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B TECH EG

Group Number :	1
Group Id :	708191206
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300
Is this Group for Examiner? :	No

Physics Section A

Section Id :	708191814
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 :	7081911094
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 70819119114 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If e is the electronic charge, c is the speed of light in free space and h is Planck's constant, the quantity $\frac{1}{4\pi\varepsilon_0}\frac{|e|^2}{\hbar c}$ has dimensions of :

Options :

70819162491. $[M\ L\ T^0]$

70819162492. $[M\ L\ T^{-1}]$

70819162493. $[M^0\ L^0\ T^0]$

70819162494. $[L\ C^{-1}]$

Question Number : 1 Question Id : 70819119114 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો e વિદ્યુત વિજભાર હોય, c મુક્ત અવકાશમાં પ્રકાશની ઝડપ હોય અને h પ્લાન્ક અચળાંક હોય તો $\frac{1}{4\pi\varepsilon_0}\frac{|e|^2}{\hbar c}$ સૂત્ર નું પરિમાણ :

Options :

70819162491. $[M\ L\ T^0]$

70819162492. $[M\ L\ T^{-1}]$

70819162493. $[M^0\ L^0\ T^0]$

70819162494. $[L\ C^{-1}]$

Question Number : 2 Question Id : 70819119115 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A stone is dropped from the top of a building. When it crosses a point 5 m below the top, another stone starts to fall from a point 25 m below the top. Both stones reach the bottom of building simultaneously. The height of the building is :

Options :

70819162495. 45 m

70819162496. 25 m

70819162497. 35 m

70819162498. 50 m

Question Number : 2 Question Id : 70819119115 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

મકાનની ટોચ પરથી એક પથ્થરને મુક્ત કરવામાં આવે છે. જ્યારે આ પથ્થર ટોચ થી 5 m નીચે આપેલા બિંદુ પાસેથી પસાર થાય છે ત્યારે ટોચથી 25 m નીચે રહેલા બિંદુ પરથી બીજા પથ્થર ને મુક્ત કરવામાં આવે છે. જો બંને પથ્થર મકાનનાં તળીયે એક સાથે પહોંચતા હોય તો મકાનની ઊંચાઈ _____ હશે.

Options :

70819162495. 45 m

70819162496. 25 m

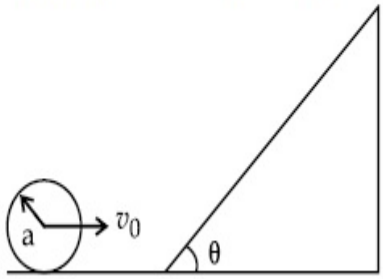
70819162497. 35 m

70819162498. 50 m

Question Number : 3 Question Id : 70819119116 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A sphere of radius 'a' and mass 'm' rolls along a horizontal plane with constant speed v_0. It encounters an inclined plane at angle θ and climbs upward. Assuming that it rolls without slipping, how far up the sphere will travel ?



Options :

70819162499. $\frac{v_0^2}{2g\ \sin\theta}$

70819162500. $\frac{v_0^2}{5g\ \sin\theta}$

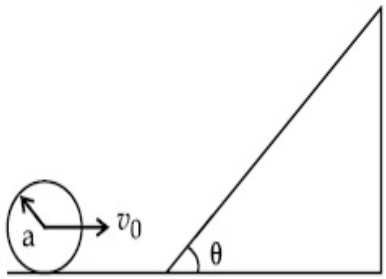
70819162501. $\frac{10v_0^2}{7g\ \sin\theta}$

70819162502. $\frac{2}{5}\frac{v_0^2}{g\sin\theta}$

Question Number : 3 Question Id : 70819119116 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

'a' ત્રિજ્યા અને 'm' દળ ધરાવતો ગોળો, અચળ ગતિ v_0 સાથે સમક્ષિતીજ સમતલને સમાંતર ગબડે છે. આ દરમ્યાન તે સમક્ષિતીજ સાથે θ કોણે નમેલા સમતલ સામનો કરતાં તેના ઉપર ચઢે છે. જો આપણે ધારી લઈએ કે તે લપસ્યા વગર ગબડે છે તો આ ગોળો ઉપરની દિશામાં કેટલું અંતર કાપશે ?



Options :

70819162499. $\frac{v_0^2}{2g\sin\theta}$

70819162500. $\frac{v_0^2}{5g\sin\theta}$

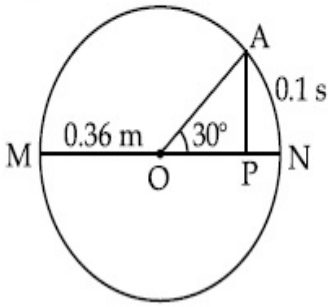
70819162501. $\frac{10v_0^2}{7g\sin\theta}$

70819162502. $\frac{2}{5}\frac{v_0^2}{g\sin\theta}$

Question Number : 4 Question Id : 70819119117 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The point A moves with a uniform speed along the circumference of a circle of radius 0.36 m and covers 30° in 0.1 s. The perpendicular projection 'P' from 'A' on the diameter MN represents the simple harmonic motion of 'P'. The restoration force per unit mass when P touches M will be :



Options :

70819162503. 100 N

70819162504. 9.87 N

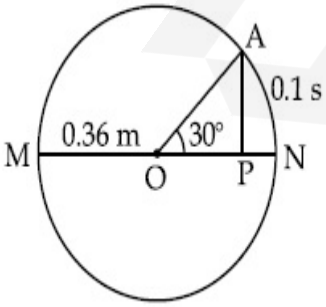
70819162505. 50 N

70819162506. 0.49 N

Question Number : 4 Question Id : 70819119117 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

0.36 m ત્રિજ્યા ધરાવતાં વર્તુળની પરિધ પર ગતિ કરતો બિંદુ 'A', 30° અંતર 0.1 s માં કાપે છે. વ્યાસ MN પર બિંદુ 'A' પાસેથી દોરેલ લંબ પ્રક્ષેપણ, 'P' સરળ આવર્ત ગતિ દર્શાવે છે. જ્યારે P, M ને સ્પર્શે ત્યારે પુનઃ સ્થાપન બળ _____ હશે.



Options :

70819162503. 100 N

70819162504. $9.87\ N$

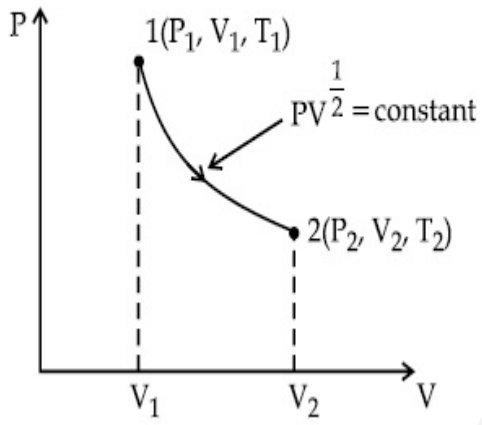
70819162505. $50\ N$

70819162506. $0.49\ N$

Question Number : 5 Question Id : 70819119118 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Thermodynamic process is shown below on a P-V diagram for one mole of an ideal gas. If $V_2 = 2V_1$ then the ratio of temperature T_2/T_1 is :



Options :

70819162507. $\frac{1}{\sqrt{2}}$

70819162508. $\sqrt{2}$

70819162509. $\frac{1}{2}$

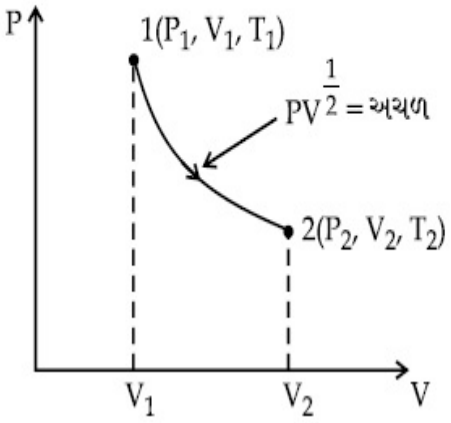
70819162510. 2

Question Number : 5 Question Id : 70819119118 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

1 મોલ આદર્શ વાયુ માટે, ઉષ્માગતિશાસ્ત્ર પ્રક્રિયાને P-V આકૃતિ દ્વારા દર્શાવવામાં આવેલ છે. જો $V_2 = 2V_1$ હોય તો તાપમાનનો ગુણોત્તર T_2/T_1 _____ છે.



Options :

70819162507. $\frac{1}{\sqrt{2}}$

70819162508. $\sqrt{2}$

70819162509. $\frac{1}{2}$

70819162510. 2

Question Number : 6 Question Id : 70819119119 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : In a diatomic molecule, the rotational energy at a given temperature obeys Maxwell's distribution.

Statement II : In a diatomic molecule, the rotational energy at a given temperature equals the translational kinetic energy for each molecule.

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

Options :

70819162511. Both Statement I and Statement II are true.

70819162512. Both Statement I and Statement II are false.

70819162513. Statement I is true but Statement II is false.

70819162514. Statement I is false but Statement II is true.

Question Number : 6 Question Id : 70819119119 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : દ્વિપરમાણ્વિક અણુ માટે આપેલ તાપમાને, ભ્રમણીય ઊર્જા મેક્સવેલ વિતરણને અનુસરે છે.

વિધાન II : દ્વિપરમાણ્વિક અણુ માટે આપેલ તાપમાને, ભ્રમણીય ઊર્જા દરેક અણુની સ્થાનાંતરીય ગતિ ઊર્જા બરાબર હોય છે.

ઉપરોક્ત આપેલ વિધાન માટે આપેલ વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819162511. બંને વિધાન I અને વિધાન II સાચાં છે.

70819162512. બંને વિધાન I અને વિધાન II ખોટા છે.

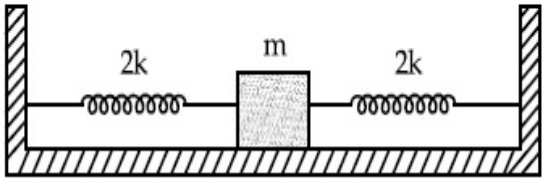
70819162513. વિધાન I સાચું છે પરંતુ વિધાન II ખોટું છે.

70819162514. વિધાન I ખોટું છે પરંતુ વિધાન II સાચું છે.

Question Number : 7 Question Id : 70819119120 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two identical springs of spring constant '2k' are attached to a block of mass m and to fixed support (see figure). When the mass is displaced from equilibrium position on either side, it executes simple harmonic motion. The time period of oscillations of this system is :



Options :

70819162515. $2\pi\sqrt{\frac{m}{2k}}$

70819162516. $2\pi\sqrt{\frac{m}{k}}$

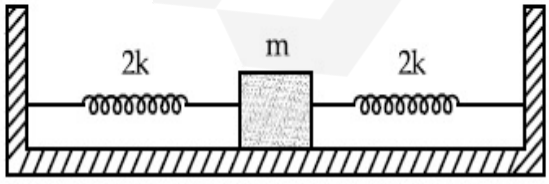
70819162517. $\pi\sqrt{\frac{m}{k}}$

70819162518. $\pi\sqrt{\frac{m}{2k}}$

Question Number : 7 Question Id : 70819119120 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા મુજબ '2k' સ્પ્રિંગ અચળાંક ધરાવતી બે એકસમાન સ્પ્રિંગ, દૃઢ આધાર સાથે જડિત છે અને m દળ ધરાવતાં ચોસલાં સાથે જોડાયેલ છે. સંતુલન સ્થિતિ સ્થાનની બંને તરફ જો દળને વિસ્થાપીત કરવામાં આવે તો તે સરળ આવર્ત ગતિ કરે છે. આ તંત્રનાં દોલનોનો આવર્તકાળ _____ છે.



Options :

70819162515. $2\pi\sqrt{\frac{m}{2k}}$

70819162516. $2\pi\sqrt{\frac{m}{k}}$

70819162517. $\pi\sqrt{\frac{m}{k}}$

70819162518. $\pi\sqrt{\frac{m}{2k}}$

Question Number : 8 Question Id : 70819119121 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$Y = A\sin(\omega t + \phi_0)$ is the time-displacement equation of a SHM. At $t = 0$ the displacement of the particle is $Y = \frac{A}{2}$ and it is moving along negative x-direction. Then the initial phase angle ϕ_0 will be :

Options :

70819162519. $\frac{\pi}{3}$

70819162520. $\frac{5\pi}{6}$

70819162521. $\frac{\pi}{6}$

70819162522. $\frac{2\pi}{3}$

Question Number : 8 Question Id : 70819119121 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સ.આ.દ. માટે સમય-સ્થાનાંતરનું સમીકરણ $Y = A\sin(\omega t + \phi_0)$ છે. $t = 0$ સમયે, કણનું સ્થાનાંતર $Y = \frac{A}{2}$ છે અને ઋણ x-દિશામાં ગતિ કરે છે. તો પ્રારંભિક કળા કોણ ϕ_0 _____ હશે.

Options :

70819162519. $\frac{\pi}{3}$

70819162520. $\frac{5\pi}{6}$

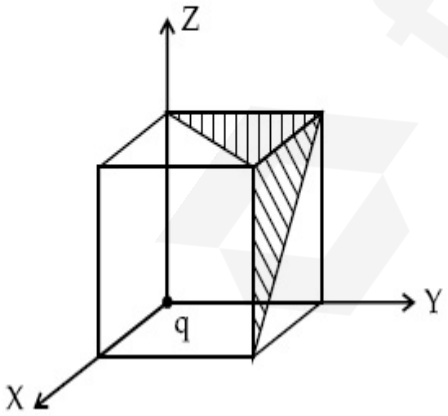
70819162521. $\frac{\pi}{6}$

70819162522. $\frac{2\pi}{3}$

Question Number : 9 Question Id : 70819119122 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A charge 'q' is placed at one corner of a cube as shown in figure. The flux of electrostatic field $\vec{E}$ through the shaded area is :



Options :

70819162523. $\frac{q}{48\varepsilon_0}$

70819162524. $\frac{q}{4\varepsilon_0}$

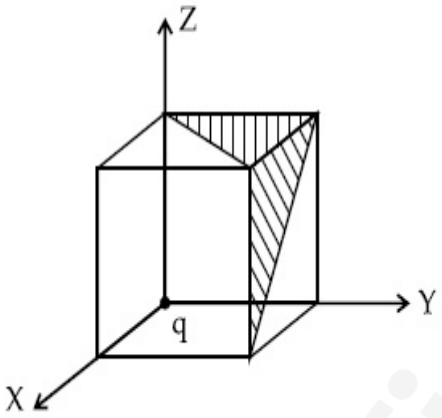
70819162525. $\frac{q}{8\varepsilon_0}$

70819162526. $\frac{q}{24\varepsilon_0}$

Question Number : 9 Question Id : 70819119122 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા મુજબ 'q' વિજભાર ને સમઘનનાં એક ખૂણા પર ગોઠવવામાં આવ્યો છે. આચ્છાદિત ક્ષેત્રફળમાંથી પસાર થતાં સ્થિત વીજક્ષેત્ર $\vec{E}$ નું ફ્લક્સ _____ હશે.



Options :

70819162523. $\frac{q}{48\varepsilon_0}$

70819162524. $\frac{q}{4\varepsilon_0}$

70819162525. $\frac{q}{8\varepsilon_0}$

70819162526.

$\frac{q}{24\varepsilon_0}$

Question Number : 10 Question Id : 70819119123 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An electron with kinetic energy K_1 enters between parallel plates of a capacitor at an angle 'α' with the plates. It leaves the plates at angle 'β' with kinetic energy K_2. Then the ratio of kinetic energies $K_1 : K_2$ will be :

Options :

70819162527. $\frac{\cos\beta}{\cos\alpha}$

70819162528. $\frac{\cos\beta}{\sin\alpha}$

70819162529. $\frac{\sin^2\beta}{\cos^2\alpha}$

70819162530. $\frac{\cos^2\beta}{\cos^2\alpha}$

Question Number : 10 Question Id : 70819119123 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સંધારકનાં બે સમાંતર પ્લેટ વચ્ચે 'α' કોણ રચાય તે પ્રમાણે K_1 ગતિ ઊર્જા ધરાવતો ઈલેક્ટ્રોન બંને પ્લેટની વચ્ચે પ્રવેશે છે. તે પ્લેટોને K_2 જેટલી ગતિ ઊર્જા સાથે 'β' કોણે છોડે છે. તો ગતિ ઊર્જાનો ગુણોત્તર $K_1 : K_2$ _____ થશે.

Options :

70819162527. $\frac{\cos\beta}{\cos\alpha}$

70819162528. $\frac{\cos\beta}{\sin\alpha}$

70819162529. $\frac{\sin^2\beta}{\cos^2\alpha}$

70819162530. $\frac{\cos^2\beta}{\cos^2\alpha}$

Question Number : 11 Question Id : 70819119124 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In a ferromagnetic material, below the curie temperature, a domain is defined as :

Options :

70819162531. a macroscopic region with zero magnetization.

70819162532. a macroscopic region with saturation magnetization.

70819162533. a macroscopic region with randomly oriented magnetic dipoles.

70819162534. a macroscopic region with consecutive magnetic dipoles oriented in opposite direction.

Question Number : 11 Question Id : 70819119124 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

લોહચુંબકીય દ્રવ્યમાં, ક્યુરી તાપમાન થી ઓછા તાપમાને, પ્રદેશ (ડોમેઈન) ને _____ પ્રમાણે વ્યાખ્યાયીત કરવામાં આવે છે.

Options :

70819162531. શૂન્ય ચુંબકન ધરાવતો સ્થુળ પ્રદેશ.

70819162532. સંતૃપ્ત ચુંબકન ધરાવતો સ્થુળ પ્રદેશ.

70819162533. યાદચ્છિક અનુસ્થાપિત ચુંબકીય દ્વિધ્રુવી ધરાવતો સ્થુળ પ્રદેશ.

70819162534. પરસ્પર વિરૂધ્ધ દિશામાં અનુસ્થાપિત ચુંબકીય દ્વિધ્રુવી ધરાવતો સ્થુળ પ્રદેશ.

Question Number : 12 Question Id : 70819119125 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An LCR circuit contains resistance of 110 Ω and a supply of 220 V at 300 rad/s angular frequency. If only capacitance is removed from the circuit, current lags behind the voltage by 45°. If on the other hand, only inductor is removed the current leads by 45° with the applied voltage. The rms current flowing in the circuit will be :

Options :

70819162535. 1 A

70819162536. 1.5 A

70819162537. 2 A

70819162538. 2.5 A

Question Number : 12 Question Id : 70819119125 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક LCR પરિપથ 110 Ω અવરોધ અને 300 રેડિયન/સે કોણીય આવૃત્તિવાળો 220 V ઉદ્‌ગમ ધરાવે છે. જો માત્ર સંધારક ને દૂર કરવામાં આવે તો પ્રવાહ, વોલ્ટેજ થી કળામાં 45° પાછળ રહે છે અને જો માત્ર પ્રેરક દૂર કરવામાં આવે તો પ્રવાહ, વોલ્ટેજ થી 45° આગળ રહે છે. પરિપથમાં પસાર થતાં પ્રવાહનું મૂલ્ય _____.

Options :

70819162535. 1 A

70819162536. 1.5 A

70819162537. 2 A

70819162538. 2.5 A

Question Number : 13 Question Id : 70819119126 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The stopping potential for electrons emitted from a photosensitive surface illuminated by light of wavelength 491 nm is 0.710 V. When the incident wavelength is changed to a new value, the stopping potential is 1.43 V. The new wavelength is :

Options :

70819162539. 309 nm

70819162540. 329 nm

70819162541. 382 nm

70819162542. 400 nm

Question Number : 13 Question Id : 70819119126 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

491 nm તરંગલંબાઈ ધરાવતાં પ્રકાશ દ્વારા પ્રકાશિત ફોટોસંવેદી સપાટી પરથી ઉત્સર્જાયેલા ઈલેક્ટ્રોનનો રોક (સ્ટોપીંગ) સ્થિતિમાન 0.710 V છે. જ્યારે આપાત તરંગલંબાઈ બદલાઈને નવી કિંમત ધારણ કરે ત્યારે આ રોક સ્થિતિમાન 1.43 V થાય છે. તો નવી તરંગલંબાઈ _____ હશે.

Options :

70819162539. 309 nm

70819162540. 329 nm

70819162541. 382 nm

70819162542. 400 nm

Question Number : 14 Question Id : 70819119127 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the diffraction pattern obtained from the sunlight incident on a pinhole of diameter 0.1 μm. If the diameter of the pinhole is slightly increased, it will affect the diffraction pattern such that :

Options :

70819162543. its size increases, and intensity increases

70819162544. its size increases, but intensity decreases

70819162545. its size decreases, but intensity increases

70819162546. its size decreases, and intensity decreases

Question Number : 14 Question Id : 70819119127 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

0.1 μm પહોળાઈ ધરાવતાં છિદ્ર (પીન હોલ) પર સૂર્ય પ્રકાશ આપાત કરતાં મળતી વિવર્તન ભાત ધ્યાનમાં લો. જો છિદ્રનો વ્યાસ થોડોક વધારીએ તો વિવર્તન ભાત પર એવી રીતે અસર થશે કે _____.

Options :

70819162543. તેનું કદ વધશે અને તીવ્રતા વધે છે

70819162544. તેનું કદ વધશે પરંતુ તીવ્રતા ઘટે છે

70819162545. તેનું કદ ઘટશે પરંતુ તીવ્રતા વધે છે

70819162546. તેનું કદ ઘટશે અને તીવ્રતા ઘટે છે

Question Number : 15 Question Id : 70819119128 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An electron of mass m_e and a proton of mass $m_p = 1836\ m_e$ are moving with the same speed.

The ratio of their de Broglie wavelength $\frac{\lambda_{electron}}{\lambda_{proton}}$ will be :

Options :

70819162547. 1

70819162548. 1836

70819162549. $\frac{1}{1836}$

70819162550. 918

Question Number : 15 Question Id : 70819119128 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

m_e દળ ધરાવતો ઈલેક્ટ્રોન અને $m_p = 1836\ m_e$ દળ ધરાવતો પ્રોટોન એકસરખી ઝડપથી ગતિ કરે છે. તેમની ડી-બ્રોગ્લી

તરંગલંબાઈ નો ગુણોત્તર $\frac{\lambda_{ઈલેક્ટ્રોન}}{\lambda_{પ્રોટોન}}$ _____ હશે.

Options :

70819162547. 1

70819162548. 1836

70819162549. $\frac{1}{1836}$

70819162550. 918

Question Number : 16 Question Id : 70819119129 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The wavelength of the photon emitted by a hydrogen atom when an electron makes a transition from $n=2$ to $n=1$ state is :

Options :

70819162551. 121.8 nm

70819162552. 194.8 nm

70819162553. 490.7 nm

70819162554. 913.3 nm

Question Number : 16 Question Id : 70819119129 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જ્યારે ઈલેક્ટ્રોન $n=2$ થી $n=1$ કક્ષામાં સંક્રાંતિ કરે ત્યારે હાઈડ્રોજન પરમાણું દ્વારા ઉત્સર્જીયેલા ફોટોનની તરંગલંબાઈ _____ હશે.

Options :

70819162551. 121.8 nm

70819162552. 194.8 nm

70819162553. 490.7 nm

70819162554. 913.3 nm

Question Number : 17 Question Id : 70819119130 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If a message signal of frequency 'f_m' is amplitude modulated with a carrier signal of frequency 'f_c' and radiated through an antenna, the wavelength of the corresponding signal in air is :

Options :

70819162555. $\frac{c}{f_c - f_m}$

70819162556. $\frac{c}{f_c + f_m}$

70819162557. $\frac{c}{f_c}$

70819162558. $\frac{c}{f_m}$

Question Number : 17 Question Id : 70819119130 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

'f_m' આવૃત્તિ ધરાવતાં મેસેજ (સંદેશા) સિગ્નલને 'f_c' આવૃત્તિ ધરાવતાં કેરીયર સિગ્નલમાં કંપવિસ્તાર [illegible] દ્વારા રૂપાંતરણ કરીને એન્ટેના દ્વારા વિકેરીત કરવામાં આવે છે. હવામાં સિગ્નલની તરંગલંબાઈ _____ હશે.

Options :

70819162555. $\frac{c}{f_c - f_m}$

70819162556. $\frac{c}{f_c + f_m}$

70819162557. $\frac{c}{f_c}$

70819162558. $\frac{c}{f_m}$

Question Number : 18 Question Id : 70819119131 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

For extrinsic semiconductors; when doping level is increased;

Options :

70819162559. Fermi-level of p-type semiconductor will go upward and Fermi-level of n-type semiconductors will go downward.

70819162560. Fermi-level of p-type semiconductors will go downward and Fermi-level of n-type semiconductor will go upward.

70819162561. Fermi-level of p and n-type semiconductors will not be affected.

70819162562. Fermi-level of both p-type and n-type semiconductors will go upward for $T > T_F$ K and downward for $T < T_F$ K, where T_F is Fermi temperature.

Question Number : 18 Question Id : 70819119131 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

અશુધ્ધ અર્ધવાહકોમાં જ્યારે અશુધ્ધિનું પ્રમાણ વધારવામાં આવે :

Options :

70819162559. p-પ્રકારનાં અર્ધવાહકમાં ફર્મી સ્તર ઉપર ખસે છે અને n-પ્રકારનાં અર્ધવાહકમાં ફર્મી સ્તર નીચે ખસે છે.

70819162560. p-પ્રકારનાં અર્ધવાહકમાં ફર્મી સ્તર નીચે ખસે છે અને n-પ્રકારનાં અર્ધવાહકમાં ફર્મી સ્તર ઉપર ખસે છે.

70819162561. p અને n પ્રકારનાં અર્ધવાહકમાં ફર્મી સ્તરને કોઈ અસર થતી નથી.

70819162562. બંને, p-પ્રકાર અને n-પ્રકારનાં અર્ધવાહક માટે જ્યારે $T > T_F$ K હશે ત્યારે ફર્મી સ્તર ઉપર ખસે છે અને $T < T_F$ K હશે ત્યારે ફર્મી સ્તર નીચે ખસે છે, જ્યાં T_F એ ફર્મી તાપમાન દર્શાવે છે.

Question Number : 19 Question Id : 70819119132 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List I with List II.

	List I		List II
(a)	Rectifier	(i)	Used either for stepping up or stepping down the a.c. voltage
(b)	Stabilizer	(ii)	Used to convert a.c. voltage into d.c. voltage
(c)	Transformer	(iii)	Used to remove any ripple in the rectified output voltage
(d)	Filter	(iv)	Used for constant output voltage even when the input voltage or load current change

Choose the correct answer from the options given below :

Options :

70819162563. (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

70819162564. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

70819162565. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

70819162566. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

Question Number : 19 Question Id : 70819119132 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સૂચી I અને સૂચી II સાથે મેળવો :

	સૂચી I		સૂચી II
(a)	રેક્ટિફાયર	(i)	a.c. વોલ્ટેજ ને સ્ટેપ-અપ અથવા સ્ટેપડાઉન કરવા માટે ઉપયોગ થાય છે.
(b)	સ્ટેબીલાઈઝર	(ii)	a.c. વોલ્ટેજનું d.c. વોલ્ટેજમાં રૂપાંતરણ કરવા માટે થાય છે.
(c)	ટ્રાન્સફોર્મર	(iii)	રેક્ટિફાયર આઉટપુટ વોલ્ટેજ માંથી a.c. ઘટક (રીપલ) દૂર કરવા માટે થાય છે.
(d)	ફિલ્ટર	(iv)	ઈનપુટ વોલ્ટેજ અથવા લોડ પ્રવાહ બદલાતાં રહેતો હોય તો પણ અચળ આઉટપુટ વોલ્ટેજ માટે ઉપયોગ થાય છે.

આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો :

Options :

70819162563. (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

70819162564. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

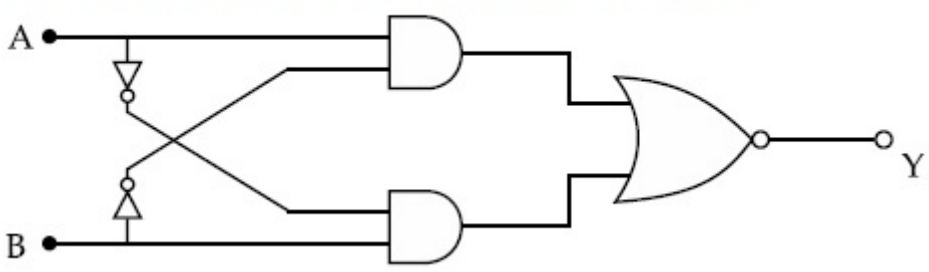
70819162565. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

70819162566. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

Question Number : 20 Question Id : 70819119133 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The truth table for the following logic circuit is :



Options :

70819162567.

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

70819162568.

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

70819162569.

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

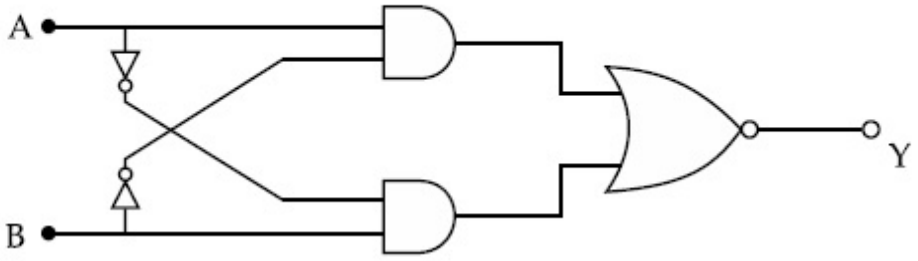
70819162570.

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

Question Number : 20 Question Id : 70819119133 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે જણાવેલ લોજીક પરિપથ માટે સત્યાર્થ સારણી (ટ્રુથ ટેબલ) નીચે _____ મુજબ હશે.



Options :

70819162567.

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

70819162568.

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

70819162569.

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

70819162570.

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

Physics Section B

Section Id :	708191815
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 :	7081911095
Question Shuffling Allowed :	Yes

Question Number : 21 Question Id : 70819119134 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Two particles having masses 4 g and 16 g respectively are moving with equal kinetic energies. The ratio of the magnitudes of their linear momentum is n : 2. The value of n 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 : 21 Question Id : 70819119134 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

4 g અને 16 g ધરાવતાં બે દળોની ગતિ ઊર્જા એક સરખી છે. જો તેમનાં રેખીય વેગમાનનો માનાંકનો ગુણોત્તર n : 2 છે.
n નું મૂલ્ય _____ 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 : 22 Question Id : 70819119135 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The initial velocity v_i required to project a body vertically upward from the surface of the earth to reach a height of 10R, where R is the radius of the earth, may be described in terms of escape velocity v_e such that $v_i = \sqrt{\frac{x}{y}} \times v_e$. The value of x 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 : 22 Question Id : 70819119135 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

R ત્રિજ્યા ધરાવતી પૃથ્વીની સપાટીથી 10R ઊંચાઈ સુધી શિરોલંબ દિશામાં પદાર્થને પ્રક્ષેપિત કરવા માટે જરૂરી પ્રારંભિક વેગ v_i ને નિષ્ક્રમણ વેગ v_e ના $v_i = \sqrt{\frac{x}{y}} \times v_e$ સ્વરૂપમાં લખી શકાય. અહિંયા x નું મૂલ્ય _____ 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 : 70819119136 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The percentage increase in the speed of transverse waves produced in a stretched string if the tension is increased by 4%, 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 : 23 Question Id : 70819119136 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો તાણમાં 4% નો વધારો કરવામાં આવે તો ખેંચાયેલી દોરમાં ઉત્પન્ન થતાં લંબગત તરંગોની ઝડપમાં _____ જેટલો પ્રતિશત વધારો થશે.

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 : 70819119137 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $\vec{P} \times \vec{Q} = \vec{Q} \times \vec{P}$, the angle between $\vec{P}$ and $\vec{Q}$ is θ $(0° < \theta < 360°)$. The value of 'θ' 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 : 24 Question Id : 70819119137 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો $\vec{P} \times \vec{Q} = \vec{Q} \times \vec{P}$ હોય તો $\vec{P}$ અને $\vec{Q}$ વચ્ચેનો કોણ θ $(0° < \theta < 360°)$ છે. જ્યાં 'θ' નું મૂલ્ય _____ ડિગ્રી 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 : 25 Question Id : 70819119138 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A reversible heat engine converts one-fourth of the heat input into work. When the temperature of the sink is reduced by 52 K, its efficiency is doubled. The temperature in Kelvin of the source 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 : 25 Question Id : 70819119138 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

પ્રતિવર્તી ઉષ્મા એન્જીન, એક ચર્તુથાંશ ઈનપુટ (આપાત) ઊર્જાનું કાર્યમાં રૂપાંતરણ કરે છે. જ્યારે ઠારણનું તાપમાન 52 K જેટલું ઘટાડવામાં આવે ત્યારે તેની કાર્યક્ષમતાં બે ગણી થાય છે. ઉદ્ગમનું કેલ્વીનમાં તાપમાન _____ 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 : 26 Question Id : 70819119139 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Two small spheres each of mass 10 mg are suspended from a point by threads 0.5 m long. They are equally charged and repel each other to a distance of 0.20 m. The charge on each of the sphere is $\frac{a}{21} \times 10^{-8}$ C. The value of 'a' will be _____.

[Given $g = 10\ ms^{-2}$]

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 : 26 Question Id : 70819119139 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

10 mg દળ ધરાવતાં બે નાના ગોળાઓને 0.5 m લંબાઈની દોરી દ્વારા એક બિંદુ પરથી લટકાવવામાં આવ્યા છે. બંને પર એક સરખો વિજભાર છે અને એકબીજાને 0.20 m અંતર સુધી અપાકર્ષિત કરે છે. દરેક ગોળા પરનો વિજભાર $\frac{a}{21} \times 10^{-8}$ C. છે તો 'a' નું મૂલ્ય _____ હશે. [$g = 10\ ms^{-2}$ આપેલ 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 : 27 Question Id : 70819119140 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Two identical conducting spheres with negligible volume have 2.1 nC and -0.1 nC charges, respectively. They are brought into contact and then separated by a distance of 0.5 m. The electrostatic force acting between the spheres is _____ $\times 10^{-9}$ N.

[Given : $4\pi\varepsilon_0 = \frac{1}{9 \times 10^9}$ SI unit]

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 : 70819119140 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

અવગણ્ય કદ ધરાવતાં બે એક સરખા વીજભારિત ગોળાઓ અનુક્રમે 2.1 nC અને -0.1 nC વીજભાર ધરાવે છે. બંનેને એકબીજાનાં સંપર્કમાં લાવી 0.5 મીટર અંતર માટે જુદા પાડવામાં આવે છે. બંને ગોળાઓ વચ્ચે ઉદ્‌ભવતું સ્થિત વિદ્યુત બળ _____ $\times 10^{-9}$ N છે.

[$4\pi\varepsilon_0 = \frac{1}{9 \times 10^9}$ SI એકમ આપેલ 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 : 70819119141 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The peak electric field produced by the radiation coming from the 8 W bulb at a distance of 10 m is $\frac{x}{10}\sqrt{\frac{\mu_0 c}{\pi}}\frac{\text{V}}{\text{m}}$. The efficiency of the bulb is 10% and it is a point source. 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 : 28 Question Id : 70819119141 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

10 m અંતરે 8 W પ્રકાશનાં ગોળામાંથી ઉત્સર્જતા વિકિરણને કારણે ઉત્પન્ન મહત્તમ વીજક્ષેત્ર $\frac{x}{10}\sqrt{\frac{\mu_0 c}{\pi}}\frac{V}{m}$ છે.

પ્રકાશનાં ગોળાની કાર્યક્ષમતાં 10% છે અને તે બિંદુવત્ સ્ત્રોત છે. તો x નું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

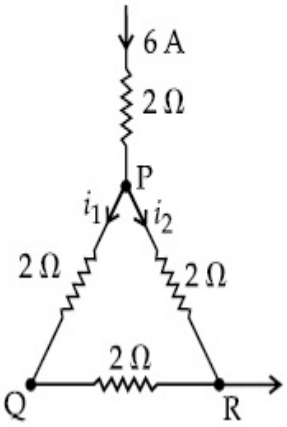
Possible Answers :

5 to 5.001

Question Number : 29 Question Id : 70819119142 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A current of 6 A enters one corner P of an equilateral triangle PQR having 3 wires of resistance 2 Ω each and leaves by the corner R. The currents i_1 in ampere is _____ .



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

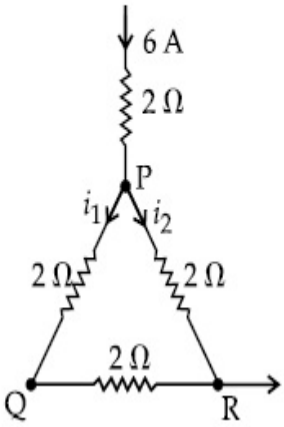
Possible Answers :

5 to 5.001

Question Number : 29 Question Id : 70819119142 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

2 Ω અવરોધ ધરાવતાં ત્રણે તારથી રચાતાં સમબાજું ત્રિકોણ PQR નાં ખૂણા P માંથી 6 A પ્રવાહ પ્રવેશે છે અને ખૂણા R માંથી બાહર નિકળે છે. પ્રવાહ i_1 નું મૂલ્ય _____ 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 : 30 Question Id : 70819119143 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The wavelength of an X-ray beam is 10 Å. The mass of a fictitious particle having the same energy as that of the X-ray photons is $\frac{x}{3}$h kg. The value of x is _____.
(h = Planck's constant)

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 : 70819119143 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ક્ષ-કિરણની તરંગલંબાઈ 10 Å છે. ક્ષ-કિરણનાં ફોટોન જેટલી ઊર્જા ધરાવતાં કલ્પિત કણનું દળ $\frac{x}{3}$h kg છે તો x નું મૂલ્ય _____ હશે.
(h = પ્લાન્ક અચળાંક)

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 :	708191816
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 :	7081911096
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 70819119144 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which among the following species has unequal bond lengths ?

Options :

70819162581. XeF_4

70819162582. SiF_4

70819162583. SF_4

70819162584. BF_4^-

Question Number : 31 Question Id : 70819119144 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ સ્પીસીઝો પૈકી કયામાં અસમાન (સમાન નથી) બંધલંબાઈઓ છે ?

Options :

70819162581. XeF_4

70819162582. SiF_4

70819162583. SF_4

70819162584. BF_4^-

Question Number : 32 Question Id : 70819119145 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The solubility of $Ca(OH)_2$ in water is :
[Given : The solubility product of $Ca(OH)_2$ in water $= 5.5 \times 10^{-6}$]

Options :

70819162585. 1.11×10^{-2}

70819162586. 1.11×10^{-6}

70819162587. 1.77×10^{-2}

70819162588. 1.77×10^{-6}

Question Number : 32 Question Id : 70819119145 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

પાણીમાં $Ca(OH)_2$ ની દ્રાવ્યતા શોધો.
[આપેલ : પાણીમાં $Ca(OH)_2$ નો દ્રાવ્યતા ગુણાકાર $= 5.5 \times 10^{-6}$ છે.]

Options :

70819162585. 1.11×10^{-2}

70819162586. 1.11×10^{-6}

70819162587. 1.77×10^{-2}

70819162588. 1.77×10^{-6}

Question Number : 33 Question Id : 70819119146 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following statements is FALSE for hydrophilic sols ?

Options :

70819162589. They do not require electrolytes for stability.

70819162590. These sols are reversible in nature.

70819162591. Their viscosity is of the order of that of H_2O.

70819162592. The sols cannot be easily coagulated.

Question Number : 33 Question Id : 70819119146 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જલઅનુરાગી (જલાનુરાગી) સોલસ્ માટે નીચે આપેલામાંથી કયું એક વિધાન ખોટું છે ?

Options :

70819162589. સ્થિરતા માટે તેઓને વિદ્યુતવિભાજ્યોની જરૂર નથી.

70819162590. આવા સોલની પ્રકૃતિ પ્રતિવર્તી છે.

70819162591. તેમની સ્નિગ્ધતા પાણીના જેવી હોય છે.

70819162592. સોલ સહેલાઈથી સ્કંદન પામતા નથી.

Question Number : 34 Question Id : 70819119147 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct order of bond dissociation enthalpy of halogens is :

Options :

70819162593. $F_2 > Cl_2 > Br_2 > I_2$

70819162594. $I_2 > Br_2 > Cl_2 > F_2$

70819162595. $Cl_2 > Br_2 > F_2 > I_2$

70819162596. $Cl_2 > F_2 > Br_2 > I_2$

Question Number : 34 Question Id : 70819119147 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

હેલોજનોની બંધ વિયોજન એન્થાલ્પીનો સાચો ક્રમ શોધો.

Options :

70819162593. $F_2 > Cl_2 > Br_2 > I_2$

70819162594. $I_2 > Br_2 > Cl_2 > F_2$

70819162595. $Cl_2 > Br_2 > F_2 > I_2$

70819162596. $Cl_2 > F_2 > Br_2 > I_2$

Question Number : 35 Question Id : 70819119148 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The method used for the purification of Indium is :

Options :

70819162597. van Arkel method

70819162598. liquation

70819162599. zone refining

70819162600. vapour phase refining

Question Number : 35 Question Id : 70819119148 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ઈન્ડીયન (Indium) ના શુધ્ધિકરણ માટે ઉપયોગી પધ્ધતિ શોધો.

Options :

70819162597. વાન આર્કેલ પધ્ધતિ

70819162598. દ્રવગલન (liquation)

70819162599. ઝોન શુધ્ધિકરણ

70819162600. બાષ્પ અવસ્થા શુધ્ધિકરણ

Question Number : 36 Question Id : 70819119149 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Water does not produce CO on reacting with :

Options :

70819162601. CH_4

70819162602. C

70819162603. CO_2

70819162604. C_3H_8

Question Number : 36 Question Id : 70819119149 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

પાણી નીચેનાની સાથે પ્રક્રિયા કરીને CO ઉત્પન્ન કરતું નથી.

Options :

70819162601. CH_4

70819162602. C

70819162603. CO_2

70819162604. C_3H_8

Question Number : 37 Question Id : 70819119150 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I :

α and β forms of sulphur can change reversibly between themselves with slow heating or slow cooling.

Statement II :

At room temperature the stable crystalline form of sulphur is monoclinic sulphur.

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

Options :

70819162605. Both Statement I and Statement II are true.

70819162606. Both Statement I and Statement II are false.

70819162607. Statement I is true but Statement II is false.

70819162608. Statement I is false but Statement II is true.

Question Number : 37 Question Id : 70819119150 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : સલ્ફરના α અને β સ્વરૂપોને ધીમેથી ગરમ કરતાં (slow heating) અથવા ધીમેથી ઠંડુ પાડતાં (slow cooling.) તેઓ પ્રતિવર્તીય રીતે એકબીજામાં ફેરફાર પામી શકે છે.

વિધાન II : ઓરડાના તાપમાને, સલ્ફરનું સ્થાયી સ્ફટિકમય સ્વરૂપ એ મોનોક્લિનીક સલ્ફર છે.

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

Options :

70819162605. બંને, વિધાન I અને વિધાન II સાચાં છે.

70819162606. બંને, વિધાન I અને વિધાન II ખોટાં છે.

70819162607. વિધાન I સાચું છે પણ વિધાન II ખોટું છે.

70819162608. વિધાન I ખોટું છે પણ વિધાન II સાચું છે.

Question Number : 38 Question Id : 70819119151 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The major components of German Silver are :

Options :

70819162609. Cu, Zn and Ag

70819162610. Cu, Zn and Ni

70819162611. Ge, Cu and Ag

70819162612. Zn, Ni and Ag

Question Number : 38 Question Id : 70819119151 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જર્મન સિલ્વરનાં મુખ્ય ઘટકો શોધો :

Options :

70819162609. Cu, Zn અને Ag

70819162610. Cu, Zn અને Ni

70819162611. Ge, Cu અને Ag

70819162612. Zn, Ni અને Ag

Question Number : 39 Question Id : 70819119152 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In which of the following order the given complex ions are arranged correctly with respect to their decreasing spin only magnetic moment ?

(i) $[FeF_6]^{3-}$ (ii) $[Co(NH_3)_6]^{3+}$ (iii) $[NiCl_4]^{2-}$ (iv) $[Cu(NH_3)_4]^{2+}$

Options :

70819162613. (i) > (iii) > (iv) > (ii)

70819162614. (ii) > (iii) > (i) > (iv)

70819162615. (iii) > (iv) > (ii) > (i)

70819162616. (ii) > (i) > (iii) > (iv)

Question Number : 39 Question Id : 70819119152 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંકીર્ણ આયનો નો ક્યો ક્રમ તેમની ઘટતી સ્પિન ફક્ત ચુંબકીય ચાકમાત્રાના સંદર્ભમાં સાચી ગોઠવણી દર્શાવે છે.

(i) $[FeF_6]^{3-}$ (ii) $[Co(NH_3)_6]^{3+}$ (iii) $[NiCl_4]^{2-}$ (iv) $[Cu(NH_3)_4]^{2+}$

Options :

70819162613. (i) > (iii) > (iv) > (ii)

70819162614. (ii) > (iii) > (i) > (iv)

70819162615. (iii) > (iv) > (ii) > (i)

70819162616. (ii) > (i) > (iii) > (iv)

Question Number : 40 Question Id : 70819119153 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I :

The pH of rain water is normally ~5.6.

Statement II :

If the pH of rain water drops below 5.6, it is called acid rain.

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

Options :

70819162617. Both Statement I and Statement II are true.

70819162618. Both Statement I and Statement II are false.

70819162619. Statement I is true but Statement II is false.

70819162620. Statement I is false but Statement II is true.

Question Number : 40 Question Id : 70819119153 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : વરસાદના પાણીની pH સામાન્ય રીતે 5.6 ની નજીક હોય છે. (~5.6)

વિધાન II : જો વરસાદના પાણીના ટીપાંઓની pH 5.6 કરતાં નીચે જાય તો તેને એસિડ વર્ષા કહે છે.

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

Options :

70819162617. બંને, વિધાન I અને વિધાન II સાચાં છે.

70819162618. બંને, વિધાન I અને વિધાન II ખોટાં છે.

70819162619. વિધાન I સાચું છે પણ વિધાન II ખોટું છે.

70819162620. વિધાન I ખોટું છે પણ વિધાન II સાચું છે.

Question Number : 41 Question Id : 70819119154 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following compound is added to the sodium extract before addition of silver nitrate for testing of halogens ?

Options :

70819162621. Hydrochloric acid

70819162622. Sodium hydroxide

70819162623. Nitric acid

70819162624. Ammonia

Question Number : 41 Question Id : 70819119154 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

હેલોજનોની કસોટી માટે, સોડીયમ નિષ્કર્ષણમાં સિલ્વર નાઈટ્રેટ ઉમેરતાં પહેલા નીચેનામાંથી કયું સંયોજન ઉમેરવામાં આવે છે ?

Options :

70819162621. હાઈડ્રોકલોરીક એસિડ

70819162622. સોડીયમ હાઈડ્રોક્સાઈડ

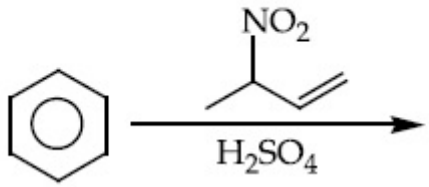
70819162623. નાઈટ્રીક એસિડ

70819162624. એમોનિયા

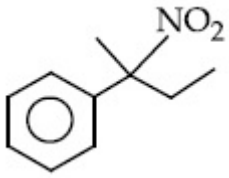
Question Number : 42 Question Id : 70819119155 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

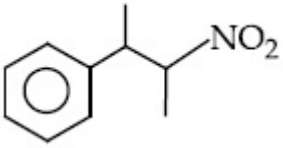
Correct Marks : 4 Wrong Marks : 1

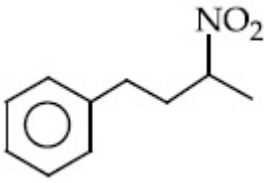
The major product of the following reaction is :

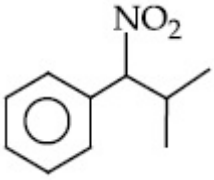


Options :

70819162625. 

70819162626. 

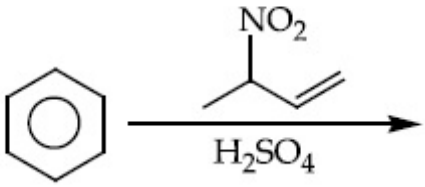
70819162627. 

70819162628. 

Question Number : 42 Question Id : 70819119155 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

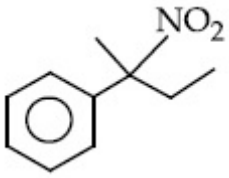
Correct Marks : 4 Wrong Marks : 1

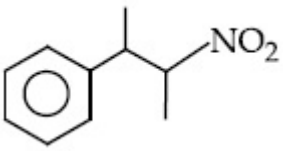
નીચે આપેલ પ્રક્રિયામાં મુખ્ય નીપજ શોધો.

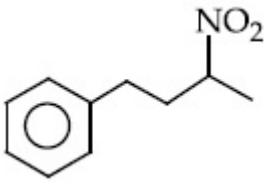


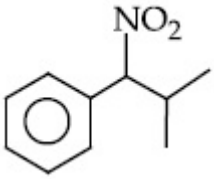
Options :

70819162625.



70819162626. 

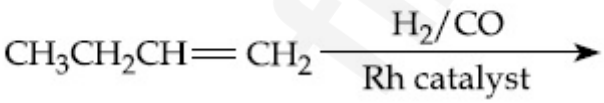
70819162627. 

70819162628. 

Question Number : 43 Question Id : 70819119156 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



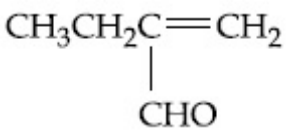
Options :

70819162629. $CH_3CH_2CH_2CH_2CHO$

70819162630. $CH_3CH_2CH_2CHO$

70819162631. $CH_3CH_2CH=CH-CHO$

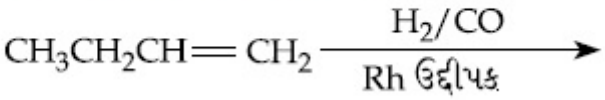
70819162632.



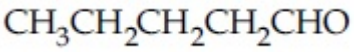
Question Number : 43 Question Id : 70819119156 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

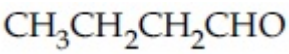
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ પ્રક્રિયામાં મુખ્ય નીપજ શોધો.

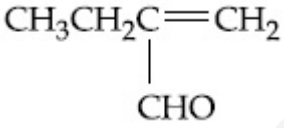


Options :

70819162629. 

70819162630. 

70819162631. 

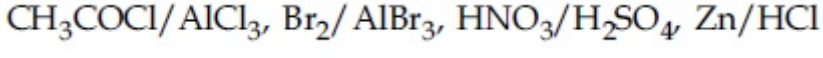
70819162632. 

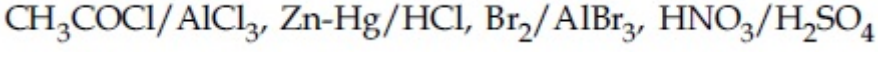
Question Number : 44 Question Id : 70819119157 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct sequence of reagents used in the preparation of 4-bromo-2-nitroethyl benzene from benzene is :

Options :

70819162633. 

70819162634. 

70819162635. $Br_2/AlBr_3$, $CH_3COCl/AlCl_3$, HNO_3/H_2SO_4, Zn/HCl

70819162636. HNO_3/H_2SO_4, $Br_2/AlCl_3$, $CH_3COCl/AlCl_3$, Zn-Hg/HCl

Question Number : 44 Question Id : 70819119157 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બેન્ઝિનમાંથી 4-બ્રોમો-2-નાઈટ્રોઈથાઈલ બેન્ઝિન બનાવવા માટે વપરાતા પ્રક્રિયકોની સાચી શ્રેણી શોધો.

Options :

70819162633. $CH_3COCl/AlCl_3$, $Br_2/AlBr_3$, HNO_3/H_2SO_4, Zn/HCl

70819162634. $CH_3COCl/AlCl_3$, Zn-Hg/HCl, $Br_2/AlBr_3$, HNO_3/H_2SO_4

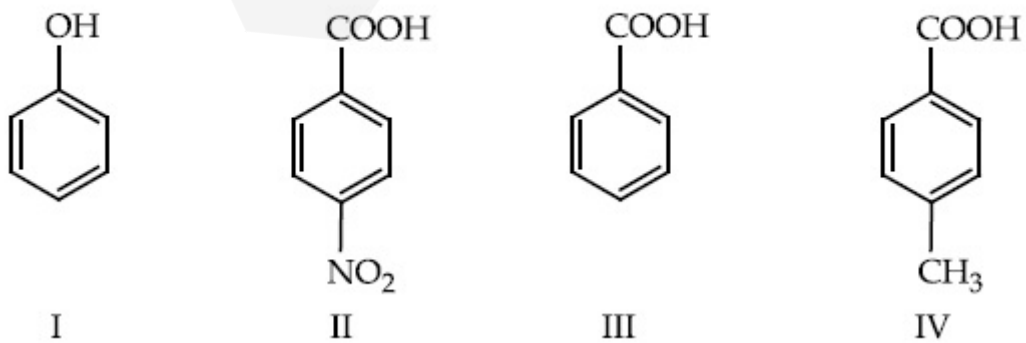
70819162635. $Br_2/AlBr_3$, $CH_3COCl/AlCl_3$, HNO_3/H_2SO_4, Zn/HCl

70819162636. HNO_3/H_2SO_4, $Br_2/AlCl_3$, $CH_3COCl/AlCl_3$, Zn-Hg/HCl

Question Number : 45 Question Id : 70819119158 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct order of acid character of the following compounds is :



I II III IV

Options :

70819162637. I > II > III > IV

70819162638. III > II > I > IV

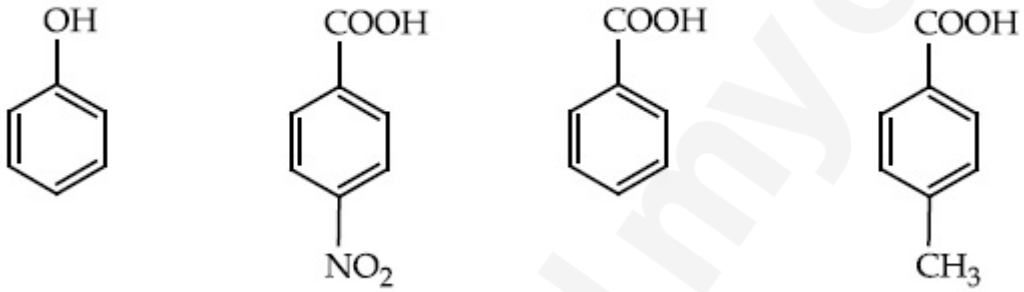
70819162639. II > III > IV > I

70819162640. IV > III > II > I

Question Number : 45 Question Id : 70819119158 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ સંયોજનોની એસિડ પ્રકૃતિનો સાચો ક્રમ જણાવો :



I II III IV

Options :

70819162637. I > II > III > IV

70819162638. III > II > I > IV

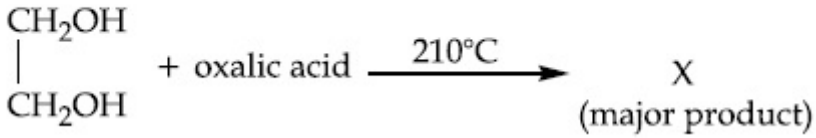
70819162639. II > III > IV > I

70819162640. IV > III > II > I

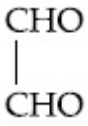
Question Number : 46 Question Id : 70819119159 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

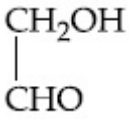
Correct Marks : 4 Wrong Marks : 1

What is 'X' in the given reaction ?

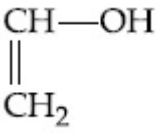


Options :

70819162641. 

70819162642. 

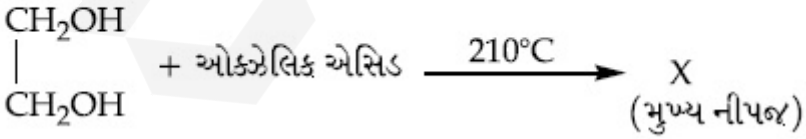
70819162643. 

70819162644. 

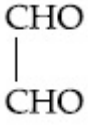
Question Number : 46 Question Id : 70819119159 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

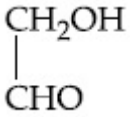
Correct Marks : 4 Wrong Marks : 1

આપેલ પ્રક્રિયામાં 'X' શું છે ?

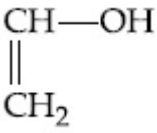


Options :

70819162641. 

70819162642. 

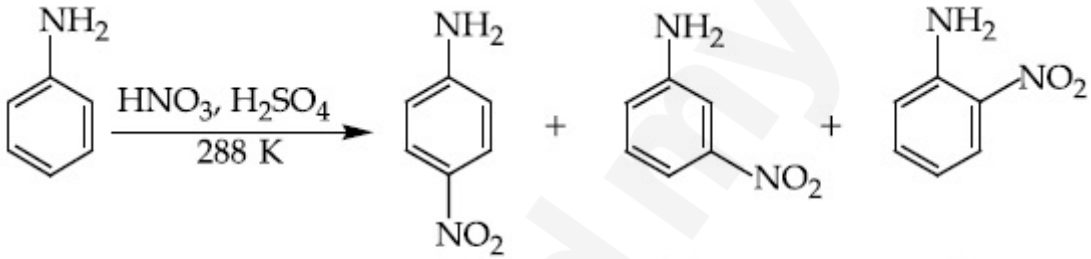
70819162643. 

70819162644. 

Question Number : 47 Question Id : 70819119160 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1



Correct statement about the given chemical reaction is :

Options :

70819162645. $\ddot{\text{N}}\text{H}_2$ group is *ortho* and *para* directive, so product (B) is not possible.

70819162646. Reaction is possible and compound (B) will be the major product.

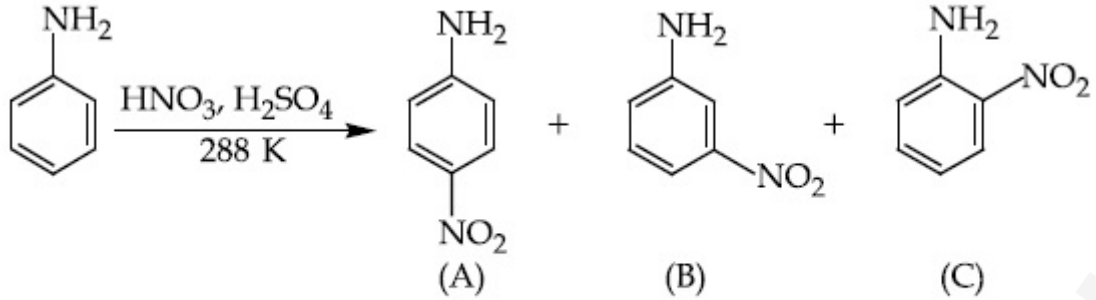
70819162647. The reaction will form sulphonated product instead of nitration.

70819162648. Reaction is possible and compound (A) will be major product.

Question Number : 47 Question Id : 70819119160 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1



(A) (B) (C)

ઉપર આપેલ રાસાયણિક પ્રક્રિયાનાં સંદર્ભમાં સાચું વિધાન શોધો.

Options :

70819162645. $-\ddot{N}H_2$ સમૂહ એ *ઓર્થો* અને *પેરા* નિર્દેશક છે, તેથી નીપજ (B) શક્ય નથી.

70819162646. પ્રક્રિયા શક્ય છે અને સંયોજન (B) એ મુખ્ય નીપજ બની રહેશે.

70819162647. પ્રક્રિયા નાઈટ્રેશનની જગ્યાએ સલ્ફોનેટેડ નીપજ બનાવશે.

70819162648. પ્રક્રિયા શક્ય છે અને સંયોજન (A) એ મુખ્ય નીપજ બની રહેશે.

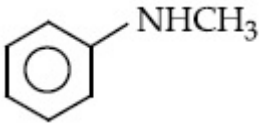
Question Number : 48 Question Id : 70819119161 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

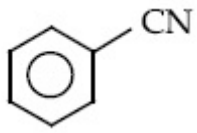
Correct Marks : 4 Wrong Marks : 1

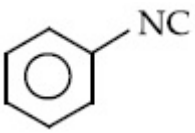
Carbylamine test is used to detect the presence of primary amino group in an organic compound. Which of the following compound is formed when this test is performed with aniline ?

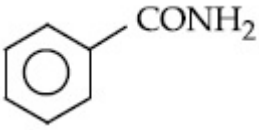
Options :

70819162649. 

70819162650.



70819162651. 

70819162652. 

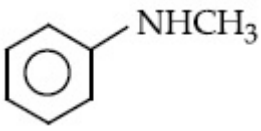
Question Number : 48 Question Id : 70819119161 Question Type : MCQ Option Shuffling : Yes

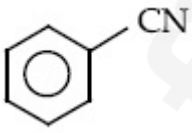
Is Question Mandatory : No

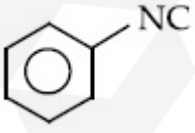
Correct Marks : 4 Wrong Marks : 1

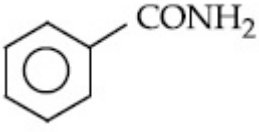
કાર્બનિક સંયોજનમાં પ્રાથમિક એમીનો સમૂહની હાજરી શોધવા માટે કાર્બાઈલએમાઈન કસોટીનો ઉપયોગ થાય છે. આ કસોટી એનિલીન સાથે કરવામાં આવે ત્યારે નીચે આપેલામાંથી કયું સંયોજન બને છે ?

Options :

70819162649. 

70819162650. 

70819162651. 

70819162652. 

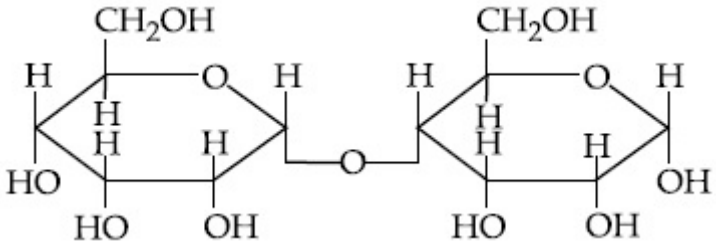
Question Number : 49 Question Id : 70819119162 Question Type : MCQ Option Shuffling : Yes

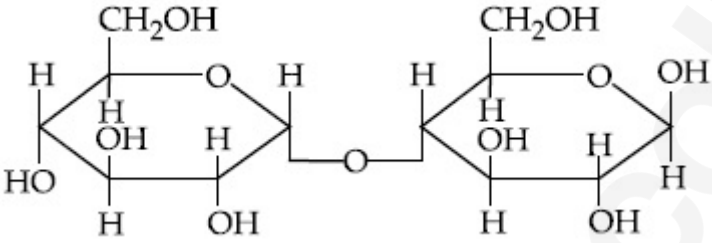
Is Question Mandatory : No

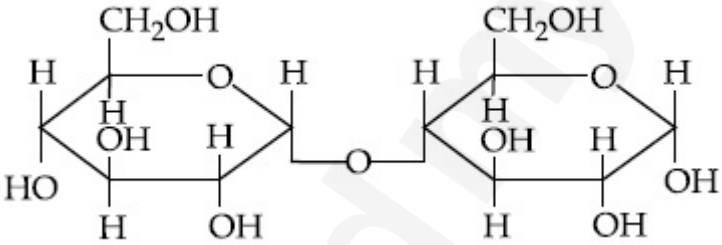
Correct Marks : 4 Wrong Marks : 1

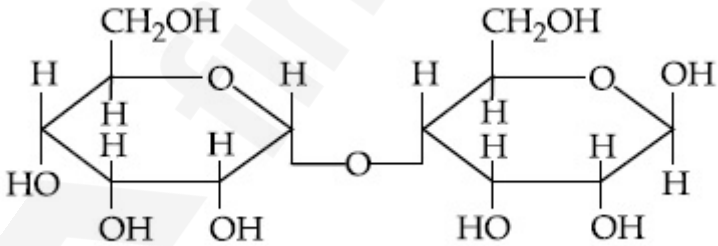
Which of the following is correct structure of α-anomer of maltose ?

Options :

70819162653. 

70819162654. 

70819162655. 

70819162656. 

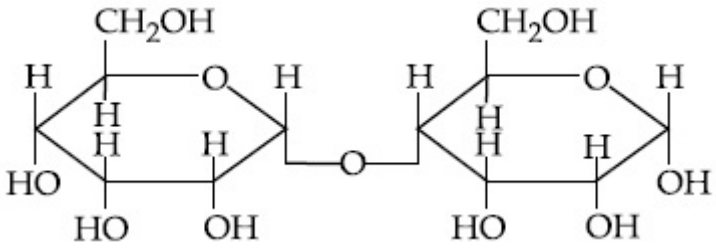
Question Number : 49 Question Id : 70819119162 Question Type : MCQ Option Shuffling : Yes

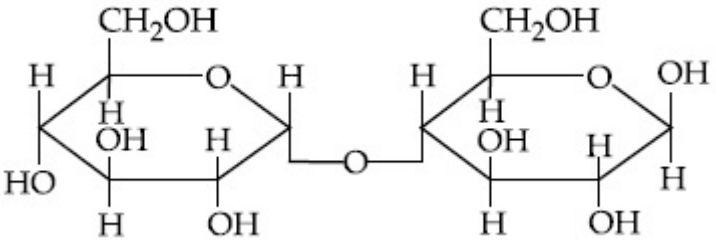
Is Question Mandatory : No

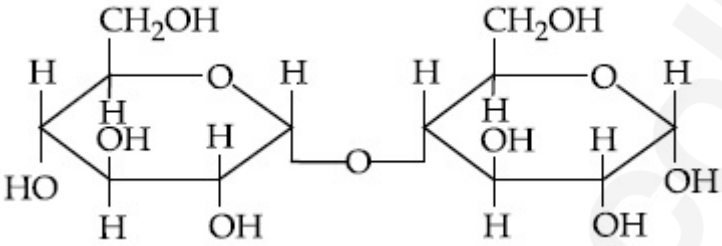
Correct Marks : 4 Wrong Marks : 1

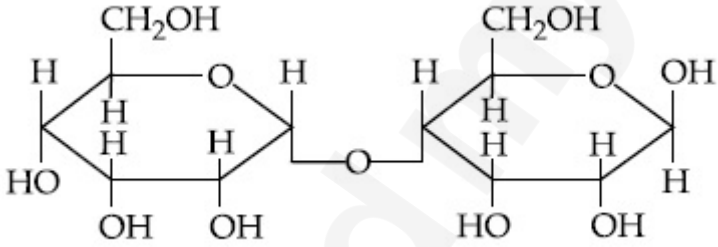
માલ્ટોઝના α-એનોમરનું સાચું બંધારણ નીચે આપેલામાંથી કયું છે ?

Options :

70819162653. 

70819162654. 

70819162655. 

70819162656. 

Question Number : 50 Question Id : 70819119163 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I :

The identification of Ni^{2+} is carried out by dimethyl glyoxime in the presence of NH_4OH.

Statement II :

The dimethyl glyoxime is a bidentate neutral ligand.

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

Options :

70819162657. Both Statement I and Statement II are true.

70819162658. Both Statement I and Statement II are false.

70819162659. Statement I is true but Statement II is false.

70819162660. Statement I is false but Statement II is true.

Question Number : 50 Question Id : 70819119163 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલા છે :

વિધાન I : Ni^{2+} ની ઓળખ NH_4OH ની હાજરીમાં ડાયમિથાઈલ ગ્લાયોક્ઝાઈમ વડે કરી શકાય છે.

વિધાન II : ડાયમિથાઈલ ગ્લાયોક્ઝાઈમ એ દ્વિદંતીય તટસ્થ લિગાન્ડ છે.

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

Options :

70819162657. બંને, વિધાન I અને વિધાન II સાચાં છે.

70819162658. બંને, વિધાન I અને વિધાન II ખોટાં છે.

70819162659. વિધાન I સાચું છે પણ વિધાન II ખોટું છે.

70819162660. વિધાન I ખોટું છે પણ વિધાન II સાચું છે.

Chemistry Section B

Section Id :	708191817
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 : 7081911097

Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 70819119164 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Consider titration of NaOH solution versus 1.25 M oxalic acid solution. At the end point following burette readings were obtained.

(i) 4.5 mL (ii) 4.5 mL (iii) 4.4 mL

(iv) 4.4 mL (v) 4.4 mL

If the volume of oxalic acid taken was 10.0 mL then the molarity of the NaOH solution is _____ M. (Rounded-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 : 51 Question Id : 70819119164 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

NaOH નાં દ્રાવણ વિરૂધ્ધ 1.25 M ઓક્ઝેલિક એસિડ દ્રાવણના અનુમાપનને ધ્યાનમાં લો. અંતિમ બિંદુ પર નીચે મુજબ બ્યૂરેટ અવલોકનો મળ્યાં.

(i) 4.5 mL (ii) 4.5 mL (iii) 4.4 mL

(iv) 4.4 mL (v) 4.4 mL

જો ઓક્ઝેલિક એસિડનું કદ 10.0 mL લેવામાં આવ્યું હોય તો NaOH દ્રાવણની મોલારિટી _____ M છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઑફ કરો)

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 : 70819119165 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The unit cell of copper corresponds to a face centered cube of edge length 3.596 Å with one copper atom at each lattice point. The calculated density of copper in kg/m^3 is _____.
[Molar mass of Cu : 63.54 g ; Avogadro Number $= 6.022 \times 10^{23}$]

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 : 70819119165 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

3.596 Å ધાર લંબાઈના ફલક કેન્દ્રિત ઘન સાથે સંકળાયેલ કોપરનાં એકમ કોષમાં કે જેમાં દરેક લેટાઈસ બિંદુ પર એક કોપર પરમાણું આવેલો છે. કોપરની ગણતરી કરેલ ઘનતા kg/m^3 માં _____ છે.
[મોલર દળ Cu : 63.54 g ; એવોગેડ્રો આંક $= 6.022 \times 10^{23}$]

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 : 70819119166 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Electromagnetic radiation of wavelength 663 nm is just sufficient to ionise the atom of metal A. The ionization energy of metal A in kJ mol^{-1} is _____. (Rounded-off to the nearest integer)

[$h = 6.63 \times 10^{-34}$ Js, $c = 3.00 \times 10^{8}$ ms^{-1}, $N_A = 6.02 \times 10^{23}$ 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 : 53 Question Id : 70819119166 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધાતુ A નાં પરમાણુનું આયનીકરણ કરવા માટે 663 nm તરંગલંબાઈ વાળા વિદ્યુતચુંબકીય વિકિરણ પર્યાપ્ત છે. તો ધાતુ A ની આયનીકરણ ઊર્જા kJ mol^{-1} માં _____ છે. (નજીકનાં પૂર્ણાંકમાં રાઉન્ડ ઑફ કરો)

[$h = 6.63 \times 10^{-34}$ Js, $c = 3.00 \times 10^{8}$ ms^{-1}, $N_A = 6.02 \times 10^{23}$ 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 : 54 Question Id : 70819119167 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Five moles of an ideal gas at 293 K is expanded isothermally from an initial pressure of 2.1 MPa to 1.3 MPa against at constant external pressure 4.3 MPa. The heat transferred in this process is _____ kJ mol^{-1}. (Rounded-off to the nearest integer)

[Use R = 8.314 J $mol^{-1}K^{-1}$]

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 : 54 Question Id : 70819119167 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

293 K પર, એક આદર્શ વાયુના પાંચ મોલ તેના અચળ બાહ્ય દબાણ 4.3 MPa એ તેનું શરૂઆતનું દબાણ 2.1 MPa થી 1.3 MPa કરતાં સમતાપીય રીતે વિસ્તરે છે. તો આ પ્રક્રમમાં ઉષ્મા પરિવહન _____ kJ mol^{-1} છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઑફ)

[ઉપયોગ કરો R = 8.314 J $mol^{-1}K^{-1}$]

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 : 70819119168 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If a compound AB dissociates to the extent of 75% in an aqueous solution, the molality of the solution which shows a 2.5 K rise in the boiling point of the solution is _____ molal. (Rounded-off to the nearest integer)

[K_b = 0.52 K kg 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 : 70819119168 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક સંયોજન AB જલીય દ્રાવણમાં 75% સુધી વિયોજન પામે છે. દ્રાવણની મોલાલિટી કે જે દ્રાવણનું ઉત્કલન બિંદુમાં 2.5 K નો વધારો દર્શાવે છે તો તે _____ મોલલ છે. (નજીકનાં પૂર્ણાંકમાં રાઉન્ડ ઑફ)

$[K_b = 0.52 \text{ K kg mol}^{-1}]$

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 : 70819119169 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Copper reduces NO_3^- into NO and NO_2 depending upon the concentration of HNO_3 in solution. (Assuming fixed $[Cu^{2+}]$ and $P_{NO} = P_{NO_2}$), the HNO_3 concentration at which the thermodynamic tendency for reduction of NO_3^- into NO and NO_2 by copper is same is 10^x M. The value of $2x$ is _____. (Rounded-off to the nearest integer)

[Given, $E^o_{Cu^{2+}/Cu} = 0.34$ V, $E^o_{NO_3^-/NO} = 0.96$ V, $E^o_{NO_3^-/NO_2} = 0.79$ V and at 298 K, $\frac{RT}{F}(2.303) = 0.059$]

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 : 70819119169 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

તાંબુ (કોપર) NO_3^- નું NO અને NO_2 માં રિડક્શન કરે છે જે HNO_3 દ્રાવણની સાંદ્રતા પર આધારિત છે. (ધારી લો અપરિવર્તનીય (fixed) $[Cu^{2+}]$ અને $P_{NO}=P_{NO_2}$) થર્મોડાયનેમિક પ્રકૃતિ માટે, કોપર વડે NO_3^- નું NO અને NO_2 માં રિડક્શન HNO_3 ની કઈ સાંદ્રતા એ 10^x M ને સમાન થશે. તો $2x$ નું મૂલ્ય _____ છે. (નજીકનાં પૂર્ણાંકમાં રાઉન્ડ ઑફ)

[આપેલ 298 K પર, $E^o_{Cu^{2+}/Cu}=0.34$ V, $E^o_{NO_3^-/NO}=0.96$ V, $E^o_{NO_3^-/NO_2}=0.79$ V,

$\frac{RT}{F}(2.303)=0.059$]

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 : 70819119170 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The rate constant of a reaction increases by five times on increase in temperature from 27°C to 52°C. The value of activation energy in kJ mol^{-1} is _____. (Rounded-off to the nearest integer)

[$R=8.314$ J 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 : 57 Question Id : 70819119170 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

27°C થી 52°C તાપમાનમાં વધારો કરતાં એક પ્રક્રિયાનો વેગ અચળાંક પાંચ ગણો વધે છે. તો સક્રિયકરણ શક્તિ નું મૂલ્ય kJ mol^{-1} માં _____ છે. (નજીકનાં પૂર્ણાંકમાં રાઉન્ડ ઑફ)
[$R = 8.314\ J\ K^{-1}\ mol^{-1}$]

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 : 70819119171 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following, number of metal/s which can be used as electrodes in the photoelectric cell is _____. (Integer answer)

(A) Li (B) Na (C) Rb (D) Cs

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 : 70819119171 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

નીચે આપેલા પૈકી, ધાતુ(ઓ) ની સંખ્યા કે જેનો ઉપયોગ પ્રકાશ વૈદ્યુત કોષ (ફોટોઈલેક્ટ્રીક કોષ) માં ઈલેક્ટ્રોડસ્ તરીકે થાય છે તે _____ છે.(પૂર્ણાંક જવાબ)

(A) Li (B) Na (C) Rb (D) Cs

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 : 70819119172 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The spin only magnetic moment of a divalent ion in aqueous solution (atomic number 29) is _____ BM.

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 : 70819119172 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જલીય દ્રાવણમાં એક દ્વિસંયોજક આયનની (પરમાણુ ક્રમાંક 29) સ્પીન ફક્ત ચુંબકીય ચાકમાત્રા _____ BM 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 : 70819119173 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of compound/s given below which contain/s —COOH group is _____.
(Integer answer)

(A) Sulphanilic acid
(B) Picric acid
(C) Aspirin
(D) Ascorbic acid

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 : 70819119173 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

—COOH સમૂહ ધરાવતા નીચે દર્શાવેલ સંયોજન(નો)ની સંખ્યા _____ છે. (પૂર્ણાંક જવાબ)

(A) સલ્ફાનિલિક એસિડ
(B) પિક્રિક એસિડ
(C) એસ્પિરીન
(D) એસ્કોર્બિક એસિડ

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 :	708191818
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 :	7081911098
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 70819119174 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If for the matrix, $A = \begin{bmatrix} 1 & -\alpha \\ \alpha & \beta \end{bmatrix}$, $AA^T = I_2$, then the value of $\alpha^4 + \beta^4$ is :

Options :

70819162671. 4

70819162672. 1

70819162673. 2

70819162674. 3

Question Number : 61 Question Id : 70819119174 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો શ્રેણિક $A=\begin{bmatrix}1 & -\alpha\\ \alpha & \beta\end{bmatrix}$ માટે, $AA^T=I_2$ હોય, તો $\alpha^4+\beta^4$ નું મૂલ્ય _____ થાય.

Options :

70819162671. 4

70819162672. 1

70819162673. 2

70819162674. 3

Question Number : 62 Question Id : 70819119175 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let A be a 3×3 matrix with $\det(A)=4$. Let R_i denote the i^{th} row of A. If a matrix B is obtained by performing the operation $R_2\rightarrow 2R_2+5R_3$ on 2A, then det(B) is equal to :

Options :

70819162675. 16

70819162676. 80

70819162677. 64

70819162678. 128

Question Number : 62 Question Id : 70819119175 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે A એ $\det(A)=4$ થાય તેવો 3×3 શ્રેણિક છે. ધારોકે R_i એ શ્રેણિક A ની i મી હાર દર્શાવે છે. જો 2A પર પ્રક્રિયા $R_2 \to 2R_2+5R_3$ કરી શ્રેણિક B મેળવવામાં આવે, તો $\det(B)=$_____.

Options :

70819162675. 16

70819162676. 80

70819162677. 64

70819162678. 128

Question Number : 63 Question Id : 70819119176 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The following system of linear equations

$$2x+3y+2z=9$$
$$3x+2y+2z=9$$
$$x-y+4z=8$$

Options :

70819162679. does not have any solution

70819162680. has a unique solution

70819162681. has infinitely many solutions

70819162682. has a solution (α, β, γ) satisfying $\alpha+\beta^2+\gamma^3=12$

Question Number : 63 Question Id : 70819119176 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચેની સુરેખ સમીકરણ સંહતિ

$$2x+3y+2z=9$$
$$3x+2y+2z=9$$
$$x-y+4z=8 \text{ ને}$$

Options :

70819162679. એક પણ ઉકેલ નથી.

70819162680. અનન્ય ઉકેલ છે.

70819162681. અસંખ્ય ઉકેલો છે.

70819162682. $\alpha+\beta^2+\gamma^3=12$ નું સમાધાન કરતો ઉકેલ (α, β, γ) છે.

Question Number : 64 Question Id : 70819119177 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $I_n = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cot^n x \, dx$, then :

Options :

70819162683. $\frac{1}{I_2+I_4}, \frac{1}{I_3+I_5}, \frac{1}{I_4+I_6}$ are in A.P.

70819162684. $I_2+I_4, I_3+I_5, I_4+I_6$ are in A.P.

70819162685. $\frac{1}{I_2+I_4}, \frac{1}{I_3+I_5}, \frac{1}{I_4+I_6}$ are in G.P.

70819162686. $I_2+I_4, (I_3+I_5)^2, I_4+I_6$ are in G.P.

Question Number : 64 Question Id : 70819119177 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો $I_n = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cot^n x \, dx$, તો

Options :

70819162683. $\frac{1}{I_2+I_4}, \frac{1}{I_3+I_5}, \frac{1}{I_4+I_6}$ સમાંતર શ્રેણીમાં છે.

70819162684. $I_2+I_4, I_3+I_5, I_4+I_6$ સમાંતર શ્રેણીમાં છે.

70819162685. $\frac{1}{I_2+I_4}, \frac{1}{I_3+I_5}, \frac{1}{I_4+I_6}$ સમગુણોત્તર શ્રેણીમાં છે.

70819162686. $I_2+I_4, (I_3+I_5)^2, I_4+I_6$ સમગુણોત્તર શ્રેણીમાં છે.

Question Number : 65 Question Id : 70819119178 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A function $f(x)$ is given by $f(x) = \frac{5^x}{5^x + 5}$, then the sum of the series

$$f\left(\frac{1}{20}\right) + f\left(\frac{2}{20}\right) + f\left(\frac{3}{20}\right) + \ldots\ldots + f\left(\frac{39}{20}\right)$$

is equal to :

Options :

70819162687. $\frac{29}{2}$

70819162688. $\frac{49}{2}$

70819162689. $\frac{39}{2}$

70819162690. $\frac{19}{2}$

Question Number : 65 Question Id : 70819119178 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

વિધેય $f(x)$ એ $f(x) = \frac{5^x}{5^x + 5}$ મુજબ આપેલ છે, તો શ્રેઢી $f\left(\frac{1}{20}\right) + f\left(\frac{2}{20}\right) + f\left(\frac{3}{20}\right) + \ldots\ldots + f\left(\frac{39}{20}\right)$

નો સરવાળો _____ થાય.

Options :

70819162687. $\frac{29}{2}$

70819162688. $\frac{49}{2}$

70819162689. $\frac{39}{2}$

70819162690. $\frac{19}{2}$

Question Number : 66 Question Id : 70819119179 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let α and β be the roots of $x^2-6x-2=0$. If $a_n=\alpha^n-\beta^n$ for $n \geq 1$, then the value of $\frac{a_{10}-2a_8}{3a_9}$ is :

Options :

70819162691. 4

70819162692. 3

70819162693. 2

70819162694. 1

Question Number : 66 Question Id : 70819119179 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે α અને β એ સમીકરણ $x^2-6x-2=0$ નાં બીજ છે. જો $n \geq 1$ માટે, $a_n=\alpha^n-\beta^n$ હોય. તો $\frac{a_{10}-2a_8}{3a_9}$ નું મૂલ્ય _____ થાય.

Options :

70819162691. 4

70819162692. 3

70819162693. 2

70819162694. 1

Question Number : 67 Question Id : 70819119180 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The minimum value of $f(x)=a^{a^x}+a^{1-a^x}$, where a, $x \in R$ and $a > 0$, is equal to :

Options :

70819162695. $a+1$

70819162696. $a+\frac{1}{a}$

70819162697. $2\sqrt{a}$

70819162698. $2a$

Question Number : 67 Question Id : 70819119180 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો a, $x \in R$ અને $a > 0$ હોય, તો $f(x)=a^{a^x}+a^{1-a^x}$ નું ન્યૂનતમ મૂલ્ય _____ છે.

Options :

70819162695. $a+1$

70819162696. $a+\frac{1}{a}$

70819162697. $2\sqrt{a}$

70819162698. $2a$

Question Number : 68 Question Id : 70819119181 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The integral $\int\frac{e^{3\log_e 2x}+5e^{2\log_e 2x}}{e^{4\log_e x}+5e^{3\log_e x}-7e^{2\log_e x}}dx$, $x>0$, is equal to :

(where c is a constant of integration)

Options :

70819162699. $\log_e|x^2+5x-7|+c$

70819162700. $4\log_e|x^2+5x-7|+c$

70819162701. $\frac{1}{4}\log_e|x^2+5x-7|+c$

70819162702. $\log_e\sqrt{x^2+5x-7}+c$

Question Number : 68 Question Id : 70819119181 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સંકલિત $\int \frac{e^{3\log_e 2x} + 5e^{2\log_e 2x}}{e^{4\log_e x} + 5e^{3\log_e x} - 7e^{2\log_e x}} dx,\ x > 0 =$ _____ થાય.
(જ્યાં c એ સંકલનનો અચળાંક છે)

Options :

70819162699. $\log_e|x^2+5x-7|+c$

70819162700. $4\log_e|x^2+5x-7|+c$

70819162701. $\frac{1}{4}\log_e|x^2+5x-7|+c$

70819162702. $\log_e\sqrt{x^2+5x-7}+c$

Question Number : 69 Question Id : 70819119182 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $\alpha, \beta \in R$ are such that $1-2i$ (here $i^2=-1$) is a root of $z^2+\alpha z+\beta=0$, then $(\alpha-\beta)$ is equal to :

Options :

70819162703. 3

70819162704. -3

70819162705. 7

70819162706. -7

Question Number : 69 Question Id : 70819119182 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો $\alpha, \beta \in \mathbf{R}$ એવા હોય કે જેથી $1-2i$ (અહીં $i^2=-1$) એ $z^2+\alpha z+\beta=0$ નું બીજ હોય, તો $(\alpha-\beta)$ = _____ થાય.

Options :

70819162703. 3

70819162704. -3

70819162705. 7

70819162706. -7

Question Number : 70 Question Id : 70819119183 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the curve $x^2+2y^2=2$ intersects the line $x+y=1$ at two points P and Q, then the angle subtended by the line segment PQ at the origin is :

Options :

70819162707. $\frac{\pi}{2}+\tan^{-1}\left(\frac{1}{4}\right)$

70819162708. $\frac{\pi}{2}-\tan^{-1}\left(\frac{1}{4}\right)$

70819162709. $\frac{\pi}{2}+\tan^{-1}\left(\frac{1}{3}\right)$

70819162710. $\frac{\pi}{2} - \tan^{-1}\left(\frac{1}{3}\right)$

Question Number : 70 Question Id : 70819119183 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો વક્ર $x^2+2y^2=2$, રેખા $x+y=1$ ને બે બિંદુઓ P અને Q એ છેદે, તો રેખાખંડ PQ એ ઊગમબિંદુ આગળ આંતરેલ ખૂણો _____ થાય.

Options :

70819162707. $\frac{\pi}{2} + \tan^{-1}\left(\frac{1}{4}\right)$

70819162708. $\frac{\pi}{2} - \tan^{-1}\left(\frac{1}{4}\right)$

70819162709. $\frac{\pi}{2} + \tan^{-1}\left(\frac{1}{3}\right)$

70819162710. $\frac{\pi}{2} - \tan^{-1}\left(\frac{1}{3}\right)$

Question Number : 71 Question Id : 70819119184 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The shortest distance between the line $x-y=1$ and the curve $x^2=2y$ is :

Options :

70819162711. $\frac{1}{\sqrt{2}}$

70819162712. $\frac{1}{2\sqrt{2}}$

70819162713. 0

70819162714. $\frac{1}{2}$

Question Number : 71 Question Id : 70819119184 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

રેખા $x-y=1$ અને વક્ર $x^2=2y$ વચ્ચેનું લઘુત્તમ અંતર _____ છે.

Options :

70819162711. $\frac{1}{\sqrt{2}}$

70819162712. $\frac{1}{2\sqrt{2}}$

70819162713. 0

70819162714. $\frac{1}{2}$

Question Number : 72 Question Id : 70819119185 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A hyperbola passes through the foci of the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ and its transverse and conjugate axes coincide with major and minor axes of the ellipse, respectively. If the product of their eccentricities is one, then the equation of the hyperbola is :

Options :

70819162715. $\frac{x^2}{9}-\frac{y^2}{16}=1$

70819162716. $\frac{x^2}{9}-\frac{y^2}{4}=1$

70819162717. $\frac{x^2}{9}-\frac{y^2}{25}=1$

70819162718. $x^2-y^2=9$

Question Number : 72 Question Id : 70819119185 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

કોઈ એક અતિવલય, એ ઉપવલય $\frac{x^2}{25}+\frac{y^2}{16}=1$ ની નાભિઓમાંથી પસાર થાય છે અને તેની મુખ્ય અક્ષ અને અનુબધ્ધ અક્ષ અનુક્રમે ઉપવલયની મુખ્ય અક્ષ અને ગૌણ અક્ષ સાથે એકાકાર છે. જો તેમની ઉત્કેન્દ્રતાઓનો ગુણાકાર એક હોય, તો તે અતિવલયનું સમીકરણ _____ થશે.

Options :

70819162715. $\frac{x^2}{9}-\frac{y^2}{16}=1$

70819162716. $\frac{x^2}{9}-\frac{y^2}{4}=1$

70819162717.

$\frac{x^2}{9} - \frac{y^2}{25} = 1$

70819162718. $x^2 - y^2 = 9$

Question Number : 73 Question Id : 70819119186 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A plane passes through the points A(1, 2, 3), B(2, 3, 1) and C(2, 4, 2). If O is the origin and P is (2, −1, 1), then the projection of $\overrightarrow{OP}$ on this plane is of length :

Options :

70819162719. $\sqrt{\frac{2}{3}}$

70819162720. $\sqrt{\frac{2}{11}}$

70819162721. $\sqrt{\frac{2}{7}}$

70819162722. $\sqrt{\frac{2}{5}}$

Question Number : 73 Question Id : 70819119186 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક સમતલ બિંદુઓ A(1, 2, 3), B(2, 3, 1) અને C(2, 4, 2) માંથી પસાર થાય છે. જો O ઊગમબિંદુ અને P એ (2, −1, 1) હોય, તો $\overrightarrow{OP}$ નાં આ સમતલ પરના પ્રક્ષેપની લંબાઈ _____ છે.

Options :

70819162719. $\sqrt{\frac{2}{3}}$

70819162720. $\sqrt{\frac{2}{11}}$

70819162721. $\sqrt{\frac{2}{7}}$

70819162722. $\sqrt{\frac{2}{5}}$

Question Number : 74 Question Id : 70819119187 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\lim_{n\to\infty}\left[\frac{1}{n}+\frac{n}{(n+1)^2}+\frac{n}{(n+2)^2}+\ldots\ldots\ldots+\frac{n}{(2n-1)^2}\right]$ is equal to :

Options :

70819162723. 1

70819162724. $\frac{1}{2}$

70819162725. $\frac{1}{3}$

70819162726. $\frac{1}{4}$

Question Number : 74 Question Id : 70819119187 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\lim_{n\to\infty}\left[\frac{1}{n}+\frac{n}{(n+1)^2}+\frac{n}{(n+2)^2}+\ldots\ldots\ldots+\frac{n}{(2n-1)^2}\right]=\_\_\_\_\_.$$

Options :

70819162723. 1

70819162724. $\frac{1}{2}$

70819162725. $\frac{1}{3}$

70819162726. $\frac{1}{4}$

Question Number : 75 Question Id : 70819119188 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In a group of 400 people, 160 are smokers and non-vegetarian; 100 are smokers and vegetarian and the remaining 140 are non-smokers and vegetarian. Their chances of getting a particular chest disorder are 35%, 20% and 10% respectively. A person is chosen from the group at random and is found to be suffering from the chest disorder. The probability that the selected person is a smoker and non-vegetarian is :

Options :

70819162727. $\frac{7}{45}$

70819162728. $\frac{8}{45}$

70819162729. $\frac{28}{45}$

70819162730. $\frac{14}{45}$

Question Number : 75 Question Id : 70819119188 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

400 વ્યક્તિઓના એક સમૂહમાં, 160 વ્યક્તિઓ ધૂમ્રપાન કરે છે અને માંસાહારી છે ; 100 ધૂમ્રપાન કરે છે અને શાકાહારી છે. તથા બાકીનાં 140 ધૂમ્રપાન કરતા નથી અને શાકાહારી છે. તેમને છાતીમાં ચોક્કસ પ્રકારની તકલીફ થાય તેની શક્યતા અનુક્રમે 35%, 20% અને 10% છે. યાદચ્છિક રીતે આ સમૂહમાંથી એક વ્યક્તિ પસંદ કરવામાં આવે છે અને તેને છાતીમાં ચોક્કસ પ્રકારની તકલીફ છે તેવું માલૂમ પડે છે. તો પસંદ કરેલ વ્યક્તિ ધૂમ્રપાન કરે છે અને માંસાહારી છે તેની સંભાવના_____છે.

Options :

70819162727. $\frac{7}{45}$

70819162728. $\frac{8}{45}$

70819162729. $\frac{28}{45}$

70819162730. $\frac{14}{45}$

Question Number : 76 Question Id : 70819119189 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let A be a set of all 4-digit natural numbers whose exactly one digit is 7. Then the probability that a randomly chosen element of A leaves remainder 2 when divided by 5 is :

Options :

70819162731. $\frac{1}{5}$

70819162732. $\frac{2}{9}$

70819162733. $\frac{97}{297}$

70819162734. $\frac{122}{297}$

Question Number : 76 Question Id : 70819119189 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારો કે જેમાં બરાબર એક અંક 7 હોય જ તેવી 4-અંકોની તમામ પ્રાકૃતિક સંખ્યાઓનો ગણ A છે. તો યાદચ્છિક રીતે પસંદ કરેલ A ના એક ઘટકને 5 વડે ભાગતાં શેષ 2 વધે તેની સંભાવના _____ છે.

Options :

70819162731. $\frac{1}{5}$

70819162732. $\frac{2}{9}$

70819162733. $\frac{97}{297}$

70819162734. $\frac{122}{297}$

Question Number : 77 Question Id : 70819119190 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $0 < x, y < \pi$ and $\cos x + \cos y - \cos(x + y) = \frac{3}{2}$, then $\sin x + \cos y$ is equal to :

Options :

70819162735. $\frac{1}{2}$

70819162736. $\frac{\sqrt{3}}{2}$

70819162737. $\frac{1 - \sqrt{3}}{2}$

70819162738. $\frac{1 + \sqrt{3}}{2}$

Question Number : 77 Question Id : 70819119190 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો $0 < x, y < \pi$ અને $\cos x + \cos y - \cos(x + y) = \frac{3}{2}$ હોય, તો $\sin x + \cos y =$ _____.

Options :

70819162735. $\frac{1}{2}$

70819162736. $\frac{\sqrt{3}}{2}$

70819162737. $\frac{1-\sqrt{3}}{2}$

70819162738. $\frac{1+\sqrt{3}}{2}$

Question Number : 78 Question Id : 70819119191 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let x denote the total number of one-one functions from a set A with 3 elements to a set B with 5 elements and y denote the total number of one-one functions from the set A to the set $A \times B$. Then :

Options :

70819162739. $2y = 91x$

70819162740. $2y = 273x$

70819162741. $y = 91x$

70819162742. $y = 273x$

Question Number : 78 Question Id : 70819119191 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારો કે x એ 3 ઘટકોવાળા ગણ A થી 5 ઘટકોવાળા ગણ B પરના એક-એક વિધેયોની કુલ સંખ્યા દર્શાવે છે. અને y એ ગણ A થી ગણ $A \times B$ પરના એક-એક વિધેયોની કુલ સંખ્યા દર્શાવે છે. તો :

Options :

70819162739. $2y = 91x$

70819162740. $2y = 273x$

70819162741. $y = 91x$

70819162742. $y = 273x$

Question Number : 79 Question Id : 70819119192 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\text{cosec}\left[2\cot^{-1}(5) + \cos^{-1}\left(\frac{4}{5}\right)\right]$ is equal to :

Options :

70819162743. $\frac{56}{33}$

70819162744. $\frac{65}{33}$

70819162745. $\frac{65}{56}$

70819162746. $\frac{75}{56}$

Question Number : 79 Question Id : 70819119192 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\text{cosec}\left[2\cot^{-1}(5)+\cos^{-1}\left(\frac{4}{5}\right)\right]=$ _____.

Options :

70819162743. $\frac{56}{33}$

70819162744. $\frac{65}{33}$

70819162745. $\frac{65}{56}$

70819162746. $\frac{75}{56}$

Question Number : 80 Question Id : 70819119193 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The contrapositive of the statement "If you will work, you will earn money" is :

Options :

70819162747. To earn money, you need to work

70819162748. You will earn money, if you will not work

70819162749. If you will not earn money, you will not work

70819162750. If you will earn money, you will work

Question Number : 80 Question Id : 70819119193 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

''જો તમે કામ કરશો, તો તમે નાણું કમાશો.'' નું સમાનાર્થી પ્રેરણ _____ છે.

Options :

70819162747. નાણું કમાવવા, તમારે કામ કરવું પડે.

70819162748. તમે નાણું કમાશો, જો તમે કામ નહિ કરો.

70819162749. જો તમે નાણું કમાશો નહિ, તો તમે કામ નહિ કરો.

70819162750. જો તમે નાણું કમાશો, તો તમે કામ કરશો.

Mathematics Section B

Section Id :	708191819
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 :	7081911099
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 70819119194 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A function f is defined on $[-3, 3]$ as

$$f(x) = \begin{cases} \min\{|x|, 2-x^2\}, & -2 \le x \le 2 \\ [|x|], & 2 < |x| \le 3 \end{cases}$$

where $[x]$ denotes the greatest integer $\le x$. The number of points, where f is not differentiable in $(-3, 3)$ 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 : 81 Question Id : 70819119194 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

વિધેય f, $[-3, 3]$ પર $f(x) = \begin{cases} \min\{|x|, 2-x^2\}, & -2 \le x \le 2 \\ [|x|], & 2 < |x| \le 3 \end{cases}$ વડે વ્યાખ્યાયીત છે,

જ્યાં $[x]$ મહત્તમ પૂર્ણાંક $\le x$ દર્શાવે છે. $(-3, 3)$ માં f વિકલનીય ન થાય તેવા બિંદુઓની 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 : 82 Question Id : 70819119195 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the curve, $y = y(x)$ represented by the solution of the differential equation $(2xy^2 - y)dx + xdy = 0$, passes through the intersection of the lines, $2x - 3y = 1$ and $3x + 2y = 8$, then $|y(1)|$ 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 : 82 Question Id : 70819119195 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો વિકલ સમીકરણ $(2xy^2 - y)dx + xdy = 0$ નાં ઉકેલ તરીકે નિદર્શીત થતો વક્ર $y = y(x)$, રેખાઓ $2x - 3y = 1$ અને $3x + 2y = 8$ ના છેદ માંથી પસાર થાય, તો $|y(1)| =$ _____.

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 : 83 Question Id : 70819119196 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The total number of two digit numbers 'n', such that $3^n + 7^n$ is a multiple of 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 : 83 Question Id : 70819119196 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$3^n + 7^n$ એ 10 નો ગુણક બને તેવી બે આંકોની સંખ્યા 'n' ની કુલ 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 : 84 Question Id : 70819119197 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $\lim\limits_{x\to 0} \dfrac{ax - (e^{4x} - 1)}{ax(e^{4x} - 1)}$ exists and is equal to b, then the value of $a - 2b$ 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 : 84 Question Id : 70819119197 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો $\lim\limits_{x\to 0} \dfrac{ax - (e^{4x} - 1)}{ax(e^{4x} - 1)}$ નું અસ્તિત્વ હોય અને તે b હોય, તો $a - 2b$ 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 : 85 Question Id : 70819119198 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the curves $x=y^4$ and $xy=k$ cut at right angles, then $(4k)^6$ 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 : 85 Question Id : 70819119198 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો વક્રો $x=y^4$ અને $xy=k$ કાટખૂણે છેદે, તો $(4k)^6$ = _____.

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 : 70819119199 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The value of $\int_{-2}^{2} |3x^2 - 3x - 6| \, dx$ 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 : 86 Question Id : 70819119199 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$\int_{-2}^{2} |3x^2 - 3x - 6| \, dx$ 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 : 87 Question Id : 70819119200 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the remainder when x is divided by 4 is 3, then the remainder when $(2020 + x)^{2022}$ is divided by 8 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 : 87 Question Id : 70819119200 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો x ને 4 વડે ભાગતાં શેષ 3 મળે, તો $(2020+x)^{2022}$ ને 8 વડે ભાગતાં મળતી શેષ _____ 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 : 88 Question Id : 70819119201 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A line 'l' passing through origin is perpendicular to the lines

$$l_1 : \vec{r} = (3+t)\hat{i} + (-1+2t)\hat{j} + (4+2t)\hat{k}$$

$$l_2 : \vec{r} = (3+2s)\hat{i} + (3+2s)\hat{j} + (2+s)\hat{k}$$

If the co-ordinates of the point in the first octant on 'l_2' at a distance of $\sqrt{17}$ from the point of intersection of 'l' and 'l_1' are (a, b, c), then $18(a+b+c)$ 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 : 88 Question Id : 70819119201 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ઊગમબિંદુમાંથી પસાર થતી રેખા 'l', રેખાઓ

$l_1 : \vec{r} = (3+t)\hat{i} + (-1+2t)\hat{j} + (4+2t)\hat{k}$

$l_2 : \vec{r} = (3+2s)\hat{i} + (3+2s)\hat{j} + (2+s)\hat{k}$ ને

લંબ છે. જો 'l' અને 'l_1' નાં છેદબિંદુથી $\sqrt{17}$ અંતરે પ્રથમ અષ્ટાંશમાં આવેલા 'l_2' પરના બિંદુના યામ (a, b, c) હોય, તો $18(a+b+c) =$ _____.

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 : 70819119202 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A line is a common tangent to the circle $(x-3)^2+y^2=9$ and the parabola $y^2=4x$. If the two points of contact (a, b) and (c, d) are distinct and lie in the first quadrant, then $2(a+c)$ 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 : 89 Question Id : 70819119202 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક રેખા, એ વર્તુળ $(x-3)^2+y^2=9$ અને પરવલય $y^2=4x$ નો સામાન્ય સ્પર્શક છે. જો બે સ્પર્શબિંદુઓ (a, b) અને (c, d) ભિન્ન હોય તથા પ્રથમ ચરણમાં આવેલ હોય, તો $2(a+c)=$ _____.

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 : 70819119203 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $\vec{a}=\hat{i}+\alpha\hat{j}+3\hat{k}$ and $\vec{b}=3\hat{i}-\alpha\hat{j}+\hat{k}$. If the area of the parallelogram whose adjacent sides are represented by the vectors $\vec{a}$ and $\vec{b}$ is $8\sqrt{3}$ square units, then $\vec{a}\cdot\vec{b}$ 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 : 90 Question Id : 70819119203 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે $\vec{a} = \hat{i} + \alpha\hat{j} + 3\hat{k}$ અને $\vec{b} = 3\hat{i} - \alpha\hat{j} + \hat{k}$ છે. જેની પાસ પાસેની બાજુંઓ સદિશો $\vec{a}$ અને $\vec{b}$ વડે દર્શાવેલ હોય તેવા સમાંતર બાજું ચતુષ્કોણનું નું ક્ષેત્રફળ $8\sqrt{3}$ ચો. એકમ હોય, તો $\vec{a} \cdot \vec{b}$ = _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001