

National Testing Agency

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B. Tech

Group Number :	1
Group Id :	878270680
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 :	8782701164
Section Number :	1

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 :	8782702071
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 1 Question Id : 87827055878 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 $f(x) = \frac{1}{7 - \sin 5x}$ be a function defined on $\mathbb{R}$. Then the range of the function $f(x)$ is equal to :

Options :

878270219591. $\left[\frac{1}{8}, \frac{1}{5} \right]$

878270219592. $\left[\frac{1}{7}, \frac{1}{5} \right]$

878270219593. $\left[\frac{1}{7}, \frac{1}{6} \right]$

878270219594.

$$\left[\frac{1}{8}, \frac{1}{6}\right]$$

Question Number : 1 Question Id : 87827055878 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 फलन $f(x) = \frac{1}{7 - \sin 5x}$, $\mathbf{R}$ पर परिभाषित है। तो फलन $f(x)$ का परिसर बराबर है :

Options :

878270219591. $\left[\frac{1}{8}, \frac{1}{5}\right]$

878270219592. $\left[\frac{1}{7}, \frac{1}{5}\right]$

878270219593. $\left[\frac{1}{7}, \frac{1}{6}\right]$

878270219594. $\left[\frac{1}{8}, \frac{1}{6}\right]$

Question Number : 2 Question Id : 87827055879 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 $A = \{1, 2, 3, 4, 5\}$. Let R be a relation on A defined by xRy if and only if $4x \leq 5y$. Let m be the number of elements in R and n be the minimum number of elements from $A \times A$ that are required to be added to R to make it a symmetric relation. Then $m + n$ is equal to :

Options :

878270219595. 23

878270219596. 24

878270219597. 25

878270219598. 26

Question Number : 2 Question Id : 87827055879 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 $A = \{1, 2, 3, 4, 5\}$ है। माना A पर एक संबंध R इस प्रकार परिभाषित है कि xRy यदि और केवल यदि $4x \leq 5y$ । माना R में अवयवों की संख्या m है तथा R को एक सममित संबंध बनाने के लिए, R में $A \times A$ से जुड़ने वाले आवश्यक अवयवों की न्यूनतम संख्या n है, तो $m + n$ बराबर है -

Options :

878270219595. 23

878270219596. 24

878270219597. 25

Question Number : 3 Question Id : 87827055880 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 z_1, z_2 are two distinct complex number such that $\left| \frac{z_1 - 2z_2}{\frac{1}{2} - z_1 \bar{z}_2} \right| = 2$, then

Options :

878270219599. both z_1 and z_2 lie on the same circle.

878270219600. z_1 lies on a circle of radius $\frac{1}{2}$ and z_2 lies on a circle of radius 1.

878270219601. either z_1 lies on a circle of radius $\frac{1}{2}$ or z_2 lies on a circle of radius 1.

878270219602. either z_1 lies on a circle of radius 1 or z_2 lies on a circle of radius $\frac{1}{2}$.

Question Number : 3 Question Id : 87827055880 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 z_1, z_2 दो भिन्न सम्मिश्र संख्याएँ इस प्रकार हैं कि $\left| \frac{z_1 - 2z_2}{\frac{1}{2} - z_1 \bar{z}_2} \right| = 2$ है, तो :

Options :

878270219599. z_1 तथा z_2 दोनों समान वृत्त पर स्थित हैं।

878270219600. $z_1, \frac{1}{2}$ त्रिज्या के वृत्त पर तथा $z_2, 1$ त्रिज्या के वृत्त पर स्थित है।

878270219601. या तो $z_1, \frac{1}{2}$ त्रिज्या के वृत्त पर या $z_2, 1$ त्रिज्या के वृत्त पर स्थित है।

878270219602. या तो $z_1, 1$ त्रिज्या के वृत्त पर या $z_2, \frac{1}{2}$ त्रिज्या के वृत्त पर स्थित है।

Question Number : 4 Question Id : 87827055881 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 is a square matrix of order 3 such that $\det(A) = 3$ and $\det(\text{adj}(-4 \text{ adj}(-3 \text{ adj}(3 \text{ adj}((2A)^{-1})))) = 2^m 3^n$, then $m + 2n$ is equal to :

Options :

878270219603. 2

878270219604. 4

878270219605. 3

878270219606.

6

Question Number : 4 Question Id : 87827055881 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 A कोटि 3 का एक वर्ग आव्यूह इस प्रकार है कि $\det(A) = 3$ है तथा $\det(\text{adj}(-4 \text{ adj}(-3 \text{ adj}(3 \text{ adj}((2A)^{-1})))))) = 2^m 3^n$, तो $m + 2n$ बराबर है -

Options :

878270219603.

2

878270219604.

4

878270219605.

3

878270219606.

6

Question Number : 5 Question Id : 87827055882 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 all the words with or without meaning made using all the letters of the word "NAGPUR" are arranged as in a dictionary, then the word at 315th position in this arrangement is :

Options :

878270219607. NRAGPU

878270219608. NRAPGU

878270219609. NRAGUP

878270219610. NRAPUG

**Question Number : 5 Question Id : 87827055882 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 "NAGPUR" शब्द के सभी अक्षरों के प्रयोग से बने अर्थपूर्ण या अर्थहीन शब्दों को शब्दकोश में व्यवस्थित किया जाता है, तो इस शब्दकोश में 315-वीं स्थिति पर शब्द है :

Options :

878270219607. NRAGPU

878270219608. NRAPGU

878270219609. NRAGUP

878270219610. NRAPUG

Question Number : 6 Question Id : 87827055883 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 $0 \leq r \leq n$. If ${}^{n+1}C_{r+1} : {}^nC_r : {}^{n-1}C_{r-1} = 55 : 35 : 21$, then $2n + 5r$ is equal to :

Options :

878270219611. 50

878270219612. 55

878270219613. 60

878270219614. 62

Question Number : 6 Question Id : 87827055883 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 $0 \leq r \leq n$ है। यदि ${}^{n+1}C_{r+1} : {}^nC_r : {}^{n-1}C_{r-1} = 55 : 35 : 21$ है, तो $2n + 5r$ बराबर है :

Options :

878270219611. 50

878270219612. 55

878270219613. 60

878270219614. 62

Question Number : 7 Question Id : 87827055884 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 software company sets up m number of computer systems to finish an assignment in 17 days. If 4 computer systems crashed on the start of the second day, 4 more computer systems crashed on the start of the third day and so on, then it took 8 more days to finish the assignment. The value of m is equal to :

Options :

878270219615. 150

878270219616. 125

878270219617. 160

878270219618. 180

Question Number : 7 Question Id : 87827055884 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 कार्य को 17 दिन में समाप्त करने के लिए एक साफ्टवेयर कंपनी ने m कंप्यूटर स्थापित किए। यदि दूसरे दिन के शुरू में ही 4 कंप्यूटर खराब हो गए, तीसरे दिन के शुरू में 4 और कंप्यूटर खराब हो गए, और इसी प्रकार से आगे के दिनों में भी, तो कार्य को समाप्त करने में 8 दिन अधिक लगे। m का मान बराबर है :

Options :

878270219615. 150

878270219616. 125

878270219617. 160

878270219618. 180

Question Number : 8 Question Id : 87827055885 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 $f(x) = \left(\frac{1}{x}\right)^{2x}$; $x > 0$ attains the maximum value at $x = \frac{1}{e}$ then :

Options :

878270219619. $e^\pi > \pi^e$

878270219620. $e^\pi < \pi^e$

878270219621. $e^{2\pi} < (2\pi)^e$

878270219622. $(2e)^\pi > \pi^{(2e)}$

Question Number : 8 Question Id : 87827055885 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 $f(x) = \left(\frac{1}{x}\right)^{2x}$; $x > 0$, $x = \frac{1}{e}$ पर उच्चतम मान प्राप्त करता है, तो :

Options :

878270219619. $e^\pi > \pi^e$

878270219620. $e^\pi < \pi^e$

878270219621. $e^{2\pi} < (2\pi)^e$

878270219622. $(2e)^\pi > \pi^{(2e)}$

Question Number : 9 Question Id : 87827055886 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

$\lim_{n \rightarrow \infty} \frac{(1^2 - 1)(n-1) + (2^2 - 2)(n-2) + \dots + ((n-1)^2 - (n-1)) \cdot 1}{(1^3 + 2^3 + \dots + n^3) - (1^2 + 2^2 + \dots + n^2)}$ is equal to :

Options :

878270219623. $\frac{1}{2}$

878270219624.

$$\frac{1}{3}$$

878270219625. $\frac{2}{3}$

878270219626. $\frac{3}{4}$

Question Number : 9 Question Id : 87827055886 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

$$\lim_{n \rightarrow \infty} \frac{(1^2-1)(n-1) + (2^2-2)(n-2) + \dots + ((n-1)^2-(n-1)) \cdot 1}{(1^3+2^3+\dots+n^3) - (1^2+2^2+\dots+n^2)} \text{ बराबर है :}$$

Options :

878270219623. $\frac{1}{2}$

878270219624. $\frac{1}{3}$

878270219625. $\frac{2}{3}$

878270219626. $\frac{3}{4}$

Question Number : 10 Question Id : 87827055887 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

Suppose for a differentiable function h , $h(0)=0$, $h(1)=1$ and $h'(0)=h'(1)=2$. If $g(x)=h(e^x)e^{h(x)}$, then $g'(0)$ is equal to :

Options :

878270219627. 3

878270219628. 4

878270219629. 5

878270219630. 8

Question Number : 10 Question Id : 87827055887 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

मान लीजिए कि अवकलनीय फलन h के लिए, $h(0)=0$, $h(1)=1$ तथा $h'(0)=h'(1)=2$ हैं। यदि $g(x)=h(e^x)e^{h(x)}$, तो $g'(0)$ बराबर है -

Options :

878270219627. 3

878270219628.

4

878270219629. 5

878270219630. 8

Question Number : 11 Question Id : 87827055888 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 area of the region $\left\{(x, y): \frac{a}{x^2} \leq y \leq \frac{1}{x}, 1 \leq x \leq 2, 0 < a < 1\right\}$ is $(\log_e 2) - \frac{1}{7}$ then the value of $7a - 3$ is equal to :

Options :

878270219631. -1

878270219632. 0

878270219633. 1

878270219634. 2

Question Number : 11 Question Id : 87827055888 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 क्षेत्र $\left\{(x, y): \frac{a}{x^2} \leq y \leq \frac{1}{x}, 1 \leq x \leq 2, 0 < a < 1\right\}$ का क्षेत्रफल $(\log_e 2) - \frac{1}{7}$ है, तो $7a - 3$ का मान बराबर है -

Options :

878270219631. -1

878270219632. 0

878270219633. 1

878270219634. 2

Question Number : 12 Question Id : 87827055889 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 $\int \frac{1}{a^2 \sin^2 x + b^2 \cos^2 x} dx = \frac{1}{12} \tan^{-1}(3 \tan x) + \text{constant}$, then the maximum value of $a \sin x + b \cos x$, is :

Options :

878270219635. $\sqrt{42}$

878270219636. $\sqrt{39}$

878270219637. $\sqrt{40}$

878270219638. $\sqrt{41}$

Question Number : 12 Question Id : 87827055889 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 $\int \frac{1}{a^2 \sin^2 x + b^2 \cos^2 x} dx = \frac{1}{12} \tan^{-1}(3 \tan x) + \text{अचर है, तो } a \sin x + b \cos x \text{ का उच्चतम मान है :}$

Options :

878270219635. $\sqrt{42}$

878270219636. $\sqrt{39}$

878270219637. $\sqrt{40}$

878270219638. $\sqrt{41}$

Question Number : 13 Question Id : 87827055890 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

Suppose the solution of the differential equation $\frac{dy}{dx} = \frac{(2 + \alpha)x - \beta y + 2}{\beta x - 2\alpha y - (\beta\gamma - 4\alpha)}$ represents a circle passing through origin. Then the radius of this circle is :

Options :

878270219639. $\frac{\sqrt{17}}{2}$

878270219640. 2

878270219641. $\sqrt{17}$

878270219642. $\frac{1}{2}$

Question Number : 13 Question Id : 87827055890 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

मान लीजिए कि अवकल समीकरण $\frac{dy}{dx} = \frac{(2 + \alpha)x - \beta y + 2}{\beta x - 2\alpha y - (\beta\gamma - 4\alpha)}$ का हल मूल बिन्दु से गुजरने वाले वृत्त को दर्शाता

है, तो इस वृत्त की त्रिज्या है -

Options :

878270219639. $\frac{\sqrt{17}}{2}$

878270219640. 2

878270219641. $\sqrt{17}$

878270219642. $\frac{1}{2}$

Question Number : 14 Question Id : 87827055891 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 locus of the point, whose distances from the point (2, 1) and (1, 3) are in the ratio 5 : 4, is $ax^2 + by^2 + cxy + dx + ey + 170 = 0$, then the value of $a^2 + 2b + 3c + 4d + e$ is equal to :

Options :

878270219643. 5

878270219644. 437

878270219645. - 27

878270219646. 37

Question Number : 14 Question Id : 87827055891 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 उस बिन्दु, जिसकी बिन्दुओं (2, 1) और (1, 3) से दूरियों का अनुपात 5 : 4 है, का बिन्दुपथ $ax^2 + by^2 + cxy + dx + ey + 170 = 0$ है, तो $a^2 + 2b + 3c + 4d + e$ का मान बराबर है -

Options :

878270219643.

878270219644. 437

878270219645. - 27

878270219646. 37

Question Number : 15 Question Id : 87827055892 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 P(6, 1) be the orthocentre of the triangle whose vertices are A (5, -2), B(8, 3) and C (h, k), then the point C lies on the circle :

Options :

878270219647. $x^2 + y^2 - 52 = 0$

878270219648. $x^2 + y^2 - 61 = 0$

878270219649. $x^2 + y^2 - 65 = 0$

878270219650. $x^2 + y^2 - 74 = 0$

Question Number : 15 Question Id : 87827055892 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 $P(6, 1)$ उस त्रिभुज का लंबकेन्द्र है, जिसके शीर्ष $A(5, -2)$, $B(8, 3)$ तथा $C(h, k)$ हैं, तो बिन्दु C किस वृत्त पर स्थित है -

Options :

878270219647. $x^2 + y^2 - 52 = 0$

878270219648. $x^2 + y^2 - 61 = 0$

878270219649. $x^2 + y^2 - 65 = 0$

878270219650. $x^2 + y^2 - 74 = 0$

Question Number : 16 Question Id : 87827055893 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 ABC be an equilateral triangle. A new triangle is formed by joining the middle points of all sides of the triangle ABC and the same process is repeated infinitely many times. If P is the sum of perimeters and Q is be the sum of areas of all the triangles formed in this process, then :

Options :

878270219651. $P = 36\sqrt{3}Q^2$

878270219652.

$$P^2 = 6\sqrt{3}Q$$

878270219653. $P^2 = 36\sqrt{3}Q$

878270219654. $P^2 = 72\sqrt{3}Q$

Question Number : 16 Question Id : 87827055893 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 ABC एक समबाहु त्रिभुज है। त्रिभुज ABC की सभी भुजाओं के मध्य बिन्दुओं को जोड़ने से एक नया त्रिभुज बनाया गया है तथा इसी प्रक्रिया को अनन्त बार दोहराया गया है। यदि इस प्रक्रिया से बने सभी त्रिभुजों के परिमापों का योग P है तथा क्षेत्रफलों का योग Q है, तो :

Options :

878270219651. $P = 36\sqrt{3}Q^2$

878270219652. $P^2 = 6\sqrt{3}Q$

878270219653. $P^2 = 36\sqrt{3}Q$

878270219654. $P^2 = 72\sqrt{3}Q$

Question Number : 17 Question Id : 87827055894 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 P (α , β , γ) be the image of the point Q (3, -3, 1) in the line $\frac{x-0}{1} = \frac{y-3}{1} = \frac{z-1}{-1}$ and R be the point

(2, 5, -1). If the area of the triangle PQR is λ and $\lambda^2 = 14K$, then K is equal to :

Options :

878270219655. 18

878270219656. 36

878270219657. 72

878270219658. 81

Question Number : 17 Question Id : 87827055894 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 $\frac{x-0}{1} = \frac{y-3}{1} = \frac{z-1}{-1}$ में बिन्दु Q (3, -3, 1) का प्रतिबिम्ब बिन्दु P (α , β , γ) है और R(2, 5, -1) एक अन्य

बिन्दु है। यदि त्रिभुज PQR का क्षेत्रफल λ है तथा $\lambda^2 = 14K$, तो K बराबर है :

Options :

878270219655. 18

878270219656. 36

878270219657. 72

878270219658. 81

Question Number : 18 Question Id : 87827055895 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 $\vec{a} = 2\hat{i} + \hat{j} - \hat{k}$, $\vec{b} = \left(\left(\vec{a} \times \left(\hat{i} + \hat{j} \right) \right) \times \hat{i} \right) \times \hat{i}$. Then the square of the projection of $\vec{a}$ on $\vec{b}$ is :

Options :

878270219659. $\frac{1}{3}$

878270219660. 2

878270219661. $\frac{2}{3}$

878270219662. $\frac{1}{5}$

Question Number : 18 Question Id : 87827055895 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 $\vec{a} = 2\hat{i} + \hat{j} - \hat{k}$, $\vec{b} = \left(\left(\vec{a} \times (\hat{i} + \hat{j}) \right) \times \hat{i} \right) \times \hat{i}$ हैं। तो $\vec{b}$ पर $\vec{a}$ के प्रक्षेप का वर्ग है :

Options :

878270219659. $\frac{1}{3}$

878270219660. 2

878270219661. $\frac{2}{3}$

878270219662. $\frac{1}{5}$

Question Number : 19 Question Id : 87827055896 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 $\vec{a} = 6\hat{i} + \hat{j} - \hat{k}$ and $\vec{b} = \hat{i} + \hat{j}$. If $\vec{c}$ is a vector such that $|\vec{c}| \geq 6$, $\vec{a} \cdot \vec{c} = 6|\vec{c}|$, $|\vec{c} - \vec{a}| = 2\sqrt{2}$ and

the angle between $\vec{a} \times \vec{b}$ and $\vec{c}$ is 60° , then $\left| (\vec{a} \times \vec{b}) \times \vec{c} \right|$ is equal to :

Options :

878270219663. $\frac{3}{2}\sqrt{3}$

878270219664.

$$\frac{3}{2}\sqrt{6}$$

878270219665. $\frac{9}{2}(6-\sqrt{6})$

878270219666. $\frac{9}{2}(6+\sqrt{6})$

Question Number : 19 Question Id : 87827055896 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 $\vec{a} = 6\hat{i} + \hat{j} - \hat{k}$ तथा $\vec{b} = \hat{i} + \hat{j}$ है। यदि एक सदिश $\vec{c}$ इस प्रकार है कि $|\vec{c}| \geq 6$, $\vec{a} \cdot \vec{c} = 6|\vec{c}|$, $|\vec{c} - \vec{a}| = 2\sqrt{2}$

तथा $\vec{a} \times \vec{b}$ और $\vec{c}$ के मध्य का कोण 60° है, तो $\left| (\vec{a} \times \vec{b}) \times \vec{c} \right|$ बराबर है :

Options :

878270219663. $\frac{3}{2}\sqrt{3}$

878270219664. $\frac{3}{2}\sqrt{6}$

878270219665. $\frac{9}{2}(6-\sqrt{6})$

878270219666.

$$\frac{9}{2}(6+\sqrt{6})$$

Question Number : 20 Question Id : 87827055897 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 three letters can be posted to any one of the 5 different addresses, then the probability that the three letters are posted to exactly two addresses is :

Options :

878270219667. $\frac{4}{25}$

878270219668. $\frac{6}{25}$

878270219669. $\frac{12}{25}$

878270219670. $\frac{18}{25}$

Question Number : 20 Question Id : 87827055897 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 तीन पत्रों को 5 भिन्न पतों में से किसी पर भी भेजा जा सकता हो, तो तीन पत्रों को ठीक दो पतों पर भेजे जाने की प्रायिकता है :

Options :

878270219667. $\frac{4}{25}$

878270219668. $\frac{6}{25}$

878270219669. $\frac{12}{25}$

878270219670. $\frac{18}{25}$

Mathematics Section B

Section Id :	8782701165
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 : 8782702072

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 21 Question Id : 87827055898 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let α, β be roots of $x^2 + \sqrt{2}x - 8 = 0$. If $U_n = \alpha^n + \beta^n$, then $\frac{U_{10} + \sqrt{2}U_9}{2U_8}$ 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 : 87827055898 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना $x^2 + \sqrt{2}x - 8 = 0$ के मूल α, β हैं। यदि $U_n = \alpha^n + \beta^n$, तो $\frac{U_{10} + \sqrt{2}U_9}{2U_8}$ 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 : 87827055899 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 system of equations

$$2x + 7y + \lambda z = 3$$

$$3x + 2y + 5z = 4$$

$$x + \mu y + 32z = -1$$

has infinitely many solutions, then $(\lambda - \mu)$ 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 : 22 Question Id : 87827055899 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

यदि समीकरणों का निकाय

$$2x + 7y + \lambda z = 3$$

$$3x + 2y + 5z = 4$$

$$x + \mu y + 32z = -1$$

अनन्त हल रखता है, तो $(\lambda - \mu)$ 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 : 23 Question Id : 87827055900 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

If $S(x) = (1+x) + 2(1+x)^2 + 3(1+x)^3 + \dots + 60(1+x)^{60}$, $x \neq 0$, and $(60)^2 S(60) = a(b)^b + b$, where $a, b \in \mathbb{N}$, then $(a+b)$ 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 : 23 Question Id : 87827055900 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

यदि $S(x) = (1+x) + 2(1+x)^2 + 3(1+x)^3 + \dots + 60(1+x)^{60}$, $x \neq 0$, तथा $(60)^2 S(60) = a(b)^b + b$, जहाँ $a, b \in \mathbb{N}$, तो $(a+b)$ 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 : 24 Question Id : 87827055901 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let $[t]$ denote the greatest integer less than or equal to t . Let $f: [0, \infty) \rightarrow \mathbb{R}$ be a function defined by $f(x) = \left\lceil \frac{x}{2} + 3 \right\rceil - \lfloor \sqrt{x} \rfloor$. Let S be the set of all points in the interval $[0, 8]$ at which f is not continuous. Then $\sum_{a \in S} a$ 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 : 24 **Question Id :** 87827055901 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

माना $[t]$, t से कम या t के बराबर महत्तम पूर्णांक को दर्शाता है। माना फलन $f: [0, \infty) \rightarrow \mathbb{R}$, $f(x) = \left\lceil \frac{x}{2} + 3 \right\rceil - \lfloor \sqrt{x} \rfloor$ द्वारा परिभाषित है। माना S , अन्तराल $[0, 8]$ में उन सभी बिन्दुओं का समुच्चय है, जहाँ f संतत नहीं है। तो $\sum_{a \in S} a$ 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 : 25 **Question Id :** 87827055902 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 Wrong Marks : 1

Let $[t]$ denote the largest integer less than or equal to t . If

$$\int_0^3 \left([x^2] + \left[\frac{x^2}{2} \right] \right) dx = a + b\sqrt{2} - \sqrt{3} - \sqrt{5} + c\sqrt{6} - \sqrt{7}, \text{ where } a, b, c \in \mathbb{Z}, \text{ then } a + b + c \text{ is equal to}$$

_____.

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 : 87827055902 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना $[t]$, t से कम या t के बराबर महत्तम पूर्णांक को दर्शाता है। यदि

$$\int_0^3 \left([x^2] + \left[\frac{x^2}{2} \right] \right) dx = a + b\sqrt{2} - \sqrt{3} - \sqrt{5} + c\sqrt{6} - \sqrt{7}, \text{ जहाँ } a, b, c \in \mathbb{Z}, \text{ तो } a + b + c \text{ बराबर है } \underline{\hspace{2cm}}$$

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 : 87827055903 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 solution $y(x)$ of the given differential equation $(e^y + 1) \cos x \, dx + e^y \sin x \, dy = 0$ passes through the point $\left(\frac{\pi}{2}, 0\right)$, then the value of $e^{y\left(\frac{\pi}{6}\right)}$ 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 : 87827055903 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

यदि अवकल समीकरण $(e^y + 1) \cos x \, dx + e^y \sin x \, dy = 0$ का हल $y(x)$ बिन्दु $\left(\frac{\pi}{2}, 0\right)$ से गुजरता है, तो $e^{y\left(\frac{\pi}{6}\right)}$ का मान 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 : 87827055904 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The length of the latus rectum and directrices of a hyperbola with eccentricity e are 9 and $x = \pm \frac{4}{\sqrt{3}}$,

respectively. Let the line $y - \sqrt{3}x + \sqrt{3} = 0$ touch this hyperbola at (x_0, y_0) . If m is the product of the focal distances of the point (x_0, y_0) , then $4e^2 + m$ 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 : 27 **Question Id :** 87827055904 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

किसी e उत्केन्द्रता वाले अतिपरवलय, जिसके नाभीयलंब की लम्बाई तथा नियताएँ क्रमशः 9 तथा $x = \pm \frac{4}{\sqrt{3}}$ हैं। माना रेखा

$y - \sqrt{3}x + \sqrt{3} = 0$ इस अतिपरवलय को (x_0, y_0) पर स्पर्श करती है। यदि m बिन्दु (x_0, y_0) की नाभीय दूरियों का गुणनफल है, तो $4e^2 + m$ 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 : 28 **Question Id :** 87827055905 **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 shortest distance between the lines $\frac{x-\lambda}{3} = \frac{y-2}{-1} = \frac{z-1}{1}$ and $\frac{x+2}{-3} = \frac{y+5}{2} = \frac{z-4}{4}$ is $\frac{44}{\sqrt{30}}$, then the largest possible value of $|\lambda|$ 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 :** 87827055905 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

यदि रेखाओं $\frac{x-\lambda}{3} = \frac{y-2}{-1} = \frac{z-1}{1}$ तथा $\frac{x+2}{-3} = \frac{y+5}{2} = \frac{z-4}{4}$ के बीच की न्यूनतम दूरी $\frac{44}{\sqrt{30}}$ है, तो $|\lambda|$ का अधिकतम संभव मान 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 : 29 **Question Id :** 87827055906 **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 12 items containing 3 defectives, a sample of 5 items is drawn at random. Let the random variable X denote the number of defective items in the sample. Let items in the sample be drawn one by one without replacement. If variance of X is $\frac{m}{n}$, where $\gcd(m, n) = 1$, then $n - m$ 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 : 29 **Question Id :** 87827055906 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

12 वस्तुओं की एक खेप से, जिसमें 3 वस्तुएँ खराब हैं, 5 वस्तुओं का एक नमूना यादृच्छया निकाला जाता है। माना X एक यादृच्छिक चर है जो नमूने में खराब वस्तुओं की संख्या को दर्शाता है। माना नमूने से वस्तुओं को एक-एक करके बिना प्रतिस्थापन के निकाला जाता है। यदि X का प्रसरण $\frac{m}{n}$ है, जहाँ $\gcd(m, n) = 1$, तो $n - m$ 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 :** 87827055907 **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 triangle ABC, $BC=7$, $AC=8$, $AB=\alpha \in \mathbb{N}$ and $\cos A = \frac{2}{3}$. If $49\cos(3C)+42=\frac{m}{n}$, where $\gcd(m,n)=1$, then $m+n$ 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 :** 87827055907 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

एक त्रिभुज ABC में, $BC=7$, $AC=8$, $AB=\alpha \in \mathbb{N}$ तथा $\cos A = \frac{2}{3}$ हैं। यदि $49\cos(3C)+42=\frac{m}{n}$, जहाँ $\gcd(m,n)=1$, तो $m+n$ 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 : 8782701166

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 :	8782702073
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 31 Question Id : 87827055908 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 car of 800 kg is taking turn on a banked road of radius 300 m and angle of banking 30° . If coefficient of static friction is 0.2 then the maximum speed with which car can negotiate the turn safely : ($g = 10 \text{ m/s}^2$, $\sqrt{3} = 1.73$)

Options :

878270219681. 51.4 m/s

878270219682. 264 m/s

878270219683. 102.8 m/s

878270219684. 70.4 m/s

Question Number : 31 Question Id : 87827055908 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 800 kg की कार एक सड़क के मोड़ पर, त्रिज्या 300 m मुड़ रही है, कार के झुकने का कोण 30° है। यदि स्थितिज घर्षण का गुणांक 0.2 हो तब कार अधिकतम गति ले सकती है : ($g = 10$ मी/से², $\sqrt{3} = 1.73$)

Options :

878270219681. 51.4 मी/से

878270219682. 2640 मी/से

878270219683. 102.8 मी/से

878270219684. 70.4 मी/से

Question Number : 32 Question Id : 87827055909 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) : Dimensions of specific heat is $[L^2T^{-2}K^{-1}]$.

Statement (II) : Dimensions of gas constant is $[M L^2 T^{-1}K^{-1}]$.

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

Options :

878270219685.

Both statement (I) and statement (II) are correct

878270219686. Both statement (I) and statement (II) are incorrect

878270219687. Statement (I) is correct but statement (II) is incorrect

878270219688. Statement (I) is incorrect but statement (II) is correct

Question Number : 32 Question Id : 87827055909 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) : विशिष्ट उष्मा की विमा है $[L^2T^{-2}K^{-1}]$.

कथन (II) : गैश नियतांक की विमा है $[M^1 L^2 T^{-1}K^{-1}]$.

ऊपर दिये कथनों के अनुसार, निम्न में से सबसे सही उत्तर होगा :

Options :

878270219685. दोनों कथन I एवं कथन II सही हैं।

878270219686. दोनों कथन I एवं कथन II गलत हैं।

878270219687. कथन I सही है परन्तु कथन II गलत है।

878270219688.

कथन I गलत है परन्तु कथन II सही है।

Question Number : 33 Question Id : 87827055910 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 projected vertically upwards with a certain speed from the top of a tower reaches the ground in t_1 . If it is projected vertically downwards from the same point with the same speed, it reaches the ground in t_2 . Time required to reach the ground, if it is dropped from the top of the tower, is :

Options :

878270219689. $\sqrt{t_1 t_2}$

878270219690. $\sqrt{t_1 + t_2}$

878270219691. $\sqrt{t_1 - t_2}$

878270219692. $\sqrt{\frac{t_1}{t_2}}$

Question Number : 33 Question Id : 87827055910 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 वस्तु एक टॉवर की छत से v चाल से ऊपर फेंकी जाती है। यह समय t_1 में जमीन पर पहुंचती है। यदि यही टॉवर की छत से ही उर्ध्वाधर नीचे की ओर फेंकी जाए, उसी गति से उसी बिन्दु से, तब यह जमीन पर t_2 समय में पहुंचती है। यदि यह टॉवर से उसी बिन्दु से नीचे को स्वतन्त्र छोड़ दी जाए तब जमीन तक पहुंचने में समय लगेगा :

Options :

878270219689. $\sqrt{t_1 t_2}$

878270219690. $\sqrt{t_1 + t_2}$

878270219691. $\sqrt{t_1 - t_2}$

878270219692. $\sqrt{\frac{t_1}{t_2}}$

Question Number : 34 Question Id : 87827055911 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 weight 200 N is suspended from a tree branch through a chain of mass 10 kg. The branch pulls the chain by a force equal to (if $g = 10 \text{ m/s}^2$) :

Options :

878270219693. 200 N

878270219694. 100 N

878270219695. 300 N

878270219696. 150 N

Question Number : 34 Question Id : 87827055911 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 200 न्यूटन भार की वस्तु, एक 10 kg की चेन द्वारा एक पेड़ की शाखा से लटकायी जाती है। पेड़ की शाखा चेन को एक बल से खींचती है : ($g = 10 \text{ m/s}^2$) :

Options :

878270219693. 200 N

878270219694. 100 N

878270219695. 300 N

878270219696. 150 N

Question Number : 35 Question Id : 87827055912 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

Match **List-I** with **List-II** :

List-I

Y vs X

(A) Y = magnetic susceptibility

X = magnetising field

(B) Y = magnetic field

X = distance from centre of a current carrying wire for $x < a$
(where a = radius of wire)

(C) Y = magnetic field

X = distance from centre of a current carrying wire for $x > a$
(where a = radius of wire)

(D) Y = magnetic field inside solenoid

X = distance from centre

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

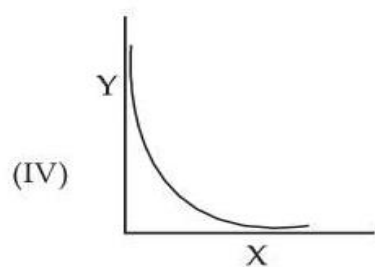
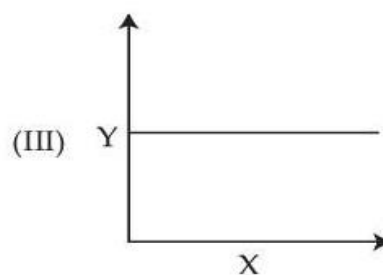
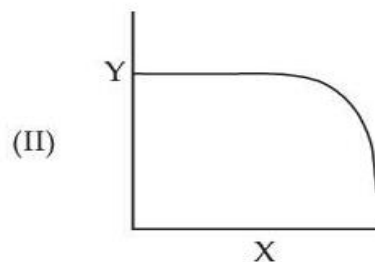
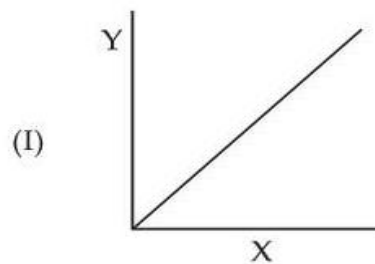
Options :

878270219697. (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

878270219698. (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

List-II

Shape of Graph



878270219699. (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

878270219700. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Question Number : 35 Question Id : 87827055912 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

सूची - I का मिलान सूची - II से करें :

सूची - I

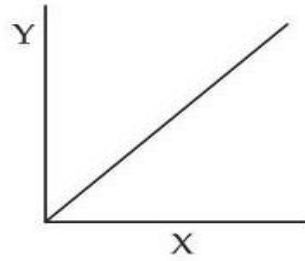
Y vs X

सूची - II

ग्राफ की आकृति

(A) $Y =$ चुम्बकीय प्रवृत्ति

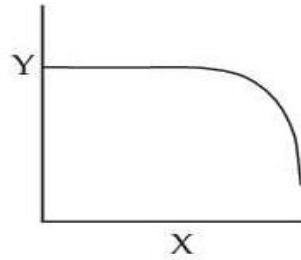
(I)



$X =$ चुम्बकीय क्षेत्र

(B) $Y =$ चुम्बकीय क्षेत्र

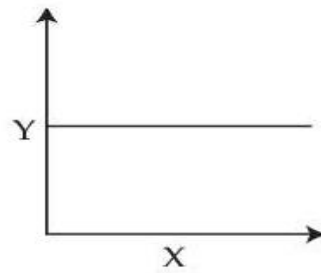
(II)



$X =$ तार के केन्द्र से दूरी $x < a$

(C) $Y =$ चुम्बकीय क्षेत्र

(III)

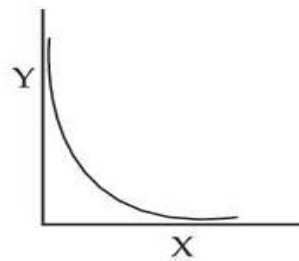


$X =$ तार के केन्द्र से दूरी

(यहां $a =$ तार की त्रिज्या है) $x > a$

(D) $Y =$ परिनालिका के अंदर चुम्बकीय क्षेत्र

(IV)



$X =$ केन्द्र से दूरी

निम्न दिए उत्तरों में कौन सही हैं :

Options :

878270219697. (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

878270219698. (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

878270219699. (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

878270219700. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Question Number : 36 Question Id : 87827055913 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

When kinetic energy of a body becomes 36 times of its original value, the percentage increase in the momentum of the body will be :

Options :

878270219701. 6%

878270219702. 500%

878270219703. 60%

878270219704. 600%

Question Number : 36 Question Id : 87827055913 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 एक वस्तु की गतिज ऊर्जा 36 गुना मूल मान की अपेक्षा बढ़ जाए तब वस्तु का संवेग कितने प्रतिशत से बढ़ जायेगा :

Options :

878270219701. 6%

878270219702. 500%

878270219703. 60%

878270219704. 600%

Question Number : 37 Question Id : 87827055914 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

Assuming the earth to be a sphere of uniform mass density, a body weighed 300 N on the surface of earth. How much it would weigh at $R/4$ depth under surface of earth ?

Options :

878270219705. 75 N

878270219706. 225 N

878270219707. 300 N

878270219708. 375 N

Question Number : 37 Question Id : 87827055914 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 पृथ्वी एक समान घनत्व का गोला है, एक 300 N की वस्तु पृथ्वी के अंदर $R/4$ गहराई पर निम्न भार की होगी :

Options :

878270219705. 75 N

878270219706. 225 N

878270219707. 300 N

878270219708. 375 N

Question Number : 38 Question Id : 87827055915 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

Pressure inside a soap bubble is greater than the pressure outside by an amount :
(given : R = Radius of bubble, S = Surface tension of bubble)

Options :

878270219709. $\frac{2S}{R}$

878270219710. $\frac{4S}{R}$

878270219711. $\frac{S}{R}$

878270219712. $\frac{4R}{S}$

Question Number : 38 Question Id : 87827055915 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 साबुन के बुलबुले के अन्दर दाब, बाह्य दाब की अपेक्षा कितना अधिक होता है :

[दिया है R = बुलबुले की त्रिज्या, S = पृष्ठ तनाव]

Options :

878270219709. $\frac{2S}{R}$

878270219710. $\frac{4S}{R}$

878270219711. $\frac{S}{R}$

878270219712. $\frac{4R}{S}$

Question Number : 39 Question Id : 87827055916 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 total of 48 J heat is given to one mole of helium kept in a cylinder. The temperature of helium increases by 2°C . The work done by the gas is :

Given, $R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$.

Options :

878270219713. 24.9 J

878270219714. 48 J

878270219715. 72.9 J

878270219716. 23.1 J

Question Number : 39 Question Id : 87827055916 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 बेलनाकार नली में रखी हीलियम को 48 J उष्मा दी जाती है, हीलियम गैस का तापक्रम 2°C से बढ़ जाता है। गैस द्वारा किया गया कार्य है [दिया है $R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$] :

Options :

878270219713. 24.9 J

878270219714. 48 J

878270219715. 72.9 J

878270219716. 23.1 J

Question Number : 40 Question Id : 87827055917 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 vernier calliper, when both jaws touch each other, zero of the vernier scale shifts towards left and its 4th division coincides exactly with a certain division on main scale. If 50 vernier scale divisions equal to 49 main scale divisions and zero error in the instrument is 0.04 mm then how many main scale divisions are there in 1 cm ?

Options :

878270219717. 10

878270219718. 20

878270219719. 40

878270219720. 5

Question Number : 40 Question Id : 87827055917 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

वर्नियर कैलीपर्स के दोनों जबड़े आपस में स्पर्श करने के समय, वर्नियर पैमाने की शून्य रेखा, मुख्य पैमाने पर बायीं ओर रहती है। तब मुख्य पैमाने के किसी एक रेखा के साथ वर्नियर की चौथी रेखा स्पर्श करती है। यदि वर्नियर पैमाने के 50 भाग, मुख्य पैमाने के 49 भाग के बराबर हो तथा शून्यांक त्रुटि 0.04 mm हो तब मुख्य पैमाने पर 1 cm में कितने भाग होंगे?

Options :

878270219717. 10

878270219718. 20

878270219719. 40

878270219720. 5

Question Number : 41 Question Id : 87827055918 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

Energy of 10 non rigid diatomic molecules at temperature T is :

Options :

878270219721. 35 RT

878270219722. 70 K_BT

878270219723. $\frac{7}{2}$ RT

878270219724. $35 K_B T$

Question Number : 41 Question Id : 87827055918 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

T तापमान पर 10 अदृढ़ द्विपरमाणवीय अणु की ऊर्जा हैं :

Options :

878270219721. $35 RT$

878270219722. $70 K_B T$

878270219723. $\frac{7}{2} RT$

878270219724. $35 K_B T$

Question Number : 42 Question Id : 87827055919 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 identical conducting spheres P and S with charge Q on each, repel each other with a force 16 N. A third identical uncharged conducting sphere R is successively brought in contact with the two spheres. The new force of repulsion between P and S is :

Options :

878270219725. 6 N

878270219726. 12 N

878270219727. 4 N

878270219728. 1 N

Question Number : 42 Question Id : 87827055919 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 समान चालक गोले P तथा S, दोनों पर समान आवेश Q होने पर, दोनों एक-दूसरे को 16 N बल से प्रतिकर्षित करते हैं। एक तीसरा अनावेशित समान गोला अलग-अलग क्रम में दोनों से स्पर्श कराया जाता है। अब गोले P एवं S में प्रतिकर्षण होगा :

Options :

878270219725. 6 N

878270219726. 12 N

878270219727. 4 N

878270219728. 1 N

Question Number : 43 Question Id : 87827055920 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 electrons flowing per second in the filament of a 110 W bulb operating at 220 V is :

(Given $e = 1.6 \times 10^{-19} \text{ C}$)

Options :

878270219729. 6.25×10^{17}

878270219730. 1.25×10^{19}

878270219731. 31.25×10^{17}

878270219732. 6.25×10^{18}

Question Number : 43 Question Id : 87827055920 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 110 वाट बल्ब के अन्दर में उसके तार तन्तु से 220 वोल्ट पर प्रवाहित इलैक्ट्रानों की संख्या है :

[दिया है $e = 1.6 \times 10^{-19} \text{ C}$]

Options :

878270219729. 6.25×10^{17}

878270219730. 1.25×10^{19}

878270219731.

$$31.25 \times 10^{17}$$

878270219732. 6.25×10^{18}

Question Number : 44 Question Id : 87827055921 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 coil, the current changes from -2 A to $+2\text{ A}$ in 0.2 s and induces an emf of 0.1 V . The self inductance of the coil is :

Options :

878270219733. 1 mH

878270219734. 2.5 mH

878270219735. 4 mH

878270219736. 5 mH

Question Number : 44 Question Id : 87827055921 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 कुण्डली में धारा -2 A से $+2\text{ A}$ तक 0.2 सेकंड में परिवर्तित होती है। तब 0.1 V विद्युत वाहक बल प्रेरित होता है।
कुण्डली का स्वप्रेरणांक है -

Options :

878270219733. 1 mH

878270219734. 2.5 mH

878270219735. 4 mH

878270219736. 5 mH

Question Number : 45 Question Id : 87827055922 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 the given electromagnetic wave $E_y = 600 \sin(\omega t - kx) \text{ Vm}^{-1}$, intensity of the associated light beam is (in W/m^2 : (Given $\epsilon_0 = 9 \times 10^{-12} \text{ C}^2\text{N}^{-1}\text{m}^{-2}$)

Options :

878270219737. 729

878270219738. 972

878270219739. 243

878270219740. 486

Question Number : 45 Question Id : 87827055922 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 विद्युत-चुम्बकीय तरंग $E_y = 600 \sin (\omega t - kx) \text{ Vm}^{-1}$ में प्रकाश पुन्ज-रेखा की तीव्रता (W/m^2 में) होगी
(दिया गया है - $\epsilon_0 = 9 \times 10^{-12} \text{ C}^2\text{N}^{-1}\text{m}^{-2}$):

Options :

878270219737. 729

878270219738. 972

878270219739. 243

878270219740. 486

Question Number : 46 Question Id : 87827055923 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 thin convex lens, the radii of curvature are at 15 cm and 30 cm respectively. The focal length the lens is 20 cm. The refractive index of the material is :

Options :

878270219741. 1.4

878270219742. 1.5

878270219743. 1.2

878270219744. 1.8

Question Number : 46 Question Id : 87827055923 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 उत्तल लेंस की वक्रता की त्रिज्याएँ क्रमशः 15 cm तथा 30 cm हैं। लेंस की फोकस दूरी $F = 20$ cm है। पदार्थ का अपवर्तनांक होगा :

Options :

878270219741. 1.4

878270219742. 1.5

878270219743. 1.2

878270219744. 1.8

Question Number : 47 Question Id : 87827055924 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

When UV light of wavelength 300 nm is incident on the metal surface having work function 2.13 eV, electron emission takes place. The stopping potential is :

(Given $hc = 1240 \text{ eV nm}$)

Options :

878270219745. 4.1 V

878270219746. 1.5 V

878270219747. 2 V

878270219748. 4 V

Question Number : 47 Question Id : 87827055924 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 धातु सतह, जिसका कार्य-फलन 2.13 eV है, पर 300 nm तरंगदैर्घ्य का पराबैंगनी प्रकाश आपतित है। इससे इलेक्ट्रान उत्सर्जन होता है [इलेक्ट्रान का विरोधी विभव $hc = 1240 \text{ eVnm}$] :

Options :

878270219745. 4.1 V

878270219746. 1.5 V

878270219747. 2 V

878270219748.

Question Number : 48 Question Id : 87827055925 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 longest wavelength associated with Paschen series is : (Given $R_H = 1.097 \times 10^7$ SI unit)

Options :

878270219749. 2.973×10^{-6} m

878270219750. 1.876×10^{-6} m

878270219751. 1.094×10^{-6} m

878270219752. 3.646×10^{-6} m

Question Number : 48 Question Id : 87827055925 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

पाश्चन श्रेणी के साथ सम्बन्धित अधिकतम तरंगदैर्घ्य है [दिया है $R_H = 1.097 \times 10^7$ SI मात्रक] :

Options :

878270219749. 2.973×10^{-6} m

878270219750.

$$1.876 \times 10^{-6} \text{ m}$$

878270219751. $1.094 \times 10^{-6} \text{ m}$

878270219752. $3.646 \times 10^{-6} \text{ m}$

Question Number : 49 Question Id : 87827055926 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 acceptor level of a p-type semiconductor is 6 eV. The maximum wavelength of light which can create a hole would be : Given $hc = 1242 \text{ eV nm}$.

Options :

878270219753. 207 nm

878270219754. 407 nm

878270219755. 414 nm

878270219756. 103.5 nm

Question Number : 49 Question Id : 87827055926 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 p-ऊर्ध्वचालक का मान्य स्तर 6 eV है। किस अधिकतम तरंगदैर्घ्य के प्रकाश से उत्सर्जित कोटर होगा :

(दिया है $hc = 1242 \text{ eVnm}$)

Options :

878270219753. 207 nm

878270219754. 407 nm

878270219755. 414 nm

878270219756. 103.5 nm

Question Number : 50 Question Id : 87827055927 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 finding out refractive index of glass slab the following observations were made through travelling microscope 50 vernier scale division = 49 MSD; 20 divisions on main scale in each cm

For mark on paper

$$\text{MSR} = 8.45 \text{ cm, VC} = 26$$

For mark on paper seen through slab

$$\text{MSR} = 7.12 \text{ cm, VC} = 41$$

For powder particle on the top surface of the glass slab

$$\text{MSR} = 4.05 \text{ cm, VC} = 1$$

(MSR = Main Scale Reading, VC = Vernier Coincidence)

Refractive index of the glass slab is :

Options :

878270219757. 1.24

878270219758. 1.42

878270219759. 1.35

878270219760. 1.52

Question Number : 50 Question Id : 87827055927 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 कांच के आयताकार गुटके का अपवर्तनांक ज्ञात करने में निम्न प्रेक्षणांक लिये गये। सुक्ष्मदर्शी के पैमाने के 50 भाग = 49 मुख्य पैमाने के भाग तथा मुख्य पैमाने के 1 cm में 20 भाग हैं।

कागज सतह पर पाठ्यांक, मुख्य पैमाना = 8.45 cm

वर्नियर पैमाना = 26 भाग

कागज को कांच के गुटके में से देखने पर पाठ्यांक

मुख्य पैमाना पर = 7.12 cm

वर्नियर पैमाना = 4 भाग

कांच गुटके के ऊपर पाउडर डालकर देखने पर

मुख्य पैमाना पाठ्यांक = 4.05 cm

वर्नियर पाठ्यांक = 1 भाग

तब कांच गुटके का अपवर्तनांक होगा :

Options :

878270219757. 1.24

878270219758. 1.42

878270219759. 1.35

878270219760. 1.52

Physics Section B

Section Id :	8782701167
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 :	8782702074
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 51 Question Id : 87827055928 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Two open organ pipes of lengths 60 cm and 90 cm resonate at 6th and 5th harmonics respectively.
The difference of frequencies for the given modes is _____ Hz.
(Velocity of sound in air = 333 m/s)

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 : 87827055928 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

दो खुले वायु - नली 60 सेमी तथा 90 सेमी लम्बाई को क्रमशः छोटे तथा पाँचवें हारमोनिक (विधा) में कम्पित कराये जाते हैं।
इन विधाओं में आवृत्ति का अन्तर [वायुगति = 333 मी/से.] _____ है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

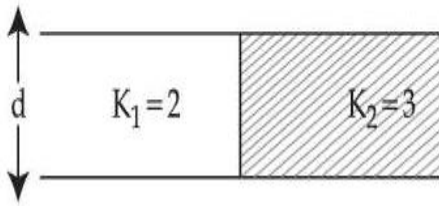
1

Question Number : 52 Question Id : 87827055929 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

A capacitor of $10\ \mu\text{F}$ capacitance whose plates are separated by $10\ \text{mm}$ through air and each plate has area $4\ \text{cm}^2$ is now filled equally with two dielectric media of $K_1 = 2$, $K_2 = 3$ respectively as shown in figure. If new force between the plates is $8\ \text{N}$. The supply voltage is _____ V.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

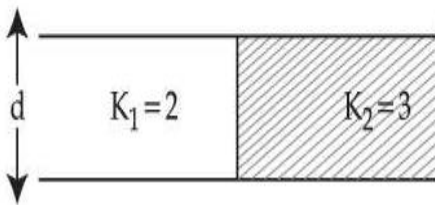
1

Question Number : 52 **Question Id :** 87827055929 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

एक $10\ \mu\text{F}$ का संधारित्र की प्लेट $10\ \text{mm}$ की दूरी पर हवा में है, प्रत्येक प्लेट की सतह का क्षेत्रफल $4\ (\text{सेमी})^2$ है। दोनों के मध्य दो समान द्वि-परा वैद्युतांक पदार्थ $K_1 = 2$, $K_2 = 3$ क्रमशः रखे जाते हैं - जैसे चित्र में दिखाया गया है। अब प्लेटों के मध्य नया बल $8\ \text{N}$ है तब आरोपित बाह्य विभव _____ V है।



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

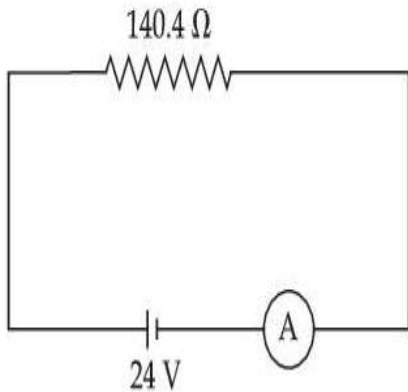
1

Question Number : 53 Question Id : 87827055930 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 given figure an ammeter A consists of a $240\ \Omega$ coil connected in parallel to a $10\ \Omega$ shunt. The reading of the ammeter is _____ mA.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

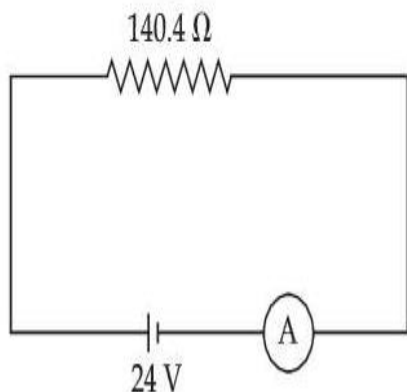
1

Question Number : 53 Question Id : 87827055930 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

दिये चित्र में अमीटर की कुण्डली 240 ओम की है जिसके समान्तर क्रम में 10 ओम का एक शन्ट तार लगा है। अमीटर का पाठ्यांक मिली-एम्पीयर में _____ है।



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 : 87827055931 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Two coherent monochromatic light beams of intensities I and $4I$ are superimposed. The difference between maximum and minimum possible intensities in the resulting beam is xI . 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 : 87827055931 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

दो कला संबद्ध एकवर्णी प्रकाश किरण पुन्ज की तीव्रता I तथा $4I$ हैं, दोनों एक स्थान पर अध्यारोपित हैं। परिणामी किरण-पुन्ज में उच्चतम तथा निम्नतम सम्भावित तीव्रताओं का अन्तर xI है 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

Question Number : 55 Question Id : 87827055932 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

In Franck-Hertz experiment, the first dip in the current-voltage graph for hydrogen is observed at 10.2 V. The wavelength of light emitted by hydrogen atom when excited to the first excitation level is _____ nm. (Given $hc = 1245 \text{ eV nm}$, $e = 1.6 \times 10^{-19} \text{ C}$).

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 : 87827055932 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक फ्रैंक-हर्ट्ज प्रयोग के धारा-विभव ग्राफ में हाइड्रोजन गैस से प्रथम निम्नतम बिन्दु 10.2 V पर पाया गया। हाइड्रोजन परमाणु को प्रथम स्तर पर उत्तेजित करने पर प्रकाश तरंगदैर्घ्य _____ nm है।

[दिया है - $hc = 1245 \text{ eVnm}$, $e = 1.6 \times 10^{-19} \text{C}$].

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 :** 87827055933 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

Three balls of masses 2kg, 4kg and 6kg respectively are arranged at centre of the edges of an equilateral triangle of side 2 m. The moment of inertia of the system about an axis through the centroid and perpendicular to the plane of triangle, will be _____ kg m^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 :** 87827055933 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

एक समबाहु त्रिभुज, भुजा 2 cm, के तीन किनारों पर 2, 4, 6 kg के तीन गेंद रखी है। त्रिभुज के सतह के लम्बवत व त्रिभुज के केन्द्र से जाने वाले अक्ष के परितः जड़त्व आघूर्ण (kg m^2) में _____ 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 :** 87827055934 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

A particle moves in a straight line so that its displacement x at any time t is given by $x^2=1+t^2$. Its acceleration at any time t is x^{-n} where $n =$ _____.

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 :** 87827055934 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

एक कण सीधी रेखा में गति करता है कि इसके विस्थापन का समय के साथ समीकरण $x^2=1+t^2$ से दिया जाता है। इसका किसी समय पर त्वरण x^{-n} है तब n 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 : 58 Question Id : 87827055935 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

A coil having 100 turns, area of $5 \times 10^{-3} \text{ m}^2$, carrying current of 1 mA is placed in uniform magnetic field of 0.20 T such a way that plane of coil is perpendicular to the magnetic field. The work done in turning the coil through 90° is _____ μJ .

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 : 87827055935 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक 100 फेरों व $5 \times 10^{-3} \text{ m}^2$ क्षेत्रफल की कुण्डली में 1 mA विद्युत है, के एक चुम्बकीय क्षेत्र 0.20 T में इस प्रकार रखा जाता है कि वह चुम्बकीय क्षेत्र के लम्बवत रहती है। कुण्डली को 90° से घुमाने में किया गया कार्य _____ μJ 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 : 87827055936 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

For a given series LCR circuit it is found that maximum current is drawn when value of variable capacitance is 2.5 nF. If resistance of 200Ω and 100 mH inductor is being used in the given circuit. The frequency of ac source is _____ $\times 10^3$ Hz. (given $\pi^2 = 10$)

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 : 87827055936 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक LCR श्रेणी परिपथ से अधिकतम विद्युत ली जाती है जबकि परिवर्तनीय वैद्युत संधारित्र का मान 2.5 nF है। यदि प्रतिरोध 200 ओम तथा प्रेरणांक 100 mH है तब स्रोत की प्रत्यावर्ती विद्युतधारा की आवृत्ति _____ $\times 10^3$ Hz होगी।

(माना $\pi^2 = 10$)

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 : 87827055937 Question Type : SA Calculator : None

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

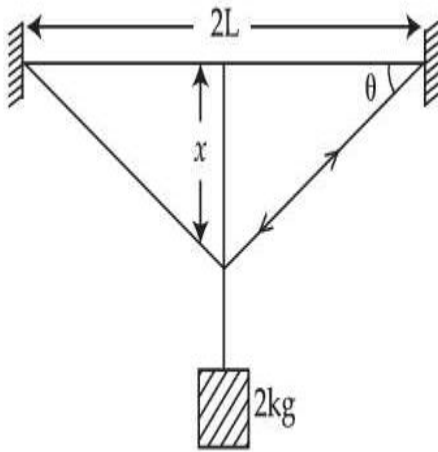
Correct Marks : 4 Wrong Marks : 1

A wire of cross sectional area A , modulus of elasticity $2 \times 10^{11} \text{ Nm}^{-2}$ and length 2 m is stretched between two vertical rigid supports. When a mass of 2 kg is suspended at the middle it sags lower

from its original position making angle $\theta = \frac{1}{100}$ radian on the points of support. The value of A is

_____ $\times 10^{-4} \text{ m}^2$ (consider $x \ll L$).

(given : $g = 10 \text{ m/s}^2$)



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

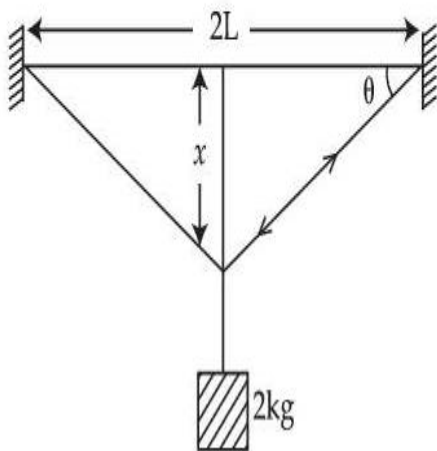
1

Question Number : 60 Question Id : 87827055937 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 दो दृढ़ ऊर्ध्वाधर बिन्दुओं के मध्य खींचकर लगाया गया है, जिसका अनुपृस्थ क्षेत्रफल A , प्रत्यास्थ गुणांक $2 \times 10^{11} \text{ Nm}^{-2}$ तथा लम्बाई 2 m है। जब इसके मध्य बिन्दु पर 2 kg का भार लटकाया जाता है तो यह एक कोण $\theta = \frac{1}{100}$ रेडियन का बनाता है। तब इसका परिच्छेद क्षेत्रफल A _____ $\times 10^{-4} \text{ m}^2$ (माना $x \ll L$) है। (given; $g=10 \text{ m/s}^2$)



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Chemistry Section A

Section Id :	8782701168
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 : 8782702075
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 61 Question Id : 87827055938 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

Molality (m) of 3 M aqueous solution of NaCl is :

(Given : Density of solution = 1.25 g mL^{-1} , Molar mass in g mol^{-1} : Na-23, Cl-35.5)

Options :

878270219771. 2.79 m

878270219772. 3.85 m

878270219773. 2.90 m

878270219774. 1.90 m

Question Number : 61 Question Id : 87827055938 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

NaCl के 3 M जलीय विलयन की मोललता (m) है :

(दिया गया है : विलयन का घनत्व = 1.25 g mL^{-1} ; g mol^{-1} में मोलर द्रव्यमान : Na-23, Cl-35.5)

Options :

878270219771. 2.79 m

878270219772. 3.85 m

878270219773. 2.90 m

878270219774. 1.90 m

Question Number : 62 Question Id : 87827055939 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 : PF_5 and BrF_5 both exhibit sp^3d hybridisation.

Statement II : Both SF_6 and $[\text{Co}(\text{NH}_3)_6]^{3+}$ exhibit sp^3d^2 hybridisation.

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

Options :

878270219775. Both **Statement I** and **Statement II** are true

878270219776. Both **Statement I** and **Statement II** are false

878270219777. **Statement I** is true but **Statement II** is false

878270219778. **Statement I** is false but **Statement II** is true

Question Number : 62 Question Id : 87827055939 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 : PF_5 एवं BrF_5 दोनों ही sp^3d संकरण प्रदर्शित करते हैं।

कथन II : SF_6 एवं $[\text{Co}(\text{NH}_3)_6]^{3+}$ दोनों ही sp^3d^2 संकरण प्रदर्शित करते हैं।

उपर्युक्त कथनों के संदर्भ में नीचे दिये गये विकल्पों में से सर्वाधिक उपयुक्त उत्तर चुनें :

Options :

878270219775. दोनों कथन I एवं कथन II सही हैं।

878270219776. दोनों कथन I एवं कथन II गलत हैं।

878270219777. कथन I सही है परन्तु कथन II गलत है।

878270219778. कथन I गलत है परन्तु कथन II सही है।

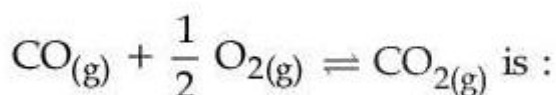
Question Number : 63 Question Id : 87827055940 Question Type : MCQ Option Shuffling : Yes

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 ratio $\frac{K_P}{K_C}$ for the reaction :



Options :

878270219779. $\frac{1}{\sqrt{RT}}$

878270219780. $(RT)^{1/2}$

878270219781. RT

878270219782. 1

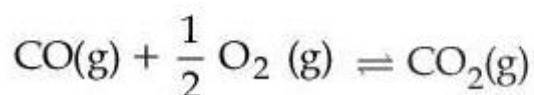
Question Number : 63 Question Id : 87827055940 Question Type : MCQ Option Shuffling : Yes

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 के लिए अनुपात $\frac{K_P}{K_C}$ है :



Options :

878270219779. $\frac{1}{\sqrt{RT}}$

878270219780. $(RT)^{1/2}$

878270219781. RT

878270219782.

Question Number : 64 Question Id : 87827055941 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

Match List - I with List - II.

List - I Reaction	List - II Type of redox reaction
(A) $\text{N}_{2(g)} + \text{O}_{2(g)} \rightarrow 2\text{NO}_{(g)}$	(I) Decomposition
(B) $2\text{Pb}(\text{NO}_3)_{2(s)} \rightarrow 2\text{PbO}_{(s)} + 4\text{NO}_{2(g)} + \text{O}_{2(g)}$	(II) Displacement
(C) $2\text{Na}_{(s)} + 2\text{H}_2\text{O}_{(l)} \rightarrow 2\text{NaOH}_{(aq.)} + \text{H}_{2(g)}$	(III) Disproportionation
(D) $2\text{NO}_{2(g)} + 2^-\text{OH}_{(aq.)} \rightarrow \text{NO}_{2(aq.)}^- + \text{NO}_{3(aq.)}^- + \text{H}_2\text{O}_{(l)}$	(IV) Combination

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

Options :

878270219783. (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

878270219784. (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

878270219785. (A)-(III), (B)-(II), (C)-(I), (D)-(IV)

878270219786. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Question Number : 64 Question Id : 87827055941 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

सूची-I का मिलान सूची-II से करें :

सूची-I (अभिक्रिया)	सूची-II (रिडॉक्स अभिक्रिया का प्रकार)
(A) $\text{N}_{2(g)} + \text{O}_{2(g)} \rightarrow 2\text{NO}_{(g)}$	(I) अपघटन
(B) $2\text{Pb}(\text{NO}_3)_{2(s)} \rightarrow 2\text{PbO}_{(s)} + 4\text{NO}_{2(g)} + \text{O}_{2(g)}$	(II) विस्थापन
(C) $2\text{Na}_{(s)} + 2\text{H}_2\text{O}_{(l)} \rightarrow 2\text{NaOH}_{(aq)} + \text{H}_{2(g)}$	(III) असमानुपातन
(D) $2\text{NO}_{2(g)} + 2\text{OH}^-_{(aq)} \rightarrow \text{NO}_2^-_{(aq)} + \text{NO}_3^-_{(aq)} + \text{H}_2\text{O}_{(l)}$	(IV) योग

नीचे दिये गए विकल्पों में से सही उत्तर को चुनें :

Options :

878270219783. (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

878270219784. (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

878270219785. (A)-(III), (B)-(II), (C)-(I), (D)-(IV)

878270219786. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Question Number : 65 Question Id : 87827055942 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

How can an electrochemical cell be converted into an electrolytic cell ?

Options :

878270219787. Exchanging the electrodes at anode and cathode.

878270219788. Reversing the flow of ions in salt bridge.

878270219789. Applying an external opposite potential lower than E^0_{cell} .

878270219790. Applying an external opposite potential greater than E^0_{cell} .

Question Number : 65 Question Id : 87827055942 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 वैद्युत रासायनिक सेल को कैसे वैद्युत अपघटनी सेल में परिवर्तित किया जा सकता है?

Options :

878270219787. एनोड एवं कैथोड के इलेक्ट्रोडों का विनिमय करना

878270219788. लवण सेतु में आयनों के प्रवाह को विपरीत दिशा में करना

878270219789. E^0 सेल से कम बाह्य विभव को विपरीत दिशा में लगाना

878270219790. E^0 सेल से अधिक बाह्य विभव को विपरीत दिशा में लगाना

Question Number : 66 Question Id : 87827055943 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

Match List - I with List - II.

List - I		List - II	
Alkali Metal		Emission Wavelength in nm	
(A)	Li	(I)	589.2
(B)	Na	(II)	455.5
(C)	Rb	(III)	670.8
(D)	Cs	(IV)	780.0

Choose the correct answer from the options given below :

Options :

878270219791. (A)-(I), (B)-(IV), (C)-(III), (D)-(II)

878270219792. (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

878270219793. (A)-(II), (B)-(IV), (C)-(III), (D)-(I)

878270219794. (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

Question Number : 66 Question Id : 87827055943 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

सूची-I का मिलान सूची-II से करें :

सूची-I (क्षार धातुएँ)	सूची-II (उत्सर्जन तरंगदैर्घ्य nm में)
(A) Li	(I) 589.2
(B) Na	(II) 455.5
(C) Rb	(III) 670.8
(D) Cs	(IV) 780.0

नीचे दिये गए विकल्पों में से सही उत्तर को चुनें :

Options :

878270219791. (A)-(I), (B)-(IV), (C)-(III), (D)-(II)

878270219792. (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

878270219793. (A)-(II), (B)-(IV), (C)-(III), (D)-(I)

878270219794. (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

Question Number : 67 Question Id : 87827055944 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 ions from the following that are expected to behave as oxidising agent is :
 Sn^{4+} , Sn^{2+} , Pb^{2+} , Tl^{3+} , Pb^{4+} , Tl^{+}

Options :

878270219795. 3

878270219796.

878270219797. 4

878270219798. 1

Question Number : 67 Question Id : 87827055944 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 आयनों में से उन आयनों की संख्या जो एक ऑक्सीकारक पदार्थ के रूप में कार्य कर सकते हैं :

Sn^{4+} , Sn^{2+} , Pb^{2+} , Tl^{3+} , Pb^{4+} , Tl^{+}

Options :

878270219795. 3

878270219796. 2

878270219797. 4

878270219798. 1

Question Number : 68 Question Id : 87827055945 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

Evaluate the following statements related to group 14 elements for their correctness.

- (A) Covalent radius decreases down the group from C to Pb in a regular manner.
- (B) Electronegativity decreases from C to Pb down the group gradually.
- (C) Maximum covalance of C is 4 whereas other elements can expand their covalance due to presence of d orbitals.
- (D) Heavier elements do not form $p\pi-p\pi$ bonds.
- (E) Carbon can exhibit negative oxidation states.

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

Options :

(A) and (B) Only

878270219799.

(C) and (D) Only

878270219800.

(A), (B) and (C) Only

878270219801.

(C), (D) and (E) Only

878270219802.

Question Number : 68 Question Id : 87827055945 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

समूह 14 तत्वों के संदर्भ में निम्नलिखित कथनों की सत्यता को मूल्यांकित करें :

- (A) C से Pb तक समूह में नीचे जाने पर सहसंयोजी त्रिज्या नियमित क्रम में घटती है।
 - (B) C से Pb तक समूह में नीचे जाने पर विद्युत ऋणात्मकता धीरे-धीरे घटती है।
 - (C) C की अधिकतम सहसंयोजकता 4 है जबकि अन्य तत्व, d-कक्षकों की उपस्थिति के कारण, अपनी सहसंयोजकता का विस्तार कर सकते हैं।
 - (D) भारी तत्व $p\pi-p\pi$ आबन्ध नहीं बनाते हैं।
 - (E) कार्बन ऋणात्मक ऑक्सीकरण अवस्थाएँ प्रदर्शित कर सकता है।
- नीचे दिये गए विकल्पों में से सही उत्तर को चुनें :

Options :

878270219799. केवल (A) एवं (B)

878270219800. केवल (C) एवं (D)

878270219801. केवल (A), (B) एवं (C)

878270219802. केवल (C), (D) एवं (E)

Question Number : 69 Question Id : 87827055946 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

Arrange the following elements in the increasing order of number of unpaired electrons in it.

- (A) Sc
- (B) Cr
- (C) V
- (D) Ti
- (E) Mn

Choose the correct answer from the options given below :

Options :

878270219803. (B) < (C) < (D) < (E) < (A)

878270219804. (A) < (D) < (C) < (B) < (E)

878270219805. (A) < (D) < (C) < (E) < (B)

878270219806. $(C) < (E) < (B) < (A) < (D)$

Question Number : 69 Question Id : 87827055946 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 तत्वों को उनके पास अयुग्मित इलेक्ट्रॉनों की संख्या को बढ़ते क्रम में व्यवस्थित करें :

- (A) Sc
- (B) Cr
- (C) V
- (D) Ti
- (E) Mn

नीचे दिये गए विकल्पों में से सही उत्तर को चुनें :

Options :

878270219803. $(B) < (C) < (D) < (E) < (A)$

878270219804. $(A) < (D) < (C) < (B) < (E)$

878270219805. $(A) < (D) < (C) < (E) < (B)$

878270219806. $(C) < (E) < (B) < (A) < (D)$

Question Number : 70 Question Id : 87827055947 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 IUPAC name of $[\text{PtBr}_2(\text{PMe}_3)_2]$ is :

Options :

878270219807. dibromobis(trimethylphosphine)platinum(II)

878270219808. bis(trimethylphosphine)dibromoplatinum(II)

878270219809. dibromodi(trimethylphosphine)platinum(II)

878270219810. bis[bromo(trimethylphosphine)]platinum(II)

Question Number : 70 Question Id : 87827055947 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

$[\text{PtBr}_2(\text{PMe}_3)_2]$ का सही IUPAC नाम है :

Options :

878270219807. dibromobis(trimethylphosphine)platinum(II)

878270219808. bis(trimethylphosphine)dibromoplatinum(II)

878270219809. dibromodi(trimethylphosphine)platinum(II)

878270219810. bis[bromo(trimethylphosphine)]platinum(II)

Question Number : 71 Question Id : 87827055948 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

Match List - I with List - II.

List - I	List - II
Tetrahedral Complex	Electronic configuration
(A) TiCl_4	(I) e^2, t_2^0
(B) $[\text{FeO}_4]^{2-}$	(II) e^4, t_2^3
(C) $[\text{FeCl}_4]^-$	(III) e^0, t_2^0
(D) $[\text{CoCl}_4]^{2-}$	(IV) e^2, t_2^3

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

Options :

878270219811. (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

878270219812. (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

878270219813. (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

878270219814. (A)-(I), (B)-(III), (C)-(IV), (D)-(II)

Question Number : 71 Question Id : 87827055948 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

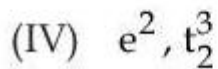
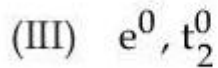
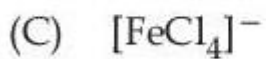
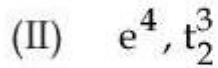
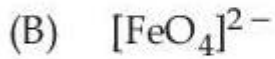
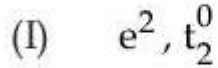
सूची-I का मिलान सूची-II से करें :

सूची-I

(चतुष्फलकीय संकुल)

सूची-II

(इलेक्ट्रॉनिक विन्यास)



नीचे दिये गए विकल्पों में से सही उत्तर को चुनें :

Options :

878270219811. (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

878270219812. (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

878270219813. (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

878270219814. (A)-(I), (B)-(III), (C)-(IV), (D)-(II)

Question Number : 72 Question Id : 87827055949 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

During the detection of acidic radical present in a salt, a student gets a pale yellow precipitate soluble with difficulty in NH_4OH solution when sodium carbonate extract was first acidified with dil. HNO_3 and then AgNO_3 solution was added. This indicates presence of :

Options :

878270219815. Cl^-

878270219816. Br^-

878270219817. I^-

878270219818. CO_3^{2-}

Question Number : 72 Question Id : 87827055949 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 लवण में उपस्थित अम्लीय मूलक की पहचान के दौरान किसी विद्यार्थी को NH_4OH विलयन में मुश्किल से साथ विलेय एक हलका-पीला अवक्षेप मिला जब तनु HNO_3 के साथ अम्लीकृत सोडियम कार्बोनेट निस्यंद में AgNO_3 को मिलाया गया। यह निम्न के उपस्थिति का संकेत करता है -

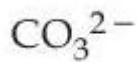
Options :

878270219815. Cl^-

878270219816. Br^-

878270219817. I^-

878270219818.



Question Number : 73 Question Id : 87827055950 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 statement among the following, for a "chromatography" purification method is :

Options :

878270219819. Non-polar compounds are retained at top and polar compounds come down in column chromatography.

878270219820. R_f is an integral value.

878270219821. Organic compounds run faster than solvent in the thin layer chromatographic plate.

878270219822. R_f of a polar compound is smaller than that of a non-polar compound.

Question Number : 73 Question Id : 87827055950 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

शोधन विधि वर्णलेखन (क्रोमैटोग्रैफी) के बारे में सही कथन है :

Options :

878270219819. अध्रुवीय यौगिक कॉलम वर्णलेखन में ऊपर रह जाते हैं और ध्रुवीय यौगिक नीचे आ जाते हैं।

878270219820. R_f एक पूर्णांक संख्या है।

878270219821. पतली परत वर्णलेखन प्लेट में कार्बनिक यौगिक विलायक से अधिक तीव्र गति से चलते हैं।

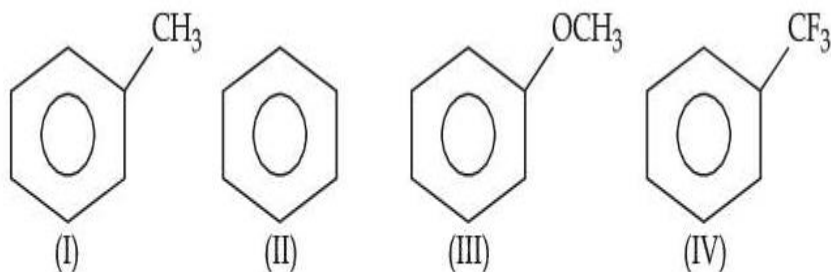
878270219822. ध्रुवीय यौगिकों का R_f मान अध्रुवीय यौगिकों से कम होता है।

Question Number : 74 Question Id : 87827055951 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 arrangement for decreasing order of electrophilic substitution for above compounds is :

Options :

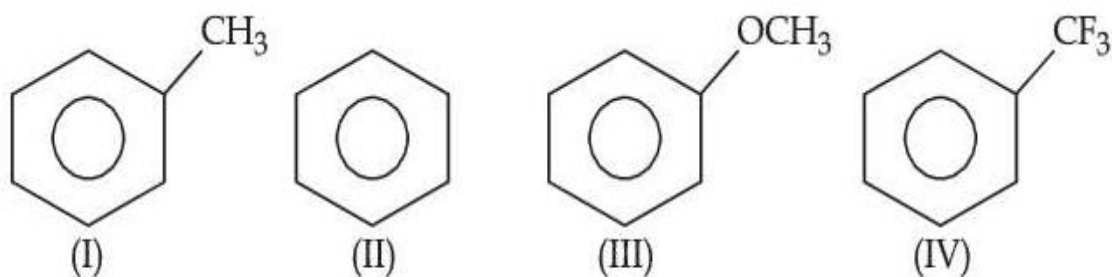
878270219823. (III) > (I) > (II) > (IV)

878270219824. (IV) > (I) > (II) > (III)

878270219825. (III) > (IV) > (II) > (I)

878270219826. (II) > (IV) > (III) > (I)

Question Number : 74 Question Id : 87827055951 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



उपर्युक्त यौगिकों के लिए इलेक्ट्रॉन स्नेही प्रतिस्थापन का सही घटता क्रम है :

Options :

878270219823. (III) > (I) > (II) > (IV)

878270219824. (IV) > (I) > (II) > (III)

878270219825. (III) > (IV) > (II) > (I)

878270219826. (II) > (IV) > (III) > (I)

Question Number : 75 Question Id : 87827055952 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 incorrect statement regarding the geometrical isomers of 2-butene is :

Options :

878270219827. cis-2-butene and trans-2-butene are stereoisomers.

878270219828. cis-2-butene and trans-2-butene are not interconvertible at room temperature.

878270219829. trans-2-butene is more stable than cis-2-butene.

878270219830. cis-2-butene has less dipole moment than trans-2-butene.

Question Number : 75 Question Id : 87827055952 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

2-ब्यूटीन के ज्यामितीय समावयवों के संदर्भ में गलत कथन है :

Options :

878270219827. सिस-2-ब्यूटीन एवं ट्रांस-2-ब्यूटीन त्रिविम समावयव हैं।

878270219828. सिस-2-ब्यूटीन एवं ट्रांस-2-ब्यूटीन कमरे के ताप में आपस में परिवर्तनीय नहीं हैं।

878270219829. ट्रांस-2-ब्यूटीन अधिक स्थायी है सिस-2-ब्यूटीन से।

878270219830.

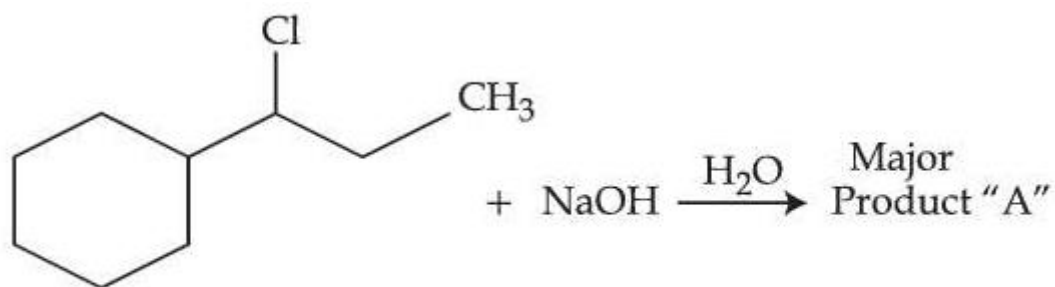
सिस-2-ब्यूटीन का द्विध्रुव आघूर्ण, ट्रांस-2-ब्यूटीन की अपेक्षा कम है।

Question Number : 76 Question Id : 87827055953 Question Type : MCQ Option Shuffling : Yes

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

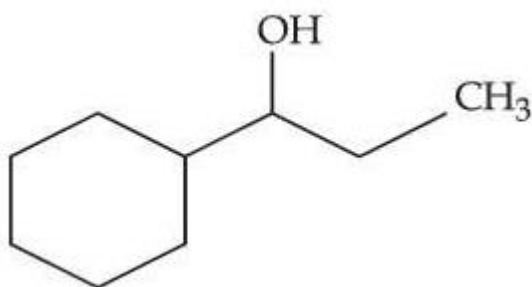
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

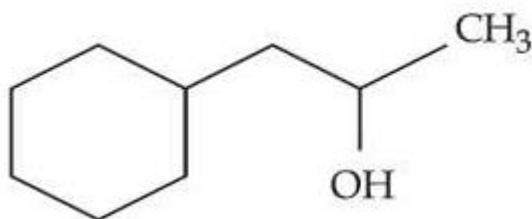


Consider the above chemical reaction. Product "A" is :

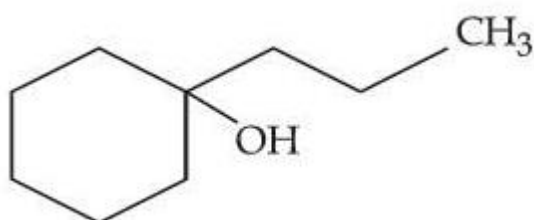
Options :



878270219831.

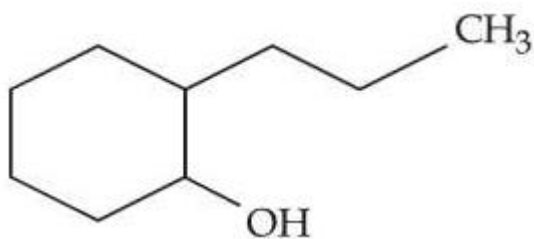


878270219832.



878270219833.

878270219834.

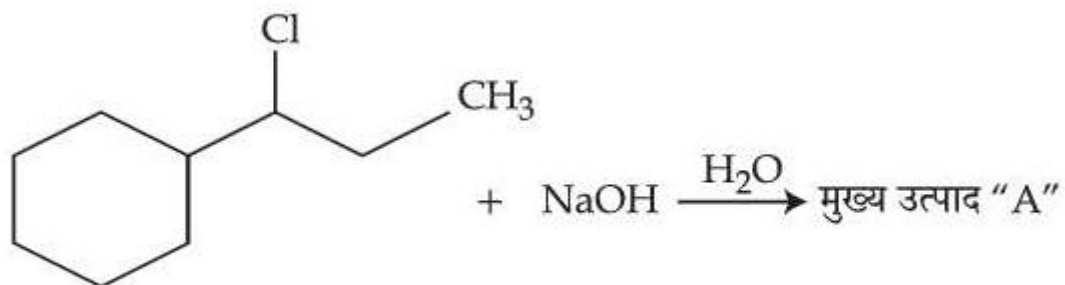


Question Number : 76 Question Id : 87827055953 Question Type : MCQ Option Shuffling : Yes

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

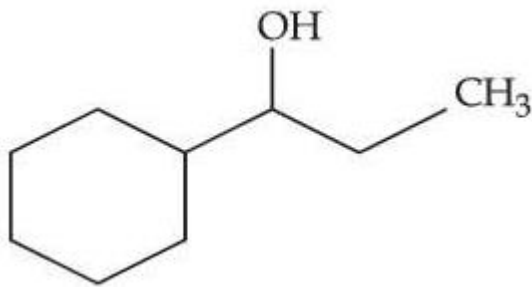
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

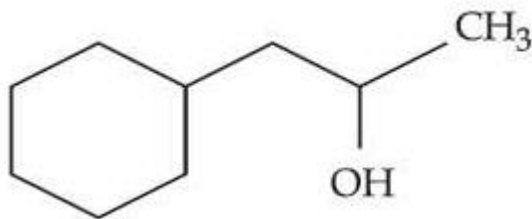


उपर्युक्त रासायनिक अभिक्रिया में मुख्य उत्पाद A है :

Options :

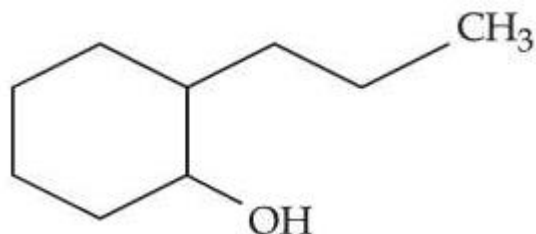
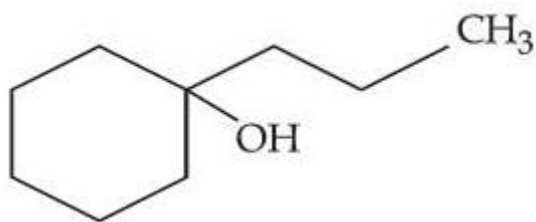


878270219831.



878270219832.

878270219833.



878270219834.

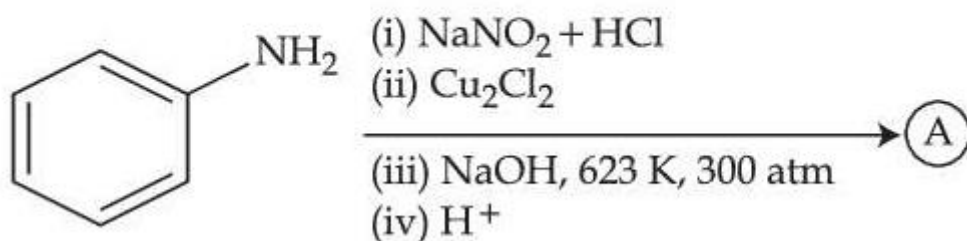
Question Number : 77 Question Id : 87827055954 Question Type : MCQ Option Shuffling : Yes

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

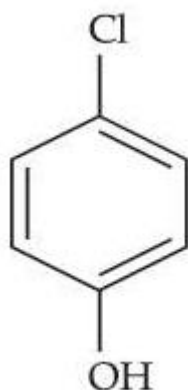
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Identify the product (A) in the following reaction.

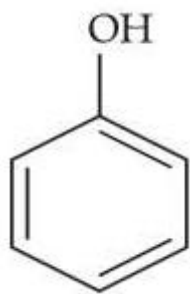
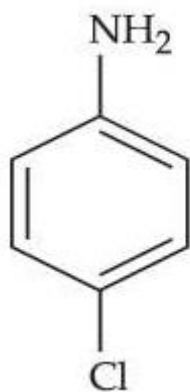


Options :

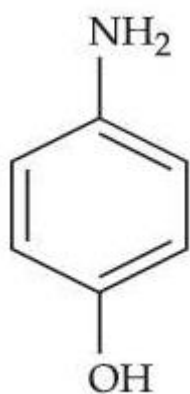


878270219835.

878270219836.



878270219837.



878270219838.

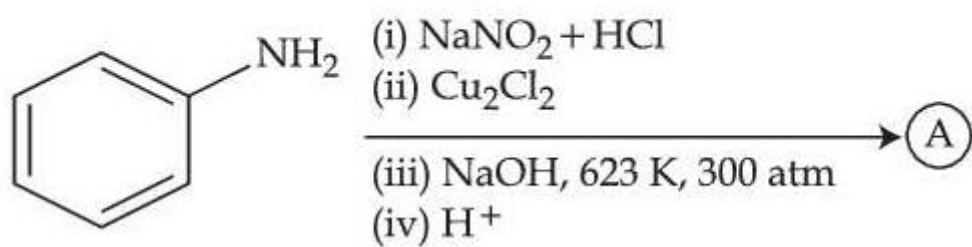
Question Number : 77 Question Id : 87827055954 Question Type : MCQ Option Shuffling : Yes

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

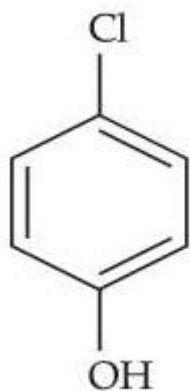
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

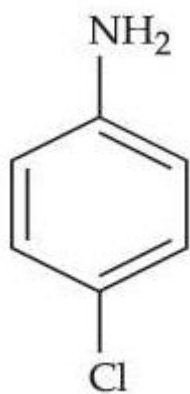
निम्न अभिक्रिया में उत्पाद (A) को पहचानिए :



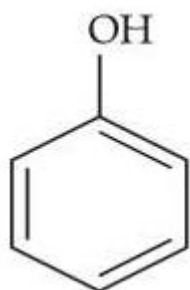
Options :



878270219835.

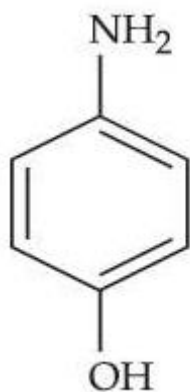


878270219836.



878270219837.

878270219838.



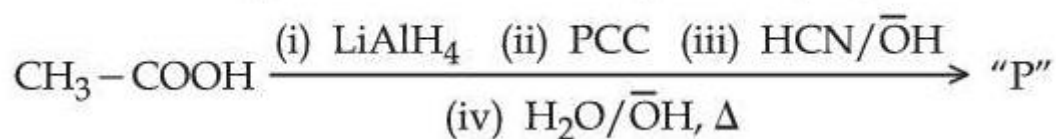
Question Number : 78 Question Id : 87827055955 Question Type : MCQ Option Shuffling : Yes

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

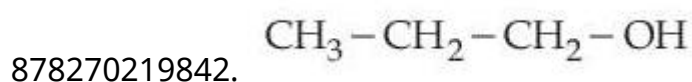
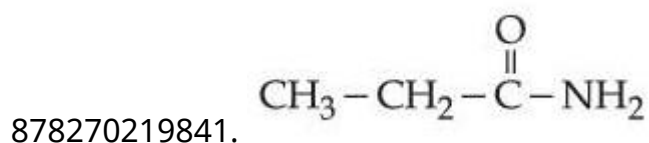
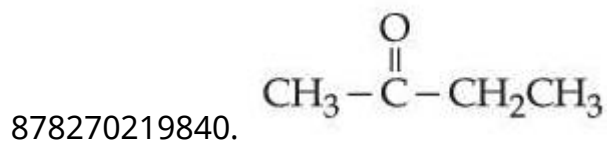
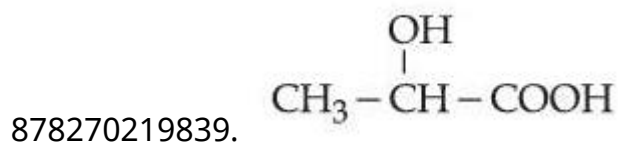
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Consider the given reaction, identify the major product P.



Options :



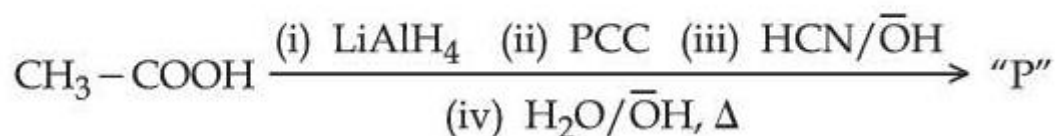
Question Number : 78 Question Id : 87827055955 Question Type : MCQ Option Shuffling : Yes

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

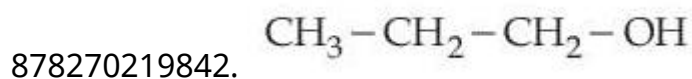
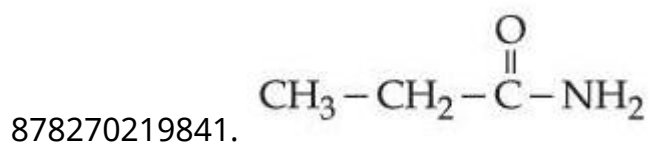
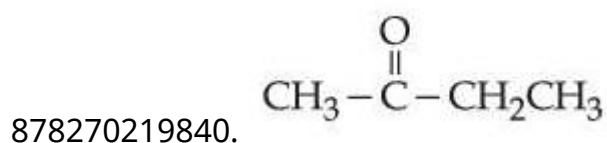
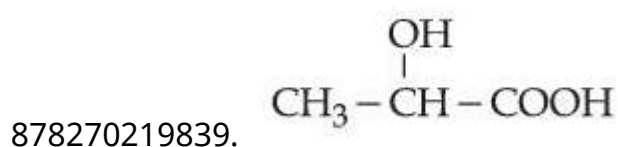
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया पर विचार करते हुए मुख्य उत्पाद 'P' को पहचानिए :



Options :



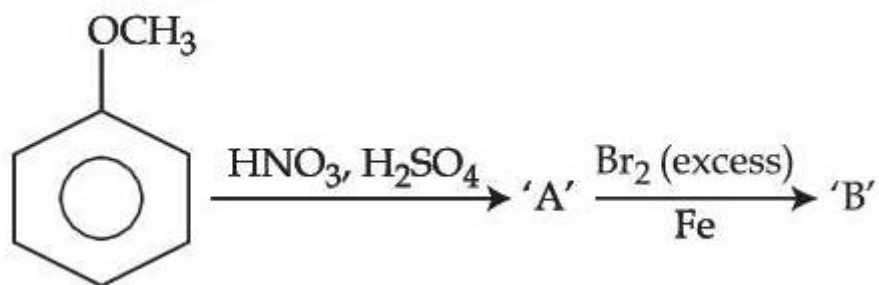
Question Number : 79 Question Id : 87827055956 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

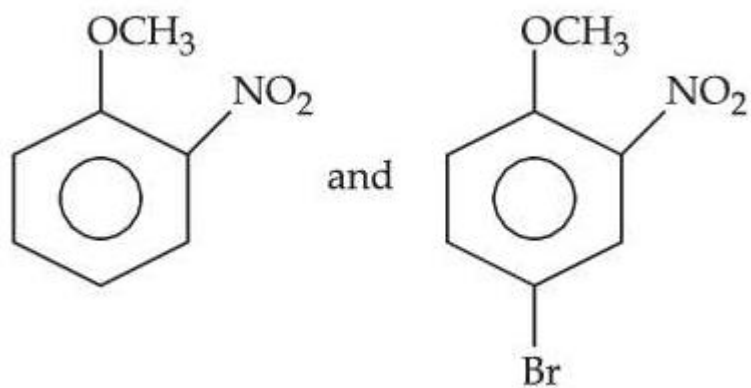
Correct Marks : 4 Wrong Marks : 1

The major products formed :

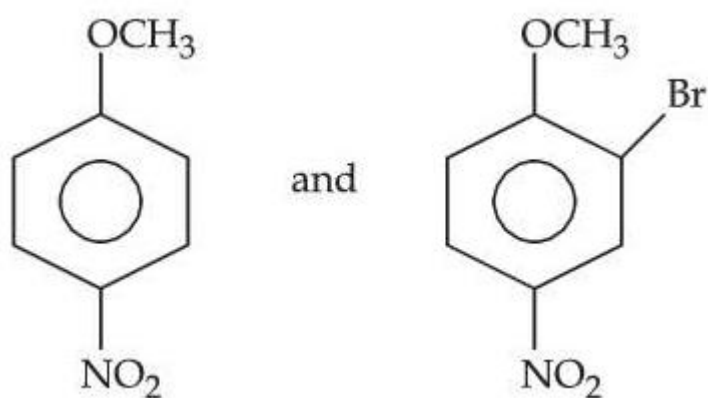


A and B respectively are :

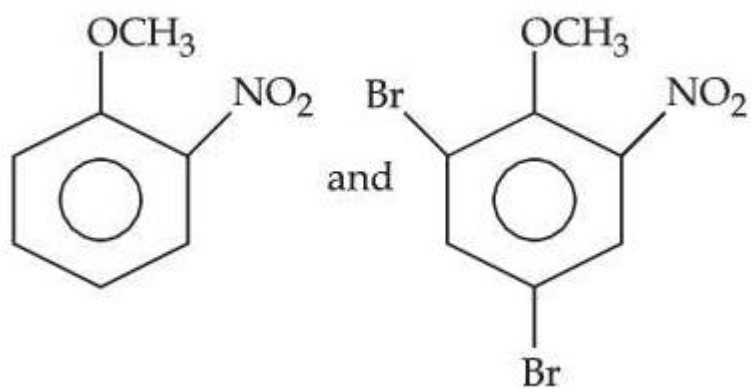
Options :



878270219843.

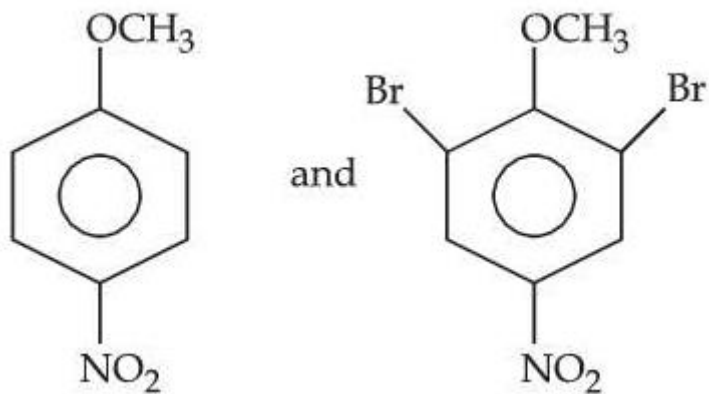


878270219844.



878270219845.

878270219846.



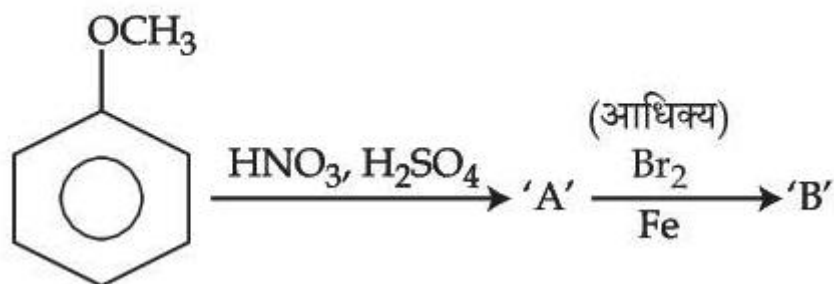
Question Number : 79 Question Id : 87827055956 Question Type : MCQ Option Shuffling : Yes

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

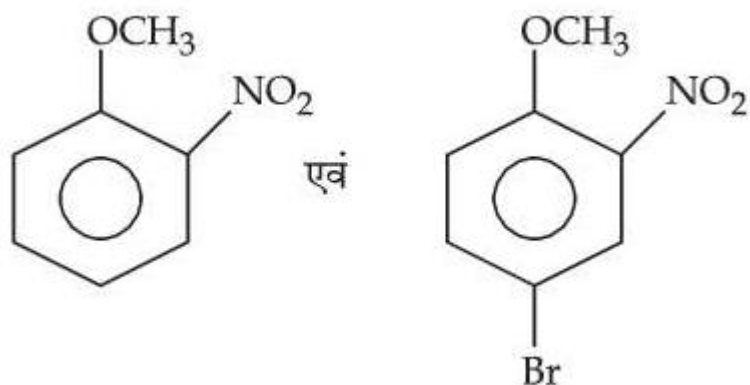
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निर्मित मुख्य उत्पाद A एवं B हैं, क्रमशः :



Options :

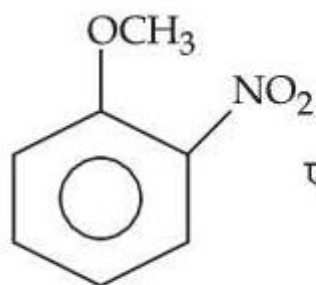
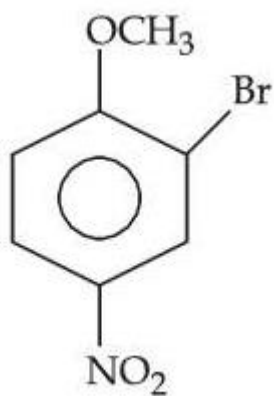


878270219843.

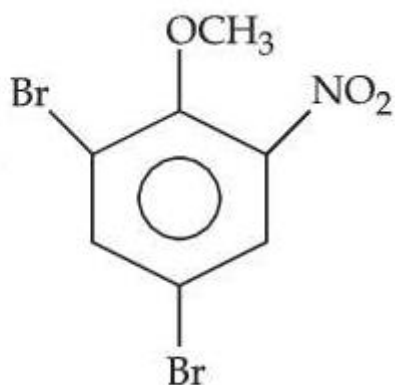
878270219844.



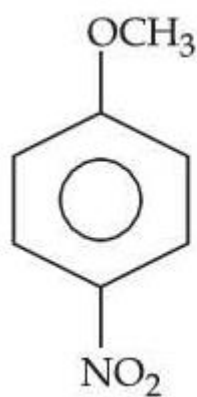
एवं



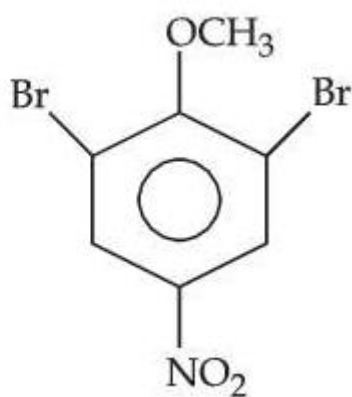
एवं



878270219845.



एवं



878270219846.

Question Number : 80 Question Id : 87827055957 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 incorrect statements regarding enzymes are :

- (A) Enzymes are biocatalysts.
- (B) Enzymes are non-specific and can catalyse different kinds of reactions.
- (C) Most Enzymes are globular proteins.
- (D) Enzyme - oxidase catalyses the hydrolysis of maltose into glucose.

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

Options :

878270219847. (B) and (D)

878270219848. (B), (C) and (D)

878270219849. (A), (B) and (C)

878270219850. (B) and (C)

Question Number : 80 Question Id : 87827055957 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

एन्जाइमों के संदर्भ में गलत कथन हैं :

- (A) एन्जाइम जैव उत्प्रेरक है।
- (B) एन्जाइम विशिष्ट नहीं है तथा विभिन्न प्रकार की अभिक्रियाओं को उत्प्रेरित कर सकते हैं।
- (C) अधिकांश एन्जाइम ग्लोब्यूलर (गोलीय) प्रोटीन होते हैं।
- (D) एन्जाइम ऑक्सिडेज, माल्टोस का ग्लूकोस में जल अपघटन उत्प्रेरित करता है।

नीचे दिये गए विकल्पों में से **सही** उत्तर को चुनें :

Options :

878270219847. (B) एवं (D)

878270219848. (B), (C) एवं (D)

878270219849. (A), (B) एवं (C)

878270219850. (B) एवं (C)

Chemistry Section B

Section Id :	8782701169
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 :	8782702076
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 81 Question Id : 87827055958 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

For hydrogen atom, energy of an electron in first excited state is -3.4 eV, K.E. of the same electron of hydrogen atom is x eV. Value of x is _____ $\times 10^{-1}$ eV. (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 :** 87827055958 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

हाइड्रोजन परमाणु के लिए, प्रथम उत्तेजित अवस्था में किसी इलेक्ट्रॉन की ऊर्जा -3.4 eV है। हाइड्रोजन परमाणु के उसी इलेक्ट्रॉन की K.E. x eV है। x का मान है : _____ $\times 10^{-1}$ eV।

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 :** 87827055959 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

Total number of species from the following with central atom utilising sp^2 hybrid orbitals for bonding is _____.

NH_3 , SO_2 , SiO_2 , $BeCl_2$, C_2H_2 , C_2H_4 , BCl_3 , $HCHO$, C_6H_6 , BF_3 , $C_2H_4Cl_2$

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 :** 87827055959 **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 स्पीशीज़ों की कुल संख्या जिनमें केन्द्रीय परमाणु आबन्धन में sp^2 संकरित कक्षकों का उपयोग करता है : _____।

NH_3 , SO_2 , SiO_2 , $BeCl_2$, C_2H_2 , C_2H_4 , BCl_3 , $HCHO$, C_6H_6 , BF_3 , $C_2H_4Cl_2$

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 :** 87827055960 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

For the reaction at 298 K, $2A + B \rightarrow C$. $\Delta H = 400 \text{ kJ mol}^{-1}$ and $\Delta S = 0.2 \text{ kJ mol}^{-1} \text{ K}^{-1}$. The reaction will become spontaneous above _____ K.

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 : 87827055960 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

298 K पर होने वाली अभिक्रिया $2A + B \rightarrow C$ के लिए, $\Delta H = 400 \text{ kJ mol}^{-1}$ एवं $\Delta S = 0.2 \text{ kJ mol}^{-1}\text{K}^{-1}$,
_____ K के ऊपर अभिक्रिया स्वतः हो जाएगी।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

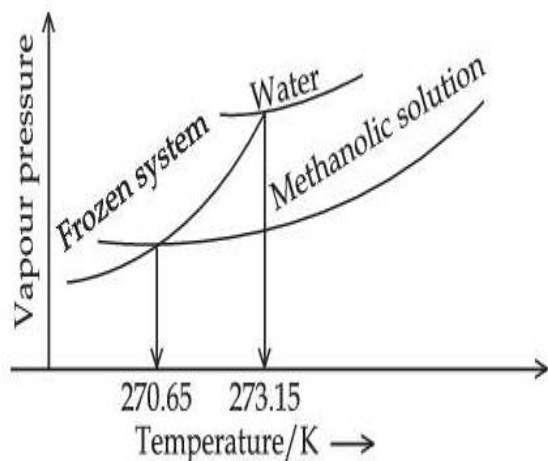
1

Question Number : 84 Question Id : 87827055961 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

When ' x ' $\times 10^{-2}$ mL methanol (molar mass = 32 g; density = 0.792 g/cm^3) is added to 100 mL water (density = 1 g/cm^3), the following diagram is obtained.



$x = \underline{\hspace{2cm}}$ (nearest integer).

[Given : Molal freezing point depression constant of water at 273.15 K is $1.86 \text{ K kg mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

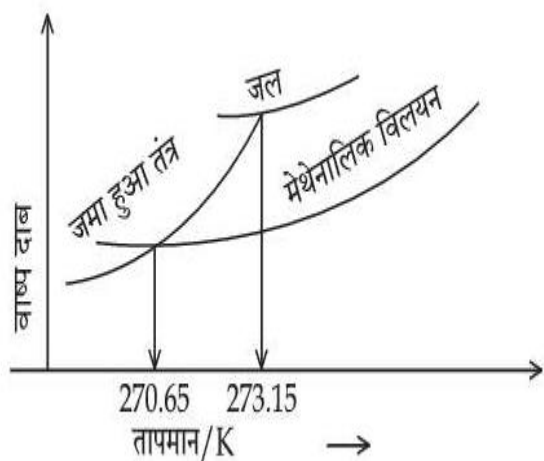
1

Question Number : 84 **Question Id :** 87827055961 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

जब मेथेनॉल (मोलर द्रव्यमान = 32 g, घनत्व = 0.792 g/cm³) के 'x' × 10⁻² mL को जल के 100 mL (घनत्व = 1 g/cm³) में मिलाया जाता है तो निम्न चित्र प्राप्त होता है।



$x =$ _____ (निकटतम पूर्णांक में)

(दिया गया है : जल का 273.15 K पर हिमांक अवनमन स्थिरांक = 1.86 K kg mol⁻¹ है)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

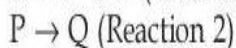
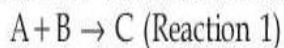
1

Question Number : 85 **Question Id :** 87827055962 **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 two different first order reactions given below



The ratio of the half life of Reaction 1 : Reaction 2 is 5 : 2. If t_1 and t_2 represent the time taken to

complete $\frac{2}{3}$ rd and $\frac{4}{5}$ th of Reaction 1 and Reaction 2, respectively, then the value of the ratio

$t_1 : t_2$ is _____ × 10⁻¹ (nearest integer).

[Given : $\log_{10}(3) = 0.477$ and $\log_{10}(5) = 0.699$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

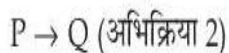
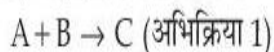
1

Question Number : 85 **Question Id :** 87827055962 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

नीचे दिए गए दो भिन्न प्रथम कोटि की अभिक्रियाओं पर विचार करें :



अभिक्रिया 1 की अर्धआयु : अभिक्रिया 2 की अर्धआयु का अनुपात 5 : 2 है। यदि अभिक्रिया 1 एवं अभिक्रिया 2 के क्रमशः

$\frac{2}{3}^{\text{rd}}$ एवं $\frac{4}{5}^{\text{th}}$ भाग को पूर्ण होने में लगा समय क्रमशः t_1 एवं t_2 है तो $t_1 : t_2$ अनुपात का मान है : _____ $\times 10^{-1}$

(निकटतम पूर्णांक में)

(दिया गया है $\log_{10}(3) = 0.477$ एवं $\log_{10}(5) = 0.699$)

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 :** 87827055963 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

Among VO_2^+ , MnO_4^- and $\text{Cr}_2\text{O}_7^{2-}$, the spin-only magnetic moment value of the species with least

oxidising ability is _____ BM (Nearest integer).

(Given atomic number V = 23, Mn = 25, Cr = 24)

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 : 87827055963 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

VO_2^+ , MnO_4^- एवं $\text{Cr}_2\text{O}_7^{2-}$ में से न्यूनतम ऑक्सीकारक क्षमता वाले स्पीशीज के 'प्रचक्रण मात्र' चुम्बकीय आघूर्ण का मान है : _____ BM (निकटतम पूर्णांक में)
(दिया गया है : परमाणु क्रमांक V = 23, Mn = 25, Cr = 24)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

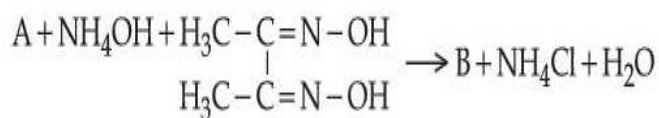
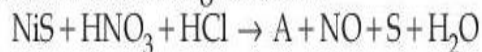
1

Question Number : 87 Question Id : 87827055964 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 following reactions



The number of protons that do not involve in hydrogen bonding in the product B is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

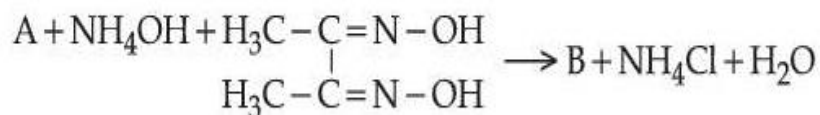
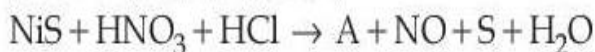
1

Question Number : 87 **Question Id :** 87827055964 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

निम्न अभिक्रियाओं पर विचार करें :



उत्पाद B में उन प्रोटॉनों की संख्या जो हाइड्रोजन आबन्धन में भाग नहीं ले रहा है : _____ ।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

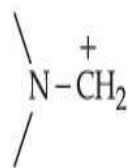
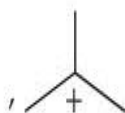
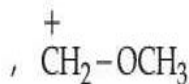
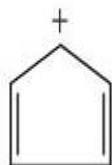
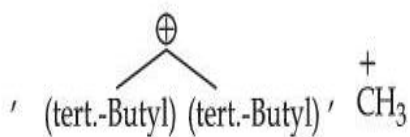
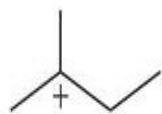
Question Number : 88 **Question Id :** 87827055965 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 Wrong Marks : 1

Number of carbocations from the following that are not stabilized by hyperconjugation is

_____.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

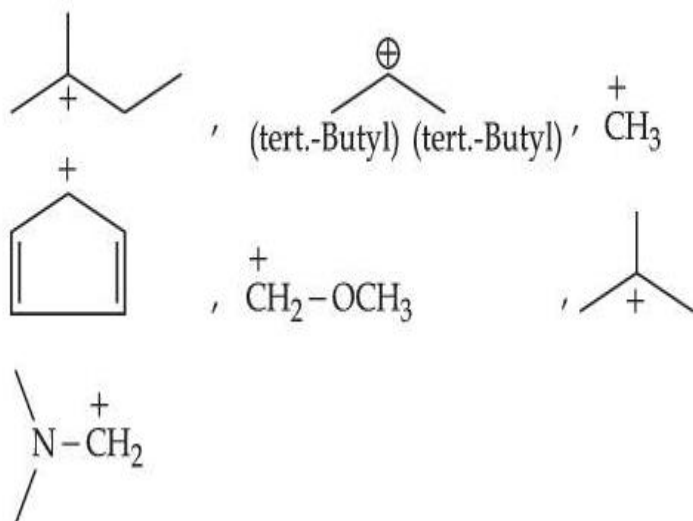
1

Question Number : 88 Question Id : 87827055965 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 कार्बकैटायनों की संख्या जो अतिसंयुग्मन द्वारा स्थायीकृत नहीं हो रहे हैं : _____ ।



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

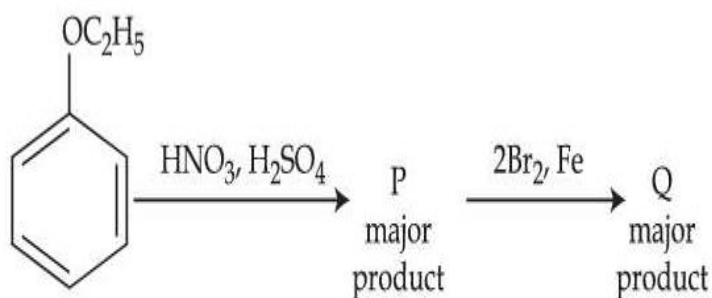
Possible Answers :

1

Question Number : 89 **Question Id :** 87827055966 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1



The ratio of number of oxygen atoms to bromine atoms in the product Q is _____ $\times 10^{-1}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

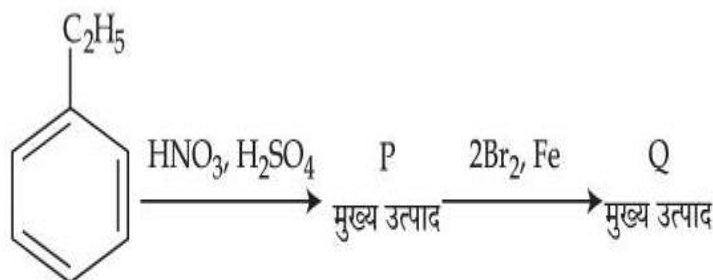
Possible Answers :

1

Question Number : 89 **Question Id :** 87827055966 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1



उत्पाद Q में ऑक्सीजन परमाणुओं की संख्या एवं ब्रोमीन परमाणुओं की संख्या का अनुपात है _____ $\times 10^{-1}$ ।

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 :** 87827055967 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4 **Wrong Marks :** 1

An amine (X) is prepared by ammonolysis of benzyl chloride. On adding p-toluenesulphonyl chloride to it the solution remains clear. Molar mass of the amine (X) formed is _____ g mol^{-1} .
(Given molar mass in g mol^{-1} C : 12, H : 1, O : 16, N : 14)

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 : 87827055967 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

बेंजिल क्लोराइड के अमोनोलिसिस से किसी ऐमीन (X) का निर्माण किया जाता है। इसमें p-टालूईन सल्फोनिल क्लोराइड मिलाने पर विलयन स्वच्छ रह जाता है।

निर्मित ऐमीन (X) का मोलर द्रव्यमान है : _____ g mol^{-1} ।

(दिया गया है मोलर द्रव्यमान gmol^{-1} में C : 12, H : 1, O : 16, N : 14)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1