nta

Question Paper Name :	B TECH EM 25th Feb 2021 Shift 1
Subject Name :	B TECH EM
Creation Date :	2021-02-24 14:12:52
Duration :	180
Number of Questions :	90
Total Marks :	300
Display Marks:	Yes

B TECH EM

Group Number :	1
Group Id :	708191195
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 :	708191748
Section Number :	1
Section type :	Online

ZOLLEGE.in

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 :	7081911028
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 70819118124 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 : The escape velocities of planet A and B are same. But A and B are of unequal mass.

Reason R : The product of their mass and radius must be same. $M_1R_1 = M_2R_2$

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

Options :

70819159521. Both A and R are correct and R is the correct explanation of A

70819159522. Both A and R are correct but R is NOT the correct explanation of A

70819159523. A is correct but R is not correct

70819159524. A is not correct but R is correct

Question Number : 1 Question Id : 70819118124 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

खाली दोन विधाने दिलेली आहेत. निश्चित **विधान A** आणि **कारण R** असे दिलेले आहे.

विधान A : A व B ह्या उपग्रहांचा मोचन वेग सारखाच आहे. पण A व B चे वस्तुमान एकसारखे नाही.

कारण R : त्यांच्या त्रिज्या व वस्तुमान यांचा गुणाकार सारखाच असला पाहिजे $M_1R_1 = M_2R_2$.

वरील विधानांसंदर्भात, खाली दिलेल्या पर्यायांतून **योग्य** उत्तर निवडा.

Options :

70819159521. **A** व **R** दोन्ही बरोबर आहेत व **R** हे **A** चे योग्य स्पष्टीकरण आहे.

70819159522. **A** व **R** दोन्ही बरोबर आहेत पण **R** हे **A** चे योग्य स्पष्टीकरण नाही.

70819159523. **A** बरोबर आहे पण **R** बरोबर नाही.

70819159524. **A** बरोबर नाही पण **R** बरोबर आहे.

Question Number : 2 Question Id : 70819118125 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)	h (Planck's constant)	(i)	$[M\,L\,T^{-1}]$
(b)	E (kinetic energy)	(ii)	$[M\,L^2\,T^{-1}]$
(c)	V (electric potential)	(iii)	$[M\,L^2\,T^{-2}]$
(d)	P (linear momentum)	(iv)	$[M\,L^2\,I^{-1}\,T^{-3}]$

Choose the correct answer from the options given below :

Options :

70819159525. (a) → (i), (b) → (ii), (c) → (iv), (d) → (iii)

70819159526. (a) → (iii), (b) → (iv), (c) → (ii), (d) → (i)

70819159527. (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)

70819159528. (a) → (iii), (b) → (ii), (c) → (iv), (d) → (i)

ZOLLEGE.in

Question Number : 2 Question Id : 70819118125 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालील जोड्या जुळवा.

यादी - I		यादी - II	
(a)	h (प्लँकचा स्थिरांक)	(i)	$[M\,L\,T^{-1}]$
(b)	E (गतिज ऊर्जा)	(ii)	$[M\,L^2\,T^{-1}]$
(c)	V (विद्युत विभव)	(iii)	$[M\,L^2\,T^{-2}]$
(d)	P (रेषीय संवेग)	(iv)	$[M\,L^2\,I^{-1}\,T^{-3}]$

खाली दिलेल्या पर्यायांतून **योग्य** उत्तर निवडा :

Options :

70819159525. (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

70819159526. (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

70819159527. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

70819159528. (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

Question Number : 3 Question Id : 70819118126 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the time period of a two meter long simple pendulum is 2 s, the acceleration due to gravity at the place where pendulum is executing S.H.M. is :

Options :

70819159529. $16\ m/s^2$

70819159530. $\pi^2\,ms^{-2}$

ZOLLEGE.in

70819159531. $9.8\ \mathrm{ms}^{-2}$

70819159532. $2\pi^2\ \mathrm{ms}^{-2}$

Question Number : 3 Question Id : 70819118126 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर दोन मीटर लांब साध्या दोलकाचा कालखंड काल $2\,\mathrm{s}$ आहे, ज्याजागी दोलक सरल आवर्त गतीत आहे तेथे गुरुत्वीय त्वरण _____ आहे.

Options :

70819159529. $16\ \mathrm{m/s^2}$

70819159530. $\pi^2\ \mathrm{ms}^{-2}$

70819159531. $9.8\ \mathrm{ms}^{-2}$

70819159532. $2\pi^2\ \mathrm{ms}^{-2}$

Question Number : 4 Question Id : 70819118127 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A student is performing the experiment of resonance column. The diameter of the column tube is 6 cm. The frequency of the tuning fork is 504 Hz. Speed of the sound at the given temperature is 336 m/s. The zero of the metre scale coincides with the top end of the resonance column tube. The reading of the water level in the column when the first resonance occurs is :

Options :

70819159533. $16.6\ \mathrm{cm}$

70819159534. $18.4\ \mathrm{cm}$

ZOLLEGE.in

70819159535. $14.8\ \text{cm}$

70819159536. $13\ \text{cm}$

Question Number : 4 Question Id : 70819118127 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

एक विद्यार्थी संस्पंदी नळीचा प्रयोग करीत आहे. नळीचा व्यास $6\ \text{cm}$ आहे. नादकाट्याची वारंवारता $504\ \text{Hz}$ आहे. दिलेल्या तापमानास ध्वनिचा वेग $336\ \text{m/s}$ आहे. संस्पंदी नळीच्या टोकाशी मीटर श्रेणीचा शून्य जुळतो. जेव्हा पहिली संस्पंदी तयार होते तेव्हा नळीतील पाण्याच्या पातळीचे वाचन _____ आहे.

Options :

70819159533. $16.6\ \text{cm}$

70819159534. $18.4\ \text{cm}$

70819159535. $14.8\ \text{cm}$

70819159536. $13\ \text{cm}$

Question Number : 5 Question Id : 70819118128 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

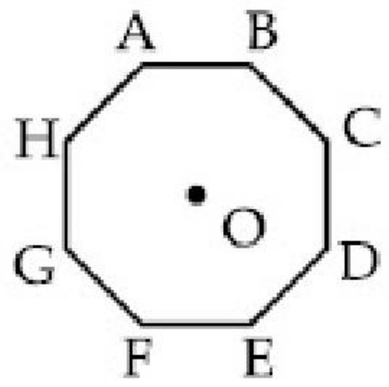
Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

In an octagon ABCDEFGH of equal side, what is the sum of

$$\vec{AB}+\vec{AC}+\vec{AD}+\vec{AE}+\vec{AF}+\vec{AG}+\vec{AH},$$

if, $\vec{AO}=2\hat{i}+3\hat{j}-4\hat{k}$



Options :

70819159537. $16\hat{i}+24\hat{j}+32\hat{k}$

70819159538. $-16\hat{i}-24\hat{j}+32\hat{k}$

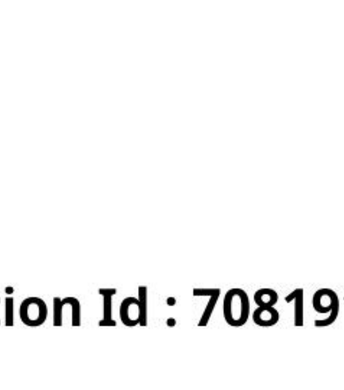
70819159539. $16\hat{i}-24\hat{j}+32\hat{k}$

70819159540. $16\hat{i}+24\hat{j}-32\hat{k}$

Question Number : 5 Question Id : 70819118128 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ABCDEFGH ह्या अष्टकोनाच्या बाजू सारख्या आहेत, $\vec{AB}+\vec{AC}+\vec{AD}+\vec{AE}+\vec{AF}+\vec{AG}+\vec{AH}$ ह्यांची बेरीज किती आहे, जर $\vec{AO}=2\hat{i}+3\hat{j}-4\hat{k}$ आहे.



Options :

ZOLLEGE.in

70819159537. $16\hat{i}+24\hat{j}+32\hat{k}$

70819159538. $-16\hat{i}-24\hat{j}+32\hat{k}$

70819159539. $16\hat{i}-24\hat{j}+32\hat{k}$

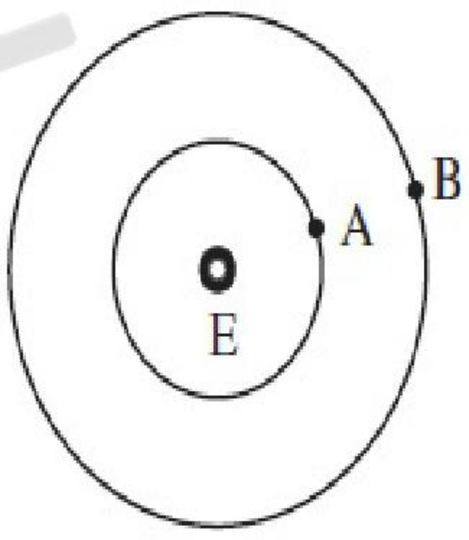
70819159540. $16\hat{i}+24\hat{j}-32\hat{k}$

Question Number : 6 Question Id : 70819118129 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two satellites A and B of masses 200 kg and 400 kg are revolving round the earth at height of 600 km and 1600 km respectively.

If T_A and T_B are the time periods of A and B respectively then the value of $T_B - T_A$:



[Given : radius of earth = 6400 km, mass of earth = 6×10^{24} kg]

Options :

70819159541. 1.33×10^{3} s

70819159542. 4.24×10^{3} s

70819159543. 4.24×10^{2} s

70819159544. 3.33×10^{2} s

ZOLLEGE.in

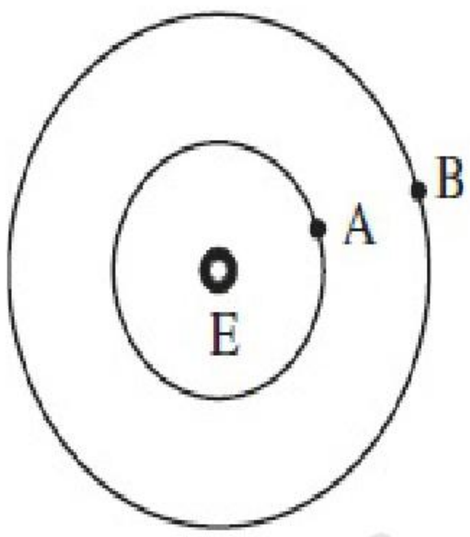
Question Number : 6 Question Id : 70819118129 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A व B हे दोन उपग्रह अनुक्रमे $200\ \text{kg}$ व $400\ \text{kg}$ वस्तुमानाचे असून ते पृथ्वीभोवती अनुक्रमे $600\ \text{km}$ व $1600\ \text{km}$ उंचीवर घूर्णन करीत आहेत.

जर T_A व T_B हे अनुक्रमे A व B चे कालखंड काल आहेत तर $(T_B - T_A)$ ची किंमत _____ आहे.

(दिले आहे : पृथ्वीची त्रिज्या $= 6400\ \text{km}$, पृथ्वीचे वस्तुमान $= 6 \times 10^{24}\ \text{kg}$)



Options :

70819159541. $1.33 \times 10^3\ \text{s}$

70819159542. $4.24 \times 10^3\ \text{s}$

70819159543. $4.24 \times 10^2\ \text{s}$

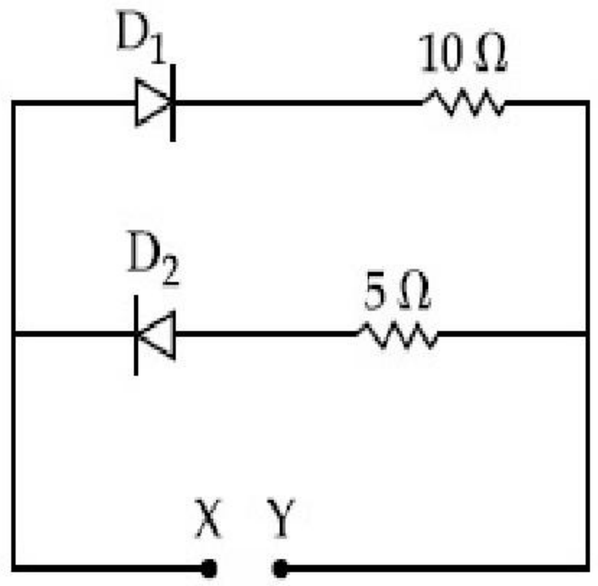
70819159544. $3.33 \times 10^2\ \text{s}$

Question Number : 7 Question Id : 70819118130 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

A 5 V battery is connected across the points X and Y. Assume D_1 and D_2 to be normal silicon diodes. Find the current supplied by the battery if the +ve terminal of the battery is connected to point X.



Options :

70819159545. ~ 0.5 A

70819159546. ~ 0.43 A

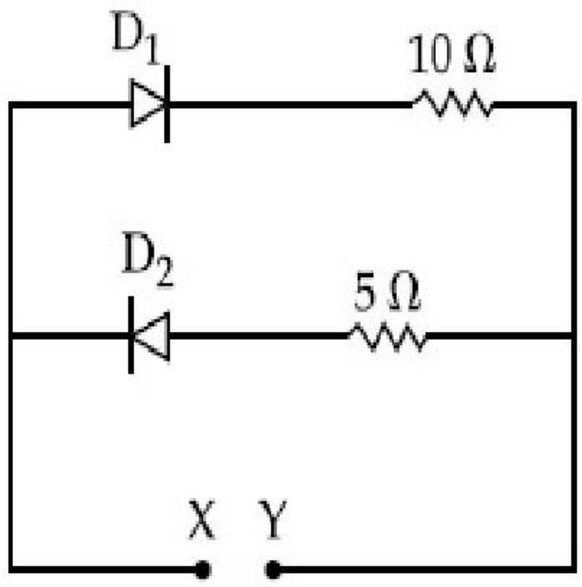
70819159547. ~ 0.86 A

70819159548. ~ 1.5 A

Question Number : 7 Question Id : 70819118130 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

X व Y बिंदूंमध्ये एक 5 V बॅटरी जोडलेली आहे. D_1 व D_2 हे सामान्य सिलीकॉन डायोड माना. जर बॅटरीचे धन टोक X बिंदूला जोडले तर बॅटरीने पुरवठा केलेली धारा काढा.



Options :

ZOLLEGE.in

70819159545. ~ 0.5 A

70819159546. ~ 0.43 A

70819159547. ~ 0.86 A

70819159548. ~ 1.5 A

Question Number : 8 Question Id : 70819118131 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : A speech signal of 2 kHz is used to modulate a carrier signal of 1 MHz. The bandwidth requirement for the signal is 4 kHz.

Statement II : The side band frequencies are 1002 kHz and 998 kHz.

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

Options :

70819159549. Both Statement I and Statement II are true

70819159550. Both Statement I and Statement II are false

70819159551. Statement I is true but Statement II is false

70819159552. Statement I is false but Statement II is true

Question Number : 8 Question Id : 70819118131 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

खाली दोन विधाने दिलेली आहेत.

विधान I : 1 MHz चा वाहनिक संकेत आपरिवर्तीत करण्यासाठी 2 kHz चा वाक् संकेत वापरला. संकेतासाठी 4 kHz ची बँडरूंदी लागते.

विधान II : बाजूच्या बँडसाठी वारंवारता 1002 kHz व 998 kHz आहेत.

वरील विधानांसंदर्भात, खाली दिलेल्या पर्यायांतून **योग्य** पर्याय निवडा.

Options :

70819159549. विधान I व विधान II दोन्ही बरोबर आहेत.

70819159550. विधान I व विधान II दोन्ही चूक आहेत.

70819159551. विधान I बरोबर आहे पण विधान II चूक आहे.

70819159552. विधान I चूक आहे पण विधान II बरोबर आहे.

Question Number : 9 Question Id : 70819118132 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 : When a rod lying freely is heated, no thermal stress is developed in it.

Reason R : On heating, the length of the rod increases.

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

Options :

70819159553. Both **A** and **R** are true and **R** is the correct explanation of **A**

70819159554. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

70819159555. **A** is true but **R** is false

70819159556. **A** is false but **R** is true

ZOLLEGE.in

Question Number : 9 Question Id : 70819118132 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खाली दोन विधाने दिलेली आहेत. निश्चित **विधान A** आणि **कारण R** असे दिलेले आहे.

विधान A : जेव्हा मुक्त पडलेला दांडा तापविला, त्यात औष्णिक प्रतिबल तयार होत नाही.

कारण R : तापविला असता, दांड्याची लांबी वाढते.

वरील विधानांसंदर्भात, खाली दिलेल्या पर्यायांतून **योग्य** उत्तर निवडा.

Options :

70819159553. **A** व **R** दोन्ही खरी आहेत व **R** हे **A** चे योग्य स्पष्टीकरण आहे.

70819159554. **A** व **R** दोन्ही खरी आहेत पण **R** हे **A** चे योग्य स्पष्टीकरण नाही.

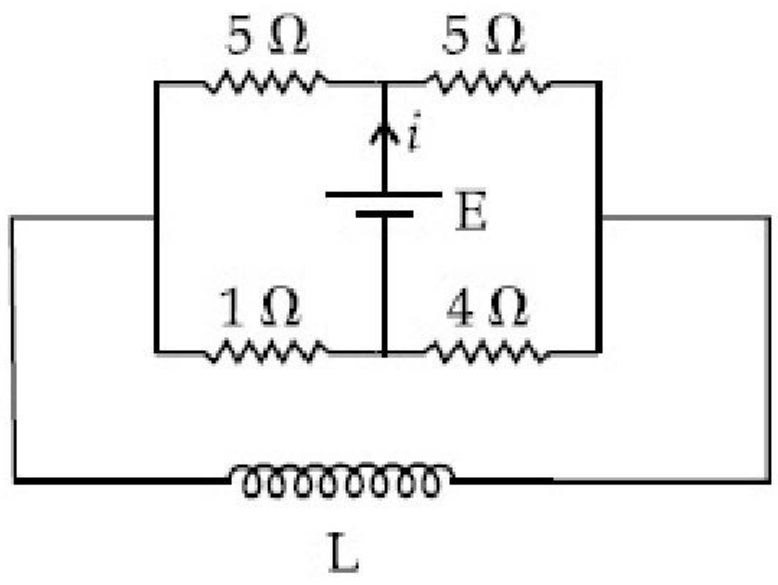
70819159555. **A** खरे आहे पण **R** खोटे आहे.

70819159556. **A** खोटे आहे पण **R** खरे आहे.

Question Number : 10 Question Id : 70819118133 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The current (i) at time $t=0$ and $t=\infty$ respectively for the given circuit is :



Options :

70819159557. $\frac{18E}{55}, \frac{5E}{18}$

ZOLLEGE.in

70819159558. $\frac{5E}{18}, \frac{18E}{55}$

70819159559. $\frac{10E}{33}, \frac{5E}{18}$

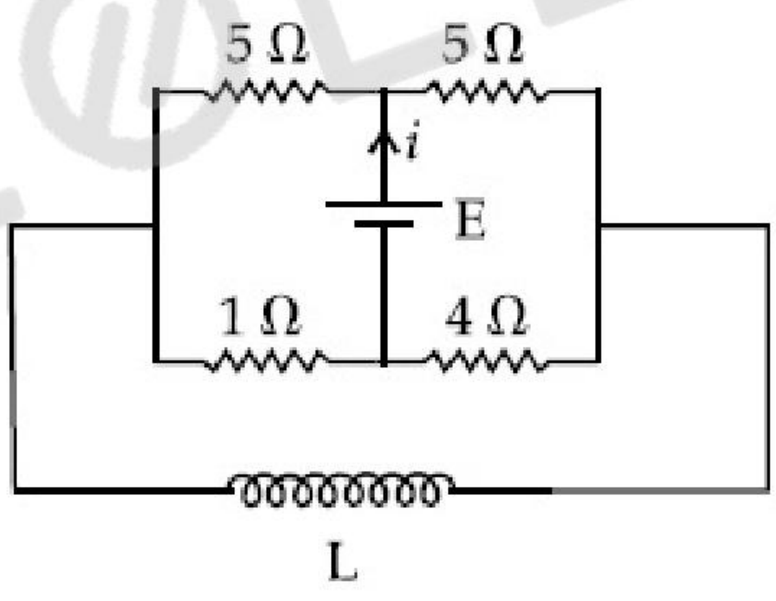
70819159560. $\frac{5E}{18}, \frac{10E}{33}$

Question Number : 10 Question Id : 70819118133 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

दिलेल्या परिपथात काल $t=0$ व $t=\infty$ असताना धारा (i) काढा.



Options :

70819159557. $\frac{18E}{55}, \frac{5E}{18}$

70819159558. $\frac{5E}{18}, \frac{18E}{55}$

70819159559. $\frac{10E}{33}, \frac{5E}{18}$

70819159560.

ZOLLEGE.in

$\frac{5E}{18}, \frac{10E}{33}$

Question Number : 11 Question Id : 70819118134 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The pitch of the screw gauge is 1 mm and there are 100 divisions on the circular scale. When nothing is put in between the jaws, the zero of the circular scale lies 8 divisions below the reference line. When a wire is placed between the jaws, the first linear scale division is clearly visible while 72^{nd} division on circular scale coincides with the reference line. The radius of the wire is :

Options :

70819159561. 1.64 mm

70819159562. 0.90 mm

70819159563. 0.82 mm

70819159564. 1.80 mm

Question Number : 11 Question Id : 70819118134 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

स्क्रू प्रमापीचे स्वरमान 1 mm आहे व त्यास वर्तुळाकार श्रेणीत 100 भाग आहेत. जेव्हा जॉ मध्ये काहीही ठेवलेले नाही, वर्तुळाकार श्रेणीचा शून्य संदर्भ रेषेच्या 8 भाग खाली आहे. जेव्हा जॉ मध्ये तार ठेवली तेव्हा पहिल्या रेषीय श्रेणीचा भाग स्वच्छ दिसला तर संदर्भ रेषेबरोबर वर्तुळाकार श्रेणीतील 72 रेषा संपाती होतात. तारेची त्रिज्या mm मध्ये _____ आहे.

Options :

70819159561. 1.64 mm

70819159562. 0.90 mm

ZOLLEGE.in

70819159563. $0.82\ \text{mm}$

70819159564. $1.80\ \text{mm}$

Question Number : 12 Question Id : 70819118135 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An α particle and a proton are accelerated from rest by a potential difference of 200 V. After this, their de Broglie wavelengths are λ_α and λ_p respectively. The ratio $\frac{\lambda_p}{\lambda_\alpha}$ is :

Options :

70819159565. 2.8

70819159566. 8

70819159567. 7.8

70819159568. 3.8

Question Number : 12 Question Id : 70819118135 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

α-कण व प्रोटॉन स्थिरतेपासून 200 V विभवांतराने त्वरणित केले. त्यानंतर त्यांच्या डी–ब्रोगीली तरंगलांबी अनुक्रमे λ_α व λ_p आहेत. $\frac{\lambda_p}{\lambda_\alpha}$ चे गुणोत्तर _____ आहे.

Options :

70819159565. 2.8

ZOLLEGE.in

70819159566. 8

70819159567. 7.8

70819159568. 3.8

Question Number : 13 Question Id : 70819118136 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two coherent light sources having intensity in the ratio $2x$ produce an interference pattern.

The ratio $\frac{I_{max}-I_{min}}{I_{max}+I_{min}}$ will be :

Options :

70819159569. $\frac{\sqrt{2x}}{2x+1}$

70819159570. $\frac{2\sqrt{2x}}{2x+1}$

70819159571. $\frac{\sqrt{2x}}{x+1}$

70819159572. $\frac{2\sqrt{2x}}{x+1}$

Question Number : 13 Question Id : 70819118136 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

दोन संसंजित प्रकाश उद्‌गमांच्या तीव्रतेचे गुणोत्तर $2x$ असून ते व्यतिकरण प्रतिरूप तयार करतात.

गुणोत्तर $\frac{I_{\text{महत्तम}} - I_{\text{लघुत्तम}}}{I_{\text{महत्तम}} + I_{\text{लघुत्तम}}}$ = _____ असेल.

Options :

70819159569. $\frac{\sqrt{2x}}{2x+1}$

70819159570. $\frac{2\sqrt{2x}}{2x+1}$

70819159571. $\frac{\sqrt{2x}}{x+1}$

70819159572. $\frac{2\sqrt{2x}}{x+1}$

Question Number : 14 Question Id : 70819118137 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An engine of a train, moving with uniform acceleration, passes the signal-post with velocity u and the last compartment with velocity v . The velocity with which middle point of the train passes the signal post is :

Options :

70819159573. $\frac{u+v}{2}$

70819159574. $\frac{v-u}{2}$

70819159575. $\sqrt{\frac{v^2+u^2}{2}}$

ZOLLEGE.in

70819159576. $\sqrt{\frac{v^2-u^2}{2}}$

Question Number : 14 Question Id : 70819118137 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

आगगाडीचे अभियंत्र एकसमान त्वरणाने गतिमान असून ते संकेत ठिकाणापासून u वेगाने जाते व शेवटचा डबा v वेगाने जातो. आगगाडीचा मध्यबिंदू संकेत ठिकाणापासून जातानाचा वेग _____ आहे.

Options :

70819159573. $\frac{u+v}{2}$

70819159574. $\frac{v-u}{2}$

70819159575. $\sqrt{\frac{v^2+u^2}{2}}$

70819159576. $\sqrt{\frac{v^2-u^2}{2}}$

Question Number : 15 Question Id : 70819118138 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A proton, a deuteron and an α particle are moving with same momentum in a uniform magnetic field. The ratio of magnetic forces acting on them is _____ and their speed is _____, in the ratio.

Options :

ZOLLEGE.in

70819159577. $4:2:1$ and $2:1:1$

70819159578. $2:1:1$ and $4:2:1$

70819159579. $1:2:4$ and $1:1:2$

70819159580. $1:2:4$ and $2:1:1$

Question Number : 15 Question Id : 70819118138 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

प्रोटॉन, ड्युटेरॉन व α-कण हे एकसमान चुंबकीय क्षेत्रात सारख्याच संवेगाने गतिमान आहेत. दिलेल्या क्रमात, त्यावर होणाऱ्या चुंबकीय बलाचे गुणोत्तर _____ आहे व त्यांच्या वेगाचे गुणोत्तर _____ आहे.

Options :

70819159577. $4:2:1$ व $2:1:1$

70819159578. $2:1:1$ व $4:2:1$

70819159579. $1:2:4$ व $1:1:2$

70819159580. $1:2:4$ व $2:1:1$

Question Number : 16 Question Id : 70819118139 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Magnetic fields at two points on the axis of a circular coil at a distance of 0.05 m and 0.2 m from the centre are in the ratio 8 : 1. The radius of coil is _____.

Options :

ZOLLEGE.in

70819159581. $0.1\ \mathrm{m}$

70819159582. $0.15\ \mathrm{m}$

70819159583. $0.2\ \mathrm{m}$

70819159584. $1.0\ \mathrm{m}$

Question Number : 16 Question Id : 70819118139 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

वर्तुळाकार कुंडलाच्या मध्यापासून अक्षावर $0.05\ \mathrm{m}$ व $0.2\ \mathrm{m}$ अंतरावर दोन बिंदूमधील चुंबकीय क्षेत्रांचे गुणोत्तर $8:1$ आहे. कुंडलाची त्रिज्या _____ आहे.

Options :

70819159581. $0.1\ \mathrm{m}$

70819159582. $0.15\ \mathrm{m}$

70819159583. $0.2\ \mathrm{m}$

70819159584. $1.0\ \mathrm{m}$

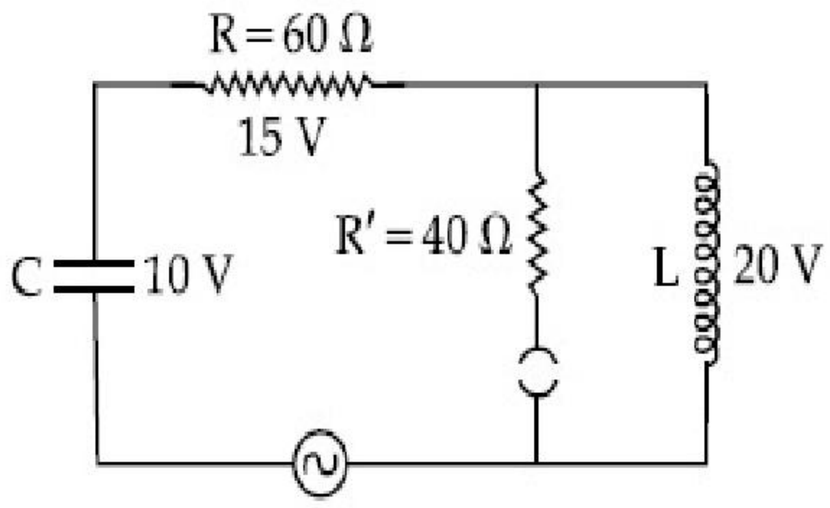
Question Number : 17 Question Id : 70819118140 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

The angular frequency of alternating current in a L-C-R circuit is 100 rad/s. The components connected are shown in the figure. Find the value of inductance of the coil and capacity of condenser.



Options :

70819159585. 1.33 H and 250 μF

70819159586. 1.33 H and 150 μF

70819159587. 0.8 H and 150 μF

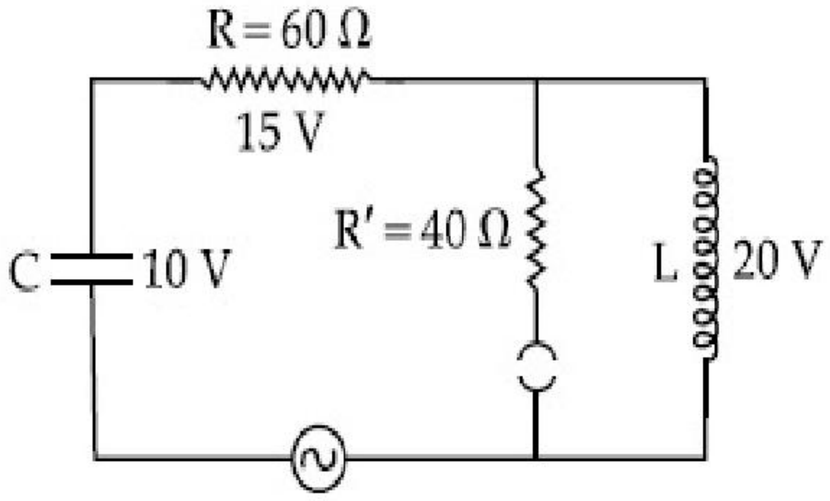
70819159588. 0.8 H and 250 μF

Question Number : 17 Question Id : 70819118140 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

L-C-R परिपथात प्रत्यावर्ती धारेची कोनीय वारंवारता 100 rad/s आहे. आकृतीत दाखविल्याप्रमाणे घटक जोडलेले आहेत. कुंडलाची प्रेरितता व संधारित्राची धारकता यांचे मूल्य काढा.



Options :

70819159585. 1.33 H व 250 μF

ZOLLEGE.in

70819159586. $1.33\ \mathrm{H}$ व $150\ \mu\mathrm{F}$

70819159587. $0.8\ \mathrm{H}$ व $150\ \mu\mathrm{F}$

70819159588. $0.8\ \mathrm{H}$ व $250\ \mu\mathrm{F}$

Question Number : 18 Question Id : 70819118141 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A diatomic gas, having $C_P = \frac{7}{2}R$ and $C_V = \frac{5}{2}R$, is heated at constant pressure. The ratio $dU : dQ : dW$:

Options :

70819159589. $5 : 7 : 2$

70819159590. $3 : 7 : 2$

70819159591. $3 : 5 : 2$

70819159592. $5 : 7 : 3$

Question Number : 18 Question Id : 70819118141 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

द्विअण्विक वायू ज्याचा $C_P = \frac{7}{2}R$ व $C_V = \frac{5}{2}R$ आहे तो स्थिर दाबास तापविला. $dU : dQ : dW$ यांचे गुणोत्तर _____ आहे.

Options :

70819159589. $5 : 7 : 2$

ZOLLEGE.in

70819159590. $3:7:2$

70819159591. $3:5:2$

70819159592. $5:7:3$

Question Number : 19 Question Id : 70819118142 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two radioactive substances X and Y originally have N_1 and N_2 nuclei respectively. Half life of X is half of the half life of Y. After three half lives of Y, number of nuclei of both are equal.

The ratio $\frac{N_1}{N_2}$ will be equal to :

Options :

70819159593. $\frac{3}{1}$

70819159594. $\frac{1}{3}$

70819159595. $\frac{8}{1}$

70819159596. $\frac{1}{8}$

Question Number : 19 Question Id : 70819118142 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

X व Y ह्या दोन किरणोत्सारी पदार्थांसाठी सुरुवातीची केंद्रके अनुक्रमे N_1 व N_2 आहेत. X चा अर्धायुकाळ Y च्या अर्धायूकाळाच्या अर्धा आहे. Y च्या तीन अर्धायूकाळानंतर, दोघांच्या केंद्रकांची संख्या सारखी आहे. $\frac{N_1}{N_2}$ चे गुणोत्तर _____ आहे.

Options :

70819159593. $\frac{3}{1}$

70819159594. $\frac{1}{3}$

70819159595. $\frac{8}{1}$

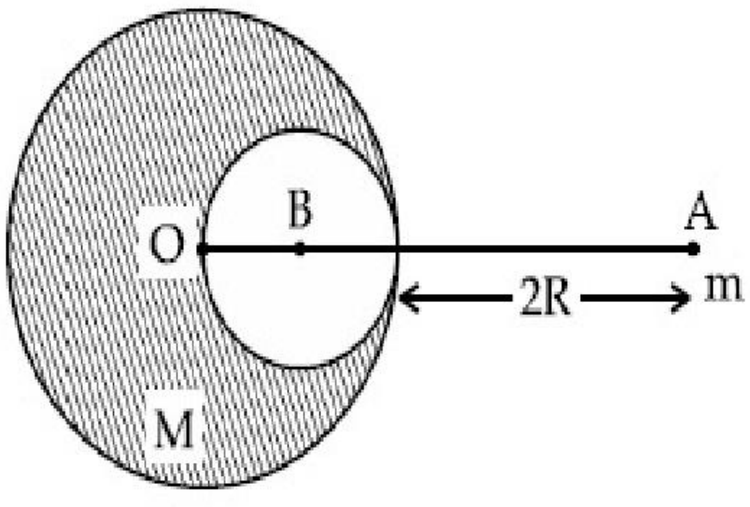
70819159596. $\frac{1}{8}$

Question Number : 20 Question Id : 70819118143 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A solid sphere of radius R gravitationally attracts a particle placed at 3R from its centre with a force F_1. Now a spherical cavity of radius $\left(\frac{R}{2}\right)$ is made in the sphere (as shown in figure) and the force becomes F_2. The value of $F_1 : F_2$ is :



Options :

70819159597. $41 : 50$

ZOLLEGE.in

70819159598. $50 : 41$

70819159599. $36 : 25$

70819159600. $25 : 36$

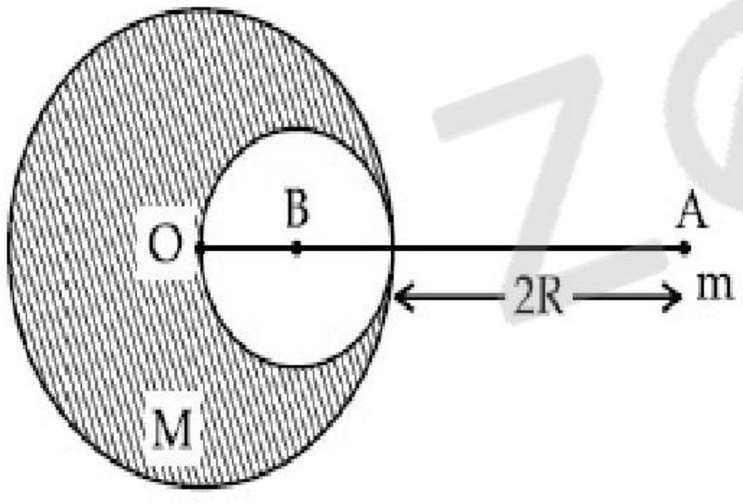
Question Number : 20 Question Id : 70819118143 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

R त्रिज्येचा भरीव गोळा F_1 बलाने त्याच्या मध्यापासून 3R अंतरावर ठेवलेला कण गुरुत्वाकर्षणाने ओढून घेतो.

आता $\left(\frac{R}{2}\right)$ त्रिज्येची गोलाकार गुहिका (आकृतीत दाखविल्याप्रमाणे) तयार केली व बल F_2 होते. $F_1 : F_2$ चे मूल्य _____ आहे.



Options :

70819159597. $41 : 50$

70819159598. $50 : 41$

70819159599. $36 : 25$

70819159600. $25 : 36$

ZOLLEGE.in

Physics Section B

Section Id : 708191749

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 : 7081911029

Question Shuffling Allowed : Yes

Question Number : 21 Question Id : 70819118144 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A monoatomic gas of mass 4.0 u is kept in an insulated container. Container is moving with velocity 30 m/s. If container is suddenly stopped then change in temperature of the gas (R = gas constant) is $\frac{x}{3R}$. 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 : 21 Question Id : 70819118144 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

एका विसंवाही भांड्यात $4.0\ \mathrm{u}$ वस्तुमानाचा एकअण्विक वायू ठेवला आहे. हे भांडे $30\ \mathrm{m/s}$ वेगाने गतिमान होत आहे. जर भांडे अचानक थांबवले तर वायुच्या तापमानातील बदल $\frac{x}{3R}$ आहे (R=वायू स्थिरांक). x चे मूल्य _____ असेल.

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 : 70819118145 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

512 identical drops of mercury are charged to a potential of 2 V each. The drops are joined to form a single drop. The potential of this drop is _____ V.

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 : 70819118145 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

मरक्युरीचे 512 एकसारखे थेंब प्रत्येकी 2 V विभवाने प्रभारित केले. त्याचा एक थेंब तयार झाला असे दिसले.
त्या थेंबाचे विभव _____ व्होल्ट आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

ZOLLEGE.in

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 Question Id : 70819118146 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A coil of inductance 2 H having negligible resistance is connected to a source of supply whose voltage is given by $V = 3t$ volt. (where t is in second). If the voltage is applied when $t = 0$, then the energy stored in the coil after 4 s is _____ J.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 Question Id : 70819118146 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$V = 3t$ व्होल्ट (t सेकंदात आहे) असलेल्या पुरवठा उद्गमास $2\,H$ प्रेरितता असलेले व नगण्य रोध असलेले कुंडल जोडले. जेव्हा $t = 0$ असताना त्यास व्होल्टेज लावले तर 4 सेकंदानंतर कुंडलात साठलेली ऊर्जा _____ ज्यूल आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

ZOLLEGE.in

Question Number : 24 Question Id : 70819118147 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A small bob tied at one end of a thin string of length 1 m is describing a vertical circle so that the maximum and minimum tension in the string are in the ratio 5 : 1. The velocity of the bob at the highest position is _____ m/s. (Take $g = 10\ m/s^2$)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 24 Question Id : 70819118147 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1 m लांबीच्या बारीक दोरीच्या एका टोकास एक लहान गोळा बांधलेला आहे व तो उभ्या वर्तुळाकार असा वर्णन करतो की दोरीतील महत्तम व लघुत्तम ताण याचे गुणोत्तर 5 : 1 आहे. महत्तम स्थितीत गोळ्याचा वेग _____ m/s आहे. (घ्या : $g = 10\ m/s^2$)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 25 Question Id : 70819118148 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

The potential energy (U) of a diatomic molecule is a function dependent on r (interatomic distance) as

$$U=\frac{\alpha}{r^{10}}-\frac{\beta}{r^{5}}-3$$

where, α and β are positive constants. The equilibrium distance between two atoms will be

$\left(\frac{2\alpha}{\beta}\right)^{\frac{a}{b}}$, where 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 : 25 Question Id : 70819118148 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

द्विअण्विक रेणूची स्थितीज ऊर्जा (U) ह्याचे r (आंतरअण्विक अंतर) वर अवलंबून फल $U=\frac{\alpha}{r^{10}}-\frac{\beta}{r^{5}}-3$ असे

आहे. जेथे α व β हे धन स्थिरांक आहेत. दोन अणूंमधील समतुल्य अंतर $\left(\frac{2\alpha}{\beta}\right)^{\frac{a}{b}}$ असेल. जिथे 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 : 26 Question Id : 70819118149 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

The electric field in a region is given by $\vec{E} = \left(\frac{3}{5}E_0\,\hat{i} + \frac{4}{5}E_0\,\hat{j}\right)\frac{N}{C}$. The ratio of flux of reported field through the rectangular surface of area 0.2 m^2 (parallel to $y-z$ plane) to that of the surface of area 0.3 m^2 (parallel to $x-z$ plane) is a : b, where a = _____ .

[Here $\hat{i}$, $\hat{j}$ and $\hat{k}$ are unit vectors along x, y and z-axes 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 : 26 Question Id : 70819118149 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

एका भागातील विद्युत क्षेत्र $\vec{E} = \left(\frac{3}{5}E_0\,\hat{i} + \frac{4}{5}E_0\,\hat{j}\right)\frac{N}{C}$ असे दिले आहे. तयार झालेल्या क्षेत्रात अभिवाहचे $0.2\ m^2$ ($y-z$ प्रतलास समांतर) आयताकृती पृष्ठभागामधून, $0.3\ m^2$ ($x-z$ प्रतलाशी समांतर) क्षेत्राच्या पृष्ठभागाबरोबरचे गुणोत्तर a : b आहे. जिथे a = _____ .

(येथे $\hat{i}$, $\hat{j}$ व $\hat{k}$ हे एकक सदिश अनुक्रमे x, y व z अक्षावर आहेत)

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 : 70819118150 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

A transmitting station releases waves of wavelength 960 m. A capacitor of 2.56 μF is used in the resonant circuit. The self inductance of coil necessary for resonance is _____ $\times 10^{-8}$ H.

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 : 70819118150 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

पारगमन स्थानक 960 m तरंगलांबीचे तरंग सोडते. संस्पंदी परिपथात 2.56 μF चे संधारित्र वापरले. संस्पंदनासाठी आवश्यक असलेली कुंडलाची स्वयंप्रेरितता _____ $\times 10^{-8}$ H आहे.

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 : 70819118151 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The same size images are formed by a convex lens when the object is placed at 20 cm or at 10 cm from the lens. The focal length of convex lens is _____ cm.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

ZOLLEGE.in

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819118151 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

जेव्हा वस्तू भिंगापासून 20 cm किंवा 10 cm वर ठेवली तर बहिर्गोल भिंगामुळे सारख्याच आकाराच्या प्रतिमा तयार होतात. बहिर्गोल भिंगाची नाभीय लांबी _____ cm आहे.

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 : 70819118152 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In a certain thermodynamical process, the pressure of a gas depends on its volume as kV^3. The work done when the temperature changes from 100°C to 300°C will be _____ nR, where n denotes number of moles of a gas.

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 : 70819118152 Question Type : SA

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 0

एका विशिष्ट उष्मागतिक प्रक्रियेत, वायुचा दाब आकारमानावर kV^3 असा अवलंबून आहे. जेव्हा तापमान $100°C$ पासून $300°C$ पर्यंत बदलते तेव्हा केलेले कार्य _____ nR असेल. जिथे n वायूच्या अणूची संख्या आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

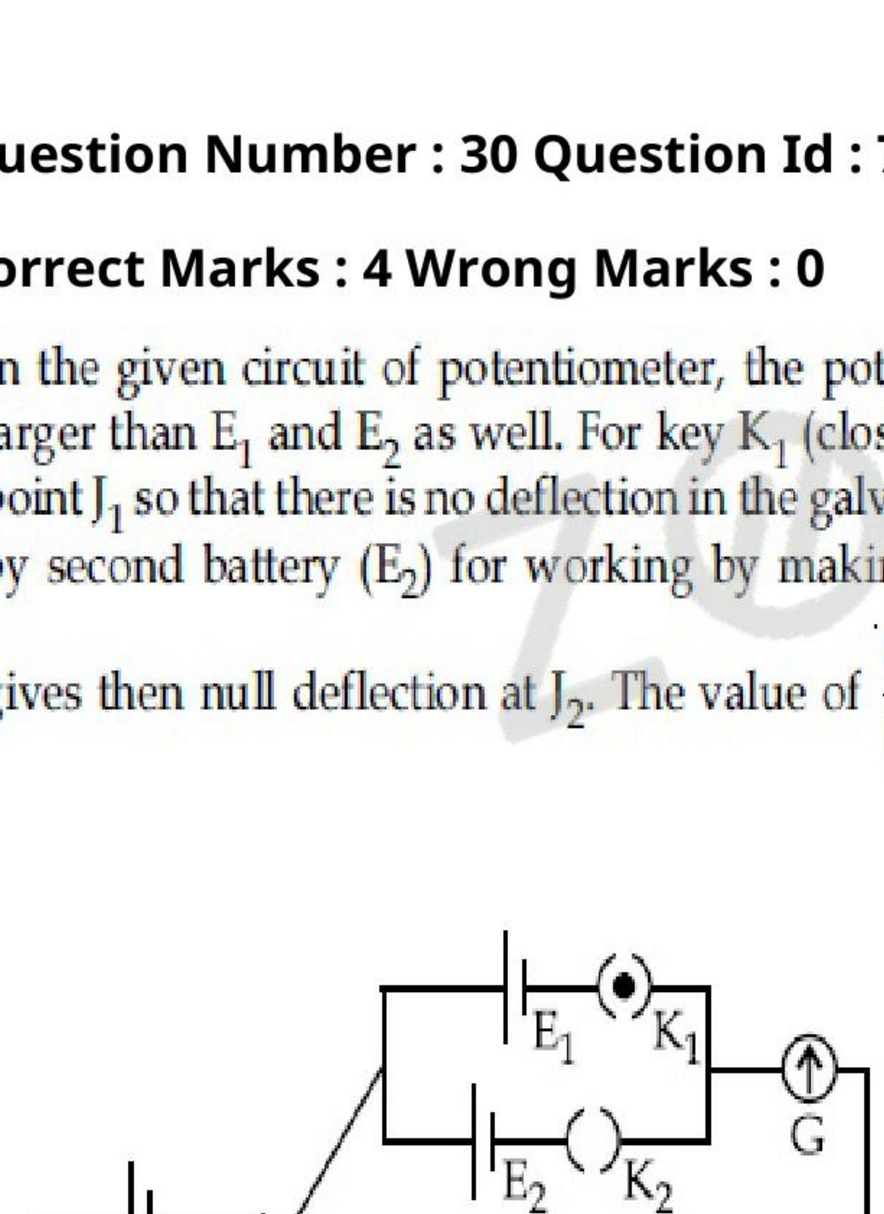
Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819118153 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In the given circuit of potentiometer, the potential difference E across AB (10 m length) is larger than E_1 and E_2 as well. For key K_1 (closed), the jockey is adjusted to touch the wire at point J_1 so that there is no deflection in the galvanometer. Now the first battery (E_1) is replaced by second battery (E_2) for working by making K_1 open and K_2 closed. The galvanometer gives then null deflection at J_2. The value of $\frac{E_1}{E_2}$ is $\frac{a}{b}$, where a=_____ .



Response Type : Numeric

ZOLLEGE.in

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

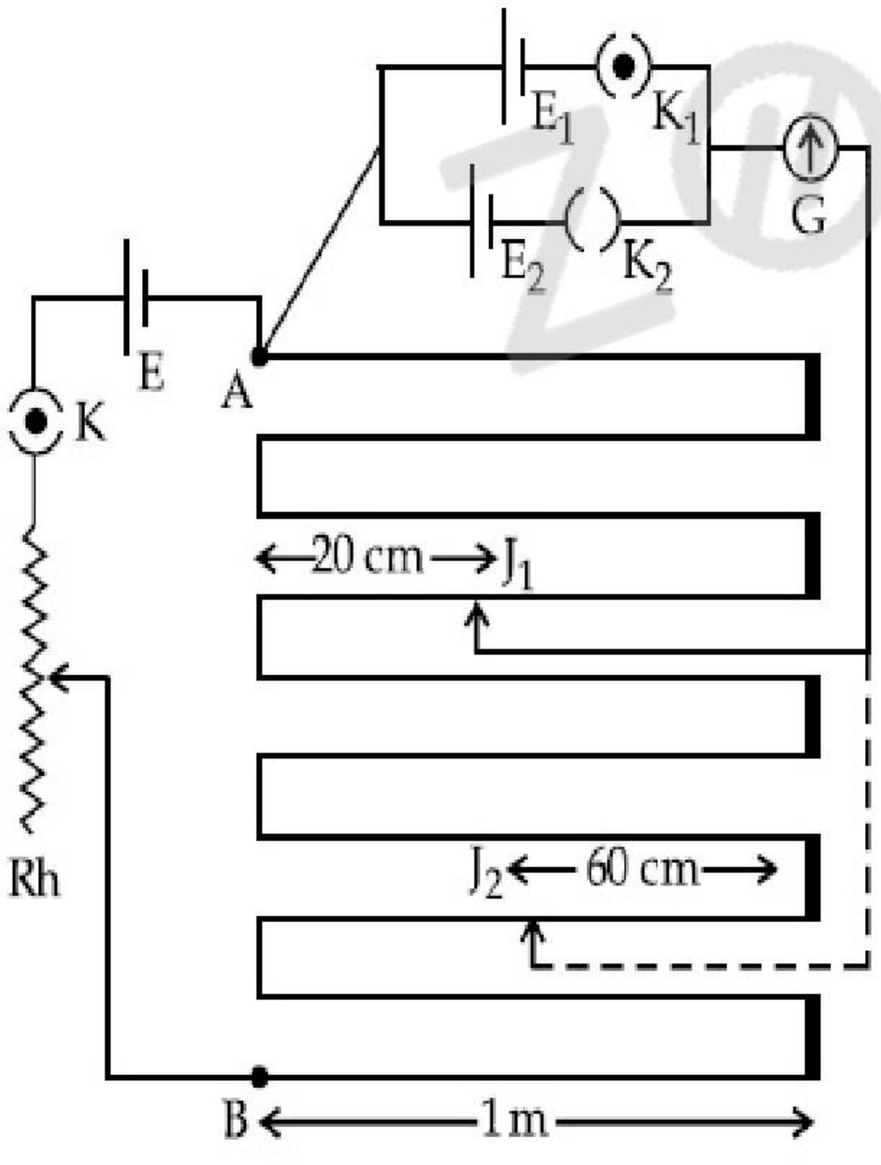
Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819118153 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

दिलेल्या विभवमापीच्या परिपथात, AB (लांबी 10 m) मध्ये E हे विभवांतर E_1 व E_2 पेक्षा जास्त आहे. कळ K_1 साठी (बंद), जॉकी तारेवर J_1 बिंदूवर असा टेकवला की गॅल्व्हानोमीटर मध्ये विक्षेपण होत नाही. आता कार्य करण्यासाठी पहिली बॅटरी (E_1) सोडली व बॅटरी (E_2) जोडली, K_1 उघडून व K_2 बंद करून गॅल्व्हानोमीटरने J_2 येथे शून्य विक्षेपण दाखविले. $\frac{E_1}{E_2}$ चे मूल्य $\frac{a}{b}$ आहे जिथे a=_____.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

ZOLLEGE.in

5 to 5.001

Chemistry Section A

Section Id :	708191750
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 :	7081911030
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 70819118154 Question Type : MCQ Option Shuffling : Yes

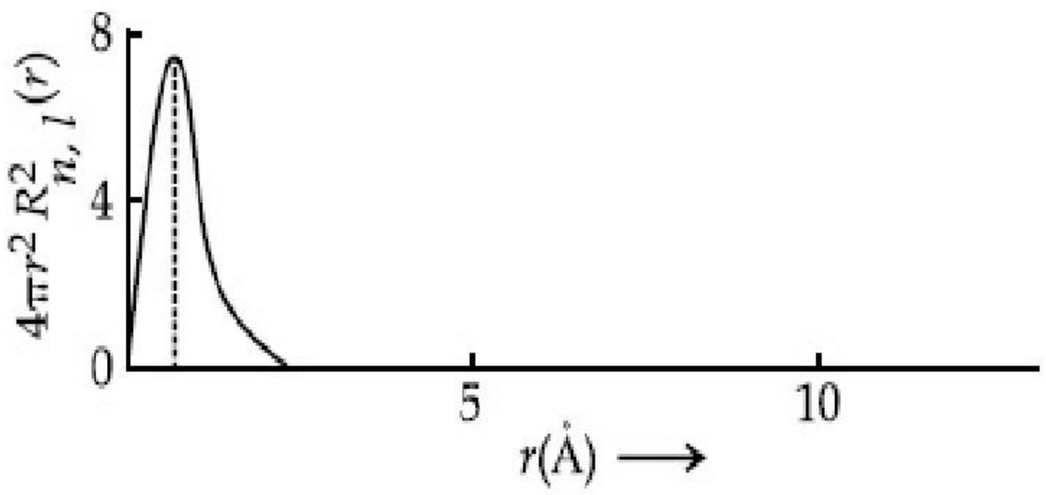
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

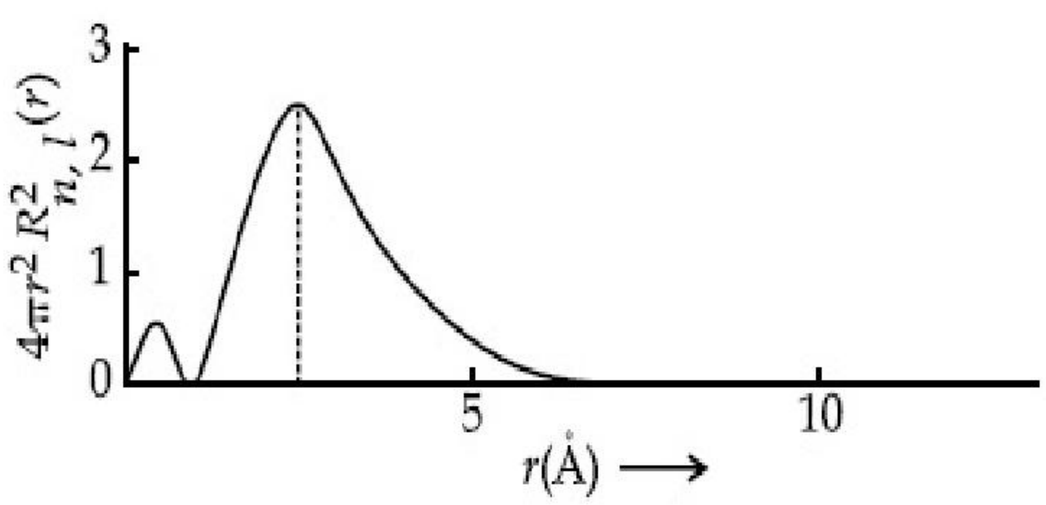
ZOLLEGE.in

The plots of radial distribution functions for various orbitals of hydrogen atom against 'r' are given below :

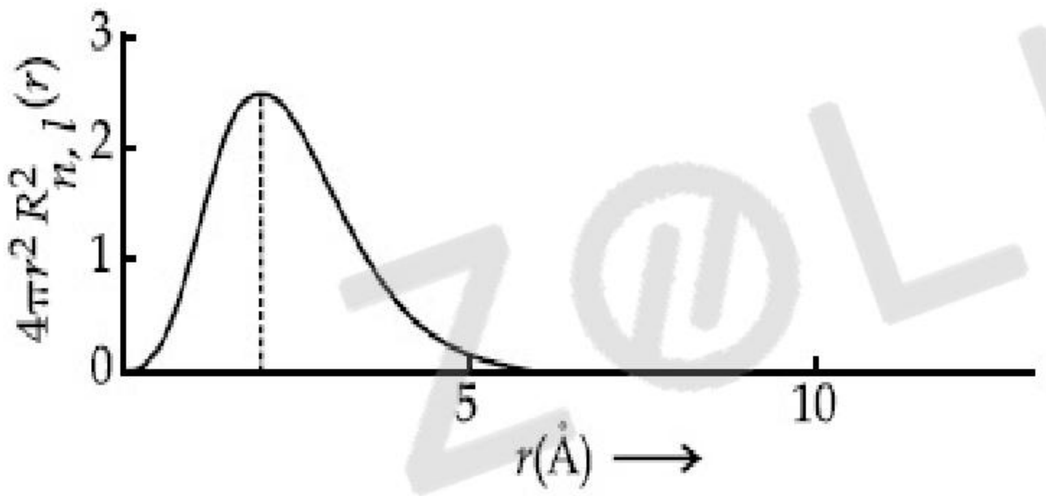
(A)



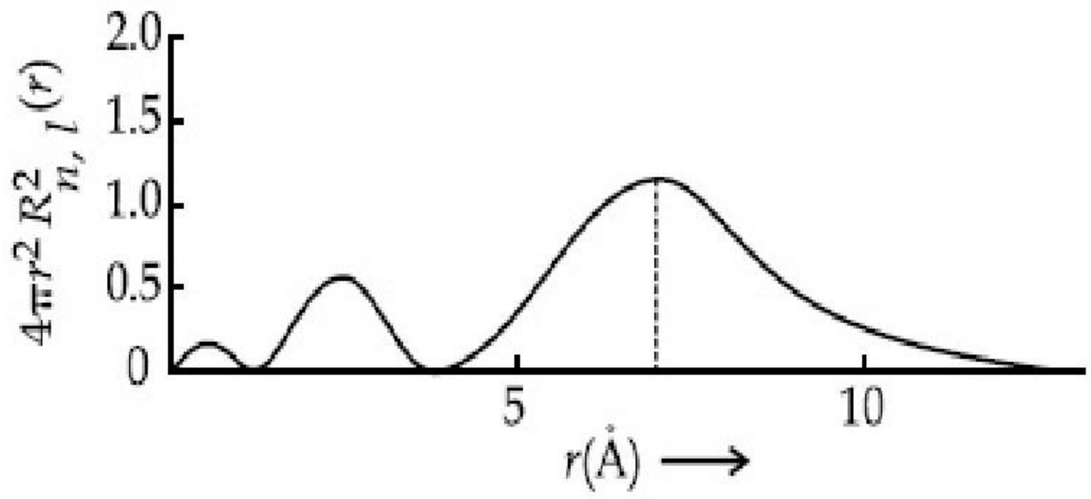
(B)



(C)



(D)



The correct plot for 3s orbital is :

Options :

70819159611. (A)

70819159612. (B)

70819159613. (C)

ZOLLEGE.in

70819159614. (D)

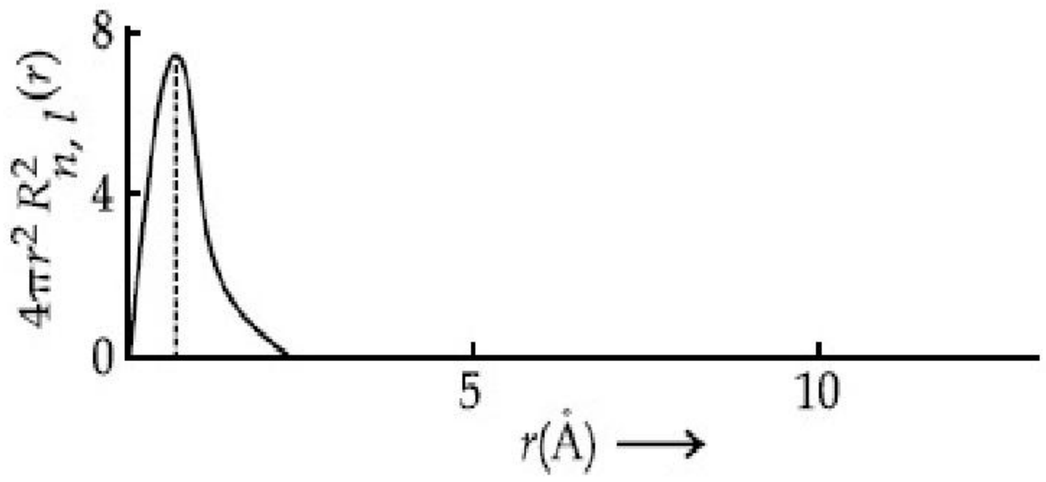
Question Number : 31 Question Id : 70819118154 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

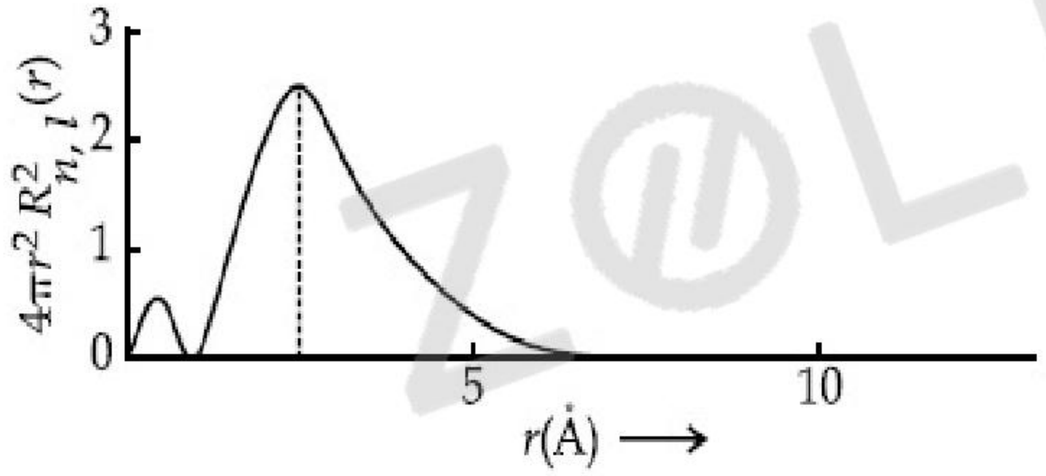
Correct Marks : 4 Wrong Marks : 1

हायड्रोजन अणूच्या वेगवेगळ्या कक्षिकांसाठी अरीय वितरण तरंगफलांचे आलेख 'r' त्रिज्येच्या विरुद्ध खाली दिलेले आहेत.

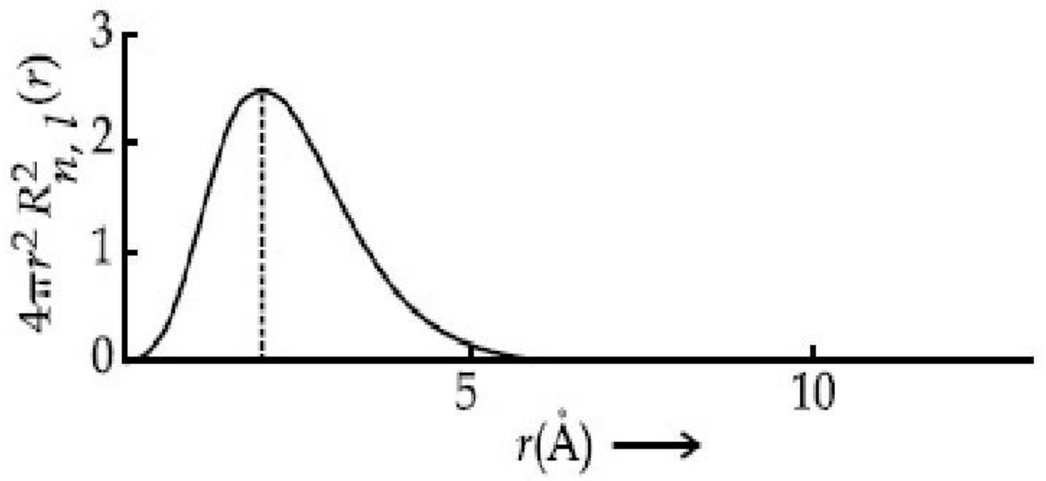
(A)



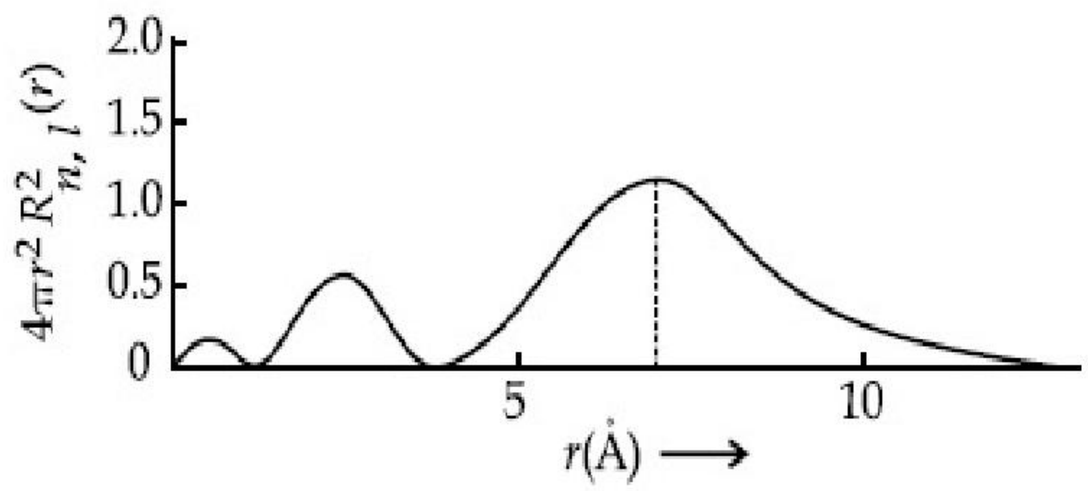
(B)



(C)



(D)



3s कक्षिकेसाठी बरोबर असलेला आलेख _____ आहे.

ZOLLEGE.in

Options :

70819159611. (A)

70819159612. (B)

70819159613. (C)

70819159614. (D)

Question Number : 32 Question Id : 70819118155 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

According to molecular orbital theory, the species among the following that does not exist is :

Options :

70819159615. O_2^{2-}

70819159616. He_2^{-}

70819159617. Be_2

70819159618. He_2^{+}

Question Number : 32 Question Id : 70819118155 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

रेणू कक्षिका सिद्धांतानुसार खालीलपैकी _____ जाती आढळत नाही.

Options :

70819159615. O_2^{2-}

ZOLLEGE.in

70819159616. He_2^-

70819159617. Be_2

70819159618. He_2^+

Question Number : 33 Question Id : 70819118156 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The solubility of AgCN in a buffer solution of pH = 3 is x. The value of x is :
[Assume : No cyano complex is formed ; $K_{sp}(AgCN) = 2.2 \times 10^{-16}$ and $K_a(HCN) = 6.2 \times 10^{-10}$]

Options :

70819159619. 0.625×10^{-6}

70819159620. 1.6×10^{-6}

70819159621. 2.2×10^{-16}

70819159622. 1.9×10^{-5}

Question Number : 33 Question Id : 70819118156 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

pH = 3 असलेल्या एका उभयरोधी द्रावणातील AgCN ची द्रावणीयता x आहे. x ची किंमत _____ आहे.

(समजा : सायनोचे कोणतेही जटिल तयार झालेले नाही.)

($K_{sp}(AgCN) = 2.2 \times 10^{-16}$ आणि $K_a(HCN) = 6.2 \times 10^{-10}$)

Options :

ZOLLEGE.in

70819159619. 0.625×10^{-6}

70819159620. 1.6×10^{-6}

70819159621. 2.2×10^{-16}

70819159622. 1.9×10^{-5}

Question Number : 34 Question Id : 70819118157 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In Freundlich adsorption isotherm at moderate pressure, the extent of adsorption $\left(\frac{x}{m}\right)$ is directly proportional to P^x. The value of x is :

Options :

70819159623. 1

70819159624. zero

70819159625. ∞

70819159626. $\frac{1}{n}$

Question Number : 34 Question Id : 70819118157 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

फ्रेउंड्लिच अधिशोषण समतापरेषेत मध्यम दाबाला, अधिशोषणाचे प्रमाण $\left(\frac{x}{m}\right)$ हे P^x ला सरळ प्रमाणात आहे.

तर x ची किंमत _____ असेल.

ZOLLEGE.in

Options :

70819159623. 1

70819159624. शून्य

70819159625. ∞

70819159626. $\frac{1}{n}$

Question Number : 35 Question Id : 70819118158 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Ellingham diagram is a graphical representation of :

Options :

70819159627. ΔG vs T

70819159628. ΔH vs T

70819159629. ΔG vs P

70819159630. $(\Delta G - T\Delta S)$ vs T

Question Number : 35 Question Id : 70819118158 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

एलिंगमचे चित्र हे _____ आलेखन दर्शविते.

Options :

70819159627. ΔG विरुद्ध T

ZOLLEGE.in

70819159628. ΔH विरुद्ध T

70819159629. ΔG विरुद्ध P

70819159630. $(\Delta G - T\Delta S)$ विरुद्ध T

Question Number : 36 Question Id : 70819118159 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following equation depicts the oxidizing nature of H_2O_2 ?

Options :

70819159631. $KIO_4 + H_2O_2 \rightarrow KIO_3 + H_2O + O_2$

70819159632. $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$

70819159633. $2I^- + H_2O_2 + 2H^+ \rightarrow I_2 + 2H_2O$

70819159634. $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$

Question Number : 36 Question Id : 70819118159 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालीलपैकी कोणते समीकरण H_2O_2 ची ऑक्सिडीकारकता दर्शविते ?

Options :

70819159631. $KIO_4 + H_2O_2 \rightarrow KIO_3 + H_2O + O_2$

70819159632. $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$

ZOLLEGE.in

70819159633. $2I^- + H_2O_2 + 2H^+ \rightarrow I_2 + 2H_2O$

70819159634. $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$

Question Number : 37 Question Id : 70819118160 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct statement about B_2H_6 is :

Options :

70819159635. All $B-H-B$ angles are of $120°$.

70819159636. The two $B-H-B$ bonds are not of same length.

70819159637. Terminal $B-H$ bonds have less p-character when compared to bridging bonds.

70819159638. Its fragment, BH_3 , behaves as a Lewis base.

Question Number : 37 Question Id : 70819118160 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

B_2H_6 बद्दलचे बरोबर विधान _____ आहे.

Options :

70819159635. सर्व $B-H-B$ कोन $120°$ चे आहेत.

70819159636. दोन $B-H-B$ बंध सारख्या लांबीचे नाहीत.

70819159637. शेवटच्या दोन $B-H$ बंधांमध्ये कक्षिका p चे गुण सेतु बंधांपेक्षा कमी आहे.

ZOLLEGE.in

70819159638. BH_3 (B_2H_6 चा तुकडा) लेविस अल्क म्हणून काम करतो.

Question Number : 38 Question Id : 70819118161 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : CeO_2 can be used for oxidation of aldehydes and ketones.

Statement II : Aqueous solution of $EuSO_4$ is a strong reducing agent.

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

Options :

70819159639. Both Statement I and Statement II are true

70819159640. Both Statement I and Statement II are false

70819159641. Statement I is true but Statement II is false

70819159642. Statement I is false but Statement II is true

Question Number : 38 Question Id : 70819118161 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खाली दोन विधाने दिलेली आहेत.

विधान I : अल्डीहाइडस् आणि किटोन्स्च्या ऑक्सिडीकरणासाठी CeO_2 वापरता येतो.

विधान II : $EuSO_4$ चे जलीय द्रावण हे शक्तिशाली क्षपणक आहे.

वरील विधानांनुसार, खालील पर्यायांमधून **बरोबर** पर्याय निवडा.

Options :

70819159639. दोन्ही विधाने I आणि II बरोबर आहेत.

70819159640. दोन्ही विधाने I आणि II चुकीची आहेत.

ZOLLEGE.in

70819159641. विधान I बरोबर आहे परंतु विधान II चुकीचे आहे.

70819159642. विधान I चुकीचे आहे परंतु विधान II बरोबर आहे.

Question Number : 39 Question Id : 70819118162 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In which of the following pairs, the outer most electronic configuration will be the same ?

Options :

70819159643. V^{2+} and Cr^{+}

70819159644. Cr^{+} and Mn^{2+}

70819159645. Ni^{2+} and Cu^{+}

70819159646. Fe^{2+} and Co^{+}

Question Number : 39 Question Id : 70819118162 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालीलपैकी कोणत्या जोड्यांमध्ये सर्वात बाहेरील इलेक्ट्रॉनी संरूपण सारखे असेल ?

Options :

70819159643. V^{2+} आणि Cr^{+}

70819159644. Cr^{+} आणि Mn^{2+}

70819159645. Ni^{2+} आणि Cu^{+}

ZOLLEGE.in

70819159646. Fe^{2+} आणि Co^{+}

Question Number : 40 Question Id : 70819118163 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The hybridization and magnetic nature of $[Mn(CN)_6]^{4-}$ and $[Fe(CN)_6]^{3-}$, respectively are :

Options :

70819159647. d^2sp^3 and paramagnetic

70819159648. sp^3d^2 and diamagnetic

70819159649. d^2sp^3 and diamagnetic

70819159650. sp^3d^2 and paramagnetic

Question Number : 40 Question Id : 70819118163 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$[Mn(CN)_6]^{4-}$ आणि $[Fe(CN)_6]^{3-}$ ह्यांचे अनुक्रमे संकरण व चुंबकीय प्रकार _____ आहे.

Options :

70819159647. d^2sp^3 आणि समचुंबकीय

70819159648. sp^3d^2 आणि प्रतिचुंबकीय

70819159649. d^2sp^3 आणि प्रतिचुंबकीय

ZOLLEGE.in

70819159650. sp^3d^2 आणि समचुंबकीय

Question Number : 41 Question Id : 70819118164 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : An allotrope of oxygen is an important intermediate in the formation of reducing smog.

Statement II : Gases such as oxides of nitrogen and sulphur present in troposphere contribute to the formation of photochemical smog.

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

Options :

70819159651. Both Statement I and Statement II are true

70819159652. Both Statement I and Statement II are false

70819159653. Statement I is true but Statement II is false

70819159654. Statement I is false but Statement II is true

Question Number : 41 Question Id : 70819118164 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खाली दोन विधाने दिलेली आहेत.

विधान I : क्षपणकारी स्मॉग तयार होताना ऑक्सिजनचा एक ॲलोट्रोप महत्वाचा माध्यमिक आहे.

विधान II : ट्रोपोस्फीअर मधील नायट्रोजन आणि सल्फर ऑक्साईडस्चे वायु प्रकाशरासायनिक स्मॉग तयार होण्यासाठी मदत करतात.

वरील विधानांनुसार, खालील पर्यायांमधून **बरोबर** उत्तराचा पर्याय निवडा.

Options :

70819159651. दोन्ही विधाने I आणि II बरोबर आहेत.

ZOLLEGE.in

70819159652. दोन्ही विधाने I आणि II चुकीची आहेत.

70819159653. विधान I बरोबर आहे परंतु विधान II चुकीचे आहे.

70819159654. विधान I चुकीचे आहे परंतु विधान II बरोबर आहे.

Question Number : 42 Question Id : 70819118165 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Complete combustion of 1.80 g of an oxygen containing compound ($C_xH_yO_z$) gave 2.64 g of CO_2 and 1.08 g of H_2O. The percentage of oxygen in the organic compound is :

Options :

70819159655. 50.33

70819159656. 53.33

70819159657. 63.53

70819159658. 51.63

Question Number : 42 Question Id : 70819118165 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

एका ऑक्सिजन असलेल्या 1.80 ग्रॅम कार्बनी संयुगाचे ($C_xH_yO_z$) संपूर्ण ज्वलन केले असता 2.64 ग्रॅम CO_2 आणि 1.08 ग्रॅम H_2O तयार झाले. कार्बनी संयुगातील ऑक्सिजनचा शेकडा प्रमाण _____ आहे.

Options :

70819159655. 50.33

ZOLLEGE.in

70819159656. 53.33

70819159657. 63.53

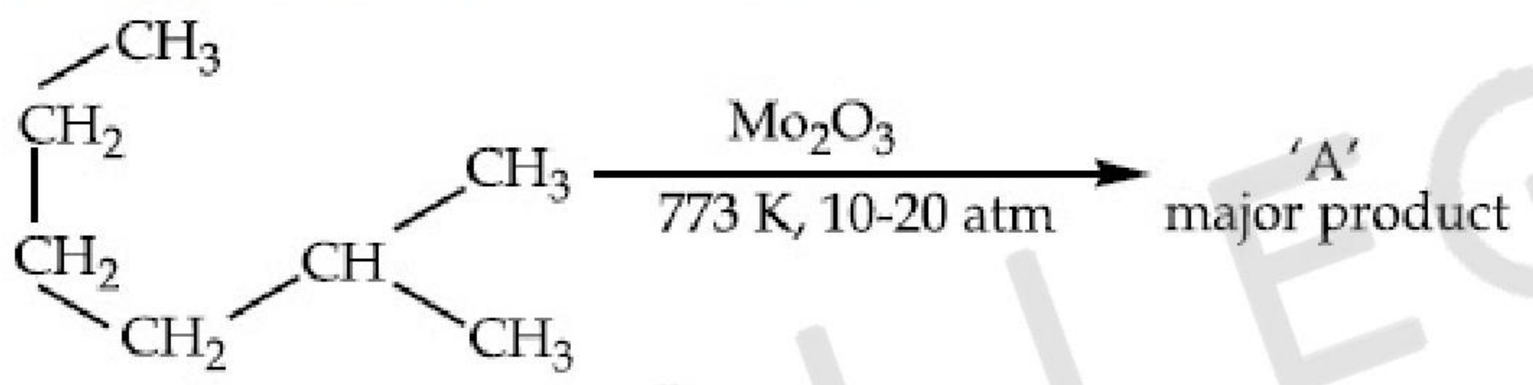
70819159658. 51.63

Question Number : 43 Question Id : 70819118166 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

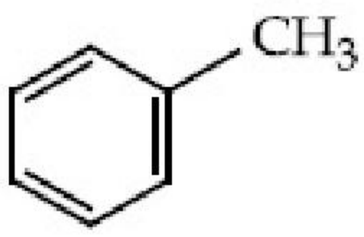
Correct Marks : 4 Wrong Marks : 1

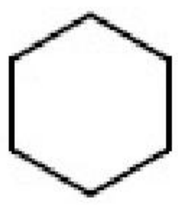
Identify A in the given chemical reaction.

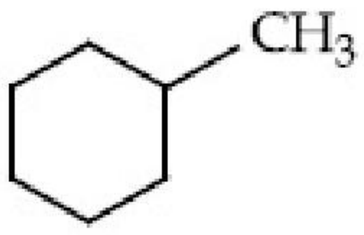


Options :

70819159659.

70819159660. 

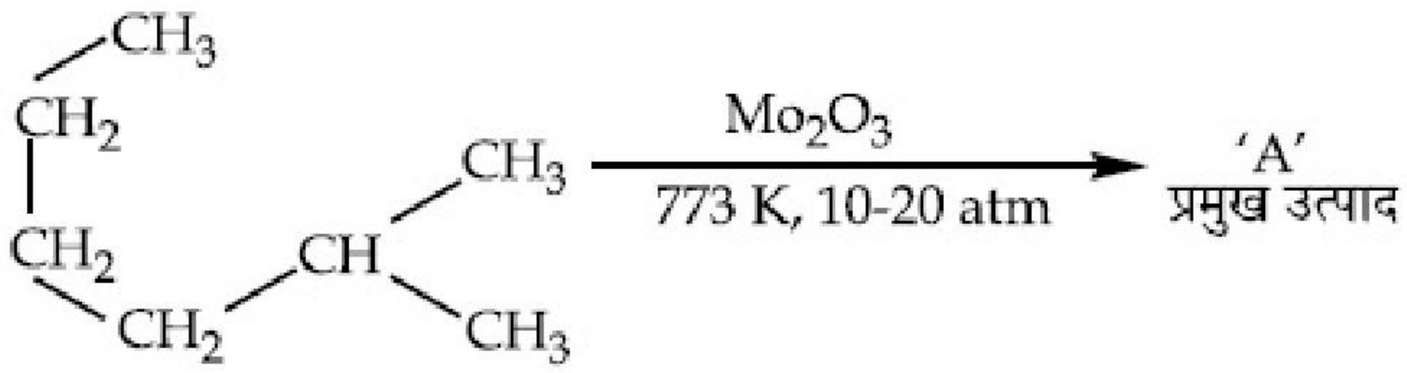
70819159661. 

70819159662. 

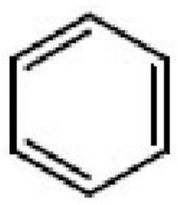
Is Question Mandatory : No

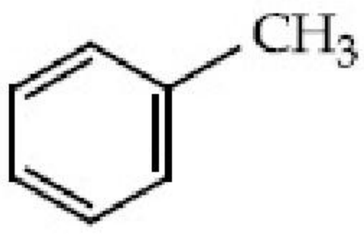
Correct Marks : 4 Wrong Marks : 1

दिलेल्या रासायनिक अभिक्रियेत A ओळखा.

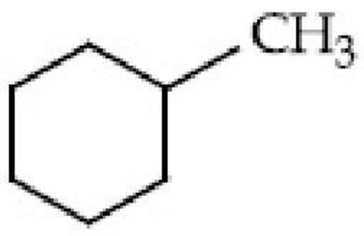


Options :

70819159659. 

70819159660. 

70819159661.

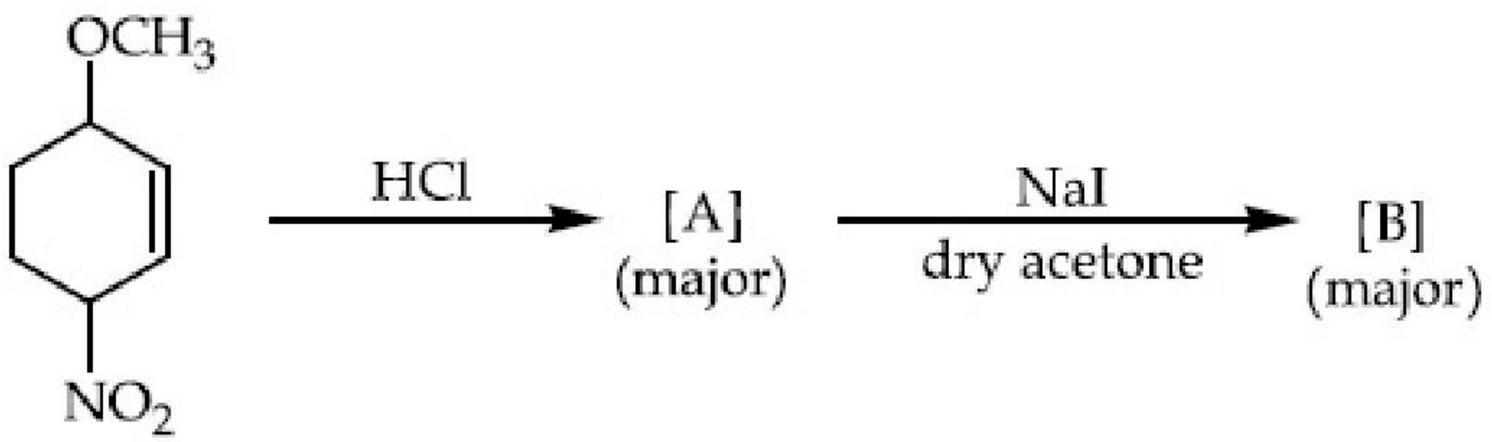
70819159662. 

Question Number : 44 Question Id : 70819118167 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

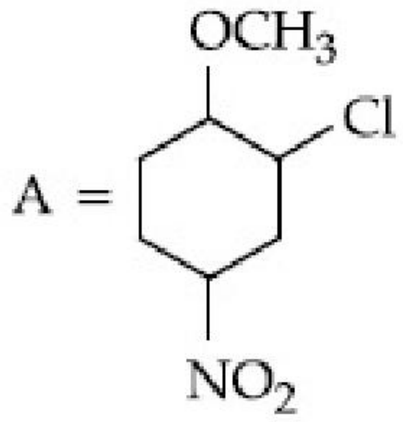
Identify A and B in the chemical reaction.

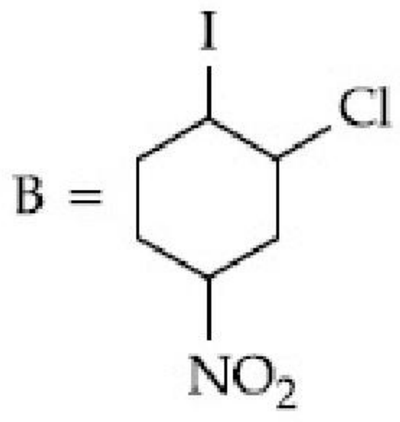


ZOLLEGE.in

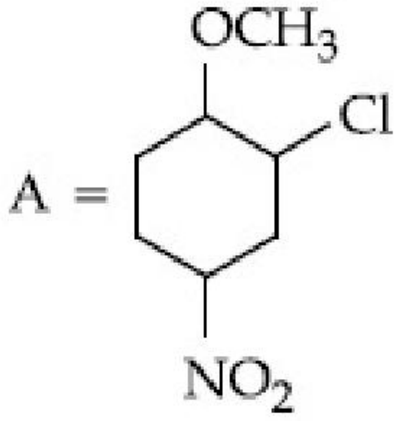
Options :

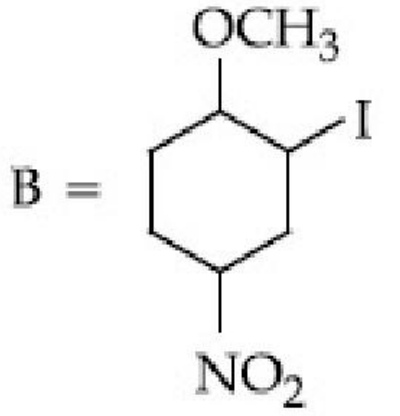
70819159663.



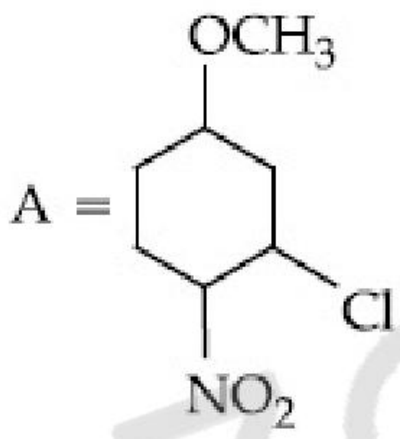


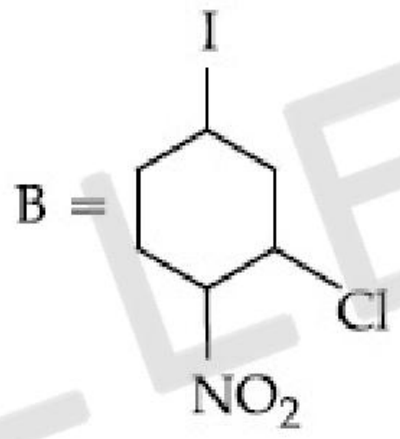
70819159664.



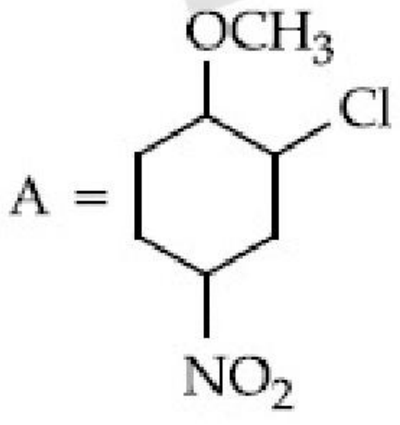


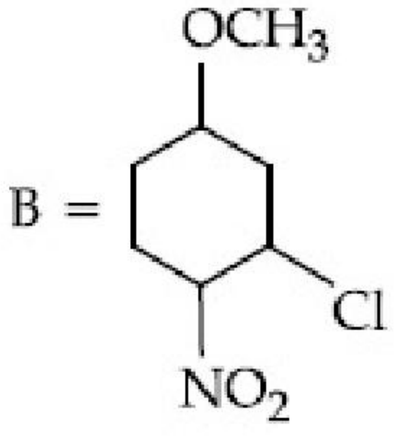
70819159665.





70819159666.





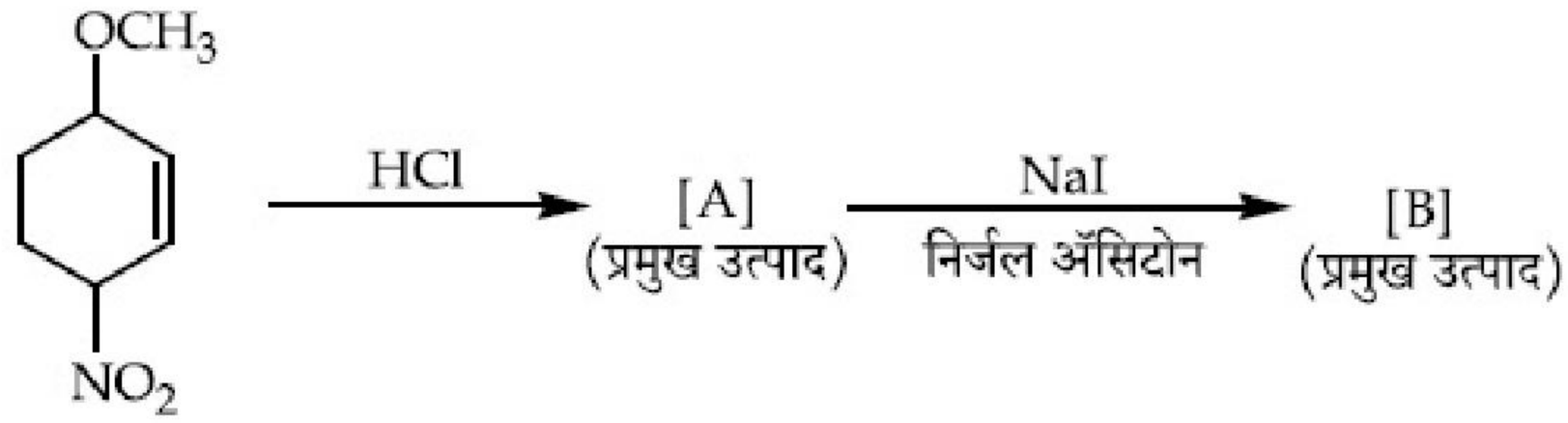
Question Number : 44 Question Id : 70819118167 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

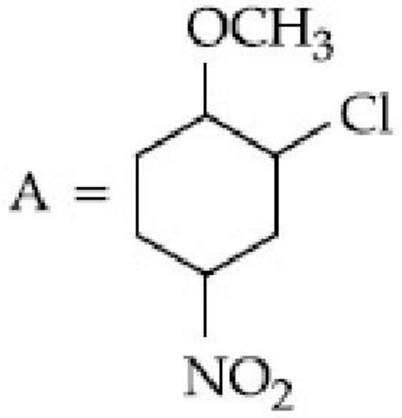
ZOLLEGE.in

खालील रासायनिक अभिक्रियेतील A आणि B ओळखा.

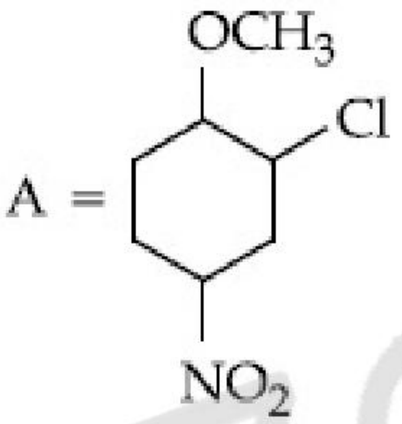


Options :

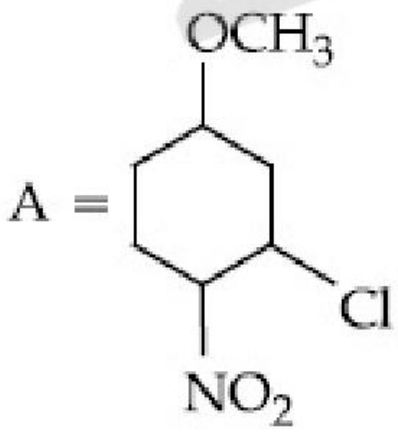
70819159663.



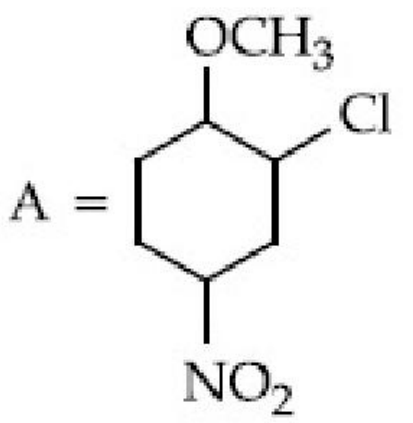
70819159664.



70819159665.



70819159666.



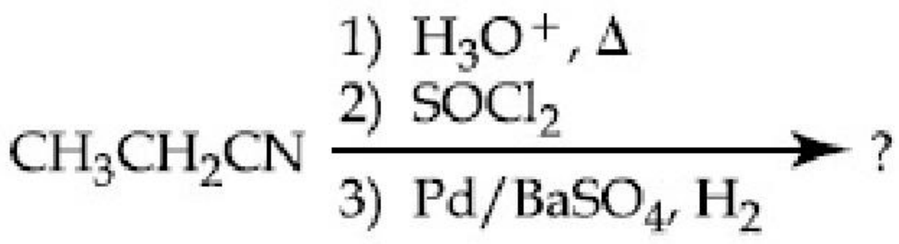
Question Number : 45 Question Id : 70819118168 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

The major product of the following chemical reaction is :



Options :

70819159667. $CH_3CH_2CH_2OH$

70819159668. $(CH_3CH_2CO)_2O$

70819159669. $CH_3CH_2CH_3$

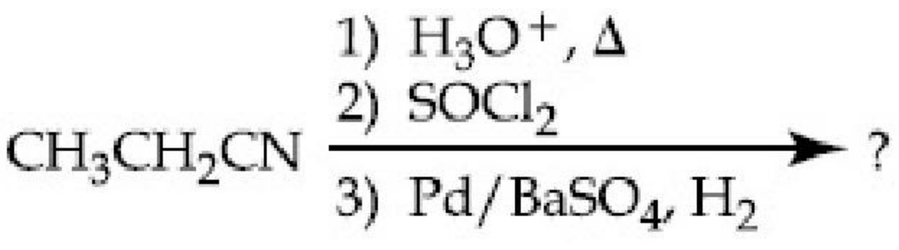
70819159670. CH_3CH_2CHO

Question Number : 45 Question Id : 70819118168 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालील रासायनिक अभिक्रियेतील प्रमुख उत्पाद _____ आहे.



Options :

70819159667. $CH_3CH_2CH_2OH$

70819159668. $(CH_3CH_2CO)_2O$

70819159669. $CH_3CH_2CH_3$

70819159670. CH_3CH_2CHO

ZOLLEGE.in

Question Number : 46 Question Id : 70819118169 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following reactions will not form acetaldehyde ?

Options :

70819159671. $CH_2=CH_2+O_2 \xrightarrow[H_2O]{Pd(II)/Cu(II)}$

70819159672. $CH_3CH_2OH \xrightarrow{CrO_3-H_2SO_4}$

70819159673. $CH_3CN \xrightarrow[ii)\ H_2O]{i)\ DIBAL\text{-}H}$

70819159674. $CH_3CH_2OH \xrightarrow[573\ K]{Cu}$

Question Number : 46 Question Id : 70819118169 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालीलपैकी कोणत्या अभिक्रियेपासून ॲसिटाल्डीहाइड तयार होणार नाही ?

Options :

70819159671. $CH_2=CH_2+O_2 \xrightarrow[H_2O]{Pd(II)/Cu(II)}$

70819159672. $CH_3CH_2OH \xrightarrow{CrO_3-H_2SO_4}$

70819159673. $CH_3CN \xrightarrow[ii)\ H_2O]{i)\ DIBAL\text{-}H}$

ZOLLEGE.in

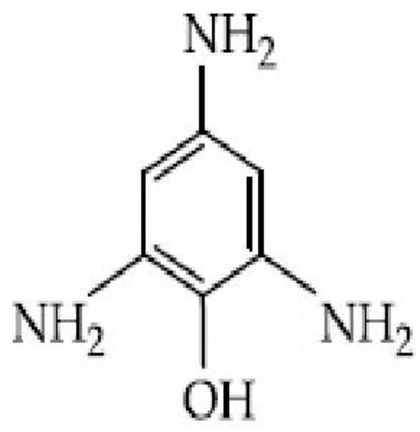
70819159674. $CH_3CH_2OH \xrightarrow[573\ K]{Cu}$

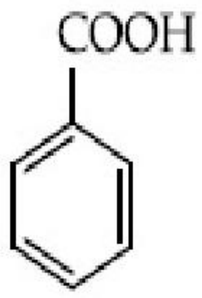
Question Number : 47 Question Id : 70819118170 Question Type : MCQ Option Shuffling : Yes

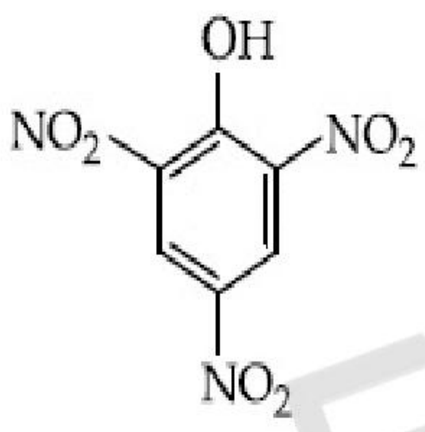
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Compound(s) which will liberate carbon dioxide with sodium bicarbonate solution is/are :

A = 

B = 

C = 

Options :

70819159675. A and B only

70819159676. C only

70819159677. B and C only

70819159678. B only

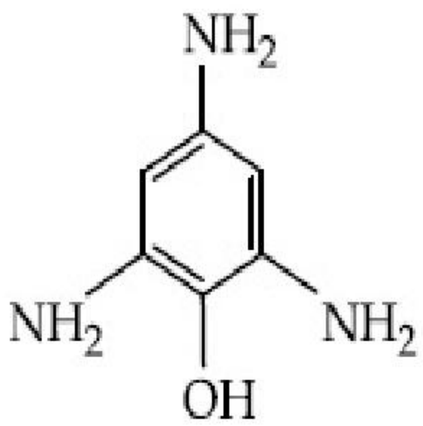
Question Number : 47 Question Id : 70819118170 Question Type : MCQ Option Shuffling : Yes

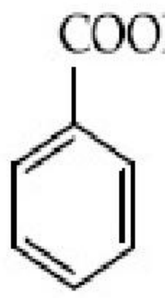
Is Question Mandatory : No

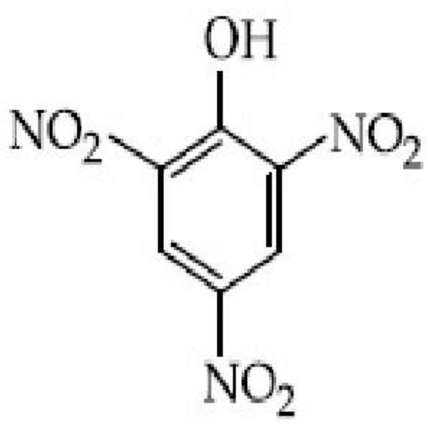
Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

सोडियम बायकार्बोनेट द्रावणाबरोबर कार्बन डायऑक्साइड बाहेर सोडतील अशी संयुगे _____ आहे.

A = 

B = 

C = 

Options :

70819159675. A आणि B फक्त

70819159676. C फक्त

70819159677. B आणि C फक्त

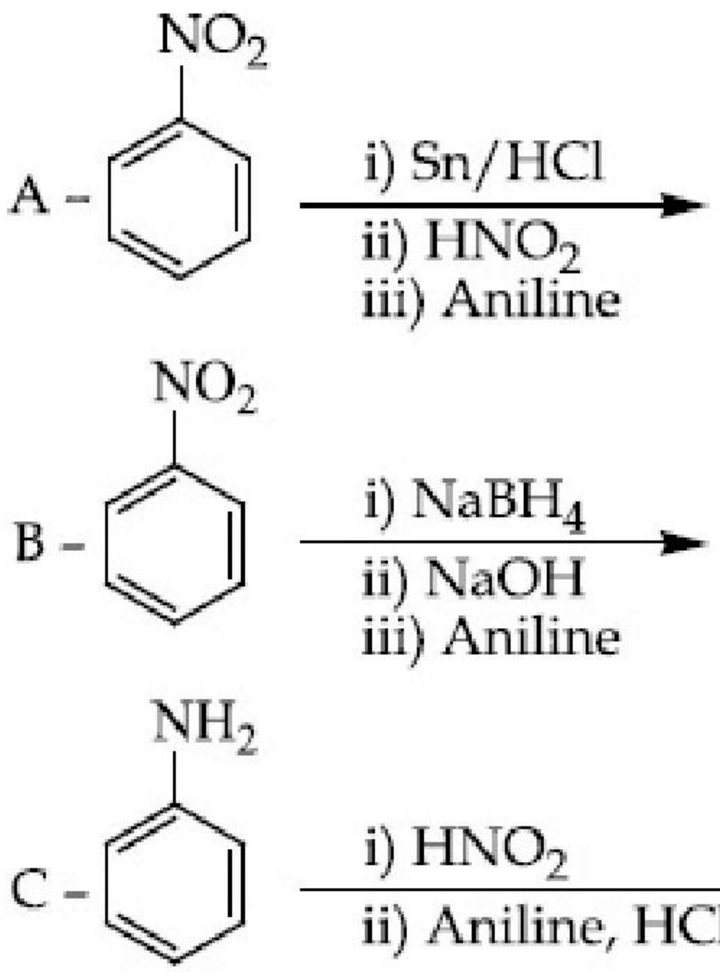
70819159678. B फक्त

Question Number : 48 Question Id : 70819118171 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following reaction/s will not give *p*-aminoazobenzene ?



Options :

70819159679. A only

ZOLLEGE.in

70819159680. C only

70819159681. B only

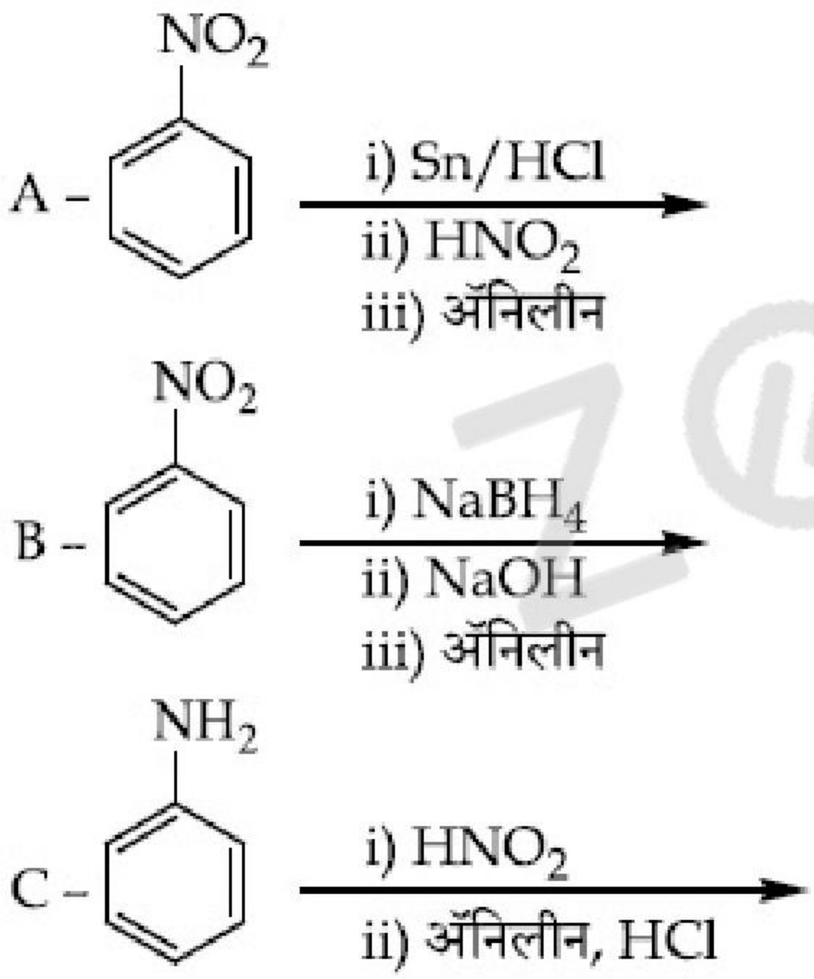
70819159682. A and B

Question Number : 48 Question Id : 70819118171 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालीलपैकी कोणती/कोणत्या अभिक्रिया p-अमायनोअझो बेंझिन देणार नाही/नाहीत ?



Options :

70819159679. फक्त A

70819159680. फक्त C

70819159681. फक्त B

70819159682. A आणि B

ZOLLEGE.in

Question Number : 49 Question Id : 70819118172 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which statement is correct ?

Options :

70819159683. Buna-N is a natural polymer.

70819159684. Buna-S is a synthetic and linear thermosetting polymer.

70819159685. Neoprene is an addition copolymer used in plastic bucket manufacturing.

70819159686. Synthesis of Buna-S needs nascent oxygen.

Question Number : 49 Question Id : 70819118172 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालीलपैकी काय बरोबर आहे ?

Options :

70819159683. ब्युना-N हे एक नैसर्गिक बहुवारिक आहे.

70819159684. ब्युना-S हे एक संश्लेषित, रेखीय व तापदृढ बहुवारिक आहे.

70819159685. प्लास्टिकच्या बादल्या बनवण्यासाठी वापरण्यात येणारे निओप्रीन हे समावेशी सहबहुवारिक आहे.

70819159686. ब्युना-S च्या संश्लेषणात नवजात ऑक्सिजनची गरज असते.

Question Number : 50 Question Id : 70819118173 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

Which of the glycosidic linkage between galactose and glucose is present in lactose ?

Options :

70819159687. C–1 of galactose and C–4 of glucose

70819159688. C–1 of galactose and C–6 of glucose

70819159689. C–1 of glucose and C–4 of galactose

70819159690. C–1 of glucose and C–6 of galactose

Question Number : 50 Question Id : 70819118173 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

लॅक्टोज मध्ये गॅलॅक्टोज आणि ग्लुकोजमधील खालीलपैकी कोणता ग्लायकोसायडीक बंध आहे ?

Options :

70819159687. C–1 of galactose आणि C–4 of glucose

70819159688. C–1 of galactose आणि C–6 of glucose

70819159689. C–1 of glucose आणि C–4 of galactose

70819159690. C–1 of glucose आणि C–6 of galactose

Chemistry Section B

Section Id : 708191751

Section Number : 4

ZOLLEGE.in

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 :	7081911031
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 70819118174 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

0.4 g mixture of NaOH, Na_2CO_3 and some inert impurities was first titrated with $\frac{N}{10}$ HCl using phenolphthalein as an indicator, 17.5 mL of HCl was required at the end point. After this methyl orange was added and titrated. 1.5 mL of same HCl was required for the next end point. The weight percentage of Na_2CO_3 in the mixture 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 : 51 Question Id : 70819118174 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

काही उदासीन अपद्रव्य असलेले NaOH आणि Na_2CO_3 चे 0.4 ग्रॅम मिश्रण प्रथम $\frac{N}{10}$ HCl व फेनॉल्फथॅलिन वापरून अनुमापन केले असता अंत्यबिंदु येण्यास 17.5 मिली HCl लागले. त्यानंतर मिथाईल ऑरेंज टाकून अनुमापन केले, तेव्हा अंत्यबिंदु येण्यास 1.5 मिली HCl लागले तर Na_2CO_3 चा मिश्रणातील वस्तुमानाचा शेकडा _____ आहे. (जवळच्या पूर्णांकात)

ZOLLEGE.in

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 : 70819118175 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A car tyre is filled with nitrogen gas at 35 psi at 27°C. It will burst if pressure exceeds 40 psi. The temperature in °C at which the car tyre will burst 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 : 70819118175 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

एका गाडीच्या टायरमध्ये 35 psi आणि 27°C तापमानाला नायट्रोजन वायु भरला आहे. दाब 40 psi असताना तो टायर फुटेल. त्या वेळचे तापमान _____°C असेल. (जवळच्या पूर्णांकात)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

ZOLLEGE.in

5 to 5.001

Question Number : 53 Question Id : 70819118176 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The reaction of cyanamide, $NH_2CN_{(s)}$ with oxygen was run in a bomb calorimeter and ΔU was found to be -742.24 kJ mol^{-1}. The magnitude of ΔH_{298} for the reaction

$$NH_2CN_{(s)} + \frac{3}{2}O_{2(g)} \rightarrow N_{2(g)} + O_{2(g)} + H_2O_{(l)}$$

is _____ kJ. (Rounded off to the nearest integer)

[Assume ideal gases and $R = 8.314$ J mol^{-1} K^{-1}]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819118176 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

बॉम्ब कॅलरीमापीमध्ये सायनामाइड $NH_2CN_{(s)}$ ची ऑक्सिजन बरोबर अभिक्रिया केली असता $\Delta U = -742.24$ kJ mol^{-1} आढळते.

तर ΔH_{298} (kJ) अभिक्रियेसाठीचे मूल्य

$$NH_2CN_{(s)} + \frac{3}{2}O_{2(g)} \rightarrow N_{2(g)} + O_{2(g)} + H_2O_{(l)}$$

_____ आहे. (जवळच्या पूर्णांकात) (आदर्श वायु असे समजा, $R = 8.314$ J mol^{-1} K^{-1})

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

ZOLLEGE.in

5 to 5.001

Question Number : 54 Question Id : 70819118177 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1 molal aqueous solution of an electrolyte A_2B_3 is 60% ionised. The boiling point of the solution at 1 atm is _____ K. (Rounded-off to the nearest integer)

[Given K_b for $(H_2O) = 0.52$ K kg mol^{-1}]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 Question Id : 70819118177 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A_2B_3 ह्या एका विद्युत अपघटनीच्या 1 मोलल जलिय द्रावणाचे 60% आयनन झाले आहे. ह्या द्रावणाचा उत्कलनांक 1 atm ला _____ K आहे. (दिलेले आहे K_b $(H_2O) = 0.52$ K kg mol^{-1}) (जवळच्या पूर्णांकात)

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 : 70819118178 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

In basic medium CrO_4^{2-} oxidises $S_2O_3^{2-}$ to form SO_4^{2-} and itself changes into $Cr(OH)_4^-$.

The volume of 0.154 M CrO_4^{2-} required to react with 40 mL of 0.25 M $S_2O_3^{2-}$ is _____ mL. (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 : 55 Question Id : 70819118178 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

आम्लारि माध्यमात CrO_4^{2-} हा $S_2O_3^{2-}$ चे ऑक्सिडीकरण करून SO_4^{2-} मध्ये रूपांतर करतो व स्वतः $Cr(OH)_4^-$ मध्ये बदलतो. 0.154 M CrO_4^{2-} चे 40 mL 0.25 M $S_2O_3^{2-}$ बरोबर पूर्णपणे अभिक्रिया होण्यासाठी _____ mL एवढे आकारमान लागेल. (जवळच्या पूर्णांकात)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

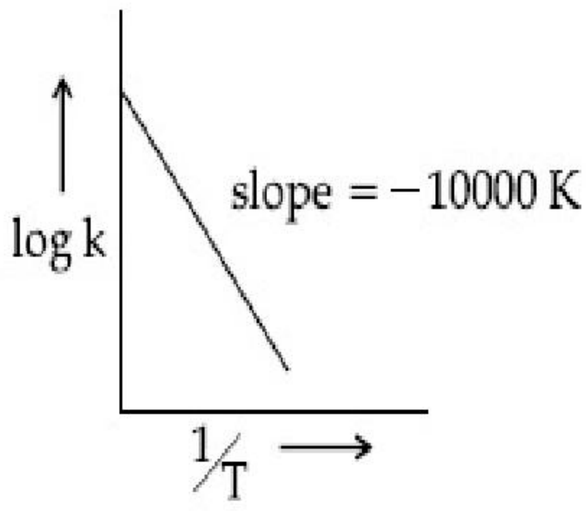
5 to 5.001

Question Number : 56 Question Id : 70819118179 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

For the reaction, $aA + bB \rightarrow cC + dD$, the plot of log k *vs* $\frac{1}{T}$ is given below :



The temperature at which the rate constant of the reaction is $10^{-4}\ s^{-1}$ is _____ K.
(Rounded-off to the nearest integer)
[Given : The rate constant of the reaction is $10^{-5}\ s^{-1}$ at 500 K.]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

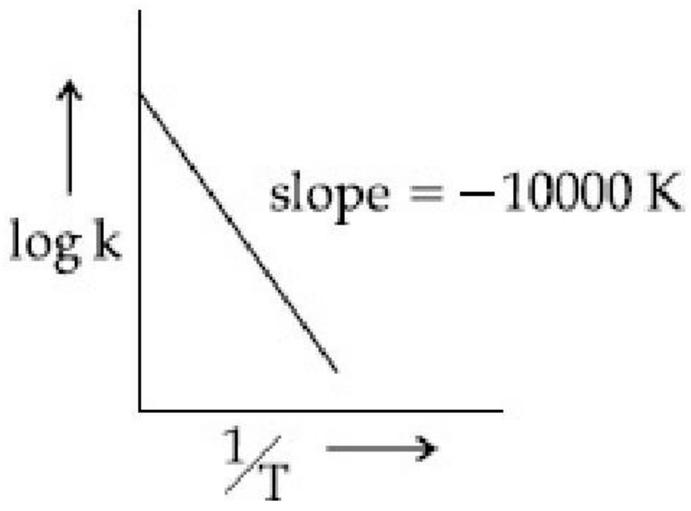
Possible Answers :

5 to 5.001

Question Number : 56 Question Id : 70819118179 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$aA + bB \rightarrow cC + dD$ ह्या अभिक्रियेसाठी log k विरुद्ध $\frac{1}{T}$ चा आलेख खाली दिलेला आहे.



$10^{-4}\ s^{-1}$ ह्या अभिक्रियेच्या वेग स्थिरांकासाठी लागणारे तापमान _____ K आहे.
(दिलेले आहे 500 K तापमानाला वेग स्थिरांक $10^{-5}\ s^{-1}$ आहे.)
(जवळच्या पूर्णांकात)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

ZOLLEGE.in

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819118180 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The ionization enthalpy of Na^+ formation from $Na_{(g)}$ is 495.8 kJ mol^{-1}, while the electron gain enthalpy of Br is -325.0 kJ mol^{-1}. Given the lattice enthalpy of NaBr is -728.4 kJ mol^{-1}. The energy for the formation of NaBr ionic solid is $(-)$_____ $\times 10^{-1}$ kJ mol^{-1}.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819118180 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Na (वायु) पासून Na^+ आयन तयार होण्याची आयनन ऊर्जा 495.8 kJ mol^{-1} आहे, तर Br ची इलेक्ट्रॉन गेन एन्थॅल्पी -325.0 kJ mol^{-1} आहे. -728.4 kJ mol^{-1} हि जलिय एन्थॅल्पी NaBr साठी दिलेली असताना NaBr हे आयनी संयुग तयार होण्याची ऊर्जा $(-)$_____ $\times 10^{-1}$ kJ mol^{-1} आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

ZOLLEGE.in

Question Number : 58 Question Id : 70819118181 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following, the number of halide(s) which is/are inert to hydrolysis is _____.

(A) BF_3 (B) $SiCl_4$ (C) PCl_5 (D) SF_6

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819118181 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

जलीय अपघटनात उदासीन असणाऱ्या खालीलपैकी हलाईडस् ची संख्या _____ आहे.

(A) BF_3 (B) $SiCl_4$ (C) PCl_5 (D) SF_6

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

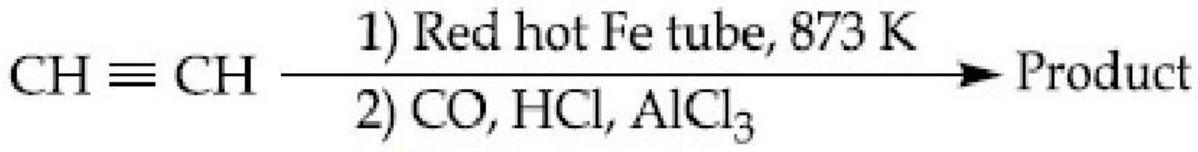
5 to 5.001

Question Number : 59 Question Id : 70819118182 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

Consider the following chemical reaction.



The number of sp^2 hybridized carbon atom(s) present in the product is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

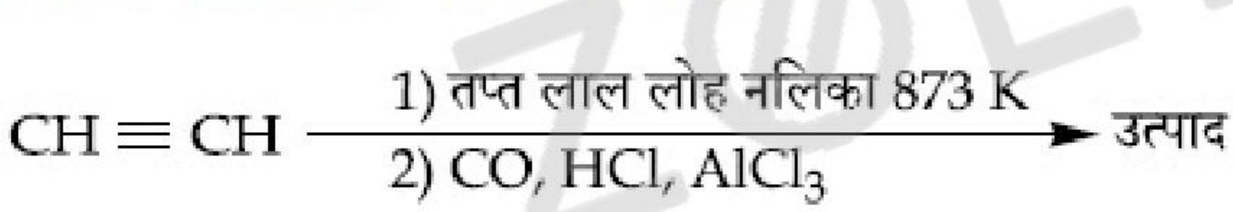
Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819118182 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

खालील रासायनिक अभिक्रिया बघा.



तर उत्पादातील sp^2 संकरित कार्बनची संख्या _____ आहे.

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 : 70819118183 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

Using the provided information in the following paper chromatogram :

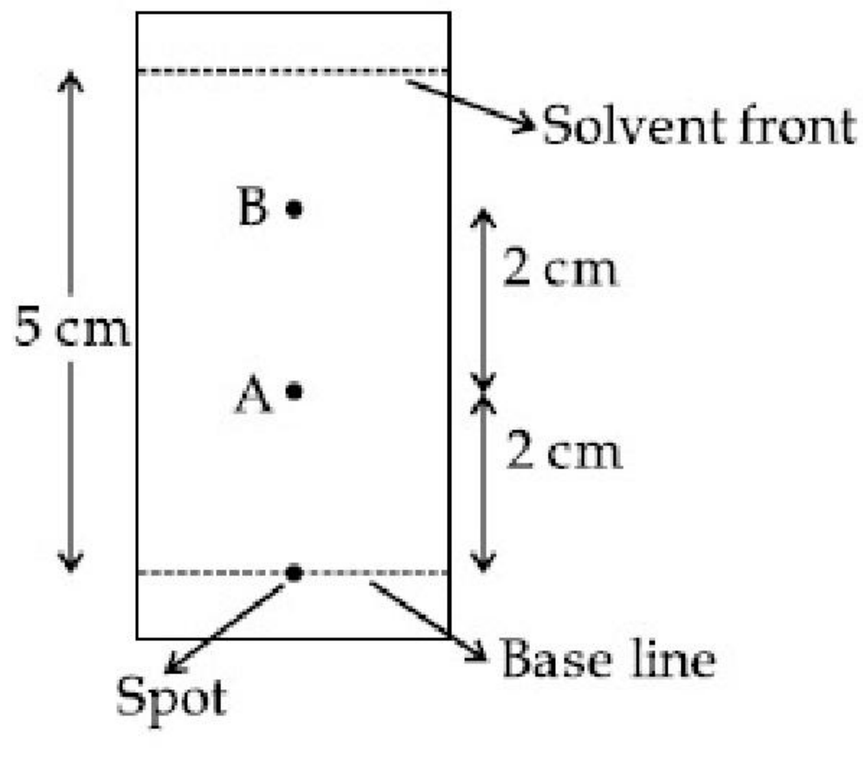


Fig : Paper chromatography for compounds A and B.

the calculated R_f value of A _____ $\times 10^{-1}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

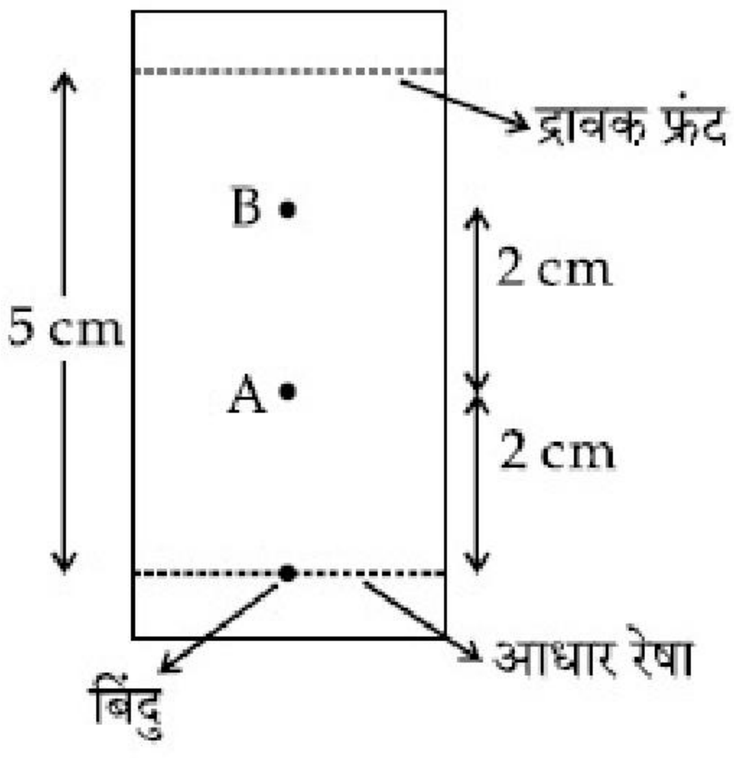
Possible Answers :

5 to 5.001

Question Number : 60 Question Id : 70819118183 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

दिलेली माहिती वापरा.



आकृती : A आणि B संयुगासाठी कागद वर्णलेखन.

A च्या R_f परिगणित केलेल्या किंमत _____ $\times 10^{-1}$ आहेत.

ZOLLEGE.in

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 :	708191752
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 :	7081911032
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 70819118184 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f, g : \mathbf{N} \to \mathbf{N}$ such that $f(n+1) = f(n) + f(1)\ \forall\ n \in \mathbf{N}$ and g be any arbitrary function. Which of the following statements is NOT true ?

Options :

70819159701. If f is onto, then $f(n) = n\ \forall\ n \in \mathbf{N}$

ZOLLEGE.in

70819159702. f is one-one

70819159703. If g is onto, then fog is one-one

70819159704. If fog is one-one, then g is one-one

Question Number : 61 Question Id : 70819118184 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

समजा $f, g : \mathbf{N} \to \mathbf{N}$, जसे की $f(n+1) = f(n) + f(1)\ \forall\ n \in \mathbf{N}$ आणि g हे कोणतेही फल (arbitrary function) आहे.

खाली दिलेल्या विधांनामध्ये कोणते विधान सत्य नाही ?

Options :

70819159701. जर f हे आच्छादक (onto) फल असेल, तर $f(n) = n, \forall\ n \in \mathbf{N}$

70819159702. f हे एकास–एक (one-one) फल आहे.

70819159703. जर g हे आच्छादक फल असेल, तर fog हे एकास–एक फल आहे.

70819159704. जर fog हे एकास–एक फल असेल, तर g हे एकास–एक फल आहे.

Question Number : 62 Question Id : 70819118185 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let the lines $(2 - i)z = (2 + i)\bar{z}$ and $(2 + i)z + (i - 2)\bar{z} - 4i = 0$, (here $i^2 = -1$) be normal to a circle C. If the line $iz + \bar{z} + 1 + i = 0$ is tangent to this circle C, then its radius is :

Options :

70819159705. $3\sqrt{2}$

ZOLLEGE.in

70819159706. $\frac{1}{2\sqrt{2}}$

70819159707. $\frac{3}{2\sqrt{2}}$

70819159708. $\frac{3}{\sqrt{2}}$

Question Number : 62 Question Id : 70819118185 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

समजा $(2-i)z = (2+i)\bar{z}$ आणि

$(2+i)z + (i-2)\bar{z} - 4i = 0$ (येथे $i^2 = -1$)

या रेषा एका वर्तुळ C च्या प्रलंब (normal) आहेत. जर $iz + \bar{z} + 1 + i = 0$ ही रेषा ह्याच वर्तुळ C ची स्पर्शिका (tangent) असेल, तर त्याची त्रिज्या (radius) _____ आहे.

Options :

70819159705. $3\sqrt{2}$

70819159706. $\frac{1}{2\sqrt{2}}$

70819159707. $\frac{3}{2\sqrt{2}}$

70819159708. $\frac{3}{\sqrt{2}}$

Question Number : 63 Question Id : 70819118186 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

The integer 'k', for which the inequality $x^2-2(3k-1)x+8k^2-7>0$ is valid for every x in R, is :

Options :

70819159709. 2

70819159710. 3

70819159711. 4

70819159712. 0

Question Number : 63 Question Id : 70819118186 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

पूर्णांक 'k' आहे, त्या साठी $x^2-2(3k-1)x+8k^2-7>0$ ही असमानता (inequality) प्रत्येक x साठी **R** मध्ये खरी आहे.

Options :

70819159709. 2

70819159710. 3

70819159711. 4

70819159712. 0

Question Number : 64 Question Id : 70819118187 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

If $0 < \theta, \phi < \frac{\pi}{2}$, $x = \sum_{n=0}^{\infty} \cos^{2n}\theta$, $y = \sum_{n=0}^{\infty} \sin^{2n}\phi$ and $z = \sum_{n=0}^{\infty} \cos^{2n}\theta \cdot \sin^{2n}\phi$ then :

Options :

70819159713. $xy - z = (x + y)z$

70819159714. $xy + z = (x + y)z$

70819159715. $xy + yz + zx = z$

70819159716. $xyz = 4$

Question Number : 64 Question Id : 70819118187 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर $0 < \theta, \phi < \frac{\pi}{2}$, $x = \sum_{n=0}^{\infty} \cos^{2n}\theta$, $y = \sum_{n=0}^{\infty} \sin^{2n}\phi$ आणि $z = \sum_{n=0}^{\infty} \cos^{2n}\theta \cdot \sin^{2n}\phi$, तर _____.

Options :

70819159713. $xy - z = (x + y)z$

70819159714. $xy + z = (x + y)z$

70819159715. $xy + yz + zx = z$

70819159716. $xyz = 4$

Question Number : 65 Question Id : 70819118188 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

If Rolle's theorem holds for the function $f(x)=x^3-ax^2+bx-4,\ x\in[1,2]$ with $f'\left(\frac{4}{3}\right)=0$,

then ordered pair (a, b) is equal to :

Options :

70819159717. $(5,\ 8)$

70819159718. $(5,\ -8)$

70819159719. $(-5,\ 8)$

70819159720. $(-5,\ -8)$

Question Number : 65 Question Id : 70819118188 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$f'\left(\frac{4}{3}\right)=0$ ला रोल्स चा सिद्धांत (Rolle's theorem) $f(x)=x^3-ax^2+bx-4,\ x\in[1,2]$ या फलासाठी

पूर्ती करेल तर क्रमित जोडी (ordered pair) (a, b) बरोबर _____ आहे.

Options :

70819159717. $(5,\ 8)$

70819159718. $(5,\ -8)$

70819159719. $(-5,\ 8)$

70819159720. $(-5,\ -8)$

Question Number : 66 Question Id : 70819118189 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

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

Options :

70819159721. 0

70819159722. $\frac{1}{2}$

70819159723. $\frac{1}{e}$

70819159724. 1

Question Number : 66 Question Id : 70819118189 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\lim_{n\to\infty}\left(1+\frac{1+\frac{1}{2}+\ldots\ldots+\frac{1}{n}}{n^2}\right)^n \text{ बरोबर _____ आहे.}$$

Options :

70819159721. 0

70819159722. $\frac{1}{2}$

70819159723. $\frac{1}{e}$

70819159724. 1

ZOLLEGE.in

Question Number : 67 Question Id : 70819118190 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of the integral

$$\int \frac{\sin\theta.\sin 2\theta\,(\sin^6\theta + \sin^4\theta + \sin^2\theta)\,\sqrt{2\sin^4\theta + 3\sin^2\theta + 6}}{1 - \cos 2\theta}\,d\theta \text{ is :}$$

(where c is a constant of integration)

Options :

70819159725. $\frac{1}{18}\left[9 - 2\sin^6\theta - 3\sin^4\theta - 6\sin^2\theta\right]^{\frac{3}{2}} + c$

70819159726. $\frac{1}{18}\left[9 - 2\cos^6\theta - 3\cos^4\theta - 6\cos^2\theta\right]^{\frac{3}{2}} + c$

70819159727. $\frac{1}{18}\left[11 - 18\sin^2\theta + 9\sin^4\theta - 2\sin^6\theta\right]^{\frac{3}{2}} + c$

70819159728. $\frac{1}{18}\left[11 - 18\cos^2\theta + 9\cos^4\theta - 2\cos^6\theta\right]^{\frac{3}{2}} + c$

Question Number : 67 Question Id : 70819118190 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\int \frac{\sin\theta.\sin 2\theta\,(\sin^6\theta + \sin^4\theta + \sin^2\theta)\,\sqrt{2\sin^4\theta + 3\sin^2\theta + 6}}{1 - \cos 2\theta}\,d\theta$$

या पूर्णांकी (integral) चे मूल्य _____ आहे.

(जेंव्हा c हा संकलनाचा अचल (constant of integration) आहे.)

Options :

ZOLLEGE.in

70819159725. $\frac{1}{18}\left[9-2\sin^6\theta-3\sin^4\theta-6\sin^2\theta\right]^{\frac{3}{2}}+c$

70819159726. $\frac{1}{18}\left[9-2\cos^6\theta-3\cos^4\theta-6\cos^2\theta\right]^{\frac{3}{2}}+c$

70819159727. $\frac{1}{18}\left[11-18\sin^2\theta+9\sin^4\theta-2\sin^6\theta\right]^{\frac{3}{2}}+c$

70819159728. $\frac{1}{18}\left[11-18\cos^2\theta+9\cos^4\theta-2\cos^6\theta\right]^{\frac{3}{2}}+c$

Question Number : 68 Question Id : 70819118191 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\int_{-1}^{1} x^2 e^{\lfloor x^3 \rfloor} dx$, where [t] denotes the greatest integer $\leq$ t, is :

Options :

70819159729. $\frac{e+1}{3}$

70819159730. $\frac{1}{3e}$

70819159731. $\frac{e-1}{3e}$

70819159732. $\frac{e+1}{3e}$

ZOLLEGE.in

Question Number : 68 Question Id : 70819118191 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\int_{-1}^{1} x^2 e^{\lfloor x^3 \rfloor} dx$ चे मूल्य बरोबर _____ आहे, जेंव्हा, [t] हे t किंवा t पेक्षा लहान महत्तम पूर्णांक (greatest integer) दर्शवितो.

Options :

70819159729. $\frac{e+1}{3}$

70819159730. $\frac{1}{3e}$

70819159731. $\frac{e-1}{3e}$

70819159732. $\frac{e+1}{3e}$

Question Number : 69 Question Id : 70819118192 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If a curve passes through the origin and the slope of the tangent to it at any point (x, y) is $\frac{x^2 - 4x + y + 8}{x - 2}$, then this curve also passes through the point :

Options :

70819159733. $(4, 5)$

70819159734. $(5, 5)$

70819159735. $(5, 4)$

ZOLLEGE.in

70819159736. $(4, 4)$

Question Number : 69 Question Id : 70819118192 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर एक वक्र आंरभबिंदूतून (origin) जाईल आणि त्या वक्रावरील कोणत्याही बिंदू (x, y) शी असलेल्या स्पर्शिकेचा (tangent) कल (slope) $\frac{x^2 - 4x + y + 8}{x - 2}$ असेल, तर हा वक्र सुद्धा _____ बिंदूतून जाईल.

Options :

70819159733. $(4, 5)$

70819159734. $(5, 5)$

70819159735. $(5, 4)$

70819159736. $(4, 4)$

Question Number : 70 Question Id : 70819118193 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The image of the point $(3, 5)$ in the line $x - y + 1 = 0$, lies on :

Options :

70819159737. $(x-4)^2 + (y+2)^2 = 16$

70819159738. $(x-2)^2 + (y-4)^2 = 4$

ZOLLEGE.in

70819159739. $(x-4)^2+(y-4)^2=8$

70819159740. $(x-2)^2+(y-2)^2=12$

Question Number : 70 Question Id : 70819118193 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$x-y+1=0$ या रेषेमधील $(3, 5)$ या बिंदूची प्रतिमा (image) _____ वर असेल.

Options :

70819159737. $(x-4)^2+(y+2)^2=16$

70819159738. $(x-2)^2+(y-4)^2=4$

70819159739. $(x-4)^2+(y-4)^2=8$

70819159740. $(x-2)^2+(y-2)^2=12$

Question Number : 71 Question Id : 70819118194 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A tangent is drawn to the parabola $y^2=6x$ which is perpendicular to the line $2x+y=1$.
Which of the following points does **NOT** lie on it ?

Options :

70819159741. $(0, 3)$

70819159742. $(-6, 0)$

70819159743. $(5, 4)$

ZOLLEGE.in

70819159744. $(4, 5)$

Question Number : 71 Question Id : 70819118194 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$y^2=6x$ या अन्वस्त (parabola) वर एक स्पर्शिका (tangent) काढली जी $2x+y=1$ या रेषेला लंब (perpendicular) आहे.

खाली दिलेल्या बिंदू पैकी कोणता बिंदू त्यावर नसेल ?

Options :

70819159741. $(0, 3)$

70819159742. $(-6, 0)$

70819159743. $(5, 4)$

70819159744. $(4, 5)$

Question Number : 72 Question Id : 70819118195 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the curves, $\frac{x^2}{a}+\frac{y^2}{b}=1$ and $\frac{x^2}{c}+\frac{y^2}{d}=1$ intersect each other at an angle of 90°, then which of the following relations is TRUE ?

Options :

70819159745. $a+b=c+d$

70819159746. $a-b=c-d$

70819159747.

ZOLLEGE.in

$$ab = \frac{c + d}{a + b}$$

70819159748. $a - c = b + d$

Question Number : 72 Question Id : 70819118195 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\frac{x^2}{a} + \frac{y^2}{b} = 1$ आणि $\frac{x^2}{c} + \frac{y^2}{d} = 1$ हे वक्र एकमेकांना 90° च्या कोना मध्ये छेदतात, तर खाली दिलेला कोणता संबंध (relation) सत्य आहे ?

Options :

70819159745. $a + b = c + d$

70819159746. $a - b = c - d$

70819159747. $ab = \frac{c + d}{a + b}$

70819159748. $a - c = b + d$

Question Number : 73 Question Id : 70819118196 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let α be the angle between the lines whose direction cosines satisfy the equations $l + m - n = 0$ and $l^2 + m^2 - n^2 = 0$. Then the value of $\sin^4\alpha + \cos^4\alpha$ is :

Options :

70819159749. $\frac{5}{8}$

70819159750.

ZOLLEGE.in

70819159752. $\frac{3}{8}$

70819159751. $\frac{1}{2}$

70819159752. $\frac{3}{4}$

Question Number : 73 Question Id : 70819118196 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

समजा α हा दोन रेषांमधील कोन आहे. त्या रेषांचे दिक् कोसाइन (direction cosines) $l+m-n=0$ आणि $l^2+m^2-n^2=0$ या समीकरणांची पूर्ती (satisfy) करतात. तर $\sin^4\alpha+\cos^4\alpha$ चे मूल्य _____ आहे.

Options :

70819159749. $\frac{5}{8}$

70819159750. $\frac{3}{8}$

70819159751. $\frac{1}{2}$

70819159752. $\frac{3}{4}$

Question Number : 74 Question Id : 70819118197 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

The equation of the line through the point (0, 1, 2) and perpendicular to the line $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{-2}$ is :

Options :

70819159753. $\frac{x}{3}=\frac{y-1}{4}=\frac{z-2}{-3}$

70819159754. $\frac{x}{-3}=\frac{y-1}{4}=\frac{z-2}{3}$

70819159755. $\frac{x}{3}=\frac{y-1}{-4}=\frac{z-2}{3}$

70819159756. $\frac{x}{3}=\frac{y-1}{4}=\frac{z-2}{3}$

Question Number : 74 Question Id : 70819118197 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

(0, 1, 2) या बिंदूमधून जाणारी आणि $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{-2}$ या रेषेला लंब (perpendicular) असणाऱ्या रेषेचे समीकरण _____ आहे.

Options :

70819159753. $\frac{x}{3}=\frac{y-1}{4}=\frac{z-2}{-3}$

70819159754. $\frac{x}{-3}=\frac{y-1}{4}=\frac{z-2}{3}$

70819159755. $\frac{x}{3}=\frac{y-1}{-4}=\frac{z-2}{3}$

ZOLLEGE.in

70819159756. $\frac{x}{3} = \frac{y-1}{4} = \frac{z-2}{3}$

Question Number : 75 Question Id : 70819118198 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

When a missile is fired from a ship, the probability that it is intercepted is $\frac{1}{3}$ and the probability that the missile hits the target, given that it is not intercepted, is $\frac{3}{4}$. If three missiles are fired independently from the ship, then the probability that all three hit the target, is :

Options :

70819159757. $\frac{1}{27}$

70819159758. $\frac{1}{8}$

70819159759. $\frac{3}{8}$

70819159760. $\frac{3}{4}$

Question Number : 75 Question Id : 70819118198 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जेंव्हा एका जहाजावरून क्षेपणास्त्र (missile) डागले (fired) जाते, ते रोखले (intercepted) जाण्याची संभाव्यता $\frac{1}{3}$ असते, आणि क्षेपणास्त्राने लक्षाला (target) मारले असता संभाव्यता $\frac{3}{4}$ असते, ते रोखले जाणार नाही असे दिलेले आहे. जर जहाजावरून 3 क्षेपणास्त्रे स्वतंत्रपणे (independently) डागली, तर सर्व तिघांनी लक्षाला मारण्याची संभाव्यता _____ असते.

Options :

ZOLLEGE.in

70819159757. $\frac{1}{27}$

70819159758. $\frac{1}{8}$

70819159759. $\frac{3}{8}$

70819159760. $\frac{3}{4}$

Question Number : 76 Question Id : 70819118199 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The coefficients a, b and c of the quadratic equation, $ax^2 + bx + c = 0$ are obtained by throwing a dice three times. The probability that this equation has equal roots is :

Options :

70819159761. $\frac{1}{36}$

70819159762. $\frac{1}{54}$

70819159763. $\frac{1}{72}$

70819159764. $\frac{5}{216}$

Question Number : 76 Question Id : 70819118199 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

$ax^2+bx+c=0$ या वर्गसमीकरणाचे (quadratic equation) a, b आणि c हे सहगुणक आहेत, जे एक फासा तीन वेळेस फेकल्यावर मिळतील. त्या समीकरणाची समान मूळे (equal roots) येण्यासाठीची संभाव्यता (probability) _____ आहे.

Options :

70819159761. $\frac{1}{36}$

70819159762. $\frac{1}{54}$

70819159763. $\frac{1}{72}$

70819159764. $\frac{5}{216}$

Question Number : 77 Question Id : 70819118200 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

All possible values of $\theta \in [0, 2\pi]$ for which $\sin 2\theta + \tan 2\theta > 0$ lie in :

Options :

70819159765. $\left(0, \frac{\pi}{2}\right) \cup \left(\pi, \frac{3\pi}{2}\right)$

70819159766. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{11\pi}{6}\right)$

70819159767. $\left(0, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{7\pi}{6}\right)$

70819159768. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{5\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{7\pi}{4}\right)$

ZOLLEGE.in

Question Number : 77 Question Id : 70819118200 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\sin 2\theta + \tan 2\theta > 0$ या समीकरणासाठी $\theta \in [0, 2\pi]$ ची सर्व शक्य (possible) मूल्ये _____ मध्ये आहेत.

Options :

70819159765. $\left(0, \frac{\pi}{2}\right) \cup \left(\pi, \frac{3\pi}{2}\right)$

70819159766. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{11\pi}{6}\right)$

70819159767. $\left(0, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{7\pi}{6}\right)$

70819159768. $\left(0, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{4}\right) \cup \left(\pi, \frac{5\pi}{4}\right) \cup \left(\frac{3\pi}{2}, \frac{7\pi}{4}\right)$

Question Number : 78 Question Id : 70819118201 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The total number of positive integral solutions (x, y, z) such that $xyz = 24$ is :

Options :

70819159769. 24

70819159770. 30

70819159771. 36

ZOLLEGE.in

70819159772. 45

Question Number : 78 Question Id : 70819118201 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

(x, y, z) साठी धन पूर्णांक उकली (positive integral solutions) च्या एकूण संख्या (total number) _____ आहे, जसे की $xyz = 24$.

Options :

70819159769. 24

70819159770. 30

70819159771. 36

70819159772. 45

Question Number : 79 Question Id : 70819118202 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A man is observing, from the top of a tower, a boat speeding towards the tower from a certain point A, with uniform speed. At that point, angle of depression of the boat with the man's eye is 30° (Ignore man's height). After sailing for 20 seconds, towards the base of the tower (which is at the level of water), the boat has reached a point B, where the angle of depression is 45°. Then the time taken (in seconds) by the boat from B to reach the base of the tower is :

Options :

70819159773. 10

70819159774. $10(\sqrt{3}+1)$

70819159775. $10\sqrt{3}$

ZOLLEGE.in

70819159776. $10(\sqrt{3}-1)$

Question Number : 79 Question Id : 70819118202 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

एक माणूस टॉवरच्या वरून निरिक्षण करीत आहे, एका A बिंदू पासून एक समान वेगाने (uniform speed) जलद चालणारी एक नाव (boat) टॉवर कडे येत आहे. त्या बिंदूशी ती नाव आणि त्या माणसाच्या डोळ्याशी तयार होणारा अवनत कोन (angle of depression) 30° आहे. (माणसाची उंची दूर्लक्ष करा (Ignore)). 20 सेकंद पाण्यावर प्रवास (sailing) केल्या नंतर, ती बोट B बिंदू शी पोहचते, तेंव्हा टॉवरचा पाया (तो पाण्याच्या पृष्ठभागाशी आहे), आणि B बिंदू नी तयार होणारा अवनत कोन 45° आहे. तर B बिंदू पासून टॉवरच्या पायथ्याशी पोहचण्यासाठी त्या नावेला लागणारा वेळ _____ (सेकंदात) आहे.

Options :

70819159773. 10

70819159774. $10(\sqrt{3}+1)$

70819159775. $10\sqrt{3}$

70819159776. $10(\sqrt{3}-1)$

Question Number : 80 Question Id : 70819118203 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The statement $A \rightarrow (B \rightarrow A)$ is equivalent to :

Options :

70819159777. $A \rightarrow (A \rightarrow B)$

70819159778. $A \rightarrow (A \vee B)$

ZOLLEGE.in

70819159779. $A \rightarrow (A \wedge B)$

70819159780. $A \rightarrow (A \leftrightarrow B)$

Question Number : 80 Question Id : 70819118203 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$A \rightarrow (B \rightarrow A)$ या विधानाचे सममूल्य (equivalent) _____ आहे.

Options :

70819159777. $A \rightarrow (A \rightarrow B)$

70819159778. $A \rightarrow (A \vee B)$

70819159779. $A \rightarrow (A \wedge B)$

70819159780. $A \rightarrow (A \leftrightarrow B)$

Mathematics Section B

Section Id :	708191753
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

ZOLLEGE.in

Sub-Section Number : 1

Sub-Section Id : 7081911033

Question Shuffling Allowed : Yes

Question Number : 81 Question Id : 70819118204 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $A=\begin{bmatrix} 0 & -\tan\left(\frac{\theta}{2}\right) \\ \tan\left(\frac{\theta}{2}\right) & 0 \end{bmatrix}$ and $(I_2+A)\,(I_2-A)^{-1}=\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$, then $13(a^2+b^2)$ 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 : 81 Question Id : 70819118204 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

जर $A=\begin{bmatrix} 0 & -\tan\left(\frac{\theta}{2}\right) \\ \tan\left(\frac{\theta}{2}\right) & 0 \end{bmatrix}$ आणि $(I_2+A)\,(I_2-A)^{-1}=\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$, तर $13(a^2+b^2)$ बरोबर _____ आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

ZOLLEGE.in

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819118205 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $A=\begin{bmatrix} x & y & z \\ y & z & x \\ z & x & y \end{bmatrix}$, where x, y and z are real numbers such that $x+y+z>0$ and $xyz=2$.

If $A^2=I_3$, then the value of $x^3+y^3+z^3$ 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 : 82 Question Id : 70819118205 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा $A=\begin{bmatrix} x & y & z \\ y & z & x \\ z & x & y \end{bmatrix}$, जेंव्हा x, y आणि z या वास्तव संख्या (real numbers) आहेत. जसे की

$x+y+z>0$ आणि $xyz=2$ जर $A^2=I_3$, तर $x^3+y^3+z^3$ चे मूल्य _____ आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

ZOLLEGE.in

Question Number : 83 Question Id : 70819118206 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the system of equations

$$kx + y + 2z = 1$$
$$3x - y - 2z = 2$$
$$-2x - 2y - 4z = 3$$

has infinitely many solutions, then k 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 : 70819118206 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

जर

$$kx + y + 2z = 1$$
$$3x - y - 2z = 2$$
$$-2x - 2y - 4z = 3$$

या समीकरणांच्या प्रणाली च्या अनंत बहु उकली (infinitely many solutions) आहेत, तर k बरोबर _____ आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

ZOLLEGE.in

Question Number : 84 Question Id : 70819118207 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The total number of numbers, lying between 100 and 1000 that can be formed with the digits 1, 2, 3, 4, 5, if the repetition of digits is not allowed and numbers are divisible by either 3 or 5, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 84 Question Id : 70819118207 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1, 2, 3, 4, 5 हे अंक घेवून 100 आणि 1000 यांच्या दरम्यान तयार होणाऱ्या संख्याची एकूण संख्या _____ आहे,

जर अंकाच्या पुनरावृत्ती ला परवानगी नाही (not allowed) आणि संख्या 3 किंवा 5 ने विभाज्य (divisible) होणाऱ्या आहेत.

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 : 70819118208 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $A_1, A_2, A_3, \ldots$ be squares such that for each $n \geq 1$, the length of the side of A_n equals the length of diagonal of A_{n+1}. If the length of A_1 is 12 cm, then the smallest value of n for which area of A_n is less than one, is _____.

ZOLLEGE.in

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 : 70819118208 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा $A_1, A_2, A_3, \ldots$ हे चौरस (squares) आहेत असे की प्रत्येक $n \geq 1$ साठी, A_n च्या बाजूची लांबी ही A_{n+1} च्या कर्णाच्या लांबी बरोबर आहे. जर A_1 ची लांबी 12 cm असेल तर n चे लहानात लहान मूल्य (smallest value) ज्या साठी A_n चे क्षेत्रफळ 1 पेक्षा लहान असेल, _____ आहे.

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 : 70819118209 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of points, at which the function $f(x) = |2x+1| - 3|x+2| + |x^2+x-2|$, $x \in \mathbf{R}$ is not differentiable, is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

ZOLLEGE.in

5 to 5.001

Question Number : 86 Question Id : 70819118209 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$f(x)=|2x+1|-3|x+2|+|x^2+x-2|, x \in \mathbf{R}$ हे फल ज्या बिंदूवर विकलनीय (differentiable) नाही अशा बिंदू ची संख्या _____ आहे.

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 : 70819118210 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $f(x)$ be a polynomial of degree 6 in x, in which the coefficient of x^6 is unity and it has extrema at $x=-1$ and $x=1$. If $\lim\limits_{x\to 0}\dfrac{f(x)}{x^3}=1$, then $5\cdot f(2)$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819118210 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

समजा $f(x)$ ही x मधील 6 ची कोटी (degree) असणारी बहुपदी (polynomial) आहे त्या मध्ये x^6 चा सहगुणक (coefficient) एक (unity) आहे आणि $x=-1$ आणि $x=1$ साठी ती कमाल किंवा किमान (extrema) आहे.

तर $\lim_{x\to 0} \frac{f(x)}{x^3} = 1$, तर $5 \cdot f(2)$ बरोबर _____ आहे.

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 : 70819118211 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The graphs of sine and cosine functions, intersect each other at a number of points and between two consecutive points of intersection, the two graphs enclose the same area A. Then A^4 is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819118211 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

साइन (sine) आणि कोसाइन (cosine) या फलांचा आलेख, एकमेकांना खूप बिंदू त आणि लगतच्या (consecutive) दोन बिंदूच्या छेदामध्ये छेदतात, दोन्ही आलेख समान (same) क्षेत्रफळ A ने बंदिस्त (enclose) असतील तर A^4 बरोबर _____ आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

ZOLLEGE.in

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819118212 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The locus of the point of intersection of the lines $(\sqrt{3})kx + ky - 4\sqrt{3} = 0$ and $\sqrt{3}\,x - y - 4(\sqrt{3})\,k = 0$ is a conic, whose eccentricity is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819118212 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$(\sqrt{3})kx + ky - 4\sqrt{3} = 0$ आणि

$\sqrt{3}\,x - y - 4(\sqrt{3})\,k = 0$ या रेषांच्या छेद बिंदू (point of intersection) चे निधान (locus) शांक्व (conic) आहे, त्याची उत्केंद्रता (eccentricity) _____ आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

ZOLLEGE.in

5 to 5.001

Question Number : 90 Question Id : 70819118213 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $\vec{a} = \hat{i} + 2\hat{j} - \hat{k}$, $\vec{b} = \hat{i} - \hat{j}$ and $\vec{c} = \hat{i} - \hat{j} - \hat{k}$ be three given vectors. If $\vec{r}$ is a vector such that $\vec{r} \times \vec{a} = \vec{c} \times \vec{a}$ and $\vec{r} \cdot \vec{b} = 0$, then $\vec{r} \cdot \vec{a}$ 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 : 90 Question Id : 70819118213 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा $\vec{a} = \hat{i} + 2\hat{j} - \hat{k}$, $\vec{b} = \hat{i} - \hat{j}$ आणि $\vec{c} = \hat{i} - \hat{j} - \hat{k}$ दिलेले तीन सदिश (vectors) आहेत. जर $\vec{r}$ सदिश असेल जसे की $\vec{r} \times \vec{a} = \vec{c} \times \vec{a}$ आणि $\vec{r} \cdot \vec{b} = 0$, तर $\vec{r} \cdot \vec{a}$ बरोबर _____ आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

ZOLLEGE.in