

National Testing Agency

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BTECH

Group Number :	1
Group Id :	405036116
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

Mathematics

Section Id :	405036390
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036747
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 40503610756 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a function which satisfies $f(x+y) = f(x) + f(y) \forall x, y \in \mathbb{R}$. If $f(1) = 2$ and

$$g(n) = \sum_{k=1}^{(n-1)} f(k), n \in \mathbb{N} \text{ then the value of}$$

n , for which $g(n) = 20$, is :

Options :

40503639161. 4

40503639162. 5

40503639163. 9

40503639164. 20

Question Number : 51 Question Id : 40503610756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना एक फलन $f: \mathbb{R} \rightarrow \mathbb{R}$, प्रत्येक $x, y \in \mathbb{R}$ के लिए $f(x+y) = f(x) + f(y)$ को संतुष्ट करता है।

यदि $f(1) = 2$ तथा $g(n) = \sum_{k=1}^{(n-1)} f(k), n \in \mathbb{N}$ है,

तो n का वह मान जिसके लिए $g(n) = 20$ है, है :

Options :

40503639161. 4

40503639162. 5

40503639163. 9

40503639164. 20

Question Number : 52 Question Id : 40503610757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f(x)$ be a quadratic polynomial such that $f(-1) + f(2) = 0$. If one of the roots of $f(x) = 0$ is 3, then its other root lies in :

Options :

40503639165. $(-3, -1)$

40503639166. $(-1, 0)$

40503639167. $(0, 1)$

40503639168. $(1, 3)$

Question Number : 52 Question Id : 40503610757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f(x)$ एक द्विघात बहुपद है जिसके लिए $f(-1) + f(2) = 0$ है। यदि $f(x) = 0$ का एक मूल 3 है, तो दूसरा मूल निम्न में से किस अन्तराल में स्थित है?

Options :

40503639165. $(-3, -1)$

40503639166. $(-1, 0)$

40503639167. $(0, 1)$

40503639168. $(1, 3)$

Question Number : 53 Question Id : 40503610758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The imaginary part of

$(3 + 2\sqrt{-54})^{1/2} - (3 - 2\sqrt{-54})^{1/2}$ can be :

Options :

40503639169. 6

40503639170. $\sqrt{6}$

40503639171. $-2\sqrt{6}$

40503639172. $-\sqrt{6}$

Question Number : 53 Question Id : 40503610758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$(3 + 2\sqrt{-54})^{1/2} - (3 - 2\sqrt{-54})^{1/2}$ का

काल्पनिक भाग हो सकता है :

Options :

40503639169. 6

40503639170. $\sqrt{6}$

40503639171. $-2\sqrt{6}$

40503639172. $-\sqrt{6}$

Question Number : 54 Question Id : 40503610759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $a, b, c \in \mathbb{R}$ be all non-zero and satisfy $a^3 + b^3 + c^3 = 2$. If the matrix

$$A = \begin{pmatrix} a & b & c \\ b & c & a \\ c & a & b \end{pmatrix}$$

satisfies $A^T A = I$, then a value of abc can be :

Options :

40503639173. $-\frac{1}{3}$

40503639174. $\frac{1}{3}$

40503639175. $\frac{2}{3}$

40503639176. 3

Question Number : 54 Question Id : 40503610759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $a, b, c \in \mathbb{R}$ तथा सभी अशून्य हैं और $a^3 + b^3 + c^3 = 2$ को संतुष्ट करते हैं। यदि आव्यूह

$$A = \begin{pmatrix} a & b & c \\ b & c & a \\ c & a & b \end{pmatrix} \text{ के लिए } A^T A = I \text{ है, तो } abc \text{ का}$$

एक मान हो सकता है :

Options :

40503639173. $-\frac{1}{3}$

40503639174. $\frac{1}{3}$

40503639175. $\frac{2}{3}$

40503639176. 3

Question Number : 55 Question Id : 40503610760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $A = \{X = (x, y, z)^T : PX = 0 \text{ and}$

$$x^2 + y^2 + z^2 = 1\}, \text{ where } P = \begin{bmatrix} 1 & 2 & 1 \\ -2 & 3 & -4 \\ 1 & 9 & -1 \end{bmatrix},$$

then the set A :

Options :

40503639177. is an empty set.

40503639178. is a singleton.

40503639179. contains exactly two elements.

40503639180. contains more than two elements.

Question Number : 55 Question Id : 40503610760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $A = \{X = (x, y, z)^T : PX = 0 \text{ तथा}$

$$x^2 + y^2 + z^2 = 1\} \text{ जबकि } P = \begin{bmatrix} 1 & 2 & 1 \\ -2 & 3 & -4 \\ 1 & 9 & -1 \end{bmatrix} \text{ है,}$$

तो A :

Options :

40503639177. एक रिक्त समुच्चय है।

40503639178. एक ही अवयव वाला समुच्चय है।

40503639179. में मात्र दो अवयव हैं।

40503639180. में दो से अधिक अवयव हैं।

Question Number : 56 Question Id : 40503610761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $n > 2$ be an integer. Suppose that there are n Metro stations in a city located along a circular path. Each pair of stations is connected by a straight track only. Further, each pair of nearest stations is connected by blue line, whereas all remaining pairs of stations are connected by red line. If the number of red lines is 99 times the number of blue lines, then the value of n is :

Options :

40503639181. 201

40503639182. 200

40503639183. 101

40503639184. 199

Question Number : 56 Question Id : 40503610761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $n > 2$ एक पूर्णांक है तथा एक शहर में n मेट्रो स्टेशन हैं जो एक वृत्ताकार पथ पर स्थित हैं। प्रत्येक दो स्टेशन एक सीधे ट्रैक (Track) से जोड़े गए हैं। इसके अतिरिक्त, प्रत्येक दो निकटतम स्टेशन ब्लू लाइन (Blue Line) से तथा अन्य सभी दो स्टेशन रेड लाइन (Red Line) से जोड़े गए हैं। यदि रेड लाइन्स की संख्या ब्लू लाइन्स की संख्या का 99 गुणा है, तो n का मान है :

Options :

40503639181. 201

40503639182. 200

40503639183. 101

40503639184. 199

Question Number : 57 Question Id : 40503610762 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the sum of first 11 terms of an A.P., $a_1, a_2, a_3, \dots$ is 0 ($a_1 \neq 0$), then the sum of the A.P., $a_1, a_3, a_5, \dots, a_{23}$ is ka_1 , where k is equal to :

Options :

40503639185. $\frac{121}{10}$

40503639186. $\frac{72}{5}$

40503639187. $-\frac{121}{10}$

40503639188. $-\frac{72}{5}$

Question Number : 57 Question Id : 40503610762 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि A.P., $a_1, a_2, a_3, \dots$ के प्रथम 11 पदों का योगफल 0 ($a_1 \neq 0$) है और A.P., $a_1, a_3, a_5, \dots, a_{23}$ का योगफल ka_1 है, तो k बराबर है :

Options :

40503639185. $\frac{121}{10}$

40503639186. $\frac{72}{5}$

40503639187. $-\frac{121}{10}$

40503639188. $-\frac{72}{5}$

Question Number : 58 Question Id : 40503610763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let S be the sum of the first 9 terms of the series :

$$\{x + ka\} + \{x^2 + (k + 2)a\} + \{x^3 + (k + 4)a\} + \{x^4 + (k + 6)a\} + \dots \text{ where } a \neq 0 \text{ and}$$

$$x \neq 1. \text{ If } S = \frac{x^{10} - x + 45a(x-1)}{x - 1}, \text{ then } k$$

is equal to :

Options :

40503639189. -3

40503639190. -5

40503639191. 1

40503639192. 3

Question Number : 58 Question Id : 40503610763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना श्रेणी

$$\{x + ka\} + \{x^2 + (k + 2)a\} + \{x^3 + (k + 4)a\} + \{x^4 + (k + 6)a\} + \dots \text{ के प्रथम 9 पदों का योगफल}$$

S के बराबर है, जबकि $a \neq 0$ तथा $x \neq 1$ है। यदि

$$S = \frac{x^{10} - x + 45a(x-1)}{x - 1} \text{ है, तो } k \text{ बराबर है :}$$

Options :

40503639189. -3

40503639190. -5

40503639191. 1

40503639192. 3

Question Number : 59 Question Id : 40503610764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow 0} \left(\tan \left(\frac{\pi}{4} + x \right) \right)^{1/x}$ is equal to :

Options :

40503639193. 1

40503639194. 2

40503639195. e

40503639196. e^2

Question Number : 59 Question Id : 40503610764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow 0} \left(\tan \left(\frac{\pi}{4} + x \right) \right)^{1/x}$ बराबर है :

Options :

40503639193. 1

40503639194. 2

40503639195. e

40503639196. e^2

**Question Number : 60 Question Id : 40503610765 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical**

Correct Marks : 4 Wrong Marks : 1

The equation of the normal to the curve

$y = (1+x)^{2y} + \cos^2(\sin^{-1}x)$ at $x=0$ is :

Options :

40503639197. $x + 4y = 8$

40503639198. $y = 4x + 2$

40503639199. $y + 4x = 2$

40503639200. $2y + x = 4$

**Question Number : 60 Question Id : 40503610765 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical**

Correct Marks : 4 Wrong Marks : 1

$x=0$ पर, वक्र $y = (1+x)^{2y} + \cos^2(\sin^{-1}x)$ पर
खींचे गए अभिलम्ब का समीकरण है :

Options :

40503639197. $x + 4y = 8$

40503639198. $y = 4x + 2$

40503639199. $y + 4x = 2$

40503639200. $2y + x = 4$

**Question Number : 61 Question Id : 40503610766 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical**

Correct Marks : 4 Wrong Marks : 1

Let $f: (-1, \infty) \rightarrow \mathbb{R}$ be defined by $f(0) = 1$

and $f(x) = \frac{1}{x} \log_e (1+x), x \neq 0$. Then the

function f :

Options :

40503639201. decreases in $(-1, 0)$ and increases in $(0, \infty)$.

40503639202. increases in $(-1, 0)$ and decreases in $(0, \infty)$.

40503639203. increases in $(-1, \infty)$.

40503639204. decreases in $(-1, \infty)$.

Question Number : 61 Question Id : 40503610766 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $f: (-1, \infty) \rightarrow \mathbb{R}, f(0) = 1$ तथा

$f(x) = \frac{1}{x} \log_e (1+x), x \neq 0$ द्वारा परिभाषित है,

तो फलन f :

Options :

40503639201. $(-1, 0)$ में ह्रासमान है तथा $(0, \infty)$ में वर्धमान है।

40503639202. $(-1, 0)$ में वर्धमान है तथा $(0, \infty)$ में ह्रासमान है।

40503639203. $(-1, \infty)$ में वर्धमान है।

40503639204. $(-1, \infty)$ में ह्रासमान है।

Question Number : 62 Question Id : 40503610767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider a region $R = \{(x, y) \in \mathbb{R}^2 : x^2 \leq y \leq 2x\}$. If a line $y = \alpha$ divides the area of region R into two equal parts, then which of the following is true ?

Options :

40503639205. $3\alpha^2 - 8\alpha + 8 = 0$

40503639206. $\alpha^3 - 6\alpha^2 + 16 = 0$

40503639207. $3\alpha^2 - 8\alpha^{3/2} + 8 = 0$

40503639208. $\alpha^3 - 6\alpha^{3/2} - 16 = 0$

Question Number : 62 Question Id : 40503610767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक क्षेत्र $R = \{(x, y) \in \mathbb{R}^2 : x^2 \leq y \leq 2x\}$ पर विचार कीजिए। यदि एक सरल रेखा $y = \alpha$, क्षेत्र R के क्षेत्रफल को दो बराबर भागों में बांटती है, तो निम्न में से कौन-सा सत्य है ?

Options :

40503639205. $3\alpha^2 - 8\alpha + 8 = 0$

40503639206. $\alpha^3 - 6\alpha^2 + 16 = 0$

40503639207. $3\alpha^2 - 8\alpha^{3/2} + 8 = 0$

40503639208. $\alpha^3 - 6\alpha^{3/2} - 16 = 0$

Question Number : 63 Question Id : 40503610768 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a curve $y=f(x)$, passing through the point $(1, 2)$, is the solution of the differential equation, $2x^2dy=(2xy+y^2)dx$, then $f\left(\frac{1}{2}\right)$ is equal to :

Options :

40503639209. $\frac{1}{1+\log_e 2}$

40503639210. $\frac{1}{1-\log_e 2}$

40503639211. $1+\log_e 2$

40503639212. $\frac{-1}{1+\log_e 2}$

Question Number : 63 Question Id : 40503610768 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि एक वक्र, $y=f(x)$, बिन्दु $(1, 2)$ से होकर जाता है तथा अवकल समीकरण $2x^2dy=(2xy+y^2)dx$, का हल है, तो $f\left(\frac{1}{2}\right)$ बराबर है :

Options :

40503639209. $\frac{1}{1+\log_e 2}$

40503639210. $\frac{1}{1-\log_e 2}$

40503639211. $1+\log_e 2$

40503639212. $\frac{-1}{1+\log_e 2}$

Question Number : 64 Question Id : 40503610769 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The set of all possible values of θ in the interval $(0, \pi)$ for which the points $(1, 2)$ and $(\sin\theta, \cos\theta)$ lie on the same side of the line $x + y = 1$ is :

Options :

40503639213. $\left(0, \frac{3\pi}{4}\right)$

40503639214. $\left(0, \frac{\pi}{4}\right)$

40503639215. $\left(\frac{\pi}{4}, \frac{3\pi}{4}\right)$

40503639216. $\left(0, \frac{\pi}{2}\right)$

Question Number : 64 Question Id : 40503610769 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अन्तराल $(0, \pi)$ में θ के सभी संभावित मूल्यों का समुच्चय, जिसके लिए दोनों बिन्दु, $(1, 2)$ तथा $(\sin\theta, \cos\theta)$, सरल रेखा $x + y = 1$ के एक ही तरफ स्थित हैं, है :

Options :

40503639213. $\left(0, \frac{3\pi}{4}\right)$

40503639214. $\left(0, \frac{\pi}{4}\right)$

40503639215. $\left(\frac{\pi}{4}, \frac{3\pi}{4}\right)$

40503639216. $\left(0, \frac{\pi}{2}\right)$

Question Number : 65 Question Id : 40503610770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The area (in sq. units) of an equilateral triangle inscribed in the parabola $y^2 = 8x$, with one of its vertices on the vertex of this parabola, is :

Options :

40503639217. $64\sqrt{3}$

40503639218. $128\sqrt{3}$

40503639219. $192\sqrt{3}$

40503639220. $256\sqrt{3}$

Question Number : 65 Question Id : 40503610770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समबाहु त्रिभुज, जिसका एक शीर्ष, परवलय, $y^2 = 8x$ के शीर्ष पर है, परवलय के अंतर्गत खींचा गया है। तो त्रिभुज का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

40503639217. $64\sqrt{3}$

40503639218. $128\sqrt{3}$

40503639219. $192\sqrt{3}$

40503639220. $256\sqrt{3}$

Question Number : 66 Question Id : 40503610771 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

For some $\theta \in \left(0, \frac{\pi}{2}\right)$, if the eccentricity of the hyperbola, $x^2 - y^2 \sec^2 \theta = 10$ is $\sqrt{5}$ times the eccentricity of the ellipse, $x^2 \sec^2 \theta + y^2 = 5$, then the length of the latus rectum of the ellipse, is :

Options :

40503639221. $2\sqrt{6}$

40503639222. $\sqrt{30}$

40503639223. $\frac{4\sqrt{5}}{3}$

40503639224. $\frac{2\sqrt{5}}{3}$

Question Number : 66 Question Id : 40503610771 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 4 Wrong Marks : 1

किसी $\theta \in \left(0, \frac{\pi}{2}\right)$ के लिए, यदि अतिपरवलय, $x^2 - y^2 \sec^2 \theta = 10$ की उत्केन्द्रता, दीर्घवृत्त, $x^2 \sec^2 \theta + y^2 = 5$ की उत्केन्द्रता का $\sqrt{5}$ गुणा है, तो दीर्घवृत्त की नाभिलम्ब जीवा की लम्बाई बराबर है :

Options :

40503639221. $2\sqrt{6}$

40503639222. $\sqrt{30}$

40503639223. $\frac{4\sqrt{5}}{3}$

40503639224. $\frac{2\sqrt{5}}{3}$

**Question Number : 67 Question Id : 40503610772 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical**

Correct Marks : 4 Wrong Marks : 1

A plane passing through the point $(3, 1, 1)$ contains two lines whose direction ratios are $1, -2, 2$ and $2, 3, -1$ respectively. If this plane also passes through the point $(\alpha, -3, 5)$, then α is equal to :

Options :

40503639225. 10

40503639226. -5

40503639227. 5

40503639228. -10

**Question Number : 67 Question Id : 40503610772 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical**

Correct Marks : 4 Wrong Marks : 1

बिन्दु $(3, 1, 1)$ से होकर जाने वाले समतल में दो सरल रेखाएँ स्थित हैं जिनके दिक् अनुपात (direction ratios) क्रमशः $1, -2, 2$ तथा $2, 3, -1$ हैं। यदि यह समतल बिन्दु $(\alpha, -3, 5)$ से भी होकर जाता है, तो α बराबर है :

Options :

40503639225. 10

40503639226. -5

40503639227. 5

40503639228. -10

Question Number : 68 Question Id : 40503610773 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let E^C denote the complement of an event E . Let E_1, E_2 and E_3 be any pairwise independent events with $P(E_1) > 0$ and $P(E_1 \cap E_2 \cap E_3) = 0$. Then

$P(E_2^C \cap E_3^C / E_1)$ is equal to :

Options :

40503639229. $P(E_2^C) + P(E_3)$

40503639230. $P(E_3^C) - P(E_2^C)$

40503639231. $P(E_3^C) - P(E_2)$

40503639232. $P(E_3) - P(E_2^C)$

Question Number : 68 Question Id : 40503610773 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना E^C घटना E का पूरक है। यदि कोई तीन घटनाएँ E_1, E_2 तथा E_3 युग्मों में स्वतंत्र हैं, तथा $P(E_1) > 0$ और $P(E_1 \cap E_2 \cap E_3) = 0$, तो $P(E_2^C \cap E_3^C / E_1)$ बराबर है :

Options :

40503639229. $P(E_2^C) + P(E_3)$

40503639230. $P(E_3^C) - P(E_2^C)$

40503639231. $P(E_3^C) - P(E_2)$

40503639232. $P(E_3) - P(E_2^C)$

Question Number : 69 Question Id : 40503610774 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the equation $\cos^4\theta + \sin^4\theta + \lambda = 0$ has real solutions for θ , then λ lies in the interval :

Options :

40503639233. $\left(-\frac{1}{2}, -\frac{1}{4}\right]$

40503639234. $\left[-1, -\frac{1}{2}\right]$

40503639235. $\left(-\frac{5}{4}, -1\right)$

40503639236. $\left[-\frac{3}{2}, -\frac{5}{4}\right]$

Question Number : 69 Question Id : 40503610774 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि समीकरण $\cos^4\theta + \sin^4\theta + \lambda = 0$ के θ में वास्तविक हल हैं, तो λ निम्न में से किस अन्तराल में स्थित है?

Options :

40503639233. $\left(-\frac{1}{2}, -\frac{1}{4}\right]$

40503639234. $\left[-1, -\frac{1}{2}\right]$

40503639235. $\left(-\frac{5}{4}, -1\right)$

40503639236. $\left[-\frac{3}{2}, -\frac{5}{4}\right]$

Question Number : 70 Question Id : 40503610775 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following is a tautology ?

Options :

40503639237. $(p \rightarrow q) \wedge (q \rightarrow p)$

40503639238. $(\sim p) \wedge (p \vee q) \rightarrow q$

40503639239. $(\sim q) \vee (p \wedge q) \rightarrow q$

40503639240. $(q \rightarrow p) \vee \sim (p \rightarrow q)$

Question Number : 70 Question Id : 40503610775 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन सा कथन पुनरुक्ति है?

Options :

40503639237. $(p \rightarrow q) \wedge (q \rightarrow p)$

40503639238. $(\sim p) \wedge (p \vee q) \rightarrow q$

40503639239. $(\sim q) \vee (p \wedge q) \rightarrow q$

40503639240. $(q \rightarrow p) \vee \sim (p \rightarrow q)$

Sub-Section Number :

2

Sub-Section Id :

405036748

Question Shuffling Allowed :

Yes

Question Number : 71 Question Id : 40503610776 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

For a positive integer n , $\left(1 + \frac{1}{x}\right)^n$ is

expanded in increasing powers of x . If three consecutive coefficients in this expansion are in the ratio, 2 : 5 : 12, then n is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 71 Question Id : 40503610776 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

एक धन पूर्णांक n के लिए, $\left(1 + \frac{1}{x}\right)^n$ को x की

बढ़ती घातों में प्रसारित किया गया है। यदि इस प्रसार में तीन क्रमागत गुणांकों का अनुपात, $2:5:12$ है, तो n बराबर है _____।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 72 **Question Id :** 40503610777 **Question Type :** SA **Display Question Number :** Yes

Correct Marks : 4 **Wrong Marks :** 0

If $y = \sum_{k=1}^6 k \cos^{-1} \left\{ \frac{3}{5} \cos kx - \frac{4}{5} \sin kx \right\},$

then $\frac{dy}{dx}$ at $x=0$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 72 **Question Id :** 40503610777 **Question Type :** SA **Display Question Number :** Yes

Correct Marks : 4 **Wrong Marks :** 0

यदि $y = \sum_{k=1}^6 k \cos^{-1} \left\{ \frac{3}{5} \cos kx - \frac{4}{5} \sin kx \right\},$

तो $x=0$ पर $\frac{dy}{dx}$ का मान है _____।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 73 Question Id : 40503610778 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

Let the position vectors of points 'A' and 'B' be $\hat{i} + \hat{j} + \hat{k}$ and $2\hat{i} + \hat{j} + 3\hat{k}$, respectively. A point 'P' divides the line segment AB internally in the ratio $\lambda : 1$ ($\lambda > 0$). If O is the origin and $\vec{OB} \cdot \vec{OP} - 3 |\vec{OA} \times \vec{OP}|^2 = 6$, then λ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 73 Question Id : 40503610778 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

माना बिन्दुओं 'A' तथा 'B' के स्थिति सदिश क्रमशः $\hat{i} + \hat{j} + \hat{k}$ तथा $2\hat{i} + \hat{j} + 3\hat{k}$ हैं। एक बिन्दु P, रेखा खंड AB को अन्तः अनुपात $\lambda : 1$ ($\lambda > 0$) में विभाजित करता है। यदि O मूल बिन्दु है तथा $\vec{OB} \cdot \vec{OP} - 3 |\vec{OA} \times \vec{OP}|^2 = 6$ है, तो λ बराबर है _____।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 74 Question Id : 40503610779 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

Let $[t]$ denote the greatest integer less than or equal to t . Then the value of

$$\int_1^2 |2x - [3x]| dx \text{ is } \underline{\hspace{2cm}}.$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 74 Question Id : 40503610779 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

यदि $[t]$ महत्तम पूर्णांक $\leq t$ है, तो

$$\int_1^2 |2x - [3x]| dx \text{ का मान बराबर है}$$

$\underline{\hspace{2cm}}.$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 75 Question Id : 40503610780 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

If the variance of the terms in an increasing A.P., $b_1, b_2, b_3, \dots, b_{11}$ is 90, then the common difference of this A.P. is

$\underline{\hspace{2cm}}.$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 75 Question Id : 40503610780 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

यदि $b_1, b_2, b_3, \dots, b_{11}$ एक वर्धमान A.P. है और
इसके पदों का प्रसरण 90 है, तो इस A.P. का सार्व
अन्तर है _____ ।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002