

JEE (Joint Entrance Examination)

JEE Main 2024 — 4 April, Shift 1

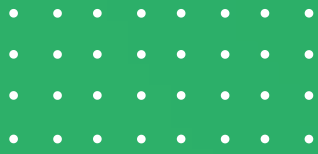
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JEE MAIN
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QUESTION PAPER

2024

**JOINT ENTRANCE EXAMINATION - MAIN
PREVIOUS YEAR QUESTION PAPER**

National Testing Agency

Question Paper Name :	B Tech 04th April 2024 Shift 1 Paper
Subject Name :	B. Tech
Creation Date :	2024-04-04 21:35:49
Duration :	180
Total Marks :	300
Display Marks:	Yes

B. Tech

Group Number :	1
Group Id :	878270675
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 :	8782701134
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 :	8782702041
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 1 Question Id : 87827055428 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 domain of the function $\sin^{-1}\left(\frac{3x-22}{2x-19}\right) + \log_e\left(\frac{3x^2-8x+5}{x^2-3x-10}\right)$ is $(\alpha, \beta]$, then $3\alpha + 10\beta$ is equal to :

Options :

878270218241. 95

878270218242. 97

878270218243. 98

878270218244. 100

Question Number : 1 Question Id : 87827055428 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 $\sin^{-1}\left(\frac{3x-22}{2x-19}\right) + \log_e\left(\frac{3x^2-8x+5}{x^2-3x-10}\right)$ का प्रांत $(\alpha, \beta]$ है, तो $3\alpha + 10\beta$ बराबर है :

Options :

878270218241. 95

878270218242. 97

878270218243. 98

878270218244. 100



Question Number : 2 Question Id : 87827055429 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 α and β be the sum and the product of all the non-zero solutions of the equation $(\bar{z})^2 + |z| = 0$,
 $z \in \mathbb{C}$. Then $4(\alpha^2 + \beta^2)$ is equal to :

Options :

878270218245. 2

878270218246. 4

878270218247. 6

878270218248. 8

Question Number : 2 Question Id : 87827055429 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 समीकरण $(\bar{z})^2 + |z| = 0, z \in \mathbb{C}$ के सभी शून्येतर हलों के योग और गुणनफल क्रमशः α और β हैं। तो $4(\alpha^2 + \beta^2)$ बराबर है :

Options :

878270218245. 2

878270218246. 4

878270218247. 6

878270218248. 8



Question Number : 3 Question Id : 87827055430 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 2 and 6 are the roots of the equation $ax^2+bx+1=0$, then the quadratic equation, whose roots are $\frac{1}{2a+b}$ and $\frac{1}{6a+b}$, is:

Options :

878270218249. $x^2 + 8x + 12 = 0$

878270218250. $4x^2 + 14x + 12 = 0$

878270218251. $2x^2 + 11x + 12 = 0$

878270218252. $x^2 + 10x + 16 = 0$

Question Number : 3 Question Id : 87827055430 Question Type : MCQ Option Shuffling : Yes

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

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि समीकरण $ax^2+bx+1=0$ के मूल 2 तथा 6 हैं, तो वह द्विघात समीकरण, जिसके मूल $\frac{1}{2a+b}$ तथा $\frac{1}{6a+b}$ हैं, है:

Options :

878270218249. $x^2 + 8x + 12 = 0$

878270218250. $4x^2 + 14x + 12 = 0$

878270218251. $2x^2 + 11x + 12 = 0$

878270218252. $x^2 + 10x + 16 = 0$

Question Number : 4 Question Id : 87827055431 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the system of equations

$$x + (\sqrt{2} \sin \alpha)y + (\sqrt{2} \cos \alpha)z = 0$$

$$x + (\cos \alpha)y + (\sin \alpha)z = 0$$

$$x + (\sin \alpha)y - (\cos \alpha)z = 0$$

has a non-trivial solution, then $\alpha \in \left(0, \frac{\pi}{2}\right)$ is equal to :

Options :

878270218253. $\frac{3\pi}{4}$

878270218254. $\frac{7\pi}{24}$

878270218255. $\frac{5\pi}{24}$

878270218256. $\frac{11\pi}{24}$



Question Number : 4 Question Id : 87827055431 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि समीकरण निकाय

$$x + (\sqrt{2} \sin \alpha)y + (\sqrt{2} \cos \alpha)z = 0$$

$$x + (\cos \alpha)y + (\sin \alpha)z = 0$$

$$x + (\sin \alpha)y - (\cos \alpha)z = 0$$

का अतुच्छ हल है, तो $\alpha \in \left(0, \frac{\pi}{2}\right)$ बराबर है :

Options :

878270218253. $\frac{3\pi}{4}$

878270218254. $\frac{7\pi}{24}$

878270218255. $\frac{5\pi}{24}$

878270218256. $\frac{11\pi}{24}$



Question Number : 5 Question Id : 87827055432 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 $\alpha \in (0, \infty)$ and $A = \begin{bmatrix} 1 & 2 & \alpha \\ 1 & 0 & 1 \\ 0 & 1 & 2 \end{bmatrix}$. If $\det(\text{adj}(2A - A^T) \cdot \text{adj}(A - 2A^T)) = 2^8$, then $(\det(A))^2$ is equal

to :

Options :

878270218257. 1

878270218258. 16

878270218259. 36

878270218260. 49



Question Number : 5 Question Id : 87827055432 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 $\alpha \in (0, \infty)$ है तथा $A = \begin{bmatrix} 1 & 2 & \alpha \\ 1 & 0 & 1 \\ 0 & 1 & 2 \end{bmatrix}$ है। यदि $\det(\text{adj}(2A - A^T) \cdot \text{adj}(A - 2A^T)) = 2^8$ है, तो $(\det(A))^2$

बराबर है :

Options :

878270218257. 1

878270218258. 16

878270218259.

878270218260. 49

Question Number : 6 Question Id : 87827055433 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 $f: \mathbb{R} \rightarrow \mathbb{R}$ be a function given by

$$f(x) = \begin{cases} \frac{1 - \cos 2x}{x^2}, & x < 0 \\ \alpha, & x = 0, \\ \frac{\beta \sqrt{1 - \cos x}}{x}, & x > 0 \end{cases}$$

where $\alpha, \beta \in \mathbb{R}$. If f is continuous at $x=0$, then $\alpha^2 + \beta^2$ is equal to :

Options :

878270218261. 3

878270218262. 6

878270218263. 12

878270218264. 48



Question Number : 6 Question Id : 87827055433 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 एक फलन $f: \mathbb{R} \rightarrow \mathbb{R}$ को

$$f(x) = \begin{cases} \frac{1 - \cos 2x}{x^2}, & x < 0 \\ \alpha, & x = 0 \\ \frac{\beta \sqrt{1 - \cos x}}{x}, & x > 0 \end{cases}$$

से परिभाषित किया जाता है, जहाँ $\alpha, \beta \in \mathbb{R}$ । यदि $x=0$ पर फलन f संतत है, तो $\alpha^2 + \beta^2$ के बराबर है :

Options :

878270218261. 3

878270218262. 6

878270218263. 12

878270218264. 48



Question Number : 7 Question Id : 87827055434 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

There are 5 points P_1, P_2, P_3, P_4, P_5 on the side AB, excluding A and B, of a triangle ABC. Similarly there are 6 points $P_6, P_7, \dots, P_{11}$ on the side BC and 7 points $P_{12}, P_{13}, \dots, P_{18}$ on the side CA of the triangle. The number of triangles, that can be formed using the points $P_1, P_2, \dots, P_{18}$ as vertices, is :

Options :

878270218265. 771

878270218266. 776

878270218267. 796

878270218268. 751

Question Number : 7 Question Id : 87827055434 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 त्रिभुज ABC की भुजा AB पर, A तथा B के अतिरिक्त 5 बिंदु P_1, P_2, P_3, P_4, P_5 हैं। इसी प्रकार त्रिभुज की भुजा BC पर 6 बिंदु $P_6, P_7, P_8, P_9, P_{10}, P_{11}$ हैं तथा भुजा CA पर 7 बिंदु $P_{12}, P_{13}, \dots, P_{18}$ हैं। बिंदुओं $P_1, P_2, \dots, P_{18}$ को शीर्ष बिंदु लेकर बनाए जा सकने वाले त्रिभुजों की संख्या है :



Options :

878270218265. 771

878270218266. 776

878270218267. 796

878270218268. 751

Question Number : 8 Question Id : 87827055435 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 sum of all rational terms in the expansion of $\left(2^{\frac{1}{5}} + 5^{\frac{1}{3}}\right)^{15}$ is equal to :

Options :

878270218269. 931

878270218270. 3133

878270218271. 633

878270218272. 6131



Question Number : 8 Question Id : 87827055435 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

$\left(2^{\frac{1}{5}} + 5^{\frac{1}{3}}\right)^{15}$ के प्रसार में सभी परिमेय पदों का योग है :

Options :

878270218269. 931

878270218270. 3133

878270218271.

878270218272. 6131

Question Number : 9 Question Id : 87827055436 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let the first three terms 2, p and q, with $q \neq 2$, of a G.P. be respectively the 7th, 8th and 13th terms of an A.P. If the 5th term of the G.P. is the nth term of the A.P., then n is equal to :

Options :

878270218273. 151

878270218274. 163

878270218275. 169

878270218276. 177



Question Number : 9 Question Id : 87827055436 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 एक G.P. के प्रथम तीन पद 2, p तथा q, जहाँ $q \neq 2$, एक A.P. के क्रमशः 7वाँ, 8वाँ तथा 13वाँ पद हैं। यदि G.P. का 5वाँ पद, A.P. का nवाँ पद है, तो n बराबर है :

Options :

878270218273. 151

878270218274. 163

878270218275. 169

878270218276. 177

Question Number : 10 Question Id : 87827055437 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 $f(x) = \begin{cases} -2, & -2 \leq x \leq 0 \\ x - 2, & 0 < x \leq 2 \end{cases}$ and $h(x) = f(|x|) + |f(x)|$. Then $\int_{-2}^2 h(x) dx$ is equal to :

Options :

878270218277. 1

878270218278. 2

878270218279. 4

878270218280. 6

Question Number : 10 Question Id : 87827055437 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $f(x) = \begin{cases} -2, & -2 \leq x \leq 0 \\ x - 2, & 0 < x \leq 2 \end{cases}$ तथा $h(x) = f(|x|) + |f(x)|$ हैं। तो $\int_{-2}^2 h(x) dx$ बराबर है :

Options :

878270218277. 1

878270218278. 2

878270218279. 4

878270218280. 6



Question Number : 11 Question Id : 87827055438 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let $f(x) = x^5 + 2e^{x/4}$ for all $x \in \mathbb{R}$. Consider a function $g(x)$ such that $(g \circ f)(x) = x$ for all $x \in \mathbb{R}$. Then the value of $8g'(2)$ is :

Options :

878270218281. 2

878270218282. 4

878270218283. 8

878270218284. 16

Question Number : 11 Question Id : 87827055438 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 सभी $x \in \mathbb{R}$ के लिए $f(x) = x^5 + 2e^{x/4}$ है। एक फलन $g(x)$, जिसके लिए $(g \circ f)(x) = x \quad \forall x \in \mathbb{R}$ है, का विचार कीजिए। तो $8g'(2)$ का मान है :

Options :

878270218281. 2

878270218282. 4

878270218283. 8

878270218284. 16



Question Number : 12 Question Id : 87827055439 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let the sum of the maximum and the minimum values of the function $f(x) = \frac{2x^2 - 3x + 8}{2x^2 + 3x + 8}$ be $\frac{m}{n}$,

where $\gcd(m, n) = 1$. Then $m + n$ is equal to :

Options :

878270218285. 182

878270218286. 195

878270218287. 201

878270218288. 217

Question Number : 12 Question Id : 87827055439 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 $f(x) = \frac{2x^2 - 3x + 8}{2x^2 + 3x + 8}$ के उच्चतम तथा न्यूनतम मानों का योग $\frac{m}{n}$, जहाँ $\gcd(m, n) = 1$, है। तो $m + n$

बराबर है :

Options :

878270218285. 182

878270218286. 195

878270218287. 201

878270218288. 217

Question Number : 13 Question Id : 87827055440 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

One of the points of intersection of the curves $y = 1 + 3x - 2x^2$ and $y = \frac{1}{x}$ is $\left(\frac{1}{2}, 2\right)$. Let the area of the region enclosed by these curves be $\frac{1}{24}(l\sqrt{5} + m) - n \log_e(1 + \sqrt{5})$, where $l, m, n \in \mathbb{N}$. Then $l + m + n$ is equal to

Options :

878270218289. 30

878270218290. 29

878270218291. 31

878270218292. 32



Question Number : 13 Question Id : 87827055440 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

वक्रों $y=1+3x-2x^2$ तथा $y = \frac{1}{x}$ का एक प्रतिच्छेदन बिंदु $\left(\frac{1}{2}, 2\right)$ है। माना इन वक्रों से घिरे क्षेत्र का क्षेत्रफल

$\frac{1}{24}(l\sqrt{5} + m) - n\log_e(1 + \sqrt{5})$ है, जहाँ $l, m, n \in \mathbb{N}$ है। तो $l+m+n$ बराबर है :

Options :

878270218289. 30

878270218290. 29

878270218291. 31

878270218292. 32



Question Number : 14 Question Id : 87827055441 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 solution $y=y(x)$ of the differential equation $(x^4+2x^3+3x^2+2x+2)dy - (2x^2+2x+3)dx=0$

satisfies $y(-1) = -\frac{\pi}{4}$, then $y(0)$ is equal to :

Options :

878270218293. $\frac{\pi}{4}$

878270218294. $\frac{\pi}{2}$

878270218295. 0

878270218296. $-\frac{\pi}{12}$

Question Number : 14 Question Id : 87827055441 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि अवकल समीकरण $(x^4 + 2x^3 + 3x^2 + 2x + 2)dy - (2x^2 + 2x + 3)dx = 0$ का हल $y = y(x)$, $y(-1) = -\frac{\pi}{4}$

को संतुष्ट करता है, तो $y(0)$ बराबर है :

Options :

878270218293. $\frac{\pi}{4}$

878270218294. $\frac{\pi}{2}$

878270218295. 0

878270218296. $-\frac{\pi}{12}$



Question Number : 15 Question Id : 87827055442 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 square is inscribed in the circle $x^2 + y^2 - 10x - 6y + 30 = 0$. One side of this square is parallel to $y = x + 3$. If (x_i, y_i) are the vertices of the square, then $\sum (x_i^2 + y_i^2)$ is equal to :

Options :

878270218297. 148

878270218298. 152

878270218299. 156

878270218300. 160

Question Number : 15 Question Id : 87827055442 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

वृत्त $x^2 + y^2 - 10x - 6y + 30 = 0$ के अंतर्गत एक वर्ग है। वर्ग की एक भुजा $y = x + 3$ के समांतर है। यदि वर्ग के शीर्ष (x_i, y_i) हैं, तो $\sum (x_i^2 + y_i^2)$ बराबर है :

Options :

878270218297. 148

878270218298. 152

878270218299. 156

Question Number : 16 Question Id : 87827055443 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 vertices of a triangle are $A(-1, 3)$, $B(-2, 2)$ and $C(3, -1)$. A new triangle is formed by shifting the sides of the triangle by one unit inwards. Then the equation of the side of the new triangle nearest to origin is :

Options :

878270218301. $x + y - (2 - \sqrt{2}) = 0$

878270218302. $x + y + (2 - \sqrt{2}) = 0$

878270218303. $x - y - (2 + \sqrt{2}) = 0$

878270218304. $-x + y - (2 - \sqrt{2}) = 0$



Question Number : 16 Question Id : 87827055443 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 त्रिभुज के शीर्ष $A(-1, 3)$, $B(-2, 2)$ तथा $C(3, -1)$ हैं। इस त्रिभुज की भुजाओं को त्रिभुज के अंदर की तरफ एक इकाई स्थानांतरित कर एक नया त्रिभुज बनाया गया है। तो नए त्रिभुज की मूलबिंदु के सबसे निकट भुजा का समीकरण है :

Options :

878270218301. $x + y - (2 - \sqrt{2}) = 0$

878270218302. $x + y + (2 - \sqrt{2}) = 0$

878270218303. $x - y - (2 + \sqrt{2}) = 0$

878270218304. $-x + y - (2 - \sqrt{2}) = 0$

Question Number : 17 Question Id : 87827055444 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1



Let the point, on the line passing through the points P(1, -2, 3) and Q (5, -4, 7), farther from the origin and at a distance of 9 units from the point P, be (α, β, γ) . Then $\alpha^2 + \beta^2 + \gamma^2$ is equal to :

Options :

878270218305. 150

878270218306. 165

878270218307. 160

878270218308. 155

Question Number : 17 Question Id : 87827055444 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 बिंदुओं P (1, -2, 3) तथा Q (5, -4, 7) से होकर जाने वाली रेखा पर, मूल बिंदु से ज्यादा दूर तथा बिंदु P से 9 इकाई दूरी पर, स्थित बिंदु (α, β, γ) है। तो $\alpha^2 + \beta^2 + \gamma^2$ बराबर है :

Options :

878270218305. 150

878270218306. 165

878270218307. 160

878270218308. 155



Question Number : 18 Question Id : 87827055445 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 unit vector which makes an angle of 60° with $2\hat{i} + 2\hat{j} - \hat{k}$ and an angle of 45° with $\hat{i} - \hat{k}$

be $\vec{C}$. Then $\vec{C} + \left(-\frac{1}{2}\hat{i} + \frac{1}{3\sqrt{2}}\hat{j} - \frac{\sqrt{2}}{3}\hat{k}\right)$ is :

Options :

878270218309. $\left(\frac{1}{\sqrt{3}} + \frac{1}{2}\right)\hat{i} + \left(\frac{1}{\sqrt{3}} - \frac{1}{3\sqrt{2}}\right)\hat{j} + \left(\frac{1}{\sqrt{3}} + \frac{\sqrt{2}}{3}\right)\hat{k}$

878270218310.

$$-\frac{\sqrt{2}}{3} \hat{i} + \frac{\sqrt{2}}{3} \hat{j} + \left(\frac{1}{2} + \frac{2\sqrt{2}}{3}\right) \hat{k}$$

878270218311.

$$\frac{\sqrt{2}}{3} \hat{i} - \frac{1}{2} \hat{k}$$

878270218312.

$$\frac{\sqrt{2}}{3} \hat{i} + \frac{1}{3\sqrt{2}} \hat{j} - \frac{1}{2} \hat{k}$$

Question Number : 18 Question Id : 87827055445 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 सदिश $2\hat{i} + 2\hat{j} - \hat{k}$ से 60° का कोण तथा सदिश $\hat{i} - \hat{k}$ से 45° का कोण बनाने वाला एक मात्रक सदिश $\vec{C}$ है।

तो $\vec{C} + \left(-\frac{1}{2}\hat{i} + \frac{1}{3\sqrt{2}}\hat{j} - \frac{\sqrt{2}}{3}\hat{k}\right)$ है :

Options :

878270218309.

$$\left(\frac{1}{\sqrt{3}} + \frac{1}{2}\right) \hat{i} + \left(\frac{1}{\sqrt{3}} - \frac{1}{3\sqrt{2}}\right) \hat{j} + \left(\frac{1}{\sqrt{3}} + \frac{\sqrt{2}}{3}\right) \hat{k}$$

878270218310.

$$-\frac{\sqrt{2}}{3} \hat{i} + \frac{\sqrt{2}}{3} \hat{j} + \left(\frac{1}{2} + \frac{2\sqrt{2}}{3}\right) \hat{k}$$

878270218311.

$$\frac{\sqrt{2}}{3} \hat{i} - \frac{1}{2} \hat{k}$$

878270218312.

$$\frac{\sqrt{2}}{3} \hat{i} + \frac{1}{3\sqrt{2}} \hat{j} - \frac{1}{2} \hat{k}$$

Question Number : 19 Question Id : 87827055446 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

Three urns A, B and C contain 7 red, 5 black; 5 red, 7 black and 6 red, 6 black balls, respectively. One of the urn is selected at random and a ball is drawn from it. If the ball drawn is black, then the probability that it is drawn from urn A is :

Options :

878270218313. $\frac{5}{16}$

878270218314. $\frac{4}{17}$

878270218315. $\frac{5}{18}$

878270218316. $\frac{7}{18}$



Question Number : 19 Question Id : 87827055446 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

तीन थैलों A, B तथा C में क्रमशः 7 लाल, 5 काली; 5 लाल, 7 काली तथा 6 लाल, 6 काली गेंदें हैं। एक थैला यादृच्छया चुना जाता है तथा इसमें से एक गेंद निकाली जाती है। यदि निकाली गई गेंद काली है, तो इसके थैले A से निकाले जाने की प्रायिकता है :

Options :

878270218313. $\frac{5}{16}$

878270218314. $\frac{4}{17}$

878270218315. $\frac{5}{18}$

878270218316. $\frac{7}{18}$



Question Number : 20 Question Id : 87827055447 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 $\alpha, \beta \in \mathbb{R}$. Let the mean and the variance of 6 observations $-3, 4, 7, -6, \alpha, \beta$ be 2 and 23, respectively. The mean deviation about the mean of these 6 observations is :

Options :

878270218317. $\frac{11}{3}$

878270218318. $\frac{16}{3}$

878270218319. $\frac{14}{3}$

878270218320. $\frac{13}{3}$

Question Number : 20 Question Id : 87827055447 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 $\alpha, \beta \in \mathbb{R}$ हैं। माना 6 प्रेक्षणों $-3, 4, 7, -6, \alpha, \beta$ के माध्य तथा प्रसरण क्रमशः 2 तथा 23 हैं। तो इन 6 प्रेक्षणों का माध्य के सापेक्ष माध्य विचलन है :

Options :



878270218317. $\frac{11}{3}$

878270218318. $\frac{16}{3}$

878270218319. $\frac{14}{3}$

878270218320. $\frac{13}{3}$

Mathematics Section B

Section Id :	8782701135
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 :	8782702042
Question Shuffling Allowed :	Yes
Is Section Default? :	null



Question Number : 21 Question Id : 87827055448 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 survey of 220 students of a higher secondary school, it was found that at least 125 and at most 130 students studied Mathematics; at least 85 and at most 95 studied Physics; at least 75 and at most 90 studied Chemistry; 30 studied both Physics and Chemistry; 50 studied both Chemistry and Mathematics; 40 studied both Mathematics and Physics and 10 studied none of these subjects. Let m and n respectively be the least and the most number of students who studied all the three subjects. 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 :

Question Number : 21 Question Id : 87827055448 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक उच्चतर माध्यमिक विद्यालय के 220 छात्रों के एक सर्वेक्षण में यह पाया गया कि कम से कम 125 तथा अधिक से अधिक 130 छात्रों ने गणित का अध्ययन किया; कम से कम 85 तथा अधिक से अधिक 95 छात्रों ने भौतिक विज्ञान का अध्ययन किया; कम से कम 75 तथा अधिक से अधिक 90 छात्रों ने रसायन विज्ञान का अध्ययन किया; 30 छात्रों ने भौतिक विज्ञान तथा रसायन विज्ञान दोनों का अध्ययन किया; 50 छात्रों ने रसायन विज्ञान तथा गणित दोनों का अध्ययन किया; 40 छात्रों ने गणित तथा भौतिक विज्ञान दोनों का अध्ययन किया तथा 10 छात्रों ने इन विषयों में से किसी का भी अध्ययन नहीं किया। माना सभी तीनों विषयों का अध्ययन करने वाले कम से कम तथा अधिक से अधिक छात्रों की संख्या क्रमशः m तथा n है। 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



Question Number : 22 Question Id : 87827055449 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let A be a 3×3 matrix of non-negative real elements such that $A \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = 3 \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$.

Then the maximum value of $\det(A)$ is _____.

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 :** 87827055449 **Question Type :** SA **Calculator :** None

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

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

माना ऋणोत्तर वास्तविक अवयवों का 3×3 का एक आव्यूह A है तथा $A \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = 3 \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ है। तो $\det(A)$ का अधिकतम मान

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 :** 87827055450 **Question Type :** SA **Calculator :** None

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

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

$$\text{Let } a = 1 + \frac{{}^2C_2}{3!} + \frac{{}^3C_2}{4!} + \frac{{}^4C_2}{5!} + \dots,$$

$$b = 1 + \frac{{}^1C_0 + {}^1C_1}{1!} + \frac{{}^2C_0 + {}^2C_1 + {}^2C_2}{2!} + \frac{{}^3C_0 + {}^3C_1 + {}^3C_2 + {}^3C_3}{3!} + \dots$$

Then $\frac{2b}{a^2}$ is equal to _____.

Response Type : Numeric



Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 23 Question Id : 87827055450 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

$$\text{माना } a = 1 + \frac{{}^2C_2}{3!} + \frac{{}^3C_2}{4!} + \frac{{}^4C_2}{5!} + \dots,$$

$$b = 1 + \frac{{}^1C_0 + {}^1C_1}{1!} + \frac{{}^2C_0 + {}^2C_1 + {}^2C_2}{2!} + \frac{{}^3C_0 + {}^3C_1 + {}^3C_2 + {}^3C_3}{3!} + \dots$$

हैं। तो $\frac{2b}{a^2}$ 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 : 87827055451 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

$$\text{If } \lim_{x \rightarrow 1} \frac{(5x+1)^{1/3} - (x+5)^{1/3}}{(2x+3)^{1/2} - (x+4)^{1/2}} = \frac{m\sqrt{5}}{n(2n)^{2/3}}, \text{ where } \gcd(m, n) = 1, \text{ then } 8m + 12n \text{ is equal to}$$

_____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 24 **Question Id :** 87827055451 **Question Type :** SA **Calculator :** None

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

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

यदि $\lim_{x \rightarrow 1} \frac{(5x+1)^{1/3} - (x+5)^{1/3}}{(2x+3)^{1/2} - (x+4)^{1/2}} = \frac{m\sqrt{5}}{n(2n)^{2/3}}$, जहाँ $\gcd(m, n) = 1$ है, तो $8m + 12n$ 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 :** 87827055452 **Question Type :** SA **Calculator :** None

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

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

If $\int_0^{\frac{\pi}{4}} \frac{\sin^2 x}{1 + \sin x \cos x} dx = \frac{1}{a} \log_e \left(\frac{a}{3} \right) + \frac{\pi}{b\sqrt{3}}$, where $a, b \in \mathbb{N}$, then $a + b$ 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 :** 87827055452 **Question Type :** SA **Calculator :** None

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

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

यदि $\int_0^{\frac{\pi}{4}} \frac{\sin^2 x}{1 + \sin x \cos x} dx = \frac{1}{a} \log_e \left(\frac{a}{3} \right) + \frac{\pi}{b\sqrt{3}}$, जहाँ $a, b \in \mathbb{N}$, है, 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 : 26 **Question Id :** 87827055453 **Question Type :** SA **Calculator :** None

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

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

Let the solution $y=y(x)$ of the differential equation $\frac{dy}{dx} - y = 1 + 4\sin x$ satisfy $y(\pi)=1$. Then

$y\left(\frac{\pi}{2}\right) + 10$ 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 : 87827055453 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना अवकल समीकरण $\frac{dy}{dx} - y = 1 + 4\sin x$ के हल $y = y(x)$ के लिए $y(\pi) = 1$ है। तो $y\left(\frac{\pi}{2}\right) + 10$ 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 : 87827055454 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let A be a square matrix of order 2 such that $|A| = 2$ and the sum of its diagonal elements is -3 . If the points (x, y) satisfying $A^2 + xA + yI = O$ lie on a hyperbola, whose transverse axis is parallel to the x-axis, eccentricity is e and the length of the latus rectum is l, then $e^4 + l^4$ 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 : 87827055454 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना A कोटि 2 का एक वर्ग आव्यूह है, जिसके लिए $|A|=2$ है तथा जिसके विकर्ण के अवयवों का योग -3 है। यदि $A^2 + xA + yI = O$ को संतुष्ट करने वाले बिंदु (x, y) एक अतिपरवलय पर हैं, जिसका अनुप्रस्थ अक्ष x -अक्ष के समांतर है, उत्केन्द्रता e है तथा नाभिलंब जीवा की लंबाई l है, तो $e^4 + l^4$ 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 : 87827055455 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let the length of the focal chord PQ of the parabola $y^2 = 12x$ be 15 units. If the distance of PQ from the origin is p , then $10p^2$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 28 Question Id : 87827055455 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना परवलय $y^2 = 12x$ की नाभीय जीवा PQ की लंबाई 15 इकाई है। यदि मूलबिंदु से PQ की दूरी p है, तो $10p^2$ 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 : 87827055456 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 $\frac{x+2}{2} = \frac{y+3}{3} = \frac{z-5}{4}$ and $\frac{x-3}{1} = \frac{y-2}{-3} = \frac{z+4}{2}$

is $\frac{38}{3\sqrt{5}}$ k, and $\int_0^k [x^2] dx = \alpha - \sqrt{\alpha}$, where $[x]$ denotes the greatest integer function, then $6\alpha^3$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 29 Question Id : 87827055456 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 $\frac{x+2}{2} = \frac{y+3}{3} = \frac{z-5}{4}$ तथा $\frac{x-3}{1} = \frac{y-2}{-3} = \frac{z+4}{2}$ के बीच न्यूनतम दूरी $\frac{38}{3\sqrt{5}}$ है तथा

$\int_0^k [x^2] dx = \alpha - \sqrt{\alpha}$ है, जहाँ $[x]$ महत्तम पूर्णांक फलन है, तो $6\alpha^3$ बराबर है _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 30 Question Id : 87827055457 Question Type : SA Calculator : None

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



Correct Marks : 4 Wrong Marks : 1

Let ABC be a triangle of area $15\sqrt{2}$ and the vectors $\vec{AB} = \hat{i} + 2\hat{j} - 7\hat{k}$, $\vec{BC} = a\hat{i} + b\hat{j} + c\hat{k}$ and

$\vec{AC} = 6\hat{i} + d\hat{j} - 2\hat{k}$, $d > 0$. Then the square of the length of the largest side of the triangle ABC is _____.

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 : 87827055457 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना एक त्रिभुज ABC का क्षेत्रफल $15\sqrt{2}$ है तथा सदिश $\vec{AB} = \hat{i} + 2\hat{j} - 7\hat{k}$, $\vec{BC} = a\hat{i} + b\hat{j} + c\hat{k}$ और $\vec{AC} = 6\hat{i} + d\hat{j} - 2\hat{k}$, $d > 0$ हैं। तो त्रिभुज ABC की सबसे बड़ी भुजा की लंबाई का वर्ग 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 :	8782701136
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 :	8782702043
Question Shuffling Allowed :	Yes
Is Section Default? :	null



Question Number : 31 Question Id : 87827055458 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 equation of stationary wave is :

$$y = 2a \sin\left(\frac{2\pi nt}{\lambda}\right) \cos\left(\frac{2\pi x}{\lambda}\right).$$

Which of the following is NOT correct :

Options :

878270218331. The dimensions of nt is $[L]$

878270218332. The dimensions of x is $[L]$

878270218333. The dimensions of n is $[LT^{-1}]$

878270218334. The dimensions of n/λ is $[T]$



Question Number : 31 Question Id : 87827055458 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

अप्रगामी तरंग का समीकरण $y = 2a \sin\left(\frac{2\pi nt}{\lambda}\right) \cos\left(\frac{2\pi x}{\lambda}\right)$ है।

निम्नलिखित में से कौन-सा विकल्प सही नहीं है :

Options :

878270218331. nt की विमा $[L]$ है

878270218332. x की विमा [L] है

878270218333. n की विमा $[LT^{-1}]$ है

878270218334. n/λ की विमा [T] है

Question Number : 32 Question Id : 87827055459 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 co-ordinates of a particle moving in x - y plane are given by :

$$x = 2 + 4t, y = 3t + 8t^2.$$

The motion of the particle is :

Options :

878270218335. non-uniformly accelerated.

878270218336. uniformly accelerated having motion along a straight line.

878270218337. uniformly accelerated having motion along a parabolic path.

878270218338. uniform motion along a straight line.



Question Number : 32 Question Id : 87827055459 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

x - y तल में गतिमान एक कण के निर्देशांक निम्न प्रकार दिये गये हैं; $x=2+4t$, $y=3t+8t^2$ ।
कण की गति है :

Options :

878270218335. असमान त्वरित

878270218336. सीधी रेखा के अनुदिश एकसमान त्वरित गति

878270218337. परवलयकार पथ के अनुदिश एकसमान त्वरित गति

878270218338. एक सरलरेखा के अनुदिश एकसमान गति



Question Number : 33 Question Id : 87827055460 Question Type : MCQ Option Shuffling : Yes

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

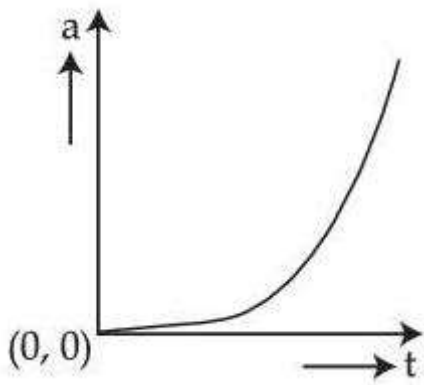
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

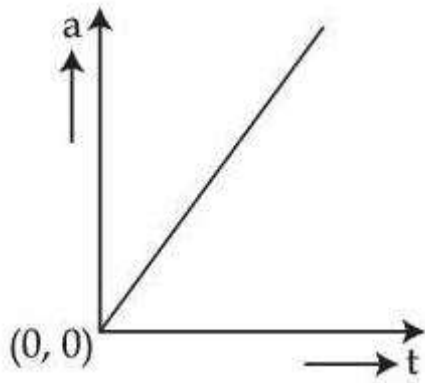
A wooden block, initially at rest on the ground, is pushed by a force which increases linearly with time t . Which of the following curve best describes acceleration of the block with time :

Options :

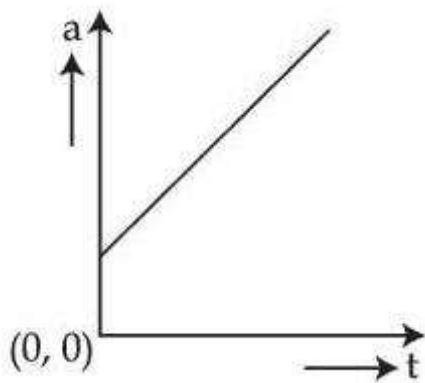
878270218339.



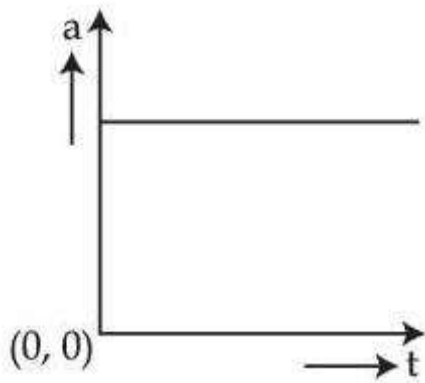
878270218340.



878270218341.



878270218342.



Question Number : 33 Question Id : 87827055460 Question Type : MCQ Option Shuffling : Yes

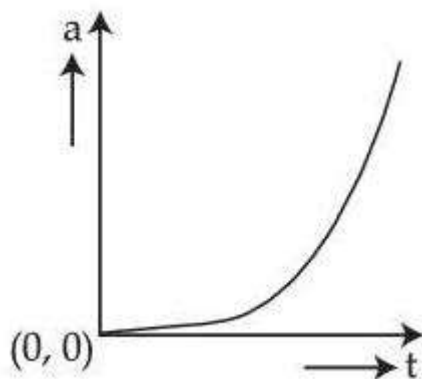
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

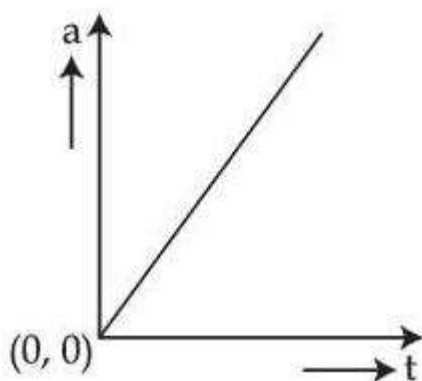
Correct Marks : 4 Wrong Marks : 1

पृथ्वी तल पर विरामावस्था में स्थित एक लकड़ी का गुटका समय के साथ रेखीय रूप से बढ़ने वाले किसी बल द्वारा धकेला जाता है। निम्नलिखित में से कौन-सा वक्र समय के साथ गुटके का त्वरण वर्णित करता है :

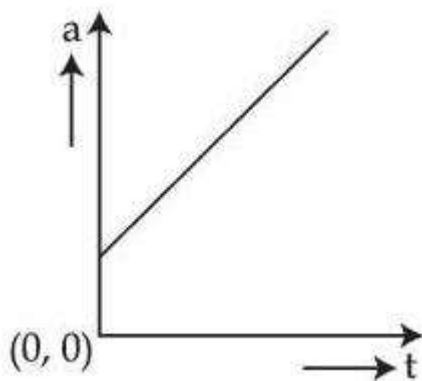
Options :



878270218339.



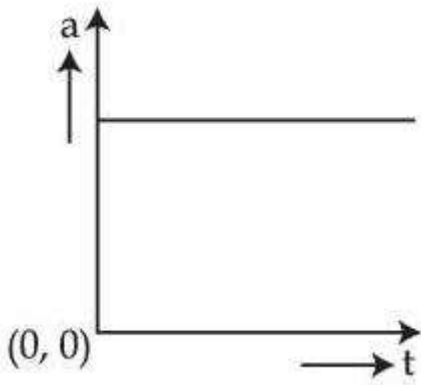
878270218340.



878270218341.

878270218342.





Question Number : 34 Question Id : 87827055461 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 travels 102.5 m in n^{th} second and 115.0 m in $(n+2)^{\text{th}}$ second. The acceleration is :

Options :

878270218343. 5 m/s^2



878270218344. 6.25 m/s^2

878270218345. 12.5 m/s^2

878270218346. 9 m/s^2

Question Number : 34 Question Id : 87827055461 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 पिण्ड n वें सेकंड में 102.5 m तथा $(n+1)$ वें सेकंड में 115.0 m दूरी तय करता है। इसका त्वरण है :

Options :

878270218343. 5 m/s^2

878270218344. 6.25 m/s^2

878270218345. 12.5 m/s^2

878270218346. 9 m/s^2

Question Number : 35 Question Id : 87827055462 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 rubber ball falls from a height h and rebounds upto the height of $h/2$. The percentage loss of total energy of the initial system as well as velocity ball before it strikes the ground, respectively, are :

Options :

878270218347. $50\%, \sqrt{gh}$

878270218348. $50\%, \sqrt{2gh}$

878270218349. $40\%, \sqrt{2gh}$

878270218350. $50\%, \sqrt{\frac{gh}{2}}$

Question Number : 35 Question Id : 87827055462 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 रबड़ की एक गेंद h ऊँचाई से गिरती है तथा $h/2$ ऊँचाई तक उछलती है। प्रारम्भिक निकाय की कुल ऊर्जा में प्रतिशत हानि तथा पृथ्वी तल से टकराने से पूर्व गेंद का वेग क्रमशः हैं :

Options :

878270218347. $50\%, \sqrt{gh}$

878270218348. $50\%, \sqrt{2gh}$

878270218349. $40\%, \sqrt{2gh}$

878270218350. $50\%, \sqrt{\frac{gh}{2}}$



Question Number : 36 Question Id : 87827055463 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 metal wire of uniform mass density having length L and mass M is bent to form a semicircular arc and a particle of mass m is placed at the centre of the arc. The gravitational force on the particle by the wire is :

Options :

878270218351. 0

878270218352. $\frac{GmM\pi^2}{L^2}$

878270218353. $\frac{2GmM\pi}{L^2}$

878270218354. $\frac{GMm\pi}{2L^2}$



Question Number : 36 Question Id : 87827055463 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

L लम्बाई तथा M द्रव्यमान के एकसमान द्रव्यमान घनत्व के धातु के तार को मोड़कर एक अर्द्धवृत्ताकार चाप बनाया गया है एवं चाप के केन्द्र पर m द्रव्यमान का एक कण रख दिया गया है। कण पर लगने वाला गुरुत्वीय बल है :

Options :

878270218351. शून्य

878270218352. $\frac{GmM\pi^2}{L^2}$

878270218353.

$$\frac{2GmM\pi}{L^2}$$

878270218354.

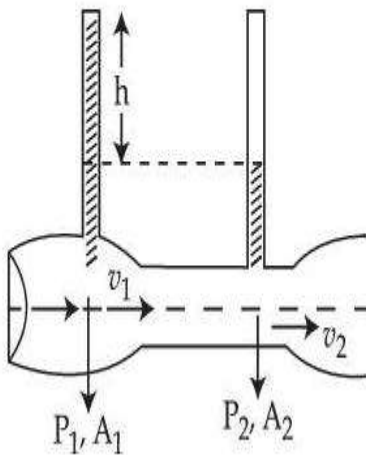
$$\frac{GMm\pi}{2L^2}$$

Question Number : 37 Question Id : 87827055464 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 : When speed of liquid is zero everywhere, pressure difference at any two points depends on equation $P_1 - P_2 = \rho g(h_2 - h_1)$.

Statement II : In ventury tube shown $2gh = v_1^2 - v_2^2$



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

Options :

878270218355. Both **Statement I** and **Statement II** are correct.

878270218356. Both **Statement I** and **Statement II** are incorrect.

878270218357. **Statement I** is correct but **Statement II** is incorrect.

878270218358. **Statement I** is incorrect but **Statement II** is correct.

Question Number : 37 Question Id : 87827055464 Question Type : MCQ Option Shuffling : Yes

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

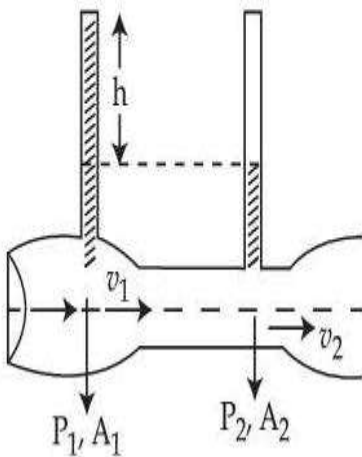
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

नीचे दो कथन दिये गये हैं :

कथन I : जब प्रत्येक स्थान पर द्रव की चाल शून्य है तो किन्हीं दो बिन्दुओं के बीच दाबान्तर समीकरण $P_1 - P_2 = \rho g(h_2 - h_1)$ पर निर्भर करता है।

कथन II : प्रदर्शित वैन्चुरी नली में $2gh = v_1^2 - v_2^2$ ।



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

Options :

878270218355. दोनों कथन I व कथन II सही हैं।

878270218356. दोनों कथन I व कथन II गलत हैं।

878270218357.

कथन I सही है परन्तु कथन II गलत है।

878270218358. कथन I गलत है परन्तु कथन II सही है।

Question Number : 38 Question Id : 87827055465 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

On celcius scale the temperature of body increases by 40°C . The increase in temperature on Fahrenheit scale is :

Options :

878270218359. 72°F

878270218360. 70°F

878270218361. 75°F

878270218362. 68°F



Question Number : 38 Question Id : 87827055465 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

सेल्सियस पैमाने पर एक वस्तु का तापमान 40°C बढ़ता है। फॉरेनहाइट पैमाने पर ताप वृद्धि है :

Options :

878270218359. 72°F

878270218360. 70°F

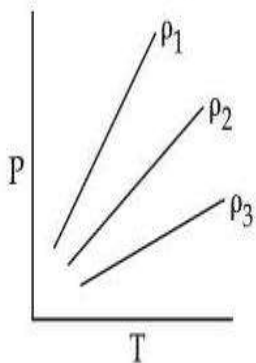
878270218361. 75°F

878270218362. 68°F

Question Number : 39 Question Id : 87827055466 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

P-T diagram of an ideal gas having three different densities ρ_1, ρ_2, ρ_3 (in three different cases) is shown in the figure. Which of the following is correct :



Options :

878270218363. $\rho_1 < \rho_2$

878270218364. $\rho_2 < \rho_3$

878270218365. $\rho_1 = \rho_2 = \rho_3$

878270218366. $\rho_1 > \rho_2$

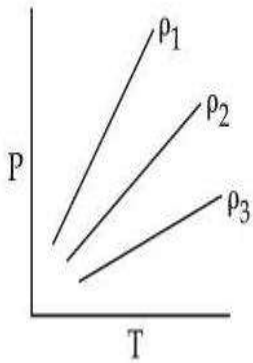
Question Number : 39 Question Id : 87827055466 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

तीन विभिन्न घनत्वों ρ_1, ρ_2, ρ_3 वाली एक आदर्श गैस का P-T आरेख (तीन स्थितियों में) चित्र में दर्शाया गया है। निम्न में से कौन-सा विकल्प सही है :



Options :

878270218363. $\rho_1 < \rho_2$

878270218364. $\rho_2 < \rho_3$

878270218365. $\rho_1 = \rho_2 = \rho_3$

878270218366. $\rho_1 > \rho_2$

Question Number : 40 Question Id : 87827055467 Question Type : MCQ Option Shuffling : Yes

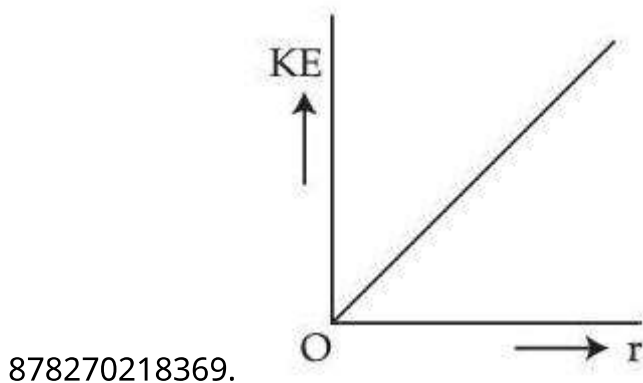
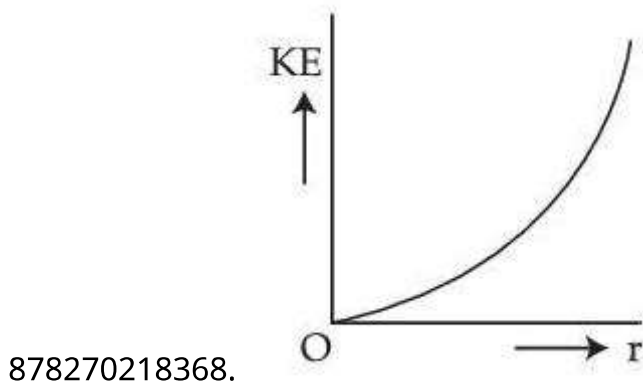
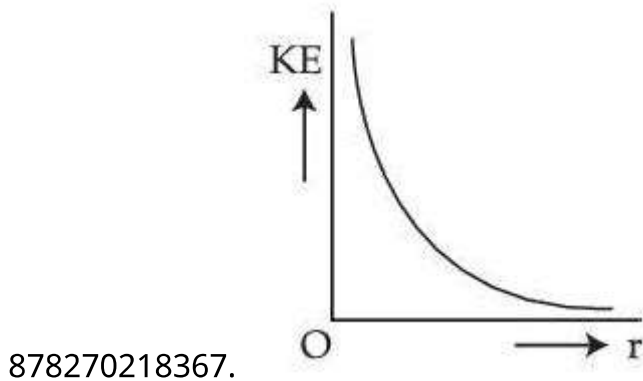
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

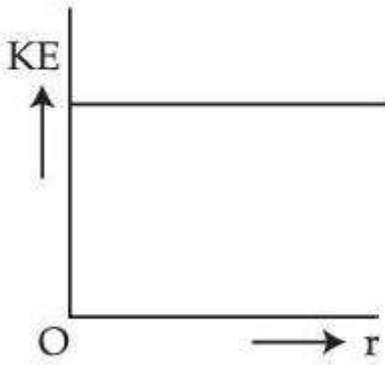
An infinitely long positively charged straight thread has a linear charge density $\lambda \text{ Cm}^{-1}$. An electron revolves along a circular path having axis along the length of the wire. The graph that correctly represents the variation of the kinetic energy of electron as a function of radius of circular path from the wire is :

Options :



878270218370.





Question Number : 40 Question Id : 87827055467 Question Type : MCQ Option Shuffling : Yes

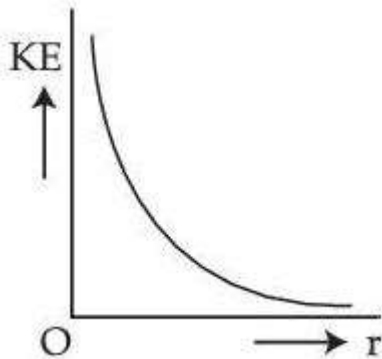
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

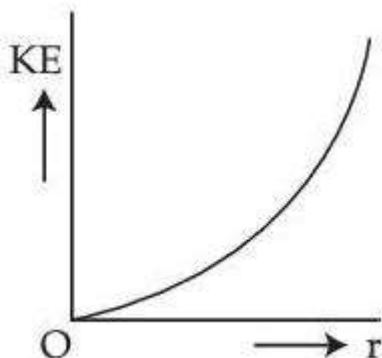
Correct Marks : 4 Wrong Marks : 1

एक अनंत लम्बे धनावेशित सीधे धागे का रेखीय आवेश घनत्व $\lambda \text{ Cm}^{-1}$ है। एक इलैक्ट्रॉन तार की लम्बाई के अनुदिश अक्ष के परितः एक वृत्तीय पथ पर परिक्रमण करता है। वह ग्राफ जो तार से वृत्तीय पथ की त्रिज्या के फलन के रूप में इलैक्ट्रॉन की गतिज ऊर्जा परिवर्तन को प्रदर्शित है :

Options :

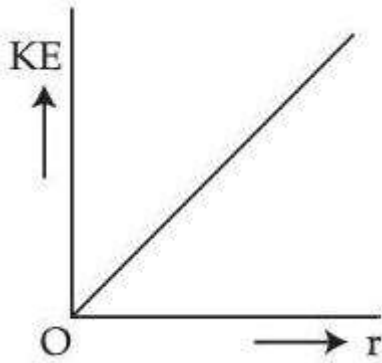


878270218367.

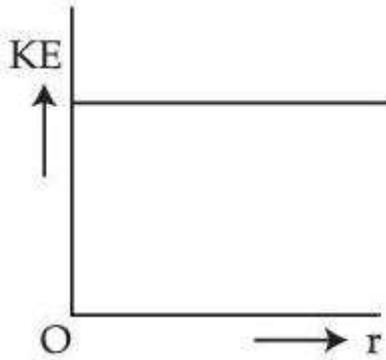


878270218368.

878270218369.



878270218370.



Question Number : 41 Question Id : 87827055468 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 resistances of the platinum wire of a platinum resistance thermometer at the ice point and steam point are $8\ \Omega$ and $10\ \Omega$ respectively. After inserting in a hot bath of temperature 400°C , the resistance of platinum wire is :

Options :

878270218371. $8\ \Omega$

878270218372. $10\ \Omega$

878270218373. $16\ \Omega$

878270218374. $2\ \Omega$

Question Number : 41 Question Id : 87827055468 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

प्लेटिनम प्रतिरोध तापमापी के प्लेटिनम के तार का हिमांक बिन्दु तथा वाष्प बिन्दु पर प्रतिरोध क्रमशः $8\ \Omega$ व $10\ \Omega$ है।
प्लेटिनम के तार को 400°C ताप के एक गर्म बॉथ में धंसाने पर प्लेटिनम के तार का प्रतिरोध है :

Options :

878270218371. $8\ \Omega$

878270218372. $10\ \Omega$

878270218373. $16\ \Omega$

878270218374. $2\ \Omega$



Question Number : 42 Question Id : 87827055469 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

An electron is projected with uniform velocity along the axis inside a current carrying long solenoid.
Then :

Options :

878270218375. the electron will be accelerated along the axis.

878270218376. the electron path will be circular about the axis.

878270218377. the electron will experience a force at 45° to the axis and execute a helical path.

878270218378. the electron will continue to move with uniform velocity along the axis of the solenoid.

Question Number : 42 Question Id : 87827055469 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 इलैक्ट्रॉन को एक लम्बी धारावाही परिनालिका में इसकी अक्ष के अनुदिश एकसमान वेग से प्रक्षेपित किया गया है। तब :



Options :

878270218375. इलैक्ट्रॉन अक्ष के अनुदिश त्वरित होगा।

878270218376. अक्ष के परितः इलैक्ट्रॉन का पथ वृत्ताकार होगा।

878270218377. इलैक्ट्रॉन अक्ष से 45° के कोण पर एक बल अनुभव करेगा तथा हैलीकल पथ बनायेगा।

878270218378. इलैक्ट्रॉन परिनालिका की अक्ष के अनुदिश एकसमान वेग से गति को सुचारु रखेगा।

Question Number : 43 Question Id : 87827055470 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 an ac circuit, the instantaneous current is zero, when the instantaneous voltage is maximum. In this case, the source may be connected to :

- A. pure inductor.
- B. pure capacitor.
- C. pure resistor.
- D. combination of an inductor and capacitor.

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

Options :

878270218379. A, B and C only

878270218380. B, C and D only

878270218381. A, B and D only

878270218382. A and B only



Question Number : 43 Question Id : 87827055470 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 प्रत्यावर्ती परिपथ में, जब क्षणिक वोल्टेज अधिकतम है तो क्षणिक धारा शून्य है। इस अवस्था में स्रोत किससे जुड़ा हो सकता है :

- (A) शुद्ध प्रेरक
 - (B) शुद्ध संधारित्र
 - (C) शुद्ध प्रतिरोध
 - (D) एक प्रेरक व संधारित्र का संयोजन
- नीचे दिये गये विकल्पों से सही उत्तर चुनिए :

Options :

878270218379. केवल (A), (B) और (C)

878270218380. केवल (B), (C) और (D)

878270218381. केवल (A), (B) और (D)

878270218382. केवल (A) और (B)



Question Number : 44 Question Id : 87827055471 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 electric field in an electromagnetic wave is given by $\vec{E} = \hat{i} 40 \cos \omega \left(t - \frac{z}{c} \right) \text{NC}^{-1}$. The magnetic field induction of this wave is (in SI unit) :

Options :

878270218383. $\vec{B} = \hat{j} 40 \cos \omega \left(t - \frac{z}{c} \right)$

878270218384.

$$\vec{B} = \hat{k} \frac{40}{c} \cos \omega \left(t - \frac{z}{c} \right)$$

878270218385.

$$\vec{B} = \hat{j} \frac{40}{c} \cos \omega \left(t - \frac{z}{c} \right)$$

878270218386.

$$\vec{B} = \hat{i} \frac{40}{c} \cos \omega \left(t - \frac{z}{c} \right)$$

Question Number : 44 Question Id : 87827055471 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 चुंबकीय तरंग में वैद्युत क्षेत्र निम्न प्रकार दिया गया है $\vec{E} = \hat{i} 40 \cos \omega \left(t - \frac{z}{c} \right) \text{ N C}^{-1}$ । इस तरंग का प्रेरित चुम्बकीय क्षेत्र (SI मात्रक में) है :



Options :

878270218383.

$$\vec{B} = \hat{j} 40 \cos \omega \left(t - \frac{z}{c} \right)$$

878270218384.

$$\vec{B} = \hat{k} \frac{40}{c} \cos \omega \left(t - \frac{z}{c} \right)$$

878270218385.

$$\vec{B} = \hat{j} \frac{40}{c} \cos \omega \left(t - \frac{z}{c} \right)$$

878270218386.

$$\vec{B} = \hat{i} \frac{40}{c} \cos \omega \left(t - \frac{z}{c} \right)$$

Question Number : 45 Question Id : 87827055472 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

An effective power of a combination of 5 identical convex lenses which are kept in contact along the principal axis is 25 D. Focal length of each of the convex lens is :

Options :

878270218387. 20 cm

878270218388. 50 cm

878270218389. 500 cm

878270218390. 25 cm



Question Number : 45 Question Id : 87827055472 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

मुख्य अक्ष के अनुदिश रखे 5 एकसमान उत्तल लेंसों के संयोजन की प्रभावी क्षमता 25 D है। प्रत्येक उत्तल लेंस की फोकस दूरी है :

Options :

878270218387. 20 cm

878270218388.

50 cm

878270218389. 500 cm

878270218390. 25 cm

Question Number : 46 Question Id : 87827055473 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

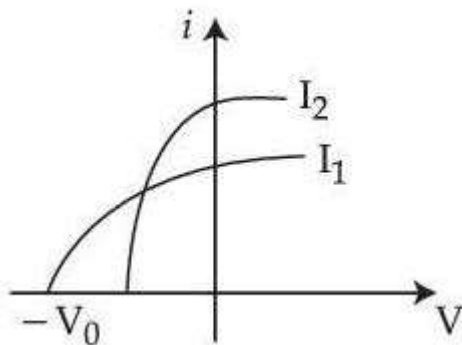
Correct Marks : 4 Wrong Marks : 1

Which figure shows the correct variation of applied potential difference (V) with photoelectric current (I) at two different intensities of light ($I_1 < I_2$) of same wavelengths :

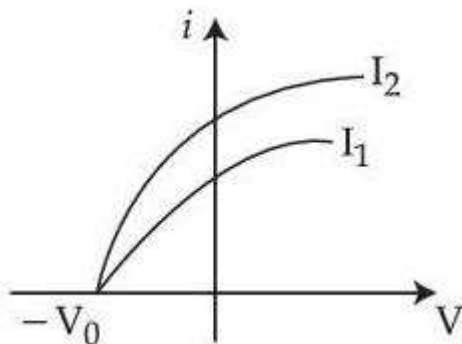
Options :



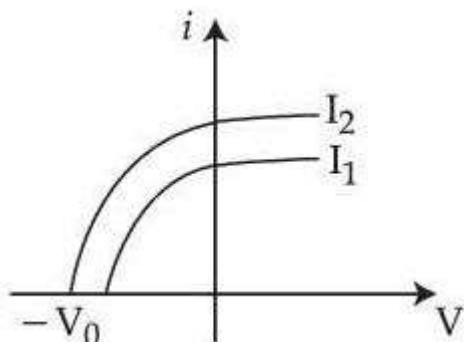
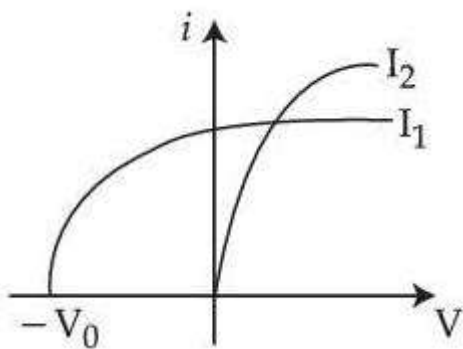
878270218391.



878270218392.



878270218393.



878270218394.

Question Number : 46 Question Id : 87827055473 Question Type : MCQ Option Shuffling : Y

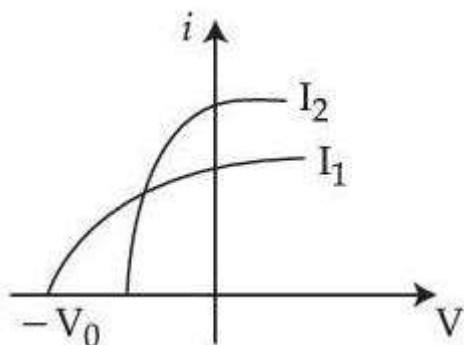
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

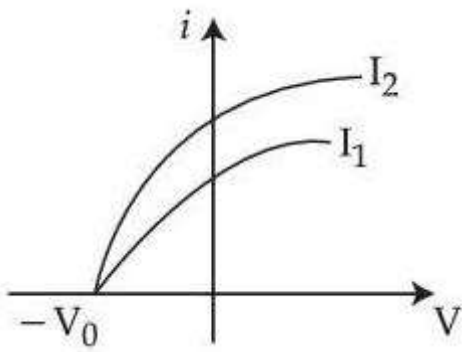
प्रकाश की दो तीव्रताओं ($I_1 < I_2$) तथा समान तरंगदैर्घ्यों पर कौन-सा चित्र प्रकाश वैद्युत धारा (I) के साथ आरोपित विभान्तर (V) के परिवर्तन को प्रदर्शित करता है :

Options :

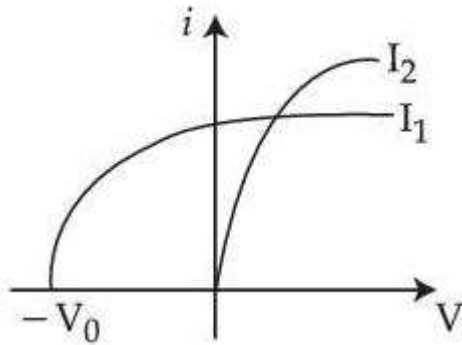


878270218391.

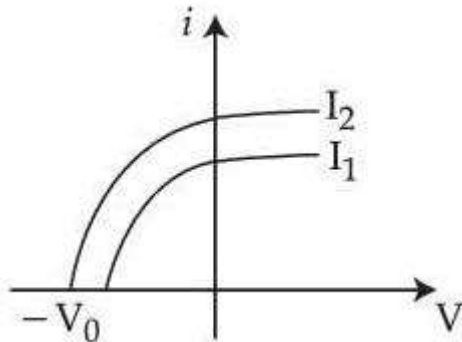
878270218392.



878270218393.



878270218394.



Question Number : 47 Question Id : 87827055474 Question Type : MCQ Option Shuffling : Yes

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

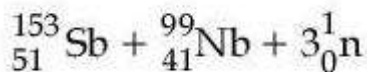
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

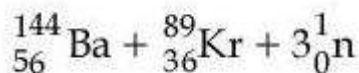
Which of the following nuclear fragments corresponding to nuclear fission between neutron $\left({}^1_0\text{n} \right)$ and uranium isotope $\left({}^{235}_{92}\text{U} \right)$ is correct :

Options :

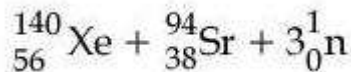
878270218395.



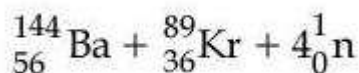
878270218396.



878270218397.



878270218398.



Question Number : 47 Question Id : 87827055474 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

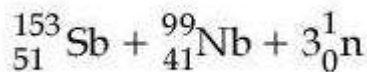


Correct Marks : 4 Wrong Marks : 1

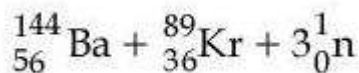
न्यूट्रॉन (${}_0^1\text{n}$) तथा यूरेनियम समस्थानिक (${}_{92}^{235}\text{U}$) के मध्य नाभिकीय विखण्डन के संगत निम्नलिखित कौन से नाभिकीय खण्ड (fragments) सही हैं :

Options :

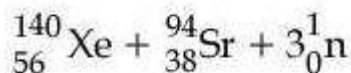
878270218395.



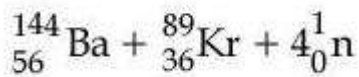
878270218396.



878270218397.



878270218398.



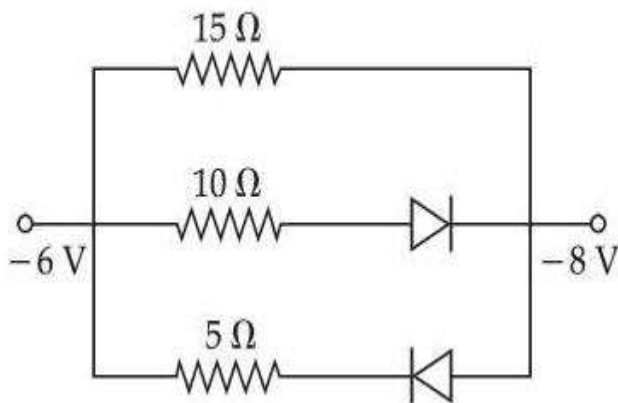
Question Number : 48 Question Id : 87827055475 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The value of net resistance of the network as shown in the given figure is :



Options :



878270218399. $(30/11) \Omega$

878270218400. $(15/4) \Omega$

878270218401. $(5/2) \Omega$

878270218402. 6Ω

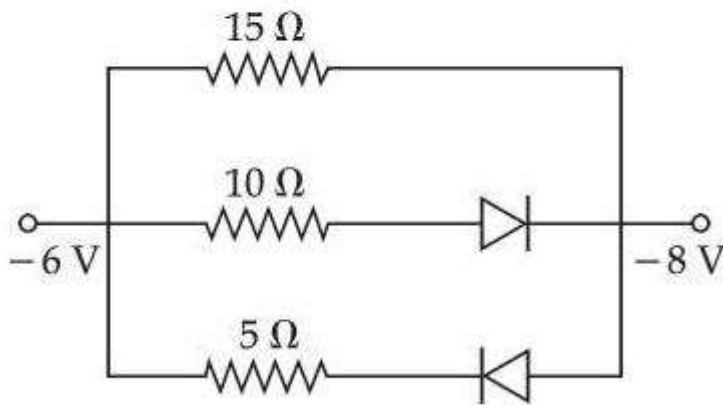
Question Number : 48 Question Id : 87827055475 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

दिये गये चित्र में नेटवर्क के तुल्य प्रतिरोध का मान है :



Options :

878270218399. $(30/11)\ \Omega$

878270218400. $(15/4)\ \Omega$

878270218401. $(5/2)\ \Omega$

878270218402. $6\ \Omega$



Question Number : 49 Question Id : 87827055476 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 an experiment to measure focal length (f) of convex lens, the least counts of the measuring scales for the position of object (u) and for the position of image (v) are Δu and Δv , respectively. The error in the measurement of the focal length of the convex lens will be :

Options :

878270218403. $f \left[\frac{\Delta u}{u} + \frac{\Delta v}{v} \right]$

878270218404. $2f \left[\frac{\Delta u}{u} + \frac{\Delta v}{v} \right]$

878270218405. $\frac{\Delta u}{u} + \frac{\Delta v}{v}$

878270218406. $f^2 \left[\frac{\Delta u}{u^2} + \frac{\Delta v}{v^2} \right]$

Question Number : 49 Question Id : 87827055476 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 प्रयोग में उत्तल लेंस की फोकस दूरी (f) ज्ञात करने के लिए वस्तु की स्थिति (u) तथा प्रतिबिम्ब की स्थिति (v) के मापन में पैमाने की अल्पतमोक्त क्रमशः Δu व Δv हैं। उत्तल लेंस की फोकस दूरी के मापन में त्रुटि होगी :

Options :

878270218403. $f \left[\frac{\Delta u}{u} + \frac{\Delta v}{v} \right]$

878270218404. $2f \left[\frac{\Delta u}{u} + \frac{\Delta v}{v} \right]$

878270218405. $\frac{\Delta u}{u} + \frac{\Delta v}{v}$

878270218406. $f^2 \left[\frac{\Delta u}{u^2} + \frac{\Delta v}{v^2} \right]$

Question Number : 50 Question Id : 87827055477 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

To measure the internal resistance of a battery, potentiometer is used. For $R=10\ \Omega$, the balance point is observed at $l=500\text{ cm}$ and for $R=1\ \Omega$ the balance point is observed at $l=400\text{ cm}$. The internal resistance of the battery is approximately :

Options :

878270218407. $0.1\ \Omega$

878270218408. $0.2\ \Omega$

878270218409. $0.3\ \Omega$

878270218410. $0.4\ \Omega$



Question Number : 50 Question Id : 87827055477 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

बैटरी के आन्तरिक प्रतिरोध ज्ञात करने के लिए विभवमापी का उपयोग किया गया है। $R=10\ \Omega$ के लिए सन्तुलन बिन्दु $l=500$ सेमी पर प्राप्त होता है तथा $R=1\ \Omega$ के लिए सन्तुलन बिन्दु $l=400$ सेमी पर प्राप्त होता है। बैटरी का आन्तरिक प्रतिरोध लगभग है :

Options :

878270218407. $0.1\ \Omega$

878270218408. $0.2\ \Omega$

878270218409. $0.3\ \Omega$

878270218410. $0.4\ \Omega$



Physics Section B

Section Id :	8782701137
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 :	8782702044
Question Shuffling Allowed :	Yes

Is Section Default? :

null

Question Number : 51 Question Id : 87827055478 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Two forces $\vec{F}_1$ and $\vec{F}_2$ are acting on a body. One force has magnitude thrice that of the other force and the resultant of the two forces is equal to the force of larger magnitude. The angle between

$\vec{F}_1$ and $\vec{F}_2$ is $\cos^{-1}\left(\frac{1}{n}\right)$. The value of $|n|$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1



Question Number : 51 Question Id : 87827055478 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक पिण्ड पर दो बल $\vec{F}_1$ व $\vec{F}_2$ कार्यरत हैं। एक बल का परिमाण दूसरे बल के परिमाण का तीन गुना है तथा दोनों बलों के

परिणामी का परिमाण बड़े बल के परिमाण के बराबर है। $\vec{F}_1$ व $\vec{F}_2$ के बीच का कोण $\cos^{-1}\left(\frac{1}{n}\right)$ 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 :

Question Number : 52 Question Id : 87827055479 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

A solid sphere and a hollow cylinder roll up without slipping on same inclined plane with same initial speed v . The sphere and the cylinder reaches upto maximum heights h_1 and h_2 , respectively,

above the initial level. The ratio $h_1 : h_2$ is $\frac{n}{10}$. The value of n is _____.

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 : 87827055479 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक ठोस गोला व एक खोखला बेलन एकसमान आनत तल पर समान प्रारम्भिक चाल v से बिना फिसले ऊपर की ओर

लुढ़कते हैं। गोला तथा बेलन प्रारम्भिक स्तर से क्रमशः h_1 व h_2 अधिकतम ऊँचाइयों तक पहुँचते हैं। $h_1 : h_2$ अनुपात $\frac{n}{10}$ है।

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 : 53 Question Id : 87827055480 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

A soap bubble is blown to a diameter of 7 cm. 36960 erg of work is done in blowing it further. If surface tension of soap solution is 40 dyne/cm then the new radius is _____ cm Take $\left(\pi = \frac{22}{7}\right)$.

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 : 87827055480 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक साबुन का बुलबुला 7 सेमी व्यास तक फूलता है। इसे पुनः फुलाने में कृत कार्य 36960 अर्ग है। यदि साबुन के घोल का पृष्ठ तनाव 40 dyne/cm है तब नई त्रिज्या _____ सेमी है। (दिया है $\pi = \frac{22}{7}$)।

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 : 87827055481 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

An elastic spring under tension of 3 N has a length a . Its length is b under tension 2 N. For its length $(3a - 2b)$, the value of tension will be _____ N.

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 : 87827055481 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

3 N तनाव के अन्तर्गत एक प्रत्यास्थ स्प्रिंग की लम्बाई a है। 2 N तनाव के अन्तर्गत इसकी लम्बाई b है। इसकी $(3a - 2b)$ लम्बाई के लिए तनाव का मान _____ N होगा।

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 : 87827055482 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1



An infinite plane sheet of charge having uniform surface charge density $+\sigma_s \text{ C/m}^2$ is placed on x - y plane. Another infinitely long line charge having uniform linear charge density $+\lambda_e \text{ C/m}$ is placed at $z=4 \text{ m}$ plane and parallel to y -axis. If the magnitude values $|\sigma_s|=2|\lambda_e|$ then at point $(0, 0, 2)$, the ratio of magnitudes of electric field values due to sheet charge to that of line charge is $\pi\sqrt{n}:1$. The value of n is _____.

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 :** 87827055482 **Question Type :** SA **Calculator :** None

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

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



एकसमान पृष्ठ आवेश घनत्व $+\sigma_s \text{ C/m}^2$ की एक अनंत समतल आवेशित चादर x - y तल पर रखी गयी है। दूसरा एकसमान रेखीय आवेश घनत्व $+\lambda_e \text{ C/m}$ का अनंत लम्बाई का सीधा रेखीय आवेश y -अक्ष के समान्तर व $z=4 \text{ m}$ तल पर रखा गया है। यदि परिमाणिक मान $|\sigma_s|=2|\lambda_e|$ हो तब बिन्दु $(0, 0, 2)$ पर चादर के आवेश के कारण वैद्युत क्षेत्र के परिमाण तथा रेखीय आवेश के कारण वैद्युत क्षेत्र के परिमाण का अनुपात $\pi\sqrt{n}:1$ है। n का मान _____ है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

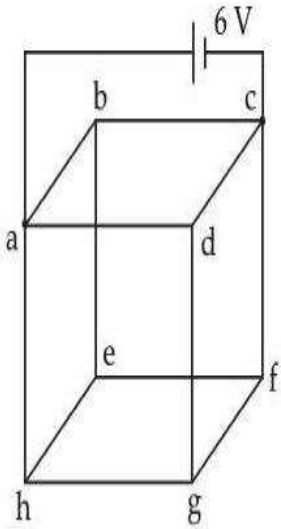
1

Question Number : 56 **Question Id :** 87827055483 **Question Type :** SA **Calculator :** None

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

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

Twelve wires each having resistance $2\ \Omega$ are joined to form a cube. A battery of 6 V emf is joined across point a and c. The voltage difference between e and f is _____ V.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

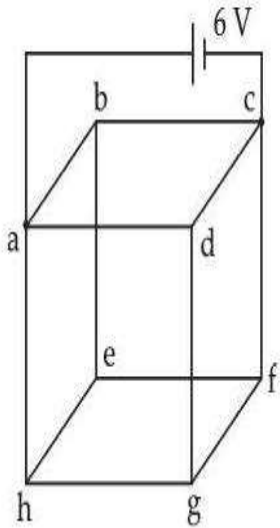


Question Number : 56 **Question Id :** 87827055483 **Question Type :** SA **Calculator :** None

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

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

बारह एकसमान तारों को जोड़कर एक घन बनाया गया है जिनमें प्रत्येक तार का प्रतिरोध 2Ω है। बिन्दु a तथा c के बीच एक 6 V वि.वा. बल की बैटरी जोड़ी गई है। e तथा f के बीच विभान्तर _____ V है।



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

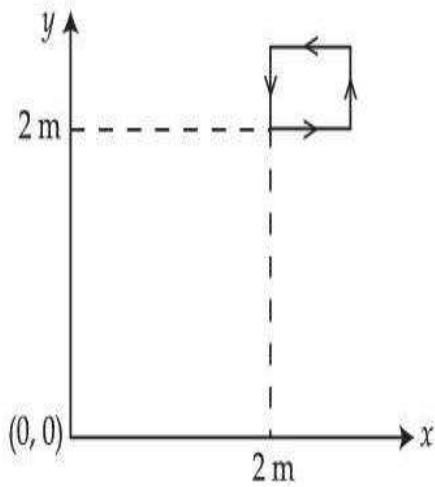
Question Number : 57 **Question Id :** 87827055484 **Question Type :** SA **Calculator :** None

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

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



The magnetic field existing in a region is given by $\vec{B} = 0.2(1 + 2x)\hat{k} \text{ T}$. A square loop of edge 50 cm carrying 0.5 A current is placed in x - y plane with its edges parallel to the x - y axes, as shown in figure. The magnitude of the net magnetic force experienced by the loop is _____ mN.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

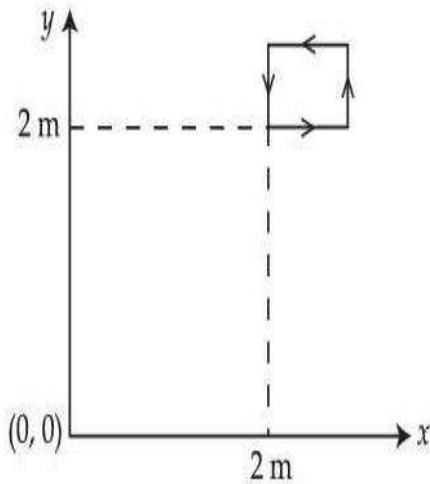
Question Number : 57 **Question Id :** 87827055484 **Question Type :** SA **Calculator :** None

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

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



एक परिसर में पाया जाने वाला चुम्बकीय क्षेत्र $\vec{B} = 0.2(1 + 2x)\hat{k}$ T है। 50 से.मी. भुजा के एक वर्गाकार लूप जिसमें प्रवाहित धारा 0.5 A है, इसकी भुजाओं को x - y अक्षों के समान्तर रखकर x - y तल में चित्रानुसार रखा गया है। लूप पर लगने वाले परिणामी चुम्बकीय बल का परिमाण _____ mN 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 :** 87827055485 **Question Type :** SA **Calculator :** None

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

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

A alternating current at any instant is given by $i = [6 + \sqrt{56} \sin(100\pi t + \pi/3)]$ A. The *rms* value of the current is _____ A.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :



Question Number : 58 Question Id : 87827055485 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

किसी क्षण प्रत्यावर्ती धारा $i = [6 + \sqrt{56} \sin(100\pi t + \pi/3)]$ A दी गई है। धारा का वर्ग माध्य मूल मान _____ A है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :



Question Number : 59 Question Id : 87827055486 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Two wavelengths λ_1 and λ_2 are used in Young's double slit experiment. $\lambda_1 = 450$ nm and $\lambda_2 = 650$ nm. The minimum order of fringe produced by λ_2 which overlaps with the fringe produced by λ_1 is n. The value of n is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 59 Question Id : 87827055486 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

यंग द्विचित्री प्रयोग में दो तरंगदैर्घ्यों का उपयोग किया गया है। $\lambda_1 = 450 \text{ nm}$ तथा $\lambda_2 = 650 \text{ nm}$ । λ_2 द्वारा उत्पन्न फ्रिंज का न्यूनतम क्रम x है जोकि λ_1 द्वारा उत्पन्न फ्रिंज के साथ संपाती है। x का मान _____ है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 60 Question Id : 87827055487 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1



A hydrogen atom changes its state from $n=3$ to $n=2$. Due to recoil, the percentage change in the wave length of emitted light is approximately 1×10^{-n} . The value of n is _____.

[Given $Rhc = 13.6 \text{ eV}$, $hc = 1242 \text{ eV nm}$, $h = 6.6 \times 10^{-34} \text{ J s}$ mass of the hydrogen atom $= 1.6 \times 10^{-27} \text{ kg}$]

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 : 87827055487 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक हाइड्रोजन परमाणु $n=3$ से $n=2$ में अपनी अवस्था परिवर्तित करता है। स्थानान्तरण के कारण उत्सर्जित प्रकाश की तरंगदैर्घ्य में प्रतिशत परिवर्तन 1×10^{-x} है। x का मान _____ है।

[दिया है $Rhc = 13.6 \text{ eV}$, $hc = 1242 \text{ eV nm}$, $h = 6.6 \times 10^{-19} \text{ J s}$, हाइड्रोजन परमाणु का द्रव्यमान $= 1.6 \times 10^{-27} \text{ kg}$]

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 :	8782701138
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 :	8782702045
Question Shuffling Allowed :	Yes
Is Section Default? :	null



Question Number : 61 Question Id : 87827055488 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 Molarity (M) of an aqueous solution containing 5.85 g of NaCl in 500 mL water is :
(Given : Molar Mass Na : 23 and Cl : 35.5 gmol^{-1})

Options :

878270218421. 4

878270218422. 20

878270218423. 0.2

878270218424. 2



Question Number : 61 Question Id : 87827055488 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

500 mL जल में विलेय 5.85 g NaCl वाले जलीय विलयन की मोलरता (M) है :
(दिया गया है : g mol^{-1} में मोलर द्रव्यमान Na : 23, Cl : 35.5)

Options :

878270218421. 4

878270218422. 20

878270218423. 0.2

878270218424. 2

Question Number : 62 Question Id : 87827055489 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which one of the following molecules has maximum dipole moment ?

Options :

878270218425. NF_3

878270218426. NH_3

878270218427. CH_4

878270218428. PF_5



Question Number : 62 Question Id : 87827055489 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 अणुओं में से किसका द्विध्रुव आघूर्ण अधिकतम है ?

Options :

878270218425. NF_3

878270218426. NH_3

878270218427. CH_4

878270218428. PF_5

Question Number : 63 Question Id : 87827055490 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

What will be the decreasing order of basic strength of the following conjugate bases ?

^-OH , $\text{R}\bar{\text{O}}$, $\text{CH}_3\text{CO}\bar{\text{O}}$, Cl^-



Options :

878270218429. $^-\text{OH} > \text{R}\bar{\text{O}} > \text{CH}_3\text{CO}\bar{\text{O}} > \text{Cl}^-$

878270218430. $\text{R}\bar{\text{O}} > ^-\text{OH} > \text{CH}_3\text{CO}\bar{\text{O}} > \text{Cl}^-$

878270218431. $\text{Cl}^- > ^-\text{OH} > \text{R}\bar{\text{O}} > \text{CH}_3\text{CO}\bar{\text{O}}$

878270218432. $\text{Cl}^- > \text{R}\bar{\text{O}} > ^-\text{OH} > \text{CH}_3\text{CO}\bar{\text{O}}$

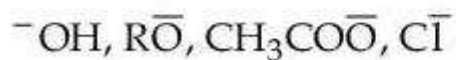
Question Number : 63 Question Id : 87827055490 Question Type : MCQ Option Shuffling : Yes

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

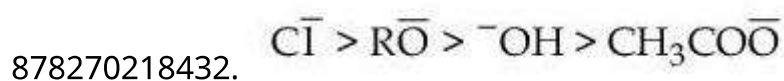
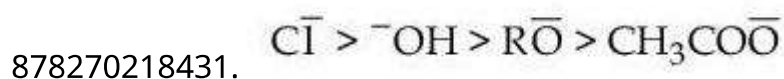
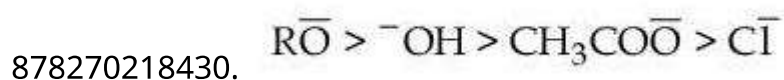
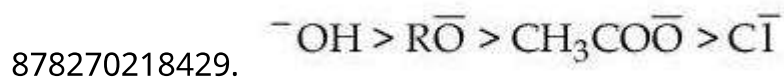
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित संयुग्मी क्षारकों के क्षारीय सामर्थ्य का घटता क्रम क्या है?



Options :



Question Number : 64 Question Id : 87827055491 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

One of the commonly used electrode is calomel electrode. Under which of the following categories, calomel electrode comes ?

Options :

878270218433. Gas - Ion electrodes

878270218434. Metal ion - Metal electrodes

878270218435. Metal - Insoluble Salt - Anion electrodes

878270218436. Oxidation - Reduction electrodes

Question Number : 64 Question Id : 87827055491 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

कैलोमल इलेक्ट्रोड सामान्यतया उपयोग किया जाने वाले इलेक्ट्रोडों में से एक है। कैलोमल इलेक्ट्रोड निम्नलिखित में से किस वर्गीकरण में आता है?

Options :

878270218433. गैस - आयन इलेक्ट्रोड

878270218434. धातु आयन - धातु इलेक्ट्रोड

878270218435. धातु - अविलेय लवण ऋणायन इलेक्ट्रोड

878270218436. ऑक्सीकरण - अपचयन इलेक्ट्रोड



Question Number : 65 Question Id : 87827055492 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

What pressure (bar) of H_2 would be required to make emf of hydrogen electrode zero in pure water at $25^\circ C$?

Options :

878270218437. 10^{-7}

878270218438. 10^{-14}

878270218439. 1

878270218440. 0.5

Question Number : 65 Question Id : 87827055492 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

$25^\circ C$ पर शुद्ध जल में हाइड्रोजन इलेक्ट्रोड के emf का मान शून्य रखने के लिए H_2 के किस दाब (bar) की आवश्यकता होगी ?

Options :

878270218437. 10^{-7}

878270218438. 10^{-14}

878270218439. 1

878270218440. 0.5

Question Number : 66 Question Id : 87827055493 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The correct order of first ionization enthalpy values of the following elements is :

- (A) O
- (B) N
- (C) Be
- (D) F
- (E) B

Choose the correct answer from the options given below :

Options :

878270218441. $A < B < D < C < E$

878270218442. $B < D < C < E < A$

878270218443. $E < C < A < B < D$

878270218444. $C < E < A < B < D$



Question Number : 66 Question Id : 87827055493 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 के प्रथम आयनन एन्थैल्पी मानों का सही क्रम है :

- (A) O
- (B) N
- (C) Be
- (D) F
- (E) B

नीचे दिए गए विकल्पों में से सही उत्तर को चुनें :

Options :

878270218441. $A < B < D < C < E$

878270218442. $B < D < C < E < A$

878270218443. $E < C < A < B < D$

878270218444. $C < E < A < B < D$



Question Number : 67 Question Id : 87827055494 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Number of elements from the following that CANNOT form compounds with valencies which match with their respective group valencies is _____.

B, C, N, S, O, F, P, Al, Si

Options :

878270218445. 5

878270218446. 3

878270218447.

6

878270218448.

7

Question Number : 67 Question Id : 87827055494 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से उन तत्वों की संख्या जो उन संयोजकताओं के साथ यौगिक नहीं बना सकते हैं जो उनकी समूह संयोजकता के साथ मेल खाती हो।

B, C, N, S, O, F, P, Al, Si

Options :

878270218445.

5



878270218446.

3

878270218447.

6

878270218448.

7

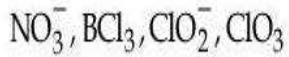
Question Number : 68 Question Id : 87827055495 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Number of molecules/ions from the following in which the central atom is involved in sp^3 hybridization is _____.



Options :

878270218449. 1

878270218450. 2

878270218451. 3

878270218452. 4

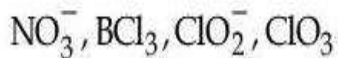
Question Number : 68 Question Id : 87827055495 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से उन अणुओं/आयनों की संख्या जिसमें केन्द्रीय परमाणु sp^3 संकरण प्रदर्शित करता है :



Options :

878270218449. 1

878270218450. 2

878270218451. 3

878270218452. 4

Question Number : 69 Question Id : 87827055496 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 element which shows only one oxidation state other than its elemental form is :

Options :

878270218453. Cobalt

878270218454. Scandium

878270218455. Titanium

878270218456. Nickel



Question Number : 69 Question Id : 87827055496 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

वह तत्व जो तात्विक अवस्था के अतिरिक्त केवल एक ही ऑक्सीकरण अवस्था प्रदर्शित करता है :

Options :

878270218453. कोबाल्ट

878270218454. स्कैन्डियम

878270218455. टाइटेनियम

878270218456. निकैल

Question Number : 70 Question Id : 87827055497 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 sequence of ligands in the order of decreasing field strength is :

Options :



878270218457. $\text{CO} > \text{H}_2\text{O} > \text{F}^- > \text{S}^{2-}$

878270218458. $\text{NCS}^- > \text{EDTA}^{4-} > \text{CN}^- > \text{CO}$

878270218459. $^-\text{OH} > \text{F}^- > \text{NH}_3 > \text{CN}^-$

878270218460. $\text{S}^{2-} > ^-\text{OH} > \text{EDTA}^{4-} > \text{CO}$

Question Number : 70 Question Id : 87827055497 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

लिगण्डों के घटते हुए क्षेत्र प्रबलता का सही क्रम है :

Options :

878270218457. $\text{CO} > \text{H}_2\text{O} > \text{F}^- > \text{S}^{2-}$

878270218458. $\text{NCS}^- > \text{EDTA}^{4-} > \text{CN}^- > \text{CO}$

878270218459. $^-\text{OH} > \text{F}^- > \text{NH}_3 > \text{CN}^-$

878270218460. $\text{S}^{2-} > ^-\text{OH} > \text{EDTA}^{4-} > \text{CO}$

Question Number : 71 Question Id : 87827055498 Question Type : MCQ Option Shuffling : Y 

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Number of complexes from the following with even number of unpaired "d" electrons is _____.

$[\text{V}(\text{H}_2\text{O})_6]^{3+}$, $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$, $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$, $[\text{Ni}(\text{H}_2\text{O})_6]^{3+}$, $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$

[Given atomic numbers : V = 23, Cr = 24, Fe = 26, Ni = 28 Cu = 29]

Options :

878270218461. 1

878270218462. 2

878270218463. 4

878270218464. 5

Question Number : 71 Question Id : 87827055498 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से उन संकुलों की संख्या, जिसमें अयुग्मित d इलेक्ट्रॉनों की सम संख्या हो, है :
 $[V(H_2O)_6]^{3+}$, $[Cr(H_2O)_6]^{2+}$, $[Fe(H_2O)_6]^{3+}$, $[Ni(H_2O)_6]^{3+}$, $[Cu(H_2O)_6]^{2+}$
[दिया गया परमाणु क्रमांक है : V = 23, Cr = 24, Fe = 26, Ni = 28 Cu = 29]

Options :

878270218461. 1

878270218462. 2

878270218463. 4

878270218464. 5



Question Number : 72 Question Id : 87827055499 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 precipitation of the iron group (III) in qualitative analysis, ammonium chloride is added before adding ammonium hydroxide to :

Options :

878270218465.

decrease concentration of OH^- ions

878270218466. prevent interference by phosphate ions

878270218467. increase concentration of Cl^- ions

878270218468. increase concentration of NH_4^+ ions

Question Number : 72 Question Id : 87827055499 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



आयरन समूह (III) के गुणात्मक विश्लेषण में, अवक्षेपण के लिए अमोनियम हाइड्रॉक्साइड के पहले अमोनियम क्लोराइड क्यों मिलाया जाता है?

Options :

878270218465. OH^- आयनों की सान्द्रता को घटाने के लिए

878270218466. फॉस्फेट आयनों के द्वारा बाधा पहुँचाने से रोका जा सके

878270218467. Cl^- आयनों की सान्द्रता को बढ़ाने के लिए

878270218468. NH_4^+ आयनों की सान्द्रता को बढ़ाने के लिए

Question Number : 73 Question Id : 87827055500 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the following nitrogen containing compound does not give Lassaigne's test ?

Options :

878270218469. Urea

878270218470. Glycine

878270218471. Hydrazine

878270218472. Phenyl hydrazine



Question Number : 73 Question Id : 87827055500 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से कौन सा नाइट्रोजन युक्त यौगिक लैसें परीक्षण नहीं देता है ?

Options :

878270218469. यूरिया

878270218470. ग्लाइसीन

878270218471.

Question Number : 74 Question Id : 87827055501 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 Mechanism steps	List - II Effect
(A)	(I) - E effect
(B)	(II) - R effect
(C)	(III) + E effect
(D)	(IV) + R effect

Choose the correct answer from the options given below :

Options :



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

878270218474. (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

878270218475. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

878270218476. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

Question Number : 74 Question Id : 87827055501 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

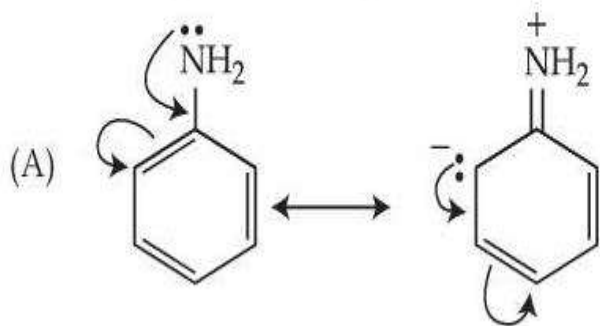
Correct Marks : 4 Wrong Marks : 1



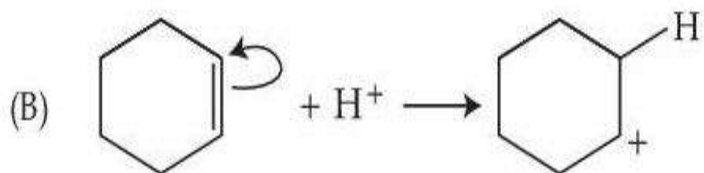
सूची - I का मिलान सूची - II से करें :

सूची - I
(क्रियाविधि पद)

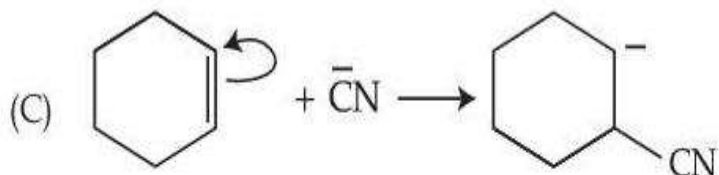
सूची - II
(प्रभाव)



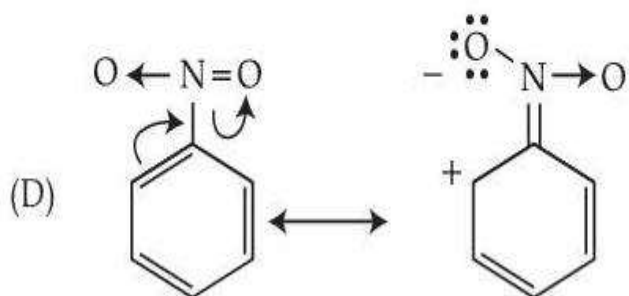
(I) - E प्रभाव



(II) - R प्रभाव



(III) + E प्रभाव



(IV) + R प्रभाव

नीचे दिए गए विकल्पों में से सही उत्तर को चुनें :

Options :

878270218473. (A) - (IV), (B) - (III), (C) - (I), (D) - (II)

878270218474. (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

878270218475. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

878270218476. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)



Question Number : 75 Question Id : 87827055502 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

Which among the following is incorrect statement ?

Options :

878270218477. The organic compound shows electromeric effect in the presence of the reagent only.

878270218478. The electromeric effect is, temporary effect

878270218479. Electromeric effect dominates over inductive effect

878270218480. Hydrogen ion (H^+) shows negative electromeric effect



Question Number : 75 Question Id : 87827055502 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से कौन सा कथन गलत है ?

Options :

878270218477. कार्बनिक यौगिक अभिकर्मक की उपस्थिति में ही इलेक्ट्रोमेरी प्रभाव प्रदर्शित करते हैं।

878270218478. इलेक्ट्रोमेरी प्रभाव अस्थायी प्रभाव है।

878270218479.

इलेक्ट्रोमेरी प्रभाव प्रेरणिक प्रभाव से प्रबल है।

878270218480.

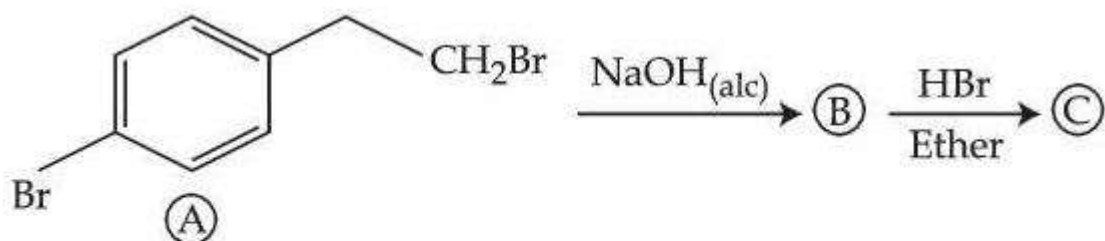
हाइड्रोजन आयन (H^+) ऋणात्मक इलेक्ट्रोमेरी प्रभाव प्रदर्शित करता है।

Question Number : 76 Question Id : 87827055503 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

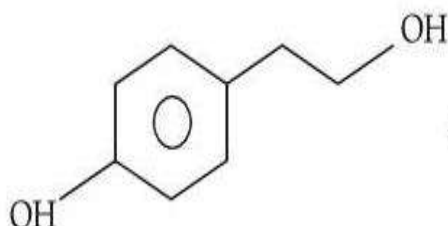
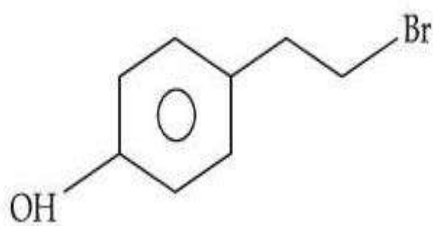
Correct Marks : 4 Wrong Marks : 1



Identify (B) and (C) and how are (A) and (C) related ?
(B) (C)

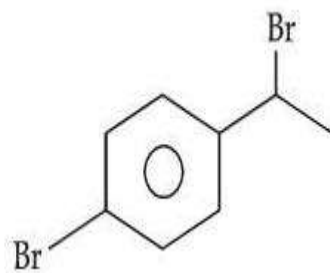
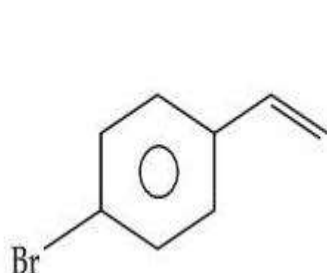
Options :

878270218481.



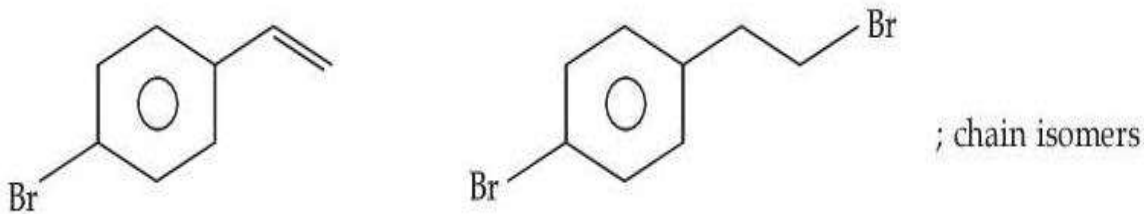
; functional group isomers

878270218482.

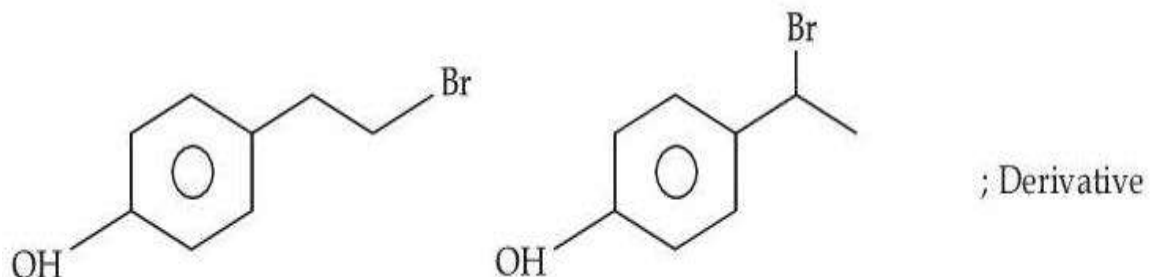


; position isomers

878270218483.



878270218484.

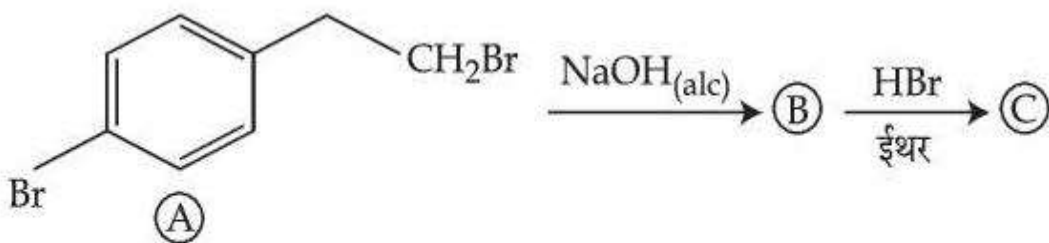


Question Number : 76 Question Id : 87827055503 Question Type : MCQ Option Shuffling : Yes

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

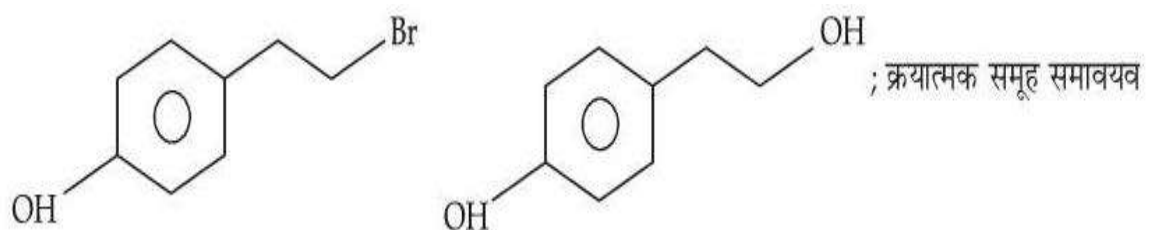
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1



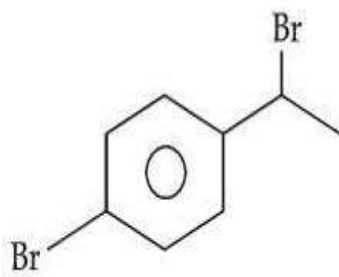
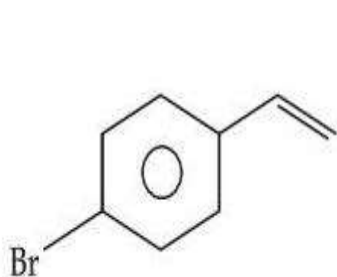
(B) एवं (C) को पहचानिए एवं बताइए कि (A) एवं (C) किस प्रकार सम्बन्धित हैं।
(B) (C)

Options :



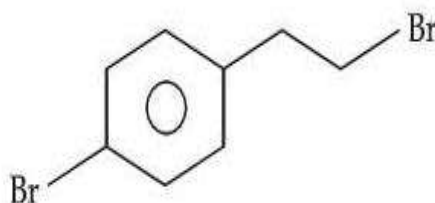
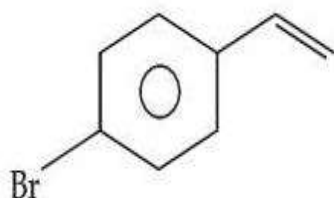
878270218481.

878270218482.



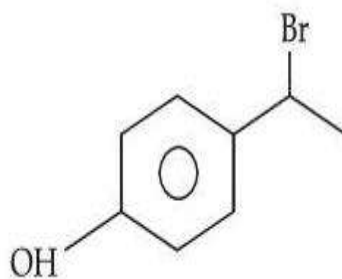
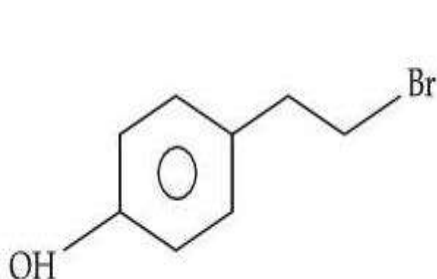
; स्थिति समावयव

878270218483.



; शृंखला समावयव

878270218484.



; व्युत्पन्न (डेरिवेटिव)



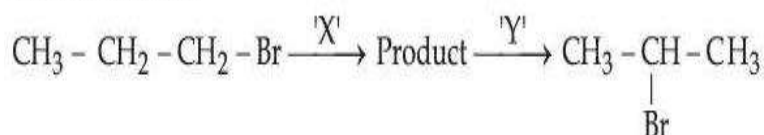
Question Number : 77 Question Id : 87827055504 Question Type : MCQ Option Shuffling : Yes

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 correct set of reagents or reaction conditions 'X' and 'Y' in the following set of transformation.



Options :

878270218485. X = dil.aq. NaOH, 20°C, Y = HBr/acetic acid

878270218486.

X = conc. alc. NaOH, 80°C, Y = HBr/ acetic acid

878270218487. X = dil. aq. NaOH, 20°C, Y = Br₂/CHCl₃

878270218488. X = conc. alc. NaOH, 80°C, Y = Br₂/CHCl₃

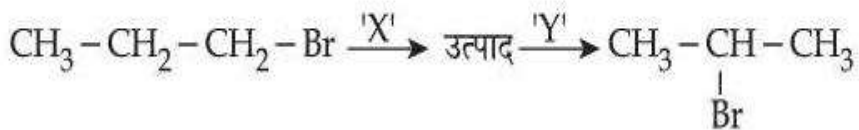
Question Number : 77 Question Id : 87827055504 Question Type : MCQ Option Shuffling : Yes

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 परिवर्तनों में अभिकर्मक/अभिक्रिया दशा 'X' एवं 'Y' के सेट को पहचानें : उत्पाद



Options :

878270218485. X = तनु जलीय NaOH, 20°C, Y = HBr/ऐसीटिक अम्ल

878270218486. X = सान्द्र एल्को. NaOH, 80°C, Y = HBr/ऐसीटिक अम्ल

878270218487. X = तनु जलीय NaOH, 20°C, Y = Br₂/CHCl₃

878270218488. X = सान्द्र एल्को. NaOH, 80°C, Y = Br₂/CHCl₃

Question Number : 78 Question Id : 87827055505 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 :

Statements I : Acidity of α -hydrogens of aldehydes and ketones is responsible for Aldol reaction.

Statement II : Reaction between benzaldehyde and ethanal will NOT give Cross - Aldol product.

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

Options :

878270218489. Both **Statement I** and **Statement II** are correct

878270218490. Both **Statement I** and **Statement II** are incorrect

878270218491. **Statement I** is correct but **Statement II** is incorrect

878270218492. **Statement I** is incorrect but **Statement II** is correct



Question Number : 78 Question Id : 87827055505 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 : ऐल्डिहाइडों एवं कीटानों के α -हाइड्रोजनों की अम्लता ऐल्डोल अभिक्रिया के लिए जिम्मेदार है।

कथन II : बैन्ज़ैल्डिहाइड एवं ऐथेनैल की अभिक्रिया क्रॉस ऐल्डोल उत्पाद नहीं देता है।

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

Options :

878270218489. दोनों **कथन I** एवं **कथन II** सही हैं।

878270218490. दोनों कथन I एवं कथन II गलत हैं।

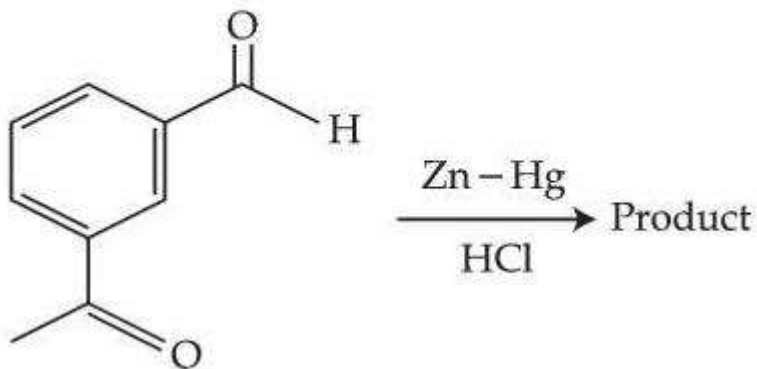
878270218491. कथन I सही है परन्तु कथन II गलत है।

878270218492. कथन I गलत है परन्तु कथन II सही है।

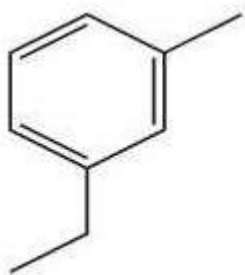
Question Number : 79 Question Id : 87827055506 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Identify the product in the following reaction :

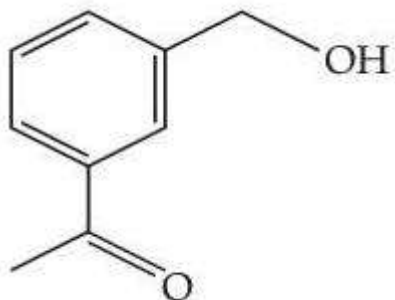
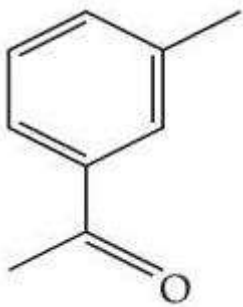


Options :

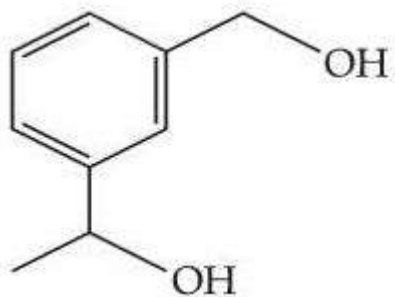


878270218493.

878270218494.



878270218495.



878270218496.



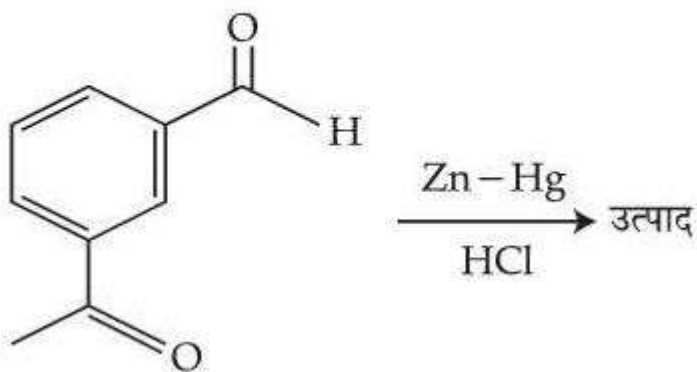
Question Number : 79 Question Id : 87827055506 Question Type : MCQ Option Shuffling : Yes

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

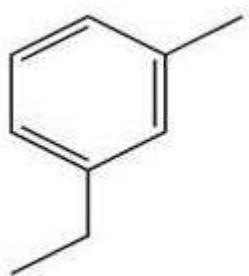
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

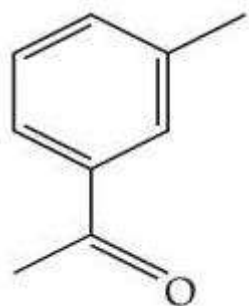
निम्नलिखित अभिक्रिया में उत्पाद को पहचाने :



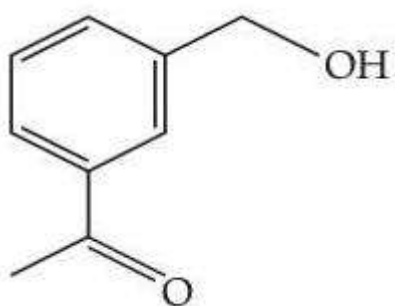
Options :



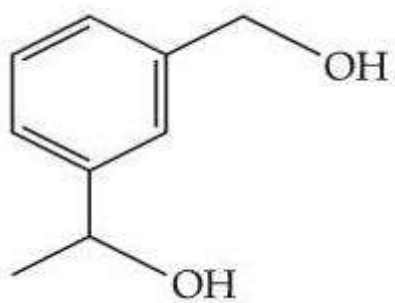
878270218493.



878270218494.



878270218495.



878270218496.



Question Number : 80 Question Id : 87827055507 Question Type : MCQ Option Shuffling : Yes

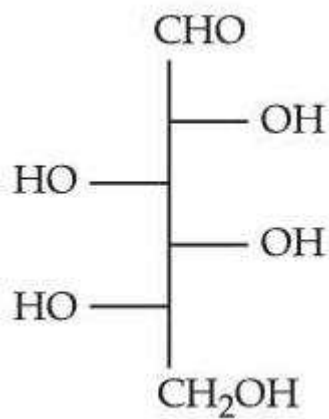
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

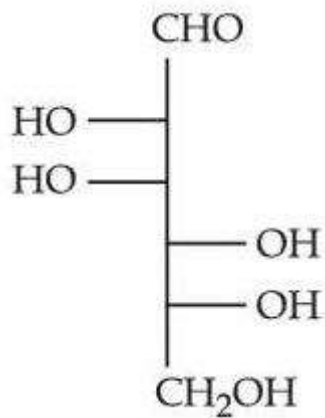
Correct Marks : 4 Wrong Marks : 1

Which of the following is the correct structure of L-Glucose ?

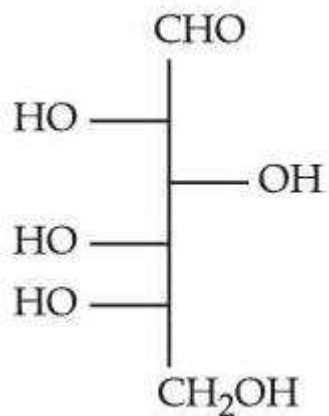
Options :



878270218497.



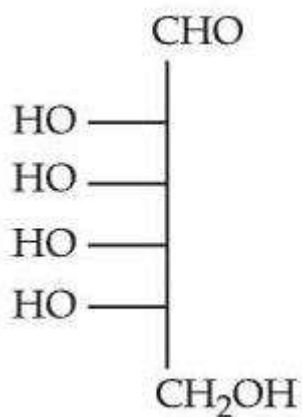
878270218498.



878270218499.

878270218500.





Question Number : 80 Question Id : 87827055507 Question Type : MCQ Option Shuffling : Yes

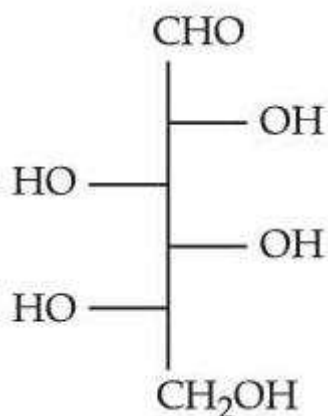
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

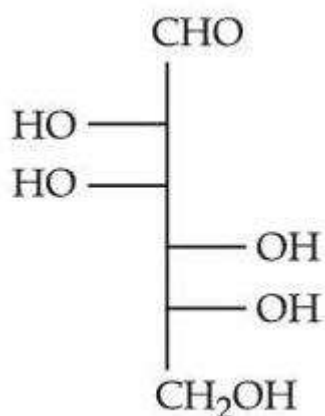
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से कौन L-ग्लूकोस की सही संरचना है?

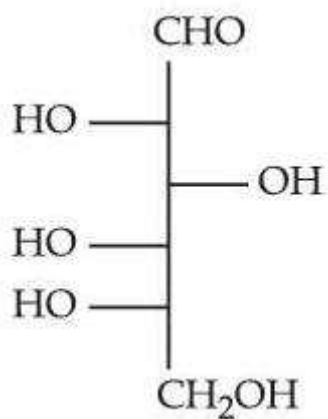
Options :



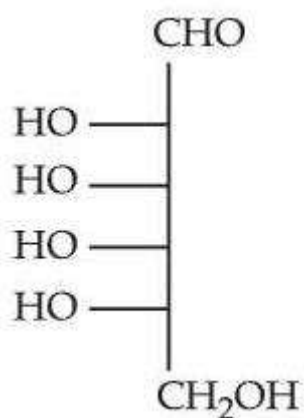
878270218497.



878270218498.



878270218499.



878270218500.



Chemistry Section B

Section Id :	8782701139
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 : 8782702046

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 81 Question Id : 87827055508 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The de-Broglie's wavelength of an electron in the 4th orbit is _____ πa_0 . (a_0 = Bohr's radius)

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 : 87827055508 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

4th कक्षा में किसी इलेक्ट्रॉन की डि-ब्रॉग्ली तरंगदैर्घ्य है : _____ πa_0 . (a_0 = बोर त्रिज्या)

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 : 87827055509 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 molecules/species from the following having one unpaired electron is _____.
 O_2 , O_2^{-1} , NO, CN^{-1} , O_2^{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 : 87827055509 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

निम्न में से एक अयुग्मित इलेक्ट्रॉन रखने वाले अणु/स्पीशीज़ की संख्या है : _____.
 O_2 , O_2^{-1} , NO, CN^{-1} , O_2^{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 : 87827055510 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1



The enthalpy of formation of ethane (C_2H_6) from ethylene by addition of hydrogen where the bond-energies of C-H, C-C, C=C, H-H are 414 kJ, 347 kJ, 615 kJ and 435 kJ respectively is
- _____ kJ

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 :** 87827055510 **Question Type :** SA **Calculator :** None

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

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

एथाइन के साथ हाइड्रोजन के योग से एथेन (C_2H_6) के गठन की एन्थैल्पी है : - _____ kJ
C-H, C-C, C=C एवं H-H की आबंध ऊर्जाएँ हैं, क्रमशः 414 kJ, 347 kJ, 615 kJ एवं 435 kJ.



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 :** 87827055511 **Question Type :** SA **Calculator :** None

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

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

2.5 g of a non-volatile, non-electrolyte is dissolved in 100 g of water at 25°C. The solution showed a boiling point elevation by 2°C. Assuming the solute concentration is negligible with respect to the solvent concentration, the vapor pressure of the resulting aqueous solution is _____ mm of Hg (nearest integer)

[Given: Molal boiling point elevation constant of water (K_b) = 0.52 K. kg mol⁻¹,
1 atm pressure = 760 mm of Hg, molar mass of water = 18 g 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 :** 87827055511 **Question Type :** SA **Calculator :** None

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

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



किसी अवाष्पशील विद्युत अपघट्य के 2.5 g को 25°C पर जल के 100 g में घोला जाता है तो विलयन 2°C का क्वथनांक उन्नयन प्रदर्शित करता है। यह मानते हुए कि विलेय की सान्द्रता, विलायक की सान्द्रता की तुलना में नगण्य है, तो परिणामी जलीय विलयन का वाष्प दाब है : _____ mm Hg (निकटतम पूर्णांक में)

[दिया गया है : जल का मोलल क्वथनांक उन्नयन स्थिरांक (K_b) = 0.52 K. kg mol⁻¹,
1 atm दाब = 760 mm Hg, जल का मोलर द्रव्यमान = 18 g mol⁻¹]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

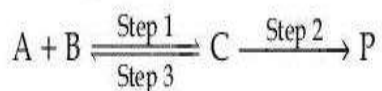
1

Question Number : 85 **Question Id :** 87827055512 **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 transformation involving first order elementary reaction in each step at constant temperature as shown below.



Some details of the above reactions are listed below.

Step	Rate constant (sec^{-1})	Activation energy (kJ mol^{-1})
1	k_1	300
2	k_2	200
3	k_3	E_{a_3}

If the overall rate constant of the above transformation (k) is given as $k = \frac{k_1 k_2}{k_3}$ and the overall activation energy (E_a) is 400 kJ mol^{-1} , then the value of E_{a_3} is _____ kJ mol^{-1} (nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

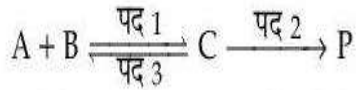
Question Number : 85 Question Id : 87827055512 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1



निम्नलिखित परिवर्तन पर विचार कीजिए जिसमें स्थिर ताप पर प्रत्येक पद में प्रथम कोटि की प्राथमिक अभिक्रिया भाग ले रही है जैसा नीचे दिखाया गया है :



उपर्युक्त अभिक्रिया की कुछ सूचनाएँ नीचे दी गई हैं :

पद	वेग स्थिरांक (सेकेन्ड ⁻¹)	सक्रियण ऊर्जा (kJ mol ⁻¹)
1	k ₁	300
2	k ₂	200
3	k ₃	E _{a3}

यदि उपर्युक्त परिवर्तन का समग्र वेग स्थिरांक (k) को $k = \frac{k_1 k_2}{k_3}$ द्वारा निरूपित किया जाता है तथा समग्र सक्रियण

ऊर्जा (E_a) 400 kJ mol⁻¹ है तो E_{a3} का मान है : _____ kJ mol⁻¹ (निकटतम पूर्णांक में)।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

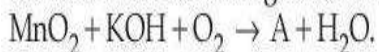


Question Number : 86 **Question Id :** 87827055513 **Question Type :** SA **Calculator :** None

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

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

Consider the following reaction



Product 'A' in neutral or acidic medium disproportionate to give products 'B' and 'C' along with water. The sum of spin-only magnetic moment values of B and C is _____ BM. (nearest integer) (Given atomic number of Mn is 25)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

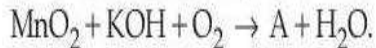
1

Question Number : 86 Question Id : 87827055513 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया पर विचार करें :



उत्पाद 'A' उदासीन या अम्लीय माध्यम में असमानुपातित होकर जल के साथ उत्पाद 'B' एवं 'C' देता है। B एवं C के 'प्रचक्रण मात्र' चुम्बकीय आघूर्ण के मानों का योग है : _____ BM (निकटतम पूर्णांक में)।

(दिया गया है : Mn का परमाणु क्रमांक = 25)

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 : 87827055514 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Only 2 mL of KMnO_4 solution of unknown molarity is required to reach the end point of a titration of 20 mL of oxalic acid (2 M) in acidic medium. The molarity of KMnO_4 solution should be _____ M.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 87 Question Id : 87827055514 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

अम्लीय माध्यम में 20 mL ऑक्सैलिक अम्ल (2 M) के अनुमापन में अंतिम बिंदु तक पहुंचने में अज्ञात मोलरता के KMnO_4 विलयन के मात्र 2 mL की आवश्यकता पड़ती है। KMnO_4 विलयन की मोलरता है : _____ M

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 : 87827055515 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The number of different chain isomers for C_7H_{16} 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 : 87827055515 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

C_7H_{16} के विभिन्न शृंखला समावयवों की संख्या है _____।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

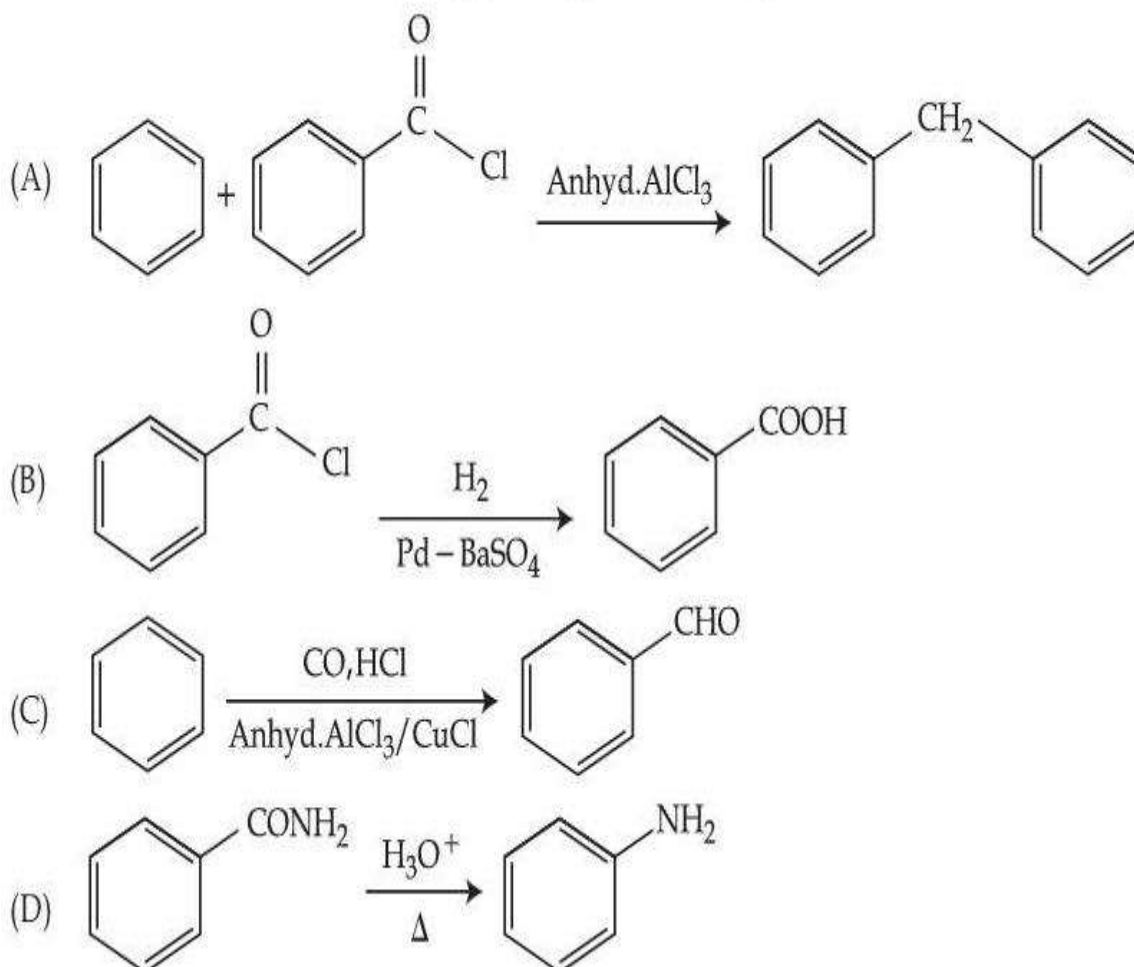
1

Question Number : 89 Question Id : 87827055516 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The number of the correct reaction(s) among the following is _____.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

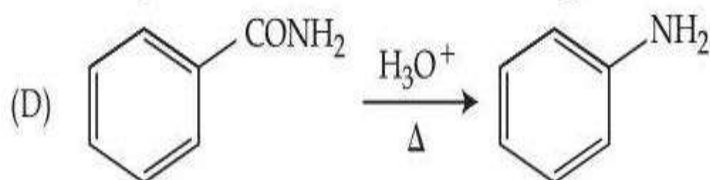
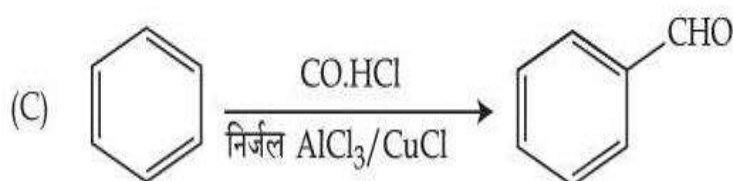
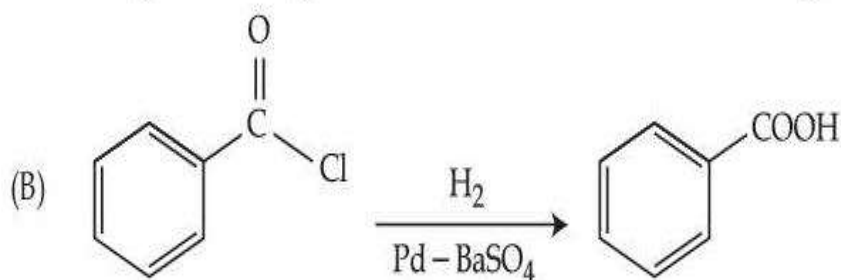
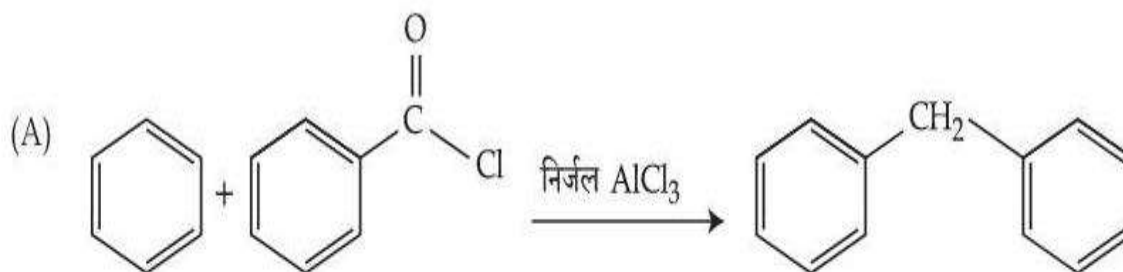
1

Question Number : 89 Question Id : 87827055516 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 सही अभिक्रिया/ओं की संख्या है : _____



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :



1

Question Number : 90 Question Id : 87827055517 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

X g of ethylamine is subjected to reaction with NaNO_2/HCl followed by water; evolved dinitrogen gas which occupied 2.24 L volume at STP. X is _____ $\times 10^{-1}$ g.

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 : 87827055517 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

X g एथिलऐमीन की क्रिया NaNO_2/HCl तदोपरान्त जल से कराने पर डाइनाइट्रोजन गैस उत्पन्न होती है जो STP पर 2.24 L आयतन ग्रहण करती है। X है : _____ $\times 10^{-1}$ g

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1