

National Testing Agency

Question Paper Name :	BTECH E 6th Sep 2020 Shift 1
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BTECH

Group Number :	1
Group Id :	405036126
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 :	405036420
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 :	405036807
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 40503611506 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 region represented by $\{z = x + iy \in \mathbb{C} : |z| - \operatorname{Re}(z) \leq 1\}$ is also given by the inequality :

Options :

40503641711. $y^2 \leq x + \frac{1}{2}$

40503641712. $y^2 \leq 2\left(x + \frac{1}{2}\right)$

40503641713. $y^2 \geq x + 1$

40503641714. $y^2 \geq 2(x + 1)$

Question Number : 51 Question Id : 40503611506 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

$\{z = x + iy \in \mathbb{C} : |z| - \operatorname{Re}(z) \leq 1\}$ द्वारा निरूपित क्षेत्र
निम्न में से किस असमता द्वारा भी दिया जाता है?

Options :

40503641711. $y^2 \leq x + \frac{1}{2}$

40503641712. $y^2 \leq 2\left(x + \frac{1}{2}\right)$

40503641713. $y^2 \geq x + 1$

40503641714. $y^2 \geq 2(x + 1)$

Question Number : 52 Question Id : 40503611507 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 α and β be two roots of the equation $x^2 - 64x + 256 = 0$. Then the value of

$\left(\frac{\alpha^3}{\beta^5}\right)^{1/8} + \left(\frac{\beta^3}{\alpha^5}\right)^{1/8}$ is :

Options :

40503641715. 1

40503641716. 4

40503641717. 2

40503641718. 3

Question Number : 52 Question Id : 40503611507 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 α तथा β , समीकरण $x^2 - 64x + 256 = 0$ के

दो मूल हैं, तो $\left(\frac{\alpha^3}{\beta^5}\right)^{1/8} + \left(\frac{\beta^3}{\alpha^5}\right)^{1/8}$ का मान है :

Options :

40503641715. 1

40503641716. 4

40503641717. 2

40503641718. 3

Question Number : 53 Question Id : 40503611508 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 values of λ and μ for which the system of linear equations

$$x + y + z = 2$$

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

$$x + 3y + \lambda z = \mu$$

has infinitely many solutions are, respectively :

Options :

40503641719. 5 and 8

40503641720. 4 and 9

40503641721. 6 and 8

40503641722. 5 and 7

Question Number : 53 Question Id : 40503611508 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

λ तथा μ के क्रमशः मान, जिनके लिए समीकरण निकाय

$$x + y + z = 2$$

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

$$x + 3y + \lambda z = \mu$$

के असंख्य हल हैं, हैं :

Options :

40503641719. 5 तथा 8

40503641720. 4 तथा 9

40503641721. 6 तथा 8

40503641722. 5 तथा 7

Question Number : 54 Question Id : 40503611509 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 m and M be respectively the minimum and maximum values of

$$\begin{vmatrix} \cos^2 x & 1 + \sin^2 x & \sin 2x \\ 1 + \cos^2 x & \sin^2 x & \sin 2x \\ \cos^2 x & \sin^2 x & 1 + \sin 2x \end{vmatrix}.$$

Then the ordered pair (m, M) is equal to :

Options :

40503641723. $(-3, -1)$

40503641724. $(-3, 3)$

40503641725. $(-4, -1)$

40503641726. $(1, 3)$

Question Number : 54 Question Id : 40503611509 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 m तथा M

$$\begin{vmatrix} \cos^2 x & 1 + \sin^2 x & \sin 2x \\ 1 + \cos^2 x & \sin^2 x & \sin 2x \\ \cos^2 x & \sin^2 x & 1 + \sin 2x \end{vmatrix} \text{ के, क्रमशः}$$

न्यूनतम तथा अधिकतम मान हैं, तो क्रमित युग्म (m, M) बराबर है :

Options :

40503641723. $(-3, -1)$

40503641724. $(-3, 3)$

40503641725. $(-4, -1)$

40503641726. $(1, 3)$

Question Number : 55 Question Id : 40503611510 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

Two families with three members each and one family with four members are to be seated in a row. In how many ways can they be seated so that the same family members are not separated ?

Options :

40503641727. $(3!)^3 \cdot (4!)$

40503641728. $(3!)^2 \cdot (4!)$

40503641729. $3! (4!)^3$

40503641730. $2! 3! 4!$

Question Number : 55 Question Id : 40503611510 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

तीन तीन सदस्यों वाले दो परिवारों तथा चार सदस्यों वाले एक परिवार के सदस्यों को एक पंक्ति में बिठाना है। उन्हें कितने तरीकों से बिठाया जा सकता है जबकि एक ही परिवार के सदस्य अलग न हों ?

Options :

40503641727. $(3!)^3 \cdot (4!)$

40503641728. $(3!)^2 \cdot (4!)$

40503641729. $3! (4!)^3$

40503641730. $2! 3! 4!$

Question Number : 56 Question Id : 40503611511 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 $\{p\}$ denotes the fractional part of the

number p , then $\left\{ \frac{3^{200}}{8} \right\}$, is equal to :

Options :

40503641731. $\frac{3}{8}$

40503641732. $\frac{1}{8}$

40503641733. $\frac{5}{8}$

40503641734. $\frac{7}{8}$

Question Number : 56 Question Id : 40503611511 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 $\{p\}$, संख्या p के भिन्नात्मक भाग (fractional part) को दर्शाता है, तो $\left\{\frac{3^{200}}{8}\right\}$, बराबर है :

Options :

40503641731. $\frac{3}{8}$

40503641732. $\frac{1}{8}$

40503641733. $\frac{5}{8}$

40503641734. $\frac{7}{8}$

Question Number : 57 Question Id : 40503611512 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, d and p be any non zero distinct real numbers such that $(a^2 + b^2 + c^2)p^2 - 2(ab + bc + cd)p + (b^2 + c^2 + d^2) = 0$. Then :

Options :

40503641735. a, b, c, d are in A.P.

40503641736. a, c, p are in G.P.

40503641737. a, b, c, d are in G.P.

40503641738. a, c, p are in A.P.

Question Number : 57 Question Id : 40503611512 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, b, c, d तथा p कोई भी भिन्न अशून्य वास्तविक संख्याएँ हैं, कि
 $(a^2 + b^2 + c^2)p^2 - 2(ab + bc + cd)p + (b^2 + c^2 + d^2) = 0$, है, तो :

Options :

40503641735. a, b, c, d समांतर श्रेढ़ी में हैं।

40503641736. a, c, p गुणोत्तर श्रेढ़ी में हैं।

40503641737. a, b, c, d गुणोत्तर श्रेढ़ी में हैं।

40503641738. a, c, p समांतर श्रेढ़ी में हैं।

Question Number : 58 Question Id : 40503611513 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 $f(x+y) = f(x)f(y)$ and $\sum_{x=1}^{\infty} f(x) = 2$, $x,$

$y \in \mathbb{N}$, where $\mathbb{N}$ is the set of all natural

numbers, then the value of $\frac{f(4)}{f(2)}$ is :

Options :

40503641739. $\frac{2}{3}$

40503641740. $\frac{1}{3}$

40503641741. $\frac{1}{9}$

40503641742. $\frac{4}{9}$

Question Number : 58 Question Id : 40503611513 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 $f(x+y) = f(x)f(y)$ तथा $\sum_{x=1}^{\infty} f(x) = 2$, $x,$

$y \in \mathbb{N}$ हैं, जहाँ $\mathbb{N}$, सभी प्राकृत संख्याओं का समुच्चय

है, तो $\frac{f(4)}{f(2)}$ का मान है :

Options :

40503641739. $\frac{2}{3}$

40503641740. $\frac{1}{3}$

40503641741. $\frac{1}{9}$

40503641742. $\frac{4}{9}$

Question Number : 59 Question Id : 40503611514 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

$$\lim_{x \rightarrow 1} \left(\frac{\int_0^{(x-1)^2} t \cos(t^2) dt}{(x-1) \sin(x-1)} \right)$$

Options :

40503641743. does not exist

40503641744. is equal to 1

40503641745. is equal to $\frac{1}{2}$

40503641746. is equal to $-\frac{1}{2}$

Question Number : 59 Question Id : 40503611514 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

$$\lim_{x \rightarrow 1} \left(\frac{\int_0^{(x-1)^2} t \cos(t^2) dt}{(x-1) \sin(x-1)} \right)$$

Options :

40503641743. का अस्तित्व नहीं है।

40503641744. 1 के बराबर है।

40503641745. $\frac{1}{2}$ के बराबर है।

40503641746. $-\frac{1}{2}$ के बराबर है।

Question Number : 60 Question Id : 40503611515 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 position of a moving car at time t is given by $f(t) = at^2 + bt + c$, $t > 0$, where a , b and c are real numbers greater than 1. Then the average speed of the car over the time interval $[t_1, t_2]$ is attained at the point :

Options :

40503641747. $2a(t_1 + t_2) + b$

40503641748. $(t_1 + t_2)/2$

40503641749. $(t_2 - t_1)/2$

40503641750. $a(t_2 - t_1) + b$

Question Number : 60 Question Id : 40503611515 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 गतिशील कार की t समय पर स्थिति (position)
 $f(t) = at^2 + bt + c$, $t > 0$ द्वारा दी गई है, जहाँ $a > 1$,
 $b > 1$ तथा $c > 1$ वास्तविक संख्याएँ हैं, तो समय
 अंतराल $[t_1, t_2]$ में कार की औसत गति निम्न में से
 किस बिन्दु पर प्राप्त होती है?

Options :

40503641747. $2a(t_1 + t_2) + b$

40503641748. $(t_1 + t_2)/2$

40503641749. $(t_2 - t_1)/2$

40503641750. $a(t_2 - t_1) + b$

Question Number : 61 Question Id : 40503611516 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 $I_1 = \int_0^1 (1 - x^{50})^{100} dx$ and

$I_2 = \int_0^1 (1 - x^{50})^{101} dx$ such that $I_2 = \alpha I_1$ then

α equals to :

Options :

40503641751. $\frac{5050}{5051}$

40503641752. $\frac{5051}{5050}$

40503641753. $\frac{5049}{5050}$

40503641754. $\frac{5050}{5049}$

Question Number : 61 Question Id : 40503611516 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 $I_1 = \int_0^1 (1-x^{50})^{100} dx$ तथा

$I_2 = \int_0^1 (1-x^{50})^{101} dx$ हैं जिन के लिए $I_2 = \alpha I_1$

है, तो α बराबर है :

Options :

40503641751. $\frac{5050}{5051}$

40503641752. $\frac{5051}{5050}$

40503641753. $\frac{5049}{5050}$

40503641754. $\frac{5050}{5049}$

Question Number : 62 Question Id : 40503611517 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 the region

$A = \{(x, y) : |x| + |y| \leq 1, 2y^2 \geq |x|\}$ is :

Options :

40503641755. $\frac{5}{6}$

40503641756. $\frac{1}{6}$

40503641757. $\frac{1}{3}$

40503641758. $\frac{7}{6}$

Question Number : 62 Question Id : 40503611517 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

क्षेत्र $A = \{(x, y) : |x| + |y| \leq 1, 2y^2 \geq |x|\}$ का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

40503641755. $\frac{5}{6}$

40503641756. $\frac{1}{6}$

40503641757. $\frac{1}{3}$

40503641758. $\frac{7}{6}$

Question Number : 63 Question Id : 40503611518 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 general solution of the differential

equation $\sqrt{1+x^2+y^2+x^2y^2} + xy \frac{dy}{dx} = 0$ is :

(where C is a constant of integration)

Options :

40503641759. $\sqrt{1+y^2} + \sqrt{1+x^2} = \frac{1}{2} \log_e \left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1} \right) + C$

40503641760.

$$\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$$

40503641761.

$$\sqrt{1+y^2}+\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$$

40503641762.

$$\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1}\right)+C$$

Question Number : 63 Question Id : 40503611518 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

अवकल समीकरण

$$\sqrt{1+x^2+y^2+x^2y^2}+xy\frac{dy}{dx}=0 \text{ का व्यापक}$$

हल है :

(जहाँ C एक समाकलन अचर है)

Options :

40503641759.

$$\sqrt{1+y^2}+\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1}\right)+C$$

40503641760.

$$\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$$

40503641761.

$$\sqrt{1+y^2}+\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}+1}{\sqrt{1+x^2}-1}\right)+C$$

40503641762.

$$\sqrt{1+y^2}-\sqrt{1+x^2}=\frac{1}{2}\log_e\left(\frac{\sqrt{1+x^2}-1}{\sqrt{1+x^2}+1}\right)+C$$

Question Number : 64 Question Id : 40503611519 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 ray of light coming from the point $(2, 2\sqrt{3})$ is incident at an angle 30° on the line $x=1$ at the point A. The ray gets reflected on the line $x=1$ and meets x -axis at the point B. Then, the line AB passes through the point :

Options :

40503641763. $(4, -\sqrt{3})$

40503641764. $\left(4, -\frac{\sqrt{3}}{2}\right)$

40503641765. $\left(3, -\frac{1}{\sqrt{3}}\right)$

40503641766. $(3, -\sqrt{3})$

Question Number : 64 Question Id : 40503611519 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

$(2, 2\sqrt{3})$ से होकर आती हुई प्रकाश की एक किरण रेखा $x=1$ पर 30° के कोण पर बिन्दु A पर आपतित (incident) होती है तथा रेखा $x=1$ से प्रावर्तित हो कर x -अक्ष को बिंदु B पर मिलती है, तो रेखा AB निम्न में से किस बिन्दु से होकर जाती है :

Options :

40503641763. $(4, -\sqrt{3})$

40503641764. $\left(4, -\frac{\sqrt{3}}{2}\right)$

40503641765. $\left(3, -\frac{1}{\sqrt{3}}\right)$

40503641766. $(3, -\sqrt{3})$

Question Number : 65 Question Id : 40503611520 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 points lies on the locus of the foot of perpendicular drawn upon any tangent to the ellipse,

$$\frac{x^2}{4} + \frac{y^2}{2} = 1 \text{ from any of its foci ?}$$

Options :

40503641767. $(-1, \sqrt{3})$

40503641768. $(1, 2)$

40503641769. $(-1, \sqrt{2})$

40503641770. $(-2, \sqrt{3})$

Question Number : 65 Question Id : 40503611520 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 बिंदु, दीर्घवृत्त $\frac{x^2}{4} + \frac{y^2}{2} = 1$ की

किसी भी स्पर्श रेखा पर इसकी किसी एक नाभि से खींचे गए लंब के पाद के बिंदु पथ पर स्थित है?

Options :

40503641767. $(-1, \sqrt{3})$

40503641768. $(1, 2)$

40503641769. $(-1, \sqrt{2})$

40503641770. $(-2, \sqrt{3})$

Question Number : 66 Question Id : 40503611521 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 L_1 be a tangent to the parabola $y^2 = 4(x + 1)$ and L_2 be a tangent to the parabola $y^2 = 8(x + 2)$ such that L_1 and L_2 intersect at right angles. Then L_1 and L_2 meet on the straight line :

Options :

40503641771. $x + 2 = 0$

40503641772. $2x + 1 = 0$

40503641773. $x + 2y = 0$

40503641774. $x + 3 = 0$

Question Number : 66 Question Id : 40503611521 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 L_1 , परवलय $y^2 = 4(x + 1)$ की एक स्पर्श रेखा है, तथा L_2 , परवलय $y^2 = 8(x + 2)$ की एक स्पर्श रेखा है। यदि L_1 तथा L_2 परस्पर लंबवत प्रतिच्छेदन करती हैं, तो वे निम्न में से जिस रेखा पर मिलती हैं, वह है :

Options :

40503641771. $x + 2 = 0$

40503641772. $2x + 1 = 0$

40503641773. $x + 2y = 0$

40503641774. $x + 3 = 0$

Question Number : 67 Question Id : 40503611522 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 shortest distance between the lines

$$\frac{x-1}{0} = \frac{y+1}{-1} = \frac{z}{1} \quad \text{and} \quad x+y+z+1=0,$$

$2x-y+z+3=0$ is :

Options :

40503641775. 1

40503641776. $\frac{1}{\sqrt{2}}$

40503641777. $\frac{1}{\sqrt{3}}$

40503641778. $\frac{1}{2}$

Question Number : 67 Question Id : 40503611522 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

रेखाओं $\frac{x-1}{0} = \frac{y+1}{-1} = \frac{z}{1}$ तथा $x+y+z+1=0$,

$2x-y+z+3=0$ के बीच की न्यूनतम दूरी है :

Options :

40503641775. 1

40503641776. $\frac{1}{\sqrt{2}}$

40503641777. $\frac{1}{\sqrt{3}}$

40503641778. $\frac{1}{2}$

Question Number : 68 Question Id : 40503611523 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 $\sum_{i=1}^n (x_i - a) = n$ and $\sum_{i=1}^n (x_i - a)^2 = na$,

($n, a > 1$) then the standard deviation of n observations $x_1, x_2, \dots, x_n$ is :

Options :

40503641779. $\sqrt{n(a-1)}$

40503641780. $a-1$

40503641781. $\sqrt{a-1}$

40503641782. $n\sqrt{a-1}$

Question Number : 68 Question Id : 40503611523 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 $\sum_{i=1}^n (x_i - a) = n$ तथा $\sum_{i=1}^n (x_i - a)^2 = na$,

($n, a > 1$) हैं, तो n प्रेक्षणों $x_1, x_2, \dots, x_n$ का मानक विचलन है :

Options :

40503641779. $\sqrt{n(a-1)}$

40503641780. $a-1$

40503641781. $\sqrt{a-1}$

40503641782. $n\sqrt{a-1}$

Question Number : 69 Question Id : 40503611524 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

Out of 11 consecutive natural numbers if three numbers are selected at random (without repetition), then the probability that they are in A.P. with positive common difference, is :

Options :

40503641783. $\frac{15}{101}$

40503641784. $\frac{5}{33}$

40503641785. $\frac{5}{101}$

40503641786. $\frac{10}{99}$

Question Number : 69 Question Id : 40503611524 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

11 क्रमागत प्राकृत संख्याओं में से यदि तीन संख्याएँ यादृच्छया बिना प्रतिस्थापना के निकाली जाती हैं तो इन तीन संख्याओं के समांतर श्रेणी, जिनका सार्वअन्तर धनात्मक है, में होने की प्रायिकता है :

Options :

40503641783. $\frac{15}{101}$

40503641784. $\frac{5}{33}$

40503641785. $\frac{5}{101}$

40503641786. $\frac{10}{99}$

Question Number : 70 Question Id : 40503611525 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 negation of the Boolean expression

$p \vee (\sim p \wedge q)$ is equivalent to :

Options :

40503641787. $\sim p \wedge \sim q$

40503641788. $\sim p \vee \sim q$

40503641789. $p \wedge \sim q$

40503641790. $\sim p \vee q$

Question Number : 70 Question Id : 40503611525 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

बूले के व्यंजक (Boolean expression)

$p \vee (\sim p \wedge q)$ का निषेधन (Negation) निम्न में से
किसके तुल्य है?

Options :

40503641787. $\sim p \wedge \sim q$

40503641788. $\sim p \vee \sim q$

40503641789. $p \wedge \sim q$

40503641790. $\sim p \vee q$

Sub-Section Number : 2
Sub-Section Id : 405036808
Question Shuffling Allowed : Yes

Question Number : 71 Question Id : 40503611526 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

Set A has m elements and Set B has n elements. If the total number of subsets of A is 112 more than the total number of subsets of B, then the value of $m \cdot n$ 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 : 71 Question Id : 40503611526 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

समुच्चय A में m अवयव हैं तथा समुच्चय B में n अवयव हैं। यदि A के सभी उपसमुच्चयों की संख्या, B के सभी उपसमुच्चयों की संख्या से 112 अधिक है, तो $m \cdot n$ 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 : 72 Question Id : 40503611527 Question Type : SA Display Question Number : Yes
Correct Marks : 4 Wrong Marks : 0

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined as

$$f(x) = \begin{cases} x^5 \sin\left(\frac{1}{x}\right) + 5x^2, & x < 0 \\ 0, & x = 0 \\ x^5 \cos\left(\frac{1}{x}\right) + \lambda x^2, & x > 0 \end{cases}$$

The value of λ for which $f''(0)$ exists, 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 :** 40503611527 **Question Type :** SA **Display Question Number :** Yes

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

माना $f: \mathbb{R} \rightarrow \mathbb{R}$,

$$f(x) = \begin{cases} x^5 \sin\left(\frac{1}{x}\right) + 5x^2, & x < 0 \\ 0, & x = 0 \\ x^5 \cos\left(\frac{1}{x}\right) + \lambda x^2, & x > 0 \end{cases}$$

द्वारा परिभाषित है। λ का मान जिसके लिए $f''(0)$ का अस्तित्व है, 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 :** 40503611528 **Question Type :** SA **Display Question Number :** Yes

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

Let AD and BC be two vertical poles at A and B respectively on a horizontal ground. If $AD=8$ m, $BC=11$ m and $AB=10$ m; then the distance (in meters) of a point M on AB from the point A such that $MD^2 + MC^2$ is minimum 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 : 73 **Question Id :** 40503611528 **Question Type :** SA Display **Question Number :** Yes

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

माना AD तथा BC, क्षैतिज समतल भूमि पर क्रमशः A तथा B पर सीधे खड़े दो खम्भे हैं। यदि $AD=8$ मी., $BC=11$ मी. तथा $AB=10$ मी. है, तो AB पर स्थित एक बिंदु M की, बिंदु A से वह दूरी (मीटरों में) जिसके लिए $MD^2 + MC^2$ का मान न्यूनतम है, 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 :** 40503611529 **Question Type :** SA Display **Question Number :** Yes

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

If $\vec{a}$ and $\vec{b}$ are unit vectors, then the greatest value of $\sqrt{3}|\vec{a} + \vec{b}| + |\vec{a} - \vec{b}|$ 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 : 74 Question Id : 40503611529 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

यदि $\vec{a}$ तथा $\vec{b}$ एकक सदिश हैं, तो
 $\sqrt{3}|\vec{a} + \vec{b}| + |\vec{a} - \vec{b}|$ का अधिकतम 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 : 75 Question Id : 40503611530 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

The angle of elevation of the top of a hill from a point on the horizontal plane passing through the foot of the hill is found to be 45° . After walking a distance of 80 meters towards the top, up a slope inclined at an angle of 30° to the horizontal plane, the angle of elevation of the top of the hill becomes 75° . Then the height of the hill (in meters) 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 : 75 Question Id : 40503611530 Question Type : SA Display Question Number : Yes

Correct Marks : 4 Wrong Marks : 0

एक पहाड़ की चोटी का इसके पाद से हो कर जाने वाले क्षैतिज समतल पर स्थित एक बिंदु पर उन्नयन कोण 45° पाया गया। इस बिंदु से क्षैतिज तल से 30° का कोण बनाते हुए तल पर पहाड़ की चोटी की ओर 80 मीटर चलने के बाद चोटी का उन्नयन कोण 75° हो जाता है, तो पहाड़ की ऊँचाई (मीटरों में) 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