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National Testing Agency

Question Paper Name :	B Tech 5th April 2024 Shift 1 Paper
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B. Tech

Group Number :	1
Group Id :	878270677
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
Examiner permission :	Cant View
Show Progress Bar? :	No

Mathematics Section A

Section Id :	8782701146
Section Number :	1

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Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8782702053
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 1 Question Id : 87827055608 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let $A = \{1, 3, 7, 9, 11\}$ and $B = \{2, 4, 5, 7, 8, 10, 12\}$. Then the total number of one-one maps $f : A \to B$, such that $f(1) + f(3) = 14$, is :

Options :

878270218781. 120

878270218782. 180

878270218783. 240

878270218784. 480

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Question Number : 1 Question Id : 87827055608 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $A = \{1, 3, 7, 9, 11\}$ तथा $B = \{2, 4, 5, 7, 8, 10, 12\}$ हैं। तो एकैकी प्रतिचित्रों (maps) $f: A \to B$, जिनके लिए $f(1) + f(3) = 14$ है, की कुल संख्या है :

Options :

878270218781. 120

878270218782. 180

878270218783. 240

878270218784. 480

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Question Number : 2 Question Id : 87827055609 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Consider the following two statements :

Statement I : For any two non-zero complex numbers z_1, z_2,

$$(|z_1| + |z_2|)\left|\frac{z_1}{|z_1|} + \frac{z_2}{|z_2|}\right| \le 2(|z_1| + |z_2|), \text{ and}$$

Statement II : If x, y, z are three distinct complex numbers and a, b, c are three positive real numbers such that $\frac{a}{|y-z|} = \frac{b}{|z-x|} = \frac{c}{|x-y|}$, then

$$\frac{a^2}{y-z} + \frac{b^2}{z-x} + \frac{c^2}{x-y} = 1.$$

Between the above two statements,

Options :

878270218785. both Statement I and Statement II are correct.

878270218786. both Statement I and Statement II are incorrect.

878270218787. Statement I is correct but Statement II is incorrect.

878270218788. Statement I is incorrect but Statement II is correct.

Question Number : 2 Question Id : 87827055609 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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कथनों

कथन I : किसी भी दो शून्येत्तर सम्मिश्र संख्याओं z_1, z_2 के लिए

$$(|z_1| + |z_2|)\left|\frac{z_1}{|z_1|} + \frac{z_2}{|z_2|}\right| \le 2(|z_1| + |z_2|) \text{ है।}$$

कथन II : यदि x, y, z तीन भिन्न सम्मिश्र संख्याएँ हैं और a, b, c तीन धनात्मक वास्तविक संख्याएँ हैं ताकि

$$\frac{a}{|y-z|} = \frac{b}{|z-x|} = \frac{c}{|x-y|} \text{ है, तो } \frac{a^2}{y-z} + \frac{b^2}{z-x} + \frac{c^2}{x-y} = 1 \text{ है।}$$

में से

Options :

878270218785. **कथन I** तथा **कथन II** दोनों सही हैं।

878270218786. **कथन I** तथा **कथन II** दोनों गलत हैं।

878270218787. **कथन I** सही है परन्तु **कथन II** गलत है।

878270218788. **कथन I** गलत है परन्तु **कथन II** सही है।

Question Number : 3 Question Id : 87827055610 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let A and B be two square matrices of order 3 such that $|A| = 3$ and $|B| = 2$. Then $\left|A^T A(\text{adj}(2A))^{-1}(\text{adj}(4B))(\text{adj}(AB))^{-1} AA^T\right|$ is equal to :

Options :

878270218789. 32

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878270218790. 64

878270218791. 81

878270218792. 108

Question Number : 3 Question Id : 87827055610 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना कोटि 3 के दो वर्ग आव्यूह A तथा B के लिए $|A|=3$ तथा $|B|=2$ हैं। तो $\left|A^T A(\text{adj}(2A))^{-1} (\text{adj}(4B)) (\text{adj}(AB))^{-1} AA^T\right|$ बराबर है :

Options :

878270218789. 32

878270218790. 64

878270218791. 81

878270218792. 108

Question Number : 4 Question Id : 87827055611 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the system of equations

$$11x + y + \lambda z = -5$$
$$2x + 3y + 5z = 3$$
$$8x - 19y - 39z = \mu$$

has infinitely many solutions, then $\lambda^4 - \mu$ is equal to :

Options :

878270218793. 45

878270218794. 47

878270218795. 49

878270218796. 51

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Question Number : 4 Question Id : 87827055611 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि समीकरण निकाय

$$11x + y + \lambda z = -5$$
$$2x + 3y + 5z = 3$$
$$8x - 19y - 39z = \mu$$

के अनंत हल हैं, तो $\lambda^4 - \mu$ बराबर है :

Options :

878270218793. 45

878270218794. 47

878270218795. 49

878270218796. 51

Question Number : 5 Question Id : 87827055612 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For the function

$$f(x) = \sin x + 3x - \frac{2}{\pi}(x^2 + x), \text{ where } x \in \left[0, \frac{\pi}{2}\right],$$

consider the following two statements :

(I) f is increasing in $\left(0, \frac{\pi}{2}\right)$.

(II) f' is decreasing in $\left(0, \frac{\pi}{2}\right)$.

Between the above two statements,

Options :

878270218797. only (I) is true.

878270218798. only (II) is true.

878270218799. neither (I) nor (II) is true.

878270218800. both (I) and (II) are true.

Question Number : 5 Question Id : 87827055612 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

फलन

$$f(x) = \sin x + 3x - \frac{2}{\pi}(x^2 + x), \text{ जहाँ } x \in \left[0, \frac{\pi}{2}\right],$$

के लिए, निम्न दो कथनों पर विचार करें।

(I) f अंतराल $\left(0, \frac{\pi}{2}\right)$ में वर्धमान है।

(II) f' अंतराल $\left(0, \frac{\pi}{2}\right)$ में ह्रसमान है।

उपरोक्त दो कथनों में से

Options :

878270218797. केवल (I) सत्य है।

878270218798. केवल (II) सत्य है।

878270218799. (I) और (II) दोनों असत्य हैं।

878270218800. (I) और (II) दोनों सत्य हैं।

Question Number : 6 Question Id : 87827055613 Question Type : MCQ Option Shuffling : Yes Is

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Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If $\frac{1}{\sqrt{1}+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\ldots+\frac{1}{\sqrt{99}+\sqrt{100}}=m$ and $\frac{1}{1\cdot2}+\frac{1}{2\cdot3}+\ldots+\frac{1}{99\cdot100}=n$, then the point (m, n) lies on the line

Options :

878270218801. $11x-100y=0$

878270218802. $11(x-1)-100y=0$

878270218803. $11(x-2)-100(y-1)=0$

878270218804. $11(x-1)-100(y-2)=0$

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Question Number : 6 Question Id : 87827055613 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि $\frac{1}{\sqrt{1}+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\ldots+\frac{1}{\sqrt{99}+\sqrt{100}}=m$ तथा $\frac{1}{1\cdot2}+\frac{1}{2\cdot3}+\ldots+\frac{1}{99\cdot100}=n$ है, तो बिंदु (m, n) किस रेखा पर है ?

Options :

878270218801. $11x-100y=0$

878270218802.

$11(x-1)-100y=0$

878270218803. $11(x-2)-100(y-1)=0$

878270218804. $11(x-1)-100(y-2)=0$

Question Number : 7 Question Id : 87827055614 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the function $f(x)=\dfrac{\sin 3x+\alpha \sin x-\beta \cos 3x}{x^3}$, $x \in \mathbf{R}$, is continuous at $x=0$, then $f(0)$ is equal to :

Options :

878270218805. 2

878270218806. -2

878270218807. 4

878270218808. -4

Question Number : 7 Question Id : 87827055614 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि फलन $f(x) = \frac{\sin 3x + \alpha \sin x - \beta \cos 3x}{x^3}$, $x \in \mathbf{R}$, बिंदु $x=0$ पर संतत है, तो $f(0)$ बराबर है :

Options :

878270218805. 2

878270218806. -2

878270218807. 4

878270218808. -4

Question Number : 8 Question Id : 87827055615 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let $f(x) = x^5 + 2x^3 + 3x + 1$, $x \in \mathbf{R}$, and $g(x)$ be a function such that $g(f(x)) = x$ for all $x \in \mathbf{R}$. Then $\frac{g(7)}{g'(7)}$ is equal to :

Options :

878270218809. 1

878270218810. 7

878270218811. 14

878270218812. 42

Question Number : 8 Question Id : 87827055615 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $f(x)=x^5+2x^3+3x+1, x \in \mathbf{R}$ है, तथा एक फलन $g(x)$ इस प्रकार है कि $g(f(x))=x \ \forall x \in \mathbf{R}$ है। तो $\frac{g(7)}{g'(7)}$ बराबर है :

Options :

878270218809. 1

878270218810. 7

878270218811. 14

878270218812. 42

Question Number : 9 Question Id : 87827055616 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let a rectangle ABCD of sides 2 and 4 be inscribed in another rectangle PQRS such that the vertices of the rectangle ABCD lie on the sides of the rectangle PQRS. Let a and b be the sides of the rectangle PQRS when its area is maximum. Then $(a+b)^2$ is equal to :

Options :

878270218813. 72

878270218814. 64

878270218815. 80

878270218816. 60

Question Number : 9 Question Id : 87827055616 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना भुजाओं 2 तथा 4 का एक आयत ABCD एक अन्य आयत PQRS के अंतर्गत इस प्रकार है कि आयत ABCD के शीर्ष आयत PQRS की भुजाओं पर हैं। माना आयत PQRS की भुजाएँ a तथा b है, जब इसका क्षेत्रफल अधिकतम है। तो $(a+b)^2$ बराबर है :

Options :

878270218813. 72

878270218814. 64

878270218815. 80

878270218816. 60

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Question Number : 10 Question Id : 87827055617 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The value of $\int_{-\pi}^{\pi} \frac{2y(1+\sin y)}{1+\cos^2 y} dy$ is :

Options :

878270218817. π^2

878270218818. $\frac{\pi^2}{2}$

878270218819. $2\pi^2$

878270218820. $\frac{\pi}{2}$

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Question Number : 10 Question Id : 87827055617 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

$\int_{-\pi}^{\pi} \frac{2y(1+\sin y)}{1+\cos^2 y} dy$ का मान बराबर है :

Options :

878270218817. π^2

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878270218818. $\frac{\pi^2}{2}$

878270218819. $2\pi^2$

878270218820. $\frac{\pi}{2}$

Question Number : 11 Question Id : 87827055618 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The integral $\int_0^{\pi/4} \frac{136 \sin x}{3 \sin x + 5 \cos x} dx$ is equal to :

Options :

878270218821. $3\pi - 10 \log_e(2\sqrt{2}) + 10 \log_e 5$

878270218822. $3\pi - 30 \log_e 2 + 20 \log_e 5$

878270218823. $3\pi - 25 \log_e 2 + 10 \log_e 5$

878270218824. $3\pi - 50 \log_e 2 + 20 \log_e 5$

Question Number : 11 Question Id : 87827055618 Question Type : MCQ Option Shuffling : Yes

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Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

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Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

समाकलन $\int_0^{\pi/4} \frac{136 \sin x}{3 \sin x + 5 \cos x} dx$ बराबर है :

Options :

878270218821. $3\pi - 10 \log_e(2\sqrt{2}) + 10 \log_e 5$

878270218822. $3\pi - 30 \log_e 2 + 20 \log_e 5$

878270218823. $3\pi - 25 \log_e 2 + 10 \log_e 5$

878270218824. $3\pi - 50 \log_e 2 + 20 \log_e 5$

Question Number : 12 Question Id : 87827055619 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If $y = y(x)$ is the solution of the differential equation $\frac{dy}{dx} + 2y = \sin(2x)$, $y(0) = \frac{3}{4}$, then $y\left(\frac{\pi}{8}\right)$ is equal to :

Options :

878270218825. $e^{-\pi/4}$

878270218826. $e^{\pi/4}$

878270218827. $e^{\pi/8}$

878270218828. $e^{-\pi/8}$

Question Number : 12 Question Id : 87827055619 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि अवकल समीकरण $\frac{dy}{dx} + 2y = \sin(2x), y(0) = \frac{3}{4}$ का हल $y = y(x)$ है, तो $y\left(\frac{\pi}{8}\right)$ बराबर है :

Options :

878270218825. $e^{-\pi/4}$

878270218826. $e^{\pi/4}$

878270218827. $e^{\pi/8}$

878270218828. $e^{-\pi/8}$

Question Number : 13 Question Id : 87827055620 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Let a circle C of radius 1 and closer to the origin be such that the lines passing through the point (3, 2) and parallel to the coordinate axes touch it. Then the shortest distance of the circle C from the point (5, 5) is :

Options :

878270218829. 5

878270218830. $2\sqrt{2}$

878270218831. 4

878270218832. $4\sqrt{2}$

Question Number : 13 Question Id : 87827055620 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना मूल बिंदु के निकट त्रिज्या 1 का एक वृत्त C है, जिसे बिंदु (3, 2) से होकर जाने वाली तथा निर्देशांक अक्षों के समांतर रेखाएँ स्पर्श करती हैं। तो वृत्त C की बिंदु (5, 5) से न्यूनतम दूरी है :

Options :

878270218829. 5

878270218830. $2\sqrt{2}$

878270218831. 4

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878270218832. $4\sqrt{2}$

Question Number : 14 Question Id : 87827055621 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let two straight lines drawn from the origin O intersect the line $3x+4y=12$ at the points P and Q such that ΔOPQ is an isosceles triangle and $\angle POQ=90°$. If $l=OP^2+PQ^2+QO^2$, then the greatest integer less than or equal to l is :

Options :

878270218833. 48

878270218834. 42

878270218835. 44

878270218836. 46

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Question Number : 14 Question Id : 87827055621 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना मूलबिंदु से खींची गई दो रेखाएँ, रेखा $3x+4y=12$ को बिन्दुओं P तथा Q पर इस प्रकार काटती है कि ΔOPQ एक समद्विबाहु त्रिभुज है तथा $\angle POQ=90°$ है। यदि $l=OP^2+PQ^2+QO^2$ है, तो l से कम या l के बराबर महत्तम पूर्णांक है :

Options :

878270218833.

48

878270218834. 42

878270218835. 44

878270218836. 46

Question Number : 15 Question Id : 87827055622 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let the line $2x+3y-k=0$, $k>0$, intersect the x-axis and y-axis at the points A and B, respectively. If the equation of the circle having the line segment AB as a diameter is $x^2+y^2-3x-2y=0$ and the length of the latus rectum of the ellipse $x^2+9y^2=k^2$ is $\frac{m}{n}$, where m and n are coprime, then $2m+n$ is equal to

Options :

878270218837. 10

878270218838. 11

878270218839. 12

878270218840. 13

Question Number : 15 Question Id : 87827055622 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना रेखा $2x+3y-k=0, k>0$, x-अक्ष तथा y-अक्ष को क्रमश: बिंदुओं A तथा B पर काटती है। यदि वृत्त, जिसका एक व्यास रेखाखंड AB है, का समीकरण $x^2+y^2-3x-2y=0$ है तथा दीर्घवृत्त $x^2+9y^2=k^2$ की नाभिलंब जीवा की लंबाई $\frac{m}{n}$ है, जहाँ m तथा n असहभाज्य संख्याएँ है, तो $2m+n$ बराबर है :

Options :

878270218837. 10

878270218838. 11

878270218839. 12

878270218840. 13

Question Number : 16 Question Id : 87827055623 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the line $\frac{2-x}{3}=\frac{3y-2}{4\lambda+1}=4-z$ makes a right angle with the line $\frac{x+3}{3\mu}=\frac{1-2y}{6}=\frac{5-z}{7}$, then $4\lambda+9\mu$ is equal to :

Options :

878270218841. 4

878270218842. 5

878270218843. 6

878270218844. 13

Question Number : 16 Question Id : 87827055623 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि रेखा $\frac{2-x}{3}=\frac{3y-2}{4\lambda+1}=4-z$, रेखा $\frac{x+3}{3\mu}=\frac{1-2y}{6}=\frac{5-z}{7}$ से एक समकोण बनाती है, तो $4\lambda+9\mu$ बराबर है :

Options :

878270218841. 4

878270218842. 5

878270218843. 6

878270218844. 13

Question Number : 17 Question Id : 87827055624 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let d be the distance of the point of intersection of the lines $\frac{x+6}{3}=\frac{y}{2}=\frac{z+1}{1}$ and $\frac{x-7}{4}=\frac{y-9}{3}=\frac{z-4}{2}$ from the point $(7,8,9)$. Then d^2+6 is equal to :

Options :

878270218845. 69

878270218846. 72

878270218847. 75

878270218848. 78

Question Number : 17 Question Id : 87827055624 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना रेखाओं $\frac{x+6}{3}=\frac{y}{2}=\frac{z+1}{1}$ तथा $\frac{x-7}{4}=\frac{y-9}{3}=\frac{z-4}{2}$ के प्रतिच्छेदन बिंदु की बिंदु $(7,8,9)$ से दूरी d है। तो d^2+6 बराबर है :

Options :

878270218845. 69

878270218846. 72

878270218847. 75

878270218848. 78

Question Number : 18 Question Id : 87827055625 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If A(1, −1, 2), B(5, 7, −6), C(3, 4, −10) and D(−1, −4, −2) are the vertices of a quadrilateral ABCD, then its area is :

Options :

878270218849. $12\sqrt{29}$

878270218850. $24\sqrt{29}$

878270218851. $48\sqrt{7}$

878270218852. $24\sqrt{7}$

Question Number : 18 Question Id : 87827055625 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि एक चतुर्भुज ABCD के शीर्ष A(1, −1, 2), B(5, 7, −6), C(3, 4, −10) तथा D(−1, −4, −2) हैं, तो इसका क्षेत्रफल है :

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Options :

878270218849. $12\sqrt{29}$

878270218850. $24\sqrt{29}$

878270218851. $48\sqrt{7}$

878270218852. $24\sqrt{7}$

Question Number : 19 Question Id : 87827055626 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The coefficients a, b, c in the quadratic equation $ax^2+bx+c=0$ are chosen from the set $\{1, 2, 3, 4, 5, 6, 7, 8\}$. The probability of this equation having repeated roots is :

Options :

878270218853. $\frac{3}{256}$

878270218854. $\frac{1}{128}$

878270218855. $\frac{3}{128}$

878270218856.

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$\frac{1}{64}$

Question Number : 19 Question Id : 87827055626 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

द्विघातीय समीकरण $ax^2+bx+c=0$ के गुणांक a, b, c, समुच्चय {1, 2, 3, 4, 5, 6, 7, 8} से लिए जाते हैं। इस समीकरण के दोनों मूल बराबर होने की प्रायिकता है :

Options :

878270218853. $\frac{3}{256}$

878270218854. $\frac{1}{128}$

878270218855. $\frac{3}{128}$

878270218856. $\frac{1}{64}$

Question Number : 20 Question Id : 87827055627 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Suppose $\theta \in \left[0, \frac{\pi}{4}\right]$ is a solution of $4\cos\theta - 3\sin\theta = 1$. Then $\cos\theta$ is equal to :

Options :

878270218857. $\frac{6-\sqrt{6}}{(3\sqrt{6}-2)}$

878270218858. $\frac{4}{(3\sqrt{6}-2)}$

878270218859. $\frac{4}{(3\sqrt{6}+2)}$

878270218860. $\frac{6+\sqrt{6}}{(3\sqrt{6}+2)}$

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Question Number : 20 Question Id : 87827055627 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $4\cos\theta - 3\sin\theta = 1$ का एक हल $\theta \in \left[0, \frac{\pi}{4}\right]$ है। तो $\cos\theta$ बराबर है :

Options :

878270218857. $\frac{6-\sqrt{6}}{(3\sqrt{6}-2)}$

878270218858.

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$\frac{4}{(3\sqrt{6}-2)}$

878270218859. $\frac{4}{(3\sqrt{6}+2)}$

878270218860. $\frac{6+\sqrt{6}}{(3\sqrt{6}+2)}$

Mathematics Section B

Section Id :	8782701147
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8782702054
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 21 Question Id : 87827055628 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If $S=\{a \in \mathbf{R} : |2a-1| = 3[a]+2\{a\}\}$, where $[t]$ denotes the greatest integer less than or equal to t and $\{t\}$ represents the fractional part of t, then $72 \sum_{a \in S} a$ is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 21 Question Id : 87827055628 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि $S=\{a \in \mathbf{R} : |2a-1| = 3[a]+2\{a\}\}$ है, जहाँ $[t]$ महत्तम पूर्णांक फलन है तथा $\{t\}$, t के भिन्नात्मक भाग को दर्शाता है, तो $72 \sum_{a \in S} a$ बराबर है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 22 Question Id : 87827055629 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The number of distinct real roots of the equation $|x||x+2|-5|x+1|-1=0$ is ________.

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Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 22 Question Id : 87827055629 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

समीकरण $|x||x+2|-5|x+1|-1=0$ के भिन्न वास्तविक मूलों की संख्या है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 23 Question Id : 87827055630 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The number of ways of getting a sum 16 on throwing a dice four times is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 23 Question Id : 87827055630 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक पासे को चार बार फेंकने पर योग 16 प्राप्त करने के तरीकों की संख्या है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 24 Question Id : 87827055631 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the constant term in the expansion of $(1+2x-3x^3)\left(\frac{3}{2}x^2-\frac{1}{3x}\right)^9$ is p, then 108p is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 24 Question Id : 87827055631 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि $(1+2x-3x^2)\left(\frac{3}{2}x^2-\frac{1}{3x}\right)^9$ के प्रसार में अचर पद p है, तो 108p बराबर है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 25 Question Id : 87827055632 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let $a_1, a_2, a_3, \ldots$ be in an arithmetic progression of positive terms.

Let $A_k = a_1^2 - a_2^2 + a_3^2 - a_4^2 + \ldots + a_{2k-1}^2 - a_{2k}^2$.

If $A_3 = -153$, $A_5 = -435$ and $a_1^2 + a_2^2 + a_3^2 = 66$, then $a_{17} - A_7$ is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 25 Question Id : 87827055632 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $a_1, a_2, a_3, \ldots$ एक समांतर श्रेणी है, जिसके पद धनात्मक हैं।

माना $A_k = a_1^2 - a_2^2 + a_3^2 - a_4^2 + \ldots + a_{2k-1}^2 - a_{2k}^2$ है। यदि $A_3 = -153$, $A_5 = -435$ तथा $a_1^2 + a_2^2 + a_3^2 = 66$ हैं, तो $a_{17} - A_7$ बराबर है ______

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 26 Question Id : 87827055633 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let f be a differentiable function in the interval $(0, \infty)$ such that $f(1) = 1$ and $\lim_{t \to x} \frac{t^2 f(x) - x^2 f(t)}{t - x} = 1$ for each $x > 0$. Then $2 f(2) + 3 f(3)$ is equal to ______.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 26 Question Id : 87827055633 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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माना अंतराल $(0, \infty)$ में एक अवकलनीय फलन f है, जिसके लिए $f(1)=1$ है तथा प्रत्येक $x>0$ के लिए

$\lim_{t \to x} \frac{t^2 f(x) - x^2 f(t)}{t - x} = 1$ है। तो $2f(2)+3f(3)$ बराबर है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 27 Question Id : 87827055634 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The area of the region enclosed by the parabolas $y=x^2-5x$ and $y=7x-x^2$ is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 27 Question Id : 87827055634 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

परवलयों $y=x^2-5x$ तथा $y=7x-x^2$ से घिरे क्षेत्र का क्षेत्रफल है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 28 Question Id : 87827055635 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Suppose AB is a focal chord of the parabola $y^2 = 12x$ of length l and slope $m < \sqrt{3}$. If the distance of the chord AB from the origin is d, then ld^2 is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 28 Question Id : 87827055635 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

परवलय $y^2 = 12x$ की एक नाभीय जीवा AB की लंबाई l तथा प्रवणता $m < \sqrt{3}$ है। यदि मूलबिंदु से जीवा AB की दूरी d है, तो ld^2 बराबर है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

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Possible Answers :

1

Question Number : 29 Question Id : 87827055636 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let $\vec{a} = \hat{i} - 3\hat{j} + 7\hat{k}$, $\vec{b} = 2\hat{i} - \hat{j} + \hat{k}$ and $\vec{c}$ be a vector such that $\left(\vec{a} + 2\vec{b}\right) \times \vec{c} = 3\left(\vec{c} \times \vec{a}\right)$.

If $\vec{a} \cdot \vec{c} = 130$, then $\vec{b} \cdot \vec{c}$ is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 29 Question Id : 87827055636 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $\vec{a} = \hat{i} - 3\hat{j} + 7\hat{k}$, $\vec{b} = 2\hat{i} - \hat{j} + \hat{k}$ तथा एक सदिश $\vec{c}$ के लिए $\left(\vec{a} + 2\vec{b}\right) \times \vec{c} = 3\left(\vec{c} \times \vec{a}\right)$ हैं। यदि

$\vec{a} \cdot \vec{c} = 130$ है, तो $\vec{b} \cdot \vec{c}$ बराबर है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 30 Question Id : 87827055637 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

From a lot of 10 items, which include 3 defective items, a sample of 5 items is drawn at random. Let the random variable X denote the number of defective items in the sample. If the variance of X is σ^2, then $96\sigma^2$ is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 30 Question Id : 87827055637 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

10 वस्तुओं के एक ढेर, जिसमें 3 खराब हैं, 5 वस्तुओं का एक प्रतिदर्श यादृच्छया लिया जाता है। माना यादृच्छिक चर X, प्रतिदर्श में खराब वस्तुओं की संख्या को दर्शाता है। यदि X का प्रसरण σ^2 है, तो $96\sigma^2$ बराबर है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Physics Section A

Section Id :	8782701148
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8782702055
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 31 Question Id : 87827055638 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If G be the gravitational constant and u be the energy density then which of the following quantity have the dimensions as that of the $\sqrt{uG}$:

Options :

878270218871. Force per unit mass

878270218872. Gravitational potential

878270218873.

Energy per unit mass

878270218874. pressure gradient per unit mass

Question Number : 31 Question Id : 87827055638 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि G सार्वत्रिक गुरुत्वाकर्षण नियतांक तथा u ऊर्जा घनत्व हो तो निम्न में से कौन सी राशि की विमा $\sqrt{uG}$ की विमा के समान है :

Options :

878270218871. प्रति एकांक द्रव्यमान का बल

878270218872. गुरुत्वीय स्थितिज ऊर्जा

878270218873. प्रति एकांक द्रव्यमान की ऊर्जा

878270218874. प्रति एकांक द्रव्यमान की दाब प्रवणता

Question Number : 32 Question Id : 87827055639 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The angle between vector $\vec{Q}$ and the resultant of $(2\vec{Q} + 2\vec{P})$ and $(2\vec{Q} - 2\vec{P})$ is :

Options :

878270218875. $\tan^{-1}\left({}^{2Q}\!/_{P}\right)$

878270218876. $\tan^{-1}\left({}^{P}\!/_{Q}\right)$

878270218877. $\tan^{-1}\dfrac{\left(2\vec{Q} - 2\vec{P}\right)}{2\vec{Q} + 2\vec{P}}$

878270218878. $0°$

Question Number : 32 Question Id : 87827055639 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

$\left(2\vec{Q} + 2\vec{P}\right)$ एवं $\left(2\vec{Q} - 2\vec{P}\right)$ के परिणामी तथा सदिश $\vec{Q}$ के बीच का कोण है :

Options :

878270218875. $\tan^{-1}\left({}^{2Q}\!/_{P}\right)$

878270218876. $\tan^{-1}\left({}^{P}\!/_{Q}\right)$

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878270218877. $\tan^{-1}\frac{\left(2\vec{Q} - 2\vec{P}\right)}{2\vec{Q} + 2\vec{P}}$

878270218878. $0°$

Question Number : 33 Question Id : 87827055640 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A wooden block of mass 5 kg rests on a soft horizontal floor. When an iron cylinder of mass 25 kg is placed on the top of the block, the floor yields and the block and the cylinder together go down with an acceleration of 0.1 ms^{-2}. The action force of the system on the floor is equal to :

Options :

878270218879. 297 N

878270218880. 294 N

878270218881. 291 N

878270218882. 196 N

Question Number : 33 Question Id : 87827055640 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

5 किग्रा द्रव्यमान का एक लकड़ी का गुटका एक कोमल क्षैतिज फर्श पर रखा है। जब 25 किग्रा द्रव्यमान का एक लोहे का बेलन गुटके के शिखर पर रखा जाता है फर्श दबता है तथा गुटका व बेलन एकसाथ 0.1 मी/से^{2} त्वरण से नीचे जाने लगते हैं। निकाय का फर्श पर क्रियाबल है :

Options :

878270218879. 297 N

878270218880. 294 N

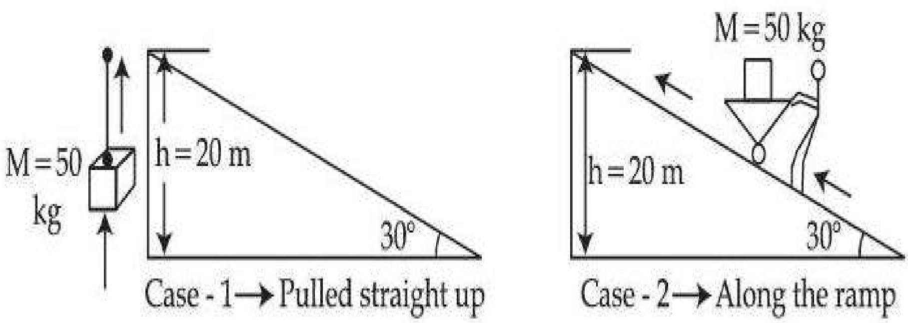
878270218881. 291 N

878270218882. 196 N

Question Number : 34 Question Id : 87827055641 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A body of mass 50 kg is lifted to a height of 20 m from the ground in the two different ways as shown in the figures. The ratio of work done against the gravity in both the respective cases, will be :



Options :

878270218883. 1 : 2

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878270218884. $2:1$

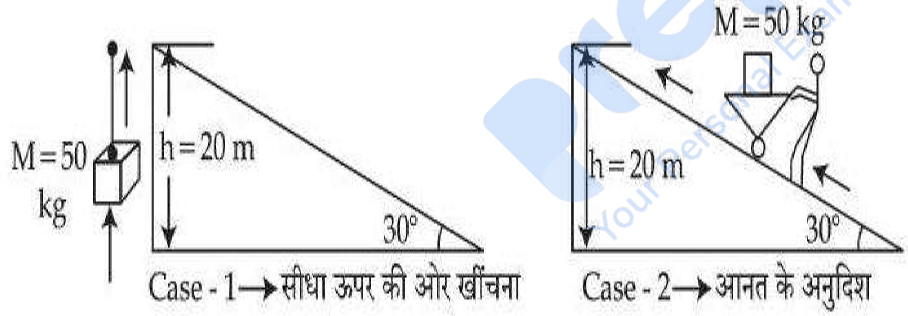
878270218885. $\sqrt{3}:2$

878270218886. $1:1$

Question Number : 34 Question Id : 87827055641 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

दिये गये चित्रों के अनुसार 50 किग्रा द्रव्यमान के एक पिण्ड की पृथ्वी तल से 20 मी की ऊँचाई तक दो तरीकों से ऊपर ले जाया जाता है। दोनों स्थितियों में गुरुत्व के विरुद्ध किये गये क्रमशः कार्यों का अनुपात होगा :



Options :

878270218883. $1:2$

878270218884. $2:1$

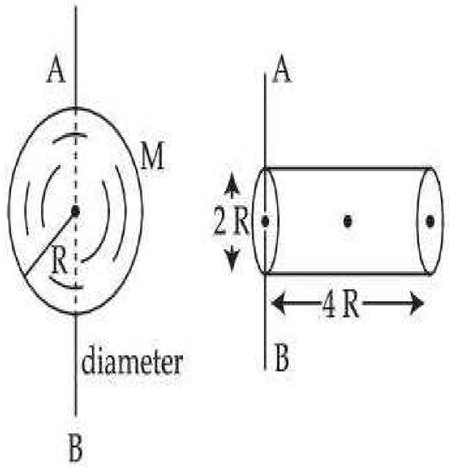
878270218885. $\sqrt{3}:2$

878270218886. $1:1$

Question Number : 35 Question Id : 87827055642 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Ratio of radius of gyration of a hollow sphere to that of a solid cylinder of equal mass, for moment of Inertia about their diameter axis AB as shown in figure is $\sqrt{8/x}$. The value of x is :



Options :

878270218887. 17

878270218888. 67

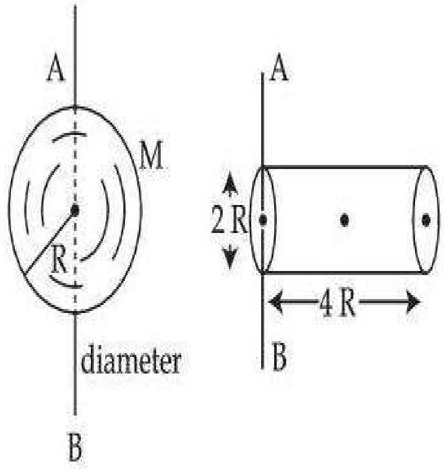
878270218889. 51

878270218890. 34

Question Number : 35 Question Id : 87827055642 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

प्रदर्शित चित्र के अनुसार समान द्रव्यमान के एक खोखले गोले तथा ठोस बेलन की क्रमश: AB अक्षों के परित: जड़त्व आघुर्ण के लिए इनकी घूर्णन त्रिज्याओं का अनुपात $\sqrt{8/x}$ है। x का मान है :



Options :

878270218887. 17

878270218888. 67

878270218889. 51

878270218890. 34

Question Number : 36 Question Id : 87827055643 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Match List I with List II :

List I		List II	
(A)	Kinetic energy of planet	(I)	$-\frac{GMm}{a}$
(B)	Gravitation Potential energy of sun-planet system	(II)	$\frac{GMm}{2a}$
(C)	Total mechanical energy of planet	(III)	$\frac{Gm}{r}$
(D)	Escape energy at the surface of planet for unit mass object	(IV)	$-\frac{GMm}{2a}$

(Where a = radius of planet orbit, r = radius of planet, M = mass of Sun, m = mass of planet)

Choose the **correct** answer from the options given below :

Options :

878270218891. (A)-(I), (B)-(IV), (C)-(II), (D)-(III)

878270218892. (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

878270218893. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

878270218894. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Question Number : 36 Question Id : 87827055643 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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सूची-I का सूची-II से मिलान कीजिए।

सूची-I		सूची-II	
(A)	ग्रह की गतिज ऊर्जा	(I)	$-\frac{GMm}{a}$
(B)	सूर्य-ग्रह निकाय की गुरुत्वीय स्थितिज ऊर्जा	(II)	$\frac{GMm}{2a}$
(C)	ग्रह की कुल यांत्रिक ऊर्जा	(III)	$\frac{Gm}{r}$
(D)	एकांक द्रव्यमान की वस्तु के लिए ग्रह की सतह पर पलायन ऊर्जा	(IV)	$-\frac{GMm}{2a}$

जहाँ a = ग्रह कक्षा की त्रिज्या, r = ग्रह की त्रिज्या, M =सूर्य का द्रव्यमान, m =ग्रह का द्रव्यमान

नीचे दिये गये विकल्पों से **सही** उत्तर चुनिए :

Options :

878270218891. (A)-(I), (B)-(IV), (C)-(II), (D)-(III)

878270218892. (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

878270218893. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

878270218894. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Question Number : 37 Question Id : 87827055644 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Given below are two statements :

Statement I : When a capillary tube is dipped into a liquid, the liquid neither rises nor falls in the capillary. The contact angle may be 0°.

Statement II : The contact angle between a solid and a liquid is a property of the material of the solid and liquid as well.

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

Options :

878270218895. Both **Statement I** and **Statement II** are true

878270218896. Both **Statement I** and **Statement II** are false

878270218897. **Statement I** is true and **Statement II** is false

878270218898. **Statement I** is false but **Statement II** is true

Question Number : 37 Question Id : 87827055644 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

नीचे दो कथन दिये गये हैं :

कथन I : केशनली को द्रव में डुबाने पर द्रव केशनली में न तो ऊपर चढ़ता है और न ही नीचे उतरता है। स्पर्श कोण 0° हो सकता है।

कथन II : किसी ठोस तथा द्रव के बीच बना स्पर्श कोण ठोस के पदार्थ एवं द्रव का एक गुण है।

उपरोक्त कथनों के आधार पर, नीचे दिये गये विकल्पों में से सबसे **उचित** उत्तर चुनिए :

Options :

878270218895. दोनों **कथन I** व **कथन II** सही हैं।

878270218896. दोनों **कथन I** व **कथन II** गलत हैं।

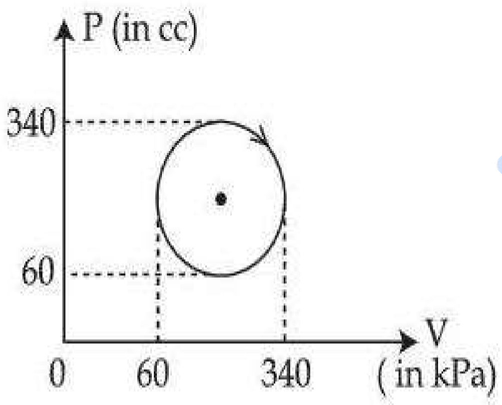
878270218897. **कथन I** सही है परन्तु **कथन II** गलत है।

878270218898. **कथन I** गलत है परन्तु **कथन II** सही है।

Question Number : 38 Question Id : 87827055645 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The heat absorbed by a system in going through the given cyclic process is :



Options :

878270218899. 431.2 J

878270218900. 616 J

878270218901. 61.6 J

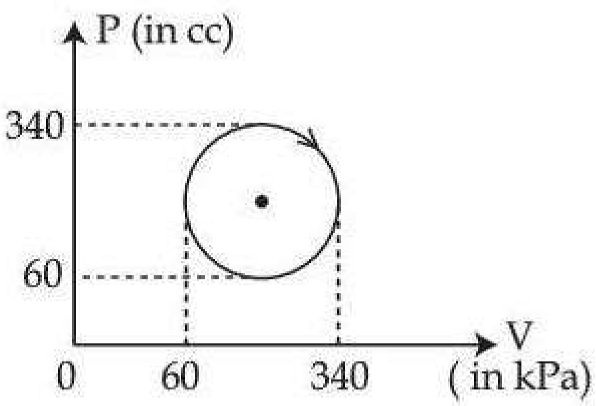
878270218902.

19.6 J

Question Number : 38 Question Id : 87827055645 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

दिये गये चक्रीय प्रक्रम से गुजरने वाले किसी निकाय द्वारा अवशोषित ऊष्मा है :



Options :

878270218899. 431.2 J

878270218900. 616 J

878270218901. 61.6 J

878270218902. 19.6 J

Question Number : 39 Question Id : 87827055646 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the collision frequency of hydrogen molecules in a closed chamber at 27°C is Z, then the collision frequency of the same system at 127°C is :

Options :

878270218903. $\frac{2}{\sqrt{3}} Z$

878270218904. $\frac{\sqrt{3}}{2} Z$

878270218905. $\frac{4}{3} Z$

878270218906. $\frac{3}{4} Z$

Question Number : 39 Question Id : 87827055646 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि 27°C पर एक बन्द चेम्बर में हाइड्रोजन अणुओं की संघट्ट आवृत्ति Z हो तब 127°C पर समान निकाय की संघट्ट आवृत्ति है :

Options :

878270218903. $\frac{2}{\sqrt{3}} Z$

878270218904.

$\frac{\sqrt{3}}{2}$ Z

878270218905. $\frac{4}{3}$ Z

878270218906. $\frac{3}{4}$ Z

Question Number : 40 Question Id : 87827055647 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A simple pendulum doing small oscillations at a place R height above earth surface has time period of $T_1 = 4$ s. T_2 would be it's time period if it is brought to a point which is at a height 2R from earth surface. Choose the correct relation [R = radius of earth] :

Options :

878270218907. $T_1 = T_2$

878270218908. $2T_1 = T_2$

878270218909. $3T_1 = 2T_2$

878270218910. $2T_1 = 3T_2$

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Question Number : 40 Question Id : 87827055647 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

पृथ्वी तल से R ऊँचाई पर एक स्थान पर एक सरल लोलक छोटे दोलन कर रहा है जिसका आवर्तकाल $T_1 = 4\ s$ है। यदि इसे पृथ्वी सतह से 2R ऊँचाई पर किसी बिन्दु पर ले जाया जाता है तो इसका आवर्तकाल T_2 है (R = पृथ्वी की त्रिज्या)। सही सम्बन्ध चुनिए :

Options :

878270218907. $T_1 = T_2$

878270218908. $2T_1 = T_2$

878270218909. $3T_1 = 2T_2$

878270218910. $2T_1 = 3T_2$

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Question Number : 41 Question Id : 87827055648 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In hydrogen like system the ratio of coulombian force and gravitational force between an electron and a proton is in the order of :

Options :

878270218911. 10^{36}

878270218912.

10^{39}

878270218913. 10^{29}

878270218914. 10^{19}

Question Number : 41 Question Id : 87827055648 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

हाइड्रोजन समतुल्य निकाय में एक इलेक्ट्रॉन तथा एक प्रोटॉन के बीच लगने वाले कूलॉम्ब बल तथा गुरुत्वीय बल के अनुपात की कोटि है :

Options :

878270218911. 10^{36}

878270218912. 10^{39}

878270218913. 10^{29}

878270218914. 10^{19}

Question Number : 42 Question Id : 87827055649 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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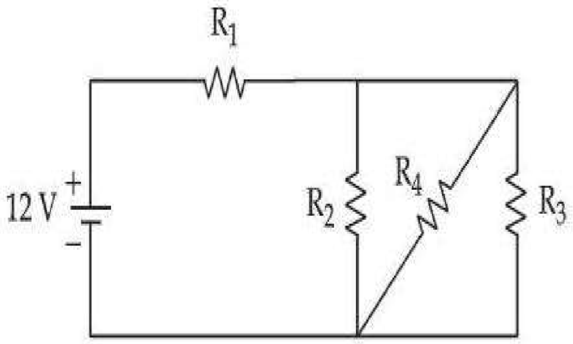
In the given figure $R_1 = 10\Omega$, $R_2 = 8\Omega$, $R_3 = 4\Omega$ and $R_4 = 8\Omega$. Battery is ideal with emf 12V. Equivalent resistant of the circuit and current supplied by battery are respectively :



Options :

878270218915. 10.5 Ω and 1.14 A

878270218916. 12 Ω and 11.4 A

878270218917. 12 Ω and 1 A

878270218918. 10.5 Ω and 1 A

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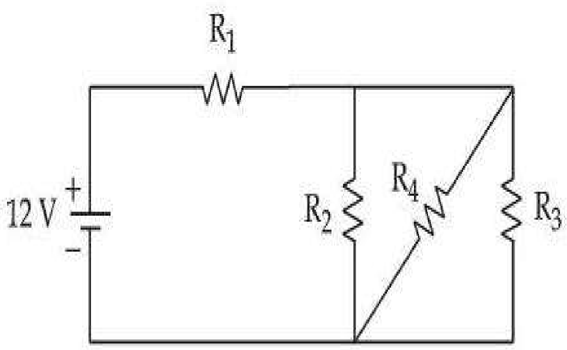
Question Number : 42 Question Id : 87827055649 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

दिये गये चित्र में, $R_1 = 10\Omega$, $R_2 = 8\Omega$, $R_3 = 4\Omega$ तथा $R_4 = 8\Omega$ है। 12V वि.बा. बल की एक आदर्श बैटरी है। परिपथ का तुल्य प्रतिरोध तथा बैटरी द्वारा प्रवाहित धारा क्रमश: हैं :



Options :

878270218915. 10.5 Ω and 1.14 A

878270218916. 12 Ω and 11.4 A

878270218917. 12 Ω and 1 A

878270218918. 10.5 Ω and 1 A

Question Number : 43 Question Id : 87827055650 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In a co-axial straight cable, the central conductor and the outer conductor carry equal currents in opposite directions. The magnetic field is zero :

Options :

878270218919. outside the cable

878270218920. inside the inner conductor

878270218921. inside the outer conductor

878270218922. in between the two conductors

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Question Number : 43 Question Id : 87827055650 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक सह-अक्षीय सीधी केबिल में केन्द्रीय चालक तथा बाहरी चालक में बराबर तथा विपरीत दिशाओं में धाराएँ प्रवाहित होती हैं।
चुम्बकीय क्षेत्र शून्य है :

Options :

878270218919. केबिल के बाहर

878270218920. आन्तरिक चालक के अन्दर

878270218921. बाहरी चालक के अन्दर

878270218922. दोनों चालकों के मध्य में

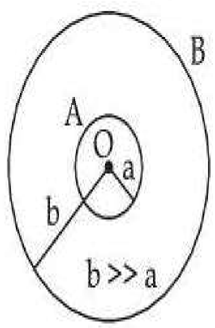
Question Number : 44 Question Id : 87827055651 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Two conducting circular loops A and B are placed in the same plane with their centres coinciding as shown in figure. The mutual inductance between them is :



Options :

878270218923. $\frac{\mu_o}{2\pi} \cdot \frac{b^2}{a}$

878270218924. $\frac{\mu_o}{2\pi} \cdot \frac{a^2}{b}$

878270218925. $\frac{\mu_o \pi b^2}{2a}$

878270218926. $\frac{\mu_o \pi a^2}{2b}$

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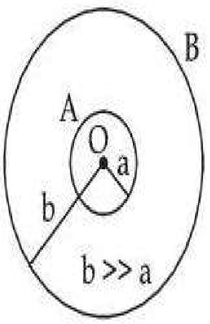
Question Number : 44 Question Id : 87827055651 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

दो वृत्ताकार चालक लूप A व B को एक समान सतह पर चित्र के अनुसार इस प्रकार रखा गया है कि इनके केन्द्र संपाती हैं।
इनके बीच अन्योन्य प्रेरकत्व है :



Options :

878270218923. $\frac{\mu_o}{2\pi} \cdot \frac{b^2}{a}$

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878270218924. $\frac{\mu_0}{2\pi} \cdot \frac{a^2}{b}$

878270218925. $\frac{\mu_0 \pi b^2}{2a}$

878270218926. $\frac{\mu_0 \pi a^2}{2b}$

Question Number : 45 Question Id : 87827055652 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

An alternating voltage of amplitude 40 V and frequency 4 kHz is applied directly across the capacitor of 12 μF. The maximum displacement current between the plates of the capacitor is nearly :

Options :

878270218927. 10 A

878270218928. 12 A

878270218929. 13 A

878270218930. 8 A

Question Number : 45 Question Id : 87827055652 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

40 V आयाम तथा 4 kHz आवृत्ति के एक प्रत्यावर्ती वोल्टेज को 12 μF के संधारित्र से जोड़ा गया है। संधारित्र की प्लेटों के बीच अधिकतम विस्थापन धारा लगभग है :

Options :

878270218927. 10 A

878270218928. 12 A

878270218929. 13 A

878270218930. 8 A

Question Number : 46 Question Id : 87827055653 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Light emerges out of a convex lens when a source of light kept at its focus. The shape of wavefront of the light is :

Options :

878270218931. spherical

878270218932. cylindrical

878270218933. both spherical and cylindrical

878270218934. plane

Question Number : 46 Question Id : 87827055653 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

जब प्रकाश स्रोत को उत्तल लैंस के फोकस पर रखा जाये तो प्रकाश इससे पारगमित होता है। इस प्रकाश के तरंगाग्र की आकृति है :

Options :

878270218931. गोलीय

878270218932. बेलनाकार

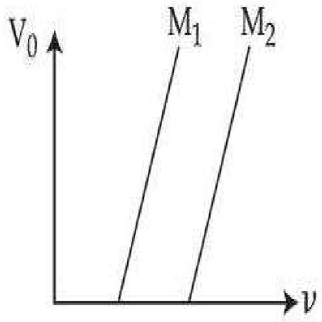
878270218933. दोनों गोलीय व बेलनाकार

878270218934. समतल

Question Number : 47 Question Id : 87827055654 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :



Statement I : Figure shows the variation of stopping potential with frequency (ν) for the two photosensitive materials M_1 and M_2. The slope gives value of $\frac{h}{e}$, where h is Planck's constant, e is the charge of electron.

Statement II : M_2 will emit photoelectrons of greater kinetic energy for the incident radiation having same frequency.

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

Options :

878270218935. Both **Statement I** and **Statement II** are correct

878270218936. Both **Statement I** and **Statement II** are incorrect

878270218937. **Statement I** is correct and **Statement II** is incorrect

878270218938. **Statement I** is incorrect but **Statement II** is correct

Question Number : 47 Question Id : 87827055654 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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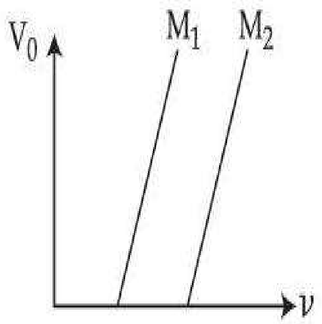
नीचे दो कथन दिये गये हैं :



कथन I : दो प्रकाश सुग्राही पदार्थों M_1 व M_2 के लिए आवृत्ति (ν) के साथ विभव पतन को चित्र प्रदर्शित करता है। प्रवणता का मान $\frac{h}{e}$ है जहाँ h प्लांक नियतांक तथा e इलेक्ट्रॉन का आवेश है।

कथन II : समान आवृत्ति के आपतित विकिरण के लिए M_2 अधिक गतिज ऊर्जा के प्रकाश इलेक्ट्रॉन उत्सर्जित करेगा।

उपरोक्त कथनों के आधार पर, नीचे दिये गये विकल्पों में से सबसे **उचित** उत्तर चुनिए :

Options :

878270218935. दोनों **कथन I** व **कथन II** सही हैं।

878270218936. दोनों **कथन I** व **कथन II** गलत हैं।

878270218937. **कथन I** सही है परन्तु **कथन II** गलत है।

878270218938. **कथन I** गलत है परन्तु **कथन II** सही है।

Question Number : 48 Question Id : 87827055655 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

An electron rotates in a circle around a nucleus having positive charge Ze. Correct relation between total energy (E) of electron to its potential energy (U) is :

Options :

878270218939. $E = 2U$

878270218940. $E = U$

878270218941. $2E = U$

878270218942. $2E = 3U$

Question Number : 48 Question Id : 87827055655 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक इलेक्ट्रॉन Ze धनावेश के नाभिक के परितः एक वृत्त में घूमता है। इलेक्ट्रॉन की कुल ऊर्जा (E) तथा इसकी स्थितिज ऊर्जा (U) में सही सम्बन्ध है :

Options :

878270218939. $E = 2U$

878270218940. $E = U$

878270218941. $2E = U$

878270218942. $2E = 3U$

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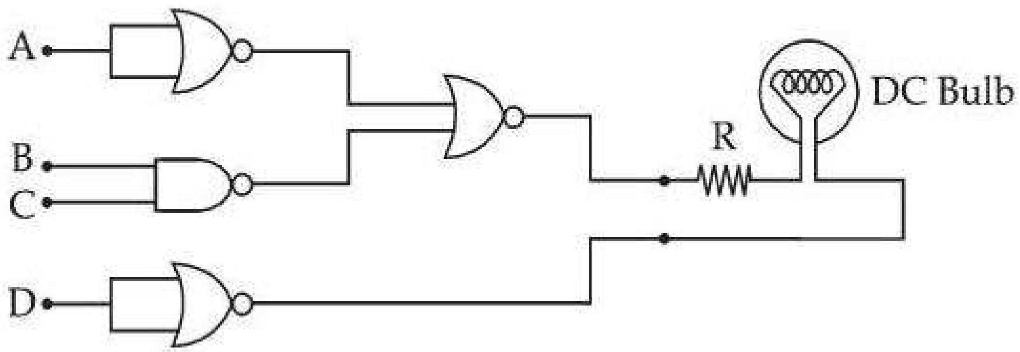
Question Number : 49 Question Id : 87827055656 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Following gates section is connected in a complete suitable circuit.



For which of the following combination, bulb will glow (ON) :

Options :

878270218943. A = 1, B = 1, C = 1, D = 0

878270218944. A = 0, B = 1, C = 1, D = 1

878270218945. A = 1, B = 0, C = 0, D = 0

878270218946. A = 0, B = 0, C = 0, D = 1

Question Number : 49 Question Id : 87827055656 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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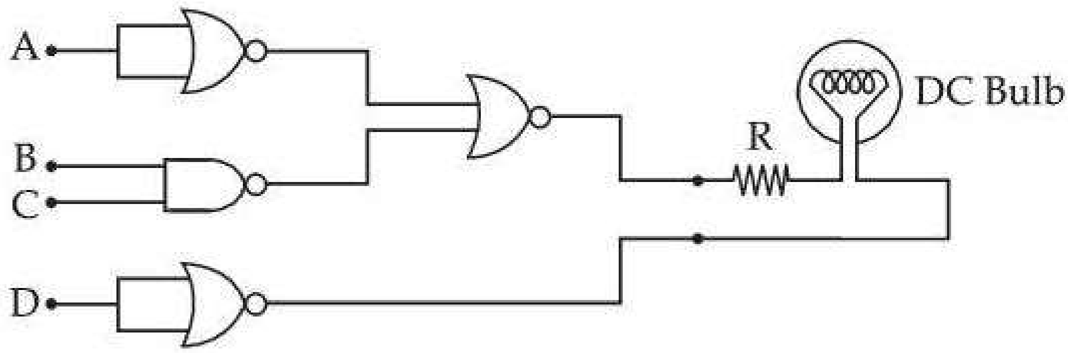
निम्नलिखित गेट खण्ड को एक उपयुक्त परिपथ पूरा करने में जोड़ा जाता है :



निम्नलिखित किस संयोजन के लिए बल्ब जलेगा :

Options :

878270218943. $A=1,\ B=1,\ C=1,\ D=0$

878270218944. $A=0,\ B=1,\ C=1,\ D=1$

878270218945. $A=1,\ B=0,\ C=0,\ D=0$

878270218946. $A=0,\ B=0,\ C=0,\ D=1$

Question Number : 50 Question Id : 87827055657 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Time periods of oscillation of the same simple pendulum measured using four different measuring clocks were recorded as 4.62 s, 4.632 s, 4.6 s and 4.64 s. The arithmetic mean of these readings in correct significant figure is :

Options :

878270218947. 4.623 s

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878270218948. 4.62 s

878270218949. 4.6 s

878270218950. 5 s

Question Number : 50 Question Id : 87827055657 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक ही सरल आवर्तन दोलक का आवर्तकाल चार विभिन्न मापक घड़ियों द्वारा नापा गया, पाया गया 4.62 s, 4.632 s, 4.6 s और 4.64 s इन सबका अंकगणितीय औसत है –

Options :

878270218947. 4.623 s

878270218948. 4.62 s

878270218949. 4.6 s

878270218950. 5 s

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Physics Section B

Section Id : 8782701149

Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8782702056
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 51 Question Id : 87827055658 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A body moves on a frictionless plane starting from rest. If S_n is distance moved between $t=n-1$ and $t=n$ and S_{n-1} is distance moved between $t=n-2$ and $t=n-1$, then the ratio $\frac{S_{n-1}}{S_n}$ is $\left(1-\frac{2}{x}\right)$ for $n=10$. The value of x is ______.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 51 Question Id : 87827055658 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक वस्तु स्थिर अवस्था से एक घर्षण रहित तल पर गति करती है। यदि S_n समय $t=n-1$ तथा $t=n$ के बीच चली गयी दूरी है और S_{n-1} समय $t=n-2$ तथा $t=n-1$ के बीच चली गयी दूरी है तब $n=10$ के लिए $\frac{S_{n-1}}{S_n}$ का अनुपात $\left(1-\frac{2}{x}\right)$ है। x का मान है ______ ।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

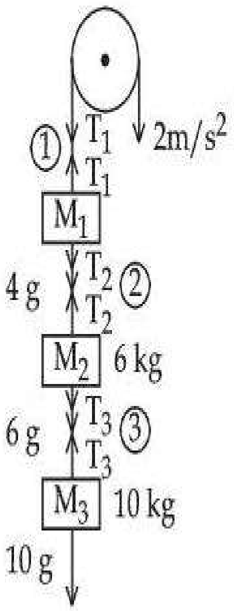
1

Question Number : 52 Question Id : 87827055659 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Three blocks M_1, M_2, M_3 having masses 4 kg, 6 kg and 10 kg respectively are hanging from a smooth pully using rope 1, 2 and 3 as shown in figure. The tension in the rope 1, T_1 when they are moving upward with acceleration of $2ms^{-2}$ is ______ N(if $g=10\ m/s^2$).



Response Type : Numeric

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Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

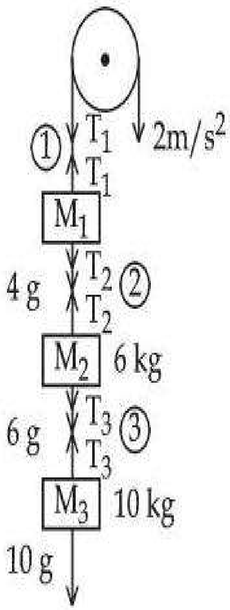
1

Question Number : 52 Question Id : 87827055659 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक घिरनी से चित्र के अनुसार क्रमशः 4 kg, 6 kg, 10 kg द्रव्यमान के तीन गुटके M_1, M_2, M_3 तीन रस्सियों 1, 2, 3 द्वारा लटकाए गये हैं, घिरनी चिकनी है। जब ये ऊपर त्वरण $2\ ms^{-2}$ से गति कर रहे हैं तो रस्सी 1 में तनाव T_1 ______ N $(g = 10\ m/s^2)$ है।



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Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 53 Question Id : 87827055660 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The density and breaking stress of a wire are $6 \times 10^4\ \mathrm{kg/m^3}$ and $1.2 \times 10^8\ \mathrm{N/m^2}$ respectively. The wire is suspended from a rigid support on a planet where acceleration due to gravity is $\frac{1}{3}^{\text{rd}}$ of the value on the surface of earth. The maximum length of the wire with breaking is ________ m (take, $g = 10\ \mathrm{m/s^2}$).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 53 Question Id : 87827055660 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक तार का घनत्व तथा परिभंजक तनाव क्रमशः $6 \times 10^4\ \mathrm{kg/m^3}$ तथा $1.2 \times 10^8\ \mathrm{N/m^2}$ है। तार को एक ग्रह पर किसी मजबूत आधार से लटकाया गया है जहाँ गुरुत्वीय त्वरण, पृथ्वी पर गुरुत्वीय त्वरण का $\frac{1}{3}$ वाँ है। तार की टूटने की अधिकतम लम्बाई होगी ________ m (दिया है, $g = 10\ \mathrm{m/s^2}$)।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 54 Question Id : 87827055661 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Three capacitors of capacitances 25 μF, 30 μF and 45 μF are connected in parallel to a supply of 100 V. Energy stored in the above combination is E. When these capacitors are connected in series to the same supply, the stored energy is $\frac{9}{x}$E. The value of x is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 54 Question Id : 87827055661 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

तीन संधारित्र, धारिता 25 μF, 30 μF और 45 μF को एक 100 V विभव के स्रोत से समान्तर में जोड़े गये हैं। इस रूप में एकत्रित ऊर्जा E है। यदि इन तीनों संधारित्रों के स्रोत से श्रेणी क्रम में लगा दें तब एकत्र ऊर्जा है $\frac{9}{x}$E, तब x का मान ________ है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 55 Question Id : 87827055662 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The electric field between the two parallel plates of a capacitor of 1.5 μF capacitance drops to one third of its initial value in 6.6 μs when the plates are connected by a thin wire.

The resistance of this wire is ________ Ω. (Given, $\log 3 = 1.1$)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 55 Question Id : 87827055662 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक संधारित्र, धारिता 1.5 μF, की दो प्लेटों के मध्य विद्युत क्षेत्र 6.6 μs में अपने प्रारम्भिक मान का एक तिहाई रह जाता है जब दोनों प्लेटों को एक पतले तार से जोड़ा जाता है। तार का प्रतिरोध ________ Ω है (दिया है $\log 3 = 1.1$)।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 56 Question Id : 87827055663 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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A 2A current carrying straight metal wire of resistance 1 Ω, resistivity 2×10^{-6} Ωm, area of cross-section 10 mm^2 and mass 500 g is suspended horizontally in mid air by applying a uniform magnetic field $\vec{B}$. The magnitude of B is ________ $\times10^{-1}$ T (given, $g=10\ m/s^2$).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 56 Question Id : 87827055663 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक 2A विद्युत धारा बहते हुए सीधे धातु के तार को एक समान चुम्बकीय क्षेत्र $\vec{B}$ में हवा में क्षैतिज रूप में लटकाया जाता है, तार का प्रतिरोध 1 Ω, प्रतिरोधकता 2×10^{-6} Ωm, परिच्छेद-क्षेत्रफल 10 mm^2 तथा द्रव्यमान 500 g है। चुम्बकीय क्षेत्र $\vec{B}$ का मान ________ $\times10^{-1}$ T (दिया है $g=10\ m/s^2$) है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 57 Question Id : 87827055664 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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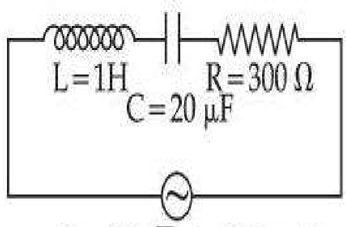
An ac source is connected in given series LCR circuit. The rms potential difference across the capacitor of 20 μF is ________ V.



$V = 50\sqrt{2}\sin 100t$ volt

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

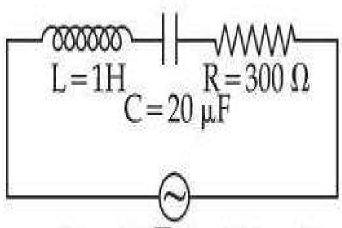
1

Question Number : 57 Question Id : 87827055664 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक प्रत्यावर्ती धारा स्रोत को श्रेणीबद्ध LCR परिपथ के साथ जोड़ा जाता है। संधारित्र 20 μF पर वर्ग माध्य मूल विभवान्तर ________ V होगा।



$V = 50\sqrt{2}\sin 100t$ volt

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 58 Question Id : 87827055665 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In Young's double slit experiment, carried out with light of wavelength 5000 Å, the distance between the slits is 0.3 mm and the screen is at 200 cm from the slits. The central maximum is at $x = 0$ cm. The value of x for third maxima is ________ mm.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 58 Question Id : 87827055665 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक यंग के द्वि-झिर्री प्रयोग को तरंग दैर्ध्य 5000 Å के प्रकाश के साथ किया जाता है, दो झिर्रियों के मध्य दूरी 0.3 mm तथा पर्दे से झिर्री तल की दूरी 200 cm है। मुख्य केन्द्रीय उच्चिष्ठ $x = 0$ cm पर है, तीसरे उच्चिष्ठ के लिए x का मान ________ mm है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 59 Question Id : 87827055666 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If three helium nuclei combine to form a carbon nucleus then the energy released in this reaction is ________ $\times 10^{-2}$ MeV. (Given 1 u = 931 MeV/c^2, atomic mass of helium = 4.002603u)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 59 Question Id : 87827055666 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि तीन हीलियम नाभिक मिलकर एक कार्बन नाभिक बनायें तो इस क्रिया में निकली ऊर्जा है ________ $\times 10^{-2}$ MeV है।

(दिया है 1 u = 931 MeV/c^2, हीलियम का परमाणु द्रव्यमान = 4.002603u)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 60 Question Id : 87827055667 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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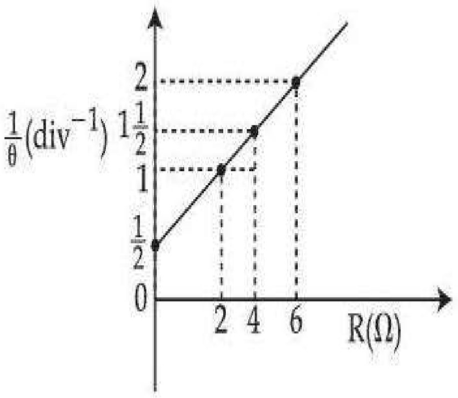
In the experiment to determine the galvanometer resistance by half-deflection method, the plot of $1/\theta$ vs the resistance (R) of the resistance box is shown in the figure. The figure of merit of the galvanometer is _______ $\times 10^{-1}$ A/division. [The source has emf 2V]



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

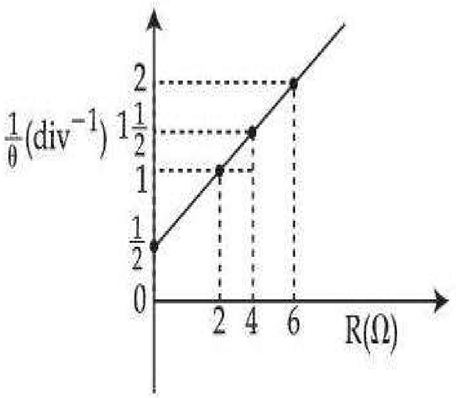
1

Question Number : 60 Question Id : 87827055667 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

अर्द्ध-विक्षेप विधि द्वारा गैल्वेनोमीटर का प्रतिरोध ज्ञात करने के लिए, $1/\theta$ तथा प्रतिरोध बॉक्स के प्रतिरोध R का ग्राफ चित्र में दिखाया गया है। इसमें गैल्वेनोमीटर का दक्षतांक K _______ $\times 10^{-1}$ A/division है। [स्रोत का वि.वा.बल 2V]



Response Type : Numeric

Evaluation Required For SA : Yes

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Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Chemistry Section A

Section Id :	8782701150
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8782702057
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 61 Question Id : 87827055668 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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The **incorrect** postulates of the Dalton's atomic theory are :

(A) Atoms of different elements differ in mass.

(B) Matter consists of divisible atoms.

(C) Compounds are formed when atoms of different element combine in a fixed ratio.

(D) All the atoms of given element have different properties including mass.

(E) Chemical reactions involve reorganisation of atoms.

Choose the **correct** answer from the options given below :

Options :

878270218961. (A), (B), (D) only

878270218962. (B), (D), (E) only

878270218963. (B), (D) only

878270218964. (C), (D), (E) only

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Question Number : 61 Question Id : 87827055668 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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डाल्टन के परमाणु सिद्धांत के **असत्य** अभिगृहीत हैं :

(A) भिन्न तत्वों के परमाणु, द्रव्यमान में भिन्नता रखते हैं।

(B) पदार्थ विभाज्य परमाणुओं से बना होता है।

(C) जब भिन्न तत्वों के परमाणु एक निश्चित अनुपात में संयोग करते हैं तो यौगिकों का निर्माण होता है।

(D) किसी दिए गए तत्व के सभी परमाणु, द्रव्यमान सहित विभिन्न गुणधर्मों में भिन्नता रखते हैं।

(E) रासायनिक अभिक्रियाओं में परमाणुओं की पुनर्व्यवस्था होती है।

नीचे दिए गए विकल्पों में से **सही** उत्तर चुनें :

Options :

878270218961. केवल (A), (B), (D)

878270218962. केवल (B), (D), (E)

878270218963. केवल (B), (D)

878270218964. केवल (C), (D), (E)

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Question Number : 62 Question Id : 87827055669 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Number of σ and π bonds present in ethylene molecule is respectively :

Options :

878270218965. 3 and 1

878270218966.

5 and 1

878270218967. 4 and 1

878270218968. 5 and 2

Question Number : 62 Question Id : 87827055669 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एथिलीन अणु में σ एवं π आबन्धों की संख्या है, क्रमश :

Options :

878270218965. 3 एवं 1

878270218966. 5 एवं 1

878270218967. 4 एवं 1

878270218968. 5 एवं 2

Question Number : 63 Question Id : 87827055670 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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The following reaction occurs in the Blast furnance where iron ore is reduced to iron metal

$$Fe_2O_{3(s)} + 3CO_{(g)} \rightleftharpoons Fe_{(l)} + 3CO_{2(g)}$$

Using the Le-chatelier's principle, predict which one of the following will not disturb the equilibrium.

Options :

878270218969. Removal of CO

878270218970. Removal of CO_2

878270218971. Addition of CO_2

878270218972. Addition of Fe_2O_3

Question Number : 63 Question Id : 87827055670 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

वात्या भट्टी में निम्न अभिक्रिया होती है जिसमें आयरन अयस्क आयरन धातु में अपचयित हो जाता है :

$$Fe_2O_{3(s)} + 3CO_{(g)} \rightleftharpoons Fe_{(l)} + 3CO_{2(g)}$$

ला-शातेलिए सिद्धांत का उपयोग करते हुए प्रागुक्ति कीजिए कि निम्न में से कौन साम्यावस्था को प्रभावित **नहीं** करेगा ?

Options :

878270218969. CO को हटाना

878270218970. CO_2 को हटाना

878270218971.

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CO_2 को मिलाना

878270218972. Fe_2O_3 को मिलाना

Question Number : 64 Question Id : 87827055671 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The reaction at cathode in the cells commonly used in clocks involves.

Options :

878270218973. reduction of Mn from $+7$ to $+2$

878270218974. reduction of Mn from $+4$ to $+3$

878270218975. oxidation of Mn from $+3$ to $+4$

878270218976. oxidation of Mn from $+2$ to $+7$

Question Number : 64 Question Id : 87827055671 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

घड़ियों में सामान्यतया उपयोग किए जाने वाले सेलों में कैथोड पर होने वाली अभिक्रिया होती है :

Options :

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878270218973. +7 से +2 में Mn का अपचयन

878270218974. +4 से +3 में Mn का अपचयन

878270218975. +3 से +4 में Mn का ऑक्सीकरण

878270218976. +2 से +7 में Mn का ऑक्सीकरण

Question Number : 65 Question Id : 87827055672 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Molar ionic conductivities of divalent cation and anion are 57 S cm^2 mol^{-1} and 73 S cm^2 mol^{-1} respectively. The molar conductivity of solution of an electrolyte with the above cation and anion will be :

Options :

878270218977. 130 S cm^2 mol^{-1}

878270218978. 65 S cm^2 mol^{-1}

878270218979. 260 S cm^2 mol^{-1}

878270218980. 187 S cm^2 mol^{-1}

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Question Number : 65 Question Id : 87827055672 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

द्विसंयोजी धनायन एवं ऋणायन की मोलर आयनिक चालकताएँ क्रमश: 57 S cm^2 mol^{-1} एवं 73 S cm^2 mol^{-1} हैं। उपर्युक्त धनायन एवं ऋणायन वाले विद्युत अपघट्य के विलयन की मोलर चालकता होगी :

Options :

878270218977. 130 S cm^2 mol^{-1}

878270218978. 65 S cm^2 mol^{-1}

878270218979. 260 S cm^2 mol^{-1}

878270218980. 187 S cm^2 mol^{-1}

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Question Number : 66 Question Id : 87827055673 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The statement(s) that are **correct** about the species O^{2-}, F^-, Na^+ and Mg^{2+}.

(A) All are isoelectronic

(B) All have the same nuclear charge

(C) O^{2-} has the largest ionic radii

(D) Mg^{2+} has the smallest ionic radii

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

Options :

878270218981. (A), (B), (C) and (D)

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878270218982. (A), (C) and (D) only

878270218983. (C) and (D) only

878270218984. (B), (C) and (D) only

Question Number : 66 Question Id : 87827055673 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

O^{2-}, F^-, Na^+ एवं Mg^{2+} स्पीशीज से सम्बन्धित **सही** कथन है / हैं :

(A) सभी समइलेक्ट्रॉनिक हैं।

(B) सभी के नाभिकीय आवेश समान हैं।

(C) O^{2-} की आयनिक त्रिज्या सर्वाधिक है।

(D) Mg^{2+} की आयनिक त्रिज्या सबसे कम है।

नीचे दिए गए विकल्पों में से **सर्वाधिक उपयुक्त** उत्तर चुनें :

Options :

878270218981. केवल (A), (B), (C) एवं (D)

878270218982. केवल (A), (C) एवं (D)

878270218983. केवल (C) एवं (D)

878270218984.

केवल (B), (C) एवं (D)

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Question Number : 67 Question Id : 87827055674 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : In group 13, the stability of +1 oxidation state increases down the group.

Statement II : The atomic size of gallium is greater than that of aluminium.

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

Options :

878270218985. Both **Statement I** and **Statement II** are correct

878270218986. Both **Statement I** and **Statement II** are incorrect

878270218987. **Statement I** is correct but **Statement II** is incorrect

878270218988. **Statement I** is incorrect but **Statement II** is correct

Question Number : 67 Question Id : 87827055674 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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नीचे दो कथन दिए गए हैं :

कथन I : समूह 13 में, +1 ऑक्सीकरण अवस्था का स्थायित्व समूह में नीचे जाने पर बढ़ता है।

कथन II : गैलियम का परमाणु आकार ऐलुमीनियम से अधिक है।

उपर्युक्त कथनों के संदर्भ में नीचे दिए गए विकल्पों में से **सर्वाधिक उपयुक्त** उत्तर चुनें :

Options :

878270218985. दोनों **कथन** I एवं **कथन** II सही हैं

878270218986. दोनों **कथन** I एवं **कथन** II गलत हैं

878270218987. **कथन** I सही है परन्तु **कथन** II गलत है

878270218988. **कथन** I गलत है परन्तु **कथन** II सही है

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Question Number : 68 Question Id : 87827055675 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The number of neutrons present in the more abundant isotope of boron is 'x'. Amorphous boron upon heating with air forms a product, in which the oxidation state of boron is 'y'. The value of $x+y$ is ________.

Options :

878270218989. 6

878270218990. 3

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878270218991. 9

878270218992. 4

Question Number : 68 Question Id : 87827055675 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

बोरॉन के अधिक प्रचुर समस्थानिक में न्यूट्रॉनों की संख्या 'x' है। अक्रिस्टलीय बोरॉन को वायु के साथ गर्म करने पर एक उत्पाद प्राप्त होता है जिसमें बोरॉन की ऑक्सीकरण अवस्था 'y' है। $x+y$ का मान है :

Options :

878270218989. 6

878270218990. 3

878270218991. 9

878270218992. 4

Question Number : 69 Question Id : 87827055676 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The metal that shows highest and maximum number of oxidation state is :

Options :

878270218993. Fe

878270218994. Ti

878270218995. Mn

878270218996. Co

Question Number : 69 Question Id : 87827055676 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

धातु जो ऑक्सीकरण अवस्था की उच्चतम एवं अधिकतम संख्याएँ प्रदर्शित करता है :

Options :

878270218993. Fe

878270218994. Ti

878270218995. Mn

878270218996. Co

Question Number : 70 Question Id : 87827055677 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The correct order of ligands arranged in increasing field strength.

Options :

878270218997. $Br^- < F^- < H_2O < NH_3$

878270218998. $F^- < Br^- < I^- < NH_3$

878270218999. $H_2O < {}^-OH < CN^- < NH_3$

878270219000. $Cl^- < {}^-OH < Br^- < CN^-$

Question Number : 70 Question Id : 87827055677 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

बढ़ते हुए क्षेत्र प्रबलता में व्यवस्थित लिगन्डों का **सही** क्रम हैं :

Options :

878270218997. $Br^- < F^- < H_2O < NH_3$

878270218998. $F^- < Br^- < I^- < NH_3$

878270218999. $H_2O < {}^-OH < CN^- < NH_3$

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878270219000. $Cl^- < {}^-OH < Br^- < CN^-$

Question Number : 71 Question Id : 87827055678 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which one of the following complexes will exhibit the least paramagnetic behaviour ?
[Atomic number, Cr = 24, Mn = 25, Fe = 26, Co = 27]

Options :

878270219001. $[Cr(H_2O)_6]^{2+}$

878270219002. $[Mn(H_2O)_6]^{2+}$

878270219003. $[Fe(H_2O)_6]^{2+}$

878270219004. $[Co(H_2O)_6]^{2+}$

Question Number : 71 Question Id : 87827055678 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सा संकुल न्यूनतम अनुचुम्बकीय व्यवहार प्रदर्शित करेगा ?

[परमाणु संख्या, Cr = 24, Mn = 25, Fe = 26, Co = 27]

Options :

878270219001. $[Cr(H_2O)_6]^{2+}$

878270219002. $[Mn(H_2O)_6]^{2+}$

878270219003. $[Fe(H_2O)_6]^{2+}$

878270219004. $[Co(H_2O)_6]^{2+}$

Question Number : 72 Question Id : 87827055679 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements : One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**

Assertion (A) : Enthalpy of neutralisation of strong monobasic acid with strong monoacidic base is always -57 kJ mol^{-1}

Reason (R) : Enthalpy of neutralisation is the amount of heat liberated when one mole of H^+ ions furnished by acid combine with one mole of ^-OH ions furnished by base to form one mole of water.

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

Options :

878270219005. Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**

878270219006. Both **(A)** and **(R)** are true but **(R)** is **not** the correct explanation of **(A)**

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878270219007. (A) is true but (R) is false

878270219008. (A) is false but (R) is true

Question Number : 72 Question Id : 87827055679 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

नीचे दो कथन दिए गए है। इनमें से एक को **अभिकथन** (A) एवं दूसरे को **कारण** (R) दर्शाया गया है :

अभिकथन (A) : किसी प्रबल एकक्षारकीय अम्ल के किसी प्रबल एक अम्लीय क्षारक के साथ उदासीनीकरण की एन्थैल्पी सदैव $-57\ kJ\ mol^{-1}$ होती है।

कारण (R) : उदासीनीकरण की एन्थैल्पी निर्मुक्त उष्मा की वह मात्रा होती है जो अम्लों द्वारा उत्पन्न एक मोल H^+ आयनों के क्षारकों द्वारा उत्पन्न एक मोल OH^- आयनों के संयोग द्वारा जल के एक मोल के निर्माण के कारण उत्पन्न होती है।

उपर्युक्त कथनों के संदर्भ में नीचे दिए गए विकल्पों में से **सही** उत्तर को चुनें :

Options :

878270219005. दोनों (A) एवं (R) सही हैं तथा (A) की सही व्याख्या (R) है

878270219006. दोनों (A) एवं (R) सही हैं परन्तु (A) की सही व्याख्या (R) नहीं है

878270219007. (A) सही है परन्तु (R) गलत है

878270219008. (A) गलत है परन्तु (R) सही है

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Question Number : 73 Question Id : 87827055680 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

An organic compound has 42.1% carbon, 6.4% hydrogen and remainder is oxygen. If its molecular weight is 342, then its molecular formula is :

Options :

878270219009. $C_{12}H_{22}O_{11}$

878270219010. $C_{11}H_{18}O_{12}$

878270219011. $C_{14}H_{20}O_{10}$

878270219012. $C_{12}H_{20}O_{12}$

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Question Number : 73 Question Id : 87827055680 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

किसी कार्बनिक यौगिक में 42.1% कार्बन, 6.4% हाइड्रोजन एवं शेष ऑक्सीजन है। यदि इसका अणुभार 342 है तो इसका अणुसूत्र होगा :

Options :

878270219009. $C_{12}H_{22}O_{11}$

878270219010.

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$C_{11}H_{18}O_{12}$

878270219011. $C_{14}H_{20}O_{10}$

878270219012. $C_{12}H_{20}O_{12}$

Question Number : 74 Question Id : 87827055681 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : Nitration of benzene involves the following step -

$$H-\overset{\overset{H}{|}\ \oplus}{\underset{\cdot\cdot}{O}}-NO_2 \rightleftharpoons H_2O+\overset{\oplus}{N}O_2$$

Statement II : Use of Lewis base promotes the electrophilic substitution of benzene.

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

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Options :

878270219013. Both **Statement I** and **Statement II** are correct

878270219014. Both **Statement I** and **Statement II** are incorrect

878270219015. **Statement I** is correct but **Statement II** is incorrect

878270219016. **Statement I** is incorrect but **Statement II** is correct

Question Number : 74 Question Id : 87827055681 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

नीचे दो कथन दिए गए हैं :

कथन I : बेन्जीन के नाइट्रेशन में निम्नलिखित पद पाया जाता है।

$$H-\overset{\overset{H}{|}\oplus}{\ddot{O}}-NO_2 \rightleftharpoons H_2O+\overset{\oplus}{N}O_2$$

कथन II : लुइस क्षारक का उपयोग बेन्जीन के इलेक्ट्रॉनस्नेही प्रतिस्थापन को प्रोत्साहित करता है।

उपर्युक्त कथनों के संदर्भ में नीचे दिए गए विकल्पों में से **सर्वाधिक उपयुक्त** उत्तर चुनें :

Options :

878270219013. दोनों **कथन** I एवं **कथन** II सही हैं

878270219014. दोनों **कथन** I एवं **कथन** II गलत हैं

878270219015. **कथन** I सही है परन्तु **कथन** II गलत है

878270219016. **कथन** I गलत है परन्तु **कथन** II सही है

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Question Number : 75 Question Id : 87827055682 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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For the Compounds :

(A) $H_3C-CH_2-O-CH_2-CH_2-CH_3$

(B) $H_3C-CH_2-CH_2-CH_2-CH_3$

(C) $CH_3-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-CH_3$

(D) $H_3C-\underset{\underset{OH}{|}}{CH}-CH_2-CH_2-CH_3$

The increasing order of boiling point is :

Choose the correct answer from the options given below :

Options :

878270219017. (A) < (B) < (C) < (D)

878270219018. (B) < (A) < (C) < (D)

878270219019. (D) < (C) < (A) < (B)

878270219020. (B) < (A) < (D) < (C)

Question Number : 75 Question Id : 87827055682 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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निम्नलिखित यौगिकों :

(A) $H_3C-CH_2-O-CH_2-CH_2-CH_3$

(B) $H_3C-CH_2-CH_2-CH_2-CH_3$

(C) $CH_3-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-CH_3$

(D) $H_3C-\underset{\underset{OH}{|}}{CH}-CH_2-CH_2-CH_3$

के लिए उनके क्वथनांकों का बढ़ता क्रम है :

नीचे दिए गए विकल्पों में से **सही** उत्तर चुनें :

Options :

878270219017. (A) < (B) < (C) < (D)

878270219018. (B) < (A) < (C) < (D)

878270219019. (D) < (C) < (A) < (B)

878270219020. (B) < (A) < (D) < (C)

Question Number : 76 Question Id : 87827055683 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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

Assertion (A) : Cis form of alkene is found to be more polar than the trans form.

Reason (R) : Dipole moment of trans isomer of 2-butene is zero.

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

Options :

878270219021. Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**

878270219022. Both **(A)** and **(R)** are true but **(R)** is **NOT** the correct explanation of **(A)**

878270219023. **(A)** is true but **(R)** is false

878270219024. **(A)** is false but **(R)** is true

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Question Number : 76 Question Id : 87827055683 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

नीचे दो कथन दिए गए हैं। इनमें से एक को **अभिकथन** (A) एवं दूसरे को **कारण** (R) दर्शाया गया है :

अभिकथन (A) : एल्कीन का सिस-रूप, ट्रांस रूप की तुलना में अधिक ध्रुवीय पाया गया है।

कारण (R) : 2-ब्यूटीन के ट्रांस समावयव का द्विध्रुव आघूर्ण शून्य होता है।

उपर्युक्त कथनों के संदर्भ में नीचे दिए गए विकल्पों में से **सही** उत्तर को चुनें :

Options :

878270219021. दोनों **(A)** एवं **(R)** सही हैं तथा **(A)** की सही व्याख्या **(R)** है

878270219022. दोनों (A) एवं (R) सही हैं परन्तु (A) की सही व्याख्या (R) नहीं है

878270219023. (A) सही है परन्तु (R) गलत है

878270219024. (A) गलत है परन्तु (R) सही है

Question Number : 77 Question Id : 87827055684 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statement :

Statements I : Bromination of phenol in solvent with low polarity such as $CHCl_3$ or CS_2 requires Lewis acid catalyst.

Statements II : The Lewis acid catalyst polarises the bromine to generate Br^+.

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

Options :

878270219025. Both **Statement I** and **Statement II** are true

878270219026. Both **Statement I** and **Statement II** are false

878270219027. **Statement I** is true but **Statement II** is false

878270219028. **Statement I** is false but **Statement II** is true

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Question Number : 77 Question Id : 87827055684 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

नीचे दो कथन दिए गए है :

कथन I : कम ध्रुवता वाले विलायक जैसे $CHCl_3$ या CS_2 में फ़ीनॉल के ब्रोमीनेशन में लुइस अम्ल उत्प्रेरक की आवश्यकता होती है।

कथन II : लुइस अम्ल उत्प्रेरक ब्रोमीन का ध्रुवण कर Br^+ उत्पन्न करते हैं।

उपर्युक्त कथनों के संदर्भ में नीचे दिए गए विकल्पों में से **सर्वाधिक उपयुक्त** उत्तर चुनें :

Options :

878270219025. दोनों **कथन I** एवं **कथन II** सही हैं

878270219026. दोनों **कथन I** एवं **कथन II** गलत हैं

878270219027. **कथन I** सही है परन्तु **कथन II** गलत है

878270219028. **कथन I** गलत है परन्तु **कथन II** सही है

Question Number : 78 Question Id : 87827055685 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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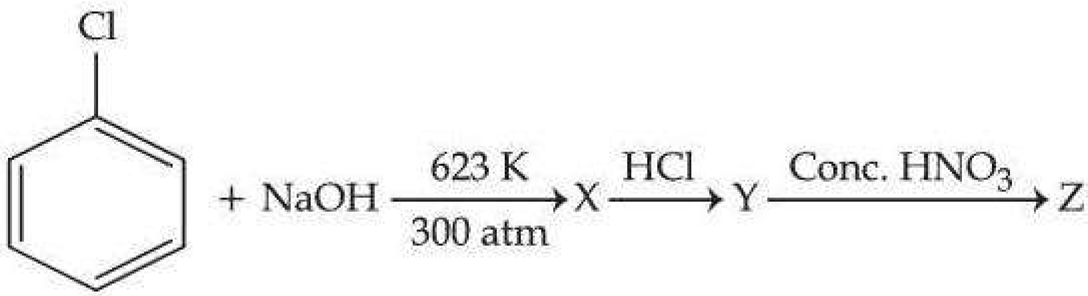
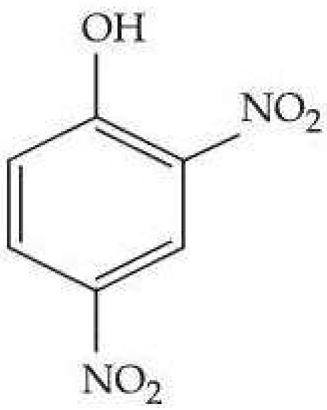
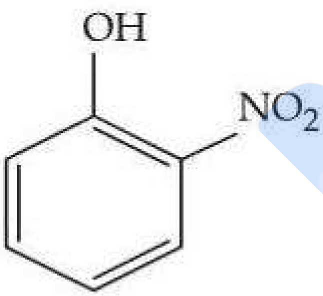
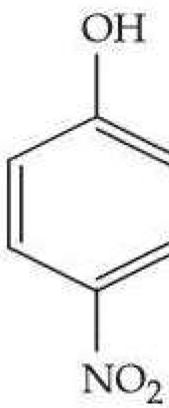
Identify compound (Z) in the following reaction sequence.



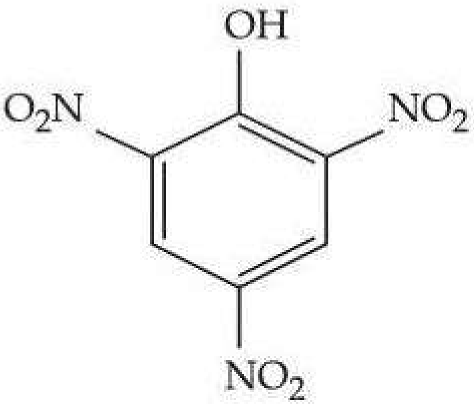
Options :

878270219029. 

878270219030. 

878270219031. 

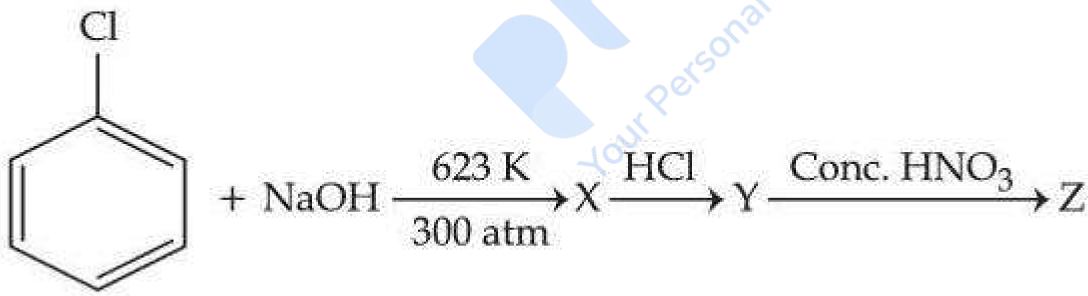
878270219032.



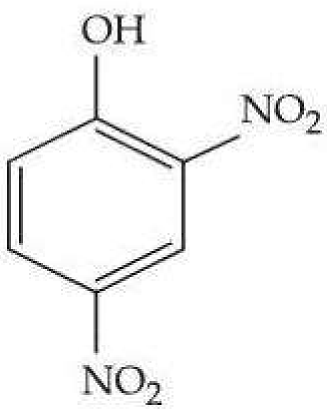
Question Number : 78 Question Id : 87827055685 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

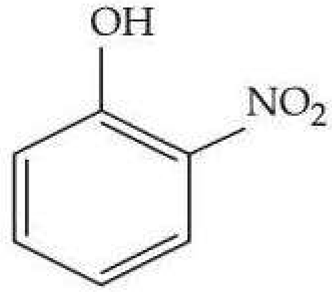
निम्न अभिक्रिया क्रम में यौगिक (Z) को पहचानिए :

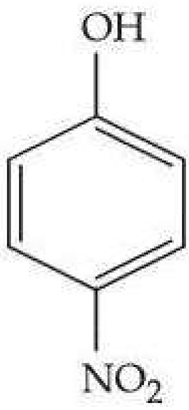


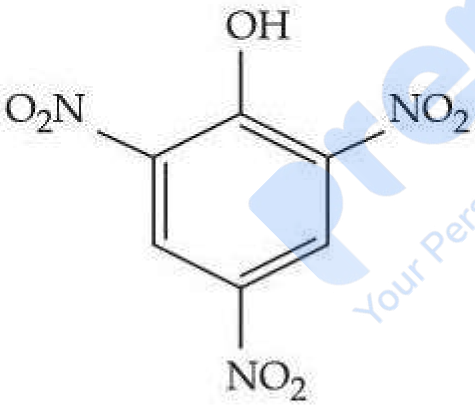
Options :

878270219029. 

878270219030.



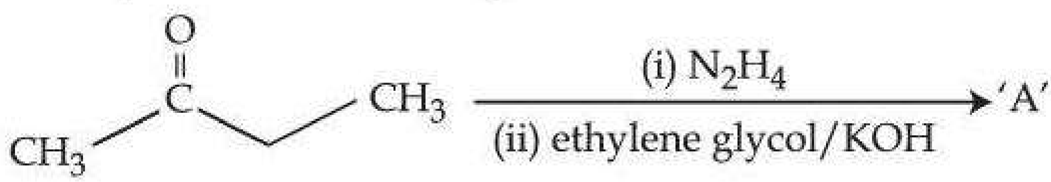
878270219031. 

878270219032. 

Question Number : 79 Question Id : 87827055686 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Identify 'A' in the following reaction :



Options :

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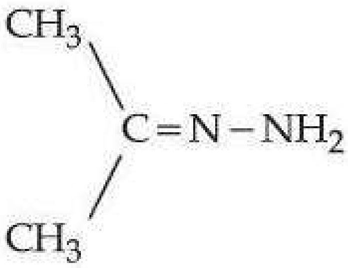
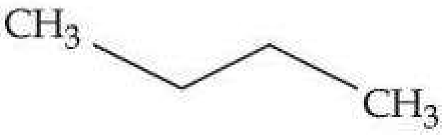
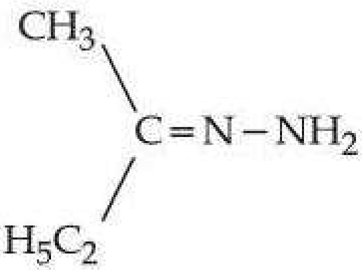
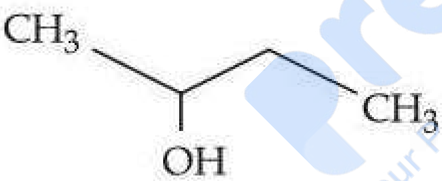
878270219033. 

878270219034. 

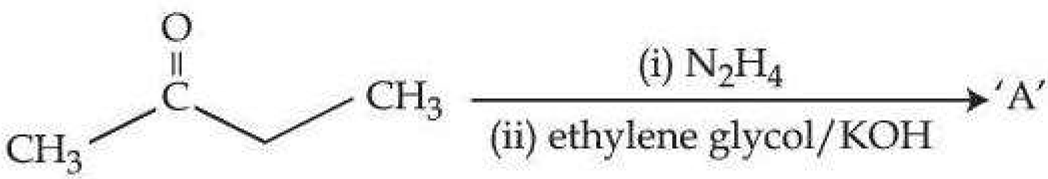
878270219035. 

878270219036. 

Question Number : 79 Question Id : 87827055686 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

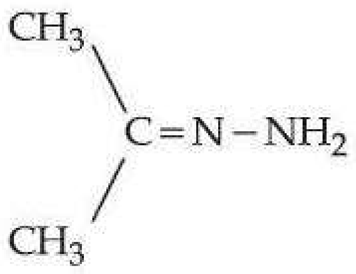
Correct Marks : 4 Wrong Marks : 1

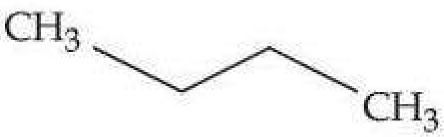
निम्नलिखित अभिक्रिया में ‘A’ को पहचानिए :

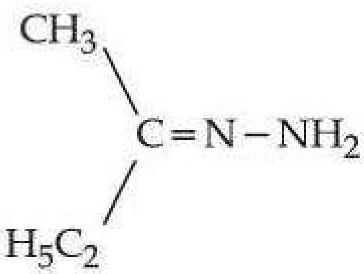


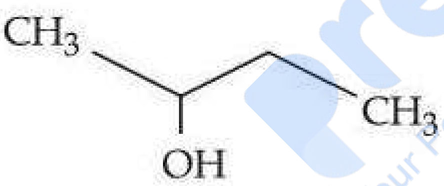
Options :

878270219033.



878270219034. 

878270219035. 

878270219036. 

Question Number : 80 Question Id : 87827055687 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following gives a positive test with ninhydrin ?

Options :

878270219037. Polyvinyl chloride

878270219038.

Starch

878270219039. Cellulose

878270219040. Egg albumin

Question Number : 80 Question Id : 87827055687 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से कौन निनहाइड्रिन के साथ धनात्मक परीक्षण देता है ?

Options :

878270219037. पॉलि वाइनिल क्लोराइड

878270219038. स्टार्च

878270219039. सेलुलोस

878270219040. अण्डे का एलब्यूमिन

Chemistry Section B

Section Id : 8782701151

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Section Number : 6

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 10

Number of Questions to be attempted : 5

Section Marks : 20

Enable Mark as Answered Mark for Review and Clear Response : Yes

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 8782702058

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 81 Question Id : 87827055688 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The value of Rydberg constant (R_H) is 2.18×10^{-18} J. The velocity of electron having mass 9.1×10^{-31} kg in Bohr's first orbit of hydrogen atom = ________ $\times 10^5$ ms^{-1} (nearest integer).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 81 Question Id : 87827055688 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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रिडबर्ग स्थिरांक (R_H) का मान 2.18×10^{-18} J है। हाइड्रोजन परमाणु के बोर के प्रथम कक्षा में 9.1×10^{-31} kg द्रव्यमान वाले इलेक्ट्रॉन का वेग है : ________ $\times 10^5$ ms^{-1} (निकटतम पूर्णांक में)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 82 Question Id : 87827055689 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In the lewis dot structure for NO_2^-, total number of valence electrons around nitrogen is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 82 Question Id : 87827055689 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

NO_2^- के लुइस डॉट संरचना में नाइट्रोजन पर उपस्थित कुल इलेक्ट्रॉनो की संख्या है ________ ।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

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Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 83 Question Id : 87827055690 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The heat of combustion of solid benzoic acid at constant volume is -321.30 kJ at 27°C. The heat of combustion at constant pressure is $(-321.30 - xR)$ kJ, the value of x is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 83 Question Id : 87827055690 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

ठोस बेन्जोइक अम्ल के स्थिर आयतन पर दहन की उष्मा 27°C पर -321.30 kJ है। स्थिर दाब पर दहन की उष्मा $-321.30 - xR$ kJ है। x का मान है ________ ।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 84 Question Id : 87827055691 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

An artificial cell is made by encapsulating 0.2 M glucose solution within a semipermeable membrane. The osmotic pressure developed when the artificial cell is placed within a 0.05 M solution of NaCl at 300 K is ________ $\times 10^{-1}$ bar. (nearest integer).

[Given : $R = 0.083$ L bar mol^{-1} K^{-1}]

Assume complete dissociation of NaCl

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 84 Question Id : 87827055691 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

किसी अर्धपारगम्य झिल्ली में 0.2 M ग्लूकोस विलयन रख कर एक कृत्रिम कोशिका बनाया गया। जब इस कृत्रिम कोशिका को 300 K पर NaCl के 0.05 M विलयन में रखा गया तो उत्पन्न परासरण दाब है : ________ $\times 10^{-1}$ bar.

[दिया गया है : $R = 0.083$ L bar mol^{-1} K^{-1}] (निकटतम पूर्णांक में)

NaCl का पूर्ण वियोजन मानिए

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

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Question Number : 85 Question Id : 87827055692 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

During Kinetic study of reaction $2A + B \rightarrow C + D$, the following results were obtained :

	A [M]	B [M]	initial rate of formation of D
I	0.1	0.1	6.0×10^{-3}
II	0.3	0.2	7.2×10^{-2}
III	0.3	0.4	2.88×10^{-1}
IV	0.4	0.1	2.40×10^{-2}

Based on above data, overall order of the reaction is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 85 Question Id : 87827055692 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

$2A + B \rightarrow C + D$ अभिक्रिया के बलगतिकीय (काइनेटिक) अध्ययन के दौरान निम्नलिखित परिणाम पाए गए :

	A [M]	B [M]	D के निर्माण की प्रारम्भिक दर
I	0.1	0.1	6.0×10^{-3}
II	0.3	0.2	7.2×10^{-2}
III	0.3	0.4	2.88×10^{-1}
IV	0.4	0.1	2.40×10^{-2}

उपर्युक्त आंकड़ों के आधार पर, अभिक्रिया की समग्र कोटि है : ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 86 Question Id : 87827055693 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The spin-only magnetic moment value of the ion among Ti^{2+}, V^{2+}, Co^{3+} and Cr^{2+}, that acts as strong oxidising agent in aqueous solution is ________ BM (Near integer).

(Given atomic numbers : Ti : 22, V : 23, Cr : 24, Co : 27)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 86 Question Id : 87827055693 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Ti^{2+}, V^{2+}, Co^{3+} एवं Cr^{2+} आयनों में से वह आयन जो जलीय माध्यम में प्रबल ऑक्सीकारक पदार्थ का कार्य करता है, उसके 'प्रचक्रण मात्र' चुम्बकीय आघूर्ण का मान है : ________ BM (निकटतम पूर्णांक में)

(दिया गया है : परमाणु क्रमांक Ti : 22, V : 23, Cr : 24, Co : 27)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

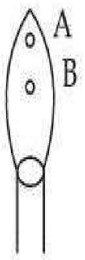
Possible Answers :

1

Question Number : 87 Question Id : 87827055694 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1



In a borax bead test under hot condition, a metal salt (one from the given) is heated at point B of the flame, resulted in green colour salt bead. The spin-only magnetic moment value of the salt is _________ BM (Nearest integer)

[Given atomic number of Cu = 29, Ni = 28, Mn = 25, Fe = 26]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 87 Question Id : 87827055694 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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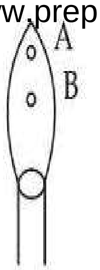


गर्म दशाओं में सुहागा-मणिका परीक्षण में दिए गए धातु लवणों में से एक को ज्वाला बिन्दु B पर गर्म किया गया जिससे हरे रंग का लवण-मणिक निर्मित हुआ। लवण का 'प्रचक्रण मात्र' चुम्बकीय आघूर्ण है : ________ BM (निकटतम पूर्णांक में)

[दिया गया है : परमाणु क्रमांक : Cu = 29, Ni = 28, Mn = 25, Fe = 26]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

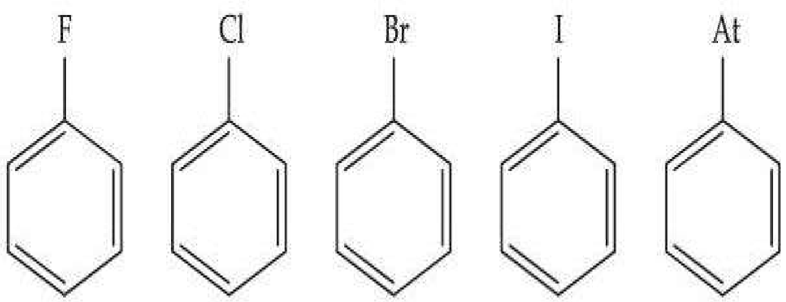
1

Question Number : 88 Question Id : 87827055695 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The number of halobenzenes from the following that can be prepared by Sandmeyer's reaction is ________.



I II III IV V

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

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Possible Answers :

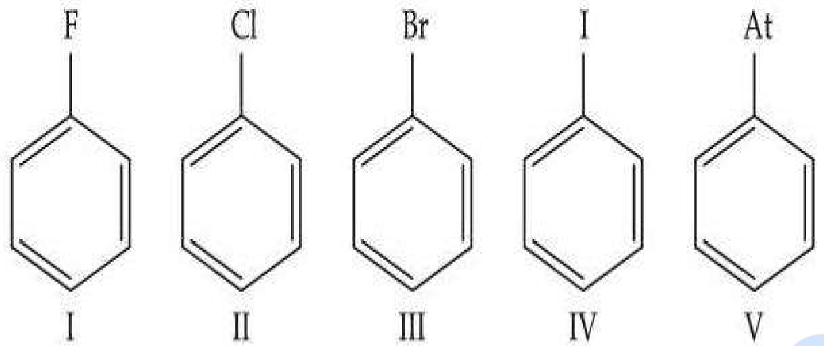
1

Question Number : 88 Question Id : 87827055695 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से उन हैलोबेन्जीन की संख्या जो सैन्डमायर अभिक्रिया द्वारा निर्मित किए जा सकते हैं ________।



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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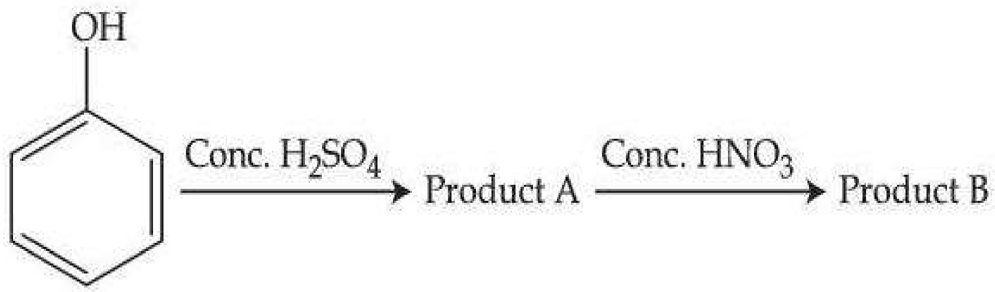
Question Number : 89 Question Id : 87827055696 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Consider the given chemical reaction sequence :



Total sum of oxygen atoms in Product A and Product B are ________.

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Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

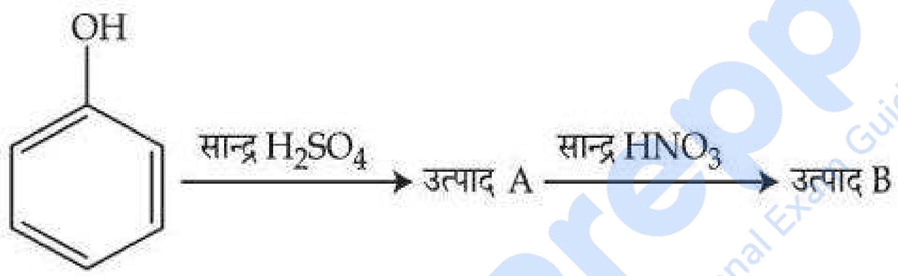
1

Question Number : 89 Question Id : 87827055696 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया क्रम पर विचार कीजिए :



उत्पाद A एवं उत्पाद B में ऑक्सीजन परमाणुओं की कुल संख्या है : ______

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 90 Question Id : 87827055697 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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9.3 g of pure aniline is treated with bromine water at room temperature to give a white precipitate of the product 'P'. The mass of product 'P' obtaind is 26.4 g. The percentage yield is ________%.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 90 Question Id : 87827055697 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

शुद्ध ऐनिलीन के 9.3 g को कमरे के ताप पर Br_2 जल के साथ उपचारित करने पर उत्पाद 'P' का एक सफेद अवक्षेप प्राप्त होता है। उत्पाद 'P' का द्रव्यमान 26.4 g है। प्रतिशत उत्पादन है : ________%.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1