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Question Paper Name :	B Tech 9th April 2024 Shift 1
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B. Tech

Group Number :	1
Group Id :	878270683
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

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Mathematics Section A

Section Id :	8782701182
Section Number :	1

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Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	8782702089
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 1 Question Id : 87827056148 Question Type : MCQ Option Shuffling : Yes 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 $f(x) = \sin^{-1}\left(\frac{x-1}{2x+3}\right)$ is $R-(\alpha, \beta)$, then $12\alpha\beta$ is equal to :

Options :

878270220401. 24

878270220402. 32

878270220403. 36

878270220404. 40

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Question Number : 1 Question Id : 87827056148 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि फलन $f(x) = \sin^{-1}\left(\frac{x-1}{2x+3}\right)$ का प्रांत $\mathbf{R} - (\alpha, \beta)$ है, तो $12\alpha\beta$ बराबर है :

Options :

878270220401. 24

878270220402. 32

878270220403. 36

878270220404. 40

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Question Number : 2 Question Id : 87827056149 Question Type : MCQ Option Shuffling : Yes 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, β be the roots of the equation $x^2 + 2\sqrt{2}\,x - 1 = 0$. The quadratic equation, whose roots are $\alpha^4 + \beta^4$ and $\frac{1}{10}\left(\alpha^6 + \beta^6\right)$, is :

Options :

878270220405. $x^2 - 180x + 9506 = 0$

878270220406. $x^2 - 190x + 9466 = 0$

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878270220407. $x^2 - 195x + 9506 = 0$

878270220408. $x^2 - 195x + 9466 = 0$

Question Number : 2 Question Id : 87827056149 Question Type : MCQ Option Shuffling : Yes 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 $x^2 + 2\sqrt{2}\,x - 1 = 0$ के मूल α, β हैं। द्विघात समीकरण, जिसके मूल $\alpha^4 + \beta^4$ तथा $\frac{1}{10}\left(\alpha^6 + \beta^6\right)$ हैं, है :

Options :

878270220405. $x^2 - 180x + 9506 = 0$

878270220406. $x^2 - 190x + 9466 = 0$

878270220407. $x^2 - 195x + 9506 = 0$

878270220408. $x^2 - 195x + 9466 = 0$

Question Number : 3 Question Id : 87827056150 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Let $\lambda, \mu \in \mathbf{R}$. If the system of equations

$$3x + 5y + \lambda z = 3$$
$$7x + 11y - 9z = 2$$
$$97x + 155y - 189z = \mu$$

has infinitely many solutions, then $\mu + 2\lambda$ is equal to :

Options :

878270220409. 22

878270220410. 24

878270220411. 25

878270220412. 27

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Question Number : 3 Question Id : 87827056150 Question Type : MCQ Option Shuffling : Yes 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 $\lambda, \mu \in \mathbf{R}$ है। यदि समीकरण निकाय

$$3x + 5y + \lambda z = 3$$
$$7x + 11y - 9z = 2$$
$$97x + 155y - 189z = \mu$$

के अनंत हल हैं, तो $\mu + 2\lambda$ बराबर है :

Options :

878270220409. 22

878270220410. 24

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878270220411. 25

878270220412. 27

Question Number : 4 Question Id : 87827056151 Question Type : MCQ Option Shuffling : Yes 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 coefficient of x^{70} in $x^2(1+x)^{98}+x^3(1+x)^{97}+x^4(1+x)^{96}+\ldots+x^{54}(1+x)^{46}$ is ${}^{99}C_p-{}^{46}C_q$. Then a possible value of $p+q$ is :

Options :

878270220413. 55

878270220414. 83

878270220415. 68

878270220416. 61

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Question Number : 4 Question Id : 87827056151 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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$x^2(1+x)^{98}+x^3(1+x)^{97}+x^4(1+x)^{96}+\ldots+x^{54}(1+x)^{46}$ में x^{70} का गुणांक ${}^{99}C_p-{}^{46}C_q$ है। तो $p+q$ का एक संभव मान है :

Options :

878270220413. 55

878270220414. 83

878270220415. 68

878270220416. 61

Question Number : 5 Question Id : 87827056152 Question Type : MCQ Option Shuffling : Yes 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 sum of the series $\frac{1}{1\cdot(1+d)}+\frac{1}{(1+d)(1+2d)}+\ldots+\frac{1}{(1+9d)(1+10d)}$ is equal to 5, then 50d is equal to :

Options :

878270220417. 5

878270220418. 10

878270220419. 15

878270220420.

20

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Question Number : 5 Question Id : 87827056152 Question Type : MCQ Option Shuffling : Yes 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 श्रेणी $\frac{1}{1\cdot(1+d)}+\frac{1}{(1+d)(1+2d)}+\ldots+\frac{1}{(1+9d)(1+10d)}$ का योग 5 है, तो 50d बराबर है :

Options :

878270220417. 5

878270220418. 10

878270220419. 15

878270220420. 20

Question Number : 6 Question Id : 87827056153 Question Type : MCQ Option Shuffling : Yes 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 $f(x)=ax^3+bx^2+cx+41$ be such that $f(1)=40$, $f'(1)=2$ and $f''(1)=4$. Then $a^2+b^2+c^2$ is equal to :

Options :

878270220421. 51

878270220422. 54

878270220423. 62

878270220424. 73

Question Number : 6 Question Id : 87827056153 Question Type : MCQ Option Shuffling : Yes 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 $f(x)=ax^3+bx^2+cx+41$ इस प्रकार है कि $f(1)=40$, $f'(1)=2$ तथा $f''(1)=4$ हैं। तो $a^2+b^2+c^2$ बराबर है :

Options :

878270220421. 51

878270220422. 54

878270220423. 62

878270220424. 73

Question Number : 7 Question Id : 87827056154 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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A variable line L passes through the point (3, 5) and intersects the positive coordinate axes at the points A and B. The minimum area of the triangle OAB, where O is the origin, is :

Options :

878270220425. 40

878270220426. 35

878270220427. 25

878270220428. 30

Question Number : 7 Question Id : 87827056154 Question Type : MCQ Option Shuffling : Yes 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 चर रेखा L, बिंदु (3, 5) से होकर जाती है तथा धनात्मक निर्देशांक अक्षों को बिंदुओं A और B पर काटती है। यदि O मूलबिंदु है, तो त्रिभुज OAB का न्यूनतम क्षेत्रफल है :

Options :

878270220425. 40

878270220426. 35

878270220427. 25

878270220428. 30

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Question Number : 8 Question Id : 87827056155 Question Type : MCQ Option Shuffling : Yes 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 $\int \frac{2-\tan x}{3+\tan x} dx = \frac{1}{2}\left(\alpha x + \log_e|\beta \sin x + \gamma \cos x|\right) + C$, where C is the constant of integration.

Then $\alpha + \frac{\gamma}{\beta}$ is equal to :

Options :

878270220429. 1

878270220430. 3

878270220431. 4

878270220432. 7

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Question Number : 8 Question Id : 87827056155 Question Type : MCQ Option Shuffling : Yes 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 $\int \frac{2-\tan x}{3+\tan x} dx = \frac{1}{2}\left(\alpha x + \log_e|\beta \sin x + \gamma \cos x|\right) + C$ है, जहाँ C समाकलन अचर है। तो $\alpha + \frac{\gamma}{\beta}$ बराबर है :

Options :

878270220429.

1

878270220430. 3

878270220431. 4

878270220432. 7

Question Number : 9 Question Id : 87827056156 Question Type : MCQ Option Shuffling : Yes 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 parabola $y^2=4x$ divides the area of the circle $x^2+y^2=5$ in two parts. The area of the smaller part is equal to :

Options :

878270220433. $\frac{1}{3}+\sqrt{5}\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

878270220434. $\frac{2}{3}+\sqrt{5}\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

878270220435. $\frac{1}{3}+5\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

878270220436.

$\frac{2}{3} + 5\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

Question Number : 9 Question Id : 87827056156 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

परवलय $y^2=4x$, वृत्त $x^2+y^2=5$ के क्षेत्रफल को दो भागों में बाँटता है। छोटे भाग का क्षेत्रफल है :

Options :

878270220433. $\frac{1}{3} + \sqrt{5}\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

878270220434. $\frac{2}{3} + \sqrt{5}\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

878270220435. $\frac{1}{3} + 5\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

878270220436. $\frac{2}{3} + 5\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

Question Number : 10 Question Id : 87827056157 Question Type : MCQ Option Shuffling : Yes 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 solution of the differential equation $(x^2+y^2)dx-5xy\ dy=0,\ y(1)=0$, is :

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Options :

878270220437. $\left|x^2 - 2y^2\right|^6 = x$

878270220438. $\left|x^2 - 2y^2\right|^5 = x^2$

878270220439. $\left|x^2 - 4y^2\right|^6 = x$

878270220440. $\left|x^2 - 4y^2\right|^5 = x^2$

Question Number : 10 Question Id : 87827056157 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

अवकल समीकरण $(x^2+y^2)dx-5xy\ dy=0,\ y(1)=0$ का हल है :

Options :

878270220437. $\left|x^2 - 2y^2\right|^6 = x$

878270220438. $\left|x^2 - 2y^2\right|^5 = x^2$

878270220439. $\left|x^2 - 4y^2\right|^6 = x$

878270220440. $\left|x^2 - 4y^2\right|^5 = x^2$

Question Number : 11 Question Id : 87827056158 Question Type : MCQ Option Shuffling : Yes 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 solution curve, of the differential equation $2y\,\frac{dy}{dx} + 3 = 5\,\frac{dy}{dx}$, passing through the point $(0, 1)$ is a conic, whose vertex lies on the line :

Options :

878270220441. $2x + 3y = 9$

878270220442. $2x + 3y = 6$

878270220443. $2x + 3y = -6$

878270220444. $2x + 3y = -9$

Question Number : 11 Question Id : 87827056158 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

अवकल समीकरण $2y\frac{dy}{dx}+3=5\frac{dy}{dx}$ का हल वक्र, जो (0, 1) से होकर जाता है, एक शांकव है। इस शांकव का शीर्ष निम्न में से किस रेखा पर है?

Options :

878270220441. $2x+3y=9$

878270220442. $2x+3y=6$

878270220443. $2x+3y=-6$

878270220444. $2x+3y=-9$

Question Number : 12 Question Id : 87827056159 Question Type : MCQ Option Shuffling : Yes 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 $f(x)=x^2+9$, $g(x)=\frac{x}{x-9}$ and $a=fog(10)$, $b=gof(3)$. If e and l denote the eccentricity and the length of the latus rectum of the ellipse $\frac{x^2}{a}+\frac{y^2}{b}=1$, then $8e^2+l^2$ is equal to.

Options :

878270220445. 16

878270220446. 12

878270220447.

8

878270220448. 6

Question Number : 12 Question Id : 87827056159 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $f(x)=x^2+9, g(x)=\frac{x}{x-9}$ हैं और $a=fog(10), b=gof(3)$ हैं। यदि दीर्घवृत्त $\frac{x^2}{a}+\frac{y^2}{b}=1$ की उत्केन्द्रता तथा नाभिलंब जीवा की लंबाई क्रमश: e तथा l हैं, तो $8e^2+l^2$ बराबर है :

Options :

878270220445. 16

878270220446. 12

878270220447. 8

878270220448. 6

Question Number : 13 Question Id : 87827056160 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Let a circle passing through (2, 0) have its centre at the point (h, k). Let (x_c, y_c) be the point of intersection of the lines $3x+5y=1$ and $(2+c)x+5c^2y=1$. If $h=\lim_{c\to 1} x_c$ and $k=\lim_{c\to 1} y_c$, then the equation of the circle is :

Options :

878270220449. $25x^2+25y^2-20x+2y-60=0$

878270220450. $25x^2+25y^2-2x+2y-60=0$

878270220451. $5x^2+5y^2-4x+2y-12=0$

878270220452. $5x^2+5y^2-4x-2y-12=0$

Question Number : 13 Question Id : 87827056160 Question Type : MCQ Option Shuffling : Yes 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 (2, 0) से होकर जाने वाले एक वृत्त का केन्द्र (h, k) है। माना रेखाओं $3x+5y=1$ तथा $(2+c)x+5c^2y=1$ का प्रतिच्छेदन बिंदु (x_c, y_c) है। यदि $h=\lim_{c\to 1} x_c$ तथा $k=\lim_{c\to 1} y_c$ हैं, तो वृत्त का समीकरण है :

Options :

878270220449. $25x^2+25y^2-20x+2y-60=0$

878270220450. $25x^2+25y^2-2x+2y-60=0$

878270220451.

$$5x^2+5y^2-4x+2y-12=0$$

878270220452. $5x^2+5y^2-4x-2y-12=0$

Question Number : 14 Question Id : 87827056161 Question Type : MCQ Option Shuffling : Yes 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 ray of light coming from the point P(1, 2) gets reflected from the point Q on the x-axis and then passes through the point R(4, 3). If the point S(h, k) is such that PQRS is a parallelogram, then hk^2 is equal to :

Options :

878270220453. 60

878270220454. 70

878270220455. 80

878270220456. 90

Question Number : 14 Question Id : 87827056161 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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बिंदु P(1, 2) से आने वाली रोशनी की एक किरण x-अक्ष पर बिंदु Q से परावर्तित होने के पश्चात् बिंदु R(4, 3) से गुजरती है। यदि बिंदु S(h, k) इस प्रकार है कि PQRS एक समांतर चतुर्भुज है, तो hk^2 बराबर है :

Options :

878270220453. 60

878270220454. 70

878270220455. 80

878270220456. 90

Question Number : 15 Question Id : 87827056162 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let the line L intersect the lines $x-2=-y=z-1$, $2(x+1)=2(y-1)=z+1$ and be parallel to the line $\frac{x-2}{3}=\frac{y-1}{1}=\frac{z-2}{2}$. Then which of the following points lies on L?

Options :

878270220457. $\left(-\frac{1}{3}, 1, -1\right)$

878270220458. $\left(-\frac{1}{3}, -1, 1\right)$

878270220459.

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$\left(-\frac{1}{3}, 1, 1\right)$

878270220460. $\left(-\frac{1}{3}, -1, -1\right)$

Question Number : 15 Question Id : 87827056162 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना रेखा L, रेखाओं $x-2=-y=z-1$, $2(x+1)=2(y-1)=z+1$ को काटती है, तथा रेखा $\frac{x-2}{3}=\frac{y-1}{1}=\frac{z-2}{2}$ के समांतर है। तो निम्न में से कौन सा बिंदु L पर है?

Options :

878270220457. $\left(-\frac{1}{3}, 1, -1\right)$

878270220458. $\left(-\frac{1}{3}, -1, 1\right)$

878270220459. $\left(-\frac{1}{3}, 1, 1\right)$

878270220460. $\left(-\frac{1}{3}, -1, -1\right)$

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Question Number : 16 Question Id : 87827056163 Question Type : MCQ Option Shuffling : Yes

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 shortest distance between the lines $\frac{x-3}{4}=\frac{y+7}{-11}=\frac{z-1}{5}$ and $\frac{x-5}{3}=\frac{y-9}{-6}=\frac{z+2}{1}$ is :

Options :

878270220461. $\frac{178}{\sqrt{563}}$

878270220462. $\frac{179}{\sqrt{563}}$

878270220463. $\frac{185}{\sqrt{563}}$

878270220464. $\frac{187}{\sqrt{563}}$

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Question Number : 16 Question Id : 87827056163 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

रेखाओं $\frac{x-3}{4}=\frac{y+7}{-11}=\frac{z-1}{5}$ तथा $\frac{x-5}{3}=\frac{y-9}{-6}=\frac{z+2}{1}$ के बीच की न्यूनतम दूरी है :

Options :

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878270220461. $\frac{178}{\sqrt{563}}$

878270220462. $\frac{179}{\sqrt{563}}$

878270220463. $\frac{185}{\sqrt{563}}$

878270220464. $\frac{187}{\sqrt{563}}$

Question Number : 17 Question Id : 87827056164 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let $\vec{OA} = 2\vec{a}$, $\vec{OB} = 6\vec{a} + 5\vec{b}$ and $\vec{OC} = 3\vec{b}$, where O is the origin. If the area of the parallelogram with adjacent sides $\vec{OA}$ and $\vec{OC}$ is 15 sq. units, then the area (in sq. units) of the quadrilateral OABC is equal to :

Options :

878270220465. 32

878270220466. 35

878270220467. 38

878270220468. 40

Question Number : 17 Question Id : 87827056164 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना $\vec{OA} = 2\vec{a}$, $\vec{OB} = 6\vec{a} + 5\vec{b}$ तथा $\vec{OC} = 3\vec{b}$ हैं, जहाँ O मूल बिंदु है। यदि $\vec{OA}$ तथा $\vec{OC}$ संलग्न भुजाओं वाले समांतर चतुर्भुज का क्षेत्रफल 15 वर्ग इकाई है, तो चतुर्भुज OABC का क्षेत्रफल (वर्ग इकाई में) बराबर है :

Options :

878270220465. 32

878270220466. 35

878270220467. 38

878270220468. 40

Question Number : 18 Question Id : 87827056165 Question Type : MCQ Option Shuffling : Yes 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 three vectors $\vec{a} = \alpha\hat{i} + 4\hat{j} + 2\hat{k}$, $\vec{b} = 5\hat{i} + 3\hat{j} + 4\hat{k}$, $\vec{c} = x\hat{i} + y\hat{j} + z\hat{k}$ form a triangle such that $\vec{c} = \vec{a} - \vec{b}$ and the area of the triangle is $5\sqrt{6}$. If α is a positive real number, then $|\vec{c}|^2$ is equal to :

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Options :

878270220469. 10

878270220470. 12

878270220471. 14

878270220472. 16

Question Number : 18 Question Id : 87827056165 Question Type : MCQ Option Shuffling : Yes 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 तीन सदिश $\vec{a} = \alpha\hat{i} + 4\hat{j} + 2\hat{k}$, $\vec{b} = 5\hat{i} + 3\hat{j} + 4\hat{k}$, $\vec{c} = x\hat{i} + y\hat{j} + z\hat{k}$ एक त्रिभुज बनाते हैं, जो इस प्रकार है कि $\vec{c} = \vec{a} - \vec{b}$ है तथा इस त्रिभुज का क्षेत्रफल $5\sqrt{6}$ है। यदि α एक धनात्मक वास्तविक संख्या है, तो $|\vec{c}|^2$ बराबर है :

Options :

878270220469. 10

878270220470. 12

878270220471. 14

878270220472. 16

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Question Number : 19 Question Id : 87827056166 Question Type : MCQ Option Shuffling : Yes 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 frequency distribution of the age of students in a class of 40 students is given below.

Age	15	16	17	18	19	20
No of Students	5	8	5	12	x	y

If the mean deviation about the median is 1.25, then $4x+5y$ is equal to :

Options :

878270220473. 43

878270220474. 44

878270220475. 46

878270220476. 47

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Question Number : 19 Question Id : 87827056166 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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40 छात्रों की एक कक्षा के छात्रों की आयु का बारंबारता बंटन नीचे दिया है।

आयु	15	16	17	18	19	20
छात्रों की संख्या	5	8	5	12	x	y

यदि माध्यिका के सापेक्ष माध्य विचलन 1.25 है, तो $4x+5y$ बराबर है :

Options :

878270220473. 43

878270220474. 44

878270220475. 46

878270220476. 47

Question Number : 20 Question Id : 87827056167 Question Type : MCQ Option Shuffling : Yes 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 $|\cos\theta \cos(60-\theta) \cos(60+\theta)| \leq \frac{1}{8}$, $\theta \epsilon [0, 2\pi]$. Then, the sum of all $\theta \epsilon [0, 2\pi]$, where $\cos 3\theta$ attains its maximum value, is :

Options :

878270220477. 6π

878270220478. 18π

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878270220479. 9π

878270220480. 15π

Question Number : 20 Question Id : 87827056167 Question Type : MCQ Option Shuffling : Yes 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 $\left|\cos\theta\cos(60-\theta)\cos(60+\theta)\right| \leq \frac{1}{8}$, $\theta\epsilon[0, 2\pi]$, है। तो $\theta\epsilon[0, 2\pi]$ के सभी मानों, जिनके लिए $\cos 3\theta$ का मान उच्चतम है, का योग है :

Options :

878270220477. 6π

878270220478. 18π

878270220479. 9π

878270220480. 15π

Mathematics Section B

Section Id :	8782701183
Section Number :	2
Section type :	Online

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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 : 8782702090

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 21 Question Id : 87827056168 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let $A = \{2, 3, 6, 7\}$ and $B = \{4, 5, 6, 8\}$. Let R be a relation defined on $A \times B$ by $(a_1, b_1) R (a_2, b_2)$ if and only if $a_1 + a_2 = b_1 + b_2$. Then the number of elements in R is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 21 Question Id : 87827056168 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना $A = \{2, 3, 6, 7\}$ तथा $B = \{4, 5, 6, 8\}$ हैं। माना $A \times B$ पर एक संबंध R, $(a_1, b_1) R (a_2, b_2)$ द्वारा तो ही परिभाषित है यदि और केवल यदि $a_1 + a_2 = b_1 + b_2$ है। तो R में अवयवों की संख्या हैं ________

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 : 87827056169 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The sum of the square of the modulus of the elements in the set $\{z = a + ib : a, b \in \mathbf{Z}, z \in \mathbf{C}, |z-1| \le 1, |z-5| \le |z-5i|\}$ 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 : 87827056169 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

समुच्चय $\{z = a + ib : a, b \in \mathbf{Z}, z \in \mathbf{C}, |z-1| \le 1, |z-5| \le |z-5i|\}$ के अवयवों के मापांकों के वर्गों का योग है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 23 Question Id : 87827056170 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 non-singular matrix of order 3. If $\det(3\operatorname{adj}(2\operatorname{adj}((\det A)A))) = 3^{-13} \cdot 2^{-10}$ and $\det(3\operatorname{adj}(2A)) = 2^m \cdot 3^n$, then $|3m+2n|$ 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 : 87827056170 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 3 का एक व्युत्क्रमणीय आव्यूह है। यदि $\det(3\operatorname{adj}(2\operatorname{adj}((\det A)A))) = 3^{-13} \cdot 2^{-10}$ तथा $\det(3\operatorname{adj}(2A)) = 2^m \cdot 3^n$ हैं, तो $|3m+2n|$ बराबर है ________

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 24 Question Id : 87827056171 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let $f:(0,\pi)\to\mathbf{R}$ be a function given by $f(x)=\begin{cases}\left(\frac{8}{7}\right)^{\frac{\tan 8x}{\tan 7x}}, & 0<x<\frac{\pi}{2}\\ a-8, & x=\frac{\pi}{2}\\ (1+|\cot x|)^{\frac{b}{a}|\tan x|}, & \frac{\pi}{2}<x<\pi\end{cases}$

where a, b$\in\mathbf{Z}$. If f is continuous at $x=\frac{\pi}{2}$, then a^2+b^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 : 24 Question Id : 87827056171 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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माना $f:(0,\pi)\rightarrow \mathbf{R}$ एक फलन दिया गया है जो कि $f(x)=\begin{cases} \left(\frac{8}{7}\right)^{\frac{\tan 8x}{\tan 7x}}, & 0<x<\frac{\pi}{2} \\ a-8, & x=\frac{\pi}{2} \\ (1+|\cot x|)^{\frac{b}{a}|\tan x|}, & \frac{\pi}{2}<x<\pi \end{cases}$

है, जहाँ $a, b \epsilon \mathbf{Z}$ है। यदि f, $x=\frac{\pi}{2}$ पर सतंत है, तो a^2+b^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 : 25 Question Id : 87827056172 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The remainder when 428^{2024} is divided by 21 is ________.

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 : 87827056172 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

428^{2024} को 21 से विभाजित करने पर शेषफल 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 : 87827056173 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

If a function f satisfies $f(m+n) = f(m) + f(n)$ for all m, n ϵ N and $f(1) = 1$, then the largest natural number λ such that $\sum_{k=1}^{2022} f(\lambda + k) \leq (2022)^2$ 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 : 26 Question Id : 87827056173 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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यदि सभी m, n ∈ N के लिए, $f(m+n)=f(m)+f(n)$ है तथा $f(1)=1$ है, तो अधिकतम धन पूर्णांक λ, जिसके लिए $\sum_{k=1}^{2022} f(\lambda + k) \le (2022)^2$ है, 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 : 87827056174 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 set of all positive values of λ, for which the point of local minimum of the function $(1+x(\lambda^2-x^2))$ satisfies $\frac{x^2+x+2}{x^2+5x+6}<0$, be (α, β). Then $\alpha^2+\beta^2$ is equal to ________.

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Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 27 Question Id : 87827056174 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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माना λ के सभी धनात्मक मानों, जिनके लिए फलन $(1+x(\lambda^2-x^2))$ का स्थानीय निम्नतम का बिंदु $\frac{x^2+x+2}{x^2+5x+6}<0$ को संतुष्ट करता है, का समुच्चय (α, β) है। तो $\alpha^2+\beta^2$ 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 : 28 Question Id : 87827056175 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let $\lim_{n\to\infty}\left(\frac{n}{\sqrt{n^4+1}}-\frac{2n}{(n^2+1)\sqrt{n^4+1}}+\frac{n}{\sqrt{n^4+16}}-\frac{8n}{(n^2+4)\sqrt{n^4+16}}+\ldots+\frac{n}{\sqrt{n^4+n^4}}-\frac{2n\cdot n^2}{(n^2+n^2)\sqrt{n^4+n^4}}\right)$ be $\frac{\pi}{k}$, using only the principal values of the inverse trigonometric functions. Then k^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 : 87827056175 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना $\lim_{n\to\infty}\left(\frac{n}{\sqrt{n^4+1}}-\frac{2n}{(n^2+1)\sqrt{n^4+1}}+\frac{n}{\sqrt{n^4+16}}-\frac{8n}{(n^2+4)\sqrt{n^4+16}}+\ldots+\frac{n}{\sqrt{n^4+n^4}}-\frac{2n\cdot n^2}{(n^2+n^2)\sqrt{n^4+n^4}}\right)=\frac{\pi}{k}$ है, जब प्रतिलोम त्रिकोणमितीय फलनों के केवल मुख्य मान लिए गए हैं। तो k^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 : 87827056176 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 centre of a circle, passing through the points (0, 0), (1, 0) and touching the circle $x^2+y^2=9$, be (h, k). Then for all possible values of the coordinates of the centre (h, k), $4(h^2+k^2)$ 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 : 29 Question Id : 87827056176 Question Type : SA Calculator : None

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

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

माना बिंदुओं (0, 0), (1, 0) से होकर जाने वाले तथा वृत्त $x^2+y^2=9$ को स्पर्श करने वाले एक वृत्त का केन्द्र (h, k) है। तो केन्द्र (h, k) के सभी संभव निर्देशांकों के लिए, $4(h^2+k^2)$ 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 : 30 **Question Id :** 87827056177 **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, b and c denote the outcome of three independent rolls of a fair tetrahedral die, whose four faces are marked 1, 2, 3, 4. If the probability that $ax^2+bx+c=0$ has all real roots is $\frac{m}{n}$, gcd(m, n) =1, then m+n is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 30 **Question Id :** 87827056177 **Question Type :** SA **Calculator :** None

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

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

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एक न्याय्य (fair) चतुष्फलकीय पासे, जिसके चार फलकों पर 1, 2, 3, 4 अंकित है, को तीन स्वतंत्र बार फेंकने पर a, b तथा c प्राप्त होते हैं। यदि $ax^2+bx+c=0$ के सभी मूल वास्तविक होने की प्रायिकता $\frac{m}{n}$ है, जहाँ $gcd(m, n)=1$ 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

Physics Section A

Section Id :	8782701184
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 :	8782702091
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 31 Question Id : 87827056178 Question Type : MCQ Option Shuffling : Yes

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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 dimensional formula of latent heat is :

Options :

878270220491. $[ML^2T^{-2}]$

878270220492. $[M^oL^2T^{-2}]$

878270220493. $[MLT^{-2}]$

878270220494. $[M^oLT^{-2}]$

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Question Number : 31 Question Id : 87827056178 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

गुप्त ऊष्मा का विमीय सूत्र है :

Options :

878270220491. $[ML^2T^{-2}]$

878270220492. $[M^oL^2T^{-2}]$

878270220493. $[MLT^{-2}]$

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878270220494. $[M^oLT^{-2}]$

Question Number : 32 Question Id : 87827056179 Question Type : MCQ Option Shuffling : Yes 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 particle moving in a straight line covers half the distance with speed 6 m/s. The other half is covered in two equal time intervals with speeds 9 m/s and 15 m/s respectively. The average speed of the particle during the motion is :

Options :

878270220495. 10 m/s

878270220496. 8 m/s

878270220497. 8.8 m/s

878270220498. 9.2 m/s

Question Number : 32 Question Id : 87827056179 Question Type : MCQ Option Shuffling : Yes 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 सरल रेखा में गतिमान एक कण आधी दूरी 6 मी/से की चाल से तय करता है। शेष आधी दूरी दो समान अन्तरालों में क्रमश: 9 मी/से व 15 मी/से की चालों से तय करता है। गति के दौरान कण की औसत चाल है :

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Options :

878270220495. 10 मी/से

878270220496. 8 मी/से

878270220497. 8.8 मी/से

878270220498. 9.2 मी/से

Question Number : 33 Question Id : 87827056180 Question Type : MCQ Option Shuffling : Yes 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 heavy iron bar, of weight W is having its one end on the ground and the other on the shoulder of a person. The bar makes an angle θ with the horizontal. The weight experienced by the person is :

Options :

878270220499. $W \cos \theta$

878270220500. $W \sin \theta$

878270220501. W

878270220502. $\frac{W}{2}$

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Question Number : 33 Question Id : 87827056180 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

W भार की एक भारी लोहे की छड़ का एक सिरा पृथ्वी सतह पर तथा दूसरा सिरा एक व्यक्ति के कँधे पर रखा है। छड़ क्षैतिज के साथ θ कोण बनाती है। व्यक्ति द्वारा अनुभव किया गया भार है :

Options :

878270220499. $W \cos \theta$

878270220500. $W \sin \theta$

878270220501. W

878270220502. $\frac{W}{2}$

Question Number : 34 Question Id : 87827056181 Question Type : MCQ Option Shuffling : Yes 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 light unstretchable string passing over a smooth light pulley connects two blocks of masses m_1 and m_2. If the acceleration of the system is $\frac{g}{8}$, then the ratio of the masses $\frac{m_2}{m_1}$ is :

Options :

878270220503. $8 : 1$

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878270220504. 9 : 7

878270220505. 4 : 3

878270220506. 5 : 3

Question Number : 34 Question Id : 87827056181 Question Type : MCQ Option Shuffling : Yes 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 हल्की घिरनी के ऊपर से जाती हुई एक हल्की न खिंचने वाली डोरी m_1 व m_2 द्रव्यमान के दो गुटकों को जोड़ती है। यदि निकाय का त्वरण $\frac{g}{8}$ हो तब द्रव्यमानों का अनुपात $\frac{m_2}{m_1}$ है :

Options :

878270220503. 8 : 1

878270220504. 9 : 7

878270220505. 4 : 3

878270220506. 5 : 3

Question Number : 35 Question Id : 87827056182 Question Type : MCQ Option Shuffling : Yes 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 particle of mass m moves on a straight line with its velocity increasing with distance according to the equation $v = \alpha\sqrt{x}$, where α is a constant. The total work done by all the forces applied on the particle during its displacement from $x = 0$ to $x = d$, will be :

Options :

878270220507. $\frac{md}{2\alpha^2}$

878270220508. $\frac{m\alpha^2 d}{2}$

878270220509. $\frac{m}{2\alpha^2 d}$

878270220510. $2m\alpha^2 d$

Question Number : 35 Question Id : 87827056182 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

m द्रव्यमान का एक कण एक सीधी रेखा में अपने वेग से गति करता है जो $v = \alpha\sqrt{x}$ समीकरण के अनुसार दूरी के साथ बढ़ता है। जहाँ α एक नियतांक है। कण पर आरोपित सभी बलों द्वारा $x = 0$ से $x = d$ तक कण के विस्थापन के दौरान कृत कार्य होगा :

Options :

878270220507. $\frac{md}{2\alpha^2}$

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878270220508. $\frac{m\alpha^2 d}{2}$

878270220509. $\frac{m}{2\alpha^2 d}$

878270220510. $2m\alpha^2 d$

Question Number : 36 Question Id : 87827056183 Question Type : MCQ Option Shuffling : Yes 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 astronaut takes a ball of mass m from earth to space. He throws the ball into a circular orbit about earth at an altitude of 318.5 km. From earth's surface to the orbit, the change in total mechanical energy of the ball is $x\frac{GM_e m}{21R_e}$. The value of x is (take $R_e = 6370$ km) :

Options :

878270220511. 9

878270220512. 10

878270220513. 11

878270220514. 12

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Question Number : 36 Question Id : 87827056183 Question Type : MCQ Option Shuffling : Yes

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 अंतरिक्ष यात्री m द्रव्यमान की एक गेंद को पृथ्वी से अंतरिक्ष में ले जाता है। वह 318.5 किमी की ऊँचाई पर पृथ्वी के परित: एक वृत्तीय कक्षा में गेंद को फेंकता है। पृथ्वी सतह से कक्षा तक गेंद की कुल यांत्रिक ऊर्जा में परिवर्तन $x\frac{GM_e m}{21R_e}$ है।

x का मान है : ($R_e = 6370$ किमी)

Options :

878270220511. 9

878270220512. 10

878270220513. 11

878270220514. 12

Question Number : 37 Question Id : 87827056184 Question Type : MCQ Option Shuffling : Yes

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 sphere of relative density σ and diameter D has concentric cavity of diameter d. The ratio of $\frac{D}{d}$, if it just floats on water in a tank is :

Options :

878270220515. $\left(\frac{\sigma - 1}{\sigma}\right)^{1/3}$

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878270220516. $\left(\frac{\sigma}{\sigma - 1}\right)^{1/3}$

878270220517. $\left(\frac{\sigma - 2}{\sigma + 2}\right)^{1/3}$

878270220518. $\left(\frac{\sigma + 1}{\sigma - 1}\right)^{1/3}$

Question Number : 37 Question Id : 87827056184 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

व्यास D व सापेक्ष घनत्व σ के एक गोले में d व्यास का एक संकेन्द्रीय कोश (cavity) है। यदि यह एक टैंक में पानी की सतह पर केवल तैरता हो तो अनुपात $\frac{D}{d}$ का मान क्या है?

Options :

878270220515. $\left(\frac{\sigma - 1}{\sigma}\right)^{1/3}$

878270220516. $\left(\frac{\sigma}{\sigma - 1}\right)^{1/3}$

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878270220517. $\left(\frac{\sigma - 2}{\sigma + 2}\right)^{1/3}$

878270220518. $\left(\frac{\sigma + 1}{\sigma - 1}\right)^{1/3}$

Question Number : 38 Question Id : 87827056185 Question Type : MCQ Option Shuffling : Yes 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 sample of 1 mole gas at temperature T is adiabatically expanded to double its volume. If adiabatic constant for the gas is $\gamma = \frac{3}{2}$, then the work done by the gas in the process is :

Options :

878270220519. $RT\left[2 - \sqrt{2}\right]$

878270220520. $RT\left[2 + \sqrt{2}\right]$

878270220521. $\frac{R}{T}\left[2 - \sqrt{2}\right]$

878270220522. $\frac{T}{R}\left[2 + \sqrt{2}\right]$

Question Number : 38 Question Id : 87827056185 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

T तापमान पर एक मोल गैस का नमूना रुद्धोष्म प्रक्रम के द्वारा आयतन के दो गुने तक प्रसारित किया जाता है। यदि गैस के लिए रुद्धोष्म नियतांक $\gamma = \frac{3}{2}$ हो, तब इस प्रक्रम में गैस द्वारा किया गया कार्य है :

Options :

878270220519. $RT\left[2-\sqrt{2}\right]$

878270220520. $RT\left[2+\sqrt{2}\right]$

878270220521. $\frac{R}{T}\left[2-\sqrt{2}\right]$

878270220522. $\frac{T}{R}\left[2+\sqrt{2}\right]$

Question Number : 39 Question Id : 87827056186 Question Type : MCQ Option Shuffling : Yes

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 volume of an ideal gas (γ = 1.5) is changed adiabatically from 5 litres to 4 litres. The ratio of initial pressure to final pressure is :

Options :

878270220523. $\frac{2}{\sqrt{5}}$

878270220524. $\frac{8}{5\sqrt{5}}$

878270220525. $\frac{4}{5}$

878270220526. $\frac{16}{25}$

Question Number : 39 Question Id : 87827056186 Question Type : MCQ Option Shuffling : Yes 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 आदर्श गैस $(\gamma = 1.5)$ का आयतन 5 लीटर से 4 लीटर तक रुद्धोष्म प्रक्रम के द्वारा बदला जाता है। प्रारम्भिक दाब तथा अन्तिम दाब में अनुपात है :

Options :

878270220523. $\frac{2}{\sqrt{5}}$

878270220524. $\frac{8}{5\sqrt{5}}$

878270220525. $\frac{4}{5}$

878270220526. $\frac{16}{25}$

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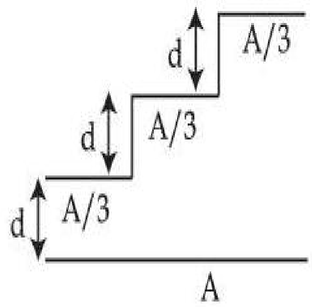
Question Number : 40 Question Id : 87827056187 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A capacitor is made of a flat plate of area A and a second plate having a stair-like structure as shown in figure. If the area of each stair is $\frac{A}{3}$ and the height is d, the capacitance of the arrangement is :



Options :

878270220527. $\frac{11 \epsilon_0 A}{18 d}$

878270220528. $\frac{13 \epsilon_0 A}{17 d}$

878270220529. $\frac{11 \epsilon_0 A}{20 d}$

878270220530. $\frac{18 \epsilon_0 A}{11 d}$

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Question Number : 40 Question Id : 87827056187 Question Type : MCQ Option Shuffling : Yes

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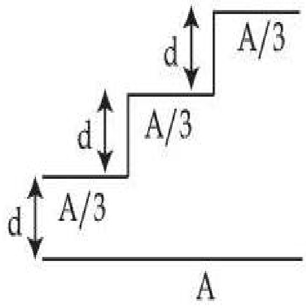
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक संधारित्र को A क्षेत्रफल की एक प्लेट तथा सीढ़ीनुमा आकृति वाली दूसरी प्लेट को लेकर बनाया गया है, जैसा कि चित्र में दर्शाया गया है। यदि प्रत्येक सीढ़ी का क्षेत्रफल $\frac{A}{3}$ तथा ऊँचाई d हो तो इस व्यवस्था की धारिता है :



Options :

878270220527. $\frac{11\,\epsilon_0\,A}{18\,d}$

878270220528. $\frac{13\,\epsilon_0\,A}{17\,d}$

878270220529. $\frac{11\,\epsilon_0\,A}{20\,d}$

878270220530. $\frac{18\,\epsilon_0\,A}{11\,d}$

Question Number : 41 Question Id : 87827056188 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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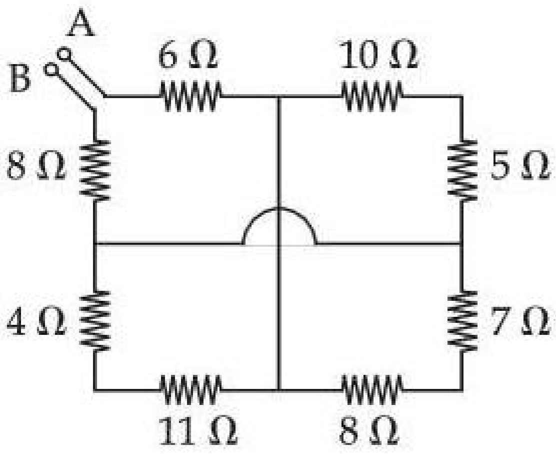
The equivalent resistance between A and B is :



Options :

878270220531. 18 Ω

878270220532. 25 Ω

878270220533. 19 Ω

878270220534. 27 Ω

Question Number : 41 Question Id : 87827056188 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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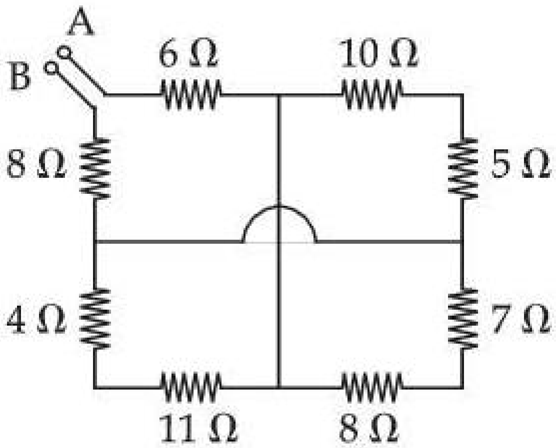
A व B के बीच समतुल्य प्रतिरोध है :



Options :

878270220531. 18 Ω

878270220532. 25 Ω

878270220533. 19 Ω

878270220534. 27 Ω

Question Number : 42 Question Id : 87827056189 Question Type : MCQ Option Shuffling : Yes 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 currents vary with time, Newton's third law is valid only if momentum carried by the electromagnetic field is taken into account.

Statement (II) : Ampere's circuital law does not depend on Biot-Savart's law.

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

Options :

878270220535.

Both Statement I and Statement II are true

878270220536. Both Statement I and Statement II are false

878270220537. Statement I is true but Statement II is false

878270220538. Statement I is false but Statement II is true

Question Number : 42 Question Id : 87827056189 Question Type : MCQ Option Shuffling : Yes 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 धारा समय के साथ बदलती है, न्यूटन का तीसरा नियम केवल तभी मान्य होगा यदि इस स्थिति में विद्युत चुंबकीय क्षेत्र द्वारा आरोपित संवेग को ध्यान रखा जाये।

कथन (II) : ऐम्पियर का परिपथीय नियम बायो-सैबर्ट के नियम पर निर्भर नहीं करता है।

उपर्युक्त कथनों के आलोक में, नीचे दिए गए विकल्पों में से **सही उत्तर** का चयन कीजिए।

Options :

878270220535. **कथन** I तथा **कथन** II दोनों सत्य हैं।

878270220536. **कथन** I तथा **कथन** II दोनों असत्य हैं।

878270220537. **कथन** I सत्य है परन्तु **कथन** II असत्य है।

878270220538.

कथन I असत्य है लेकिन कथन II सत्य है।

Question Number : 43 Question Id : 87827056190 Question Type : MCQ Option Shuffling : Yes 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 bulb and a capacitor are connected in series across an ac supply. A dielectric is then placed between the plates of the capacitor. The glow of the bulb :

Options :

878270220539. remains same

878270220540. increases

878270220541. decreases

878270220542. becomes zero

Question Number : 43 Question Id : 87827056190 Question Type : MCQ Option Shuffling : Yes 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 बल्ब तथा एक संधारित्र को एक प्रत्यावर्ती स्रोत से श्रेणीक्रम में जोड़ा गया है। जब संधारित्र की प्लेटों के बीच एक परावैद्युत रखा जाता है तब बल्ब की चमक :

Options :

878270220539. समान रहती है

878270220540. बढ़ती है

878270220541. घटती है

878270220542. शून्य हो जाती है

Question Number : 44 Question Id : 87827056191 Question Type : MCQ Option Shuffling : Yes 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 plane EM wave is propagating along x direction. It has a wavelength of 4 mm. If electric field is in y direction with the maximum magnitude of 60 Vm^{-1}, the equation for magnetic field is :

Options :

878270220543. $B_z = 60 \sin\left[\frac{\pi}{2}\left(x - 3\times10^8 t\right)\right]\hat{k}\ T$

878270220544. $B_x = 60 \sin\left[\frac{\pi}{2}\left(x - 3\times10^8 t\right)\right]\hat{i}\ T$

878270220545. $B_z = 2\times10^{-7} \sin\left[\frac{\pi}{2}\left(x - 3\times10^8 t\right)\right]\hat{k}\ T$

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878270220546. $B_z = 2\times10^{-7} \sin\left[\frac{\pi}{2}\times10^{3}\left(x-3\times10^{8}t\right)\right]\hat{k}\,T$

Question Number : 44 Question Id : 87827056191 Question Type : MCQ Option Shuffling : Yes 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 समतल विद्युत चुंबकीय तरंग x अक्ष के अनुदिश संचरित हो रही है। इसकी तरंगदैर्ध्य 4 mm है। यदि विद्युत क्षेत्र 60 Vm^{-1} के अधिकतम परिमाण के साथ y दिशा में हो तो चुम्बकीय क्षेत्र के लिए समीकरण है :

Options :

878270220543. $B_z = 60 \sin\left[\frac{\pi}{2}\left(x-3\times10^{8}t\right)\right]\hat{k}\,T$

878270220544. $B_x = 60 \sin\left[\frac{\pi}{2}\left(x-3\times10^{8}t\right)\right]\hat{i}\,T$

878270220545. $B_z = 2\times10^{-7} \sin\left[\frac{\pi}{2}\left(x-3\times10^{8}t\right)\right]\hat{k}\,T$

878270220546. $B_z = 2\times10^{-7} \sin\left[\frac{\pi}{2}\times10^{3}\left(x-3\times10^{8}t\right)\right]\hat{k}\,T$

Question Number : 45 Question Id : 87827056192 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Given below are two statements :

Statement (I) : When an object is placed at the centre of curvature of a concave lens, image is formed at the centre of curvature of the lens on the other side.

Statement (II) : Concave lens always forms a virtual and erect image.

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

Options :

878270220547. Both **Statement I** and **Statement II** are true

878270220548. Both **Statement I** and **Statement II** are false

878270220549. **Statement I** is true but **Statement II** is false

878270220550. **Statement I** is false but **Statement II** is true

Question Number : 45 Question Id : 87827056192 Question Type : MCQ Option Shuffling : Yes 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 एक वस्तु को एक अवतल लैंस के वक्रता केन्द्र पर रखा जाता है तो लैंस के दूसरी ओर वक्रता केन्द्र पर प्रतिबिम्ब प्राप्त होता है।

कथन (II) : अवतल लैंस हमेशा सीधा तथा आभासी प्रतिबिम्ब बनाता है।

उपर्युक्त कथनों के आलोक में, नीचे दिये गये विकल्पों में से **सही उत्तर** का चयन कीजिए।

Options :

878270220547. **कथन** I तथा **कथन** II दोनों सत्य हैं।

878270220548.

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कथन I तथा कथन II दोनो असत्य हैं।

878270220549. कथन I सत्य है परन्तु कथन II असत्य है।

878270220550. कथन I असत्य है लेकिन कथन II सत्य है।

Question Number : 46 Question Id : 87827056193 Question Type : MCQ Option Shuffling : Yes 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 proton, an electron and an alpha particle have the same energies. Their de-Broglie wavelengths will be compared as :

Options :

878270220551. $\lambda_p > \lambda_e > \lambda_\alpha$

878270220552. $\lambda_p < \lambda_e < \lambda_\alpha$

878270220553. $\lambda_\alpha < \lambda_p < \lambda_e$

878270220554. $\lambda_e > \lambda_\alpha > \lambda_p$

Question Number : 46 Question Id : 87827056193 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Correct Marks : 4 Wrong Marks : 1

एक प्रोटॉन, एक इलैक्ट्रान तथा एक एल्फा कण की ऊर्जा एक समान है। इनकी डी-ब्राग्ली तरंगदैर्ध्य की निम्न प्रकार तुलना की जायेगी :

Options :

878270220551. $\lambda_p > \lambda_e > \lambda_\alpha$

878270220552. $\lambda_p < \lambda_e < \lambda_\alpha$

878270220553. $\lambda_\alpha < \lambda_p < \lambda_e$

878270220554. $\lambda_e > \lambda_\alpha > \lambda_p$

Question Number : 47 Question Id : 87827056194 Question Type : MCQ Option Shuffling : Yes 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 energy equivalent of 1 g of substance is :

Options :

878270220555. 5.6 eV

878270220556. 5.6×10^{12} MeV

878270220557. 11.2×10^{24} MeV

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878270220558. 5.6×10^{26} MeV

Question Number : 47 Question Id : 87827056194 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

पदार्थ के 1 ग्राम के समतुल्य ऊर्जा है :

Options :

878270220555. 5.6 eV

878270220556. 5.6×10^{12} MeV

878270220557. 11.2×10^{24} MeV

878270220558. 5.6×10^{26} MeV

Question Number : 48 Question Id : 87827056195 Question Type : MCQ Option Shuffling : Yes 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 light emitting diode (LED) is fabricated using GaAs semiconducting material whose band gap is 1.42 eV. The wavelength of light emitted from the LED is :

Options :

878270220559. 1400 nm

878270220560. 1243 nm

878270220561. 650 nm

878270220562. 875 nm

Question Number : 48 Question Id : 87827056195 Question Type : MCQ Option Shuffling : Yes 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 प्रकाश उत्सर्जित डायोड (LED) को GaAs अर्द्धचालकीय पदार्थ का प्रयोग करके बनाया जाता है जिसका बैंड अन्तराल 1.42 eV है। LED से उत्सर्जित प्रकाश की तरंगदैर्ध्य है :

Options :

878270220559. 1400 nm

878270220560. 1243 nm

878270220561. 650 nm

878270220562. 875 nm

Question Number : 49 Question Id : 87827056196 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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One main scale division of a vernier caliper is equal to m units. If n^{th} division of main scale coincides with $(n+1)^{th}$ division of vernier scale, the least count of the vernier caliper is :

Options :

878270220563. $\frac{1}{(n+1)}$

878270220564. $\frac{m}{(n+1)}$

878270220565. $\frac{n}{(n+1)}$

878270220566. $\frac{m}{n(n+1)}$

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Question Number : 49 Question Id : 87827056196 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

वर्नियर कैलीपर्स के मुख्य पैमाने के एक खाने का मान m इकाई के बराबर है। यदि मुख्य पैमाने का nवाँ भाग वर्नियर पैमाने के $(n+1)$वें भाग से मिलता है, वर्नियर की अल्पतमांक है :

Options :

878270220563. $\frac{1}{(n+1)}$

878270220564. $\frac{m}{(n+1)}$

878270220565. $\frac{n}{(n+1)}$

878270220566. $\frac{m}{n(n+1)}$

Question Number : 50 Question Id : 87827056197 Question Type : MCQ Option Shuffling : Yes 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 galvanmeter has a coil of resistance 200 Ω with a full scale deflection at 20 μA. The value of resistance to be added to use it as an ammeter of range (0-20) mA is :

Options :

878270220567. 0.50 Ω

878270220568. 0.10 Ω

878270220569. 0.20 Ω

878270220570. 0.40 Ω

Question Number : 50 Question Id : 87827056197 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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200 Ω प्रतिरोध की कुंडली वाले एक धारामापी में 20 μ A पर पूर्ण पैमाने का विक्षेप उत्पन्न होता है। उसको (0-20) mA परास के अमीटर के रूप में प्रयोग करने के लिए जोड़े गये प्रतिरोध का मान है :

Options :

878270220567. 0.50 Ω

878270220568. 0.10 Ω

878270220569. 0.20 Ω

878270220570. 0.40 Ω

Physics Section B

Section Id :	8782701185
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 :	8782702092
Question Shuffling Allowed :	Yes
Is Section Default? :	null

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Question Number : 51 Question Id : 87827056198 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

If $\vec{a}$ and $\vec{b}$ makes an angle $\cos^{-1}\left(\frac{5}{9}\right)$ with each other, then $|\vec{a}+\vec{b}|=\sqrt{2}|\vec{a}-\vec{b}|$ for $|\vec{a}|=n|\vec{b}|$

The integer 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 : 87827056198 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

यदि $\vec{a}$ व $\vec{b}$ एक दूसरे के साथ $\cos^{-1}\left(\frac{5}{9}\right)$ का कोन बनाते हैं, तब $|\vec{a}|=n|\vec{b}|$ के लिए $|\vec{a}+\vec{b}|=\sqrt{2}|\vec{a}-\vec{b}|$

है। n का पूर्णांक मान ________ है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 52 Question Id : 87827056199 Question Type : SA Calculator : None

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

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

A string is wrapped around the rim of a wheel of moment of inertia 0.40 kgm^2 and radius 10 cm. The wheel is free to rotate about its axis. Initially the wheel is at rest. The string is now pulled by a force of 40 N. The angular velocity of the wheel after 10 s is x rad/s, where x is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 52 **Question Id :** 87827056199 **Question Type :** SA **Calculator :** None

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

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

0.40 किग्रा $मी^2$ जड़त्व आघूर्ण व 10 सेमी त्रिज्या के एक पहिए के रिम पर एक डोरी लपेटी गई है। पहिया अपनी अक्ष के परित: घूमने के लिए स्वतन्त्र है। प्रारम्भ में पहिया विरामावस्था में है। अब डोरी को 40 N बल से खींचा गया है। 10 s बाद पहिए का कोणीय वेग x रेडियन/से है, जहाँ x ________ 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 :** 87827056200 **Question Type :** SA **Calculator :** None

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

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

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Two persons pull a wire towards themselves. Each person exerts a force of 200 N on the wire. Young's modulus of the material of wire is 1×10^{11} N m^{-2}. Original length of the wire is 2 m and the area of cross section is 2 cm^2. The wire will extend in length by ________ μm.

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 : 87827056200 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

दो व्यक्ति एक तार को अपनी-अपनी ओर खींचते हैं। प्रत्येक व्यक्ति इस तार पर 200 N का एक बल लगाते हैं। तार के पदार्थ का यंग प्रत्यास्थता गुणांक 1×10^{11} N m^{-2} है। यदि तार की प्रारम्भिक लम्बाई 2 मी तथा अनुप्रस्थ परिच्छेद क्षेत्रफल 2 सेमी^{2} है। तार लम्बाई में ________ μm द्वारा खिंचता है।

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Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 54 Question Id : 87827056201 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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The position, velocity and acceleration of a particle executing simple harmonic motion are found to have magnitudes of 4 m, 2 ms^{-1} and 16 ms^{-2} at a certain instant. The amplitude of the motion is $\sqrt{x}$, m where x is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 54 Question Id : 87827056201 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 सरल आवर्त गति करते हुए किसी कण की स्थिति, वेग तथा त्वरण के परिमाण क्रमश: 4 मी, 2 मी/से$^{-1}$ तथा 16 मी/से$^{-2}$ हैं। गति का आयाम $\sqrt{x}$ मी है जहाँ x ________ है।

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Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 55 Question Id : 87827056202 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

At the centre of a half ring of radius R = 10 cm and linear charge density 4n C m^{-1}, the potential is $x\,\pi$ V. The value of x is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 55 Question Id : 87827056202 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

$R=10$ सेमी त्रिज्या तथा $4\,nC\,m^{-1}$ रेखीय आवेश घनत्व के एक अर्द्ध छल्ले के केन्द्र पर विभव $x\,\pi$ V 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 : 56 Question Id : 87827056203 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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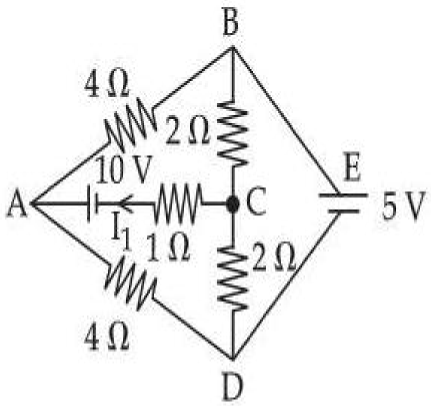
The current flowing through the 1 Ω resistor is $\frac{n}{10}$ A. The value of n is ________.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

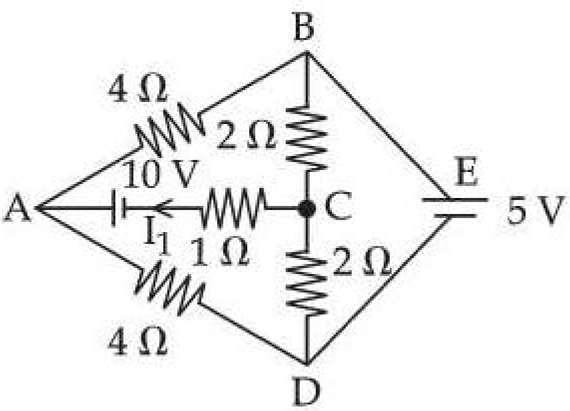
1

Question Number : 56 Question Id : 87827056203 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

1 Ω प्रतिरोध से बहने वाली धारा $\frac{n}{10}$ A 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 : 57 Question Id : 87827056204 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

A square loop of edge length 2 m carrying current of 2 A is placed with its edges parallel to the x-y axis. A magnetic field is passing through the x-y plane and expressed as $\vec{B} = B_0\,(1 + 4x)\,\hat{k}$, where $B_0 = 5$ T. The net magnetic force experienced by the loop is ________ N.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 57 Question Id : 87827056204 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

2 मी लम्बी भुजा के एक वर्गाकार लूप को इस प्रकार रखा गया है कि इसकी भुजा x-y अक्ष के समान्तर है जबकि इसमें प्रवाहित धारा 2 A है। x-y तल से एक चुम्बकीय क्षेत्र गुजरता है जिसे $\vec{B} = B_0\,(1 + 4x)\,\hat{k}$ द्वारा प्रदर्शित किया गया है, जहाँ $B_0 = 5$ T । लूप द्वारा अनुभव किये जाने वाला कुल बल ________ N 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 : 87827056205 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

When a coil is connected across a 20 V dc supply, it draws a current of 5 A. When it is connected across 20 V, 50 Hz ac supply, it draws a current of 4 A. The self inductance of the coil is ________ mH. (Take $\pi = 3$)

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 : 87827056205 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

जब एक कुंडली को 20 V दिष्ट धारा स्रोत से जोड़ा जाता है इसमें 5 A की धारा प्रावहित है। जब इसे 20V, 50Hz प्रत्यावर्ती स्रोत से जोड़ा जाता है तो इस कुंडली में 4 A की धारा बहती है। कुंडली का स्वप्रेरकत्व ________ mH है।
(दिया है $\pi = 3$)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

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Text Areas : PlainText

Possible Answers :

1

Question Number : 59 Question Id : 87827056206 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 Young's double slit experiment, the intensity at a point is $\left(\frac{1}{4}\right)^{th}$ of the maximum intensity, the minimum distance of the point from the central maximum is ________ μm.
(Given : $\lambda = 600$ nm, $d = 1.0$ mm, $D = 1.0$ m)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 59 Question Id : 87827056206 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक यंग द्विझिर्री प्रयोग में, एक बिन्दु पर तीव्रता अधिकतम तीव्रता की एक चौथाई है, उस बिन्दु की केन्द्रीय उच्चिष्ठ से न्यूनतम दूरी ________ μm है।
(दिया है : $\lambda = 600$ nm, $d = 1.0$ mm, $D = 1.0$ m)

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 : 87827056207 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

A star has 100% helium composition. It starts to convert three ^{4}He into one ^{12}C via triple alpha process as $^4He + ^4He + ^4He \rightarrow ^{12}C + Q$. The mass of the star is 2.0×10^{32} kg and it generates energy at the rate of 5.808×10^{30} W. The rate of converting these ^{4}He to ^{12}C is $n \times 10^{42}\ s^{-1}$, where n is ________.

[Take, mass of $^4He = 4.0026$ u, mass of $^{12}C = 12$ u]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 60 Question Id : 87827056207 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

एक तारा 100% हीलियम से बना है। यह तीन एल्फा प्रक्रम द्वारा तीन ^{4}He को एक ^{12}C में $^4He + ^4He + ^4He \rightarrow ^{12}C + Q$ के अनुसार परिवर्तित करना प्रारम्भ करता है। तारे का द्रव्यमान 2.0×10^{32} किग्रा है तथा यह 5.808×10^{30} W की दर से ऊर्जा उत्पन्न करता है। तीन ^{4}He के एक ^{12}C में बदलने की दर $n \times 10^{42}\ s^{-1}$ है जहाँ n ________ है।[दिया है : ^{4}He का द्रव्यमान$=4.0026$ u, ^{12}C का द्रव्यमान$=12$ u]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

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Text Areas : PlainText

Possible Answers :

1

Chemistry Section A

Section Id :	8782701186
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 :	8782702093
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 61 Question Id : 87827056208 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Compare the energies of following sets of quantum numbers for multielectron system.

(A) n=4, l=1
(B) n=4, l=2
(C) n=3, l=1
(D) n=3, l=2
(E) n=4, l=0

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

Options :

878270220581. (E) > (C) > (A) > (D) > (B)

878270220582. (C) < (E) < (D) < (A) < (B)

878270220583. (E) < (C) < (D) < (A) < (B)

878270220584. (B) > (A) > (C) > (E) > (D)

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Question Number : 61 Question Id : 87827056208 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

किसी बहु इलेक्ट्रान तंत्र में क्वांटम संख्याओं के निम्न सेटों की उर्जाओं की तुलना करें :

(A) n=4, l=1
(B) n=4, l=2
(C) n=3, l=1
(D) n=3, l=2
(E) n=4, l=0

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

Options :

878270220581. (E) > (C) > (A) > (D) > (B)

878270220582. (C) < (E) < (D) < (A) < (B)

878270220583. (E) < (C) < (D) < (A) < (B)

878270220584. (B) > (A) > (C) > (E) > (D)

Question Number : 62 Question Id : 87827056209 Question Type : MCQ Option Shuffling : Yes 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 which one of the following pairs the central atoms exhibit sp^2 hybridization ?

Options :

878270220585. NH_2^- and H_2O

878270220586. BF_3 and NO_2^-

878270220587. H_2O and NO_2

878270220588. NH_2^- and BF_3

Question Number : 62 Question Id : 87827056209 Question Type : MCQ Option Shuffling : Yes

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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 युग्मों में से किसमें केन्द्रीय परमाणु sp^2 संकरण प्रदर्शित करता है ?

Options :

878270220585. NH_2^- एवं H_2O

878270220586. BF_3 एवं NO_2^-

878270220587. H_2O एवं NO_2

878270220588. NH_2^- एवं BF_3

Question Number : 63 Question Id : 87827056210 Question Type : MCQ Option Shuffling : Yes

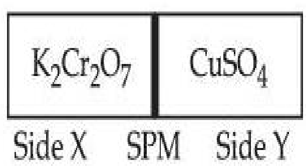
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

0.05M $CuSO_4$ when treated with 0.01M $K_2Cr_2O_7$ gives green colour solution of $Cu_2Cr_2O_7$. The two solutions are separated as shown below :

[SPM : Semi Permeable Membrane]



Due to osmosis :

Options :

878270220589. Green colour formation observed on side Y.

878270220590. Green colour formation observed on side X.

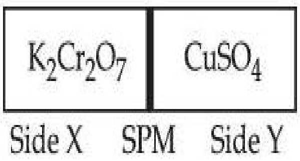
878270220591. Molarity of $K_2Cr_2O_7$ solution is lowered.

878270220592. Molarity of $CuSO_4$ solution is lowered.

Question Number : 63 Question Id : 87827056210 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

जब 0.05M $CuSO_4$ को 0.01M $K_2Cr_2O_7$ के साथ उपचारित किया जाता है तो $Cu_2Cr_2O_7$ के हरे रंग का विलयन प्राप्त होता है। दोनों विलयनों को नीचे दिखाए गए प्रकार से पृथक किया जाता है :



परासरण के कारण :

Options :

878270220589. Y साइड पर हरे रंग का निर्माण होते दिखता है।

878270220590. X साइड पर हरे रंग का निर्माण होते दिखता है।

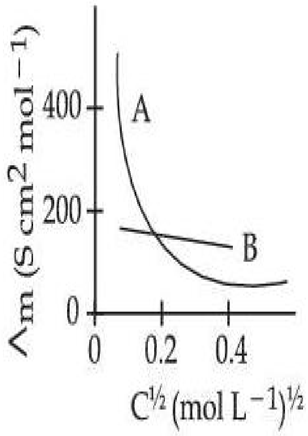
878270220591. $K_2Cr_2O_7$ विलयन की मोलरता कम होती है।

878270220592. $CuSO_4$ विलयन की मोलरता कम होती है।

Question Number : 64 Question Id : 87827056211 Question Type : MCQ Option Shuffling : Yes 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 molar conductivity for electrolytes A and B are plotted against $C^{1/2}$ as shown below. Electrolytes A and B respectively are :



A B

Options :

878270220593. weak electrolyte strong electrolyte

878270220594. strong electrolyte weak electrolyte

878270220595. weak electrolyte weak electrolyte

878270220596. strong electrolyte strong electrolyte

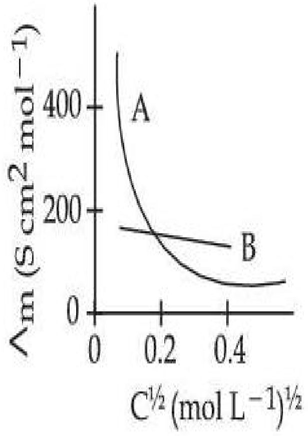
Question Number : 64 Question Id : 87827056211 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

विद्युत अपघट्यों A एवं B की मोलर चालकताओं को $C^{1/2}$ के विरुद्ध प्लाट किया गया है (जैसा नीचे दिखाया गया है)। विद्युत अपघट्य A एवं B हैं, क्रमश:



A B

Options :

878270220593. दुर्बल विद्युत अपघट्य प्रबल विद्युत अपघट्य

878270220594. प्रबल विद्युत अपघट्य दुर्बल विद्युत अपघट्य

878270220595. दुर्बल विद्युत अपघट्य दुर्बल विद्युत अपघट्य

878270220596. प्रबल विद्युत अपघट्य प्रबल विद्युत अपघट्य

Question Number : 65 Question Id : 87827056212 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Given below are two statements :

Statement (I) : The oxidation state of an element in a particular compound is the charge acquired by its atom on the basis of electron gain enthalpy consideration from other atoms in the molecule.

Statement (II) : $p\pi - p\pi$ bond formation is more prevalent in second period elements over other periods.

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

Options :

878270220597. Both **Statement I** and **Statement II** are correct

878270220598. Both **Statement I** and **Statement II** are incorrect

878270220599. **Statement I** is correct but **Statement II** is incorrect

878270220600. **Statement I** is incorrect but **Statement II** is correct

Question Number : 65 Question Id : 87827056212 Question Type : MCQ Option Shuffling : Yes 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) : किसी विशेष यौगिक में किसी तत्व की ऑक्सीकरण अवस्था अणु में दूसरे अन्य परमाणुओं से इलेक्ट्रॉन लब्धि एन्थैल्पी के आधार पर परमाणु द्वारा प्राप्त किया गया आवेश है।

कथन (II) : द्वितीय आवर्त के तत्वों में $p\pi - p\pi$ आबंध निर्माण, अन्य आवर्तों की तुलना में, अधिक पाया जाता है।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से सर्वाधिक उपयुक्त उत्तर चुने :

Options :

878270220597. दोनों **कथन I** एवं **कथन II** सही हैं।

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878270220598. दोनों **कथन I** एवं **कथन II** गलत हैं।

878270220599. **कथन I** सही है परंतु **कथन II** गलत है।

878270220600. **कथन I** गलत है परंतु **कथन II** सही है।

Question Number : 66 Question Id : 87827056213 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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

Assertion (A) : Both rhombic and monoclinic sulphur exist as S_8 while oxygen exists as O_2.

Reason (R) : Oxygen forms $p\pi - p\pi$ multiple bonds with itself and other elements having small size and high electronegativity like C, N, which is not possible for sulphur.

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

Options :

878270220601. Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

878270220602. Both **(A)** and **(R)** are correct but **(R)** is **not** the correct explanation of **(A)**

878270220603. **(A)** is correct but **(R)** is not correct

878270220604.

(A) is not correct but (R) is correct

Question Number : 66 Question Id : 87827056213 Question Type : MCQ Option Shuffling : Yes 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। एक को **अभिकथन** (A) तथा दूसरे को **कारण** (R) दर्शाया गया है :

अभिकथन (A) : विषमलंबाक्ष (रॉम्बिक) एवं एकनताक्ष (मोनोक्लीनिक) सल्फर दोनों S_8 के रूप में पाए जाते हैं जबकि ऑक्सीजन O_2 के रूप में पाया जाता है।

कारण (R) : ऑक्सीजन स्वयं के साथ एवं छोटे आकार एवं उच्च विद्युत ऋणात्मक तत्वों जैसे C, N के साथ $p\pi - p\pi$ बहु आबंध बनाता है जो सल्फर के लिए संभव नहीं है।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से **सही** उत्तर चुने :

Options :

878270220601. (A) एवं (R) दोनों सही हैं तथा (A) की सही व्याख्या (R) है।

878270220602. (A) एवं (R) दोनों सही हैं लेकिन (A) की सही व्याख्या (R) नहीं है।

878270220603. (A) सही है लेकिन (R) गलत है।

878270220604. (A) गलत है लेकिन (R) सही है।

Question Number : 67 Question Id : 87827056214 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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Correct Marks : 4 Wrong Marks : 1

The F^- ions make the enamel on teeth much harder by converting hydroxyapatite (the enamel on the surface of teeth) into much harder fluoroapatite having the formula.

Options :

878270220605. $[3(Ca_3(PO_4)_2) \cdot Ca(OH)_2]$

878270220606. $[3(Ca_2(PO_4)_2) \cdot Ca(OH)_2]$

878270220607. $[3(Ca_3(PO_4)_2) \cdot CaF_2]$

878270220608. $[3(Ca_3(PO_4)_3) \cdot CaF_2]$

Question Number : 67 Question Id : 87827056214 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

F^- आयन दाँतो के इनामेल सतह में हाइड्रॉक्सीएपेटाइट को फ्लुओएपेटाइट में परिवर्तित करके अधिक कठोर कर देते है। फ्लुओएपेटाइट का सूत्र है :

Options :

878270220605. $[3(Ca_3(PO_4)_2) \cdot Ca(OH)_2]$

878270220606. $[3(Ca_2(PO_4)_2) \cdot Ca(OH)_2]$

878270220607. $[3(Ca_3(PO_4)_2) \cdot CaF_2]$

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878270220608. $[3(Ca_3(PO_4)_3) \cdot CaF_2]$

Question Number : 68 Question Id : 87827056215 Question Type : MCQ Option Shuffling : Yes 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 electronic configuration of Cu(II) is $3d^9$ whereas that of Cu(I) is $3d^{10}$. Which of the following is correct ?

Options :

878270220609. Cu(II) is more stable

878270220610. Cu(II) is less stable

878270220611. Cu(I) and Cu(II) are equally stable

878270220612. Stability of Cu(I) and Cu(II) depends on nature of copper salts

Question Number : 68 Question Id : 87827056215 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Cu(II) का इलेक्ट्रॉनिक विन्यास $3d^9$ है जबकि Cu(I) का $3d^{10}$ है। निम्न में से कौन सही है ?

Options :

878270220609.

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Cu(II) अधिक स्थायी है

878270220610. Cu(II) कम स्थायी है

878270220611. Cu(I) एवं Cu(II) समान रूप से स्थायी हैं

878270220612. Cu(I) एवं Cu(II) का स्थायित्व कॉपर लवण की प्रकृति निर्भर करता है।

Question Number : 69 Question Id : 87827056216 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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

Assertion (A) : The total number of geometrical isomers shown by $[Co(en)_2Cl_2]^+$ complex ion is three.

Reason (R) : $[Co(en)_2Cl_2]^+$ complex ion has an octahedral geometry.

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

Options :

878270220613. Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

878270220614. Both **(A)** and **(R)** are correct but **(R)** is **not** the correct explanation of **(A)**

878270220615. **(A)** is correct but **(R)** is not correct

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878270220616. (A) is not correct but (R) is correct

Question Number : 69 Question Id : 87827056216 Question Type : MCQ Option Shuffling : Yes 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: एक को **अभिकथन** (A) तथा दूसरे को **कारण** (R) दर्शाया गया है :

अभिकथन (A) : $[Co(en)_2Cl_2]^+$ जटिल आयन द्वारा प्रदर्शित किए गए कुल ज्यामितीय समावयव तीन हैं।

कारण (R) : $[Co(en)_2Cl_2]^+$ जटिल आयन की अष्टफलकीय ज्यामिती होती है।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से सही उत्तर चुने :

Options :

878270220613. (A) एवं (R) दोनों सही हैं तथा (A) की सही व्याख्या (R) है।

878270220614. (A) एवं (R) दोनों सही हैं लेकिन (A) की सही व्याख्या (R) नहीं है।

878270220615. (A) सही है लेकिन (R) गलत है।

878270220616. (A) गलत है लेकिन (R) सही है।

Question Number : 70 Question Id : 87827056217 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Methods used for purification of organic compounds are based on :

Options :

878270220617. nature of compound only.

878270220618. presence of impurity only.

878270220619. nature of compound and presence of impurity.

878270220620. neither on nature of compound nor on the impurity present.

Question Number : 70 Question Id : 87827056217 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

कार्बनिक यौगिकों के शोधन की विधियाँ आधारित होती है :

Options :

878270220617. केवल यौगिक की प्रकृति पर

878270220618. केवल अशुद्धता की उपस्थिति पर

878270220619. यौगिक की प्रकृति पर एवं अशुद्धता की उपस्थिति पर

878270220620. न तो यौगिक की प्रकृति पर न ही अशुद्धता की उपस्थिति पर

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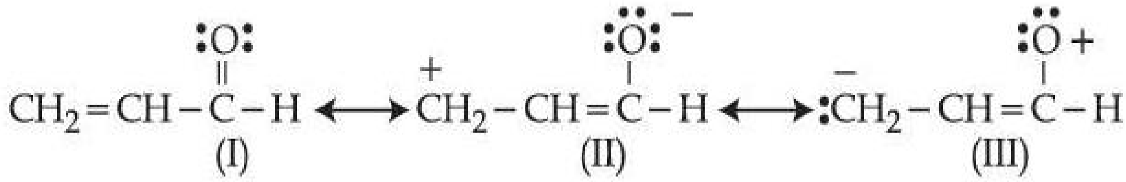
Question Number : 71 Question Id : 87827056218 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Relative stability of the contributing structures is :



Options :

878270220621. (III) > (II) > (I)

878270220622. (II) > (I) > (III)

878270220623. (I) > (III) > (II)

878270220624. (I) > (II) > (III)

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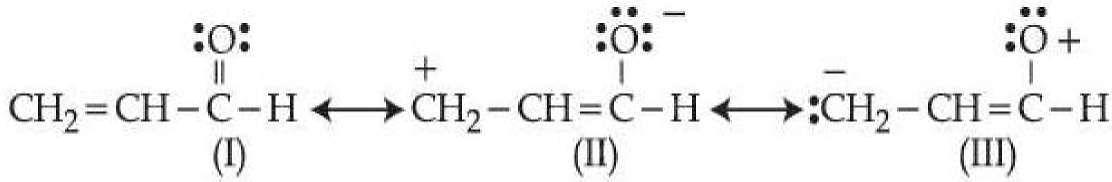
Question Number : 71 Question Id : 87827056218 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

योगदान करने वाली संरचनाओं के आपेक्षिक स्थायित्व है :



Options :

878270220621. (III) > (II) > (I)

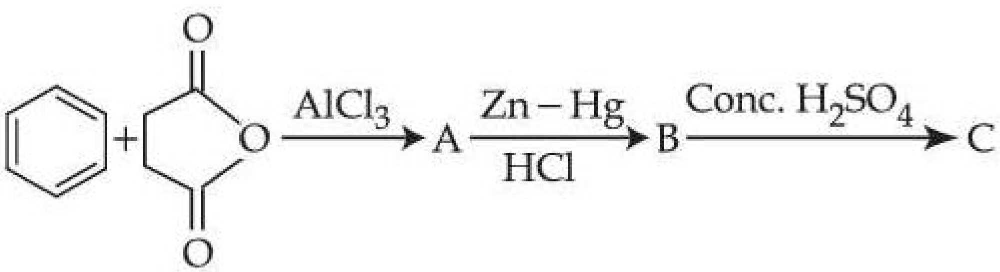
878270220622. (II) > (I) > (III)

878270220623. (I) > (III) > (II)

878270220624. (I) > (II) > (III)

Question Number : 72 Question Id : 87827056219 Question Type : MCQ Option Shuffling : Yes 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 is the structure of C ?

Options :

878270220625.

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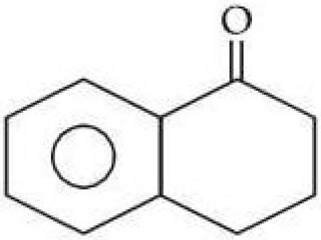
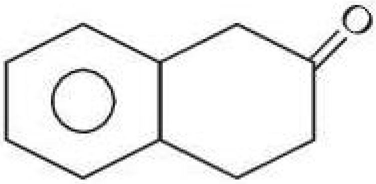
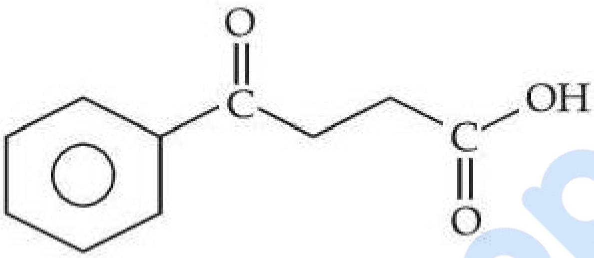
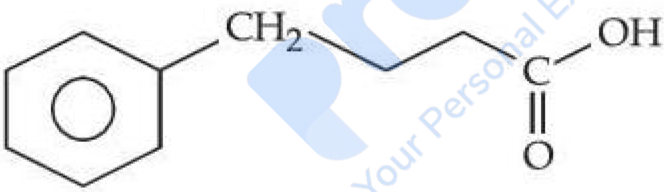


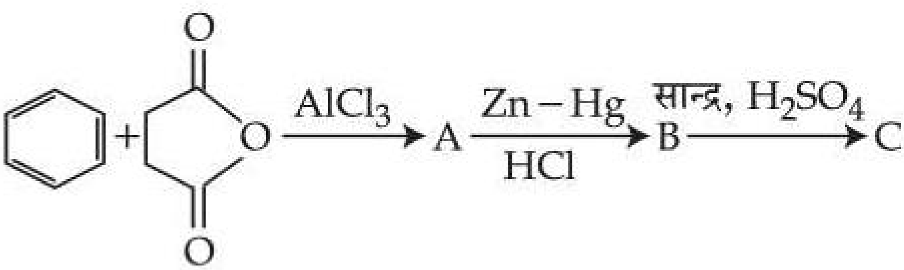
878270220626. 

878270220627. 

878270220628. 

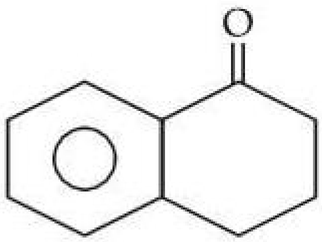
Question Number : 72 Question Id : 87827056219 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

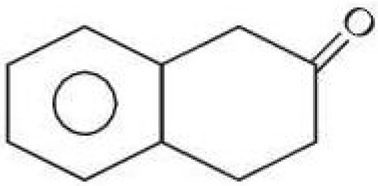
Correct Marks : 4 Wrong Marks : 1

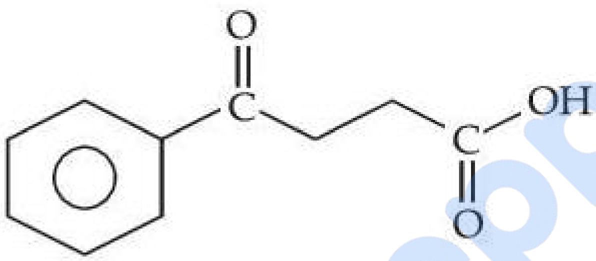


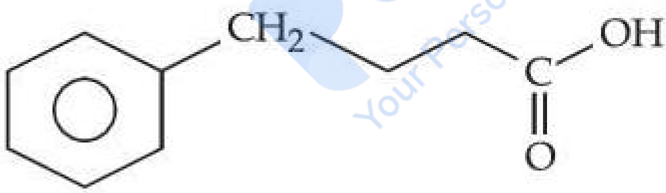
C की संरचना क्या है ?

Options :

878270220625. 

878270220626. 

878270220627. 

878270220628. 

Question Number : 73 Question Id : 87827056220 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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

Assertion (A) : S_N2 reaction of $C_6H_5CH_2Br$ occurs more readily than the S_N2 reaction of CH_3CH_2Br.

Reason (R) : The partially bonded unhybridized p-orbital that develops in the trigonal bipyramidal transition state is stabilized by conjugation with the phenyl ring.

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

Options :

878270220629. Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

878270220630. Both **(A)** and **(R)** are correct but **(R)** is **not** the correct explanation of **(A)**

878270220631. **(A)** is correct but **(R)** is not correct

878270220632. **(A)** is not correct but **(R)** is correct

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Question Number : 73 Question Id : 87827056220 Question Type : MCQ Option Shuffling : Yes 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: एक को **अभिकथन** (A) तथा दूसरे को **कारण** (R) दर्शाया गया है :

अभिकथन (A) : CH_3CH_2Br की S_N2 अभिक्रिया की तुलना में $C_6H_5CH_2Br$ की S_N2 अभिक्रिया अधिक आसानी से होती है।

कारण (R) : त्रिकोणीय बाइपिरामिडी संक्रमण अवस्था में विकसित आंशिक रूप से आबन्धित असंकरित p-कक्षक फेनिल रिंग के साथ संयुग्मन के द्वारा स्थायीकृत होती है।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से सही उत्तर चुने :

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Options :

878270220629. (A) एवं (R) दोनों सही हैं तथा (A) की सही व्याख्या (R) है।

878270220630. (A) एवं (R) दोनों सही हैं लेकिन (A) की सही व्याख्या (R) नहीं है।

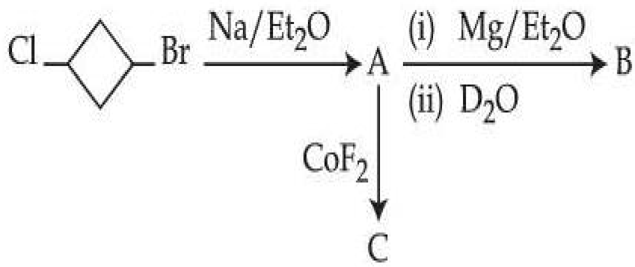
878270220631. (A) सही है लेकिन (R) गलत है।

878270220632. (A) गलत है लेकिन (R) सही है।

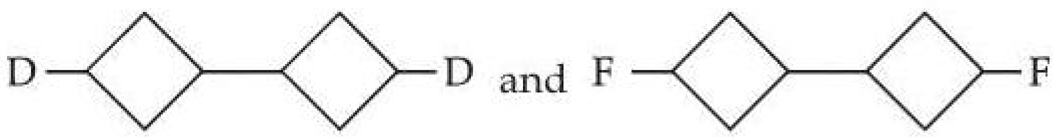
Question Number : 74 Question Id : 87827056221 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

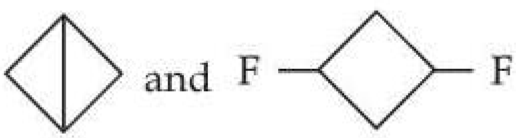
Correct Marks : 4 Wrong Marks : 1

In the following sequence of reaction, the major products B and C respectively are :



Options :

878270220633. 

878270220634. 

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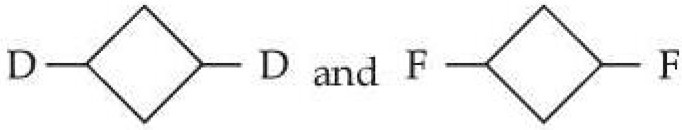
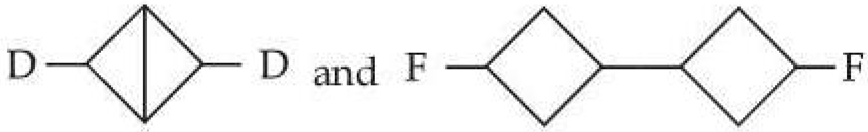
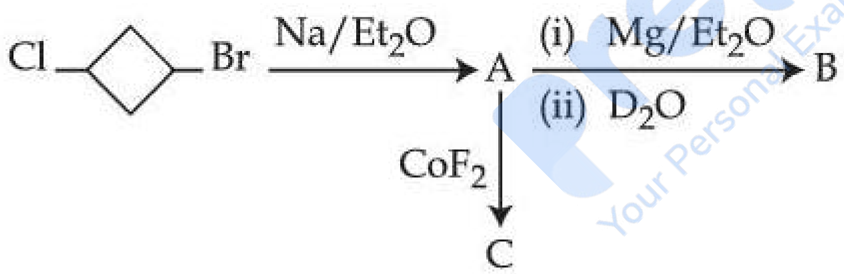
878270220635. 

878270220636. 

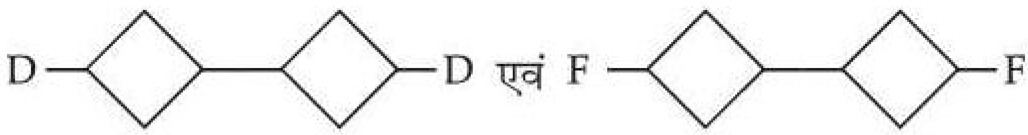
Question Number : 74 Question Id : 87827056221 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

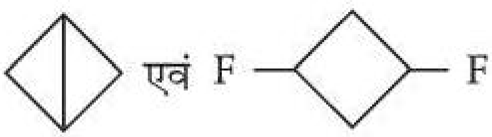
Correct Marks : 4 Wrong Marks : 1

अभिक्रियाओं के निम्न क्रम में, मुख्य उत्पाद B एवं C क्रमशः हैं :



Options :

878270220633. 

878270220634. 

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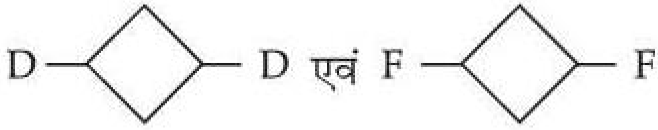
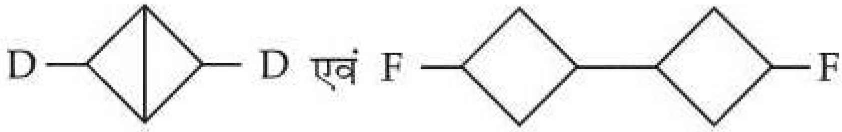
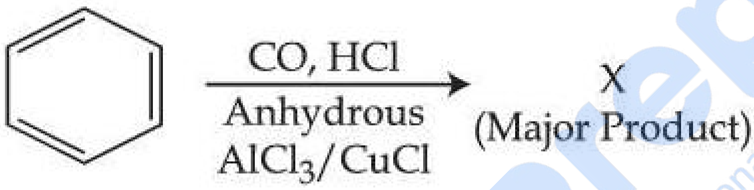
878270220635. 

878270220636. 

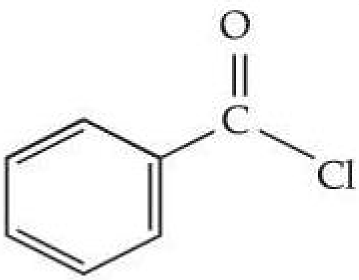
Question Number : 75 Question Id : 87827056222 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

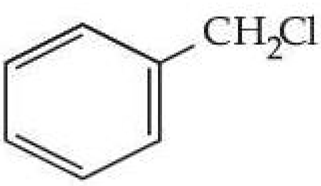
Correct Marks : 4 Wrong Marks : 1

Identify major product "X" formed in the following reaction :

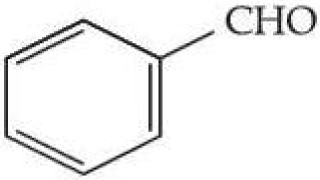


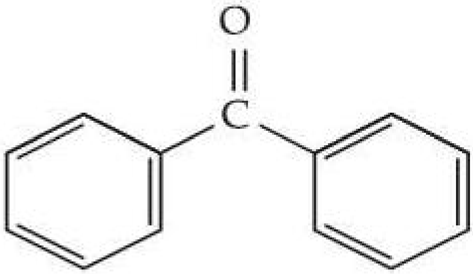
Options :

878270220637. 

878270220638. 

878270220639.



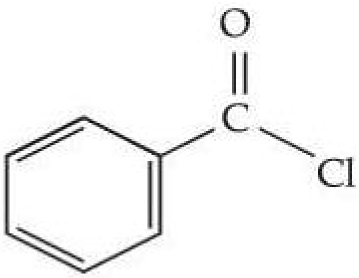
878270220640. 

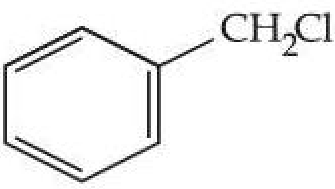
Question Number : 75 Question Id : 87827056222 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया में निर्मित मुख्य उत्पाद "X" को पहचानें :

Options :

878270220637. 

878270220638. 

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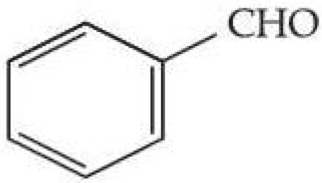
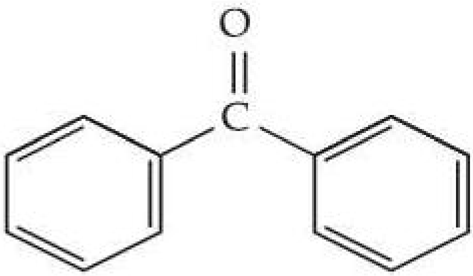
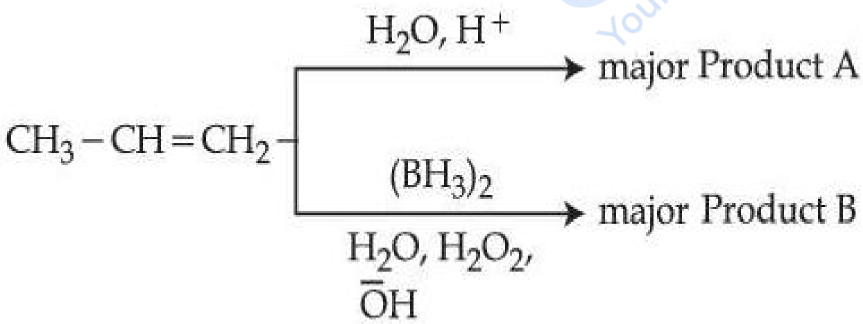
878270220639. 

878270220640. 

Question Number : 76 Question Id : 87827056223 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Identify the product A and product B in the following set of reactions.



Options :

878270220641. A - $CH_3CH_2CH_2-OH$ B - $CH_3CH_2CH_2-OH$

878270220642. A - $CH_3-CH(OH)-CH_3$ B - $CH_3CH_2CH_2-OH$

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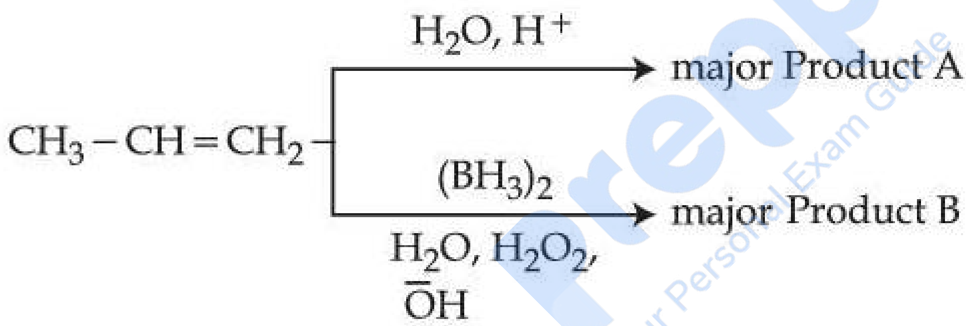
878270220643. A - $CH_3CH_2CH_2-OH$ B - $CH_3CH(OH)-CH_3$

878270220644. A - $CH_3CH_2CH_3$ B - $CH_3CH_2CH_3$

Question Number : 76 Question Id : 87827056223 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

अभिक्रियाओं के निम्न सेट में उत्पाद A एवं उत्पाद B को पहचानें :



Options :

878270220641. A - $CH_3CH_2CH_2-OH$ B - $CH_3CH_2CH_2-OH$

878270220642. A - $CH_3-CH(OH)-CH_3$ B - $CH_3CH_2CH_2-OH$

878270220643. A - $CH_3CH_2CH_2-OH$ B - $CH_3CH(OH)-CH_3$

878270220644. A - $CH_3CH_2CH_3$ B - $CH_3CH_2CH_3$

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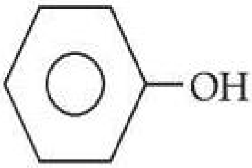
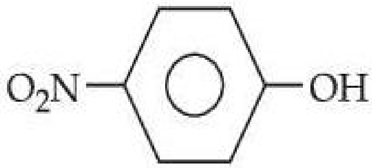
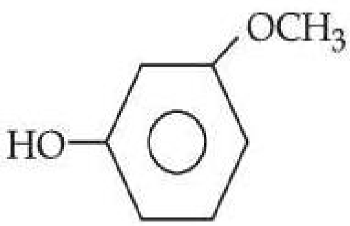
Question Number : 77 Question Id : 87827056224 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

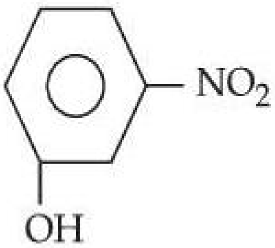
Correct Marks : 4 Wrong Marks : 1

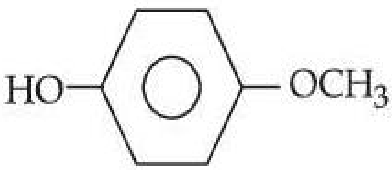
For the given compounds, the correct order of increasing pK_a value :

(A) 

(B) 

(C) 

(D) 

(E) 

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

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Options :

878270220645. (E) < (D) < (C) < (B) < (A)

878270220646.

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

878270220647. (B) < (D) < (A) < (C) < (E)

878270220648. (D) < (E) < (C) < (B) < (A)

Question Number : 77 Question Id : 87827056224 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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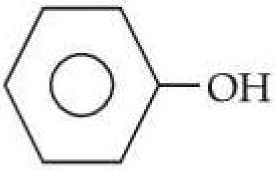
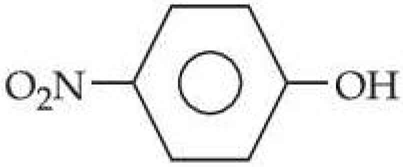
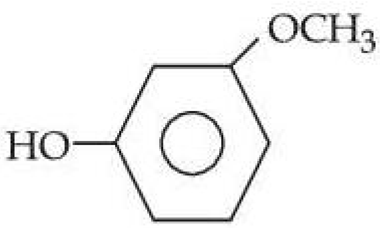
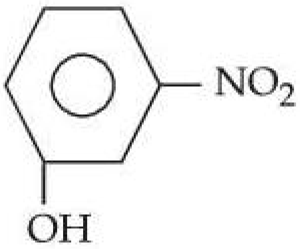
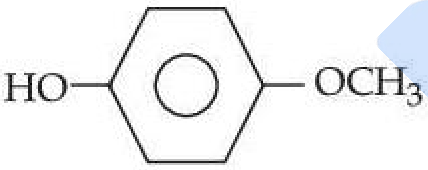
दिए गए यौगिकों के लिए, बढ़ते हुए pK_a मानों का सही क्रम है :

(A) 

(B) 

(C) 

(D) 

(E) 

नीचे दिए गए विकल्पों से **सही** उत्तर चुने :

Options :

878270220645. (E) < (D) < (C) < (B) < (A)

878270220646. (E) < (D) < (B) < (A) < (C)

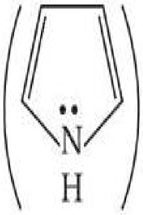
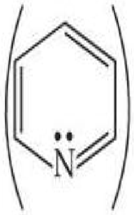
878270220647. (B) < (D) < (A) < (C) < (E)

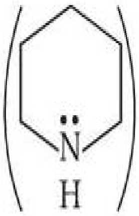
878270220648.

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

Question Number : 78 Question Id : 87827056225 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Correct order of basic strength of Pyrrole , Pyridine  and Piperidine

 is :

Options :

878270220649. Piperidine > Pyridine > Pyrrole

878270220650. Pyrrole > Pyridine > Piperidine

878270220651. Pyrrole > Piperidine > Pyridine

878270220652. Pyridine > Piperidine > Pyrrole

Question Number : 78 Question Id : 87827056225 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

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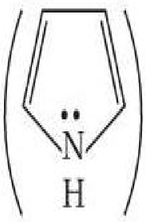
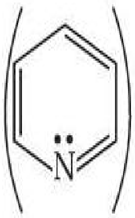
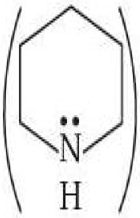
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

पाइरोल , पिरीडीन  एवं पाइपिरीडीन  के क्षारीय सामर्थ्य का सही क्रम है :

Options :

878270220649. पाइपिरीडीन > पिरीडीन > पाइरोल

878270220650. पाइरोल > पिरीडीन > पाइपिरीडीन

878270220651. पाइरोल > पाइपिरीडीन > पिरीडीन

878270220652. पिरीडीन > पाइपिरीडीन > पाइरोल

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Question Number : 79 Question Id : 87827056226 Question Type : MCQ Option Shuffling : Yes 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 reaction of Lead Sulphide with dilute nitric acid which of the following is **not** formed ?

Options :

878270220653. Lead nitrate

878270220654. Nitric oxide

878270220655. Nitrous oxide

878270220656. Sulphur

Question Number : 79 Question Id : 87827056226 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

लेड सल्फाइड की तनु नाइट्रिक अम्ल की अभिक्रिया से निम्न में से किसका निर्माण नहीं होता है ?

Options :

878270220653. लेड नाइट्रेट

878270220654. नाइट्रिक ऑक्साइड

878270220655. नाइट्रस ऑक्साइड

878270220656. सल्फर

Question Number : 80 Question Id : 87827056227 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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Identify the **incorrect** statements regarding primary standard of titrimetric analysis.

(A) It should be purely available in dry form.

(B) It should not undergo chemical change in air.

(C) It should be hygroscopic and should react with another chemical instantaneously and stoichiometrically.

(D) It should be readily soluble in water.

(E) $KMnO_4$ & NaOH can be used as primary standard.

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

Options :

878270220657. (A) and (B) only

878270220658. (C) and (D) only

878270220659. (B) and (E) only

878270220660. (C) and (E) only

Question Number : 80 Question Id : 87827056227 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

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अनुमापनात्मक विश्लेषण में प्राथमिक मानक के संदर्भ में असत्य कथनों को पहचानें :

(A) इसे शुष्क अवस्था में शुद्ध रूप में उपलब्ध होना चाहिए।

(B) इसे हवा में रासायनिक परिवर्तित नहीं होना चाहिए।

(C) इसे आर्द्रताग्राही होना चाहिए तथा अन्य रसायनों के साथ तुरंत एवं स्टाइकियोमीट्रिक प्रकार से अभिक्रिया करना चाहिए।

(D) इसे जल में आसानी के साथ विलेय होना चाहिए।

(E) $KMnO_4$ एवं NaOH के प्राथमिक मानक के रूप में उपयोग किया जा सकता है।

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

Options :

878270220657. केवल (A) एवं (B)

878270220658. केवल (C) एवं (D)

878270220659. केवल (B) एवं (E)

878270220660. केवल (C) एवं (E)

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Chemistry Section B

Section Id :	8782701187
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20

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

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 8782702094

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 81 Question Id : 87827056228 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Molarity (M) of an aqueous solution containing x g of anhyd. $CuSO_4$ in 500 mL solution at 32 °C is 2×10^{-1} M. Its molality will be ________ $\times 10^{-3}$ m. (nearest integer).

[Given density of the solution = 1.25 g/mL]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 81 Question Id : 87827056228 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

जब जलीय विलयन जिसके 500 mL विलयन में x g निर्जल $CuSO_4$ उपस्थित हों, उसकी 32 °C पर मोलरता (M) 2×10^{-1} M है। इसकी मोललता होगी ________ $\times 10^{-3}$ m. (निकटतम पूर्णांक)

[विलयन का घनत्व = 1.25 g/mL]

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 : 87827056229 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The total number of species from the following in which one unpaired electron is present, is ________.

$N_2, O_2, C_2^-, O_2^-, O_2^{2-}, H_2^+, CN^-, He_2^+$

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 : 87827056229 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 उन स्पीशीज़ जिनमें एक अयुग्मित इलेक्ट्रॉन उपस्थित हो, की कुल संख्या है : ________ ।

$N_2, O_2, C_2^-, O_2^-, O_2^{2-}, H_2^+, CN^-, He_2^+$

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 : 87827056230 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The heat of solution of anhydrous $CuSO_4$ and $CuSO_4 \cdot 5H_2O$ are -70 kJ mol^{-1} and $+12$ kJ mol^{-1} respectively.

The heat of hydration of $CuSO_4$ to $CuSO_4 \cdot 5H_2O$ is $-x$ kJ. The value of x is ________. (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 : 83 Question Id : 87827056230 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

निर्जल $CuSO_4$ एवं $CuSO_4 \cdot 5H_2O$ की विलयन की उष्माएँ हैं क्रमशः -70 kJ mol^{-1} एवं $+12$ kJ mol^{-1}।

$CuSO_4$ से $CuSO_4 \cdot 5H_2O$ की जलयोजन उष्मा $-x$ kJ है। x का मान है : ________। (निकटतम पूर्णांक)

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 : 87827056231 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

When equal volume of 1M HCl and 1M H_2SO_4 are separately neutralised by excess volume of 1M NaOH solution. x and y kJ of heat is liberated respectively. The value of y/x is ________.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 84 Question Id : 87827056231 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

जब 1M HCl एवं 1M H_2SO_4 के समान आयतन को अलग-अलग 1M NaOH के आधिक्य से उदासीनीकृत किया जाता है तो क्रमश: x एवं y kJ उष्मा निर्मुक्त होती है। y/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 : 85 Question Id : 87827056232 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The standard reduction potentials at 298 K for the following half cells are given below :

$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O, \quad E^\circ = 1.33V$

$Fe^{3+}(aq) + 3e^- \rightarrow Fe \quad E^\circ = -0.04V$

$Ni^{2+}(aq) + 2e^- \rightarrow Ni \quad E^\circ = -0.25V$

$Ag^+(aq) + e^- \rightarrow Ag \quad E^\circ = 0.80V$

$Au^{3+}(aq) + 3e^- \rightarrow Au \quad E^\circ = 1.40V$

Consider the given electrochemical reactions,

The number of metal(s) which will be oxidized be $Cr_2O_7^{2-}$, in aqueous solution is ________.

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 : 87827056232 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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298 K पर निम्न अर्ध सेलों का मानक अपचयन विभव दिया गया है :

$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O, \ E^\circ = 1.33V$

$Fe^{3+}(aq) + 3e^- \rightarrow Fe \qquad E^\circ = -0.04V$

$Ni^{2+}(aq) + 2e^- \rightarrow Ni \qquad E^\circ = -0.25V$

$Ag^+(aq) + e^- \rightarrow Ag \qquad E^\circ = 0.80V$

$Au^{3+}(aq) + 3e^- \rightarrow Au \qquad E^\circ = 1.40V$

दिए गये विद्युत रासायनिक अभिक्रिया पर विचार करें।

उन धातुओं की संख्या जो जलीय विलयन में $Cr_2O_7^{2-}$ द्वारा ऑक्सीकृत होंगी, है : _________ ।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 86 Question Id : 87827056233 Question Type : SA Calculator : None

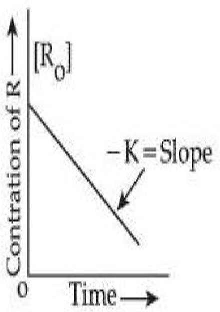
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : The rate law for the reaction $A + B \rightarrow C$ is rate $(r) = k[A]^2[B]$. When the concentration of both A and B is doubled, the reaction rate is increased "x" times.

Statement II :



The figure is showing "the variation in concentration against time plot" for a "y" order reaction.

The Value of $x + y$ is _________.

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Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 86 Question Id : 87827056233 Question Type : SA Calculator : None

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

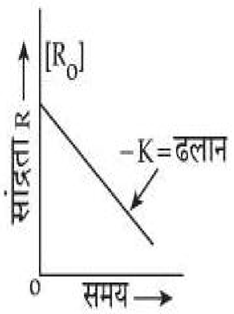
Correct Marks : 4 Wrong Marks : 1

कथन I : अभिक्रिया $A + B \rightarrow C$ का वेग नियम है :

दर $(r) = k[A]^2[B]$

जब A एवं B दोनों की सान्द्रता दो गुनी कर दी जाए तो अभिक्रिया वेग x गुना बढ़ जाएगी।

कथन II :



यह चित्र y कोटि की अभिक्रिया के लिए सांद्रता में परिवर्तन Vs. समय का प्लाट है। $x + y$ 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 : 87 Question Id : 87827056234 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 colourless lanthanoid ions among the following is ________.

Eu^{3+}, Lu^{3+}, Nd^{3+}, La^{3+}, Sm^{3+}

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 : 87827056234 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 रंगहीन लैन्थेनॉयड आयनों की संख्या है : ________ ।

Eu^{3+}, Lu^{3+}, Nd^{3+}, La^{3+}, Sm^{3+}

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 : 87827056235 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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Number of ambidentate ligands among the following is ________.

NO_2^-, SCN^-, $C_2O_4^{2-}$, NH_3, CN^-, SO_4^{2-}, H_2O.

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 : 87827056235 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 उभयदन्ती लिगन्डों की संख्या है : ________ ।

NO_2^-, SCN^-, $C_2O_4^{2-}$, NH_3, CN^-, SO_4^{2-}, H_2O.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

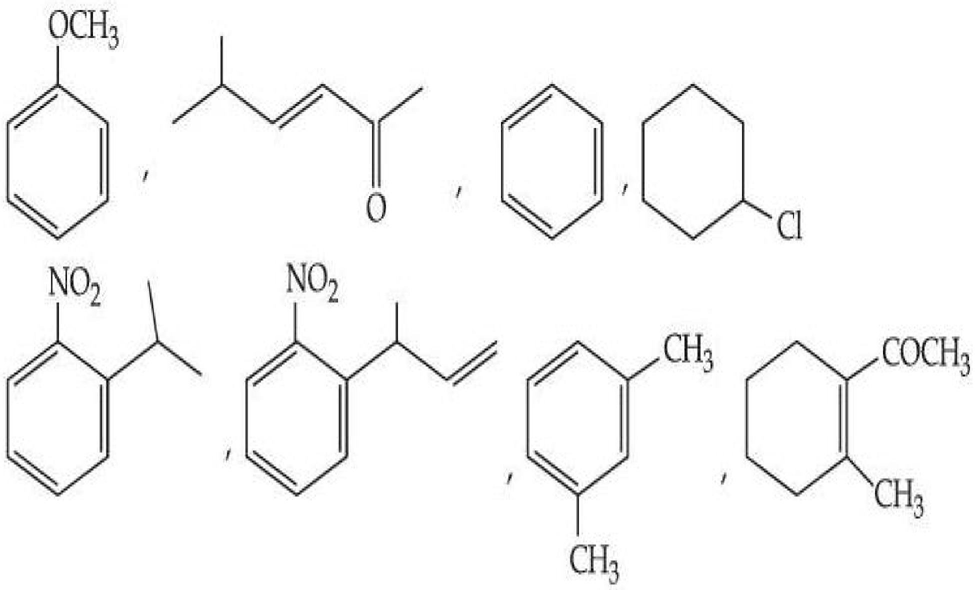
1

Question Number : 89 Question Id : 87827056236 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

How many compounds among the following compounds show inductive, mesomeric as well as hyperconjugation effects ?



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 : 87827056236 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

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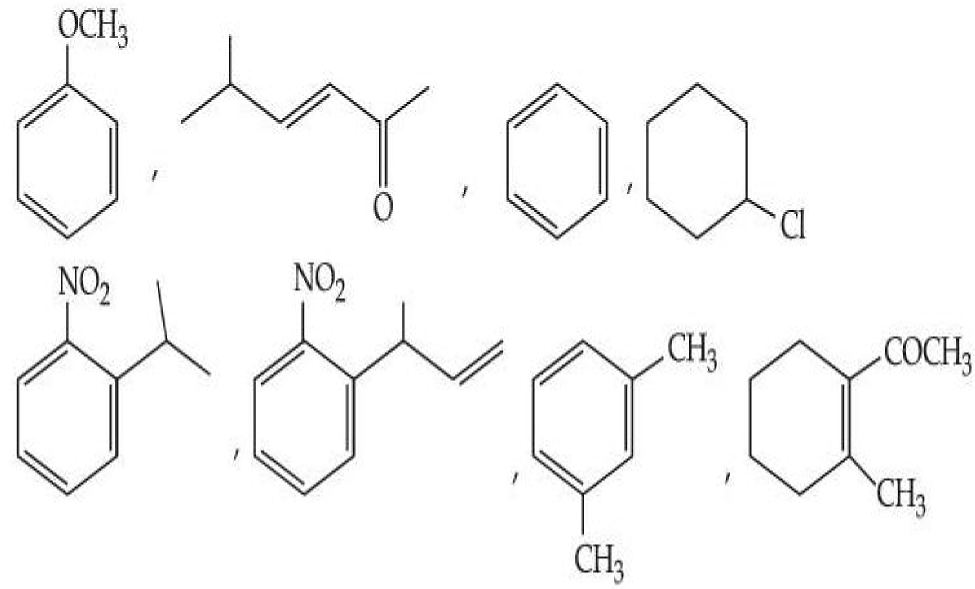
निम्न यौगिकों में से कितने यौगिक प्रेरणिक, मेसोमेरिक के साथ साथ अतिसंयुग्मन प्रभाव प्रदर्शित करते हैं : ________ ।



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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Question Number : 90 Question Id : 87827056237 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Total number of essential amino acid among the given list of amino acids is ________.

Arginine, Phenylalanine, Aspartic acid, Cysteine, Histidine, Valine, Proline

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

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Question Number : 90 Question Id : 87827056237 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

ऐमीनो अम्लों की दी गई सूची में से आवश्यक ऐमीनो अम्लों की संख्या है : ________ ।

आर्जिनीन, फेनिल-ऐलनिन, ऐस्पार्टिक अम्ल, सिस्टीन, हिस्टिडीन, वैलीन, प्रोलीन

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

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