

nta

Question Paper Name :	B TECH EG 26th Feb 2021 Shift 2
Subject Name :	B TECH EG
Creation Date :	2021-02-25 13:53:05
Duration :	180
Number of Questions :	90
Total Marks :	300
Display Marks:	Yes

B TECH EG

Group Number :	1
Group Id :	708191232
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 :	708191970
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 :	7081911250
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 70819121454 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A radioactive sample is undergoing α decay. At any time t_1 , its activity is A and another time t_2 , the activity is $\frac{A}{5}$. What is the average life time for the sample ?

Options :

70819169511. $\frac{\ln 5}{t_2 - t_1}$

70819169512. $\frac{\ln(t_2 + t_1)}{2}$

70819169513. $\frac{t_2 - t_1}{\ln 5}$

70819169514. $\frac{t_1 - t_2}{\ln 5}$

Question Number : 1 Question Id : 70819121454 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક રેડિયોએક્ટિવ નમૂનો α ક્ષય અનુભવે છે. કોઈ t_1 સમયે તેની સક્રિયતા A અને અન્ય t_2 સમયે એ તેની સક્રિયતા $\frac{A}{5}$

છે. આ નમૂનાનો સરેરાશ જીવનકાળ કેટલો હશે ?

Options :

70819169511. $\frac{\ln 5}{t_2 - t_1}$

70819169512. $\frac{\ln(t_2 + t_1)}{2}$

70819169513. $\frac{t_2 - t_1}{\ln 5}$

70819169514. $\frac{t_1 - t_2}{\ln 5}$

Question Number : 2 Question Id : 70819121455 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Assertion A : For a simple microscope, the angular size of the object equals the angular size of the image.

Reason R : Magnification is achieved as the small object can be kept much closer to the eye than 25 cm and hence it subtends a large angle.

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

Options :

70819169515. Both A and R are true and R is the correct explanation of A

70819169516. Both A and R are true but R is NOT the correct explanation of A

70819169517. A is true but R is false

70819169518. A is false but R is true

Question Number : 2 Question Id : 70819121455 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાન આપેલા છે : એક વિધાનને કથન A તરીકે દર્શાવવામાં આવે છે અને બીજા વિધાનને કારણ R તરીકે દર્શાવવામાં આવે છે.

કથન A : સાદા સૂક્ષ્મદર્શક માટે વસ્તુનું કોણીય કદ પ્રતિબિંબનો કોણીય કદ બરાબર હોય છે.

કારણ R : નાની વસ્તુને 25 cm કરતાં ખૂબ નજીકનાં અંતરે રાખવાથી મોટવણી મેળવાય છે અને તેથી તે ખૂબ મોટો ખૂણો આંતરે છે.

ઉપરોક્ત આપેલ વિધાનો અનુસાર, આપેલ વિકલ્પોમાંથી સાચો જવાબ શોધો.

Options :

70819169515. બંને A અને R સાચાં છે અને A માટે R સાચું સ્પષ્ટીકરણ કરે છે.

70819169516. બંને A અને R સાચાં છે પરંતુ A નું સાચું સ્પષ્ટીકરણ R નથી.

70819169517. A સાચું છે પરંતુ R ખોટું છે.

70819169518. A ખોટું છે પરંતુ R સાચું છે.

Question Number : 3 Question Id : 70819121456 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A tuning fork A of unknown frequency produces 5 beats/s with a fork of known frequency 340 Hz. When fork A is filed, the beat frequency decreases to 2 beats/s. What is the frequency of fork A ?

Options :

70819169519. 335 Hz

70819169520. 338 Hz

70819169521. 345 Hz

70819169522. 342 Hz

Question Number : 3 Question Id : 70819121456 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

અજ્ઞાત આવૃત્તિ ધરાવતા સ્વરકાંઠા A સાથે 340 Hz આવૃત્તિ ધરાવતા જ્ઞાત સ્વરકાંઠા 5 સ્પંદ/સેકન્ડ ઉત્પન્ન કરે. જ્યારે સ્વરકાંઠા A ને ઘસીને ટૂંકો કરવામાં આવે છે ત્યારે સ્પંદ આવૃત્તિ ઘટીને 2 સ્પંદ/સેકન્ડ થાય છે. સ્વરકાંઠા A ની આવૃત્તિ કેટલી હશે ?

Options :

70819169519. 335 Hz

70819169520. 338 Hz

70819169521. 345 Hz

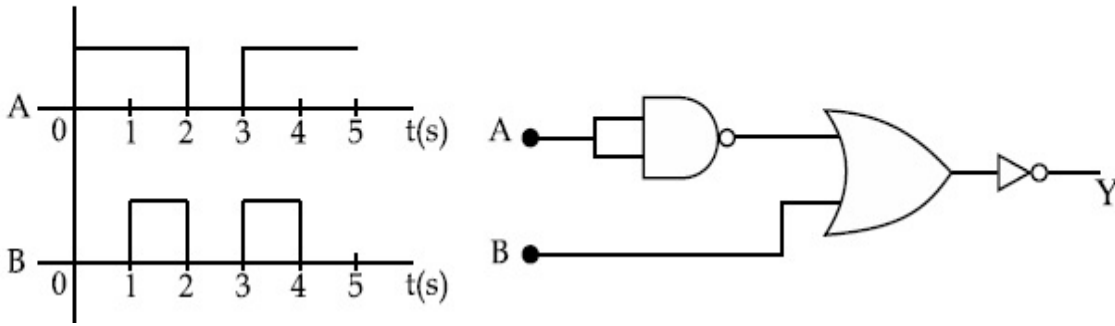
70819169522. 342 Hz

Question Number : 4 Question Id : 70819121457 Question Type : MCQ Option Shuffling : Yes Is

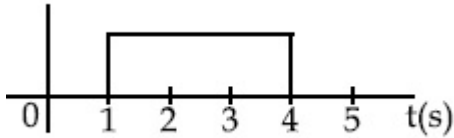
Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

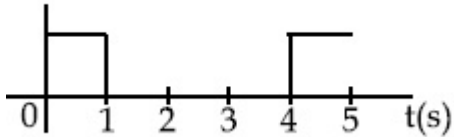
Draw the output signal Y in the given combination of gates.



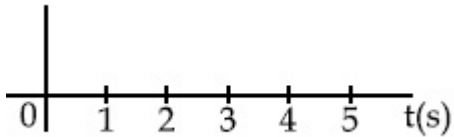
Options :



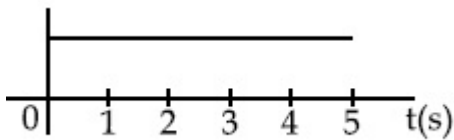
70819169523.



70819169524.



70819169525.

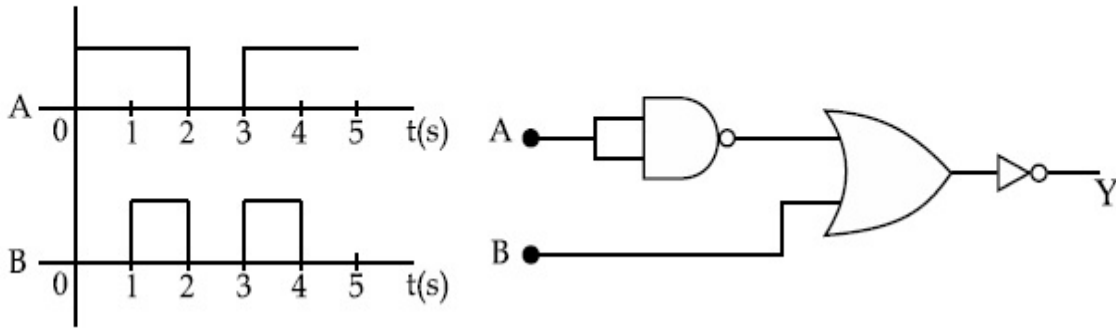


70819169526.

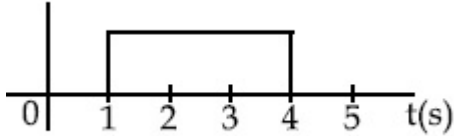
Question Number : 4 Question Id : 70819121457 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

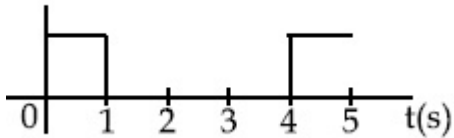
આપેલ ગેટનાં સંયોજનો માટે આઉટપુટ સિગ્નલ Y દોરો.



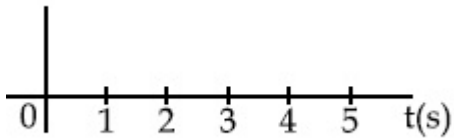
Options :



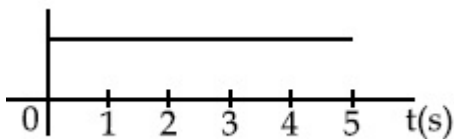
70819169523.



70819169524.



70819169525.



70819169526.

Question Number : 5 Question Id : 70819121458 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : A second's pendulum has a time period of 1 second.

Statement II : It takes precisely one second to move between the two extreme positions.

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

Options :

70819169527. Both Statement I and Statement II are true

70819169528. Both Statement I and Statement II are false

70819169529. Statement I is true but Statement II is false

70819169530. Statement I is false but Statement II is true

Question Number : 5 Question Id : 70819121458 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાનો આપેલ છે :

વિધાન I : સેકન્ડ લોલકનો આવર્તકાળ 1 સેકન્ડ છે.

વિધાન II : બે અરમ (અંતિમ) સ્થાનો વચ્ચે ગતિ કરવા માટે બરાબર 1 સેકન્ડની જરૂર પડે છે.

આ બંને વિધાનોને ધ્યાનમાં લેતા નીચે આપેલ વિકલ્પોમાંથી સાચો વિકલ્પ પસંદ કરો:

Options :

70819169527. બંને વિધાન I અને વિધાન II સાચાં છે.

70819169528. બંને વિધાન I અને વિધાન II ખોટા છે.

70819169529. વિધાન I સાચું છે પરંતુ વિધાન II ખોટું છે.

70819169530. વિધાન I ખોટું છે પરંતુ વિધાન II સાચું છે.

Question Number : 6 Question Id : 70819121459 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If 'C' and 'V' represent capacity and voltage respectively then what are the dimensions of λ where $C/V = \lambda$?

Options :

70819169531. $[M^{-2} L^{-3} I^2 T^6]$

70819169532. $[M^{-3} L^{-4} I^3 T^7]$

70819169533. $[M^{-2} L^{-4} I^3 T^7]$

70819169534. $[M^{-1} L^{-3} I^{-2} T^{-7}]$

Question Number : 6 Question Id : 70819121459 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો 'C' અને 'V' અનુક્રમે સંઘારક અને વોલ્ટેજ દર્શાવતા હોય અને $C/V = \lambda$ હોય તો λ ના પરિમાણ કેવા હશે ?

Options :

70819169531. $[M^{-2} L^{-3} I^2 T^6]$

70819169532. $[M^{-3} L^{-4} I^3 T^7]$

70819169533. $[M^{-2} L^{-4} I^3 T^7]$

70819169534. $[M^{-1} L^{-3} I^{-2} T^{-7}]$

Question Number : 7 Question Id : 70819121460 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An aeroplane, with its wings spread 10 m, is flying at a speed of 180 km/h in a horizontal direction. The total intensity of earth's field at that part is 2.5×10^{-4} Wb/m² and the angle of dip is 60°. The emf induced between the tips of the plane wings will be _____.

Options :

70819169535. 108.25 mV

70819169536. 62.50 mV

70819169537. 88.37 mV

70819169538. 54.125 mV

Question Number : 7 Question Id : 70819121460 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

10 m ફેલાયેલી પાંખો ધરાવતું વિમાન, સમક્ષિતીજ દિશામાં 180 km/h ની ઝડપથી ગતિ કરે છે. આ વિસ્તારમાં કુલ પૃથ્વી (ચુંબકીય) ક્ષેત્ર 2.5×10^{-4} Wb/m² અને નમન કોણ (angle of dip) 60° છે. પૃથ્વીની પાંખોના અંત્યબિંદુઓ વચ્ચે પ્રેરીત વિજ ચાલક બળ (emf) _____ હશે.

Options :

70819169535. 108.25 mV

70819169536. 62.50 mV

70819169537. 88.37 mV

70819169538. 54.125 mV

Question Number : 8 Question Id : 70819121461 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A cord is wound round the circumference of wheel of radius r . The axis of the wheel is horizontal and the moment of inertia about it is I . A weight mg is attached to the cord at the end. The weight falls from rest. After falling through a distance 'h', the square of angular velocity of wheel will be :

Options :

70819169539. $2gh$

70819169540. $\frac{2gh}{I + mr^2}$

70819169541. $\frac{2mgh}{I + mr^2}$

70819169542. $\frac{2mgh}{I + 2mr^2}$

Question Number : 8 Question Id : 70819121461 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

'r' ત્રિજ્યા ધરાવતા પૈડાના પરીઘનાં ફરતે દોરી વિટાળવામાં આવે છે. પૈડાની અક્ષ સમક્ષીતીજ તેમજ તે અક્ષને અનુલક્ષિને જડત્વની ચાકમાત્રા I છે. દોરીના છેડે mg વજન લટકાવવામાં આવે છે. વજન વિરામ સ્થિતિમાંથી પતન કરે છે. 'h' ઊંચાઈ પરથી પતન પછી, પૈડાના કોણીય વેગનો વર્ગ _____ હશે.

Options :

70819169539. $2gh$

70819169540. $\frac{2gh}{I + mr^2}$

70819169541. $\frac{2mgh}{I + mr^2}$

70819169542. $\frac{2mgh}{I + 2mr^2}$

Question Number : 9 Question Id : 70819121462 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The trajectory of a projectile in a vertical plane is $y = \alpha x - \beta x^2$, where α and β are constants and x & y are respectively the horizontal and vertical distances of the projectile from the point of projection. The angle of projection θ and the maximum height attained H are respectively given by :

Options :

70819169543. $\tan^{-1}\beta, \frac{\alpha^2}{2\beta}$

70819169544. $\tan^{-1}\left(\frac{\beta}{\alpha}\right), \frac{\alpha^2}{\beta}$

70819169545. $\tan^{-1}\alpha, \frac{\alpha^2}{4\beta}$

70819169546. $\tan^{-1}\alpha, \frac{4\alpha^2}{\beta}$

Question Number : 9 Question Id : 70819121462 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ઉર્ધ્વ સમતલમાં પ્રક્ષિપ્ત નો ગતિપથ $y = \alpha x - \beta x^2$ છે, જ્યાં α અને β અચળાંકો છે તેમજ x અને y પ્રક્ષિપ્ત બિંદુ થી અનુક્રમે સમક્ષિતીજ અને ઉર્ધ્વ અંતર દર્શાવે છે. અહિંયા પ્રક્ષિપ્ત કોણ θ અને પ્રાપ્ત કરેલ મહત્તમ ઊંચાઈ H અનુક્રમે નીચે જણાવેલ વિકલ્પો દ્વારા દર્શાવામાં આવે છે :

Options :

70819169543. $\tan^{-1}\beta, \frac{\alpha^2}{2\beta}$

70819169544. $\tan^{-1}\left(\frac{\beta}{\alpha}\right), \frac{\alpha^2}{\beta}$

70819169545. $\tan^{-1}\alpha, \frac{\alpha^2}{4\beta}$

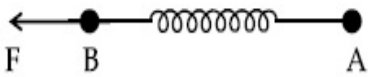
70819169546. $\tan^{-1}\alpha, \frac{4\alpha^2}{\beta}$

Question Number : 10 Question Id : 70819121463 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two masses A and B, each of mass M are fixed together by a massless spring. A force acts on the mass B as shown in figure. If the mass A starts moving away from mass B with acceleration 'a', then the acceleration of mass B will be :



Options :

70819169547. $\frac{MF}{F + Ma}$

70819169548. $\frac{F + Ma}{M}$

$$\frac{Ma - F}{M}$$

70819169549.

$$\frac{F - Ma}{M}$$

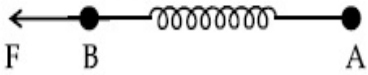
70819169550.

Question Number : 10 Question Id : 70819121463 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

દરેક M દળ ધરાવતા બંને દળો A અને B એકબીજા સાથે દળ રહિત સ્પ્રિંગ દ્વારા જોડાયેલા છે. આકૃતિમાં દર્શાવ્યા મુજબ દળ B પર બળ લાગૂ પડે છે. જો પ્રવેગ 'a' સાથે દળ A, દળ B થી દૂર જવા માંડે તો દળ B નો પ્રવેગ _____ હશે.



Options :

$$\frac{MF}{F + Ma}$$

70819169547.

$$\frac{F + Ma}{M}$$

70819169548.

$$\frac{Ma - F}{M}$$

70819169549.

$$\frac{F - Ma}{M}$$

70819169550.

Question Number : 11 Question Id : 70819121464 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : An electric dipole is placed at the centre of a hollow sphere. The flux of electric field through the sphere is zero but the electric field is not zero anywhere in the sphere.

Statement II : If R is the radius of a solid metallic sphere and Q be the total charge on it. The electric field at any point on the spherical surface of radius r ($< R$) is zero but the electric flux passing through this closed spherical surface of radius r is not zero.

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

Options :

70819169551. Both Statement I and Statement II are true

70819169552. Both Statement I and Statement II are false

70819169553. Statement I is true but Statement II is false

70819169554. Statement I is false but Statement II is true

Question Number : 11 Question Id : 70819121464 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાન આપવામાં આવ્યા છે :

વિધાન I : એક વિદ્યુત દ્વિધ્રુવીને પોલા ગોળાના કેન્દ્રમાં મૂકવામાં આવે છે. ગોળામાંથી પસાર થતા વિદ્યુત ક્ષેત્રનું ફ્લક્સ શૂન્ય છે પરંતુ ગોળામાં ક્યાંય વિદ્યુત ક્ષેત્ર શૂન્ય નથી.

વિધાન II : ઘન ધાત્વીક ગોળાની ત્રિજ્યા ' R ' અને તેના પર રહેલો કુલ વિજભાર Q છે. r ($< R$) ત્રિજ્યા ધરાવતા ગોલીય સપાટીના કોઈપણ બિંદુ પર વિદ્યુત ક્ષેત્ર શૂન્ય છે પરંતુ ' r ' ત્રિજ્યા ધરાવતા આ બંધ ગોલીય સપાટીમાંથી પસાર થતા વિદ્યુત ફ્લક્સ નું મૂલ્ય શૂન્ય નથી.

ઉપરોક્ત વિધાનને અનુલક્ષીને આપેલ વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો :

Options :

70819169551. બંને વિધાન I અને વિધાન II સાચા છે.

70819169552. બંને વિધાન I અને વિધાન II ખોટા છે.

70819169553. વિધાન I સાચું પરંતુ વિધાન II ખોટું છે.

70819169554. વિધાન I ખોટું પરંતુ વિધાન II સાચું છે.

**Question Number : 12 Question Id : 70819121465 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

A scooter accelerates from rest for time t_1 at constant rate a_1 and then retards at constant rate a_2 for time t_2 and comes to rest. The correct value of $\frac{t_1}{t_2}$ will be :

Options :

70819169555. $\frac{a_1}{a_2}$

70819169556. $\frac{a_2}{a_1}$

70819169557. $\frac{a_1 + a_2}{a_1}$

70819169558. $\frac{a_1 + a_2}{a_2}$

**Question Number : 12 Question Id : 70819121465 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

એક સ્કુટર વિરામ સ્થાનેથી t_1 સમય માટે અચળ દર a_1 થી પ્રવેગીત થાય છે, અને ત્યાર બાદ જ્યાં સુધી વિરામ ના મેળવે તે t_2 સમય સુધી અચળ દર a_2 થી પ્રતિ પ્રવેગીત થાય છે. $\frac{t_1}{t_2}$ નું સાચું મૂલ્ય _____.

Options :

70819169555. $\frac{a_1}{a_2}$

70819169556. $\frac{a_2}{a_1}$

70819169557. $\frac{a_1 + a_2}{a_1}$

70819169558. $\frac{a_1 + a_2}{a_2}$

Question Number : 13 Question Id : 70819121466 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The internal energy (U), pressure (P) and volume (V) of an ideal gas are related as $U = 3PV + 4$.

The gas is :

Options :

70819169559. monoatomic only.

70819169560. diatomic only.

70819169561. polyatomic only.

70819169562. either monoatomic or diatomic.

Question Number : 13 Question Id : 70819121466 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આદર્શ વાયુ માટે આંતરિક ઊર્જા (U), દબાણ (P) અને કદ (V) $U=3PV+4$ સંબંધ થી જોડાયેલા છે. આ વાયુ _____ છે.

Options :

70819169559. માત્ર એક પરમાણ્વિક

70819169560. માત્ર દ્વિપરમાણ્વિક

70819169561. માત્ર બહુપરમાણ્વિક

70819169562. એક પરમાણ્વિક અથવા દ્વિપરમાણ્વિક

Question Number : 14 Question Id : 70819121467 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The recoil speed of a hydrogen atom after it emits a photon in going from $n=5$ state to $n=1$ state will be :

Options :

70819169563. 4.34 m/s

70819169564. 4.17 m/s

70819169565. 3.25 m/s

70819169566. 2.19 m/s

Question Number : 14 Question Id : 70819121467 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$n=5$ થી $n=1$ કક્ષામાં સંક્રમણ દરમિયાન ફોટોનના ઉત્સર્જનને કારણે હાઈડ્રોજન પરમાણુની પ્રતિક્ષેપ ઝડપ (recoil speed) _____ m/s થશે.

Options :

70819169563. 4.34 m/s

70819169564. 4.17 m/s

70819169565. 3.25 m/s

70819169566. 2.19 m/s

Question Number : 15 Question Id : 70819121468 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The length of metallic wire is l_1 when tension in it is T_1 . It is l_2 when the tension is T_2 . The original length of the wire will be :

Options :

70819169567. $\frac{l_1 + l_2}{2}$

70819169568. $\frac{T_2 l_1 + T_1 l_2}{T_1 + T_2}$

70819169569. $\frac{T_1 l_1 - T_2 l_2}{T_2 - T_1}$

70819169570. $\frac{T_2 l_1 - T_1 l_2}{T_2 - T_1}$

Question Number : 15 Question Id : 70819121468 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જ્યારે તાણ T_1 હોય ત્યારે ધાત્વિક તારની લંબાઈ l_1 છે. જ્યારે તાણ T_2 હોય ત્યારે તે l_2 હોય છે. તારની મૂળ લંબાઈ _____ હશે.

Options :

70819169567. $\frac{l_1 + l_2}{2}$

70819169568. $\frac{T_2 l_1 + T_1 l_2}{T_1 + T_2}$

70819169569. $\frac{T_1 l_1 - T_2 l_2}{T_2 - T_1}$

70819169570. $\frac{T_2 l_1 - T_1 l_2}{T_2 - T_1}$

Question Number : 16 Question Id : 70819121469 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A particle executes S.H.M., the graph of velocity as a function of displacement is :

Options :

70819169571. a circle.

70819169572. a parabola.

70819169573. an ellipse.

70819169574. a helix.

Question Number : 16 Question Id : 70819121469 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક કણ સ.આ.ગ. કરે છે. સ્થાનાંતરના વિધેય તરીકે વેગનો આલેખ _____ છે.

Options :

70819169571. એક વર્તુળ

70819169572. એક પરવલય

70819169573. એક દ્વિધ્રુવ

70819169574. કુંડિલીની (સર્પિલાકાર)

Question Number : 17 Question Id : 70819121470 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The incident ray, reflected ray and the outward drawn normal are denoted by the unit

vectors \vec{a} , \vec{b} and \vec{c} respectively. Then choose the correct relation for these vectors.

Options :

70819169575. $\vec{b} = \vec{a} - \vec{c}$

70819169576. $\vec{b} = \vec{a} - 2 \left(\vec{a} \cdot \vec{c} \right) \vec{c}$

$$\vec{b} = \vec{a} + 2\vec{c}$$

70819169577.

$$\vec{b} = 2\vec{a} + \vec{c}$$

70819169578.

Question Number : 17 Question Id : 70819121470 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આપાત કિરણ, પરાવર્તિત કિરણ અને બાહ્ય તરફ દોરેલ લંબ ને અનુક્રમે એકમ સદિશ \vec{a} , \vec{b} અને \vec{c} દ્વારા દર્શાવામાં આવે છે. આ સદિશો વચ્ચેનો સાચો સંબંધ પસંદ કરો.

Options :

$$\vec{b} = \vec{a} - \vec{c}$$

70819169575.

$$\vec{b} = \vec{a} - 2(\vec{a} \cdot \vec{c})\vec{c}$$

70819169576.

$$\vec{b} = \vec{a} + 2\vec{c}$$

70819169577.

$$\vec{b} = 2\vec{a} + \vec{c}$$

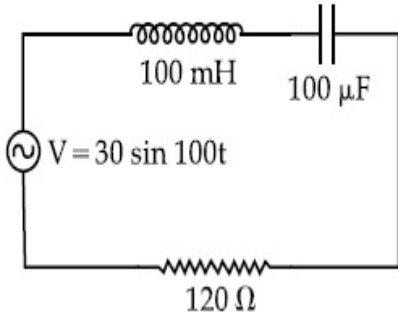
70819169578.

Question Number : 18 Question Id : 70819121471 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Find the peak current and resonant frequency of the following circuit (as shown in figure).



Options :

70819169579. 2 A and 50 Hz

70819169580. 0.2 A and 50 Hz

70819169581. 2 A and 100 Hz

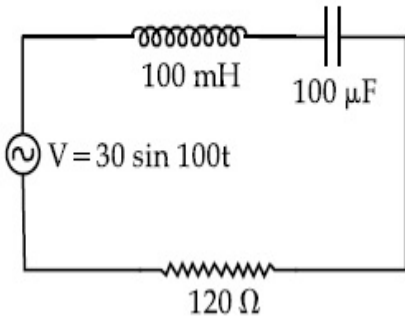
70819169582. 0.2 A and 100 Hz

Question Number : 18 Question Id : 70819121471 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે (આકૃતિમાં દર્શાવ્યા અનુસાર) જણાવેલ પરિપથ માટે ઉચ્ચત્તમ (મહત્તમ) પ્રવાહ અને અનુનાદિત આવૃત્તિ શોધો.



Options :

70819169579. 2 A અને 50 Hz

70819169580. 0.2 A અને 50 Hz

70819169581. 2 A અને 100 Hz

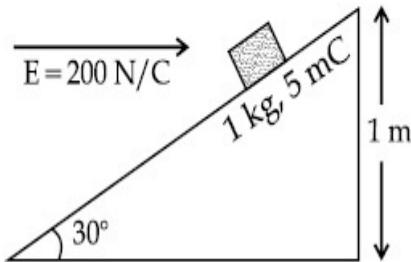
70819169582. 0.2 A અને 100 Hz

**Question Number : 19 Question Id : 70819121472 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

An inclined plane making an angle of 30° with the horizontal is placed in a uniform horizontal electric field $200 \frac{\text{N}}{\text{C}}$ as shown in the figure. A body of mass 1 kg and charge 5 mC is allowed to slide down from rest at a height of 1 m. If the coefficient of friction is 0.2, find the time taken by the body to reach the bottom.

$$[g = 9.8 \text{ m/s}^2; \sin 30^\circ = \frac{1}{2}; \cos 30^\circ = \frac{\sqrt{3}}{2}]$$



Options :

70819169583. 2.3 s

70819169584. 1.3 s

70819169585. 0.92 s

70819169586. 0.46 s

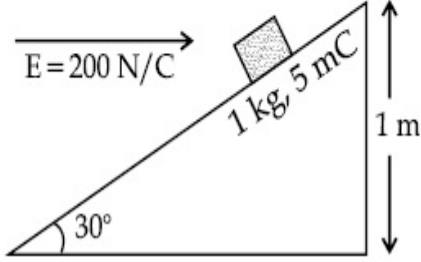
Question Number : 19 Question Id : 70819121472 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા મુજબ $200 \frac{N}{C}$ સમાન સમક્ષિતીજ વિદ્યુત ક્ષેત્રમાં મૂકેલ ઢળતી સપાટી, સમક્ષિતીજ સાથે 30° નો કોણ રચે છે. 1 kg દળ અને 5 mC વિજભાર ધરાવતા પદાર્થને આ ઢળતી સપાટી 1 m ઊંચાઈ વિરામ સ્થાનેથી સરકવા દેવામાં આવે છે. બે ઘર્ષણાંક 0.2 હોય તો તળીયે પહોંચવા માટે લીધેલો સમય શોધો.

$$[g = 9.8 \text{ m/s}^2; \sin 30^\circ = \frac{1}{2}; \cos 30^\circ = \frac{\sqrt{3}}{2}]$$



Options :

70819169583. 2.3 s

70819169584. 1.3 s

70819169585. 0.92 s

70819169586. 0.46 s

Question Number : 20 Question Id : 70819121473 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A wire of 1Ω has a length of 1 m . It is stretched till its length increases by 25% . The percentage change in resistance to the nearest integer is :

Options :

70819169587. 76 %

70819169588. 56 %

70819169589. 25%

70819169590. 12.5%

Question Number : 20 Question Id : 70819121473 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

1 Ω તારની લંબાઈ 1 m છે. તેની લંબાઈ 25% વધે ત્યાં સુધી તેને તાણવામાં (ખેંચવામાં) આવે છે. નજીકત્તમ પૂર્ણાંકમાં અવરોધમાં થતો પ્રતિશત ફેરફાર _____ છે.

Options :

70819169587. 76%

70819169588. 56%

70819169589. 25%

70819169590. 12.5%

Physics Section B

Section Id :	708191971
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 :

7081911251

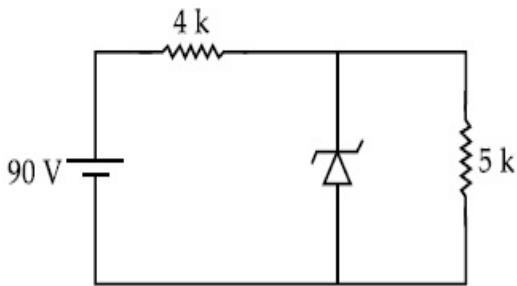
Question Shuffling Allowed :

Yes

Question Number : 21 Question Id : 70819121474 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The zener diode has a $V_z = 30$ V. The current passing through the diode for the following circuit is _____ mA.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

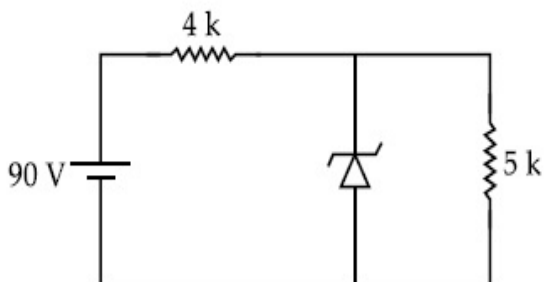
Possible Answers :

5 to 5.001

Question Number : 21 Question Id : 70819121474 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ઝેનર ડાયોડ માટે $V_z = 30$ V છે. નીચે જણાવેલ પરિપથ માટે ડાયોડમાંથી પસાર થતો પ્રવાહ _____ mA 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 : 22 **Question Id :** 70819121475 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

Time period of a simple pendulum is T. The time taken to complete $\frac{5}{8}$ oscillations starting from mean position is $\frac{\alpha}{\beta}T$. The value of α 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 : 22 **Question Id :** 70819121475 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

સાદા લોલકનો આવર્તકાળ T છે. મધ્યમાન સ્થિતિથી $\frac{5}{8}$ દોલનો પૂર્ણ કરવા માટે લાગતો સમય $\frac{\alpha}{\beta} T$ છે. α 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 : 23 Question Id : 70819121476 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The volume V of a given mass of monoatomic gas changes with temperature T according to

the relation $V = KT^{\frac{2}{3}}$. The workdone when temperature changes by 90 K will be xR . The value of x is _____.

[R = universal gas 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 : 23 Question Id : 70819121476 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક પરમાણ્વિક વાયુનું કદ V , તાપમાન T સાથે $V = KT^{\frac{2}{3}}$ સંબંધ અનુસાર બદલાય છે. જ્યારે તાપમાન 90 K જેટલું બદલાય ત્યારે થતું કાર્ય xR છે. અહિંયા x નું મૂલ્ય _____ છે.

[R = વાયુ નિયતાંક]

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 : 70819121477 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Two stream of photons, possessing energies equal to twice and ten times the work function of metal are incident on the metal surface successively. The value of ratio of maximum velocities of the photoelectrons emitted in the two respective cases is $x : y$. 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 : 24 Question Id : 70819121477 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધાતુનાં કાર્ય વિધેયથી બે ગણી અને દસ ગણી ઊર્જા ધરાવતી ફોટોનની બે ધારા (પ્રવાહો) ઓને વારાફરતી ધાતુ સપાટી પર આપાત કરવામાં આવે છે. બંને કિસ્સામાં અનુક્રમે ઉત્સર્જાયેલા ફોટો ઈલેક્ટ્રોન્સના મહત્તમ વેગના ગુણોત્તરનાં મૂલ્યો $x : y$ છે. x ના 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 : 25 Question Id : 70819121478 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the highest frequency modulating a carrier is 5 kHz, then the number of AM broadcast stations accommodated in a 90 kHz bandwidth are _____.

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 : 70819121478 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો અધિસરણ પામેલ વાહક તરંગની મહત્તમ આવૃત્તિ 5 kHz હોય તો 90 kHz બેન્ડવીથ માં સમાવેલ AM બ્રોડકાસ્ટ સ્ટેશનની સંખ્યા _____ હશે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

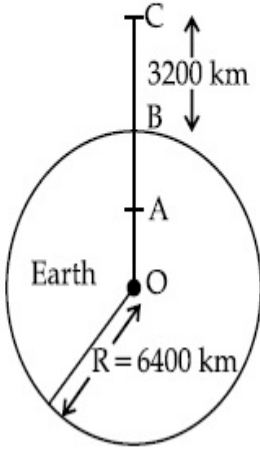
Possible Answers :

5 to 5.001

Question Number : 26 Question Id : 70819121479 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In the reported figure of earth, the value of acceleration due to gravity is same at point A and C but it is smaller than that of its value at point B (surface of the earth). The value of OA : AB will be $x : y$. The value of x is _____.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

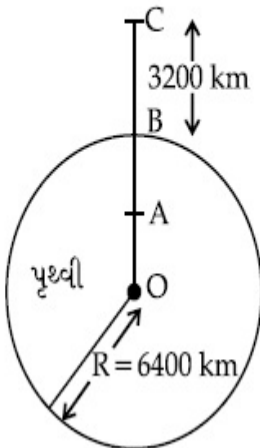
Possible Answers :

5 to 5.001

Question Number : 26 **Question Id :** 70819121479 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

નીચે જણાવેલ પૃથ્વીની આકૃતિ માટે, A અને C બિંદુ પાસે ગુરુત્વપ્રવેગનું મૂલ્ય એક સરખું છે પરંતુ બિંદુ B (પૃથ્વીની સપાટી) ના મૂલ્ય થી તે મૂલ્ય ઓછું છે. OA : AB નું મૂલ્ય $x : y$ છે. 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 : 27 **Question Id :** 70819121480 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

1 mole of rigid diatomic gas performs a work of $\frac{Q}{5}$ when heat Q is supplied to it. The molar

heat capacity of the gas during this transformation is $\frac{xR}{8}$. The value of x is _____.

[R = universal gas 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 : 27 **Question Id :** 70819121480 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

જ્યારે Q ઉષ્મા આપવામાં આવે ત્યારે દૃઢ એક પરમાણ્વિક વાયુ $\frac{Q}{5}$ જેટલું કાર્ય કરે છે. આ રૂપાંતરણ દરમિયાન વાયુની

મોલર ઉષ્માધરીતા $\frac{xR}{8}$ છે. x નું મૂલ્ય _____ છે.

[R = વાયુ નિયતાંક]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

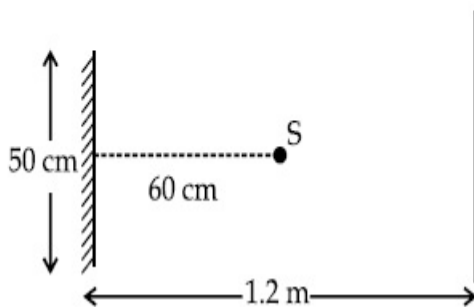
Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819121481 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A point source of light S , placed at a distance 60 cm in front of the centre of a plane mirror of width 50 cm, hangs vertically on a wall. A man walks in front of the mirror along a line parallel to the mirror at a distance 1.2 m from it (see in the figure). The distance between the extreme points where he can see the image of the light source in the mirror is _____ cm.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

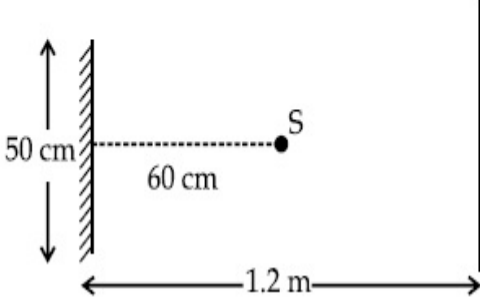
Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819121481 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

પ્રકાશનો બિંદુવત્ ઉદ્ગમ S, 50 cm પહોળાઈ ધરાવતા દિવાલ પર શિરોલંબ લટકાયેલ સાદા અરીસાના કેન્દ્રની સામે 60 cm ના અંતરે ગોઠવાયેલો છે. આકૃતિમાં દર્શાવ્યા મુજબ એક માણસ આ અરિસાથી 1.2 m દૂરના અંતરે, અરીસાને સમાંતર લીટી પર ચાલે છે. અરીસામાં દષ્ટ્યમાન પ્રકાશનું પ્રતીબિંબ, ચરમ બિંદુઓ (extreme points) થી _____ cm અંતરે આવેલ 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 :** 70819121482 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

A particle executes S.H.M. with amplitude 'a' and time period 'T'. The displacement of the particle when its speed is half of maximum speed is $\frac{\sqrt{x}a}{2}$. The value of x is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 29 **Question Id :** 70819121482 **Question Type :** SA

Correct Marks : 4 Wrong Marks : 0

'a' કંપવિસ્તાર અને 'T' આવર્તકાળ ધરાવતો કણ સ.આ.દો. કરે છે. મહત્તમ ઝડપથી અડધી ઝડપ હોય ત્યારે કણનું

સ્થાનાંતર $\frac{\sqrt{x}a}{2}$ છે જ્યાં x નું મૂલ્ય _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819121483 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

27 similar drops of mercury are maintained at 10 V each. All these spherical drops combine into a single big drop. The potential energy of the bigger drop is _____ times that of a smaller drop.

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 : 70819121483 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

27 એકસમાન પારાના દરેક ટીપાંને 10 V પર જાળવી રાખવામાં આવ્યા છે. આ બધાજ ગોલીય ટીપાં સંયોજનને એક મોટું ટીપું રચે છે. મોટા ટીપા ની સ્થિતિ ઊર્જા, એક નાના ટીપા કરતા _____ ગણી 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

Chemistry Section A

Section Id :	708191972
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 :	7081911252
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 70819121484 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List-I with List-II.

List-I (Molecule)	List-II (Bond order)
(a) Ne ₂	(i) 1
(b) N ₂	(ii) 2
(c) F ₂	(iii) 0
(d) O ₂	(iv) 3

Choose the correct answer from the options given below :

Options :

70819169601. (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

70819169602. (a) → (iv), (b) → (iii), (c) → (ii), (d) → (i)

70819169603. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819169604. (a) → (iii), (b) → (iv), (c) → (i), (d) → (ii)

Question Number : 31 Question Id : 70819121484 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સૂચી - I સાથે સૂચી - II ને જોડો.

સૂચી - I (અણુ)	સૂચી - II (બંધ ક્રમાંક)
(a) Ne ₂	(i) 1
(b) N ₂	(ii) 2
(c) F ₂	(iii) 0
(d) O ₂	(iv) 3

નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819169601. (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

70819169602. (a) → (iv), (b) → (iii), (c) → (ii), (d) → (i)

70819169603. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819169604. (a) → (iii), (b) → (iv), (c) → (i), (d) → (ii)

Question Number : 32 Question Id : 70819121485 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The nature of charge on resulting colloidal particles when FeCl_3 is added to excess of hot water is :

Options :

70819169605. positive

70819169606. negative

70819169607. neutral

70819169608. sometimes positive and sometimes negative

Question Number : 32 Question Id : 70819121485 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

વધારે પ્રમાણ વાળા ગરમ પાણીમાં જ્યારે FeCl_3 ઉમેરતાં પરિણામી કલિલમય કણોનાં ભાર (charge) ની પ્રકૃતિ શું છે ?

Options :

70819169605. ધન

70819169606. ઋણ

70819169607. તટસ્થ

70819169608. ક્યારેક ધન અને ક્યારેક ઋણ

Question Number : 33 Question Id : 70819121486 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct order of electron gain enthalpy is :

Options :

70819169609. $O > S > Se > Te$

70819169610. $Te > Se > S > O$

70819169611. $S > O > Se > Te$

70819169612. $S > Se > Te > O$

Question Number : 33 Question Id : 70819121486 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ઈલેક્ટ્રોન પ્રાપ્તિ એન્ટાલ્પીનો સાચો ક્રમ :

Options :

70819169609. $O > S > Se > Te$

70819169610. $Te > Se > S > O$

70819169611. $S > O > Se > Te$

70819169612. $S > Se > Te > O$

Question Number : 34 Question Id : 70819121487 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) Siderite	(i) Cu
(b) Calamine	(ii) Ca
(c) Malachite	(iii) Fe
(d) Cryolite	(iv) Al
	(v) Zn

Choose the correct answer from the options given below :

Options :

70819169613. (a) → (i), (b) → (ii), (c) → (v), (d) → (iii)

70819169614. (a) → (iii), (b) → (v), (c) → (i), (d) → (iv)

70819169615. (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

70819169616. (a) → (iii), (b) → (i), (c) → (v), (d) → (ii)

Question Number : 34 Question Id : 70819121487 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સૂચી - I સાથે સૂચી - II ને જોડો.

સૂચી - I	સૂચી - II
(a) સીડેરાઈટ	(i) Cu
(b) કેલેમાઈન	(ii) Ca
(c) મેલેકાઈટ	(iii) Fe
(d) ક્રાયોલાઈટ	(iv) Al
	(v) Zn

નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819169613. (a) → (i), (b) → (ii), (c) → (v), (d) → (iii)

70819169614. (a) → (iii), (b) → (v), (c) → (i), (d) → (iv)

70819169615. (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

70819169616. (a) → (iii), (b) → (i), (c) → (v), (d) → (ii)

**Question Number : 35 Question Id : 70819121488 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Which of the following forms of hydrogen emits low energy β^- particles ?

Options :

70819169617. Proton H^+

70819169618. Protium ${}_1^1H$

70819169619. Deuterium ${}_1^2H$

70819169620. Tritium ${}_1^3H$

**Question Number : 35 Question Id : 70819121488 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા હાઈડ્રોજનના સ્વરૂપો પૈકી કયો એક ઓછી ઊર્જાવાળા β^- કણો ઉત્સર્જત કરે છે ?

Options :

70819169617. પ્રોટોન H^+

70819169618. પ્રોટીયમ ${}_1^1H$

70819169619. ડ્યુટેરીયમ ${}_1^2H$

70819169620. $\text{द्वितीयम } {}^3_1\text{H}$

Question Number : 36 Question Id : 70819121489 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) Sodium Carbonate	(i) Deacon
(b) Titanium	(ii) Castner-Kellner
(c) Chlorine	(iii) van-Arkel
(d) Sodium hydroxide	(iv) Solvay

Choose the correct answer from the options given below :

Options :

70819169621. (a) → (iv), (b) → (iii), (c) → (i), (d) → (ii)

70819169622. (a) → (iv), (b) → (i), (c) → (ii), (d) → (iii)

70819169623. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

70819169624. (a) → (iii), (b) → (ii), (c) → (i), (d) → (iv)

Question Number : 36 Question Id : 70819121489 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

सूची - I ने सूची - II साथे जोडो.

सूची - I	सूची - II
(a) सोडीयम कार्बोनेट	(i) डेकोन
(b) टिटानियम	(ii) क्वाटरनर-केल्नर
(c) क्लोरीन	(iii) वोन-आर्केल
(d) सोडीयम हाइड्रोजेनसल्फाइड	(iv) सोल्वे

नीचे आपेला विकल्पो पैकी साथो जवाब शोधो.

Options :

70819169621. (a) → (iv), (b) → (iii), (c) → (i), (d) → (ii)

70819169622. (a) → (iv), (b) → (i), (c) → (ii), (d) → (iii)

70819169623. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

70819169624. (a) → (iii), (b) → (ii), (c) → (i), (d) → (iv)

Question Number : 37 Question Id : 70819121490 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which pair of oxides is acidic in nature ?

Options :

70819169625. B_2O_3, SiO_2

70819169626. B_2O_3, CaO

70819169627. N_2O, BaO

70819169628. CaO, SiO_2

Question Number : 37 Question Id : 70819121490 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી ઓક્સાઈડોની જોડ પૈકી કઈ સ્વભાવે એસિડીક છે ?

Options :

70819169625. B_2O_3, SiO_2

70819169626. B_2O_3, CaO

70819169627. N_2O, BaO

70819169628. CaO, SiO_2

Question Number : 38 Question Id : 70819121491 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Assertion A : In TlI_3 , isomorphous to CsI_3 , the metal is present in +1 oxidation state.

Reason R : Tl metal has fourteen f electrons in its electronic configuration.

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

Options :

70819169629. Both A and R are correct and R is the correct explanation of A

70819169630. Both A and R are correct but R is NOT the correct explanation of A

70819169631. A is correct but R is not correct

70819169632. A is not correct but R is correct

Question Number : 38 Question Id : 70819121491 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે બે વિધાન આપેલા છે :

એક ને કથન A વડે લેબલ કરેલ છે બીજાને કારણ R વડે લેબલ કરેલ છે.

કથન A : TlI_3 માં, CsI_3 ને સમઝપ (isomorphous), ધાતુ +1 ઓક્સિડેશન અવસ્થામાં હાજર હોય છે.

કારણ R : Tl ધાતુ પાસે તેની ઈલેક્ટ્રોન સંરચનામાં ચૌદ f ઈલેક્ટ્રોનો છે.

ઉપરોક્ત વિધાનોને ધ્યાનમાં લઈ, સૌથી યોગ્ય જવાબ નીચેનાં વિકલ્પોમાંથી શોધો.

Options :

70819169629. બંને A અને R સાચાં છે અને R એ A ની સચોટ સમજૂતી છે.

70819169630. બંને A અને R સાચાં છે પરંતુ R એ A ની સચોટ સમજૂતી નથી.

70819169631. A સાચું છે પરંતુ R સાચું નથી.

70819169632. A સાચું નથી પરંતુ R સાચું છે.

Question Number : 39 Question Id : 70819121492 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Calgon is used for water treatment. Which of the following statement is NOT true about Calgon ?

Options :

70819169633. Calgon contains the 2nd most abundant element by weight in the Earth's crust.

70819169634. It is polymeric compound and is water soluble.

70819169635. It is also known as Graham's salt.

70819169636. It doesnot remove Ca^{2+} ion by precipitation.

**Question Number : 39 Question Id : 70819121492 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

કેલ્શિયમનો ઉપયોગ પાણીનાં શુદ્ધિકરણ (treatment) માટે કરવામાં આવે છે. નીચે આપેલા વિધાનો પૈકી કયું વિધાન કેલ્શિયમ માટે સાચું નથી ?

Options :

70819169633. પૃથ્વીનાં ખોપડામાં કેલ્શિયમ વજનથી બીજા નંબરનું સૌથી વધુ પ્રચૂર તત્ત્વ ધરાવે છે.

70819169634. એ બહુલકીય સંયોજન છે અને તે પાણીમાં દ્રાવ્ય છે.

70819169635. તેને ગ્રેહામના ક્ષાર તરીકે પણ જાણીતો છે.

70819169636. તે Ca^{2+} આયનને અવક્ષેપીત કરી દૂર કરી શકતો નથી.

**Question Number : 40 Question Id : 70819121493 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Ceric ammonium nitrate and $\text{CHCl}_3/\text{alc. KOH}$ are used for the identification of functional groups present in _____ and _____ respectively.

Options :

70819169637. alcohol, amine

70819169638. amine, alcohol

70819169639. alcohol, phenol

70819169640. amine, phenol

Question Number : 40 Question Id : 70819121493 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સેરીક એમોનિયમ નાઈટ્રેટ અને CHCl_3 /આલ્કો. KOH નો ઉપયોગ અનુક્રમે _____ અને _____
ક્રિયાશીલ સમૂહ શોધવા માટે થાય છે.

Options :

70819169637. આલ્કોહોલ, એમાઈન

70819169638. એમાઈન, આલ્કોહોલ

70819169639. આલ્કોહોલ, ક્વિનોલ

70819169640. એમાઈન, ક્વિનોલ

Question Number : 41 Question Id : 70819121494 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In $\overset{1}{\text{C}}\text{H}_2=\overset{2}{\text{C}}=\overset{3}{\text{C}}\text{H}-\overset{4}{\text{C}}\text{H}_3$ molecule, the hybridization of carbon 1, 2, 3 and 4 respectively,
are :

Options :

70819169641. sp^2, sp^2, sp^2, sp^3

70819169642. sp^3, sp, sp^3, sp^3

70819169643. sp^2, sp, sp^2, sp^3

70819169644.

sp^2, sp^3, sp^2, sp^3

Question Number : 41 Question Id : 70819121494 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

આપેલ $\overset{1}{\text{C}}\text{H}_2 = \overset{2}{\text{C}} = \overset{3}{\text{C}}\text{H} - \overset{4}{\text{C}}\text{H}_3$ અણુમાં, કાર્બન 1, 2, 3 અને 4 નું સંકરણ અનુક્રમે શોધો.

Options :

70819169641. sp^2, sp^2, sp^2, sp^3

70819169642. sp^3, sp, sp^3, sp^3

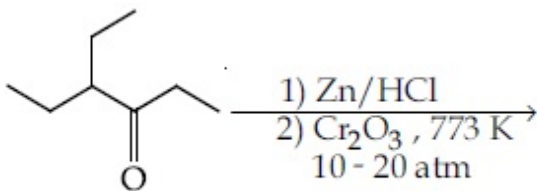
70819169643. sp^2, sp, sp^2, sp^3

70819169644. sp^2, sp^3, sp^2, sp^3

Question Number : 42 Question Id : 70819121495 Question Type : MCQ Option Shuffling : Yes

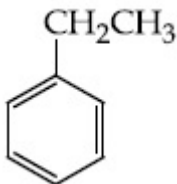
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1



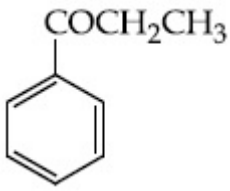
Considering the above reaction, the major product among the following is :

Options :

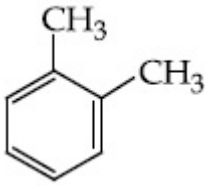


70819169645.

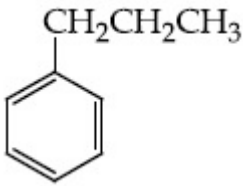
70819169646.



70819169647.



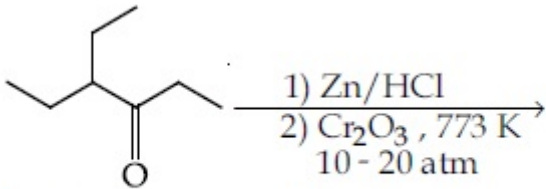
70819169648.



Question Number : 42 Question Id : 70819121495 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

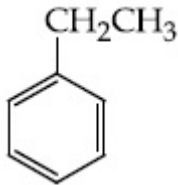
Correct Marks : 4 Wrong Marks : 1



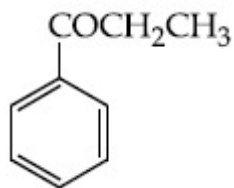
ઉપરોક્ત પ્રક્રિયા ધ્યાનમાં લઈ, નીચેનામાંથી મુખ્ય નીપજ શોધો.

Options :

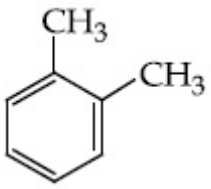
70819169645.



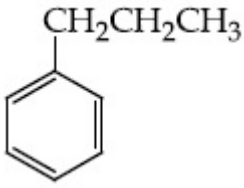
70819169646.



70819169647.



70819169648.

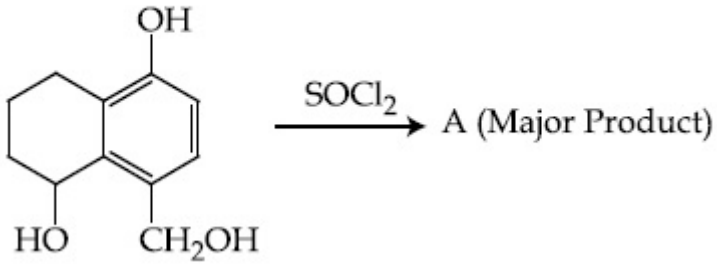


Question Number : 43 Question Id : 70819121496 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

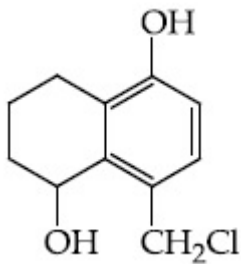
Correct Marks : 4 Wrong Marks : 1

Identify A in the given reaction.

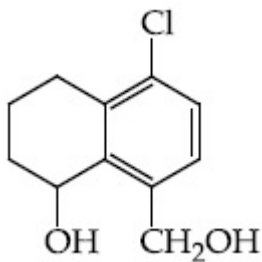


Options :

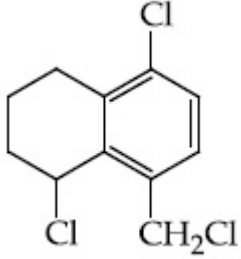
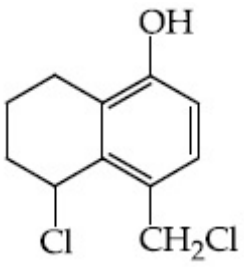
70819169649.



70819169650.



70819169651.

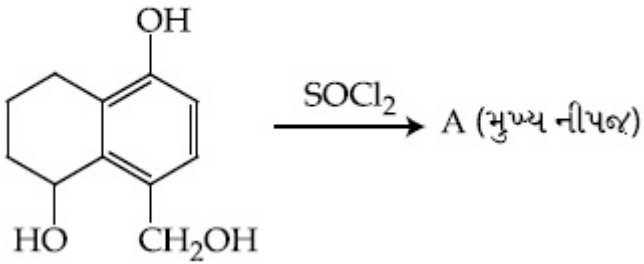


70819169652.

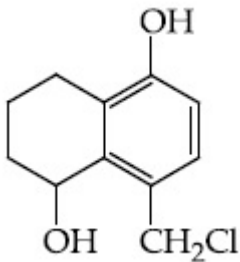
Question Number : 43 Question Id : 70819121496 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

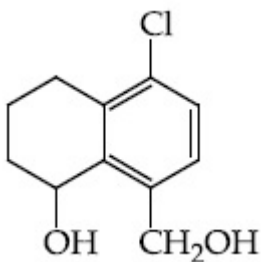
આપેલ પ્રક્રિયામાં A શોધો.



Options :

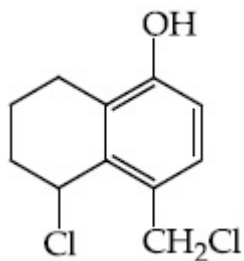


70819169649.

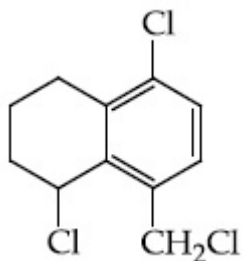


70819169650.

70819169651.



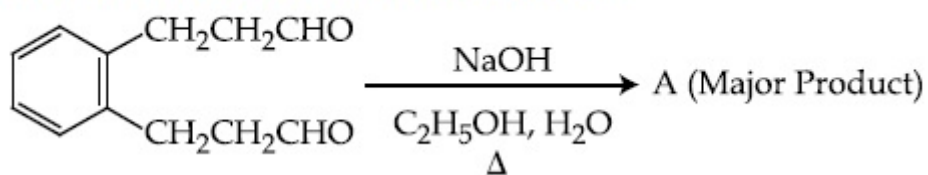
70819169652.



Question Number : 44 Question Id : 70819121497 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

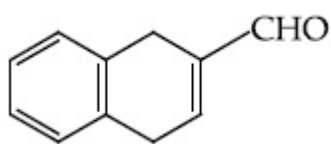
Correct Marks : 4 Wrong Marks : 1

Identify A in the given chemical reaction.

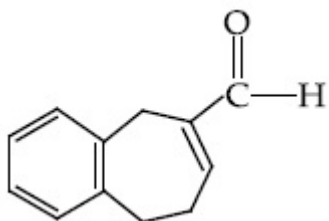


Options :

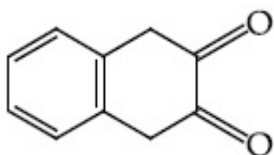
70819169653.



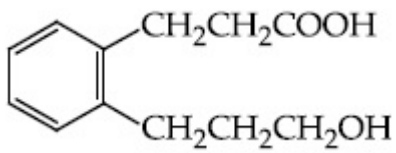
70819169654.



70819169655.



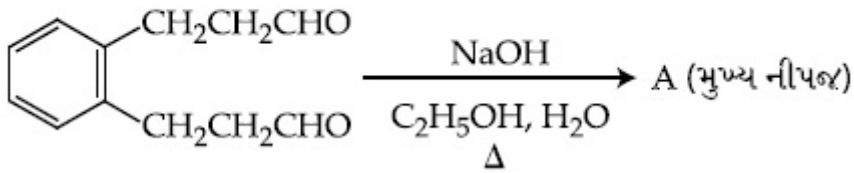
70819169656.



Question Number : 44 Question Id : 70819121497 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

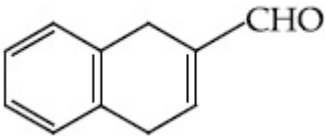
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી રાસાયણિક પ્રક્રિયામાં 'A' શોધો.

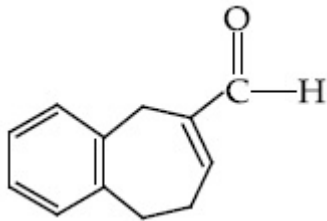


Options :

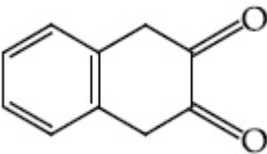
70819169653.



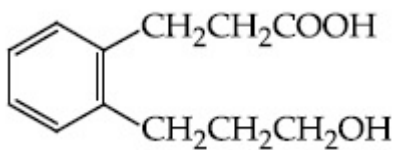
70819169654.



70819169655.



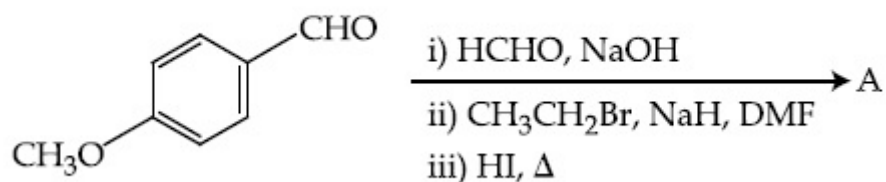
70819169656.



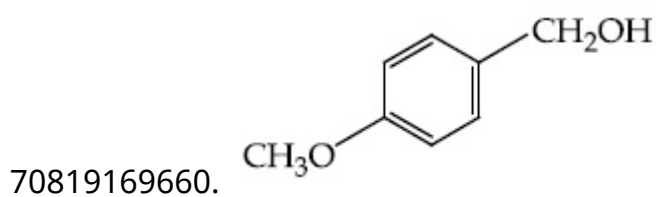
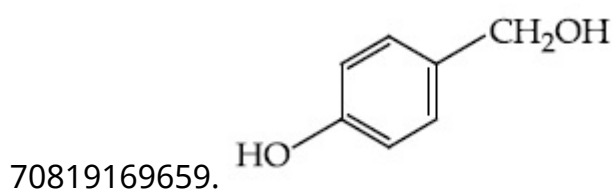
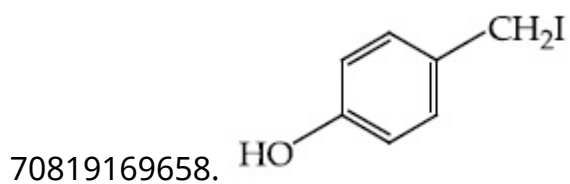
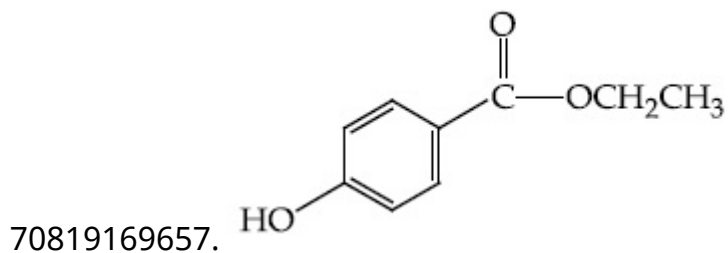
Question Number : 45 Question Id : 70819121498 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify A in the following chemical reaction.



Options :

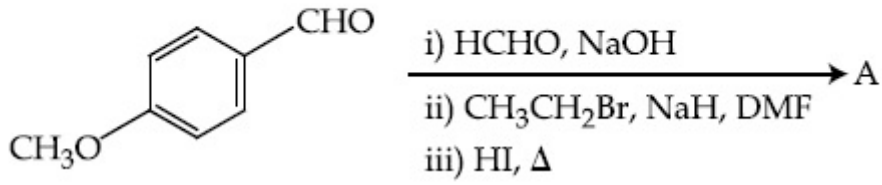


Question Number : 45 Question Id : 70819121498 Question Type : MCQ Option Shuffling : Yes

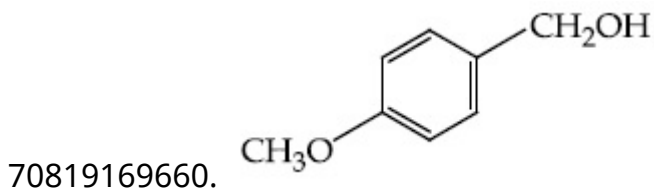
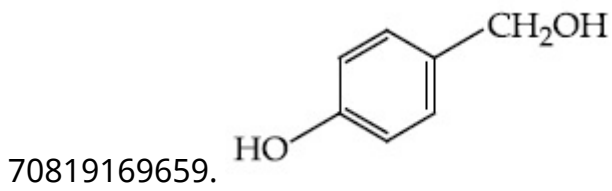
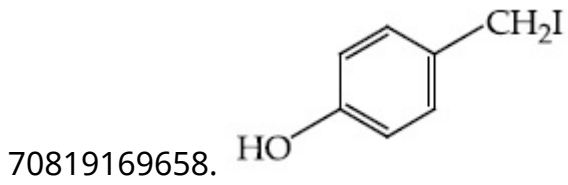
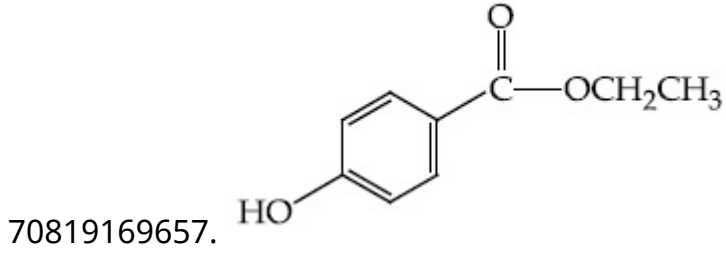
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ રાસાયણિક પ્રક્રિયામાં A ઓળખો.



Options :



Question Number : 46 Question Id : 70819121499 Question Type : MCQ Option Shuffling : Yes

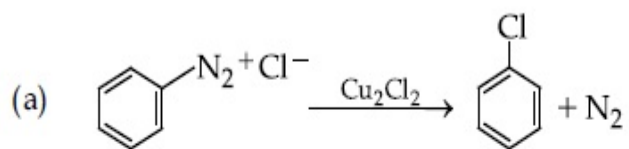
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

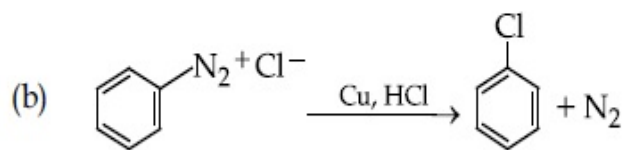
Match List-I with List-II.

List-I

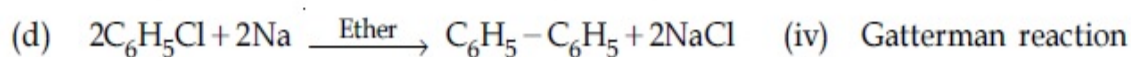
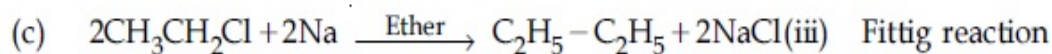
List-II



(i) Wurtz reaction



(ii) Sandmeyer reaction



Choose the correct answer from the options given below :

Options :

70819169661. (a) \rightarrow (ii), (b) \rightarrow (iv), (c) \rightarrow (i), (d) \rightarrow (iii)

70819169662. (a) \rightarrow (ii), (b) \rightarrow (i), (c) \rightarrow (iv), (d) \rightarrow (iii)

70819169663. (a) \rightarrow (iii), (b) \rightarrow (i), (c) \rightarrow (iv), (d) \rightarrow (ii)

70819169664. (a) \rightarrow (iii), (b) \rightarrow (iv), (c) \rightarrow (i), (d) \rightarrow (ii)

Question Number : 46 Question Id : 70819121499 Question Type : MCQ Option Shuffling : Yes

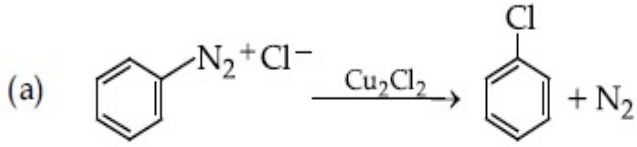
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

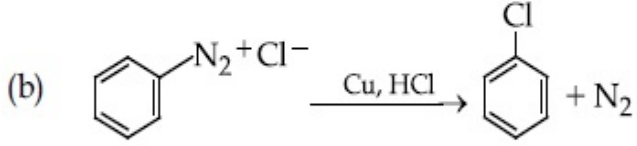
સૂચી - I ને સૂચી - II સાથે જોડો.

સૂચી - I

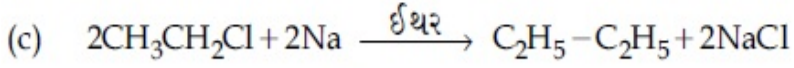
સૂચી - II



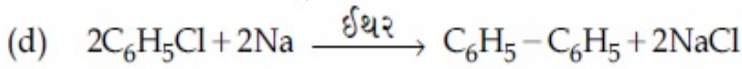
(i) વુર્ટઝ પ્રક્રિયા



(ii) સેન્ડમેયર પ્રક્રિયા



(iii) ફિટિંગ પ્રક્રિયા



(iv) ગેટરમેન પ્રક્રિયા

નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819169661. (a) → (ii), (b) → (iv), (c) → (i), (d) → (iii)

70819169662. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819169663. (a) → (iii), (b) → (i), (c) → (iv), (d) → (ii)

70819169664. (a) → (iii), (b) → (iv), (c) → (i), (d) → (ii)

Question Number : 47 Question Id : 70819121500 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Seliwanoff test and Xanthoproteic test are used for the identification of _____ and _____ respectively.

Options :

70819169665. aldoses, ketoses

70819169666. ketoses, aldoses

70819169667. ketoses, proteins

70819169668. proteins, ketoses

**Question Number : 47 Question Id : 70819121500 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

સેલીવોનોફ કસોટી અને ઝેન્થોપ્રોટીક કસોટીનો ઉપયોગ અનુક્રમે _____ અને _____ શોધવા માટે થાય છે.

Options :

70819169665. આલ્ડોઝ, કિટોઝ

70819169666. કિટોઝ, આલ્ડોઝ

70819169667. કિટોઝ, પ્રોટીન

70819169668. પ્રોટીન, કિટોઝ

**Question Number : 48 Question Id : 70819121501 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) Sucrose	(i) β -D-Galactose and β -D-Glucose
(b) Lactose	(ii) α -D-Glucose and β -D-Fructose
(c) Maltose	(iii) α -D-Glucose and α -D-Glucose

Choose the correct answer from the options given below :

Options :

70819169669. (a) \rightarrow (ii), (b) \rightarrow (i), (c) \rightarrow (iii)

70819169670. (a) → (iii), (b) → (ii), (c) → (i)

70819169671. (a) → (i), (b) → (iii), (c) → (ii)

70819169672. (a) → (iii), (b) → (i), (c) → (ii)

Question Number : 48 Question Id : 70819121501 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સૂચી - I અને સૂચી - II ને જોડો.

સૂચી - I	સૂચી - II
(a) સુક્રોઝ	(i) β -D-ગેલેક્ટોઝ અને β -D-ગ્લુકોઝ
(b) લેક્ટોઝ	(ii) α -D-ગ્લુકોઝ અને β -D-ફ્રુક્ટોઝ
(c) માલ્ટોઝ	(iii) α -D-ગ્લુકોઝ અને α -D-ગ્લુકોઝ

નીચે આપેલા વિકલ્પોમાંથી સાચો જવાબ પસંદ કરો.

Options :

70819169669. (a) → (ii), (b) → (i), (c) → (iii)

70819169670. (a) → (iii), (b) → (ii), (c) → (i)

70819169671. (a) → (i), (b) → (iii), (c) → (ii)

70819169672. (a) → (iii), (b) → (i), (c) → (ii)

Question Number : 49 Question Id : 70819121502 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

2,4-DNP test can be used to identify :

Options :

70819169673. halogens

70819169674. aldehyde

70819169675. amine

70819169676. ether

Question Number : 49 Question Id : 70819121502 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

2,4-DNP કસોટીનો ઉપયોગ શું ઓળખવા માટે થાય છે ?

Options :

70819169673. હેલોજનો

70819169674. આલ્ડીહાઇડ

70819169675. એમાઇન

70819169676. ઈથર

Question Number : 50 Question Id : 70819121503 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A. Phenyl methanamine

B. N,N-Dimethylaniline

C. N-Methyl aniline

D. Benzenamine

Choose the correct order of basic nature of the above amines.

Options :

70819169677. $A > B > C > D$

70819169678. $D > C > B > A$

70819169679. $A > C > B > D$

70819169680. $D > B > C > A$

Question Number : 50 Question Id : 70819121503 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A. ફિનાઈલ મિથેનામાઈન

B. N,N-ડાયમિથાઈલ એનિલીન

C. N-મિથાઈલ એનીલીન

D. બેન્ઝીનામાઈન

ઉપર આપેલા એમાઈનસની બેઝીક પ્રકૃત્તિનો સાચો ક્રમ પસંદ કરો.

Options :

70819169677. $A > B > C > D$

70819169678. $D > C > B > A$

70819169679. $A > C > B > D$

70819169680. $D > B > C > A$

Chemistry Section B

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 :	7081911253
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 70819121504 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The NaNO_3 weighed out to make 50 mL of an aqueous solution containing 70.0 mg Na^+ per mL is _____ g. (Rounded off to the nearest integer)

[Given : Atomic weight in g mol^{-1} - Na : 23 ; N : 14 ; O : 16]

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 : 70819121504 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

NaNO_3 નું _____ g વજન કરી અને તેનું 50 mL જલીય દ્રાવણ બનાવવામાં આવે કે જે 70.0 mg પ્રતિ mL Na^+ ધરાવે. (નજીકનો પૂર્ણાંકમાં રાઉન્ડ ઓફ) (આપેલ : પરમાણ્વીય વજન g mol^{-1} માં) (Na : 23 ; N : 14 ; O : 16)

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 :** 70819121505 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

The number of octahedral voids per lattice site in a lattice is _____. (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 : 52 **Question Id :** 70819121505 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

એક લેટાઈસમાં અષ્ટકલકીય છિદ્રોની સંખ્યા પ્રતિ લેટાઈસ નિર્દેશન _____ છે.
(નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

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 : 70819121506 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A ball weighing 10 g is moving with a velocity of 90 ms^{-1} . If the uncertainty in its velocity is 5%, then the uncertainty in its position is _____ $\times 10^{-33} \text{ m}$. (Rounded off to the nearest integer)

[Given : $h = 6.63 \times 10^{-34} \text{ Js}$]

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 : 70819121506 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક 10 g વજન ધરાવતો દડો 90 ms^{-1} વેગ સાથે ગતિ કરે છે. જો તેના વેગમાં અનિશ્ચિતતા 5% હોય તો તેના સ્થાનમાં અનિશ્ચિતતા _____ $\times 10^{-33} \text{ m}$ છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ) [આપેલ : $h = 6.63 \times 10^{-34} \text{ Js}$]

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 : 70819121507 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The average S–F bond energy in kJ mol^{-1} of SF_6 is _____. (Rounded off to the nearest integer)

[Given : The values of standard enthalpy of formation of $\text{SF}_6(\text{g})$, $\text{S}(\text{g})$ and $\text{F}(\text{g})$ are - 1100, 275 and 80 kJ mol^{-1} respectively.]

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 : 70819121507 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

SF_6 માં સરેરાશ S-F બંધ ઊર્જા kJ mol^{-1} માં _____ છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

[આપેલ : $SF_6(g)$, $S(g)$ અને $F(g)$ ની પ્રમાણિત સર્જન એન્થાલ્પીનાં મૂલ્યો અનુક્રમે - 1100, 275 અને 80 kJ mol^{-1} 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 : 55 Question Id : 70819121508 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

When 12.2 g of benzoic acid is dissolved in 100 g of water, the freezing point of solution was found to be -0.93°C ($K_f(\text{H}_2\text{O}) = 1.86 \text{ K kg mol}^{-1}$). The number (n) of benzoic acid molecules associated (assuming 100% association) 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 : 55 Question Id : 70819121508 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જ્યારે 12.2 g બેન્ઝોઈક એસિડને 100 g પાણીમાં ઓગાળવામાં આવે છે ત્યારે દ્રાવણનું ઠારબિંદુ -0.93°C પ્રાપ્ત થાય છે. ($K_f(\text{H}_2\text{O})=1.86 \text{ K kg mol}^{-1}$) સુયોજિત (100% સુયોજન ધારી લો) બેન્ઝોઈક એસિડ અણુઓની સંખ્યા (n) _____ 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 : 56 Question Id : 70819121509 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The pH of ammonium phosphate solution, if pK_a of phosphoric acid and pK_b of ammonium hydroxide are 5.23 and 4.75 respectively, 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 : 56 Question Id : 70819121509 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

બે ફોસ્ફોરિક એસિડનો pK_a અને એમોનિયમ હાઈડ્રોક્સાઈડનો pK_b અનુક્રમે 5.23 અને 4.75 હોય તો, એમોનિયમ ફોસ્ફેટ દ્રાવણની pH _____ છે.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

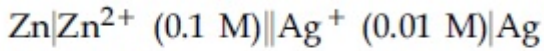
Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819121510 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Emf of the following cell at 298 K in V is $x \times 10^{-2}$.



The value of x is _____. (Rounded off to the nearest integer)

[Given : $E^\theta_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$; $E^\theta_{\text{Ag}^+/\text{Ag}} = +0.80 \text{ V}$; $\frac{2.303RT}{F} = 0.059$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

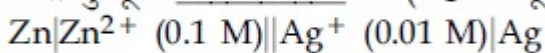
5 to 5.001

Question Number : 57 Question Id : 70819121510 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

298 K પર નીચે આપેલા કોષનો Emf V માં $x \times 10^{-2}$ છે.

તો x નું મૂલ્ય _____ છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)



[આપેલ : $E^\theta_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$; $E^\theta_{\text{Ag}^+/\text{Ag}} = +0.80 \text{ V}$; $\frac{2.303RT}{F} = 0.059$]

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 : 58 Question Id : 70819121511 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the activation energy of a reaction is 80.9 kJ mol^{-1} , the fraction of molecules at 700 K , having enough energy to react to form products is e^{-x} . The value of x is _____.
(Rounded off to the nearest integer)

[Use $R = 8.31 \text{ J K}^{-1} \text{ mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819121511 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

એક પ્રક્રિયાની સક્રિયકરણ શક્તિ 80.9 kJ mol^{-1} છે. તેમાં અણુઓનો એક અંશ (ભાગ) જે 700 K પર, પ્રક્રિયા કરીને નીપજ બનવા માટે પૂરતા પ્રમાણમાં ઊર્જા ધરાવે છે તે e^{-x} છે. તો x નું મૂલ્ય _____ છે. (નજીકના પૂર્ણાંકમાં રાઉન્ડ ઓફ)

[ઉપયોગ કરો : $R = 8.31 \text{ J K}^{-1} \text{ mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819121512 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In mildly alkaline medium, thiosulphate ion is oxidized by MnO_4^- to "A". The oxidation state of sulphur in "A" is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819121512 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

મંદ આલ્કલી માધ્યમમાં, થાયોસલ્ફેટ આયનનું MnO_4^- દ્વારા ઓક્સિડેશન થવાથી "A" મળે છે. તો "A" માં સલ્ફરની ઓક્સિડેશન અવસ્થા _____ 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 : 70819121513 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of stereoisomers possible for $[\text{Co}(\text{ox})_2(\text{Br})(\text{NH}_3)]^{2-}$ is _____.
[ox = oxalate]

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 : 70819121513 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$[\text{Co}(\text{ox})_2(\text{Br})(\text{NH}_3)]^{2-}$ માટે શક્ય અવકાશીય સમઘટકોની સંખ્યા _____ છે.
[ox = ઓક્સલેટ]

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 :	708191974
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 :	7081911254
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 70819121514 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the mirror image of the point $(1, 3, 5)$ with respect to the plane $4x - 5y + 2z = 8$ is (α, β, γ) , then $5(\alpha + \beta + \gamma)$ equals :

Options :

70819169691. 39

70819169692. 41

70819169693. 43

70819169694. 47

Question Number : 61 Question Id : 70819121514 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો બિંદુ $(1, 3, 5)$ નું સમતલ $4x - 5y + 2z = 8$ ને સાપેક્ષ પ્રતિબિંબ (α, β, γ) હોય, તો $5(\alpha + \beta + \gamma)$ બરાબર _____ થાય.

Options :

70819169691. 39

70819169692. 41

70819169693. 43

70819169694. 47

**Question Number : 62 Question Id : 70819121515 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Let $A = \{1, 2, 3, \dots, 10\}$ and $f: A \rightarrow A$ be defined as

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

Then the number of possible functions $g: A \rightarrow A$ such that $g \circ f = f$ is :

Options :

70819169695. 5!

70819169696. ${}^{10}C_5$

70819169697. 5^5

70819169698. 10^5

**Question Number : 62 Question Id : 70819121515 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

ધારોકે $A = \{1, 2, 3, \dots, 10\}$ અને $f: A \rightarrow A$ એ $f(k) = \begin{cases} k + 1 & \text{જો } k \text{ અચુગ્મ} \\ k & \text{જો } k \text{ ચુગ્મ} \end{cases}$, વડે વ્યાખ્યાયિત છે. તો

$g \circ f = f$ થાય તેવા શક્ય વિધેયો $g: A \rightarrow A$ ની સંખ્યા _____ છે.

Options :

70819169695. $5!$

70819169696. ${}^{10}C_5$

70819169697. 5^5

70819169698. 10^5

Question Number : 63 Question Id : 70819121516 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let A_1 be the area of the region bounded by the curves $y = \sin x$, $y = \cos x$ and y -axis in the first quadrant. Also, let A_2 be the area of the region bounded by the curves $y = \sin x$, $y = \cos x$,

x -axis and $x = \frac{\pi}{2}$ in the first quadrant. Then,

Options :

70819169699. $A_1 : A_2 = 1 : 2$ and $A_1 + A_2 = 1$

70819169700. $A_1 : A_2 = 1 : \sqrt{2}$ and $A_1 + A_2 = 1$

70819169701. $A_1 = A_2$ and $A_1 + A_2 = \sqrt{2}$

70819169702. $2A_1 = A_2$ and $A_1 + A_2 = 1 + \sqrt{2}$

Question Number : 63 Question Id : 70819121516 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે $y = \sin x$, $y = \cos x$ અને y -અક્ષ થી પ્રથમ ચરણમાં ઘેરાયેલા પ્રદેશનું ક્ષેત્રફળ A_1 છે. વળી ધારોકે વક્રો

$y = \sin x$, $y = \cos x$, x -અક્ષ અને $x = \frac{\pi}{2}$ થી પ્રથમ ચરણમાં ઘેરાયેલા પ્રદેશનું ક્ષેત્રફળ A_2 છે. તો :

Options :

70819169699. $A_1 : A_2 = 1 : 2$ and $A_1 + A_2 = 1$

70819169700. $A_1 : A_2 = 1 : \sqrt{2}$ and $A_1 + A_2 = 1$

70819169701. $A_1 = A_2$ and $A_1 + A_2 = \sqrt{2}$

70819169702. $2A_1 = A_2$ and $A_1 + A_2 = 1 + \sqrt{2}$

Question Number : 64 Question Id : 70819121517 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $0 < a, b < 1$, and $\tan^{-1} a + \tan^{-1} b = \frac{\pi}{4}$, then the value of

$(a + b) - \left(\frac{a^2 + b^2}{2}\right) + \left(\frac{a^3 + b^3}{3}\right) - \left(\frac{a^4 + b^4}{4}\right) + \dots$ is :

Options :

70819169703. e

70819169704. $e^2 - 1$

70819169705. $\log_e 2$

70819169706. $\log_e \left(\frac{e}{2}\right)$

Question Number : 64 Question Id : 70819121517 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો $0 < a, b < 1$, અને $\tan^{-1} a + \tan^{-1} b = \frac{\pi}{4}$ હોય, તો

$$(a + b) - \left(\frac{a^2 + b^2}{2}\right) + \left(\frac{a^3 + b^3}{3}\right) - \left(\frac{a^4 + b^4}{4}\right) + \dots \text{નું મૂલ્ય } \underline{\hspace{2cm}} \text{ છે.}$$

Options :

70819169703. e

70819169704. $e^2 - 1$

70819169705. $\log_e 2$

70819169706. $\log_e \left(\frac{e}{2}\right)$

Question Number : 65 Question Id : 70819121518 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let slope of the tangent line to a curve at any point $P(x, y)$ be given by $\frac{xy^2 + y}{x}$. If the curve intersects the line $x + 2y = 4$ at $x = -2$, then the value of y , for which the point $(3, y)$ lies on the curve, is :

Options :

70819169707. $-\frac{4}{3}$

70819169708. $-\frac{18}{19}$

70819169709. $\frac{18}{35}$

70819169710. $-\frac{18}{11}$

**Question Number : 65 Question Id : 70819121518 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

ધારોકે એક વક્રના કોઈ બિંદુ $P(x, y)$ આગળની સ્પર્શક રેખાનો ઠાળ $\frac{xy^2 + y}{x}$ વડે આપેલ છે. જો વક્ર, રેખા $x + 2y = 4$ ને $x = -2$ આગળ છેદે, તો $(3, y)$ બિંદુ વક્ર પર હોય તેવું y નું મૂલ્ય _____ છે.

Options :

70819169707. $-\frac{4}{3}$

70819169708. $-\frac{18}{19}$

70819169709. $\frac{18}{35}$

70819169710. $-\frac{18}{11}$

**Question Number : 66 Question Id : 70819121519 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

The sum of the series $\sum_{n=1}^{\infty} \frac{n^2 + 6n + 10}{(2n + 1)!}$ is equal to :

Options :

70819169711. $\frac{41}{8}e + \frac{19}{8}e^{-1} - 10$

70819169712. $\frac{41}{8}e + \frac{19}{8}e^{-1} + 10$

70819169713. $-\frac{41}{8}e + \frac{19}{8}e^{-1} - 10$

70819169714. $\frac{41}{8}e - \frac{19}{8}e^{-1} - 10$

**Question Number : 66 Question Id : 70819121519 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

શ્રેણી $\sum_{n=1}^{\infty} \frac{n^2 + 6n + 10}{(2n + 1)!}$ નો સરવાળો _____ થાય.

Options :

70819169711. $\frac{41}{8}e + \frac{19}{8}e^{-1} - 10$

70819169712. $\frac{41}{8}e + \frac{19}{8}e^{-1} + 10$

70819169713. $-\frac{41}{8}e + \frac{19}{8}e^{-1} - 10$

70819169714. $\frac{41}{8}e - \frac{19}{8}e^{-1} - 10$

Question Number : 67 Question Id : 70819121520 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f(x) = \int_0^x e^t f(t) dt + e^x$ be a differentiable function for all $x \in \mathbb{R}$. Then $f(x)$ equals :

Options :

70819169715. $2e^{(e^x-1)} - 1$

70819169716. $e^{(e^x-1)}$

70819169717. $e^{e^x} - 1$

70819169718. $2e^{e^x} - 1$

Question Number : 67 Question Id : 70819121520 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે પ્રત્યેક $x \in \mathbb{R}$ માટે $f(x) = \int_0^x e^t f(t) dt + e^x$ વિકલનીય વિધેય છે. તો $f(x) = \underline{\hspace{2cm}}$.

Options :

70819169715. $2e^{(e^x-1)} - 1$

70819169716. $e^{(e^x-1)}$

70819169717. $e^{e^x} - 1$

70819169718. $2e^{e^x} - 1$

Question Number : 68 Question Id : 70819121521 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f(x)$ be a differentiable function at $x = a$ with $f'(a) = 2$ and $f(a) = 4$. Then $\lim_{x \rightarrow a} \frac{xf(a) - af(x)}{x - a}$ equals :

Options :

70819169719. $2a - 4$

70819169720. $4 - 2a$

70819169721. $2a + 4$

70819169722. $a + 4$

Question Number : 68 Question Id : 70819121521 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે $f(x)$ એ $x = a$ આગળ વિકલનીય વિધેય છે, જ્યાં $f'(a) = 2$ અને $f(a) = 4$ છે. તો $\lim_{x \rightarrow a} \frac{xf(a) - af(x)}{x - a}$ = _____.

Options :

70819169719. $2a - 4$

70819169720. $4 - 2a$

70819169721. $2a + 4$

70819169722. $a + 4$

**Question Number : 69 Question Id : 70819121522 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Let $f(x) = \sin^{-1} x$ and $g(x) = \frac{x^2 - x - 2}{2x^2 - x - 6}$. If $g(2) = \lim_{x \rightarrow 2} g(x)$, then the domain of the function $f \circ g$ is :

Options :

70819169723. $(-\infty, -2] \cup \left[-\frac{3}{2}, \infty\right)$

70819169724. $(-\infty, -2] \cup \left[-\frac{4}{3}, \infty\right)$

70819169725. $(-\infty, -1] \cup [2, \infty)$

70819169726. $(-\infty, -2] \cup [-1, \infty)$

**Question Number : 69 Question Id : 70819121522 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f(x) = \sin^{-1} x$ અને $g(x) = \frac{x^2 - x - 2}{2x^2 - x - 6}$ એ $g(2) = \lim_{x \rightarrow 2} g(x)$, તો વિધેય $f \circ g$ નો પ્રદેશ _____ છે.

Options :

70819169723.

$$(-\infty, -2] \cup \left[-\frac{3}{2}, \infty\right)$$

70819169724.

$$(-\infty, -2] \cup \left[-\frac{4}{3}, \infty\right)$$

70819169725.

$$(-\infty, -1] \cup [2, \infty)$$

70819169726.

$$(-\infty, -2] \cup [-1, \infty)$$

Question Number : 70 Question Id : 70819121523 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let A(1, 4) and B(1, -5) be two points. Let P be a point on the circle $(x-1)^2 + (y-1)^2 = 1$ such that $(PA)^2 + (PB)^2$ have maximum value, then the points, P, A and B lie on :

Options :

70819169727. an ellipse

70819169728. a hyperbola

70819169729. a parabola

70819169730. a straight line

Question Number : 70 Question Id : 70819121523 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે A(1, 4) અને B(1, -5) બે બિંદુઓ છે. ધારોકે P એ વર્તુળ $(x-1)^2 + (y-1)^2 = 1$ પરનું એવું બિંદુ છે કે જેથી $(PA)^2 + (PB)^2$ નું મહત્તમ મૂલ્ય મળે, તો બિંદુઓ P, A અને B એ _____ પર આપેલ છે.

Options :

70819169727. એક ઊપવલય

70819169728. એક અતિવલય

70819169729. એક પરવલય

70819169730. એક સીધી રેખા

Question Number : 71 Question Id : 70819121524 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If vectors $\vec{a}_1 = x\hat{i} - \hat{j} + \hat{k}$ and $\vec{a}_2 = \hat{i} + y\hat{j} + z\hat{k}$ are collinear, then a possible unit vector parallel to the vector $x\hat{i} + y\hat{j} + z\hat{k}$ is :

Options :

70819169731. $\frac{1}{\sqrt{2}} (-\hat{j} + \hat{k})$

70819169732. $\frac{1}{\sqrt{3}} (\hat{i} - \hat{j} + \hat{k})$

70819169733. $\frac{1}{\sqrt{3}} (\hat{i} + \hat{j} - \hat{k})$

70819169734. $\frac{1}{\sqrt{2}} (\hat{i} - \hat{j})$

Question Number : 71 Question Id : 70819121524 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

બે સદિશો $\vec{a}_1 = x\hat{i} - \hat{j} + \hat{k}$ અને $\vec{a}_2 = \hat{i} + y\hat{j} + z\hat{k}$ સમરેખ હોય, તો $x\hat{i} + y\hat{j} + z\hat{k}$ ને સમાંતર શક્ય એકમ સદિશ _____ છે.

Options :

70819169731. $\frac{1}{\sqrt{2}} (-\hat{j} + \hat{k})$

70819169732. $\frac{1}{\sqrt{3}} (\hat{i} - \hat{j} + \hat{k})$

70819169733. $\frac{1}{\sqrt{3}} (\hat{i} + \hat{j} - \hat{k})$

70819169734. $\frac{1}{\sqrt{2}} (\hat{i} - \hat{j})$

Question Number : 72 Question Id : 70819121525 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $F_1(A, B, C) = (A \wedge \sim B) \vee [\sim C \wedge (A \vee B)] \vee \sim A$ and $F_2(A, B) = (A \vee B) \vee (B \rightarrow \sim A)$ be two logical expressions. Then :

Options :

70819169735. F_1 and F_2 both are tautologies

70819169736. F_1 is a tautology but F_2 is not a tautology

70819169737. F_1 is not a tautology but F_2 is a tautology

70819169738. Both F_1 and F_2 are not tautologies

Question Number : 72 Question Id : 70819121525 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે $F_1(A, B, C) = (A \wedge \sim B) \vee [\sim C \wedge (A \vee B)] \vee \sim A$ અને $F_2(A, B) = (A \vee B) \vee (B \rightarrow \sim A)$ એ બે તાર્કિક અભિવ્યક્તિઓ છે. તો :

Options :

70819169735. F_1 અને F_2 બંને નિત્યસત્ય છે.

70819169736. F_1 નિત્યસત્ય છે પરંતુ F_2 નિત્યસત્ય નથી.

70819169737. F_1 નિત્યસત્ય નથી પરંતુ F_2 નિત્યસત્ય છે.

70819169738. F_1 અને F_2 બંને નિત્યસત્ય નથી.

Question Number : 73 Question Id : 70819121526 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A seven digit number is formed using digits 3, 3, 4, 4, 4, 5, 5. The probability, that number so formed is divisible by 2, is :

Options :

70819169739. $\frac{3}{7}$

70819169740. $\frac{6}{7}$

70819169741. $\frac{1}{7}$

70819169742.

Question Number : 73 Question Id : 70819121526 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

3, 3, 4, 4, 4, 5, 5 અંકોનો ઉપયોગ કરી સાત આંકડાની સંખ્યા બનાવવામાં આવે છે. તે આરીતે રચાયેલ સંખ્યા 2 વડે વિભાજ્ય હોય તેની સંભાવના _____ છે.

Options :

70819169739. $\frac{3}{7}$

70819169740. $\frac{6}{7}$

70819169741. $\frac{1}{7}$

70819169742. $\frac{4}{7}$

Question Number : 74 Question Id : 70819121527 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the following system of equations :

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

$$2x + 6y - 11z = b$$

$$x - 2y + 7z = c,$$

where a, b and c are real constants. Then the system of equations :

Options :

70819169743. has a unique solution for all a, b and c

70819169744. has a unique solution when $5a = 2b + c$

70819169745. has infinite number of solutions when $5a = 2b + c$

70819169746. has no solution for all a, b and c

Question Number : 74 Question Id : 70819121527 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

સમીકરણ સંહતિ

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

$$2x + 6y - 11z = b$$

$$x - 2y + 7z = c, \text{ આપેલ છે,}$$

જ્યાં a, b અને c વાસ્તવિક અચળાંકો છે. તો સમીકરણ સંહતિને :

Options :

70819169743. બધાજ a, b અને c માટે અનન્ય ઉકેલ છે.

70819169744. જ્યારે $5a = 2b + c$ હોય ત્યારે અનન્ય ઉકેલ છે.

70819169745. જ્યારે $5a = 2b + c$ હોય ત્યારે અસંખ્ય ઉકેલો છે.

70819169746. બધાજ a, b અને c માટે ઉકેલ નથી.

Question Number : 75 Question Id : 70819121528 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The triangle of maximum area that can be inscribed in a given circle of radius ' r ' is :

Options :

70819169747. An isosceles triangle with base equal to $2r$.

70819169748. A right angle triangle having two of its sides of length $2r$ and r .

70819169749. An equilateral triangle of height $\frac{2r}{3}$.

70819169750. An equilateral triangle having each of its side of length $\sqrt{3} r$.

**Question Number : 75 Question Id : 70819121528 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

આપેલ r ત્રિજ્યાવાળા વર્તુળમાં અંતર્ગત હોય તેવો મહત્તમ ક્ષેત્રફળ ધરાવતો ત્રિકોણ એ :

Options :

70819169747. સમદ્વિબાજુ ત્રિકોણ છે કે જેના પાયાની લંબાઈ $2r$ છે.

70819169748. કાટકોણ ત્રિકોણ છે કે જેની બે બાજુઓની લંબાઈ $2r$ અને r છે.

70819169749. સમબાજુ ત્રિકોણ છે કે જેની ઊંચાઈ $\frac{2r}{3}$ છે.

70819169750. સમબાજુ ત્રિકોણ છે કે જેની ત્રણે બાજુઓની લંબાઈ $\sqrt{3} r$ છે.

**Question Number : 76 Question Id : 70819121529 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Let L be a line obtained from the intersection of two planes $x + 2y + z = 6$ and $y + 2z = 4$. If point $P(\alpha, \beta, \gamma)$ is the foot of perpendicular from $(3, 2, 1)$ on L , then the value of $21(\alpha + \beta + \gamma)$ equals :

Options :

70819169751. 68

70819169752. 102

70819169753. 136

70819169754. 142

Question Number : 76 Question Id : 70819121529 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે L એ સમવર્તી $x + 2y + z = 6$ અને $y + 2z = 4$ ના છેદથી મળતી રેખા છે. જો $(3, 2, 1)$ માંથી L પર દોરેલા લંબનો લંબચાદ બિંદુ $P(\alpha, \beta, \gamma)$ હોય, તો $21(\alpha + \beta + \gamma)$ નું મૂલ્ય _____ થાય.

Options :

70819169751. 68

70819169752. 102

70819169753. 136

70819169754. 142

Question Number : 77 Question Id : 70819121530 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined as

$$f(x) = \begin{cases} 2 \sin\left(-\frac{\pi x}{2}\right), & \text{if } x < -1 \\ ax^2 + x + b, & \text{if } -1 \leq x \leq 1 \\ \sin(\pi x), & \text{if } x > 1 \end{cases}$$

If $f(x)$ is continuous on \mathbb{R} , then $a + b$ equals :

Options :

70819169755. -3

70819169756. -1

70819169757. 1

70819169758. 3

Question Number : 77 Question Id : 70819121530 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ધારોકે વિધેય $f: \mathbb{R} \rightarrow \mathbb{R}$,

$$f(x) = \begin{cases} 2 \sin\left(-\frac{\pi x}{2}\right), & \text{જે } x < -1 \\ ax^2 + x + b, & \text{જે } -1 \leq x \leq 1 \\ \sin(\pi x), & \text{જે } x > 1 \end{cases}$$

વડે વ્યાખ્યાયીત છે. જે $f(x)$ એ \mathbb{R} પર સતત હોય, તો $a + b = \underline{\hspace{2cm}}$.

Options :

70819169755. -3

70819169756. -1

70819169757. 1

70819169758. ³

Question Number : 78 Question Id : 70819121531 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the locus of the mid-point of the line segment from the point (3, 2) to a point on the circle, $x^2 + y^2 = 1$ is a circle of radius r, then r is equal to :

Options :

70819169759. $\frac{1}{4}$

70819169760. $\frac{1}{3}$

70819169761. $\frac{1}{2}$

70819169762. 1

Question Number : 78 Question Id : 70819121531 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો બિંદુ (3, 2) થી વર્તુળ $x^2 + y^2 = 1$ પરના બિંદુ સુધીના રેખાખંડના મધ્યબિંદુના બિંદુપથનું સમીકરણ r ત્રિજ્યાવાળું વર્તુળ હોય, તો r = _____.

Options :

70819169759. $\frac{1}{4}$

70819169760. $\frac{1}{3}$

70819169761. $\frac{1}{2}$

70819169762. 1

Question Number : 79 Question Id : 70819121532 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A natural number has prime factorization given by $n=2^x3^y5^z$, where y and z are such that $y+z=5$ and $y^{-1} + z^{-1} = \frac{5}{6}$, $y > z$. Then the number of odd divisors of n , including 1, is :

Options :

70819169763. 6

70819169764. 11

70819169765. 12

70819169766. $6x$

Question Number : 79 Question Id : 70819121532 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

એક પ્રાકૃતિક સંખ્યાનું અવિભાજ્ય અવયવીકરણ $n=2^x3^y5^z$ વડે આપેલ છે, જ્યાં y અને z એ અવાં છે કે જેથી $y+z=5$ અને $y^{-1} + z^{-1} = \frac{5}{6}$, $y > z$ થાય. તો n ના 1 સહિતના અયુગ્મ ભાજકોની સંખ્યા _____ છે.

Options :

70819169763. 6

70819169764. 11

70819169765. 12

70819169766. $6x$

Question Number : 80 Question Id : 70819121533 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

For $x > 0$, if $f(x) = \int_1^x \frac{\log_e t}{(1+t)} dt$, then $f(e) + f\left(\frac{1}{e}\right)$ is equal to :

Options :

70819169767. 0

70819169768. 1

70819169769. $\frac{1}{2}$

70819169770. -1

Question Number : 80 Question Id : 70819121533 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

જો $x > 0$ માટે, $f(x) = \int_1^x \frac{\log_e t}{(1+t)} dt$ હોય, તો $f(e) + f\left(\frac{1}{e}\right) = \underline{\hspace{2cm}}$.

Options :

70819169767. 0

70819169768. 1

70819169769. $\frac{1}{2}$

70819169770. -1

Mathematics Section B

Section Id :	708191975
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 :	7081911255
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 70819121534 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $I_{m,n} = \int_0^1 x^{m-1}(1-x)^{n-1} dx$, for $m, n \geq 1$, and $\int_0^1 \frac{x^{m-1} + x^{n-1}}{(1+x)^{m+n}} dx = \alpha I_{m,n}$, $\alpha \in \mathbb{R}$, then α equals _____.

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 :** 70819121534 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

$$\text{If } I_{m,n} = \int_0^1 x^{m-1}(1-x)^{n-1} dx, \quad m, n \geq 1 \text{ and } \int_0^1 \frac{x^{m-1} + x^{n-1}}{(1+x)^{m+n}} dx = \alpha I_{m,n}, \quad \alpha \in \mathbb{R} \text{ then}$$

$\alpha =$ _____.

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 :** 70819121535 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

Let z be those complex numbers which satisfy

$$|z+5| \leq 4 \text{ and } z(1+i) + \bar{z}(1-i) \geq -10, \quad i = \sqrt{-1}.$$

If the maximum value of $|z+1|^2$ is $\alpha + \beta\sqrt{2}$, then the value of $(\alpha + \beta)$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819121535 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે z એવી સંકર સંખ્યાઓ છે, જે $|z+5| \leq 4$ અને $z(1+i) + \bar{z}(1-i) \geq -10, i = \sqrt{-1}$ નું સમાધાન કરે છે.
જો $|z+1|^2$ નું મહત્તમ મૂલ્ય $\alpha + \beta\sqrt{2}$ હોય, તો $(\alpha + \beta)$ નું મૂલ્ય _____ થાય.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 83 Question Id : 70819121536 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let the normals at all the points on a given curve pass through a fixed point (a, b) . If the curve passes through $(3, -3)$ and $(4, -2\sqrt{2})$, and given that $a - 2\sqrt{2}b = 3$, then $(a^2 + b^2 + ab)$ 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 : 83 Question Id : 70819121536 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે આપેલ વક્રના બધાજ બિંદુએ દોરેલ અભિલંબો એક નિશ્ચિત બિંદુ (a, b) માંથી પસાર થાય છે. જો વક્ર $(3, -3)$ અને $(4, -2\sqrt{2})$, માંથી પસાર થાય અને $a - 2\sqrt{2} b = 3$, આપેલ હોય, તો $(a^2 + b^2 + ab) =$ _____.

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 : 70819121537 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let a be an integer such that all the real roots of the polynomial $2x^5 + 5x^4 + 10x^3 + 10x^2 + 10x + 10$ lie in the interval $(a, a + 1)$. Then, $|a|$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 84 Question Id : 70819121537 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે a એ એવી પૂર્ણાંક છે કે જેથી બહુપદી $2x^5 + 5x^4 + 10x^3 + 10x^2 + 10x + 10$ નાં બધાજ વાસ્તવિકતા બીજ અંતરાલ $(a, a + 1)$ માં આવે તો $|a| =$ _____.

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 :** 70819121538 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

Let X_1, X_2, \dots, X_{18} be eighteen observations such that $\sum_{i=1}^{18} (X_i - \alpha) = 36$ and $\sum_{i=1}^{18} (X_i - \beta)^2 = 90$,

where α and β are distinct real numbers. If the standard deviation of these observations is 1, then the value of $|\alpha - \beta|$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 **Question Id :** 70819121538 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

ધારોકે X_1, X_2, \dots, X_{18} એ 18 અવલોકન છે કે જેથી $\sum_{i=1}^{18} (X_i - \alpha) = 36$ અને $\sum_{i=1}^{18} (X_i - \beta)^2 = 90$, જ્યાં α અને

β ભિન્ન વાસ્તવિક સંખ્યાઓ છે. જો આ અવલોકનોનું પ્રમાણિત વિચલન 1 હોય, તો $|\alpha - \beta|$ નું મૂલ્ય _____ થાય.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 Question Id : 70819121539 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 3 & 0 & -1 \end{bmatrix}$ satisfies the equation $A^{20} + \alpha A^{19} + \beta A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ for some

real numbers α and β , then $\beta - \alpha$ 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 : 86 Question Id : 70819121539 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો શ્રેણિક $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 3 & 0 & -1 \end{bmatrix}$ એ સમીકરણ $A^{20} + \alpha A^{19} + \beta A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ નું કેટલાક વાસ્તવિક સંખ્યાઓ

α અને β માટે સમાધાન કરે, તો $\beta - \alpha =$ _____.

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 : 70819121540 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let α and β be two real numbers such that $\alpha + \beta = 1$ and $\alpha\beta = -1$. Let $p_n = (\alpha)^n + (\beta)^n$, $p_{n-1} = 11$ and $p_{n+1} = 29$ for some integer $n \geq 1$. Then, the value of p_n^2 is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819121540 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે α અને β બે વાસ્તવિક સંખ્યાઓ છે કે જેથી $\alpha + \beta = 1$ અને $\alpha\beta = -1$. જો કોઈક પૂર્ણાંક $n \geq 1$ માટે ધારોકે $p_n = (\alpha)^n + (\beta)^n$, $p_{n-1} = 11$ અને $p_{n+1} = 29$ હોય, તો p_n^2 નું મૂલ્ય _____ થાય.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819121541 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The total number of 4-digit numbers whose greatest common divisor with 18 is 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 : 88 **Question Id :** 70819121541 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

જેનો 18 સાથેનો ગુરૂત્તમ સામાન્ય અવયવ 3 હોય તેવી 4 આંકડાની સંખ્યાઓની 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 : 89 **Question Id :** 70819121542 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

If the arithmetic mean and geometric mean of the p^{th} and q^{th} terms of the sequence $-16, 8, -4, 2, \dots$ satisfy the equation $4x^2 - 9x + 5 = 0$, then $p + q$ 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 : 70819121542 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

બે શ્રેણી $-16, 8, -4, 2 \dots$ ના p માં અને q માં પદોનો સમાંતર મધ્યક અને સમગુણોત્તર મધ્યક સમીકરણ $4x^2 - 9x + 5 = 0$ નું સમાધાન કરે, તો $p + q = \underline{\hspace{2cm}}$.

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 : 70819121543 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let L be a common tangent line to the curves $4x^2 + 9y^2 = 36$ and $(2x)^2 + (2y)^2 = 31$. Then the square of the slope of the line L is $\underline{\hspace{2cm}}$.

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 : 70819121543 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારોકે L એ વક્રો $4x^2 + 9y^2 = 36$ અને $(2x)^2 + (2y)^2 = 31$ ની સામાન્ય સ્પર્શરેખા છે. તો રેખા L ના ઢાળનો વર્ગ $\underline{\hspace{2cm}}$ થાય.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001