Mathematics

Section Id :	40503677
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	25
Number of Questions to be attempted:	25
Section Marks:	100

Sub-Section Number:	1
Sub-Section Id:	405036126
Question Shuffling Allowed :	Yes

Question Number : 51 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

If for all real triplets (a, b, c), $f(x) = a + bx + cx^2$; then $\int_0^1 f(x)dx$ is equal to :

Options :

1. $\frac{1}{3}\left\{f(0)+f\left(\frac{1}{2}\right)\right\}$

2. $\frac{1}{2}\left\{f(1)+3f\left(\frac{1}{2}\right)\right\}$

3. $2\left\{3f(1)+2f\left(\frac{1}{2}\right)\right\}$

4. $\frac{1}{6}\left\{f(0)+f(1)+4f\left(\frac{1}{2}\right)\right\}$

Question Number : 51 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

यदि सभी वास्तविक त्रिकों (a, b, c) के लिए,

$f(x)=a+bx+cx^2$ है, तो $\int_0^1 f(x)dx$ बराबर है :

Options :

1. $\frac{1}{3}\left\{f(0)+f\left(\frac{1}{2}\right)\right\}$

2. $\frac{1}{2}\left\{f(1)+3f\left(\frac{1}{2}\right)\right\}$

3. $2\left\{3f(1)+2f\left(\frac{1}{2}\right)\right\}$

4. $\frac{1}{6}\left\{f(0)+f(1)+4f\left(\frac{1}{2}\right)\right\}$

Question Number : 51 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

દરેક વાસ્તવિક ત્રિપુટીઓ (a, b, c) માટે, જો $f(x)=a+bx+cx^2$ હોય, તો $\int_0^1 f(x)dx$ =_____ .

Options :

1. $\frac{1}{3}\left\{f(0)+f\left(\frac{1}{2}\right)\right\}$

2. $\frac{1}{2}\left\{f(1)+3f\left(\frac{1}{2}\right)\right\}$

3. $2\left\{3f(1)+2f\left(\frac{1}{2}\right)\right\}$

4. $\frac{1}{6}\left\{f(0)+f(1)+4f\left(\frac{1}{2}\right)\right\}$

Question Number : 52 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

The number of real roots of the equation, $e^{4x}+e^{3x}-4e^{2x}+e^{x}+1=0$ is :

Options :

1. 1

2. 2

3. 3

4. 4

Question Number : 52 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

समीकरण $e^{4x}+e^{3x}-4e^{2x}+e^{x}+1=0$ के
वास्तविक मूलों की संख्या है :

Options :

1. 1

2. 2

3. 3

4. 4

Question Number : 52 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

સમીકરણ $e^{4x}+e^{3x}-4e^{2x}+e^{x}+1=0$ નાં
વાસ્તવિક બીજની સંખ્યા કેટલી થાય?

Options :

1. 1

2. 2

3. 3

4. 4

Question Number : 53 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

Let z be a complex number such that

$\left|\frac{z-i}{z+2i}\right|=1$

and $|z|=\frac{5}{2}$. Then the value of $|z+3i|$ is :

Options :

1. $\frac{15}{4}$

2. $2\sqrt{3}$

3. $\frac{7}{2}$

4. $\sqrt{10}$

Question Number : 53 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

माना z एक ऐसी सम्मिश्र संख्या है, कि $\left|\frac{z-i}{z+2i}\right|=1$

है तथा $|z|=\frac{5}{2}$ है, तो $|z+3i|$ का मान है :

Options :

1. $\frac{15}{4}$

2. $2\sqrt{3}$

3. $\frac{7}{2}$

4. $\sqrt{10}$

Question Number : 53 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

સંકર સંખ્યા z માટે $\left|\frac{z-i}{z+2i}\right|=1$ અને $|z|=\frac{5}{2}$ થાય છે. તો $|z+3i|$ ની કિંમત _____ છે.

Options :

1. $\frac{15}{4}$

2. $2\sqrt{3}$

3. $\frac{7}{2}$

4. $\sqrt{10}$

Question Number : 54 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

If the matrices $A=\begin{bmatrix}1 & 1 & 2\\ 1 & 3 & 4\\ 1 & -1 & 3\end{bmatrix}$, $B=\text{adj } A$

and $C=3A$, then $\frac{|\text{adj } B|}{|C|}$ is equal to :

Options :

1. 2

2. 8

3. 16

4. 72

Question Number : 54 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

यदि आव्यूह $A=\begin{bmatrix}1 & 1 & 2\\ 1 & 3 & 4\\ 1 & -1 & 3\end{bmatrix}$, $B=\text{adj } A$ तथा

$C=3A$ हैं, तो $\frac{|\text{adj } B|}{|C|}$ का मान है:

Options :

1. 2

2. 8

3. 16

4. 72

Question Number : 54 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

જો શ્રેણીકો $A=\begin{bmatrix}1 & 1 & 2\\ 1 & 3 & 4\\ 1 & -1 & 3\end{bmatrix}$, $B=\text{adj } A$ અને

$C=3A$ હોય, તો $\frac{|\text{adj } B|}{|C|}$ = _____ .

Options :

1. 2

2. 8

3. 16

4. 72

Question Number : 55 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

If for some α and β in R, the intersection of the following three planes

$x+4y-2z=1$

$x+7y-5z=\beta$

$x+5y+\alpha z=5$

is a line in R^3, then $\alpha+\beta$ is equal to :

Options :

1. -10

2. 0

3. 2

4. 10

Question Number : 55 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

यदि $\mathbf{R}$ में किन्हीं α तथा β के लिए, निम्न तीन समतलों

$x+4y-2z=1$

$x+7y-5z=\beta$

$x+5y+\alpha z=5$

का प्रतिच्छेदन, $\mathbf{R}^3$ में एक रेखा है, तो $\alpha+\beta$ का मान है :

Options :

1. -10

2. 0

3. 2

4. 10

Question Number : 55 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

જો કોઇક $\alpha, \beta \in \mathbf{R}$ માટે ત્રણ સમતલો

$x+4y-2z=1$

$x+7y-5z=\beta$

$x+5y+\alpha z=5$

નો છેદ એ $\mathbf{R}^3$ માં એક રેખા હોય, તો $\alpha+\beta=$_____ .

Options :

1. -10

2. 0

3. 2

4. 10

Question Number : 56 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

If the number of five digit numbers with distinct digits and 2 at the 10^{th} place is 336 k, then k is equal to :

Options :

1. 8

2. 7

3. 6

4. 4

Question Number : 56 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

यदि विभिन्न अंकों वाली पाँच अंकों की संख्याओं, जिनका दहाई का अंक 2 है, की संख्या 336 k है, तो k बराबर है :

Options :

1. 8

2. 7

3. 6

4. 4

Question Number : 56 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

જેનાં દશકનાં સ્થાને 2 આવતો હોય અને બધાજ અંકો ભિન્ન હોય તેવી પાંચ અંકોની સંખ્યાઓની સંખ્યા જો 336 k હોય, તો k=_____ .

Options :

1. 8

2. 7

3. 6

4. 4

Question Number : 57 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

The product

$2^{\frac{1}{4}} \cdot 4^{\frac{1}{16}} \cdot 8^{\frac{1}{48}} \cdot 16^{\frac{1}{128}} \cdot \ldots$ to ∞

is equal to :

Options :

1. 1

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

3. 2

4. $2^{\frac{1}{4}}$

Question Number : 57 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

गुणनफल $2^{\frac{1}{4}} \cdot 4^{\frac{1}{16}} \cdot 8^{\frac{1}{48}} \cdot 16^{\frac{1}{128}} \cdot \ldots \infty$ तक
बराबर है :

Options :

1. 1

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

3. 2

4. $2^{\frac{1}{4}}$

Question Number : 57 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

ગુણાકાર $2^{\frac{1}{4}} \cdot 4^{\frac{1}{16}} \cdot 8^{\frac{1}{48}} \cdot 16^{\frac{1}{128}} \cdot \ldots \infty$ સુધી ની
કિંમત કેટલી થાય?

Options :

1. 1

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

3. 2

4. $2^{\frac{1}{4}}$

Question Number : 58 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

If $f(x) = \begin{cases} \dfrac{\sin(a+2)x + \sin x}{x} & ; x < 0 \\ b & ; x = 0 \\ \dfrac{(x+3x^2)^{1/3} - x^{1/3}}{x^{4/3}} & ; x > 0 \end{cases}$

is continuous at $x = 0$, then $a + 2b$ is equal to :

Options :

1. -1

2. 0

3. 1

4. -2

Question Number : 58 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

यदि $f(x) = \begin{cases} \dfrac{\sin(a+2)x + \sin x}{x} & ; x < 0 \\ b & ; x = 0 \\ \dfrac{(x+3x^2)^{1/3} - x^{1/3}}{x^{4/3}} & ; x > 0 \end{cases}$

$x = 0$ पर संतत है, तो $a + 2b$ का मान है :

Options :

1. -1

2. 0

3. 1

4. -2

Question Number : 58 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

જો $f(x) = \begin{cases} \frac{\sin(a+2)x + \sin x}{x} & ; x < 0 \\ b & ; x = 0 \\ \frac{(x+3x^2)^{1/3} - x^{1/3}}{x^{4/3}} & ; x > 0 \end{cases}$

એ $x = 0$ આગળ સતત હોય, તો $a + 2b$ =_____ .

Options :

1. -1

2. 0

3. 1

4. -2

Question Number : 59 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

A spherical iron ball of 10 cm radius is coated with a layer of ice of uniform thickness that melts at a rate of $50\,cm^3/min$. When the thickness of ice is 5 cm, then the rate (in cm/min.) at which of the thickness of ice decreases, is :

Options :

1. $\frac{1}{36\pi}$

2. $\frac{5}{6\pi}$

3. $\frac{1}{18\pi}$

4. $\frac{1}{54\pi}$

Question Number : 59 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

एक 10 cm त्रिज्या वाली गोलाकार लोहे की गेंद को बर्फ की एक समान मोटाई वाली परत से लेप किया गया है, जो कि $50\,cm^3/min$ की दर से पिघलती है। जब बर्फ की परत की मोटाई 5 cm है, उस समय बर्फ की मोटाई के घटने की दर (cm/min में), है :

Options :

1. $\frac{1}{36\pi}$

2. $\frac{5}{6\pi}$

3. $\frac{1}{18\pi}$

4. $\frac{1}{54\pi}$

Question Number : 59 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

જેની ત્રિજ્યા 10 સે.મી. હોય તેવા લોખંડનાં ગોળાકાર દડાને એકસમાન જાડાઈ રહે તેવી રીતે બરફના સ્તર વડે આવરિત કરવામાં આવેલ છે, જે 50 સે.મી.^{3}/મિનિટ ના દર થી પીગળે છે. જ્યારે બરફની જાડાઈ 5 સે.મી. હોય, ત્યારે બરફની જાડાઇનો ઘટવાનો દર (સે.મી./મિનિટમાં) કેટલે થાય?

Options :

1. $\frac{1}{36\pi}$

2. $\frac{5}{6\pi}$

3. $\frac{1}{18\pi}$

4. $\frac{1}{54\pi}$

Question Number : 60 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

Let f be any function continuous on [a, b] and twice differentiable on (a, b). If for all $x \in (a, b)$, $f'(x) > 0$ and $f''(x) < 0$, then for any $c \in (a, b)$, $\frac{f(c) - f(a)}{f(b) - f(c)}$ is greater than :

Options :

1. $\frac{b - c}{c - a}$

2. $\frac{c - a}{b - c}$

3. 1

4. $\frac{b + a}{b - a}$

Question Number : 60 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

माना f कोई फलन है जोकि [a, b] में संतत तथा (a, b) में दो बार अवकलनीय है। यदि सभी $x \in (a, b)$ के लिए $f'(x) > 0$ तथा $f''(x) < 0$ हैं, तो किसी भी $c \in (a, b)$, के लिए $\frac{f(c) - f(a)}{f(b) - f(c)}$ निम्न में से किससे बड़ा है?

Options :

1. $\frac{b - c}{c - a}$

2. $\frac{c - a}{b - c}$

3. 1

4. $\frac{b+a}{b-a}$

Question Number : 60 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

ધારોકે કોઇ વિધેય f એ [a, b] માં સતત અને (a, b) માં દ્વિ-વિકલનીય છે. જો $x \in (a, b)$ માટે $f'(x) > 0$ અને $f''(x) < 0$ હોય, તો કોઈપણ $c \in (a, b)$, માટે $\frac{f(c)-f(a)}{f(b)-f(c)}$ એ નીચેનામાંથી કોના કરતાં મોટું હોય?

Options :

1. $\frac{b-c}{c-a}$

2. $\frac{c-a}{b-c}$

3. 1

4. $\frac{b+a}{b-a}$

Question Number : 61 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

If $f'(x) = \tan^{-1}(\sec x + \tan x)$, $-\frac{\pi}{2} < x < \frac{\pi}{2}$, and $f(0) = 0$, then $f(1)$ is equal to :

Options :

1. $\frac{\pi - 1}{4}$

2. $\frac{\pi + 2}{4}$

3. $\frac{\pi + 1}{4}$

4. $\frac{1}{4}$

Question Number : 61 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

यदि $f'(x) = \tan^{-1}(\sec x + \tan x)$,

$-\frac{\pi}{2} < x < \frac{\pi}{2}$ है तथा $f(0) = 0$ है, तो $f(1)$ का

मान है :

Options :

1. $\frac{\pi - 1}{4}$

2. $\frac{\pi + 2}{4}$

3. $\frac{\pi + 1}{4}$

4. $\frac{1}{4}$

Question Number : 61 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

જો $f'(x)=\tan^{-1}(\sec x+\tan x),\ -\frac{\pi}{2}<x<\frac{\pi}{2}$

અને $f(0)=0$ હોય, તો $f(1)=$_____ .

Options :

1. $\frac{\pi-1}{4}$

2. $\frac{\pi+2}{4}$

3. $\frac{\pi+1}{4}$

4. $\frac{1}{4}$

Question Number : 62 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

The integral $\int\frac{dx}{(x+4)^{8/7}(x-3)^{6/7}}$ is equal

to :

(where C is a constant of integration)

Options :

1. $\frac{1}{2}\left(\frac{x-3}{x+4}\right)^{3/7}+C$

2. $\left(\frac{x-3}{x+4}\right)^{1/7}+C$

3. $-\left(\frac{x-3}{x+4}\right)^{-1/7}+C$

4. $-\frac{1}{13}\left(\frac{x-3}{x+4}\right)^{-13/7}+C$

Question Number : 62 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

समाकल $\int \frac{dx}{(x+4)^{8/7}(x-3)^{6/7}}$ बराबर है :

(जहाँ C एक समाकलन अचर है)

Options :

1. $\frac{1}{2}\left(\frac{x-3}{x+4}\right)^{3/7}+C$

2. $\left(\frac{x-3}{x+4}\right)^{1/7}+C$

3. $-\left(\frac{x-3}{x+4}\right)^{-1/7}+C$

4. $-\frac{1}{13}\left(\frac{x-3}{x+4}\right)^{-13/7}+C$

Question Number : 62 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

સંકલન $\int \frac{dx}{(x+4)^{8/7}(x-3)^{6/7}}$ ની કિંમત બરાબર

(જ્યાં C એ સંકલનનો અચળાંક છે)

Options :

1. $\frac{1}{2}\left(\frac{x-3}{x+4}\right)^{3/7}+C$

2. $\left(\frac{x-3}{x+4}\right)^{1/7}+C$

3. $-\left(\frac{x-3}{x+4}\right)^{-1/7}+C$

4. $-\frac{1}{13}\left(\frac{x-3}{x+4}\right)^{-13/7}+C$

Question Number : 63 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

The value of $\int_0^{2\pi} \frac{x\sin^8 x}{\sin^8 x+\cos^8 x}dx$ is equal

to :

Options :

1. 4π

2. 2π

3. $2\pi^2$

4. π^2

Question Number : 63 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

$\int_0^{2\pi} \frac{x \sin^8 x}{\sin^8 x + \cos^8 x} dx$ का मान है :

Options :

1. 4π

2. 2π

3. $2\pi^2$

4. π^2

Question Number : 63 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

સંકલન $\int_0^{2\pi} \frac{x \sin^8 x}{\sin^8 x + \cos^8 x} dx$ ની કિંમત _____ થાય.

Options :

1. 4π

2. 2π

3. $2\pi^2$

4. π^2

Question Number : 64 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

Let C be the centroid of the triangle with vertices $(3, -1)$, $(1, 3)$ and $(2, 4)$. Let P be the point of intersection of the lines $x+3y-1=0$ and $3x-y+1=0$. Then the line passing through the points C and P also passes through the point :

Options :

1. $(7, 6)$

2. $(-9, -7)$

3. $(9, 7)$

4. $(-9, -6)$

Question Number : 64 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

माना शीर्षों $(3, -1)$, $(1, 3)$ तथा $(2, 4)$ वाले त्रिभुज का केंद्रक C है। माना रेखाओं $x+3y-1=0$ तथा $3x-y+1=0$ का प्रतिच्छेदन बिन्दु P है, तो बिन्दुओं C तथा P से गुजरने वाली रेखा, निम्न में से किस बिन्दु से भी गुजरती है?

Options :

1. $(7, 6)$

2. $(-9, -7)$

3. $(9, 7)$

4. $(-9, -6)$

Question Number : 64 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

ધારોકે $(3, -1)$, $(1, 3)$ અને $(2, 4)$ શિરોબિંદુઓ વાળા ત્રિકોણનું મધ્યકેન્દ્ર C છે. ધારો કે રેખાઓ $x+3y-1=0$ અને $3x-y+1=0$ નું છેદબિંદુ P છે. તો બિંદુઓ C અને P માંથી પસાર થતી રેખા એ નીચેનાં કયા બિંદુમાંથી પણ પસાર થશે?

Options :

1. $(7, 6)$

2. $(-9, -7)$

3. $(9, 7)$

4. $(-9, -6)$

Question Number : 65 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

A circle touches the y-axis at the point $(0, 4)$ and passes through the point $(2, 0)$. Which of the following lines is not a tangent to this circle ?

Options :

1. $3x-4y-24=0$

2. $3x+4y-6=0$

3. $4x+3y-8=0$

4. $4x-3y+17=0$

Question Number : 65 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

एक वृत्त y-अक्ष को बिन्दु $(0, 4)$ पर स्पर्श करता है तथा बिन्दु $(2, 0)$ से होकर जाता है। निम्न में से कौन सी रेखा इस वृत्त की स्पर्श रेखा **नहीं** है?

Options :

1. $3x-4y-24=0$

2. $3x+4y-6=0$

3. $4x+3y-8=0$

4. $4x-3y+17=0$

Question Number : 65 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

એક વર્તુળ y-અક્ષ ને બિંદુ $(0, 4)$ માં સ્પર્શે છે અને બિંદુ $(2, 0)$ માંથી પસાર થાય છે. તો નીચેના માંથી કઇ રેખા આ વર્તુળનો સ્પર્શક નથી?

Options :

1. $3x-4y-24=0$

2. $3x+4y-6=0$

3. $4x+3y-8=0$

4. $4x-3y+17=0$

Question Number : 66 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

If e_1 and e_2 are the eccentricities of the ellipse, $\frac{x^2}{18} + \frac{y^2}{4} = 1$ and the hyperbola, $\frac{x^2}{9} - \frac{y^2}{4} = 1$ respectively and (e_1, e_2) is a point on the ellipse, $15x^2+3y^2=k$, then k is equal to :

Options :

1. 17

2. 16

3. 15

4. 14

Question Number : 66 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

यदि e_1 तथा e_2 क्रमशः दीर्घवृत्त $\frac{x^2}{18} + \frac{y^2}{4} = 1$ तथा अतिपरवलय $\frac{x^2}{9} - \frac{y^2}{4} = 1$ की उत्केंद्रताएँ है तथा (e_1, e_2) दीर्घवृत्त $15x^2+3y^2=k$ पर स्थित एक बिन्दु है, तो k का मान है :

Options :

1. 17

2. 16

3. 15

4. 14

Question Number : 66 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

જો e_1 અને e_2 એ અનુક્રમે ઉપવલય $\frac{x^2}{18} + \frac{y^2}{4} = 1$

અને અતિવલય $\frac{x^2}{9} - \frac{y^2}{4} = 1$ ની ઉત્કેન્દ્રતાઓ હોય,

અને (e_1, e_2) એ ઉપવલય $15x^2 + 3y^2 = k$ પરનું બિંદુ

હોય, તો $k =$ _____ .

Options :

1. 17

2. 16

3. 15

4. 14

Question Number : 67 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

In a box, there are 20 cards, out of which 10 are labelled as A and the remaining 10 are labelled as B. Cards are drawn at random, one after the other and with replacement, till a second A-card is obtained. The probability that the second A-card appears before the third B-card is :

Options :

1. $\frac{15}{16}$

2. $\frac{13}{16}$

3. $\frac{11}{16}$

4. $\frac{9}{16}$

Question Number : 67 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

एक बक्से में 20 कार्ड हैं जिनमें से 10 पर A अंकित किया गया है तथा शेष 10 पर B अंकित किया गया है। बक्से में से यादृच्छया एक के बाद एक (प्रतिस्थापना सहित) कार्ड तब तक निकाले गए जब तक कि दूसरा A से अंकित कार्ड न आ जाए। दूसरे A से अंकित कार्ड के तीसरे B से अंकित कार्ड से पहले आने की प्रायिकता है :

Options :

1. $\frac{15}{16}$

2. $\frac{13}{16}$

3. $\frac{11}{16}$

4. $\frac{9}{16}$

Question Number : 67 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

એક ખોખામાં 20 પત્તાઓ છે, જેમાંથી 10 ને A વડે અંકિત કરવામાં આવ્યા છે અને બાકીનાં 10 ને B વડે અંકિત કરવામાં આવ્યા છે. જ્યાં સુધી બીજી વખત પત્તું A ન આવે ત્યાં સુધી એક પછી એક પત્તા પુરવણી સહિત યાદચ્છિક રીતે ખેંચવામાં આવે છે. તો ત્રીજી વખત પત્તું B આવે તે પહેલાં બીજી વખત પત્તું A આવે તેની સંભાવના કેટલી થાય?

Options :

1. $\frac{15}{16}$

2. $\frac{13}{16}$

3. $\frac{11}{16}$

4. $\frac{9}{16}$

Question Number : 68 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

Let the observations $x_i(1 \le i \le 10)$ satisfy the equations, $\sum_{i=1}^{10}(x_i - 5) = 10$ and $\sum_{i=1}^{10}(x_i - 5)^2 = 40$. If μ and λ are the mean and the variance of the observations, $x_1 - 3, x_2 - 3, ..., x_{10} - 3$, then the ordered pair (μ, λ) is equal to :

Options :

1. $(6, 6)$

2. $(3, 6)$

3. $(6, 3)$

4. $(3, 3)$

Question Number : 68 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

माना प्रेक्षण $x_i(1 \le i \le 10)$ समीकरणों $\sum_{i=1}^{10}(x_i - 5) = 10$ तथा $\sum_{i=1}^{10}(x_i - 5)^2 = 40$ को संतुष्ट करते हैं। यदि μ तथा λ, प्रेक्षणों $x_1 - 3, x_2 - 3, ..., x_{10} - 3$ के क्रमश: माध्य तथा प्रसरण हैं, तो क्रमित युग्म (μ, λ) बराबर है :

Options :

1. $(6, 6)$

2. $(3, 6)$

3. $(6, 3)$

4. $(3, 3)$

Question Number : 68 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

ધારો કે અવલોકનો $x_i (1 \le i \le 10)$ એ સમીકરણો

$\sum_{i=1}^{10} (x_i - 5) = 10$ અને $\sum_{i=1}^{10} (x_i - 5)^2 = 40$ નું

સમાધાન કરે છે. જો μ અને λ એ અવલોકનો $x_1 - 3$, $x_2 - 3, ..., x_{10} - 3$ નાં અનુક્રમે મધ્યક અને વિચરણ હોય, તો ક્રમયુક્ત જોડ (μ, λ) બરાબર :

Options :

1. $(6, 6)$

2. $(3, 6)$

3. $(6, 3)$

4. $(3, 3)$

Question Number : 69 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

The value of

$$\cos^3\left(\frac{\pi}{8}\right) \cdot \cos\left(\frac{3\pi}{8}\right) + \sin^3\left(\frac{\pi}{8}\right) \cdot \sin\left(\frac{3\pi}{8}\right)$$

is :

Options :

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

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

3. $\frac{1}{2\sqrt{2}}$

4. $\frac{1}{4}$

Question Number : 69 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

$\cos^3\left(\frac{\pi}{8}\right) \cdot \cos\left(\frac{3\pi}{8}\right) + \sin^3\left(\frac{\pi}{8}\right) \cdot \sin\left(\frac{3\pi}{8}\right)$

का मान है :

Options :

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

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

3. $\frac{1}{2\sqrt{2}}$

4. $\frac{1}{4}$

Question Number : 69 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

$\cos^3\left(\frac{\pi}{8}\right)\cdot\cos\left(\frac{3\pi}{8}\right)+\sin^3\left(\frac{\pi}{8}\right)\cdot\sin\left(\frac{3\pi}{8}\right)$

નું મૂલ્ય કેટલું થાય?

Options :

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

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

3. $\frac{1}{2\sqrt{2}}$

4. $\frac{1}{4}$

Question Number : 70 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

Negation of the statement :

'$\sqrt{5}$ is an integer or 5 is irrational' is :

Options :

1. $\sqrt{5}$ is irrational or 5 is an integer.

2. $\sqrt{5}$ is not an integer or 5 is not irrational.

3. $\sqrt{5}$ is not an integer and 5 is not irrational.

4. $\sqrt{5}$ is an integer and 5 is irrational.

Question Number : 70 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

कथन,

'$\sqrt{5}$ एक पूर्णांक है या 5 अपरिमेय है' का निषेधन है :

Options :

1. $\sqrt{5}$ अपरिमेय है या 5 एक पूर्णांक है।

2. $\sqrt{5}$ एक पूर्णांक नहीं है या 5 अपरिमेय नहीं है।

3. $\sqrt{5}$ एक पूर्णांक नहीं है और 5 अपरिमेय नहीं है।

4. $\sqrt{5}$ एक पूर्णांक है और 5 अपरिमेय है।

Question Number : 70 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 4 Wrong Marks : 1

વિધાન

'$\sqrt{5}$ એ પૂર્ણાંક સંખ્યા છે અથવા 5 એ અસંમેય સંખ્યા છે' નું નિષેધ શું થાય?

Options :

1. $\sqrt{5}$ એ અસંમેય સંખ્યા છે અથવા 5 એ પૂર્ણાંક સંખ્યા છે.

2. $\sqrt{5}$ એ પૂર્ણાંક સંખ્યા નથી અથવા 5 એ અસંમેય સંખ્યા નથી.

3. $\sqrt{5}$ એ પૂર્ણાંક સંખ્યા નથી અને 5 એ અસંમેય સંખ્યા નથી.

4. $\sqrt{5}$ એ પૂર્ણાંક સંખ્યા છે અને 5 એ અસંમેય સંખ્યા છે.

Sub-Section Number: 2
Sub-Section Id: 405036127
Question Shuffling Allowed : Yes

Question Number : 71 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The coefficient of x^4 in the expansion of $(1+x+x^2)^{10}$ is _____.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
615 to 615

Question Number : 71 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

$(1+x+x^2)^{10}$ के प्रसार में x^4 का गुणांक है _____।

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
615 to 615

Question Number : 71 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

$(1+x+x^2)^{10}$ નાં વિસ્તરણમાં x^4 નો સહગુણક _____છે.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
615 to 615

Question Number : 72 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The number of distinct solutions of the equation, $\log_{\frac{1}{2}}|\sin x| = 2 - \log_{\frac{1}{2}}|\cos x|$ in the interval $[0, 2\pi]$, is _____.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
8 to 8

Question Number : 72 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

समीकरण $\log_{\frac{1}{2}}|\sin x| = 2 - \log_{\frac{1}{2}}|\cos x|$ के अंतराल $[0, 2\pi]$ में भिन्न हलों की संख्या है _____।

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
8 to 8

Question Number : 72 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

અંતરાલ $[0, 2\pi]$ માં સમીકરણ $\log_{\frac{1}{2}}|\sin x| = 2 - \log_{\frac{1}{2}}|\cos x|$ નાં ભિન્ન ઉકેલો ની સંખ્યા _____ છે.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
8 to 8

Question Number : 73 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

If the vectors, $\vec{p} = (a+1)\hat{i} + a\hat{j} + a\hat{k}$,

$\vec{q} = a\hat{i} + (a+1)\hat{j} + a\hat{k}$ and

$\vec{r} = a\hat{i} + a\hat{j} + (a+1)\hat{k}$ $(a \in R)$ are

coplanar and $3\left(\vec{p} \cdot \vec{q}\right)^2 - \lambda\left|\vec{r} \times \vec{q}\right|^2 = 0$,

then the value of λ is _____.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
1 to 1

Question Number : 73 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

यदि सदिश $\vec{p} = (a+1)\hat{i} + a\hat{j} + a\hat{k}$,

$\vec{q} = a\hat{i} + (a+1)\hat{j} + a\hat{k}$ तथा

$\vec{r} = a\hat{i} + a\hat{j} + (a+1)\hat{k}$, $(a \in R)$ सहतलीय

हैं तथा $3\left(\vec{p} \cdot \vec{q}\right)^2 - \lambda\left|\vec{r} \times \vec{q}\right|^2 = 0$ है, तो λ

का मान है _____।

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
1 to 1

Question Number : 73 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

જો સદિશો $\vec{p} = (a+1)\hat{i} + a\hat{j} + a\hat{k}$,

$\vec{q} = a\hat{i} + (a+1)\hat{j} + a\hat{k}$ અને

$\vec{r} = a\hat{i} + a\hat{j} + (a+1)\hat{k}$, $(a \in R)$ સમતલીય

હોય, અને $3\left(\vec{p} \cdot \vec{q}\right)^2 - \lambda\left|\vec{r} \times \vec{q}\right|^2 = 0$ હોય,

તો λ ની કિંમત _____ થાય.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes

Answers Type: Range
Possible Answers :
1 to 1

Question Number : 74 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

If for $x \geq 0$, $y = y(x)$ is the solution of the differential equation,

$(x+1)dy = ((x+1)^2 + y - 3)dx$, $y(2) = 0$,

then $y(3)$ is equal to _____.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
3 to 3

Question Number : 74 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

यदि $x \geq 0$ के लिए $y = y(x)$, अवकल समीकरण $(x+1)dy = ((x+1)^2 + y - 3)dx$, $y(2) = 0$, का हल है, तो $y(3)$ का मान है _____ ।

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
3 to 3

Question Number : 74 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

જો $x \geq 0$ માટે $y = y(x)$ એ વિકલ સમીકરણ $(x+1)dy = ((x+1)^2 + y - 3)dx$, $y(2) = 0$ નો ઉકેલ હોય, તો $y(3)$=_____.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
3 to 3

Question Number : 75 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The projection of the line segment joining the points $(1, -1, 3)$ and $(2, -4, 11)$ on the line joining the points $(-1, 2, 3)$ and $(3, -2, 10)$ is _____.

Response Type: Numeric
Evaluation Required For SA: Yes

Show Word Count: Yes
Answers Type: Range
Possible Answers :
8 to 8

Question Number : 75 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

बिंदुओं $(1, -1, 3)$ तथा $(2, -4, 11)$ को मिलाने वाले रेखाखण्ड का बिंदुओं $(-1, 2, 3)$ तथा $(3, -2, 10)$ को मिलाने वाली रेखा पर प्रक्षेप है _____।

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
8 to 8

Question Number : 75 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

બિંદુઓ $(1, -1, 3)$ અને $(2, -4, 11)$ ને જોડતા રેખાખંડ નો બિંદુઓ $(-1, 2, 3)$ અને $(3, -2, 10)$ જોડતી રેખા પરનો પ્રક્ષેપ _____ થાય.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Range
Possible Answers :
8 to 8