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Question Paper Name :	B TECH EM 24th Feb 2021 Shift 1
Subject Name :	B TECH EM
Creation Date :	2021-02-23 19:53:01
Duration :	180
Number of Questions :	90
Total Marks :	300
Display Marks:	Yes

B TECH EM

Group Number :	1
Group Id :	708191168
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 :	708191586
Section Number :	1
Section type :	Online

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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 :	708191866
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 70819115694 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The workdone by a gas molecule in an isolated system is given by, $W = \alpha\beta^2 e^{-\frac{x^2}{\alpha kT}}$, where x is the displacement, k is the Boltzmann constant and T is the temperature. α and β are constants. Then the dimensions of β will be :

Options :

70819152231. $[M^2\ L\ T^2]$

70819152232. $[M^0\ L\ T^0]$

70819152233. $[M\ L\ T^{-2}]$

70819152234. $[M\ L^2\ T^{-2}]$

Question Number : 1 Question Id : 70819115694 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

विविक्त संहतीत वायूच्या रेणूने केलेले कार्य $W = \alpha\beta^2 e^{-\frac{x^2}{\alpha kT}}$ असे दिले आहे. जेथे x विस्थापन, k बोल्टझमनचा स्थिरांक व T तापमान आहे. α व β स्थिरांक आहेत. तर β ची मिती _____ असेल.

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Options :

70819152231. $[M^2\ L\ T^2]$

70819152232. $[M^0\ L\ T^0]$

70819152233. $[M\ L\ T^{-2}]$

70819152234. $[M\ L^2\ T^{-2}]$

Question Number : 2 Question Id : 70819115695 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two stars of masses m and 2m at a distance d rotate about their common centre of mass in free space. The period of revolution is :

Options :

70819152235. $\frac{1}{2\pi}\sqrt{\frac{3Gm}{d^3}}$

70819152236. $2\pi\sqrt{\frac{d^3}{3Gm}}$

70819152237. $2\pi\sqrt{\frac{3Gm}{d^3}}$

70819152238. $\frac{1}{2\pi}\sqrt{\frac{d^3}{3Gm}}$

Question Number : 2 Question Id : 70819115695 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

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Correct Marks : 4 Wrong Marks : 1

मुक्त वातावरणात, m व 2m वस्तुमानाचे दोन तारे d अंतरावर असून ते सामाईक वस्तुकेंद्राभोवती घूर्णन करीत आहेत. घूर्णनाचा काल _____ आहे.

Options :

70819152235. $\frac{1}{2\pi}\sqrt{\frac{3Gm}{d^3}}$

70819152236. $2\pi\sqrt{\frac{d^3}{3Gm}}$

70819152237. $2\pi\sqrt{\frac{3Gm}{d^3}}$

70819152238. $\frac{1}{2\pi}\sqrt{\frac{d^3}{3Gm}}$

Question Number : 3 Question Id : 70819115696 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Four identical particles of equal masses 1 kg made to move along the circumference of a circle of radius 1 m under the action of their own mutual gravitational attraction. The speed of each particle will be :

Options :

70819152239. $\frac{\sqrt{(1+2\sqrt{2})G}}{2}$

70819152240. $\sqrt{\frac{G}{2}(1+2\sqrt{2})}$

70819152241. $\sqrt{G(1+2\sqrt{2})}$

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70819152242. $\sqrt{\frac{G}{2}(2\sqrt{2}-1)}$

Question Number : 3 Question Id : 70819115696 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

चार एकसारख्या कणांचे वस्तुमान प्रत्येकी $1\,kg$ असून त्यांच्या स्वतःच्या एकमेकातल्या गुरुत्वीय आकर्षणामुळे $1\,m$ त्रिज्येच्या वर्तुळाच्या परिघाभोवती गतीमान आहेत. प्रत्येक कणाचा वेग _____ असेल.

Options :

70819152239. $\frac{\sqrt{(1+2\sqrt{2})G}}{2}$

70819152240. $\sqrt{\frac{G}{2}(1+2\sqrt{2})}$

70819152241. $\sqrt{G(1+2\sqrt{2})}$

70819152242. $\sqrt{\frac{G}{2}(2\sqrt{2}-1)}$

Question Number : 4 Question Id : 70819115697 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Moment of inertia (M.I) of four bodies, having same mass and radius, are reported as ;

I_1 = M.I. of thin circular ring about its diameter,

I_2 = M.I. of circular disc about an axis perpendicular to disc and going through the centre,

I_3 = M.I. of solid cylinder about its axis and

I_4 = M.I. of solid sphere about its diameter.

Then :

Options :

70819152243.

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$I_1 + I_2 = I_3 + \frac{5}{2} I_4$

70819152244. $I_1 + I_3 < I_2 + I_4$

70819152245. $I_1 = I_2 = I_3 < I_4$

70819152246. $I_1 = I_2 = I_3 > I_4$

Question Number : 4 Question Id : 70819115697 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

सारखेच वस्तुमान व त्रिज्या असलेल्या चार वस्तुंचे जडत्व आघूर्ण असे आहे.

I_1 = बारीक गोलाकार कड्याचे स्वतःच्या व्यासाभोवतीचे जडत्व आघूर्ण.

I_2 = तबकडीच्या मध्यातून व तिच्या लंबरूप अक्षाभोवती वर्तुळाकार तबकडीचे जडत्व आघूर्ण.

I_3 = भरीव नळकांड्याचे तिच्या अक्षाभोवतीचे जडत्व आघूर्ण.

I_4 = भरीव गोळ्याचे त्याच्या व्यासाभोवतीचे जडत्व आघूर्ण.

तर :

Options :

70819152243. $I_1 + I_2 = I_3 + \frac{5}{2} I_4$

70819152244. $I_1 + I_3 < I_2 + I_4$

70819152245. $I_1 = I_2 = I_3 < I_4$

70819152246. $I_1 = I_2 = I_3 > I_4$

Question Number : 5 Question Id : 70819115698 Question Type : MCQ Option Shuffling : Yes Is

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Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider two satellites S_1 and S_2 with periods of revolution 1 hr. and 8 hr. respectively revolving around a planet in circular orbits. The ratio of angular velocity of satellite S_1 to the angular velocity of satellite S_2 is :

Options :

70819152247. $8:1$

70819152248. $1:8$

70819152249. $2:1$

70819152250. $1:4$

Question Number : 5 Question Id : 70819115698 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

दोन उपग्रह S_1 व S_2 यांचा घूर्णन कालखंड अनुक्रमे $1\,h$ व $8\,h$ असून ते ग्रहाभोवती गोलाकार कक्षेत घूर्णन करीत आहेत. S_1 उपग्रहाचा कोनिय वेग व S_2 उपग्रहाचा कोनिय वेग यांचे गुणोत्तर _____ आहे.

Options :

70819152247. $8:1$

70819152248. $1:8$

70819152249. $2:1$

70819152250. $1:4$

Question Number : 6 Question Id : 70819115699 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

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Correct Marks : 4 Wrong Marks : 1

Each side of a box made of metal sheet in cubic shape is 'a' at room temperature 'T', the coefficient of linear expansion of the metal sheet is 'α'. The metal sheet is heated uniformly, by a small temperature ΔT, so that its new temperature is $T + \Delta T$. Calculate the increase in the volume of the metal box.

Options :

70819152251. $4\pi a^3 \alpha \Delta T$

70819152252. $4a^3 \alpha \Delta T$

70819152253. $\frac{4}{3}\pi a^3 \alpha \Delta T$

70819152254. $3a^3 \alpha \Delta T$

Question Number : 6 Question Id : 70819115699 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

धातुच्या पट्टीपासून घन आकाराचे खोके तयार केले असून त्याची प्रत्येक बाजू 'a' आहे. ते T एवढ्या खोलीच्या तापमानास आहे. धातुच्या पट्टीचा रेखीय प्रसरण गुणांक 'α' आहे. धातुची पट्टी एकसमान ΔT एवढ्या लहान तापमानातून तापविली अशी की तिचे नवे तापमान $T + \Delta T$ आहे. धातुच्या पट्टीची आकारमानातील वाढ काढा.

Options :

70819152251. $4\pi a^3 \alpha \Delta T$

70819152252. $4a^3 \alpha \Delta T$

70819152253. $\frac{4}{3}\pi a^3 \alpha \Delta T$

70819152254. $3a^3 \alpha \Delta T$

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Question Number : 7 Question Id : 70819115700 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If Y, K and η are the values of Young's modulus, bulk modulus and modulus of rigidity of any material respectively. Choose the correct relation for these parameters.

Options :

70819152255. $Y = \frac{9K\eta}{2\eta + 3K}\ N/m^2$

70819152256. $Y = \frac{9K\eta}{3K - \eta}\ N/m^2$

70819152257. $K = \frac{Y\eta}{9\eta - 3Y}\ N/m^2$

70819152258. $\eta = \frac{3YK}{9K + Y}\ N/m^2$

Question Number : 7 Question Id : 70819115700 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर कोणत्याही पदार्थासाठी Y, K व η हे मूल्य अनुक्रमे यंगचा मापांक, आयतन मापांक व दृढता मापांक आहेत.
ह्या प्राचलातील योग्य संबंध निवडा.

Options :

70819152255. $Y = \frac{9K\eta}{2\eta + 3K}\ N/m^2$

70819152256. $Y = \frac{9K\eta}{3K - \eta}\ N/m^2$

70819152257. $K = \frac{Y\eta}{9\eta - 3Y}\ N/m^2$

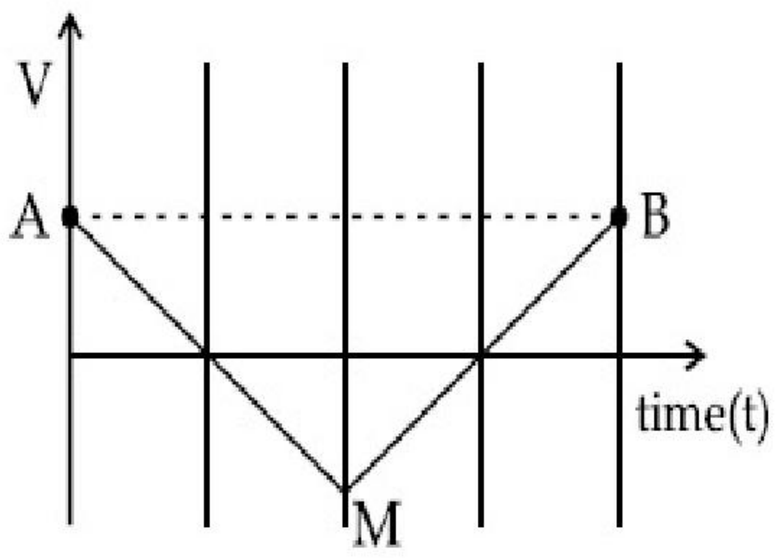
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70819152258. $\eta = \frac{3YK}{9K+Y}\ N/m^2$

Question Number : 8 Question Id : 70819115701 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

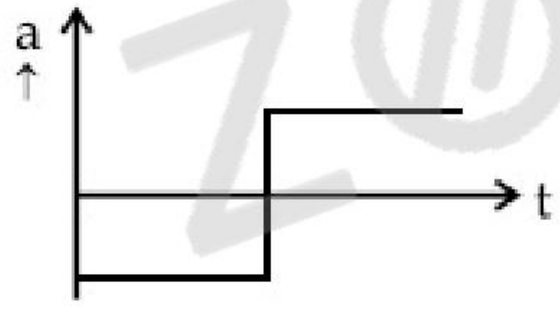
Correct Marks : 4 Wrong Marks : 1

If the velocity-time graph has the shape AMB, what would be the shape of the corresponding acceleration-time graph ?

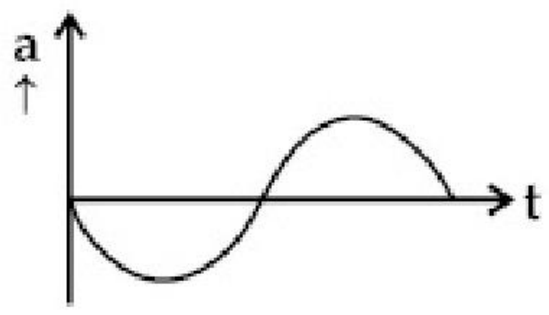


Options :

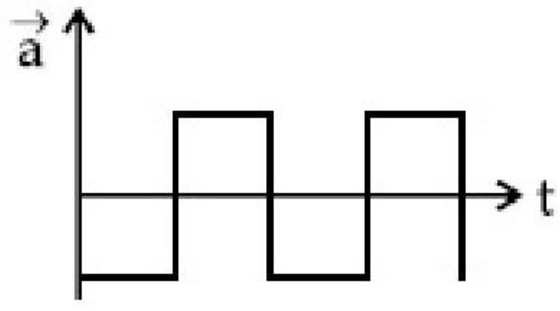
70819152259.



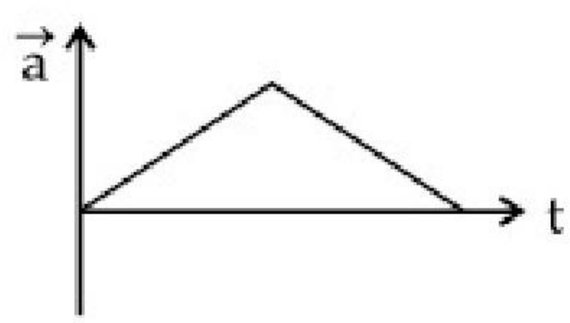
70819152260.



70819152261.



70819152262.

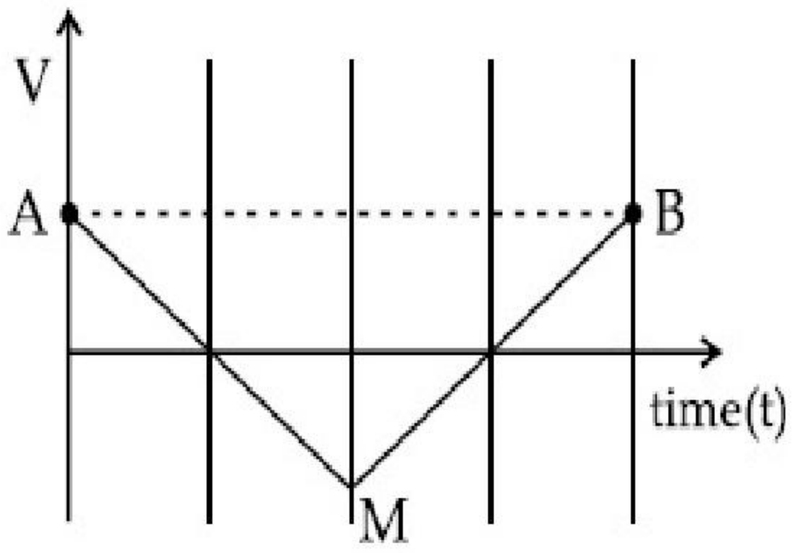


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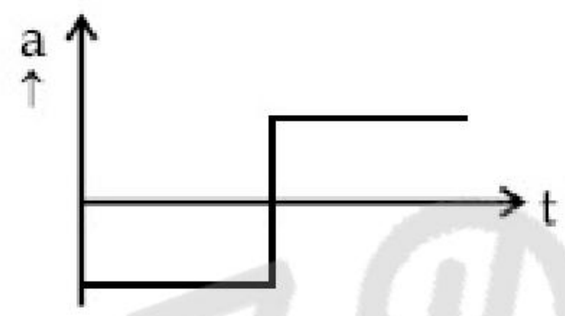
Question Number : 8 Question Id : 70819115701 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

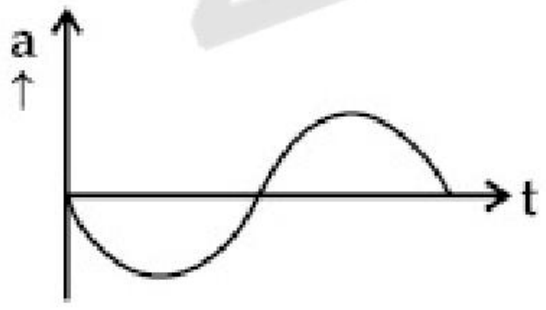
Correct Marks : 4 Wrong Marks : 1

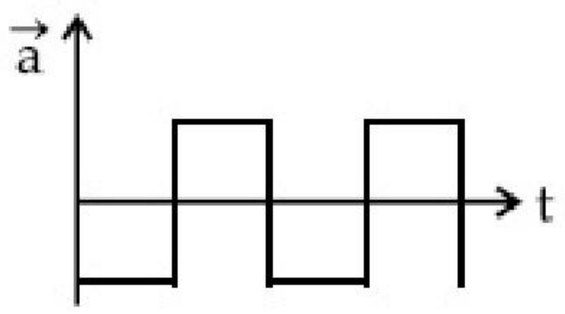
जर वेग–काल आलेखाचा आकार AMB आहे. त्यासंबंधित त्वरण–वेळ आलेखाचा आकार कसा असेल ?

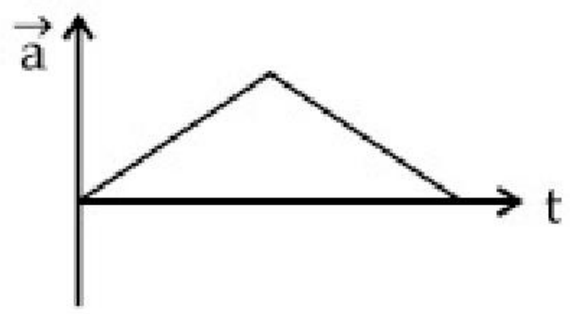


Options :

70819152259. 

70819152260. 

70819152261. 

70819152262. 

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Question Number : 9 Question Id : 70819115702 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

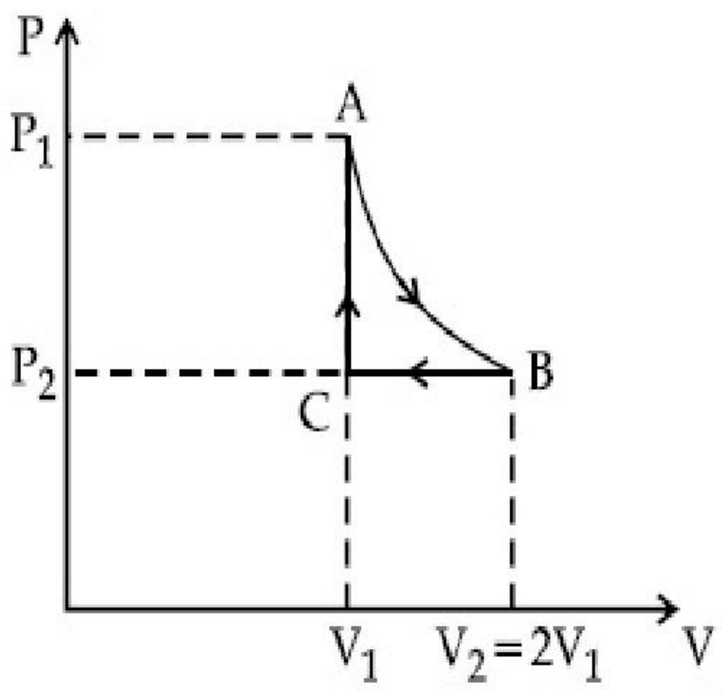
n mole of a perfect gas undergoes a cyclic process ABCA (see figure) consisting of the following processes.

$A \rightarrow B$: Isothermal expansion at temperature T so that the volume is doubled from V_1 to $V_2 = 2V_1$ and pressure changes from P_1 to P_2.

$B \rightarrow C$: Isobaric compression at pressure P_2 to initial volume V_1.

$C \rightarrow A$: Isochoric change leading to change of pressure from P_2 to P_1.

Total workdone in the complete cycle ABCA is :



Options :

70819152263. 0

70819152264. $nRT\ln 2$

70819152265. $nRT\left(\ln 2 + \frac{1}{2}\right)$

70819152266. $nRT\left(\ln 2 - \frac{1}{2}\right)$

Question Number : 9 Question Id : 70819115702 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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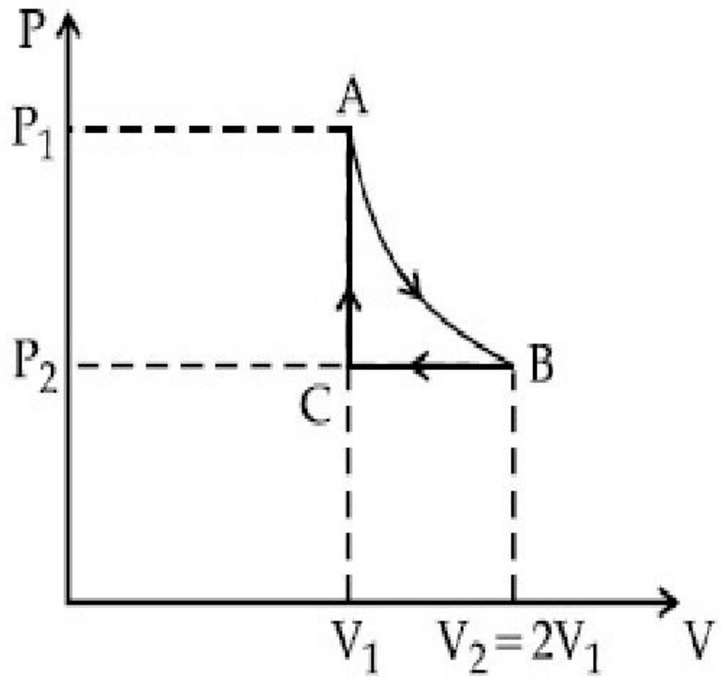
खालील प्रक्रियेत, आदर्श वायूचे n रेणू ABCA चक्रीय प्रक्रियेत जातात. (आकृती पहा)

$A \rightarrow B$: T तापमानास समतापी प्रसरण होते असे की आकारमान दोनपट होते, V_1 पासून $V_2 = 2V_1$ व दाब P_1 पासून P_2 पर्यंत बदलतो.

$B \rightarrow C$: P_2 दाबापासून सुरुवातीचे आकारमान V_1 पर्यंत समभारिक संपीडन.

$C \rightarrow A$: समआयतनी बदल ज्यामुळे दाब P_2 पासून P_1 पर्यंत बदलतो.

ABCA ह्या पूर्ण चक्रात केलेले एकूण कार्य _____ आहे.



Options :

70819152263. 0

70819152264. $nRT\ln 2$

70819152265. $nRT\left(\ln 2 + \frac{1}{2}\right)$

70819152266. $nRT\left(\ln 2 - \frac{1}{2}\right)$

Question Number : 10 Question Id : 70819115703 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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Match List I with List II.

	List I		List II
(a)	Isothermal	(i)	Pressure constant
(b)	Isochoric	(ii)	Temperature constant
(c)	Adiabatic	(iii)	Volume constant
(d)	Isobaric	(iv)	Heat content is constant

Choose the correct answer from the options given below :

Options :

70819152267. (a) → (i), (b) → (iii), (c) → (ii), (d) → (iv)

70819152268. (a) → (iii), (b) → (ii), (c) → (i), (d) → (iv)

70819152269. (a) → (ii), (b) → (iv), (c) → (iii), (d) → (i)

70819152270. (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)

Question Number : 10 Question Id : 70819115703 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालील जोड्या जुळवा.

	यादी I		यादी II
(a)	समतापी	(i)	स्थिर दाब
(b)	समआयतनी	(ii)	स्थिर तापमान
(c)	समोष्ण	(iii)	स्थिर आकारमान
(d)	समभारिक	(iv)	अंतर्विष्ट स्थिर आहे

खाली दिलेल्या पर्यायातून **योग्य** उत्तर निवडा.

Options :

70819152267. (a) → (i), (b) → (iii), (c) → (ii), (d) → (iv)

70819152268. (a) → (iii), (b) → (ii), (c) → (i), (d) → (iv)

70819152269. (a) → (ii), (b) → (iv), (c) → (iii), (d) → (i)

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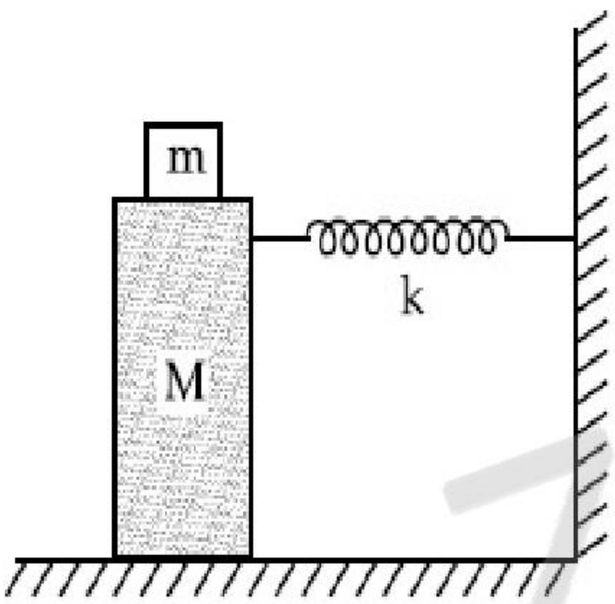
70819152270. (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)

Question Number : 11 Question Id : 70819115704 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In the given figure, a mass M is attached to a horizontal spring which is fixed on one side to a rigid support. The spring constant of the spring is k. The mass oscillates on a frictionless surface with time period T and amplitude A. When the mass is in equilibrium position, as shown in the figure, another mass m is gently fixed upon it. The new amplitude of oscillation will be :



Options :

70819152271. $A\sqrt{\frac{M+m}{M}}$

70819152272. $A\sqrt{\frac{M}{M+m}}$

70819152273. $A\sqrt{\frac{M-m}{M}}$

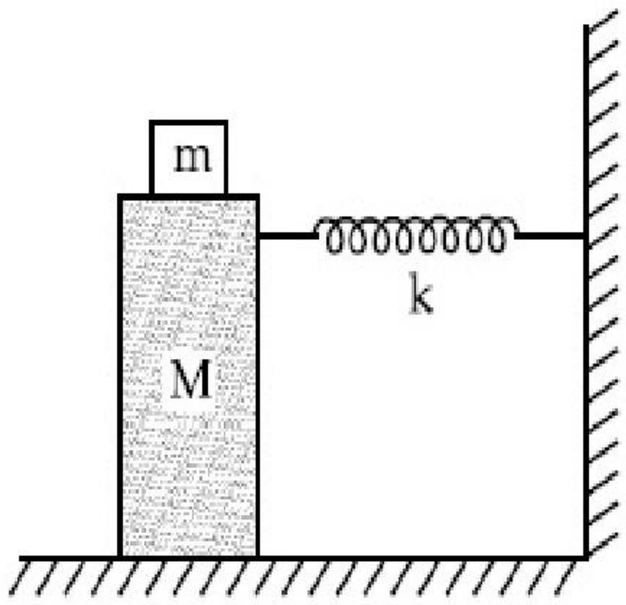
70819152274. $A\sqrt{\frac{M}{M-m}}$

Question Number : 11 Question Id : 70819115704 Question Type : MCQ Op

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

दिलेल्या आकृतीत, क्षितिजसमांतर स्प्रिंगला M वस्तुमान जोडले आहे जी घट्ट आधारास तीचे एक टोक जोडलेले आहे. स्प्रिंगचा बल स्थिरांक k आहे. 'T' एवढ्या कालखंड कालाने व 'A' आयामाने घर्षण विरहीत पृष्ठभागावर वस्तुमान दोलन पावते. आकृतीत दाखविल्याप्रमाणे, जेव्हा वस्तुमान समतुल्य स्थितीत आहे दूसरे m वस्तुमान एकदम त्यावर ठेवले. दोलनाचा नवीन आयाम _____ असेल.



Options :

70819152271. $A\sqrt{\frac{M+m}{M}}$

70819152272. $A\sqrt{\frac{M}{M+m}}$

70819152273. $A\sqrt{\frac{M-m}{M}}$

70819152274. $A\sqrt{\frac{M}{M-m}}$

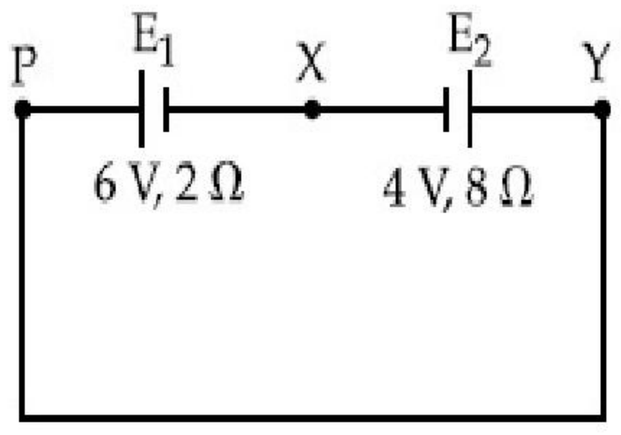
Question Number : 12 Question Id : 70819115705 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

A cell E_1 of emf 6 V and internal resistance 2 Ω is connected with another cell E_2 of emf 4 V and internal resistance 8 Ω (as shown in the figure). The potential difference across points X and Y is :



Options :

70819152275. 2.0 V

70819152276. 3.6 V

70819152277. 5.6 V

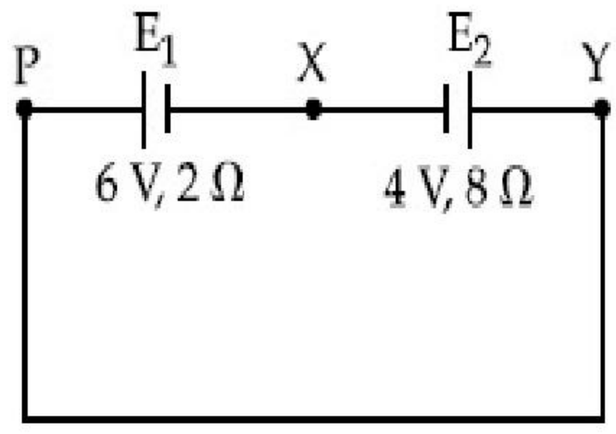
70819152278. 10.0 V

Question Number : 12 Question Id : 70819115705 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

2 Ω अंतर्गत रोध असलेला व 6 V विद्युत गामक बल असलेला E_1 घट, 8 Ω अंतर्गत रोध असलेल्या व 4 V विद्युत गामक बल असलेल्या दूसऱ्या E_2 घटास जोडला (आकृतीत दाखविल्याप्रमाणे). X व Y बिंदूमधील विभवांतर _____ आहे.



Options :

70819152275. 2.0 V

70819152276. 3.6 V

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70819152277. $5.6\ \mathrm{V}$

70819152278. $10.0\ \mathrm{V}$

Question Number : 13 Question Id : 70819115706 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A current through a wire depends on time as

$$i = \alpha_0 t + \beta t^2$$

where $\alpha_0 = 20\ \mathrm{A/s}$ and $\beta = 8\ \mathrm{As}^{-2}$. Find the charge crossed through a section of the wire in 15 s.

Options :

70819152279. $260\ \mathrm{C}$

70819152280. $2100\ \mathrm{C}$

70819152281. $11250\ \mathrm{C}$

70819152282. $2250\ \mathrm{C}$

Question Number : 13 Question Id : 70819115706 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

तारेतील धारा कालाबरोबर अशी अवलंबून आहे $i = \alpha_0 t + \beta t^2$ जेथे $\alpha_0 = 20\ \mathrm{A/s}$ व $\beta = 8\ \mathrm{As}^{-2}$ आहे 15 सेकंदात तारेच्या भागातून गेलेला प्रभार काढा.

Options :

70819152279. $260\ \mathrm{C}$

70819152280. $2100\ \mathrm{C}$

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70819152281. $11250\ C$

70819152282. $2250\ C$

Question Number : 14 Question Id : 70819115707 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two equal capacitors are first connected in series and then in parallel. The ratio of the equivalent capacities in the two cases will be :

Options :

70819152283. $1:2$

70819152284. $2:1$

70819152285. $4:1$

70819152286. $1:4$

Question Number : 14 Question Id : 70819115707 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

दोन सारखी संधारित्रे प्रथम एकसरीत जोडली व नंतर समांतर जोडली. दोन्ही बाबीतील समतुल्य धारकतेचे गुणोत्तर _____ असेल.

Options :

70819152283. $1:2$

70819152284. $2:1$

70819152285. $4:1$

ZOLLEGE.in

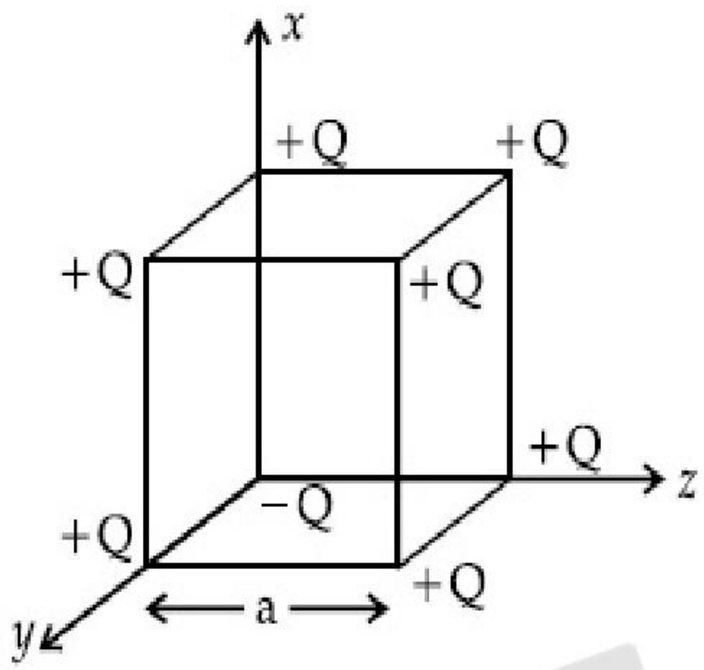
70819152286. $1:4$

Question Number : 15 Question Id : 70819115708 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A cube of side 'a' has point charges +Q located at each of its vertices except at the origin where the charge is −Q. The electric field at the centre of cube is :



Options :

70819152287. $\frac{-Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

70819152288. $\frac{Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

70819152289. $\frac{-2Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

70819152290. $\frac{2Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

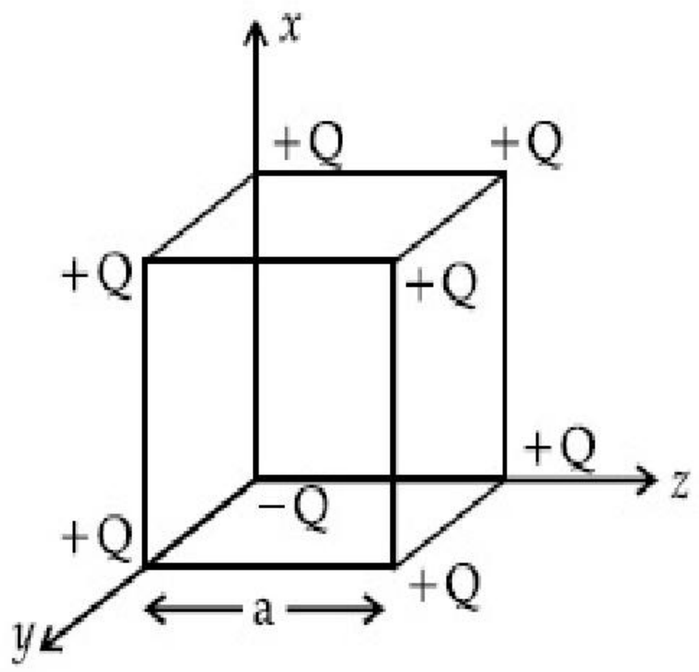
Question Number : 15 Question Id : 70819115708 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

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Correct Marks : 4 Wrong Marks : 1

घनाची प्रत्येक बाजू 'a' असून त्याच्या प्रत्येक टोकास $+Q$ प्रभार आहे फक्त मूळ सोडून जेथे $-Q$ प्रभार आहे. घनाच्या मध्यभागी विद्युत क्षेत्र _____ आहे.



Options :

70819152287. $\frac{-Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

70819152288. $\frac{Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

70819152289. $\frac{-2Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

70819152290. $\frac{2Q}{3\sqrt{3}\pi\varepsilon_0 a^2}\left(\hat{x}+\hat{y}+\hat{z}\right)$

Question Number : 16 Question Id : 70819115709 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If an emitter current is changed by 4 mA, the collector current changes by 3.5 mA. The value of β will be :

Options :

70819152291. 7

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70819152292. 0.875

70819152293. 0.5

70819152294. 3.5

Question Number : 16 Question Id : 70819115709 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर उत्सर्जी धारा 4 mA ने बदलली, संग्राही धारा 3.5 mA ने बदलते. β चे मूल्य _____ असेल.

Options :

70819152291. 7

70819152292. 0.875

70819152293. 0.5

70819152294. 3.5

Question Number : 17 Question Id : 70819115710 Question Type : MCQ Option Shuffling : Yes

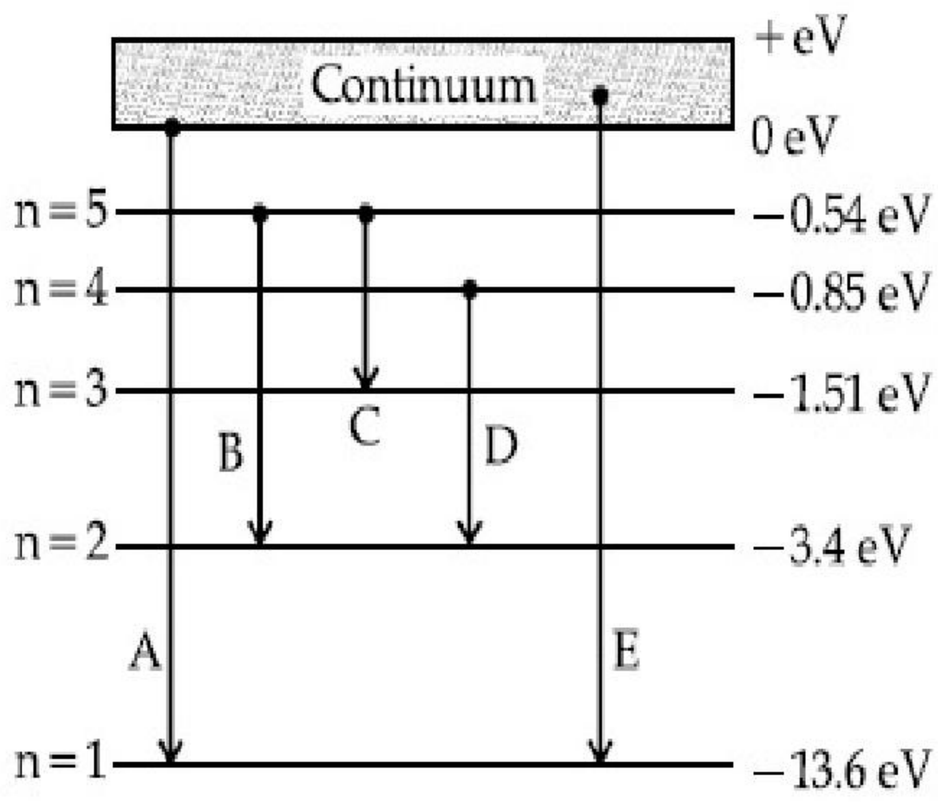
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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In the given figure, the energy levels of hydrogen atom have been shown along with some transitions marked A, B, C, D and E.

The transitions A, B and C respectively represent :



Options :

70819152295. The first member of the Lyman series, third member of Balmer series and second member of Paschen series.

70819152296. The ionization potential of hydrogen, second member of Balmer series and third member of Paschen series.

70819152297. The series limit of Lyman series, second member of Balmer series and second member of Paschen series.

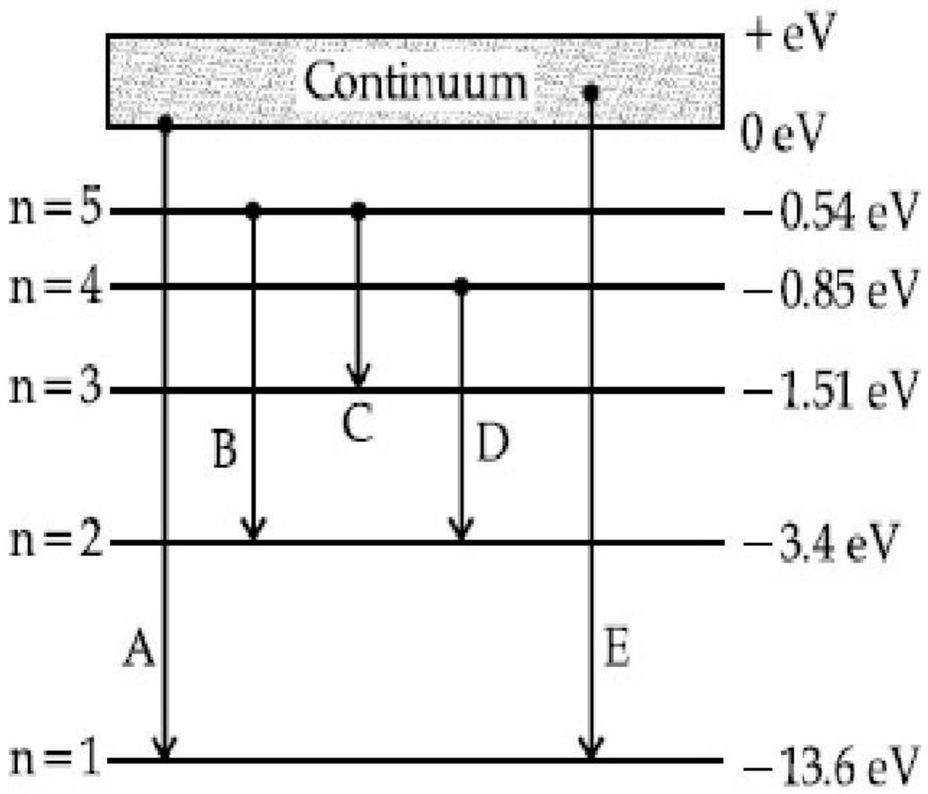
70819152298. The series limit of Lyman series, third member of Balmer series and second member of Paschen series.

Question Number : 17 Question Id : 70819115710 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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दिलेल्या आकृतीत, हायड्रोजन अणूसाठी ऊर्जा पातळ्या A, B, C, D व E खुणेने काही संक्रमणांबरोबर दाखविल्या आहेत. अनुक्रमे A, B व C संक्रमणे _____ दाखवितात.



Options :

70819152295. लायमन श्रेणीतील पहिला घटक, बामर श्रेणीतील तिसरा घटक व पाशन श्रेणीतील दूसरा घटक

70819152296. हायड्रोजनचे आयनन विभव, बामर श्रेणीतील दूसरा घटक व पाशन श्रेणीतील तिसरा घटक

70819152297. लायमन श्रेणीची मर्यादा श्रेणी, बामर श्रेणीतील दूसरा घटक व पाशन श्रेणीतील दूसरा घटक

70819152298. लायमन श्रेणीची मर्यादा श्रेणी, बामर श्रेणीतील तिसरा घटक व पाशन श्रेणीतील दूसरा घटक

Question Number : 18 Question Id : 70819115711 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : Two photons having equal linear momenta have equal wavelengths.

Statement II : If the wavelength of photon is decreased, then the momentum and energy of a photon will also decrease.

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

Options :

70819152299. Both Statement I and Statement II are true

70819152300. Both Statement I and Statement II are false

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70819152301. Statement I is true but Statement II is false

70819152302. Statement I is false but Statement II is true

Question Number : 18 Question Id : 70819115711 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खाली दोन विधाने दिलेली आहेत.

विधान I : दोन फोटॉन ज्यांचे रेषीय संवेग सारखे आहेत त्यांची तरंगलांबी सारखीच आहे.

विधान II : जर फोटॉनची तरंगलांबी कमी केली तर फोटॉनचा संवेग व ऊर्जा दोन्ही सुद्धा कमी होइल.

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

Options :

70819152299. **विधान I** व **विधान II** दोन्ही बरोबर आहेत.

70819152300. **विधान I** व **विधान II** दोन्ही चूक आहेत.

70819152301. **विधान I** बरोबर आहे पण **विधान II** चूक आहे.

70819152302. **विधान I** चूक आहे पण **विधान II** बरोबर आहे.

Question Number : 19 Question Id : 70819115712 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The focal length f is related to the radius of curvature r of the spherical convex mirror by :

Options :

70819152303. $f = \mathrm{r}$

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70819152304. $f = -\mathrm{r}$

70819152305. $f = -\frac{1}{2}\mathrm{r}$

70819152306. $f = +\frac{1}{2}\mathrm{r}$

Question Number : 19 Question Id : 70819115712 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

गोलाकार बहिर्गोल आरशाच्या वक्रतेची त्रिज्या r व नाभीय लांबी f यांचा संबंध _____ असा आहे.

Options :

70819152303. $f = \mathrm{r}$

70819152304. $f = -\mathrm{r}$

70819152305. $f = -\frac{1}{2}\mathrm{r}$

70819152306. $f = +\frac{1}{2}\mathrm{r}$

Question Number : 20 Question Id : 70819115713 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In a Young's double slit experiment, the width of the one of the slit is three times the other slit. The amplitude of the light coming from a slit is proportional to the slit-width. Find the ratio of the maximum to the minimum intensity in the interference pattern.

Options :

70819152307. $4:1$

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70819152308. $2:1$

70819152309. $1:4$

70819152310. $3:1$

Question Number : 20 Question Id : 70819115713 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

यंगच्या द्विफटी प्रयोगात, एका फटीची रुंदी दूसऱ्या फटीच्या तीन पट आहे. फटीपासून येणारा प्रकाशाचा आयाम हा फट–रुंदीस समानुपाती आहे. व्यतिकरण प्रतिरूपात महत्तम व लघुत्तम तिव्रतेचे गुणोत्तर _____ आहे.

Options :

70819152307. $4:1$

70819152308. $2:1$

70819152309. $1:4$

70819152310. $3:1$

Physics Section B

Section Id :	708191587
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5

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Section Marks : 20

Mark As Answered Required? : Yes

Sub-Section Number : 1

Sub-Section Id : 708191867

Question Shuffling Allowed : Yes

Question Number : 21 Question Id : 70819115714 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The coefficient of static friction between a wooden block of mass 0.5 kg and a vertical rough wall is 0.2. The magnitude of horizontal force that should be applied on the block to keep it adhere to the wall will be _____ N.

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 21 Question Id : 70819115714 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

0.5 kg वस्तुमानाचा ठोकळा व उभी खडबडीत भिंत यांमधील स्थितिक घर्षण गुणांक 0.2 आहे. भिंतीस आसंजीत राहण्यासाठी ठोकळ्यावर क्षितिजसमांतर बल लावावे लागेल त्याची किंमत _____ N आहे.

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

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

ZOLLEGE.in

Question Number : 22 Question Id : 70819115715 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

An unpolarized light beam is incident on the polarizer of a polarization experiment and the intensity of light beam emerging from the analyzer is measured as 100 Lumens. Now, if the analyzer is rotated around the horizontal axis (direction of light) by 30° in clockwise direction, the intensity of emerging light will be _____ Lumens.

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 : 70819115715 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ध्रुवण प्रयोगात ध्रुवकावर अध्रुवीत प्रकाश शलाका आपाती आहे व विश्लेषकापासून बाहेर पडलेल्या प्रकाश शलाकेची तीव्रता 100 ल्युमेन्स मोजली. आता विश्लेषकाने क्षितिजसमांतर अक्षाशी (प्रकाशाची दिशा) 30° तून घड्याळाच्या दिशेत घूर्णन केले. बाहेर पडलेल्या प्रकाशाची तीव्रता _____ ल्युमेन्स 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 : 23 Question Id : 70819115716 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A ball with a speed of 9 m/s collides with another identical ball at rest. After the collision, the direction of each ball makes an angle of 30° with the original direction. The ratio of velocities of the balls after collision is $x : y$, where x is _____ .

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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 : 70819115716 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$9\ \mathrm{m/s}$ वेगाने जाणारा चेंडू दूसऱ्या स्थिर असलेल्या त्यासारख्याच चेंडूवर संघात करतो. संघात झाल्यानंतर प्रत्येक चेंडूची दिशा मूळ दिशेबरोबर 30° कोन करते. संघातानंतर चेंडूच्या वेगाचे गुणोत्तर $x : y$ आहे. जेथे x _____ 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 : 24 Question Id : 70819115717 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A hydraulic press can lift 100 kg when a mass 'm' is placed on the smaller piston. It can lift _____ kg when the diameter of the larger piston is increased by 4 times and that of the smaller piston is decreased by 4 times keeping the same mass 'm' on the smaller piston.

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 : 24 Question Id : 70819115717 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

जेव्हा 'm' वस्तुमान लहान दट्ट्यावर ठेवले तेव्हा द्रविक दाबयंत्र 100 kg उचलू शकते. लहान दट्ट्यावर तेच वस्तुमान m ठेवले असता व जेव्हा मोठ्या दट्ट्याचा व्यास 4 पट वाढविला व लहान दट्ट्याचा 4 पट कमी केला तर ते _____ kg उचलू शकेल

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 : 70819115718 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

An inclined plane is bent in such a way that the vertical cross-section is given by $y = \frac{x^2}{4}$ where y is in vertical and x in horizontal direction. If the upper surface of this curved plane is rough with coefficient of friction $\mu = 0.5$, the maximum height in cm at which a stationary block will not slip downward is _____ cm.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

ZOLLEGE.in

Question Number : 25 Question Id : 70819115718 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

आनत प्रतल असे वाकविले कि उभा काटछेद $y = \frac{x^2}{4}$ असा दिला आहे जेथे y हा उभ्या दिशेत व x हा क्षितिजसमांतर दिशेत आहे. जर त्या वाकविलेल्या प्रतलाचा पृष्ठभाग खडबडीत आहे व घर्षण गुणांक $\mu = 0.5$ आहे, तर महत्तम उंची जेथून स्थिर ठोकळा खाली घसरणार नाही ती _____ 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 : 26 Question Id : 70819115719 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A resonance circuit having inductance and resistance 2×10^{-4} H and 6.28 Ω respectively oscillates at 10 MHz frequency. The value of quality factor of this resonator is _____.
$[\pi = 3.14]$

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 : 70819115719 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

प्रेरितता व रोध अनुक्रमे 2×10^{-4} H व 6.28 Ω असलेल्या संस्पंदीत परिपथाची वारंवारता 10 MHz वारंवारतेने दोलन करीत आहे. त्या संस्पंदीच्या गुण अवयवाचे मूल्य आहे. $[\pi = 3.14]$

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 : 27 Question Id : 70819115720 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

An audio signal $\nu_m = 20 \sin 2\pi(1500t)$ amplitude modulates a carrier $\nu_c = 80 \sin 2\pi(100{,}000t)$.
The value of percent modulation 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 : 27 Question Id : 70819115720 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

एक श्रवण संकेत $\nu_m = 20 \sin 2\pi(1500t)$ आयाम $\nu_c = 80 \sin 2\pi(100{,}000t)$ चे वाहनिक आपरिवर्तीत करते. आपरिवर्तनाच्या टक्केवारीचे मूल्य _____ आहे.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

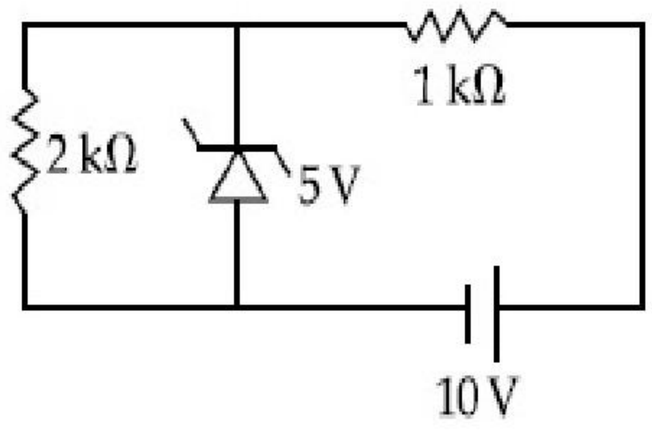
5 to 5.001

ZOLLEGE.in

Question Number : 28 Question Id : 70819115721 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In connection with the circuit drawn below, the value of current flowing through 2 kΩ resistor is _____ $\times 10^{-4}$ A.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

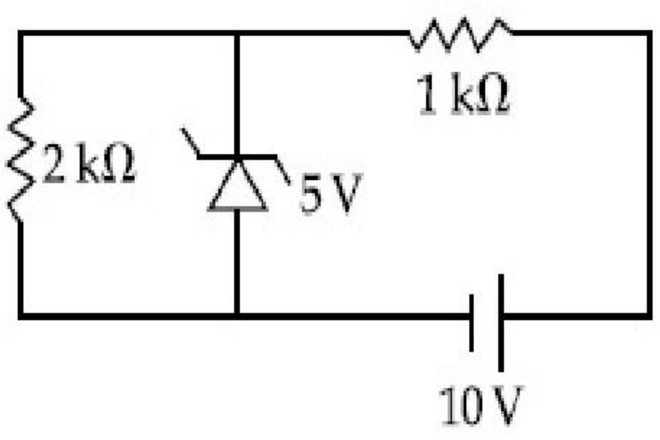
Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819115721 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

खाली दाखविलेल्या परिपथासंदर्भात, 2 kΩ रोधातून जाणाऱ्या धारेचे मूल्य _____ $\times 10^{-4}$ A 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 : 29 Question Id : 70819115722 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

An electromagnetic wave of frequency 5 GHz, is travelling in a medium whose relative electric permittivity and relative magnetic permeability both are 2. Its velocity in this medium is _____ $\times 10^7$ m/s.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 29 Question Id : 70819115722 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

5 GHz वारंवारतेचा विद्युत चुंबकीय तरंग माध्यमातून जात आहे. ज्याची सापेक्ष विद्युत पराविद्युतांक व सापेक्ष चुंबकीय पार्यता दोन्ही 2 आहेत. त्या माध्यमात तिचा वेग _____ $\times 10^7$ m/s 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 : 70819115723 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

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A common transistor radio set requires 12 V (D.C.) for its operation. The D.C. source is constructed by using a transformer and a rectifier circuit, which are operated at 220 V (A.C.) on standard domestic A.C. supply. The number of turns of secondary coil are 24, then the number of turns of primary are _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819115723 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

सामायीक ट्रांझीस्टर रेडीओ मध्ये कार्य करण्यासाठी 12 V प्रत्यक्ष धारा लागते. परिवर्तित्र व दिष्टकारी परिपथ वापरून प्रत्यक्ष धारा उद्‌गम तयार केला जे 220 V (A.C.) मानक प्रत्यावर्ती धारा पुरवठ्यास कार्य करतात. जर द्वितीयकास 24 वेढे आहेत तर प्राथमिक वेढ्यांची 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

Chemistry Section A

Section Id :	708191588
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory

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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 :	708191868
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 70819115724 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following are isostructural pairs ?

A. SO_4^{2-} and CrO_4^{2-}

B. $SiCl_4$ and $TiCl_4$

C. NH_3 and NO_3^-

D. BCl_3 and $BrCl_3$

Options :

70819152321. A and B only

70819152322. A and C only

70819152323. B and C only

70819152324. C and D only

Question Number : 31 Question Id : 70819115724 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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खालीलपैकी कोणत्या जोड्या समसंरचनांच्या जोड्या आहेत ?

(A) SO_4^{2-} आणि CrO_4^{2-} (B) $SiCl_4$ आणि $TiCl_4$

(C) NH_3 आणि NO_3^- (D) BCl_3 आणि $BrCl_3$

Options :

70819152321. (A) आणि (B) फक्त

70819152322. (A) आणि (C) फक्त

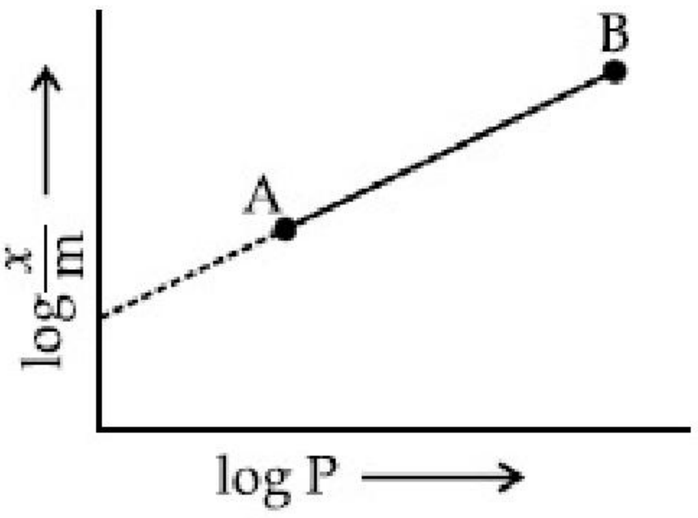
70819152323. (B) आणि (C) फक्त

70819152324. (C) आणि (D) फक्त

Question Number : 32 Question Id : 70819115725 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In Freundlich adsorption isotherm, slope of AB line is :



Options :

70819152325. n with (n, 0.1 to 0.5)

70819152326. log n with (n > 1)

70819152327. $\log \frac{1}{n}$ with (n < 1)

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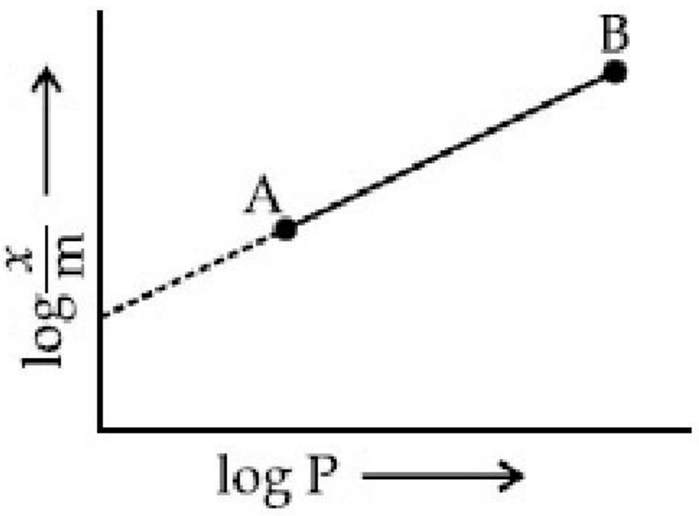
70819152328. $\frac{1}{n}$ with $\left(\frac{1}{n} = 0 \text{ to } 1\right)$

Question Number : 32 Question Id : 70819115725 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

फ्रेंडलिच अधिशोषण समतापरेषेतील AB ह्या रेषेचा उतार _____ आहे.



Options :

70819152325. n, (किंमती 0.1 - 0.5)

70819152326. $\log n$, $n > 1$ असताना

70819152327. $\log \frac{1}{n}$, $n < 1$ असताना

70819152328. $\frac{1}{n}$, $\frac{1}{n}$ =0 ते 1 असताना

Question Number : 33 Question Id : 70819115726 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the elements Mg, Al, S, P and Si, the correct increasing order of their first ionization enthalpy is :

Options :

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70819152329. $Al < Mg < Si < S < P$

70819152330. $Mg < Al < Si < P < S$

70819152331. $Mg < Al < Si < S < P$

70819152332. $Al < Mg < S < Si < P$

Question Number : 33 Question Id : 70819115726 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Mg, Al, S, P आणि Si हि मूलद्रव्ये लक्षात घ्या त्यांच्या प्रथम आयनन एन्थॅल्पीचा बरोबर चढता क्रम _____ आहे.

Options :

70819152329. $Al < Mg < Si < S < P$

70819152330. $Mg < Al < Si < P < S$

70819152331. $Mg < Al < Si < S < P$

70819152332. $Al < Mg < S < Si < P$

Question Number : 34 Question Id : 70819115727 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following ore is concentrated using group 1 cyanide salt ?

Options :

70819152333. Calamine

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70819152334. Malachite

70819152335. Siderite

70819152336. Sphalerite

Question Number : 34 Question Id : 70819115727 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालीलपैकी कोणत्या धातुकाची गट 1 मधील सायनाइड क्षार वापरून संहती वाढवतात ?

Options :

70819152333. कॅलामाइन

70819152334. मॅलॅकाइट

70819152335. सिडेराइट

70819152336. स्फोलेराइट

Question Number : 35 Question Id : 70819115728 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

(A) $HOCl + H_2O_2 \rightarrow H_3O^+ + Cl^- + O_2$

(B) $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$

Choose the correct option.

Options :

70819152337. H_2O_2 acts as oxidising agent in equations (A) and (B).

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70819152338. H_2O_2 acts as reducing agent in equations (A) and (B).

70819152339. H_2O_2 act as oxidizing and reducing agent respectively in equations (A) and (B).

70819152340. H_2O_2 acts as reducing and oxidising agent respectively in equations (A) and (B).

Question Number : 35 Question Id : 70819115728 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

(A) $HOCl + H_2O_2 \rightarrow H_3O^+ + Cl^- + O_2$

(B) $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$

बरोबर पर्याय निवडा.

Options :

70819152337. H_2O_2 हा (A) आणि (B) ह्या समीकरणात ऑक्सिडीकारक म्हणून काम करतो.

70819152338. H_2O_2 हा (A) आणि (B) ह्या समीकरणात क्षपणकारक म्हणून काम करतो.

70819152339. H_2O_2 हा अनुक्रमे ऑक्सिडीकारक आणि क्षपणकारक म्हणून (A) आणि (B) समीकरणात काम करतो.

70819152340. H_2O_2 हा अनुक्रमे क्षपणकारक आणि ऑक्सिडीकारक म्हणून (A) आणि (B) समीकरणात काम करतो.

Question Number : 36 Question Id : 70819115729 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Al_2O_3 was leached with alkali to get X. The solution of X on passing of gas Y, forms Z.
X, Y and Z respectively are :

Options :

70819152341. $X = Na[Al(OH)_4],\ Y = SO_2,\ Z = Al_2O_3$

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70819152342. $X = Al(OH)_3,\ Y = SO_2,\ Z = Al_2O_3.xH_2O$

70819152343. $X = Al(OH)_3,\ Y = CO_2,\ Z = Al_2O_3$

70819152344. $X = Na[Al(OH)_4],\ Y = CO_2,\ Z = Al_2O_3.xH_2O$

Question Number : 36 Question Id : 70819115729 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Al_2O_3 चे आम्लारिसोबत निक्षालन केले असता X मिळते. X च्या द्रावणातून Y वायू सोडला असता Z तयार होते. तर X, Y आणि Z अनुक्रमे आहेत :

Options :

70819152341. $X = Na[Al(OH)_4],\ Y = SO_2,\ Z = Al_2O_3$

70819152342. $X = Al(OH)_3,\ Y = SO_2,\ Z = Al_2O_3.xH_2O$

70819152343. $X = Al(OH)_3,\ Y = CO_2,\ Z = Al_2O_3$

70819152344. $X = Na[Al(OH)_4],\ Y = CO_2,\ Z = Al_2O_3.xH_2O$

Question Number : 37 Question Id : 70819115730 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The electrode potential of M^{2+}/M of 3d-series elements shows positive value for :

Options :

70819152345. Fe

70819152346. Co

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70819152347. Zn

70819152348. Cu

Question Number : 37 Question Id : 70819115730 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

3d श्रेणीतील ज्या मूलद्रव्याची M^{2+}/M इलेक्ट्रोड विभवाची किंमत धन असते तो _____ आहे.

Options :

70819152345. Fe

70819152346. Co

70819152347. Zn

70819152348. Cu

Question Number : 38 Question Id : 70819115731 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The major components in "Gun Metal" are :

Options :

70819152349. Cu, Sn and Zn

70819152350. Cu, Zn and Ni

70819152351. Cu, Ni and Fe

70819152352. Al, Cu, Mg and Mn

ZOLLEGE.in

Question Number : 38 Question Id : 70819115731 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

'गन मेटल' मधील प्रमुख भाग _____ आहेत.

Options :

70819152349. Cu, Sn आणि Zn

70819152350. Cu, Zn आणि Ni

70819152351. Cu, Ni आणि Fe

70819152352. Al, Cu, Mg आणि Mn

Question Number : 39 Question Id : 70819115732 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The gas released during anaerobic degradation of vegetation may lead to :

Options :

70819152353. Acid rain

70819152354. Global warming and cancer

70819152355. Corrosion of metals

70819152356. Ozone hole

ZOLLEGE.in

Question Number : 39 Question Id : 70819115732 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

वनस्पतीच्या वातनिरपेक्षी विचयनामुळे सोडणाऱ्या वायुने _____ होऊ शकते.

Options :

70819152353. आम्ल पाऊस

70819152354. ग्लोबल वॉर्मिंग व कँसर

70819152355. धातूंचे गंजणे

70819152356. ओझोन पोकळी

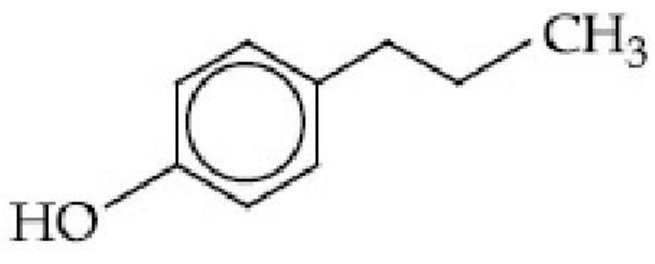
Question Number : 40 Question Id : 70819115733 Question Type : MCQ Option Shuffling : Yes

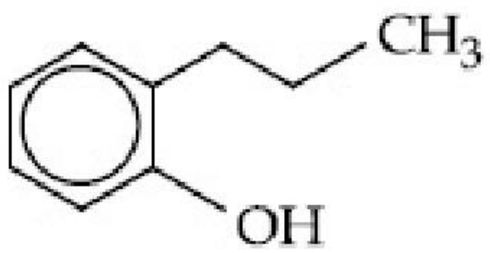
Is Question Mandatory : No

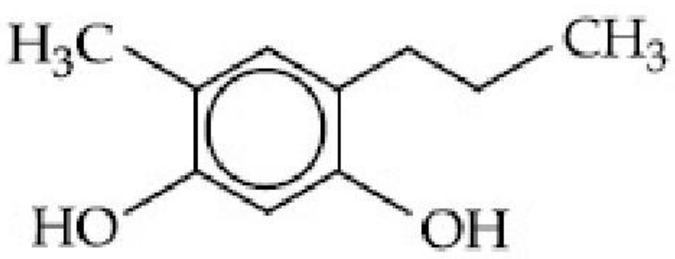
Correct Marks : 4 Wrong Marks : 1

Which of the following compound gives pink colour on reaction with phthalic anhydride in conc. H_2SO_4 followed by treatment with NaOH ?

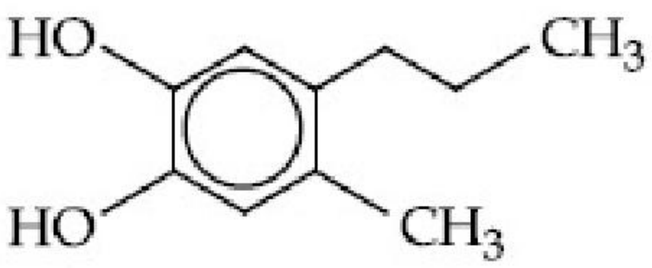
Options :

70819152357. 

70819152358. 

70819152359. 

ZOLLEGE.in

70819152360. 

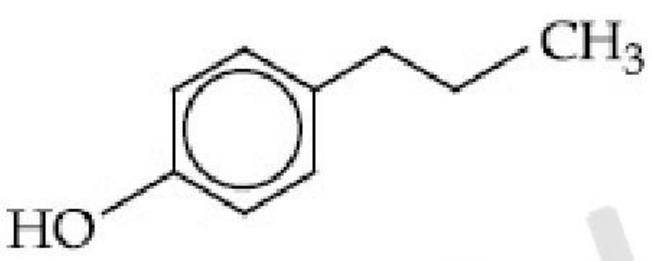
Question Number : 40 Question Id : 70819115733 Question Type : MCQ Option Shuffling : Yes

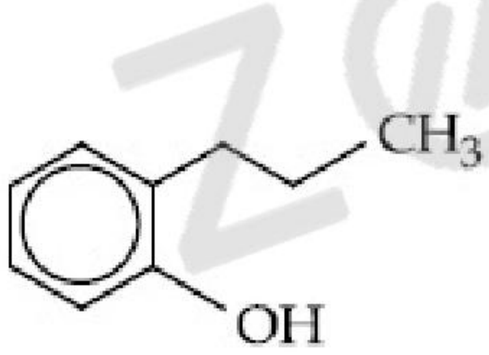
Is Question Mandatory : No

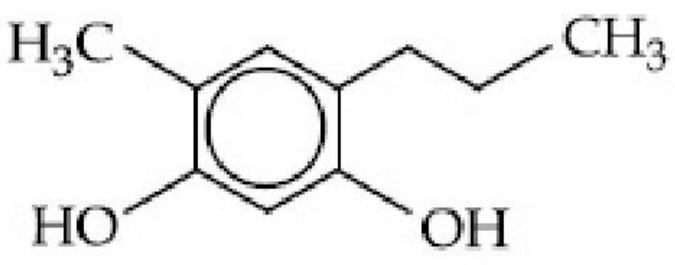
Correct Marks : 4 Wrong Marks : 1

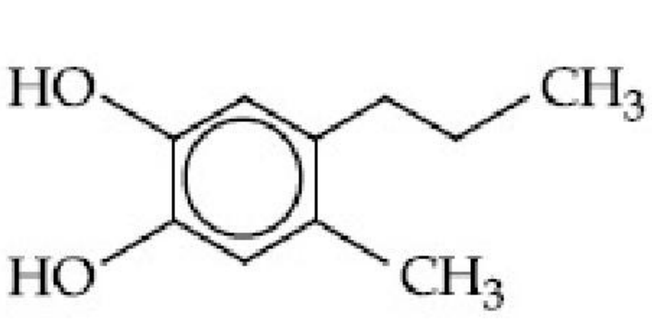
खालीलपैकी कोणते संयुग तीव्र H_2SO_4 मधील थॅलिक अनहायड्राइडसोबत आणि नंतर NaOH बरोबर गुलाबी रंग देतो ?

Options :

70819152357. 

70819152358. 

70819152359. 

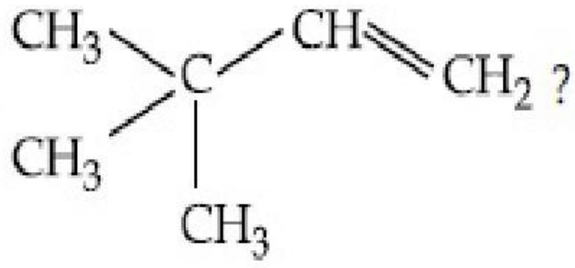
70819152360. 

Question Number : 41 Question Id : 70819115734 Question Type : MCQ Option Shuffling : Yes

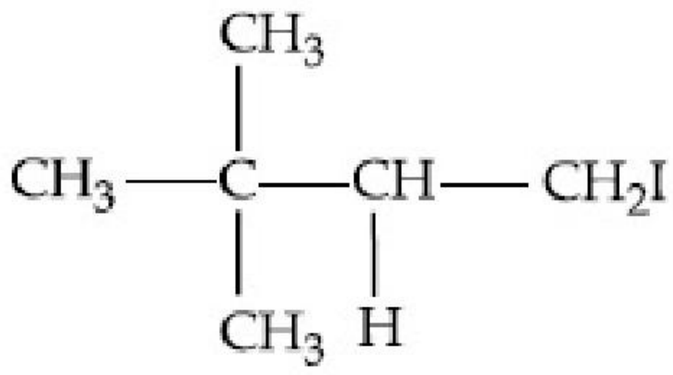
Is Question Mandatory : No

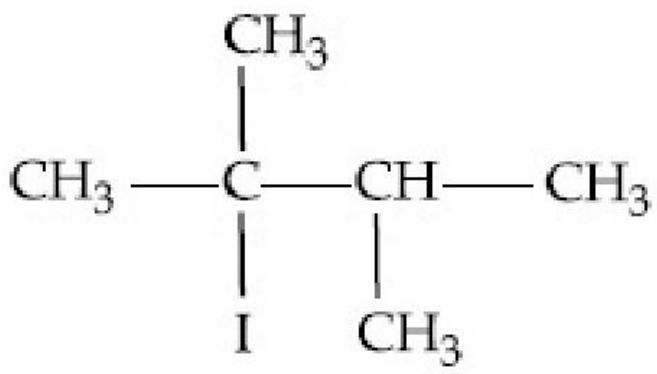
Correct Marks : 4 Wrong Marks : 1

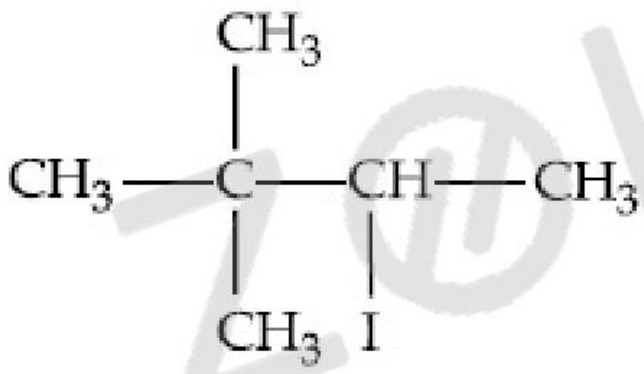
ZOLLEGE.in

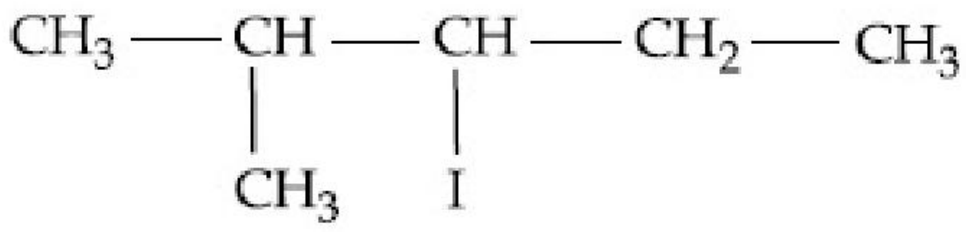
What is the major product formed by HI on reaction with  ?

Options :

70819152361. 

70819152362. 

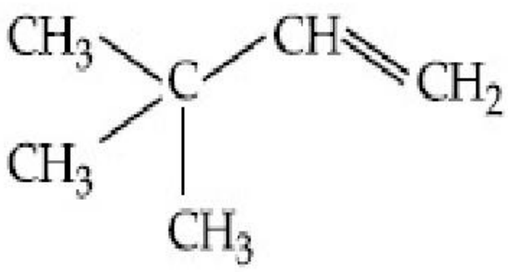
70819152363. 

70819152364. 

Question Number : 41 Question Id : 70819115734 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

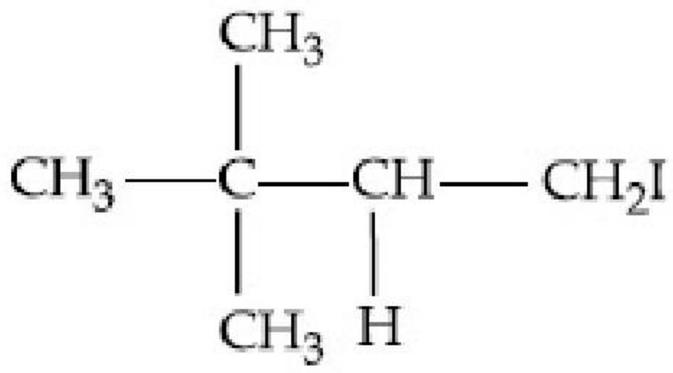
Correct Marks : 4 Wrong Marks : 1

 ची HI बरोबर अभिक्रिया केल्यानंतर तयार होणारा प्रमुख उत्पाद कोणता आहे ?

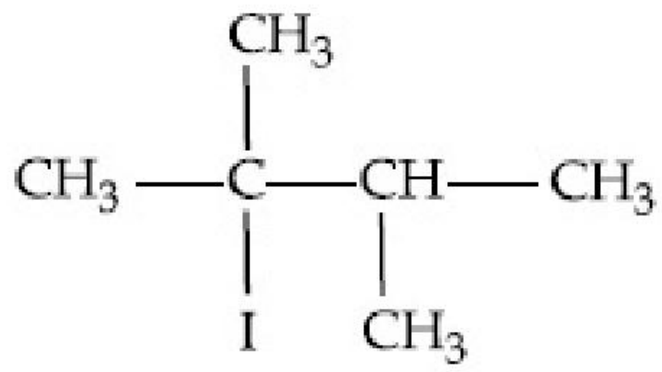
Options :

70819152361.

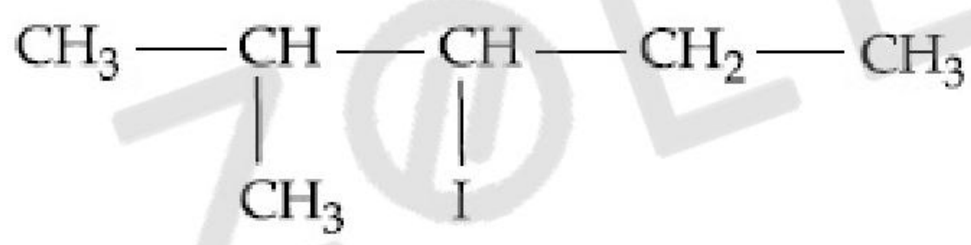
ZOLLEGE.in



70819152362.



70819152363.



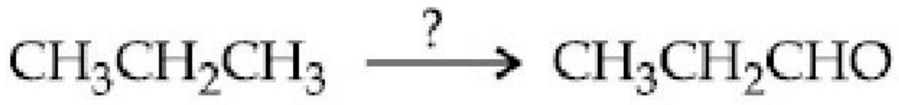
70819152364.

Question Number : 42 Question Id : 70819115735 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following reagent is used for the following reaction ?



Options :

70819152365. Copper at high temperature and pressure

70819152366. Molybdenum oxide

70819152367. Manganese acetate

ZOLLEGE.in

70819152368. Potassium permanganate

Question Number : 42 Question Id : 70819115735 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खाली दिलेल्या अभिक्रियेतील होणाऱ्या बदलासाठी खालीलपैकी कोणता अभिकारक वापरतात ?

$CH_3CH_2CH_3 \xrightarrow{?} CH_3CH_2CHO$

Options :

70819152365. उच्च तापमान व दाबाला तांबे

70819152366. मॉलिबडेनम ऑक्साइड

70819152367. मँगनिज ॲसिटेट

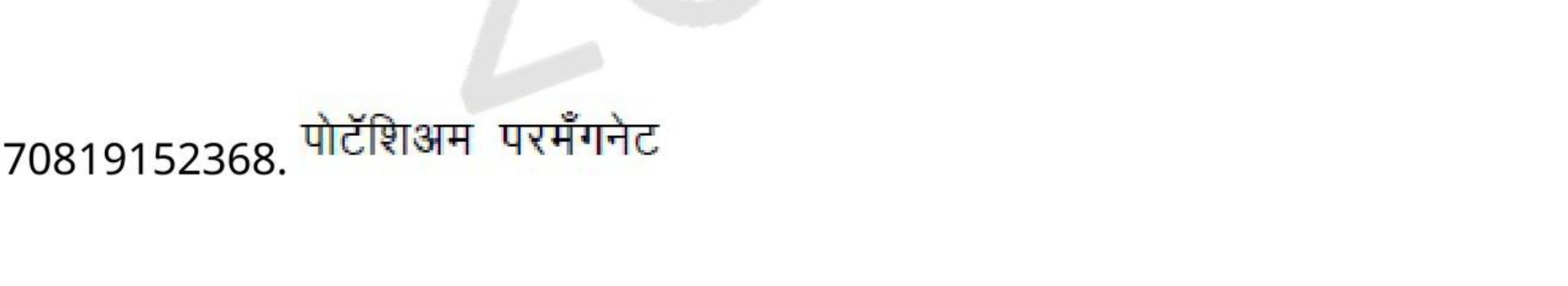
70819152368. पोटॅशिअम परमँगनेट

Question Number : 43 Question Id : 70819115736 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

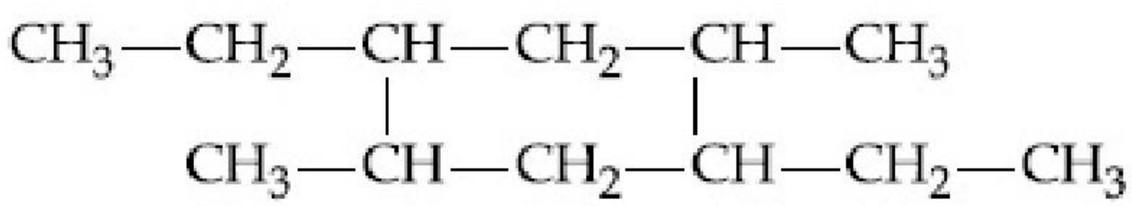
Correct Marks : 4 Wrong Marks : 1

The product formed in the first step of the reaction of

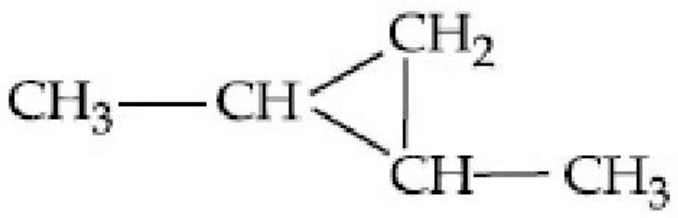


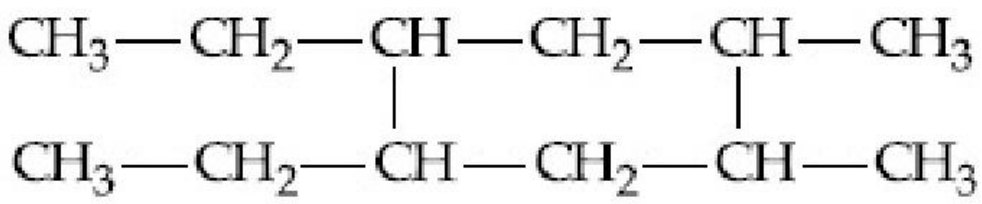
Options :

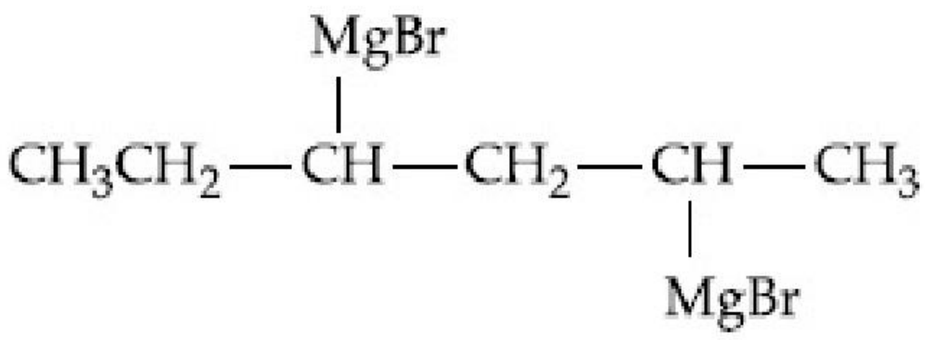
70819152369.



ZOLLEGE.in

70819152370. 

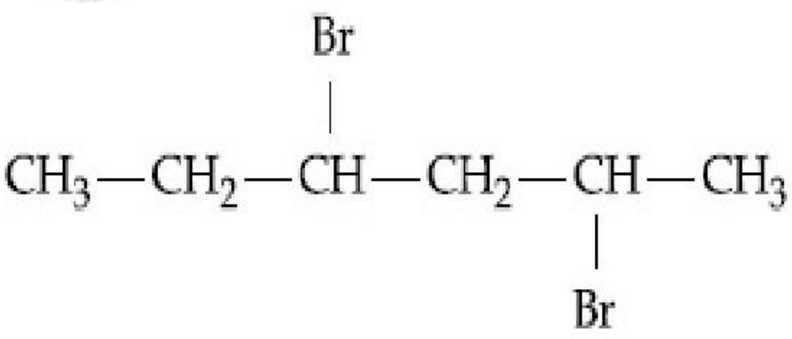
70819152371. 

70819152372. 

Question Number : 43 Question Id : 70819115736 Question Type : MCQ Option Shuffling : Yes

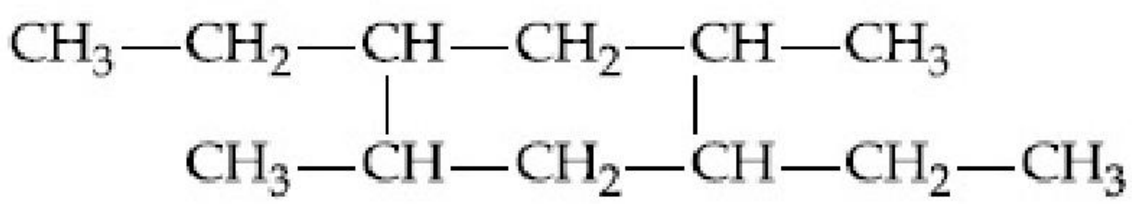
Is Question Mandatory : No

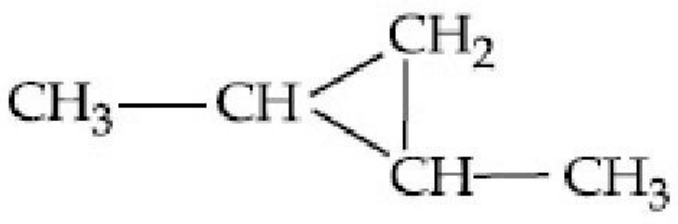
Correct Marks : 4 Wrong Marks : 1

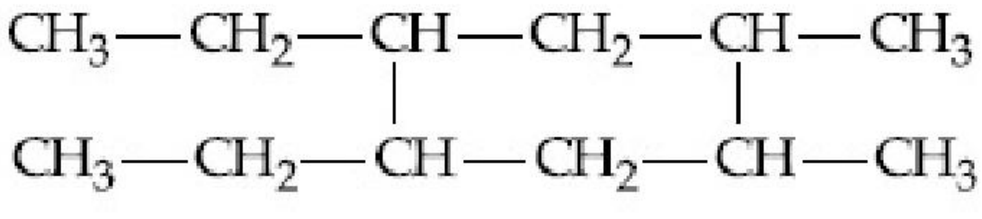
पहिल्या पायरित तयार होणारे उत्पाद  ह्याची अतिरिक्त

$Mg/Et_2O(Et=C_2H_5)$ बरोबर प्रक्रिया केली असता _____ उत्पाद मिळते.

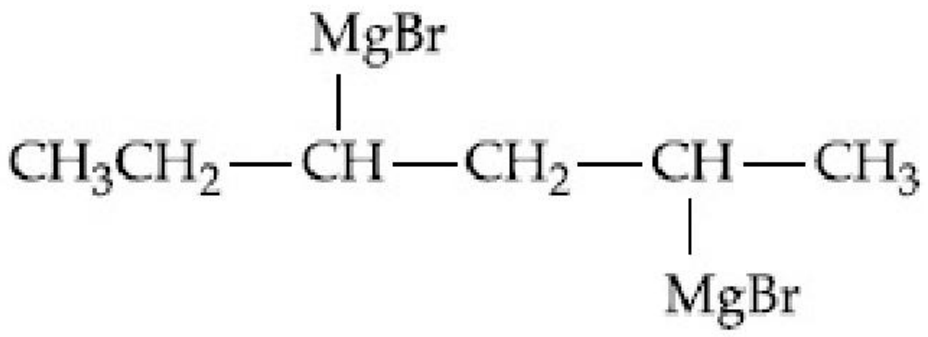
Options :

70819152369. 

70819152370. 

70819152371. 

ZOLLEGE.in



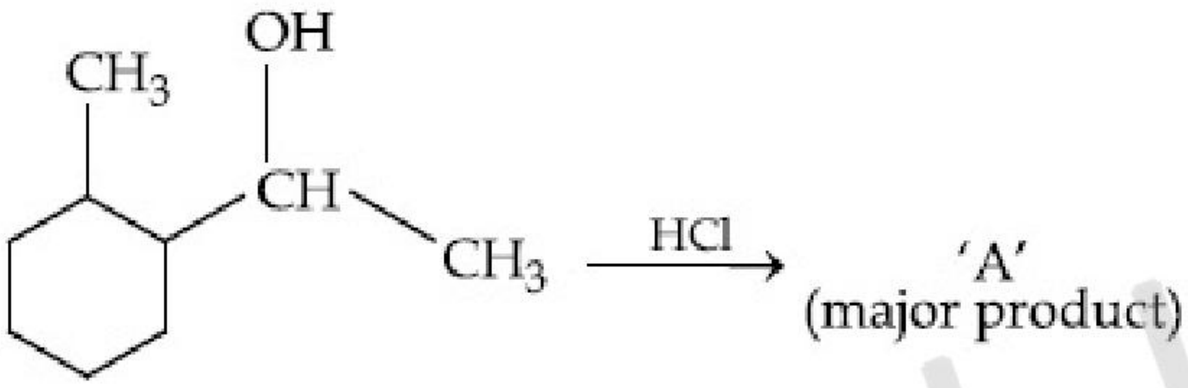
70819152372.

Question Number : 44 Question Id : 70819115737 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

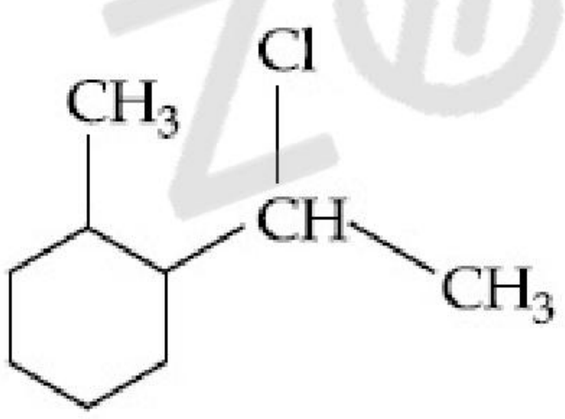
Correct Marks : 4 Wrong Marks : 1

What is the final product (major) 'A' in the given reaction ?

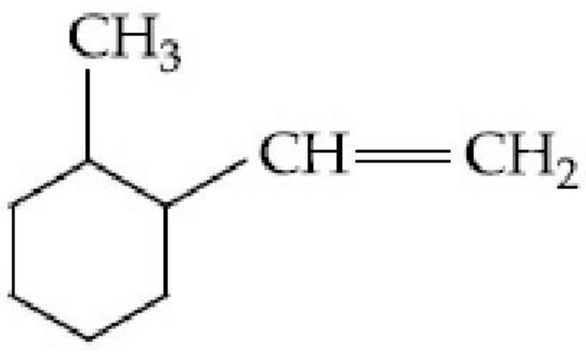


Options :

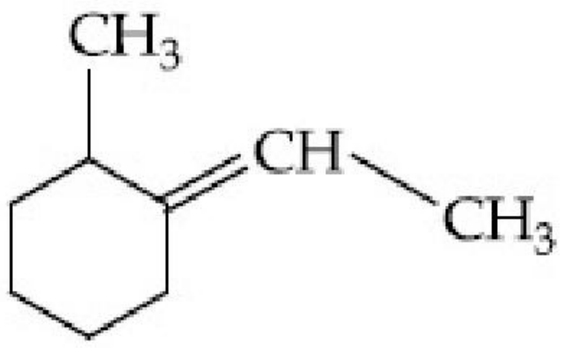
70819152373.



70819152374.

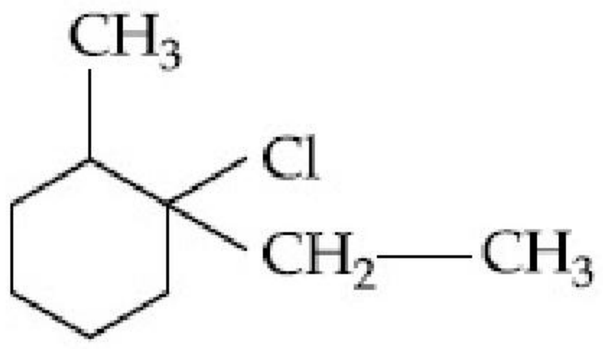


70819152375.



70819152376.

ZOLLEGE.in

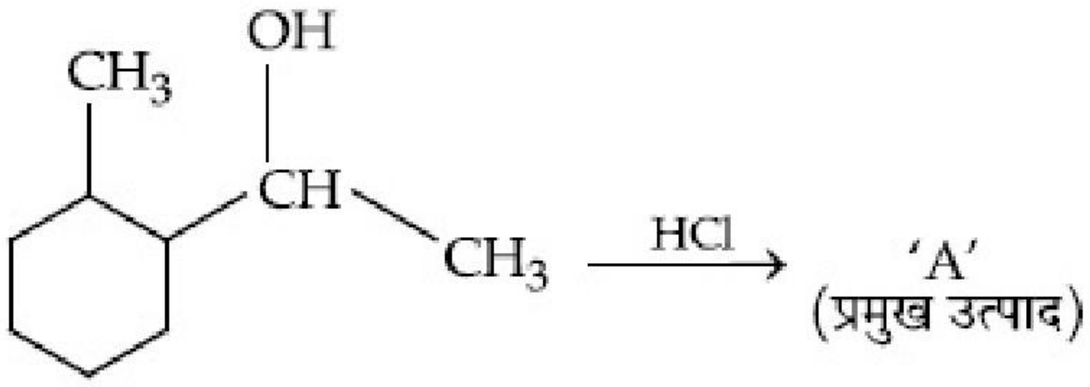


Question Number : 44 Question Id : 70819115737 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

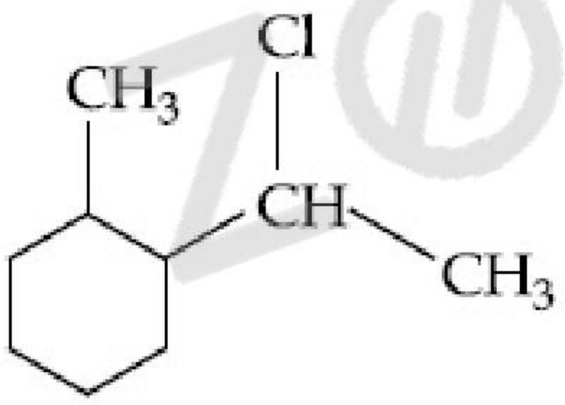
Correct Marks : 4 Wrong Marks : 1

खालील अभिक्रियेतील शेवटचे (प्रमुख) उत्पाद 'A' कोणते आहे ?

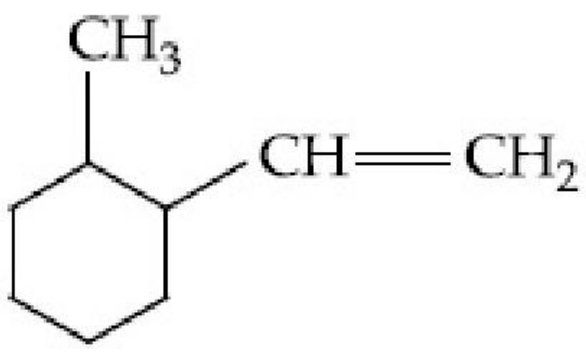


Options :

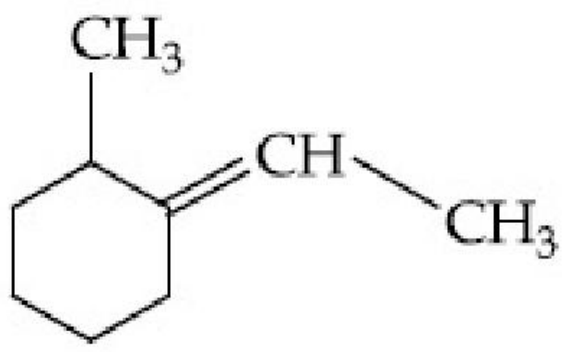
70819152373.



70819152374.

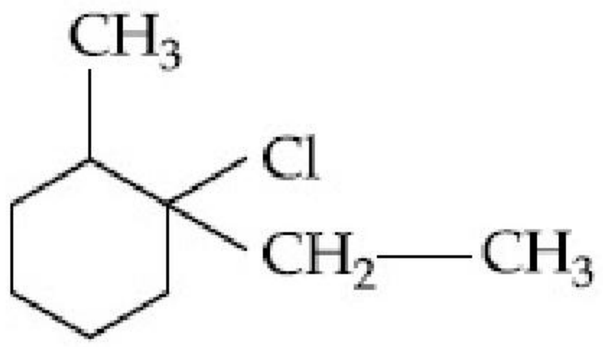


70819152375.



70819152376.

ZOLLEGE.in

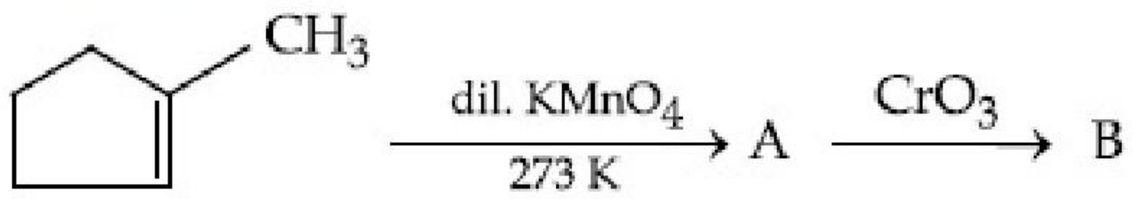


Question Number : 45 Question Id : 70819115738 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify products A and B.

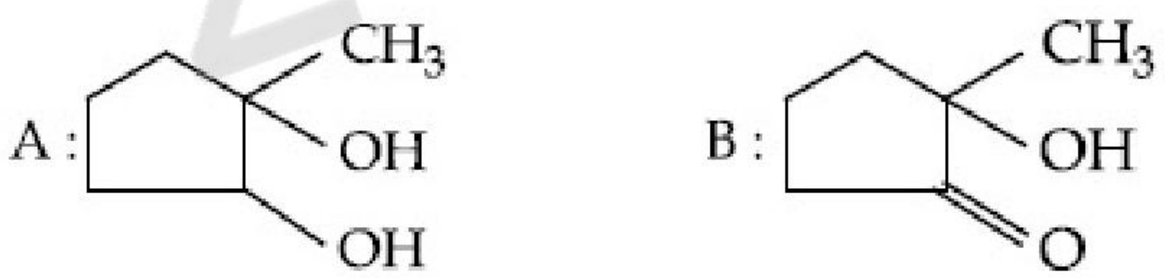


Options :

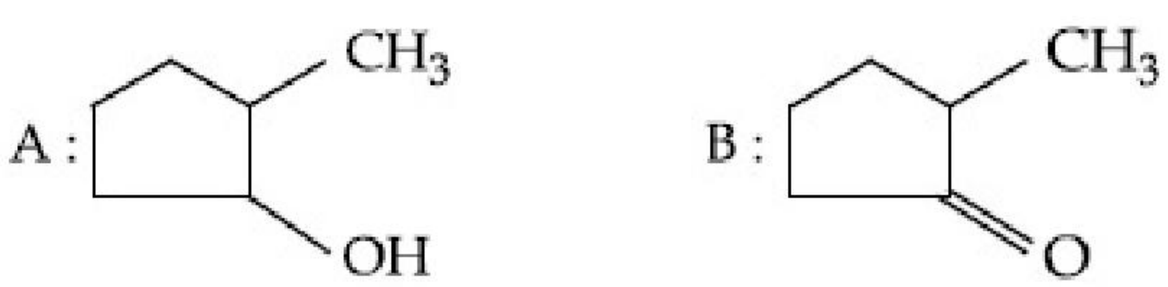
70819152377.



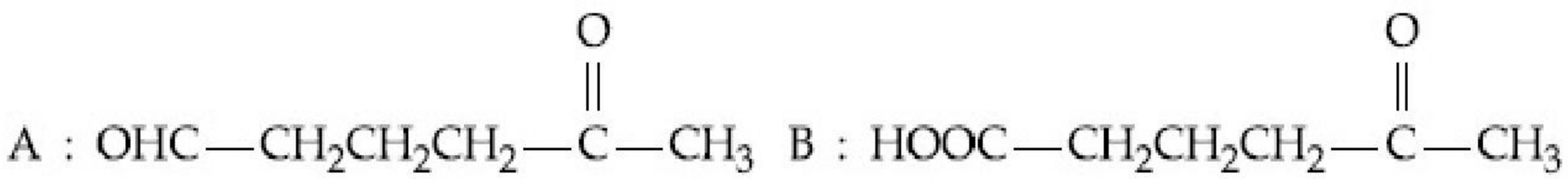
70819152378.



70819152379.



70819152380.



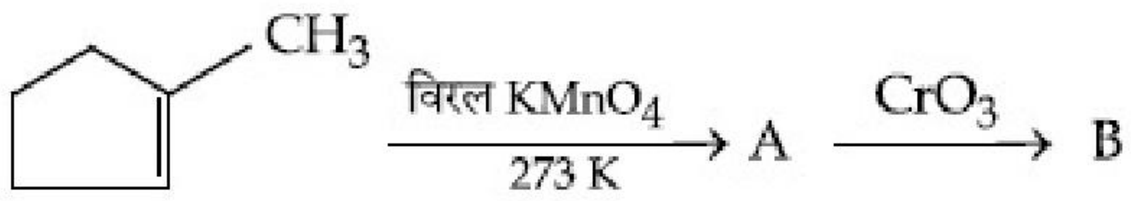
Question Number : 45 Question Id : 70819115738 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

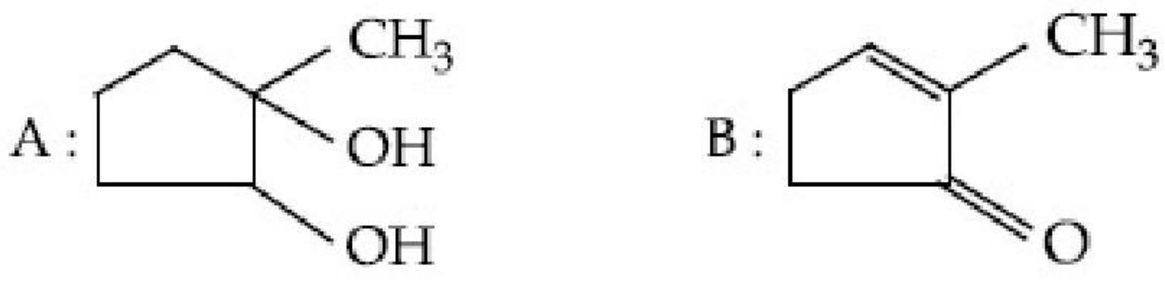
Correct Marks : 4 Wrong Marks : 1

उत्पाद A आणि B ओळखा.

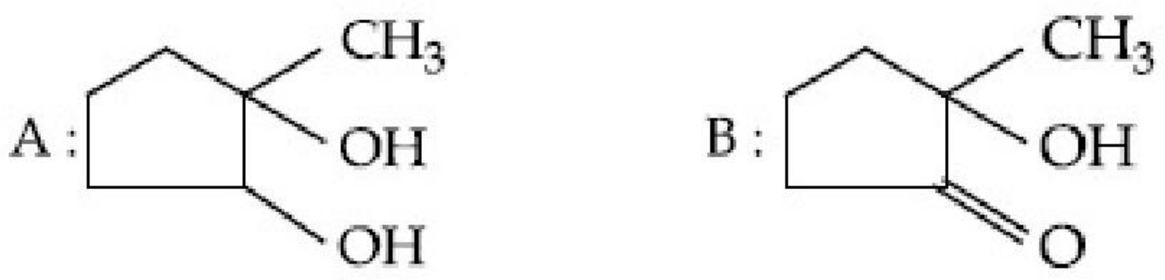


Options :

70819152377.



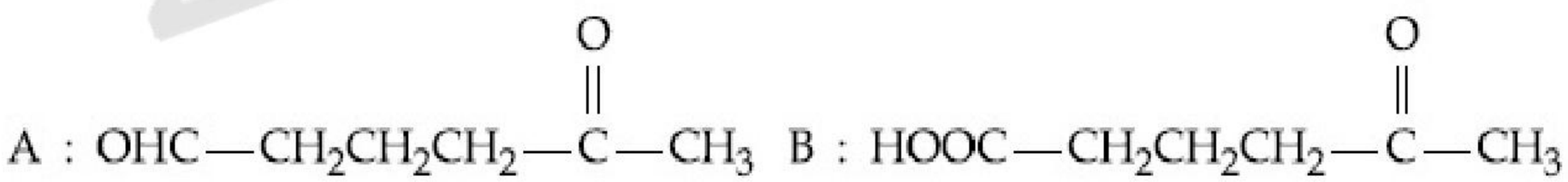
70819152378.



70819152379.



70819152380.



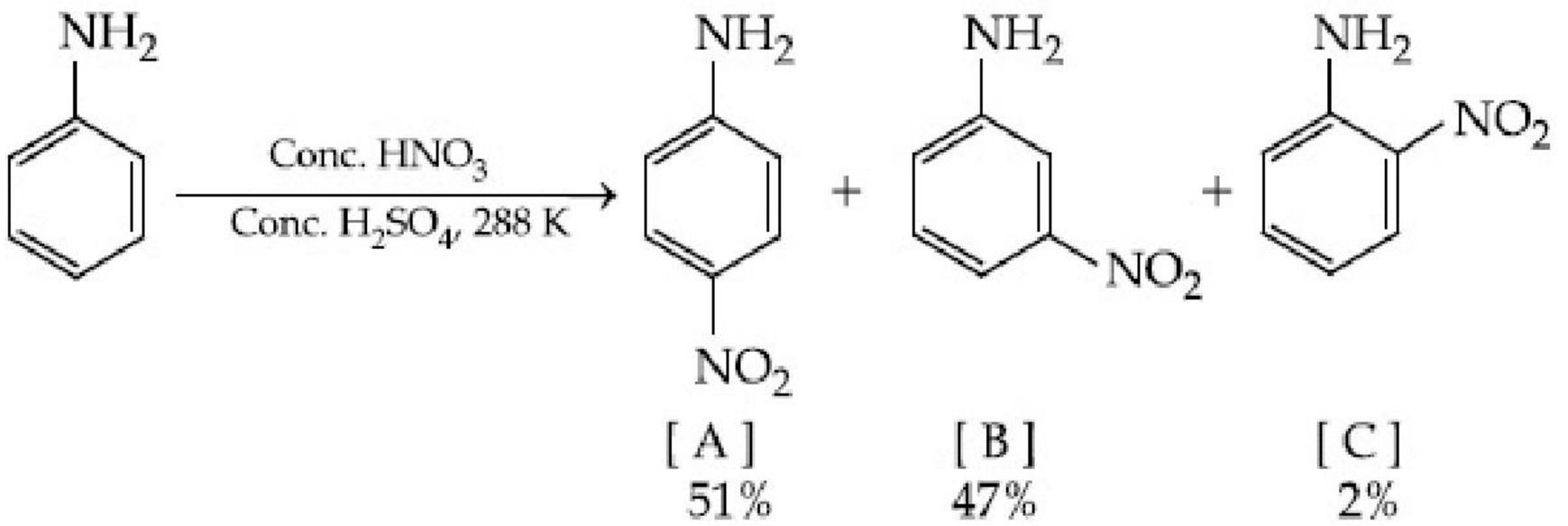
Question Number : 46 Question Id : 70819115739 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

In the following reaction the reason why *meta*-nitro product also formed is :



Options :

70819152381. $-NH_2$ group is highly *meta*-directive

70819152382. $-NO_2$ substitution always takes place at *meta*-position

70819152383. Formation of anilinium ion

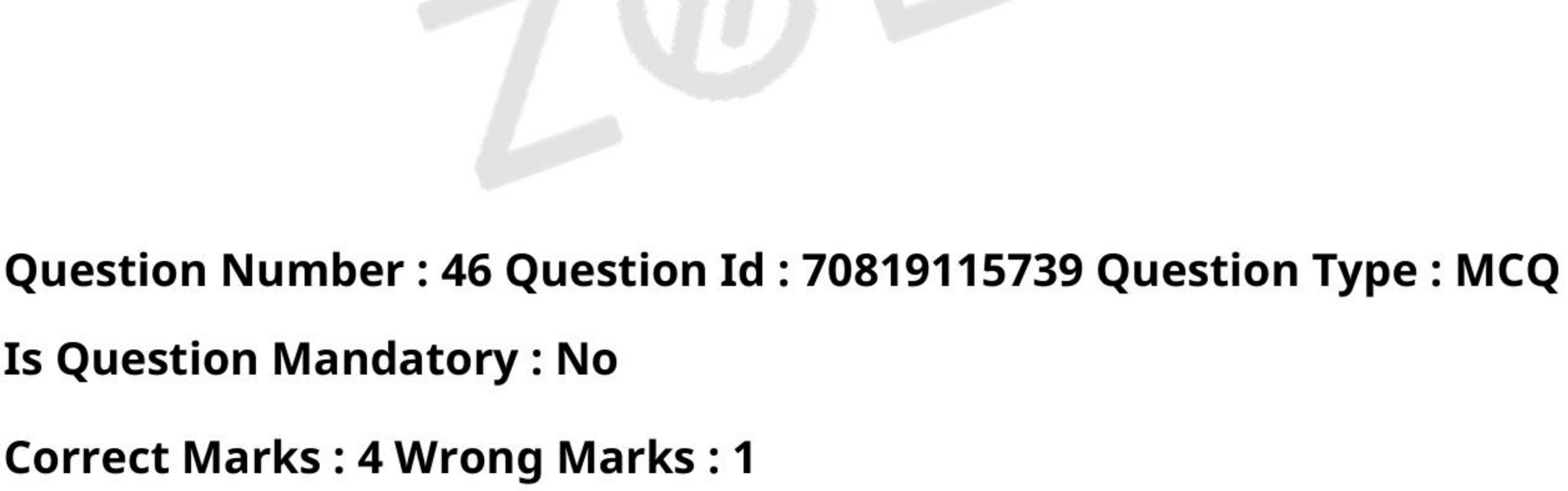
70819152384. low temperature

Question Number : 46 Question Id : 70819115739 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खालील अभिक्रियेत *मेटा*–नायट्रो उत्पाद सुद्धा तयार होण्याचे कारण _____ आहे.



Options :

70819152381. $-NH_2$ गट खूपच *मेटा* दर्शक आहे

ZOLLEGE.in

70819152382. $-NO_2$ चे प्रतियोजन नेहमीच *मेटा* जागेवर होते

70819152383. ॲनिलिनिअम आयनाच्या तयार होण्यामुळे

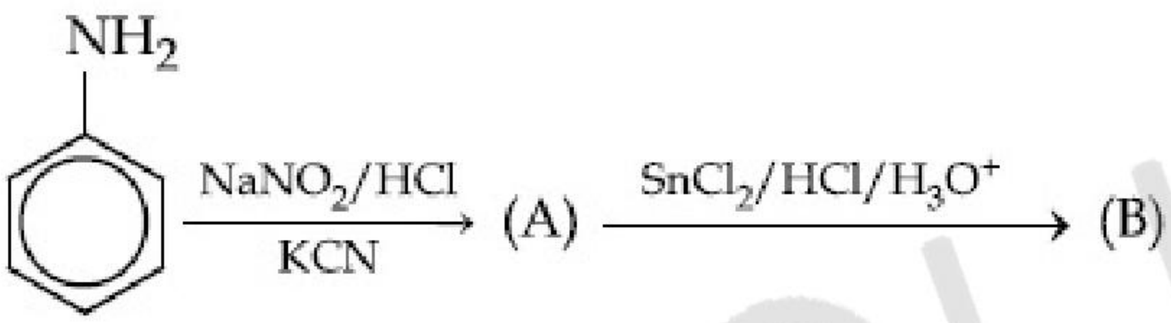
70819152384. कमी तापमानामुळे

Question Number : 47 Question Id : 70819115740 Question Type : MCQ Option Shuffling : Yes

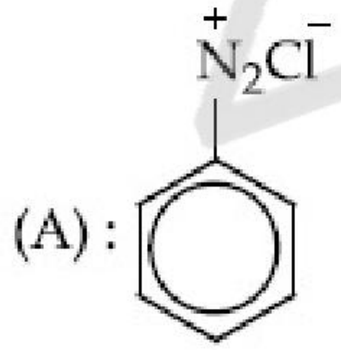
Is Question Mandatory : No

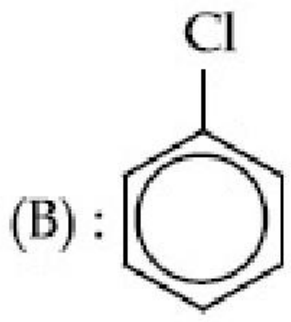
Correct Marks : 4 Wrong Marks : 1

'A' and 'B' in the following reactions are :

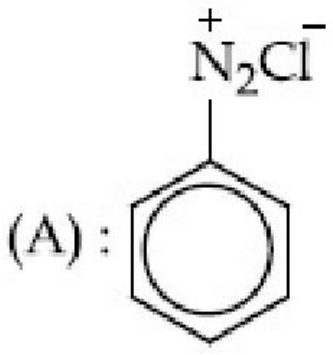


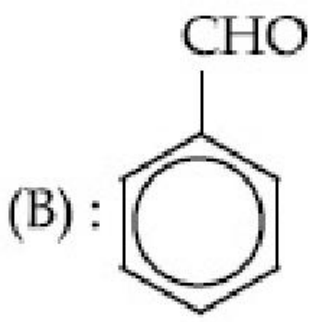
Options :



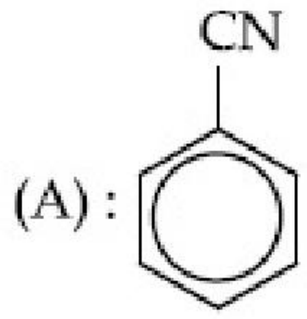


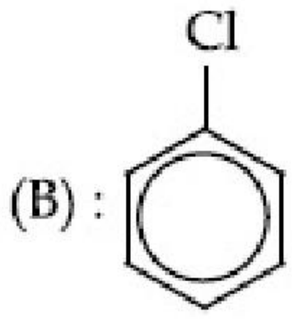
70819152385.





70819152386.

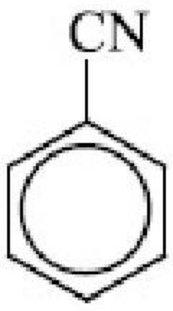


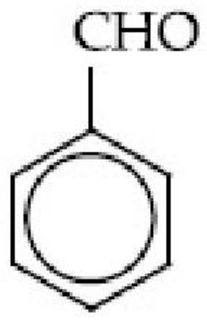


70819152387.

70819152388.

ZOLLEGE.in

(A) : 

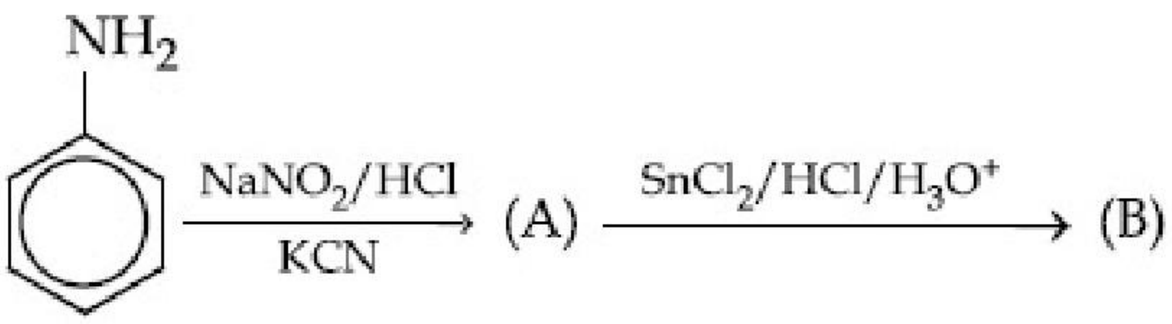
(B) : 

Question Number : 47 Question Id : 70819115740 Question Type : MCQ Option Shuffling : Yes

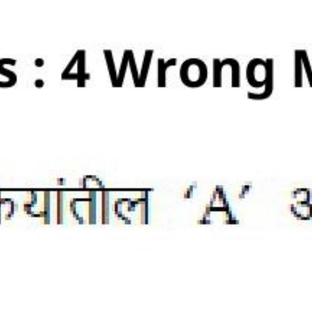
Is Question Mandatory : No

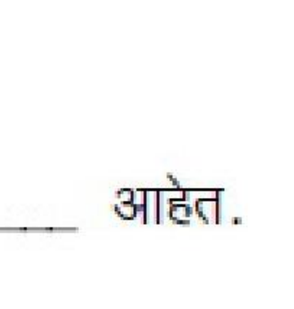
Correct Marks : 4 Wrong Marks : 1

खालील अभिक्रियांतील 'A' आणि 'B' _____ आहेत.

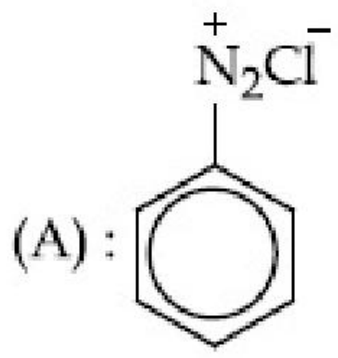


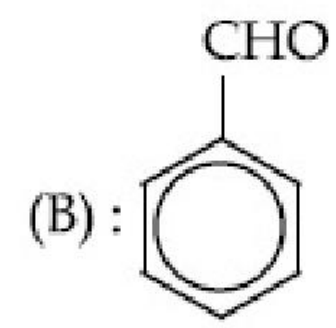
Options :

(A) : 

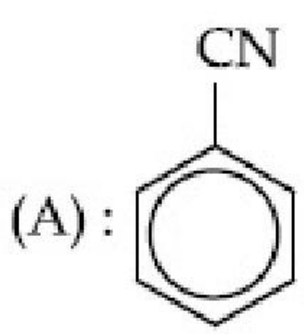
(B) : 

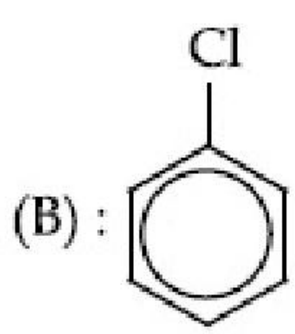
70819152385.

(A) : 

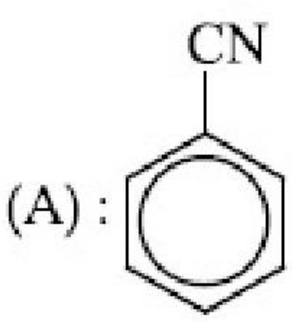
(B) : 

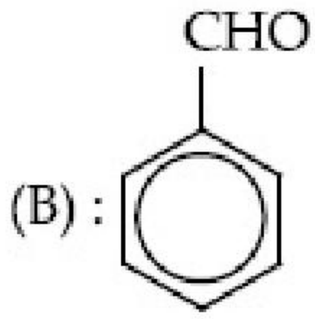
70819152386.

(A) : 

(B) : 

70819152387.

(A) : 

(B) : 

70819152388.

ZOLLEGE.in

Question Number : 48 Question Id : 70819115741 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List I with List II.

	List I (Monomer Unit)		List II (Polymer)
(a)	Caprolactum	(i)	Natural rubber
(b)	2-Chloro-1,3-butadiene	(ii)	Buna-N
(c)	Isoprene	(iii)	Nylon 6
(d)	Acrylonitrile	(iv)	Neoprene

Choose the correct answer from the options given below :

Options :

70819152389. (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

70819152390. (a) → (iv), (b) → (iii), (c) → (ii), (d) → (i)

70819152391. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819152392. (a) → (iii), (b) → (iv), (c) → (i), (d) → (ii)

Question Number : 48 Question Id : 70819115741 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

यादी I यादी II बरोबर जुळवा.

	यादी I (एकवारिक)		यादी II (बहुवारिक)
(a)	कॅप्रोलॅक्टम	(i)	नैसर्गिक रबर
(b)	2-क्लोरो-1,3-ब्युटाडाइन	(ii)	ब्युना-N
(c)	आयसोप्रीन	(iii)	नायलॉन 6
(d)	अक्रिलोनायट्राइल	(iv)	निओप्रीन

खालील पर्यायांमधून **बरोबर** उत्तर निवडा.

ZOLLEGE.in

Options :

70819152389. (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

70819152390. (a) → (iv), (b) → (iii), (c) → (ii), (d) → (i)

70819152391. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819152392. (a) → (iii), (b) → (iv), (c) → (i), (d) → (ii)

Question Number : 49 Question Id : 70819115742 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Out of the following, which type of interaction is responsible for the stabilisation of α-helix structure of proteins ?

Options :

70819152393. vander Waals forces

70819152394. Covalent bonding

70819152395. Ionic bonding

70819152396. Hydrogen bonding

Question Number : 49 Question Id : 70819115742 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

प्रथिनांमधील α-हेलिक्सच्या स्थिरतेसाठी खालीलपैकी कोणत्या प्रकारची अन्योन्यक्रिया जबाबदार असते ?

Options :

70819152393.

ZOLLEGE.in

वॅन दे वॉल्झची बले

70819152394. सहसंयुज बंधने

70819152395. आयनी बंधने

70819152396. हायड्रोजन बंधने

Question Number : 50 Question Id : 70819115743 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : Colourless cupric metaborate is reduced to cuprous metaborate in a luminous flame.

Statement II : Cuprous metaborate is obtained by heating boric anhydride and copper sulphate in a non-luminous flame.

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

Options :

70819152397. **Both Statement I and Statement II are true**

70819152398. **Both Statement I and Statement II are false**

70819152399. **Statement I is true but Statement II is false**

70819152400. **Statement I is false but Statement II is true**

Question Number : 50 Question Id : 70819115743 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 : रंगहिन क्युप्रिक मेटाबोरेटचे दीप्तिमान ज्योतीमध्ये क्युप्रस मेटाबोरेटमध्ये क्षपण होते.

विधान II : कॉपर सल्फेट आणि बोरिक अनहायड्राइडच्या दीप्तिमान नसलेल्या ज्योतीमध्ये तापवल्याने क्युप्रस मेटाबोरेट तयार होते.

वरील विधानांना अनुसरून खालील पर्यायांमधून **बरोबर** उत्तर शोधा.

Options :

70819152397. दोन्ही विधाने **I** आणि **II** बरोबर आहेत.

70819152398. दोन्ही विधाने **I** आणि **II** चुकीची आहेत.

70819152399. विधान **I** बरोबर आहे परंतु विधान **II** चुकीचे आहे.

70819152400. विधान **I** चुकीचे आहे परंतु विधान **II** बरोबर आहे.

Chemistry Section B

Section Id :	708191589
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191869
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 70819115744 Question Type : SA

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 0

4.5 g of compound A (MW = 90) was used to make 250 mL of its aqueous solution. The molarity of the solution in M is $x \times 10^{-1}$. The value of x 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 : 70819115744 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

250 mL जलीय द्रावणासाठी 4.5 ग्रॅम संयुग A चे (MW = 90) वापरले होते. द्रावणाची M मधील ग्रॅमरेणुता $x \times 10^{-1}$ आहे. x ची किंमत _____ आहे.
(उत्तर योग्य 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 : 52 Question Id : 70819115745 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The coordination number of an atom in a body-centered cubic structure is _____.
[Assume that the lattice is made up of atoms.]

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 : 52 Question Id : 70819115745 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

बॉडी सेंटर त्रिमिति जालकातील अणूचा सहबद्धांक _____ आहे.
(असे समजा कि जालक हे अणूंपासून बनलेले 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 : 53 Question Id : 70819115746 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A proton and a Li^{3+} nucleus are accelerated by the same potential. If λ_{Li} and λ_p denote the de Broglie wavelengths of Li^{3+} and proton respectively, then the value of $\frac{\lambda_{Li}}{\lambda_p}$ is $x \times 10^{-1}$.
The value of x is _____. (Rounded off to the nearest integer)
[Mass of Li^{3+} = 8.3 mass of proton]

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 : 70819115746 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

सारख्याच विभवाने एक प्रोटॉन आणि Li^{3+} च्या केंद्रकाचे त्वरण होते. जर λ_{Li} आणि λ_p यांची डी ब्रॉगीली तरंगलांबी अनुक्रमे Li^{3+} केंद्रकाच्या आणि प्रोटॉनच्या दर्शवितात, तर $\frac{\lambda_{Li}}{\lambda_p}$ ची किंमत $x \times 10^{-1}$ आहे यात x ची किंमत _____ आहे. (जवळच्या पूर्णांकात)

(Li^{3+} चे वस्तुमान 8.3 प्रोटानचे वस्तुमान)

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 : 70819115747 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

For the reaction $A_{(g)} \rightarrow B_{(g)}$, the value of the equilibrium constant at 300 K and 1 atm is equal to 100.0. The value of $\Delta_r G$ for the reaction at 300 K and 1 atm in J mol^{-1} is $-xR$, where x is _____. (Rounded off to the nearest integer)

[$R = 8.31$ J $mol^{-1}K^{-1}$ and ln 10 = 2.3)

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 : 54 Question Id : 70819115747 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$A_{(वा)} \rightarrow B_{(वा)}$ ह्या अभिक्रियेसाठी 300 K तापमान व 1 atm दाब असताना समतोल स्थिरांकाची किंमत 100.0 आहे. ह्या अभिक्रियेसाठी $\Delta_r G$ ची 300 K तापमान व 1 atm दाब असताना $J\ mol^{-1}$ मधील किंमत $-xR$, येथे x _____ आहे. $[R = 8.31\ J\ mol^{-1}K^{-1}$ आणि $\ln 10 = 2.3]$ (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 : 70819115748 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

When 9.45 g of $ClCH_2COOH$ is added to 500 mL of water, its freezing point drops by 0.5°C. The dissociation constant of $ClCH_2COOH$ is $x \times 10^{-3}$. The value of x is _____. (Rounded off to the nearest integer)

$[K_{f(H_2O)} = 1.86\ K\ kg\ mol^{-1}]$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 Question Id : 70819115748 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

9.45 g $ClCH_2COOH$ हे 500 mL पाण्यात टाकले असता त्याचा गोठणांक 0.5°C ने कमी होतो. $ClCH_2COOH$ चा विचरण स्थिरांक $x \times 10^{-3}$ आहे. यात x ची किंमत _____ आहे. ($K_{f(\text{पाणी})} = 1.86\ K\ kg\ mol^{-1}$) (जवळच्या पूर्णांकात उत्तर)

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 : 70819115749 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

At 1990 K and 1 atm pressure, there are equal number of Cl_2 molecules and Cl atoms in the reaction mixture. The value of K_p for the reaction $Cl_{2(g)} \rightleftharpoons 2Cl_{(g)}$ under the above conditions is $x \times 10^{-1}$. The value of x 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 : 56 Question Id : 70819115749 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

1990 K तापमान आणि 1 atm दाब असताना Cl_2 चे रेणू आणि Cl अणू हे अभिक्रियेच्या मिश्रणात सारख्याच अंकाने आढळतात. $Cl_{2\,(\text{वा})} \rightleftharpoons 2Cl_{\,(\text{वा})}$ ह्या क्रियेसाठी वरील परिस्थितीत K_p ची किंमत $x \times 10^{-1}$ आहे. यात x ची किंमत _____ आहे. (जवळच्या पूर्णांकात)

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 : 57 Question Id : 70819115750 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The reaction of sulphur in alkaline medium is given below :

$$S_{8(s)} + a\ OH^-_{(aq)} \longrightarrow b\ S^{2-}_{(aq)} + c\ S_2O_3^{2-}_{(aq)} + d\ H_2O_{(l)}$$

The values of 'a' is _____. (Integer answer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819115750 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

सल्फरची आम्लारि माध्यमातील अभिक्रिया खाली दिलेली आहे.

$$S_{8(\text{घन})} + a\ OH^-_{(\text{जलीय})} \longrightarrow b\ S^{2-}_{(\text{जलीय})} + c\ S_2O_3^{2-}_{(\text{जलीय})} + d\ H_2O_{(\text{द्र})}$$

यामधे 'a' ची किंमत _____ आहे. (पूर्णांकात उत्तर)

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 : 58 Question Id : 70819115751 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Gaseous cyclobutene isomerizes to butadiene in a first order process which has a 'k' value of $3.3 \times 10^{-4}\ s^{-1}$ at 153°C. The time in minutes it takes for the isomerization to proceed 40% to completion at this temperature 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 : 58 Question Id : 70819115751 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

वायुरूप सायक्लोब्युटीनचे समसूत्री रूपांतरण ब्युटाडाइनमध्ये होण्याची प्रक्रिया प्रथम कोटीची असते, ज्याच्या k ची किंमत 153°C तापमानाला $3.3 \times 10^{-4}\ s^{-1}$ आहे. त्याच तापमानाला ह्या रूपांतरणाच्या 40% पूर्णत्वाला लागणारा वेळ _____ min आहे.

(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 : 59 Question Id : 70819115752 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

Number of amphoteric compounds among the following is _____.

(A) BeO (B) BaO (C) $Be(OH)_2$ (D) $Sr(OH)_2$

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 : 59 Question Id : 70819115752 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

खालीलपैकी द्विभावी (ॲम्फोटेरिक) संयुगांची संख्या _____ आहे.

(A) BeO (B) BaO (C) $Be(OH)_2$ (D) $Sr(OH)_2$

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 : 60 Question Id : 70819115753 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

The stepwise formation of $[Cu(NH_3)_4]^{2+}$ is given below :

$$Cu^{2+} + NH_3 \xrightleftharpoons{K_1} [Cu(NH_3)]^{2+}$$

$$[Cu(NH_3)]^{2+} + NH_3 \xrightleftharpoons{K_2} [Cu(NH_3)_2]^{2+}$$

$$[Cu(NH_3)_2]^{2+} + NH_3 \xrightleftharpoons{K_3} [Cu(NH_3)_3]^{2+}$$

$$[Cu(NH_3)_3]^{2+} + NH_3 \xrightleftharpoons{K_4} [Cu(NH_3)_4]^{2+}$$

The value of stability constants K_1, K_2, K_3 and K_4 are 10^4, 1.58×10^3, 5×10^2 and 10^2 respectively. The overall equilibrium constants for dissociation of $[Cu(NH_3)_4]^{2+}$ is $x \times 10^{-12}$. The value of x 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 : 60 Question Id : 70819115753 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$[Cu(NH_3)_4]^{2+}$ चे क्रमवार तयार होणे खाली दिलेले आहे.

$$Cu^{2+} + NH_3 \xrightleftharpoons{K_1} [Cu(NH_3)]^{2+}$$

$$[Cu(NH_3)]^{2+} + NH_3 \xrightleftharpoons{K_2} [Cu(NH_3)_2]^{2+}$$

$$[Cu(NH_3)_2]^{2+} + NH_3 \xrightleftharpoons{K_3} [Cu(NH_3)_3]^{2+}$$

$$[Cu(NH_3)_3]^{2+} + NH_3 \xrightleftharpoons{K_4} [Cu(NH_3)_4]^{2+}$$

K_1, K_2, K_3 आणि K_4 ह्या स्थिरांकांच्या किंमती अनुक्रमे 10^4, 1.58×10^3, 5×10^2 आणि 10^2 आहेत. $[Cu(NH_3)_4]^{2+}$ च्या संपूर्ण निःसारणासाठीचा समतोल स्थिरांक $x \times 10^{-12}$ आहे. तर x ची किंमत _____ आहे. (जवळच्या पूर्णांकात)

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

Mathematics Section A

Section Id :	708191590
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 :	708191870
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 70819115754 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $f : \mathbf{R} \to \mathbf{R}$ be defined as $f(x) = 2x - 1$ and $g : \mathbf{R} - \{1\} \to \mathbf{R}$ be defined as $g(x) = \dfrac{x - \frac{1}{2}}{x - 1}$.

Then the composition function $f(g(x))$ is :

Options :

70819152411. one-one but not onto

ZOLLEGE.in

70819152412. onto but not one-one

70819152413. neither one-one nor onto

70819152414. both one-one and onto

Question Number : 61 Question Id : 70819115754 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

समजा $f: \mathbf{R} \to \mathbf{R}$ हे फल $f(x)=2x-1$ ची पूर्ती करते आणि $g: \mathbf{R} - \{1\} \to \mathbf{R}$ हे फल $g(x)=\frac{x-\frac{1}{2}}{x-1}$,

ची पूर्ती करते. तर गठन (composition) फल $f(g(x))$ _____ आहे.

Options :

70819152411. एकास-एक (one-one) परंतु आच्छादक (onto) नाही

70819152412. आच्छादक परंतु एकास-एक नाही

70819152413. एकास-एक पण नाही किंवा आच्छादक पण नाही

70819152414. दोन्ही एकास-एक आणि आच्छादक आहेत

Question Number : 62 Question Id : 70819115755 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let p and q be two positive numbers such that $p+q=2$ and $p^4+q^4=272$. Then p and q are roots of the equation :

Options :

70819152415. $x^2-2x+136=0$

ZOLLEGE.in

70819152416. $x^2-2x+16=0$

70819152417. $x^2-2x+8=0$

70819152418. $x^2-2x+2=0$

Question Number : 62 Question Id : 70819115755 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

समजा p आणि q या दोन धन (positive) संख्या आहेत जसे की $p+q=2$ आणि $p^4+q^4=272$. तर p आणि q हे _____ या समीकरणाची मूळे आहेत.

Options :

70819152415. $x^2-2x+136=0$

70819152416. $x^2-2x+16=0$

70819152417. $x^2-2x+8=0$

70819152418. $x^2-2x+2=0$

Question Number : 63 Question Id : 70819115756 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

The system of linear equations

$$3x-2y-kz=10$$

$$2x-4y-2z=6$$

$$x+2y-z=5m$$

is inconsistent if :

Options :

70819152419. $k \neq 3, m \neq \frac{4}{5}$

70819152420. $k = 3, m = \frac{4}{5}$

70819152421. $k = 3, m \neq \frac{4}{5}$

70819152422. $k \neq 3, m \in R$

Question Number : 63 Question Id : 70819115756 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$3x-2y-kz=10$$

$$2x-4y-2z=6$$

$$x+2y-z=5m$$

या रेषीय (linear) समीकरणाची प्रणाली (system) सुसंगत नसणारी (inconsistent) आहे जर _____.

Options :

70819152419. $k \neq 3, m \neq \frac{4}{5}$

70819152420. $k = 3, m = \frac{4}{5}$

ZOLLEGE.in

70819152421. $k = 3, m \neq \frac{4}{5}$

70819152422. $k \neq 3, m \in R$

Question Number : 64 Question Id : 70819115757 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of

$-{}^{15}C_1 + 2\cdot{}^{15}C_2 - 3\cdot{}^{15}C_3 + \cdots - 15\cdot{}^{15}C_{15} + {}^{14}C_1 + {}^{14}C_3 + {}^{14}C_5 + \cdots + {}^{14}C_{11}$ is :

Options :

70819152423. $2^{16} - 1$

70819152424. $2^{13} - 14$

70819152425. $2^{13} - 13$

70819152426. 2^{14}

Question Number : 64 Question Id : 70819115757 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$-{}^{15}C_1 + 2\cdot{}^{15}C_2 - 3\cdot{}^{15}C_3 + \cdots - 15\cdot{}^{15}C_{15} + {}^{14}C_1 + {}^{14}C_3 + {}^{14}C_5 + \cdots + {}^{14}C_{11}$ चे मूल्य _____ आहे.

Options :

70819152423. $2^{16} - 1$

70819152424. $2^{13} - 14$

ZOLLEGE.in

70819152425. $2^{13}-13$

70819152426. 2^{14}

Question Number : 65 Question Id : 70819115758 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $e^{\left(\cos^2 x+\cos^4 x+\cos^6 x+\ldots\infty\right)\log_e 2}$ satisfies the equation $t^2-9t+8=0$, then the value of $\frac{2\sin x}{\sin x+\sqrt{3}\cos x}\left(0<x<\frac{\pi}{2}\right)$ is :

Options :

70819152427. $\frac{1}{2}$

70819152428. $\sqrt{3}$

70819152429. $\frac{3}{2}$

70819152430. $2\sqrt{3}$

Question Number : 65 Question Id : 70819115758 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर $e^{\left(\cos^2 x+\cos^4 x+\cos^6 x+\ldots\infty\right)\log_e 2}$ हे $t^2-9t+8=0$ या समीकरणाची पूर्ती करते, तर $\frac{2\sin x}{\sin x+\sqrt{3}\cos x}\left(0<x<\frac{\pi}{2}\right)$ चे मूल्य _____ आहे.

ZOLLEGE.in

Options :

70819152427. $\frac{1}{2}$

70819152428. $\sqrt{3}$

70819152429. $\frac{3}{2}$

70819152430. $2\sqrt{3}$

Question Number : 66 Question Id : 70819115759 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\lim\limits_{x\to 0} \frac{\int_0^{x^2} \left(\sin\sqrt{t}\right) dt}{x^3}$ is equal to :

Options :

70819152431. $\frac{2}{3}$

70819152432. $\frac{3}{2}$

70819152433. $\frac{1}{15}$

70819152434. 0

Question Number : 66 Question Id : 70819115759 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \to 0} \frac{\int_0^{x^2} \left(\sin\sqrt{t}\right) dt}{x^3}$ बरोबर _____ आहे.

Options :

70819152431. $\frac{2}{3}$

70819152432. $\frac{3}{2}$

70819152433. $\frac{1}{15}$

70819152434. 0

Question Number : 67 Question Id : 70819115760 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The function $f(x) = \frac{4x^3 - 3x^2}{6} - 2\sin x + (2x - 1)\cos x$:

Options :

70819152435. increases in $\left[\frac{1}{2}, \infty\right)$

70819152436. decreases in $\left[\frac{1}{2}, \infty\right)$

70819152437. increases in $\left(-\infty, \frac{1}{2}\right]$

70819152438.

ZOLLEGE.in

decreases in $\left(-\infty, \frac{1}{2}\right]$

Question Number : 67 Question Id : 70819115760 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$f(x) = \frac{4x^3 - 3x^2}{6} - 2\sin x + (2x - 1)\cos x$ हे फल :

Options :

70819152435. $\left[\frac{1}{2}, \infty\right)$ मध्ये वाढता (increases) आहे.

70819152436. $\left[\frac{1}{2}, \infty\right)$ मध्ये घटता (decreases) आहे.

70819152437. $\left(-\infty, \frac{1}{2}\right]$ मध्ये वाढता आहे.

70819152438. $\left(-\infty, \frac{1}{2}\right]$ मध्ये घटता आहे.

Question Number : 68 Question Id : 70819115761 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A scientific committee is to be formed from 6 Indians and 8 foreigners, which includes at least 2 Indians and double the number of foreigners as Indians. Then the number of ways, the committee can be formed, is :

Options :

70819152439. 1050

ZOLLEGE.in

70819152440. 1625

70819152441. 560

70819152442. 575

Question Number : 68 Question Id : 70819115761 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

एक शास्त्रीय समिती (scientific committee) 6 भारतीय (Indians) आणि 8 परदेशी व्यक्ती (foreigners) यांच्या मधून तयार केली आहे, ज्या मध्ये कमीत कमी 2 भारतीय आणि भारतीयांच्या दुप्पट संख्येने परदेशी व्यक्ती आहेत. तर ही समिती किती वेळा तयार करू शकतो याची संख्या _____ आहे.

Options :

70819152439. 1050

70819152440. 1625

70819152441. 560

70819152442. 575

Question Number : 69 Question Id : 70819115762 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $f: \mathbf{R} \to \mathbf{R}$ is a function defined by $f(x) = [x-1]\ \cos\left(\frac{2x-1}{2}\right)\pi$, where $[\cdot]$ denotes the greatest integer function, then f is :

Options :

ZOLLEGE.in

70819152443. discontinuous only at $x=1$

70819152444. discontinuous at all integral values of x except at $x=1$

70819152445. continuous only at $x=1$

70819152446. continuous for every real x

Question Number : 69 Question Id : 70819115762 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर $f:\mathbf{R}\to\mathbf{R}$ हे एक फल आहे आणि f हे $f(x)=[x-1]\cos\left(\frac{2x-1}{2}\right)\pi$, जेथे $[\cdot]$ हे महत्तम पूर्णांक फल (greatest integer function) दर्शविते, द्वारा परिभाषित केलेले फल आहे. तर f _____ आहे.

Options :

70819152443. फक्त $x=1$ वर असंतत (discontinuous) आहे.

70819152444. $x=1$ सोडून x च्या सर्व पूर्णांक (integral) मूल्यां वर असंतत आहे.

70819152445. फक्त $x=1$ वर संतत आहे.

70819152446. प्रत्येक वास्तव x साठी संतत आहे.

Question Number : 70 Question Id : 70819115763 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ZOLLEGE.in

If $\int \frac{\cos x - \sin x}{\sqrt{8 - \sin 2x}} dx = a\sin^{-1}\left(\frac{\sin x + \cos x}{b}\right) + c$, where c is a constant of integration, then the ordered pair (a, b) is equal to :

Options :

70819152447. $(3, 1)$

70819152448. $(1, 3)$

70819152449. $(-1, 3)$

70819152450. $(1, -3)$

Question Number : 70 Question Id : 70819115763 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर $\int \frac{\cos x - \sin x}{\sqrt{8 - \sin 2x}} dx = a\sin^{-1}\left(\frac{\sin x + \cos x}{b}\right) + c$ जेथे c हा संकलनाचा अचल (constant of integration) आहे, तर (a, b) या क्रमित जोडी (ordered pair) बरोबर _____ आहे.

Options :

70819152447. $(3, 1)$

70819152448. $(1, 3)$

70819152449. $(-1, 3)$

70819152450. $(1, -3)$

Question Number : 71 Question Id : 70819115764 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

The area (in sq. units) of the part of the circle $x^2+y^2=36$, which is outside the parabola $y^2=9x$, is :

Options :

70819152451. $24\pi + 3\sqrt{3}$

70819152452. $24\pi - 3\sqrt{3}$

70819152453. $12\pi + 3\sqrt{3}$

70819152454. $12\pi - 3\sqrt{3}$

Question Number : 71 Question Id : 70819115764 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$x^2+y^2=36$ या वर्तुळाच्या भागाचे क्षेत्रफळ (चौ. एकक मध्ये) _____ आहे, जो भाग $y^2=9x$ या अन्वस्ता (parabola) च्या बाहेरील बाजूस आहे.

Options :

70819152451. $24\pi + 3\sqrt{3}$

70819152452. $24\pi - 3\sqrt{3}$

70819152453. $12\pi + 3\sqrt{3}$

70819152454. $12\pi - 3\sqrt{3}$

Question Number : 72 Question Id : 70819115765 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

ZOLLEGE.in

Correct Marks : 4 Wrong Marks : 1

The population $P = P(t)$ at time 't' of a certain species follows the differential equation $\frac{dP}{dt} = 0.5P - 450$. If $P(0) = 850$, then the time at which population becomes zero is :

Options :

70819152455. $\log_e 9$

70819152456. $\frac{1}{2}\log_e 18$

70819152457. $\log_e 18$

70819152458. $2\log_e 18$

Question Number : 72 Question Id : 70819115765 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\frac{dP}{dt} = 0.5P - 450$ या विकलक (differential) समीकरणाला अनुसरून एका विशिष्ट प्राण्याच्या जातीची (species) लोकसंख्या वेळ 't' असताना $P = P(t)$ आहे. जर $P(0) = 850$, तर लोकसंख्या शून्य होण्यासाठी लागणारा वेळ _____ आहे.

Options :

70819152455. $\log_e 9$

70819152456. $\frac{1}{2}\log_e 18$

70819152457. $\log_e 18$

70819152458. $2\log_e 18$

ZOLLEGE.in

Question Number : 73 Question Id : 70819115766 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A man is walking on a straight line. The arithmetic mean of the reciprocals of the intercepts of this line on the coordinate axes is $\frac{1}{4}$. Three stones A, B and C are placed at the points (1, 1), (2, 2) and (4, 4) respectively. Then which of these stones is/are on the path of the man ?

Options :

70819152459. A only

70819152460. B only

70819152461. C only

70819152462. All the three

Question Number : 73 Question Id : 70819115766 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

एक माणूस सरळ (straight) रेषेवर चालत आहे. निर्देशक अक्ष (coordinate axes) यावर त्या रेषेच्या आंतरखंडा (intercepts) च्या व्यस्तां (reciprocal) चा गणिती मध्य (arithmetic mean) $\frac{1}{4}$ आहे. A, B आणि C हे तीन दगड अनुक्रमे (1, 1), (2, 2) आणि (4, 4) या बिंदूशी ठेवले आहेत. तर त्या माणसाच्या वाटेवर कोणते दगड आहे/आहेत ?

Options :

70819152459. फक्त A

70819152460. फक्त B

ZOLLEGE.in

70819152461. फक्त C

70819152462. सर्व तीन

Question Number : 74 Question Id : 70819115767 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The locus of the mid-point of the line segment joining the focus of the parabola $y^2 = 4ax$ to a moving point of the parabola, is another parabola whose directrix is :

Options :

70819152463. $x = a$

70819152464. $x = -\frac{a}{2}$

70819152465. $x = 0$

70819152466. $x = \frac{a}{2}$

Question Number : 74 Question Id : 70819115767 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$y^2 = 4ax$ या अन्वस्ताच्या (parabola) नाभि (focus) ला जोडणाऱ्या रेषाखंडाच्या मध्यबिंदू चे निधान (locus) अन्वस्ताच्या फिरत्या बिंदूकडे जात असताना आणखी एक अन्वस्त आहे ज्याची दर्शिका (directrix) _____ आहे.

Options :

70819152463. $x = a$

ZOLLEGE.in

70819152464. $x = -\frac{a}{2}$

70819152465. $x = 0$

70819152466. $x = \frac{a}{2}$

Question Number : 75 Question Id : 70819115768 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If the tangent to the curve $y = x^3$ at the point $P(t, t^3)$ meets the curve again at Q, then the ordinate of the point which divides PQ internally in the ratio 1 : 2 is :

Options :

70819152467. 0

70819152468. $2t^3$

70819152469. $-t^3$

70819152470. $-2t^3$

Question Number : 75 Question Id : 70819115768 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

जर $P(t, t^3)$ या बिंदूवर $y = x^3$ या वक्राची स्पर्शिका वक्राला पून्हा (again) Q वर भेटते, तर जो बिंदू PQ ला आंतरभागात (internally) 1 : 2 या प्रमाणात विभागतो. त्या बिंदूची कोटी (ordinate) _____ आहे.

Options :

70819152467. 0

ZOLLEGE.in

70819152468. $2t^3$

70819152469. $-t^3$

70819152470. $-2t^3$

Question Number : 76 Question Id : 70819115769 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The equation of the plane passing through the point (1, 2, −3) and perpendicular to the planes $3x+y-2z=5$ and $2x-5y-z=7$, is :

Options :

70819152471. $6x-5y+2z+10=0$

70819152472. $11x+y+17z+38=0$

70819152473. $6x-5y-2z-2=0$

70819152474. $3x-10y-2z+11=0$

Question Number : 76 Question Id : 70819115769 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

(1, 2, −3) या बिंदू मधून जाणारे आणि $3x+y-2z=5$ आणि $2x-5y-z=7$ या प्रतलांना लंब असणाऱ्या प्रतलाचे समीकरण _____ आहे.

Options :

70819152471. $6x-5y+2z+10=0$

ZOLLEGE.in

70819152472. $11x+y+17z+38=0$

70819152473. $6x-5y-2z-2=0$

70819152474. $3x-10y-2z+11=0$

Question Number : 77 Question Id : 70819115770 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The distance of the point (1, 1, 9) from the point of intersection of the line $\frac{x-3}{1}=\frac{y-4}{2}=\frac{z-5}{2}$ and the plane $x+y+z=17$ is :

Options :

70819152475. $2\sqrt{19}$

70819152476. $19\sqrt{2}$

70819152477. $\sqrt{38}$

70819152478. 38

Question Number : 77 Question Id : 70819115770 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

रेषा $\frac{x-3}{1}=\frac{y-4}{2}=\frac{z-5}{2}$ आणि प्रतल $x+y+z=17$ यांच्या छेद बिंदूपासून (1, 1, 9) या बिंदूचे अंतर _____ आहे.

Options :

70819152475. $2\sqrt{19}$

ZOLLEGE.in

70819152476. $19\sqrt{2}$

70819152477. $\sqrt{38}$

70819152478. 38

Question Number : 78 Question Id : 70819115771 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An ordinary dice is rolled for a certain number of times. If the probability of getting an odd number 2 times is equal to the probability of getting an even number 3 times, then the probability of getting an odd number for odd number of times is :

Options :

70819152479. $\frac{1}{32}$

70819152480. $\frac{3}{16}$

70819152481. $\frac{5}{16}$

70819152482. $\frac{1}{2}$

Question Number : 78 Question Id : 70819115771 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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ठराविक वेळेसाठी एक सामान्य फासा (ordinary dice) फेकला (rolled) आहे. जर 2 वेळा विषम संख्या मिळण्याची संभाव्यता ही 3 वेळा सम संख्या मिळण्याच्या संभाव्यता बरोबर आहे, तर विषम पदाच्या संख्येसाठी विषम संख्या मिळण्याची संभाव्यता (probability) _____ आहे.

Options :

70819152479. $\frac{1}{32}$

70819152480. $\frac{3}{16}$

70819152481. $\frac{5}{16}$

70819152482. $\frac{1}{2}$

Question Number : 79 Question Id : 70819115772 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Two vertical poles are 150 m apart and the height of one is three times that of the other. If from the middle point of the line joining their feet, an observer finds the angles of elevation of their tops to be complementary, then the height of the shorter pole (in meters) is :

Options :

70819152483. 25

70819152484. 30

70819152485. $20\sqrt{3}$

70819152486. $25\sqrt{3}$

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Question Number : 79 Question Id : 70819115772 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

दोन उभे खांब 150 m अंतरावर आहेत आणि एका खांबाची उंची दूसऱ्या खांबाच्या उंची पेक्षा 3 पट आहे. जर एका निरीक्षकाने असे शोधले की त्या खांबाच्या पायांना जोडणाऱ्या रेषेचा मधला बिंदू त्यांच्या टोकाशी उन्नत (elevation) कोन चा पूरक (complementary) आहे, तर लहान खांबाची उंची (मीटर मध्ये) _____ आहे.

Options :

70819152483. 25

70819152484. 30

70819152485. $20\sqrt{3}$

70819152486. $25\sqrt{3}$

Question Number : 80 Question Id : 70819115773 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The statement among the following that is a tautology is :

Options :

70819152487. $A \wedge (A \vee B)$

70819152488. $A \vee (A \wedge B)$

70819152489. $[A \wedge (A \rightarrow B)] \rightarrow B$

70819152490. $B \rightarrow [A \wedge (A \rightarrow B)]$

Question Number : 80 Question Id : 70819115773 Question Type : MCQ Op

ZOLLEGE.in

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

खाली दिलेल्या विधांनांमध्ये समाविष्ट असणारे अनुलाप (tautology) विधान _____ आहे.

Options :

70819152487. $A \wedge (A \vee B)$

70819152488. $A \vee (A \wedge B)$

70819152489. $[A \wedge (A \rightarrow B)] \rightarrow B$

70819152490. $B \rightarrow [A \wedge (A \rightarrow B)]$

Mathematics Section B

Section Id :	708191591
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191871
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 70819115774 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

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If the least and the largest real values of α, for which the equation $z+\alpha|z-1|+2i=0$ ($z\in C$ and $i=\sqrt{-1}$) has a solution, are p and q respectively; then $4(p^2+q^2)$ 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 : 70819115774 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

जर α ची लहान (least) आणि मोठी (largest) वास्तव मूल्ये अनुक्रमे p आणि q आहेत. ज्या साठी $z+\alpha|z-1|+2i=0$ ($z\in C$ आणि $i=\sqrt{-1}$) या समीकरणाची उकल आहे, तर $4(p^2+q^2)$ 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 : 82 Question Id : 70819115775 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let B_i ($i=1, 2, 3$) be three independent events in a sample space. The probability that only B_1 occur is α, only B_2 occurs is β and only B_3 occurs is γ. Let p be the probability that none of the events B_i occurs and these 4 probabilities satisfy the equations $(\alpha-2\beta)p=\alpha\beta$ and $(\beta-3\gamma)p=2\beta\gamma$ (All the probabilities are assumed to lie in the interval (0, 1)). Then $\frac{P(B_1)}{P(B_3)}$ is equal to _____.

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 : 82 Question Id : 70819115775 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा B_i $(i=1, 2, 3)$ या नमुना अवकाश (sample space) मधिल तीन स्वतंत्र घटना आहेत. फक्त B_1 ची संभाव्यता (probability) α आढळली, फक्त B_2 ची संभाव्यता β आढळली आणि फक्त B_3 ची संभाव्यता γ आढळली. समजा p ही B_i ची कोणतीही घटना आढळली नसल्याची संभाव्यता आहे. आणि या 4 संभाव्यता $(\alpha-2\beta)\,p=\alpha\beta$ आणि $(\beta-3\gamma)\,p=2\beta\gamma$ या समीकरणांची पूर्ती करतात. (सर्व संभाव्यता (0, 1) या अंतराला मधिल आहेत हे गृहीत धरले आहे), तर $\frac{P(B_1)}{P(B_3)}$ 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 : 83 Question Id : 70819115776 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $P=\begin{bmatrix}3 & -1 & -2\\ 2 & 0 & \alpha\\ 3 & -5 & 0\end{bmatrix}$, where $\alpha\in R$. Suppose $Q=[q_{ij}]$ is a matrix satisfying $PQ=kI_3$ for some non-zero $k\in R$. If $q_{23}=-\frac{k}{8}$ and $|Q|=\frac{k^2}{2}$, then α^2+k^2 is equal to _____.

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 : 83 Question Id : 70819115776 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा $P=\begin{bmatrix}3 & -1 & -2\\ 2 & 0 & \alpha\\ 3 & -5 & 0\end{bmatrix}$, जेथे $\alpha \in R$ समजा $Q=[q_{ij}]$ ही सारणी $PQ=kI_3$ कांही शून्येतर (non-zero)

$k \in R$ साठी पूर्ती करीत आहे. जर $q_{23}=-\frac{k}{8}$ आणि $|Q|=\frac{k^2}{2}$, तर α^2+k^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 : 84 Question Id : 70819115777 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let M be any 3×3 matrix with entries from the set {0, 1, 2}. The maximum number of such matrices, for which the sum of diagonal elements of M^TM is seven, is _____.

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 : 84 Question Id : 70819115777 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा M ही कोणतीही 3×3 सारणी आहे त्याचे घटक $\{0, 1, 2\}$ या संचामधील आहेत. अशा सारणींची जास्तीत जास्त संख्या _____ आहे. ज्या साठी M^TM च्या विकर्ण (diagonal) घटकांची संख्या 7 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 : 85 Question Id : 70819115778 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $A = \{ n \in N : n \text{ is a 3-digit number} \}$

$B = \{ 9k + 2 : k \in N \}$

and $C = \{ 9k + l : k \in N \}$ for some l $(0 < l < 9)$

If the sum of all the elements of the set $A \cap (B \cup C)$ is 274×400, then l 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

ZOLLEGE.in

Question Number : 85 Question Id : 70819115778 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा $A = \{ n \in N : n$ ही 3-अंकी संख्या आहे$\}$

$B = \{ 9k + 2 : k \in N \}$

आणि $C = \{ 9k + l : k \in N \}$ कांही l $(0 < l < 9)$ साठी

जर $A \cap (B \cup C)$ या संचाच्या सर्व घटकांची बेरीज 274×400 आहे, तर l 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 : 86 Question Id : 70819115779 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The minimum value of α for which the equation $\frac{4}{\sin x} + \frac{1}{1 - \sin x} = \alpha$ has at least one solution in $\left(0, \frac{\pi}{2}\right)$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 Question Id : 70819115779 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

α चे किमान मूल्य (minimum value)_____ आहे. ज्या साठी $\frac{4}{\sin x} + \frac{1}{1 - \sin x} = \alpha$ या समीकरणाची $\left(0, \frac{\pi}{2}\right)$ या मध्ये कमीत कमी एक उकल 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 : 70819115780 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $\int_{-a}^{a} (|x| + |x - 2|)dx = 22$, (a > 2) and $[x]$ denotes the greatest integer $\leq x$, then $\int_{a}^{-a} (x + [x])\,dx$ 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 : 70819115780 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ZOLLEGE.in

जर $\int_{-a}^{a}(|x|+|x-2|)dx = 22, (a>2)$ आणि $[x]$ हे x किंवा x पेक्षा लहान महत्तम पूर्णांक (greatest integer)

दर्शविते, तर $\int_{a}^{-a}(x+[x])\,dx$ 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 : 70819115781 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If one of the diameters of the circle $x^2+y^2-2x-6y+6=0$ is a chord of another circle 'C', whose center is at (2, 1), then its radius is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819115781 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

जर $x^2+y^2-2x-6y+6=0$ या वर्तुळाच्या व्यासां (diameters) पैकी एक व्यास दूसऱ्या वर्तुळ C ची जीवा (chord) आहे. त्या वर्तुळाचा केंद्र बिंदू (center) (2, 1) वर आहे, तर त्याची त्रिज्या _____ आहे.

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 : 89 Question Id : 70819115782 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let three vectors $\vec{a}$, $\vec{b}$ and $\vec{c}$ be such that $\vec{c}$ is coplanar with $\vec{a}$ and $\vec{b}$, $\vec{a} \cdot \vec{c} = 7$ and $\vec{b}$ is perpendicular to $\vec{c}$, where $\vec{a} = -\hat{i} + \hat{j} + \hat{k}$ and $\vec{b} = 2\hat{i} + \hat{k}$, then the value of $2\left|\vec{a} + \vec{b} + \vec{c}\right|^2$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819115782 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

समजा $\vec{a}$, $\vec{b}$ आणि $\vec{c}$ हे तीन सदिश आहेत जसे की $\vec{a}$ आणि $\vec{b}$ बरोबर $\vec{c}$ एक प्रतलीय (coplanar) आहे, $\vec{a} \cdot \vec{c} = 7$ आणि $\vec{b}$ हे $\vec{c}$ वर लंब (perpendicular) आहे, जेथे $\vec{a} = -\hat{i} + \hat{j} + \hat{k}$ आणि $\vec{b} = 2\hat{i} + \hat{k}$, तर $2\left|\vec{a} + \vec{b} + \vec{c}\right|^2$ चे मूल्य _____ 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 : 90 Question Id : 70819115783 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$\lim\limits_{n\to\infty} \tan\left\{\sum\limits_{r=1}^{n} \tan^{-1}\left(\dfrac{1}{1+r+r^2}\right)\right\}$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 90 Question Id : 70819115783 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$\lim\limits_{n\to\infty} \tan\left\{\sum\limits_{r=1}^{n} \tan^{-1}\left(\dfrac{1}{1+r+r^2}\right)\right\}$ 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