2)(a+3)(a+4)$

70819166195. -2

70819166196. 0

Question Number : 64 Question Id : 70819120347 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\begin{vmatrix}(a+1)(a+2) & a+2 & 1\\(a+2)(a+3) & a+3 & 1\\(a+3)(a+4) & a+4 & 1\end{vmatrix}$ નું મૂલ્ય _____ છે.

Options :

70819166193. $(a+1)(a+2)(a+3)$

70819166194. $(a+2)(a+3)(a+4)$

70819166195. -2

70819166196. 0

Question Number : 65 Question Id : 70819120348 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The rate of growth of bacteria in a culture is proportional to the number of bacteria present and the bacteria count is 1000 at initial time $t=0$. The number of bacteria is increased by 20% in 2 hours. If the population of bacteria is 2000 after $\frac{k}{\log_e\left(\frac{6}{5}\right)}$ hours, then $\left(\frac{k}{\log_e 2}\right)^2$ is equal to :

Options :

70819166197. 2

70819166198. 4

70819166199. 8

70819166200. 16

Question Number : 65 Question Id : 70819120348 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બેક્ટેરીયાનો વૃધ્ધિ દર હયાત બેક્ટેરીયાની સંખ્યાનાં સમપ્રમાણમાં છે અને શરૂઆતમાં $t=0$ સમયે બેક્ટેરીયાની સંખ્યા 1000 છે. 2 કલાકમાં બેક્ટેરીયાની સંખ્યા 20% વધે છે. જો $\frac{k}{\log_e\left(\frac{6}{5}\right)}$ કલાકો પછી બેક્ટેરીયાની સંખ્યા 2000 હોય, તો $\left(\frac{k}{\log_e 2}\right)^2 =$ _____.

Options :

70819166197. 2

70819166198. 4

70819166199. 8

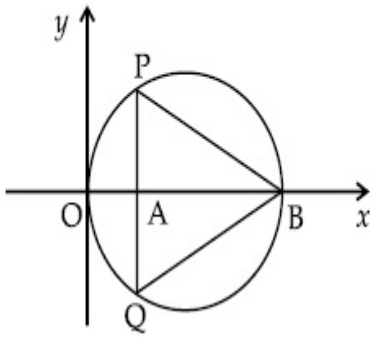
70819166200. 16

Question Number : 66 Question Id : 70819120349 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In the circle given below, let OA = 1 unit, OB = 13 unit and PQ ⊥ OB. Then, the area of the triangle PQB (in square units) is :



Options :

70819166201. $24\sqrt{2}$

70819166202. $24\sqrt{3}$

70819166203. $26\sqrt{2}$

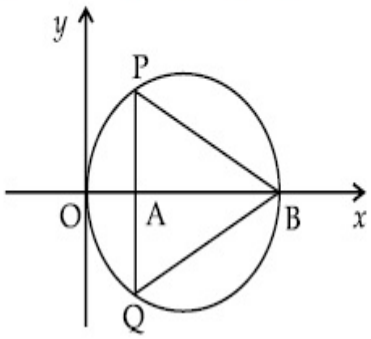
70819166204. $26\sqrt{3}$

Question Number : 66 Question Id : 70819120349 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ વર્તુળમાં ધારોકે OA = 1 એકમ, OB=13 એકમ અને PQ ⊥ OB છે. તો ત્રિકોણ PQB નું ક્ષેત્રફળ (ચો. એકમમાં) _____ થાય.



Options :

70819166201. $24\sqrt{2}$

70819166202. $24\sqrt{3}$

70819166203. $26\sqrt{2}$

70819166204. $26\sqrt{3}$

Question Number : 67 Question Id : 70819120350 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\lim\limits_{h\to 0} 2\left\{\dfrac{\sqrt{3}\sin\left(\frac{\pi}{6}+h\right)-\cos\left(\frac{\pi}{6}+h\right)}{\sqrt{3}h\left(\sqrt{3}\cos h-\sin h\right)}\right\}$ is :

Options :

70819166205. $\frac{2}{3}$

70819166206. $\frac{4}{3}$

70819166207. $\frac{2}{\sqrt{3}}$

70819166208. $\frac{3}{4}$

Question Number : 67 Question Id : 70819120350 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\lim_{h\to 0} 2\left\{\frac{\sqrt{3}\sin\left(\frac{\pi}{6}+h\right)-\cos\left(\frac{\pi}{6}+h\right)}{\sqrt{3}h\left(\sqrt{3}\cos h-\sin h\right)}\right\}$ નું મૂલ્ય _____ છે.

Options :

70819166205. $\frac{2}{3}$

70819166206. $\frac{4}{3}$

70819166207. $\frac{2}{\sqrt{3}}$

70819166208. $\frac{3}{4}$

Question Number : 68 Question Id : 70819120351 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The maximum slope of the curve $y=\frac{1}{2}x^4-5x^3+18x^2-19x$ occurs at the point :

Options :

70819166209. $(0, 0)$

70819166210. $(2, 2)$

70819166211. $\left(3, \frac{21}{2}\right)$

70819166212. $(2, 9)$

Question Number : 68 Question Id : 70819120351 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

વક્ર $y = \frac{1}{2}x^4 - 5x^3 + 18x^2 - 19x$ ને _____ બિંદુએ મહત્તમ ઢાળ મળે છે.

Options :

70819166209. $(0, 0)$

70819166210. $(2, 2)$

70819166211. $\left(3, \frac{21}{2}\right)$

70819166212. $(2, 9)$

Question Number : 69 Question Id : 70819120352 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\int_{-\pi/2}^{\pi/2} \frac{\cos^2 x}{1+3^x}\,dx$ is :

Options :

70819166213. $\frac{\pi}{2}$

70819166214. 2π

70819166215. $\frac{\pi}{4}$

70819166216. 4π

Question Number : 69 Question Id : 70819120352 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\int_{-\pi/2}^{\pi/2} \frac{\cos^2 x}{1+3^x}\,dx$ નું મૂલ્ય _____ છે.

Options :

70819166213. $\frac{\pi}{2}$

70819166214. 2π

70819166215. $\frac{\pi}{4}$

70819166216. 4π

Question Number : 70 Question Id : 70819120353 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The number of seven digit integers with sum of the digits equal to 10 and formed by using the digits 1, 2 and 3 only is :

Options :

70819166217. 42

70819166218. 35

70819166219. 77

70819166220. 82

Question Number : 70 Question Id : 70819120353 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

માત્ર 1, 2 અને 3 અંકો ઉપયોગથી રચાતી તથા જેના અંકોનો સરવાળો 10 હોય તેવા સાત આંકોના પૂર્ણાંકો ની સંખ્યા _____ છે.

Options :

70819166217. 42

70819166218. 35

70819166219. 77

70819166220. 82

Question Number : 71 Question Id : 70819120354 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The maximum value of the term independent of 't' in the expansion of $\left(tx^{\frac{1}{5}}+\frac{(1-x)^{\frac{1}{10}}}{t}\right)^{10}$ where $x \in (0, 1)$ is :

Options :

70819166221. $\frac{10!}{\sqrt{3}(5!)^2}$

70819166222. $\frac{2.10!}{3\sqrt{3}(5!)^2}$

70819166223. $\frac{2.10!}{3(5!)^2}$

70819166224. $\frac{10!}{3(5!)^2}$

Question Number : 71 Question Id : 70819120354 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\left(tx^{\frac{1}{5}}+\frac{(1-x)^{\frac{1}{10}}}{t}\right)^{10}$; જ્યાં $x \in (0, 1)$, ના વિસ્તરણમાં 't' થી સ્વતંત્ર પદની મહત્તમ કિંમત _____ છે.

Options :

70819166221. $\frac{10!}{\sqrt{3}(5!)^2}$

70819166222. $\frac{2.10!}{3\sqrt{3}(5!)^2}$

70819166223. $\frac{2.10!}{3(5!)^2}$

70819166224. $\frac{10!}{3(5!)^2}$

Question Number : 72 Question Id : 70819120355 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $R=\{(P, Q) \mid P$ and Q are at the same distance from the origin$\}$ be a relation, then the equivalence class of $(1, -1)$ is the set :

Options :

70819166225. $S=\{(x, y) \mid x^2+y^2=4\}$

70819166226. $S=\{(x, y) \mid x^2+y^2=2\}$

70819166227. $S=\{(x, y) \mid x^2+y^2=1\}$

70819166228. $S=\{(x, y) \mid x^2+y^2=\sqrt{2}\}$

Question Number : 72 Question Id : 70819120355 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે $R=\{(P, Q) \mid P$ અને Q ઊગમબિંદુથી સમાન અંતરે આવેલ છે$\}$. એ એક સંબંધ છે, તો $(1, -1)$ નો સામ્ય વર્ગ એ _____ ગણ છે.

Options :

70819166225. $S=\{(x, y) \mid x^2+y^2=4\}$

70819166226. $S=\{(x, y) \mid x^2+y^2=2\}$

70819166227. $S=\{(x, y) \mid x^2+y^2=1\}$

70819166228. $S=\{(x, y) \mid x^2+y^2=\sqrt{2}\}$

Question Number : 73 Question Id : 70819120356 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let A be a symmetric matrix of order 2 with integer entries. If the sum of the diagonal elements of A^2 is 1, then the possible number of such matrices is :

Options :

70819166229. 1

70819166230. 4

70819166231. 6

70819166232. 12

Question Number : 73 Question Id : 70819120356 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે A એ કક્ષા 2 વાળો પૂર્ણાંક ઘટકોનો સંમિત શ્રેણિક છે. જો A^2 નાં વિકર્ણોના ઘટકોનો સરવાળો 1 હોય, તો આવા શક્ય શ્રેણિકોની સંખ્યા _____ છે.

Options :

70819166229. 1

70819166230. 4

70819166231. 6

70819166232. 12

Question Number : 74 Question Id : 70819120357 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let f be any function defined on $\mathbf{R}$ and let it satisfy the condition :

$$|f(x)-f(y)| \leq |(x-y)^2|, \forall (x, y) \in \mathbf{R}$$

If $f(0) = 1$, then :

Options :

70819166233. $f(x) > 0, \forall x \in \mathbf{R}$

70819166234. $f(x) < 0, \forall x \in \mathbf{R}$

70819166235. $f(x) = 0, \forall x \in \mathbf{R}$

70819166236. $f(x)$ can take any value in $\mathbf{R}$

Question Number : 74 Question Id : 70819120357 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે f એ $\mathbf{R}$ પર વ્યાખ્યાયિત કોઈ વિધેય છે અને તે, શરત $|f(x)-f(y)| \leq |(x-y)^2|, \forall (x, y) \in \mathbf{R}$ નું સમાધાન કરે છે. જો $f(0) = 1$, તો :

Options :

70819166233. $f(x) > 0, \forall x \in \mathbf{R}$

70819166234. $f(x) < 0, \forall x \in \mathbf{R}$

70819166235. $f(x) = 0, \forall x \in \mathbf{R}$

70819166236. $f(x)$ એ R માં કોઈપણ મૂલ્ય ધારણ કરે છે

Question Number : 75 Question Id : 70819120358 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A fair coin is tossed a fixed number of times. If the probability of getting 7 heads is equal to probability of getting 9 heads, then the probability of getting 2 heads is :

Options :

70819166237. $\frac{15}{2^8}$

70819166238. $\frac{15}{2^{12}}$

70819166239. $\frac{15}{2^{13}}$

70819166240. $\frac{15}{2^{14}}$

Question Number : 75 Question Id : 70819120358 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક સમતોલ સિક્કો ચોક્કસ વખત ઉછાળવામાં આવે છે. જો 7 વખત છાપ મળવાની સંભાવનાં એ 9 વખત છાપ મળવાની સંભાવના જેટલી જ હોય, તો 2 વખત છાપ મળવાની સંભાવના _____ છે.

Options :

70819166237. $\frac{15}{2^8}$

70819166238. $\frac{15}{2^{12}}$

70819166239. $\frac{15}{2^{13}}$

70819166240. $\frac{15}{2^{14}}$

Question Number : 76 Question Id : 70819120359 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $\frac{\sin^{-1}x}{a} = \frac{\cos^{-1}x}{b} = \frac{\tan^{-1}y}{c}; 0 < x < 1$, then the value of $\cos\left(\frac{\pi c}{a+b}\right)$ is :

Options :

70819166241. $1-y^2$

70819166242. $\frac{1-y^2}{y\sqrt{y}}$

70819166243. $\frac{1-y^2}{1+y^2}$

70819166244. $\frac{1-y^2}{2y}$

Question Number : 76 Question Id : 70819120359 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો $\frac{\sin^{-1}x}{a} = \frac{\cos^{-1}x}{b} = \frac{\tan^{-1}y}{c}; 0 < x < 1$ હોય, તો $\cos\left(\frac{\pi c}{a+b}\right)$ નું મૂલ્ય _____ થાય.

Options :

70819166241. $1-y^2$

70819166242. $\frac{1-y^2}{y\sqrt{y}}$

70819166243. $\frac{1-y^2}{1+y^2}$

70819166244. $\frac{1-y^2}{2y}$

Question Number : 77 Question Id : 70819120360 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In an increasing geometric series, the sum of the second and the sixth term is $\frac{25}{2}$ and the product of the third and fifth term is 25. Then, the sum of 4^{th}, 6^{th} and 8^{th} terms is equal to :

Options :

70819166245. 26

70819166246. 30

70819166247. 32

70819166248. 35

Question Number : 77 Question Id : 70819120360 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક વધતી સમગુણોત્તર શ્રેણીમાં બીજા અને છઠ્ઠા પદોનો સરવાળો $\frac{25}{2}$ અને ત્રીજા અને પાંચમાં પદોનો ગુણાકાર 25 છે. તો ચોથા, છઠ્ઠા અને આઠમા પદોનો સરવાળો _____ થાય.

Options :

70819166245. 26

70819166246. 30

70819166247. 32

70819166248. 35

Question Number : 78 Question Id : 70819120361 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The sum of the infinite series $1+\frac{2}{3}+\frac{7}{3^2}+\frac{12}{3^3}+\frac{17}{3^4}+\frac{22}{3^5}+\ldots\ldots$ is equal to :

Options :

70819166249. $\frac{9}{4}$

70819166250. $\frac{11}{4}$

70819166251. $\frac{13}{4}$

70819166252. $\frac{15}{4}$

Question Number : 78 Question Id : 70819120361 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

અનંત શ્રેઢી $1+\frac{2}{3}+\frac{7}{3^2}+\frac{12}{3^3}+\frac{17}{3^4}+\frac{22}{3^5}+\ldots\ldots$ નો સરવાળો _____ છે.

Options :

70819166249. $\frac{9}{4}$

70819166250. $\frac{11}{4}$

70819166251. $\frac{13}{4}$

70819166252. $\frac{15}{4}$

Question Number : 79 Question Id : 70819120362 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the three planes

$P_1 : 3x+15y+21z=9,$

$P_2 : x-3y-z=5,$ and

$P_3 : 2x+10y+14z=5$

Then, which one of the following is true ?

Options :

70819166253. P_1 and P_2 are parallel.

70819166254. P_1 and P_3 are parallel.

70819166255. P_1, P_2 and P_3 all are parallel.

70819166256. P_2 and P_3 are parallel.

Question Number : 79 Question Id : 70819120362 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે ત્રણ સમતલ

$P_1 : 3x+15y+21z=9,$

$P_2 : x-3y-z=5,$ અને

$P_3 : 2x+10y+14z=5$ છે.

તો નીચેના પૈકી કયું સાચું છે ?

Options :

70819166253. P_1 અને P_2 સમાંતર છે.

70819166254. P_1 અને P_3 સમાંતર છે.

70819166255. P_1, P_2 અને P_3 ત્રણેય સમાંતર છે.

70819166256. P_2 અને P_3 સમાંતર છે.

Question Number : 80 Question Id : 70819120363 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\sum_{n=1}^{100} \int_{n-1}^{n} e^{x-[x]}\,dx$, where $[x]$ is the greatest integer $\le x$, is :

Options :

70819166257. $100(1-e)$

70819166258. $100(1+e)$

70819166259. $100e$

70819166260. $100(e-1)$

Question Number : 80 Question Id : 70819120363 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\sum_{n=1}^{100} \int_{n-1}^{n} e^{x-[x]}\,dx$ નું મૂલ્ય _____ છે, જ્યાં $[x]$ મહત્તમ પૂર્ણાંક $\leq x$ છે.

Options :

70819166257. $100(1-e)$

70819166258. $100(1+e)$

70819166259. $100e$

70819166260. $100(e-1)$

Mathematics Section B

Section Id :	708191897
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1

Sub-Section Id : 708191117

Question Shuffling Allowed : Yes

Question Number : 81 Question Id : 70819120364 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The difference between degree and order of a differential equation that represents the family of curves given by $y^2 = a\left(x + \frac{\sqrt{a}}{2}\right)$, $a > 0$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 81 Question Id : 70819120364 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$y^2 = a\left(x + \frac{\sqrt{a}}{2}\right)$; $a > 0$ દ્વારા અપાયેલ વક્રના સમૂહને રજૂ કરતા વિકલ સમીકરણના પરિમાણ અને કક્ષા વચ્ચેનો તફાવત _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819120365 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The sum of 162^{th} power of the roots of the equation $x^3-2x^2+2x-1=0$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819120365 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

સમીકરણ $x^3-2x^2+2x-1=0$ નાં બીજેની 162મી ઘાતનો સરવાળો _____ થાય.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 83 Question Id : 70819120366 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The area bounded by the lines $y=\|x-1|-2|$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 83 Question Id : 70819120366 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

રેખાઓ $y=||x-1|-2|$ થી ઘેરાયેલા પ્રદેશનું ક્ષેત્રફળ _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 84 Question Id : 70819120367 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $y=y(x)$ is the solution of the equation $e^{\sin y}\cos y\frac{dy}{dx}+e^{\sin y}\cos x=\cos x,\ y(0)=0$; then

$1+y\left(\frac{\pi}{6}\right)+\frac{\sqrt{3}}{2}y\left(\frac{\pi}{3}\right)+\frac{1}{\sqrt{2}}y\left(\frac{\pi}{4}\right)$ 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 5.001

Question Number : 84 Question Id : 70819120367 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો $y=y(x)$ એ વિકલ સમીકરણ $e^{\sin y}\cos y\frac{dy}{dx}+e^{\sin y}\cos x=\cos x$, $y(0)=0$ નો ઉકેલ હોય, તો

$1+y\left(\frac{\pi}{6}\right)+\frac{\sqrt{3}}{2}y\left(\frac{\pi}{3}\right)+\frac{1}{\sqrt{2}}y\left(\frac{\pi}{4}\right)=$_____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 Question Id : 70819120368 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of solutions of the equation $\log_4(x-1)=\log_2(x-3)$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 Question Id : 70819120368 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

સમીકરણ $\log_4(x-1)=\log_2(x-3)$ નાં ઉકેલોની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 Question Id : 70819120369 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of integral values of 'k' for which the equation $3\sin x + 4\cos x = k + 1$ has a solution, $k \in R$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 Question Id : 70819120369 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

સમીકરણ $3\sin x + 4\cos x = k + 1$; $k \in R$ ને ઉકેલ હોય તેવા 'k' નાં પૂર્ણાંક મૂલ્યોની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819120370 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $(\lambda, 2, 1)$ be a point on the plane which passes through the point $(4, -2, 2)$. If the plane is perpendicular to the line joining the points $(-2, -21, 29)$ and $(-1, -16, 23)$, then

$\left(\frac{\lambda}{11}\right)^2 - \frac{4\lambda}{11} - 4$ 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 5.001

Question Number : 87 Question Id : 70819120370 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે $(4, -2, 2)$ માંથી પસાર થતા સમતલ પર બિંદુ $(\lambda, 2, 1)$ આવેલ છે. જો આ સમતલ, એ બિંદુઓ $(-2, -21, 29)$ તથા $(-1, -16, 23)$ ને જોડની રેખાને લંબ હોય, તો $\left(\frac{\lambda}{11}\right)^2 - \frac{4\lambda}{11} - 4 =$ _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819120371 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The value of the integral $\int_0^{\pi} |\sin 2x| \, dx$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819120371 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

સંકલિત $\int_0^{\pi} |\sin 2x|\,dx$ નું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819120372 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $\sqrt{3}(\cos^2 x) = (\sqrt{3}-1)\cos x + 1$, the number of solutions of the given equation when $x \in \left[0, \frac{\pi}{2}\right]$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819120372 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જ્યારે $x \in \left[0, \frac{\pi}{2}\right]$ હોય ત્યારે સમીકરણ $\sqrt{3}(\cos^2 x) = (\sqrt{3}-1)\cos x + 1$ નાં ઉકેલોની સંખ્યા _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 90 Question Id : 70819120373 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let m, n ∈ N and gcd (2, n) = 1. If $30\binom{30}{0} + 29\binom{30}{1} + ... + 2\binom{30}{28} + 1\binom{30}{29} = n \cdot 2^m$, then n + m is equal to _____.

$\left(\text{Here } \binom{n}{k} = {}^nC_k\right)$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 90 Question Id : 70819120373 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે $m, n \in N$ અને ગુ.સા.અ. $(2, n)=1$ છે. જો $30\binom{30}{0}+29\binom{30}{1}+\ldots..+2\binom{30}{28}+1\binom{30}{29}=n \cdot 2^{m}$,

તો $n+m=$_____.

$\left(\text{અહીં } \binom{n}{k}={}^{n}C_{k}\right)$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001