

National Testing Agency

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BTECH

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Mathematics

Section Id :	40503668
Section Number :	3
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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:	405036108
Question Shuffling Allowed :	Yes

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

Let $f: (1, 3) \rightarrow \mathbb{R}$ be a function defined by

$$f(x) = \frac{x[x]}{1+x^2}, \text{ where } [x] \text{ denotes the}$$

greatest integer $\leq x$. Then the range of f is :

Options :

1. $\left(\frac{3}{5}, \frac{4}{5}\right)$

2. $\left(\frac{2}{5}, \frac{4}{5}\right]$

3. $\left(\frac{2}{5}, \frac{1}{2}\right) \cup \left(\frac{3}{5}, \frac{4}{5}\right]$

4. $\left(\frac{2}{5}, \frac{3}{5}\right] \cup \left(\frac{3}{4}, \frac{4}{5}\right)$

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

Correct Marks : 4 Wrong Marks : 1

माना $f: (1, 3) \rightarrow \mathbb{R}$ एक फलन है, जो

$$f(x) = \frac{x[x]}{1+x^2}, \text{ द्वारा परिभाषित है जहाँ } [x] \text{ महत्तम}$$

पूर्णांक $\leq x$ को दर्शाता है। तो f का परिसर है :

Options :

1. $\left(\frac{3}{5}, \frac{4}{5}\right)$

2. $\left(\frac{2}{5}, \frac{4}{5}\right]$

3. $\left(\frac{2}{5}, \frac{1}{2}\right) \cup \left(\frac{3}{5}, \frac{4}{5}\right]$

4. $\left(\frac{2}{5}, \frac{3}{5}\right] \cup \left(\frac{3}{4}, \frac{4}{5}\right]$

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

ધારો કે $f : (1, 3) \rightarrow \mathbb{R}$, $f(x) = \frac{x[x]}{1+x^2}$ થી

વ્યાખ્યાયિત વિધેય છે, જ્યાં $[x]$ એ મોટામાં મોટો પૂર્ણાંક $\leq x$ છે. તો વિધેય f નો વિસ્તાર નીચેનામાંથી કયો થશે?

Options :

1. $\left(\frac{3}{5}, \frac{4}{5}\right)$

2. $\left(\frac{2}{5}, \frac{4}{5}\right]$

3. $\left(\frac{2}{5}, \frac{1}{2}\right) \cup \left(\frac{3}{5}, \frac{4}{5}\right]$

4. $\left(\frac{2}{5}, \frac{3}{5}\right] \cup \left(\frac{3}{4}, \frac{4}{5}\right]$

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

Let $\alpha = \frac{-1 + i\sqrt{3}}{2}$. If

$$a = (1 + \alpha) \sum_{k=0}^{100} \alpha^{2k} \text{ and } b = \sum_{k=0}^{100} \alpha^{3k}, \text{ then}$$

a and b are the roots of the quadratic equation :

Options :

1. $x^2 + 101x + 100 = 0$

2. $x^2 + 102x + 101 = 0$

3. $x^2 - 101x + 100 = 0$

4. $x^2 - 102x + 101 = 0$

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

Correct Marks : 4 Wrong Marks : 1

माना $\alpha = \frac{-1 + i\sqrt{3}}{2}$ है। यदि

$$a = (1 + \alpha) \sum_{k=0}^{100} \alpha^{2k} \text{ तथा } b = \sum_{k=0}^{100} \alpha^{3k}, \text{ तो}$$

a तथा b निम्न में से किस द्विघात समीकरण के मूल हैं?

Options :

1. $x^2 + 101x + 100 = 0$

2. $x^2 + 102x + 101 = 0$

3. $x^2 - 101x + 100 = 0$

4. $x^2 - 102x + 101 = 0$

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

Correct Marks : 4 Wrong Marks : 1

ધરો કે $\alpha = \frac{-1 + i\sqrt{3}}{2}$ છે. જો

$a = (1 + \alpha) \sum_{k=0}^{100} \alpha^{2k}$ અને $b = \sum_{k=0}^{100} \alpha^{3k}$ હોય,

તો a અને b નીચેનામાંથી કયા દ્વિઘાત સમીકરણનાં બીજ થાય?

Options :

1. $x^2 + 101x + 100 = 0$

2. $x^2 + 102x + 101 = 0$

3. $x^2 - 101x + 100 = 0$

4. $x^2 - 102x + 101 = 0$

Question Number : 53 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

Let S be the set of all real roots of the equation, $3^x(3^x - 1) + 2 = |3^x - 1| + |3^x - 2|$.

Then S :

Options :

1. is an empty set.

2. is a singleton.

3. contains exactly two elements.

4. contains at least four elements.

Question Number : 53 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

માના સમીકરણ $3^x(3^x - 1) + 2 = |3^x - 1| + |3^x - 2|$
કે સઘી વાસ્તવિક મૂલોં કા સમુચ્ચય S હૈ। તો S :

Options :

1. ઁક રિક્ત સમુચ્ચય હૈ।

2. ઁક હી અવયવ વાલા સમુચ્ચય હૈ।

3. મેં માત્ર ઢો અવયવ હૈં।

4. મેં કમ સે કમ ચાર અવયવ હૈં।

Question Number : 53 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

ધારો કે S ઁ સમીકરણ

$3^x(3^x - 1) + 2 = |3^x - 1| + |3^x - 2|$ નાં તમામ
વાસ્તવિક ખીજો નો ગણ છે. તો S ઁ :

Options :

1. ખાલી ગણ છે.

2. ઁકાકી ગણ છે.

3. બરાબર બે ઘટકો ધરાવે છે.

4. ઓછામાં ઓછા ચાર ઘટકો ધરાવે છે.

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

If $A = \begin{pmatrix} 2 & 2 \\ 9 & 4 \end{pmatrix}$ and $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, then

$10A^{-1}$ is equal to :

Options :

1. $6I - A$

2. $4I - A$

3. $A - 4I$

4. $A - 6I$

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

यदि $A = \begin{pmatrix} 2 & 2 \\ 9 & 4 \end{pmatrix}$ तथा $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ हैं, तो

$10A^{-1}$ बराबर है :

Options :

1. $6I - A$

2. $4I - A$

3. $A - 4I$

4. $A - 6I$

Question Number : 54 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

જો $A = \begin{pmatrix} 2 & 2 \\ 9 & 4 \end{pmatrix}$ અને $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ હોય તો

$10A^{-1} =$

Options :

1. $6I - A$

2. $4I - A$

3. $A - 4I$

4. $A - 6I$

Question Number : 55 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

The system of linear equations

$$\lambda x + 2y + 2z = 5$$

$$2\lambda x + 3y + 5z = 8$$

$$4x + \lambda y + 6z = 10 \text{ has :}$$

Options :

1. a unique solution when $\lambda = -8$

2. no solution when $\lambda = 8$

3. infinitely many solutions when $\lambda = 2$

4. no solution when $\lambda = 2$

Question Number : 55 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

રૈખિક સમીકરણ નિકાય

$$\lambda x + 2y + 2z = 5$$

$$2\lambda x + 3y + 5z = 8$$

$$4x + \lambda y + 6z = 10$$

Options :

1. કા માત્ર ઁક હલ હૈ જબ $\lambda = -8$

2. કા કોઈ હલ નહીં હૈ જબ $\lambda = 8$

3. કે અનન્ત હલ હૈ જબ $\lambda = 2$

4. કા કોઈ હલ નહીં હૈ જબ $\lambda = 2$

Question Number : 55 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

સુરેખ સમીકરણ સંહતિ

$$\lambda x + 2y + 2z = 5$$

$$2\lambda x + 3y + 5z = 8$$

$$4x + \lambda y + 6z = 10$$

Options :

1. $\lambda = -8$ માટે અનન્ય ઉકલ છે.

2. $\lambda = 8$ માટે કોઈ ઉકેલ નથી.

3. $\lambda = 2$ માટે અનંત ઉકેલો છે.

4. $\lambda = 2$ માટે કોઈ ઉકેલ નથી.

Question Number : 56 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

If α and β be the coefficients of x^4 and x^2 respectively in the expansion of

$\left(x + \sqrt{x^2 - 1}\right)^6 + \left(x - \sqrt{x^2 - 1}\right)^6$, then :

Options :

1. $\alpha + \beta = 60$

2. $\alpha - \beta = -132$

3. $\alpha + \beta = -30$

4. $\alpha - \beta = 60$

Question Number : 56 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

यदि $\left(x + \sqrt{x^2 - 1}\right)^6 + \left(x - \sqrt{x^2 - 1}\right)^6$ के

प्रसार में x^4 तथा x^2 के गुणांक क्रमशः α तथा β हैं,
तो :

Options :

1. $\alpha + \beta = 60$

2. $\alpha - \beta = -132$

3. $\alpha + \beta = -30$

4. $\alpha - \beta = 60$

Question Number : 56 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

જો $\left(x + \sqrt{x^2 - 1}\right)^6 + \left(x - \sqrt{x^2 - 1}\right)^6$ ની

વિસ્તરણમાં x^4 અને x^2 ની સહગુણકો અનુક્રમે α અને β હોય, તો :

Options :

1. $\alpha + \beta = 60$

2. $\alpha - \beta = -132$

3. $\alpha + \beta = -30$

4. $\alpha - \beta = 60$

Question Number : 57 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

If the 10th term of an A.P. is $\frac{1}{20}$ and its

20th term is $\frac{1}{10}$, then the sum of its first

200 terms is :

Options :

1. 50

2. $50\frac{1}{4}$

3. 100

4. $100\frac{1}{2}$

Question Number : 57 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

यदि एक समान्तर श्रेणी का 10 वां पद $\frac{1}{20}$ है तथा

इसका 20 वां पद $\frac{1}{10}$ है, तो इसके प्रथम 200 पदों का

योग है :

Options :

1. 50

2. $50\frac{1}{4}$

3. 100

4. $100\frac{1}{2}$

Question Number : 57 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

એક સમાંતર શ્રેણી (A.P.) નું 10 મું પદ $\frac{1}{20}$ હોય અને

તેનું 20 મું પદ $\frac{1}{10}$ હોય તો તેનાં પ્રથમ 200 પદો નો

સરવાળો કેટલો થાય?

Options :

1. 50

2. $50\frac{1}{4}$

3. 100

4. $100\frac{1}{2}$

Question Number : 58 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

$\lim_{x \rightarrow 0} \frac{\int_0^x t \sin(10t) dt}{x}$ is equal to :

Options :

1. $-\frac{1}{5}$

2. $\frac{1}{10}$

3. $-\frac{1}{10}$

4. 0

Question Number : 58 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

$$\lim_{x \rightarrow 0} \frac{\int_0^x t \sin(10t) dt}{x} \text{ बराबर है :}$$

Options :

1. $-\frac{1}{5}$

2. $\frac{1}{10}$

3. $-\frac{1}{10}$

4. 0

Question Number : 58 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

$$\lim_{x \rightarrow 0} \frac{\int_0^x t \sin(10t) dt}{x} \text{ બરાબર :}$$

Options :

1. $-\frac{1}{5}$

2. $\frac{1}{10}$

3. $-\frac{1}{10}$

4. 0

Question Number : 59 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

Let S be the set of all functions $f: [0, 1] \rightarrow \mathbb{R}$, which are continuous on $[0, 1]$ and differentiable on $(0, 1)$. Then for every f in S , there exists a $c \in (0, 1)$, depending on f , such that :

Options :

1. $|f(c) - f(1)| < |f'(c)|$

2. $|f(c) - f(1)| < (1 - c) |f'(c)|$

3. $|f(c) + f(1)| < (1 + c) |f'(c)|$

4. $\frac{f(1) - f(c)}{1 - c} = f'(c)$

Question Number : 59 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

माना सभी फलनों $f: [0, 1] \rightarrow \mathbb{R}$, जो कि $[0, 1]$ पर संतत हैं तथा $(0, 1)$ पर अवकलनीय हैं, का समुच्चय S है। तो S में प्रत्येक f के लिए f पर निर्भर एक $c \in (0, 1)$ का अस्तित्व इस प्रकार है कि :

Options :

1. $|f(c) - f(1)| < |f'(c)|$

2. $|f(c) - f(1)| < (1 - c) |f'(c)|$

3. $|f(c) + f(1)| < (1 + c) |f'(c)|$

4. $\frac{f(1) - f(c)}{1 - c} = f'(c)$

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

ધારો કે S એ એવા તમામ વિધેયો $f : [0, 1] \rightarrow \mathbb{R}$ નો ગણ છે કે જે $[0, 1]$ પર સતત અને $(0, 1)$ પર વિકલનીય છે. તો S માંના પ્રત્યેક f માટે f ઉપર આધારીત એવા એક $c \in (0, 1)$ નું અસ્તીત્વ છે કે જેથી :

Options :

1. $|f(c) - f(1)| < |f'(c)|$

2. $|f(c) - f(1)| < (1 - c) |f'(c)|$

3. $|f(c) + f(1)| < (1 + c) |f'(c)|$

4. $\frac{f(1) - f(c)}{1 - c} = f'(c)$

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

The length of the perpendicular from the origin, on the normal to the curve, $x^2 + 2xy - 3y^2 = 0$ at the point $(2, 2)$ is :

Options :

1. $\sqrt{2}$

2. 2

3. $2\sqrt{2}$

4. $4\sqrt{2}$

Question Number : 60 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

वक्र $x^2 + 2xy - 3y^2 = 0$ के बिन्दु $(2, 2)$ पर खींचे गये अभिलम्ब पर मूल बिन्दु से डाले गये लम्ब की लम्बाई है :

Options :

1. $\sqrt{2}$

2. 2

3. $2\sqrt{2}$

4. $4\sqrt{2}$

Question Number : 60 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

वक्र $x^2 + 2xy - 3y^2 = 0$ ના બિંદુ $(2, 2)$ આગળના અભિલંબ ઉપર ઉગમબિંદુમાંથી દોરેલ લંબ ની લંબાઈ કેટલી થાય?

Options :

1. $\sqrt{2}$

2. 2

3. $2\sqrt{2}$

4. $4\sqrt{2}$

Question Number : 61 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

If $I = \int_1^2 \frac{dx}{\sqrt{2x^3 - 9x^2 + 12x + 4}}$, then :

Options :

1. $\frac{1}{9} < I^2 < \frac{1}{8}$

2. $\frac{1}{16} < I^2 < \frac{1}{9}$

3. $\frac{1}{8} < I^2 < \frac{1}{4}$

4. $\frac{1}{6} < I^2 < \frac{1}{2}$

Question Number : 61 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

यदि $I = \int_1^2 \frac{dx}{\sqrt{2x^3 - 9x^2 + 12x + 4}}$ है, तो :

Options :

1. $\frac{1}{9} < I^2 < \frac{1}{8}$

2. $\frac{1}{16} < I^2 < \frac{1}{9}$

3. $\frac{1}{8} < I^2 < \frac{1}{4}$

4. $\frac{1}{6} < I^2 < \frac{1}{2}$

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

જે $I = \int_1^2 \frac{dx}{\sqrt{2x^3 - 9x^2 + 12x + 4}}$ હોય તો :

Options :

1. $\frac{1}{9} < I^2 < \frac{1}{8}$

2. $\frac{1}{16} < I^2 < \frac{1}{9}$

3. $\frac{1}{8} < I^2 < \frac{1}{4}$

4. $\frac{1}{6} < I^2 < \frac{1}{2}$

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

The area (in sq. units) of the region
 $\{(x, y) \in \mathbb{R}^2 : x^2 \leq y \leq 3 - 2x\}$, is :

Options :

1. $\frac{32}{3}$

2. $\frac{29}{3}$

3. $\frac{31}{3}$

4. $\frac{34}{3}$

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

ક્ષેત્ર $\{(x, y) \in \mathbb{R}^2 : x^2 \leq y \leq 3 - 2x\}$ નો ક્ષેત્રફલ
(વર્ગ ઇકાઈઓ માં) છે :

Options :

1. $\frac{32}{3}$

2. $\frac{29}{3}$

3. $\frac{31}{3}$

4. $\frac{34}{3}$

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

પ્રદેશ $\{(x, y) \in \mathbb{R}^2 : x^2 \leq y \leq 3 - 2x\}$ નું ક્ષેત્રફળ
(ચો. એકમમાં) કેટલું થાય?

Options :

1. $\frac{32}{3}$

2. $\frac{29}{3}$

3. $\frac{31}{3}$

4. $\frac{34}{3}$

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

Correct Marks : 4 Wrong Marks : 1

The differential equation of the family of curves, $x^2 = 4b(y + b)$, $b \in \mathbb{R}$, is :

Options :

1. $xy'' = y'$

2. $x(y')^2 = x - 2yy'$

3. $x(y')^2 = x + 2yy'$

4. $x(y')^2 = 2yy' - x$

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

Correct Marks : 4 Wrong Marks : 1

वक्रों $x^2 = 4b(y + b)$, $b \in \mathbb{R}$ के कुल का अवकल समीकरण है :

Options :

1. $xy'' = y'$

2. $x(y')^2 = x - 2yy'$

3. $x(y')^2 = x + 2yy'$

4. $x(y')^2 = 2yy' - x$

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

Correct Marks : 4 Wrong Marks : 1

વક્ર સંહતિ $x^2 = 4b(y + b)$, $b \in \mathbb{R}$ નું વિકલ સમીકરણ નીચેનામાંથી કયું થાય?

Options :

1. $xy'' = y'$

2. $x(y')^2 = x - 2yy'$

3. $x(y')^2 = x + 2yy'$

4. $x(y')^2 = 2yy' - x$

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

Correct Marks : 4 Wrong Marks : 1

If a line, $y = mx + c$ is a tangent to the circle, $(x - 3)^2 + y^2 = 1$ and it is perpendicular to a line L_1 , where L_1 is the tangent to the circle,

$x^2 + y^2 = 1$ at the point $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$; then :

Options :

1. $c^2 - 7c + 6 = 0$

2. $c^2 + 7c + 6 = 0$

3. $c^2 + 6c + 7 = 0$

4. $c^2 - 6c + 7 = 0$

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

Correct Marks : 4 Wrong Marks : 1

यदि एक रेखा $y = mx + c$, वृत्त $(x - 3)^2 + y^2 = 1$ की एक स्पर्श रेखा है तथा यह एक रेखा L_1 पर लम्ब

है, जहाँ L_1 वृत्त $x^2 + y^2 = 1$ के बिन्दु $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

पर स्पर्श रेखा है, तो :

Options :

1. $c^2 - 7c + 6 = 0$

2. $c^2 + 7c + 6 = 0$

3. $c^2 + 6c + 7 = 0$

4. $c^2 - 6c + 7 = 0$

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

Correct Marks : 4 Wrong Marks : 1

ધારો કે L_1 એ વર્તુળ $x^2 + y^2 = 1$ ને બિંદુ $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

આગળનો સ્પર્શક છે. જો રેખા $y = mx + c$ એ વર્તુળ $(x-3)^2 + y^2 = 1$ નો સ્પર્શક હોય અને રેખા L_1 ને લંબ હોય તો :

Options :

1. $c^2 - 7c + 6 = 0$

2. $c^2 + 7c + 6 = 0$

3. $c^2 + 6c + 7 = 0$

4. $c^2 - 6c + 7 = 0$

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

Correct Marks : 4 Wrong Marks : 1

If a hyperbola passes through the point $P(10, 16)$ and it has vertices at $(\pm 6, 0)$, then the equation of the normal to it at P is :

Options :

1. $3x + 4y = 94$

2. $x + 3y = 58$

3. $x + 2y = 42$

4. $2x + 5y = 100$

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

Correct Marks : 4 Wrong Marks : 1

यदि एक अतिपरवलय बिन्दु $P(10, 16)$ से होकर जाता है तथा इसके शीर्ष $(\pm 6, 0)$ पर हैं, तो P पर इसके अभिलम्ब का समीकरण है :

Options :

1. $3x + 4y = 94$

2. $x + 3y = 58$

3. $x + 2y = 42$

4. $2x + 5y = 100$

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

Correct Marks : 4 Wrong Marks : 1

જો અતિવલય બિંદુ $P(10, 16)$ માંથી પસાર થતો હોય અને તેનાં શિરોબિંદુઓ $(\pm 6, 0)$ આગળ હોય, તો તેને બિંદુ P આગળના અભિલંબનું સમીકરણ નીચેનામાંથી કયું થશે?

Options :

1. $3x + 4y = 94$

2. $x + 3y = 58$

3. $x + 2y = 42$

4. $2x + 5y = 100$

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

Correct Marks : 4 Wrong Marks : 1

The mirror image of the point $(1, 2, 3)$ in a plane is $\left(-\frac{7}{3}, -\frac{4}{3}, -\frac{1}{3}\right)$. Which of the following points lies on this plane ?

Options :

1. $(-1, -1, -1)$

2. $(1, 1, 1)$

3. $(1, -1, 1)$

4. $(-1, -1, 1)$

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

Correct Marks : 4 Wrong Marks : 1

बिन्दु $(1, 2, 3)$ का एक समतल में प्रतिबिम्ब (mirror image), $\left(-\frac{7}{3}, -\frac{4}{3}, -\frac{1}{3}\right)$ है। निम्न में से कौन सा बिन्दु इस समतल पर स्थित है ?

Options :

1. $(-1, -1, -1)$

2. $(1, 1, 1)$

3. $(1, -1, 1)$

4. $(-1, -1, 1)$

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

Correct Marks : 4 Wrong Marks : 1

બિંદુ $(1, 2, 3)$ નું એક સમતલમાં આરસી પ્રતિબિંબ

$\left(-\frac{7}{3}, -\frac{4}{3}, -\frac{1}{3}\right)$ છે. નીચેનામાંથી કયું બિંદુ આ સમતલમાં હશે?

Options :

1. $(-1, -1, -1)$

2. $(1, 1, 1)$

3. $(1, -1, 1)$

4. $(-1, -1, 1)$

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

Correct Marks : 4 Wrong Marks : 1

Let $\vec{a} = \hat{i} - 2\hat{j} + \hat{k}$ and

$\vec{b} = \hat{i} - \hat{j} + \hat{k}$ be two vectors. If $\vec{c}$ is a

vector such that $\vec{b} \times \vec{c} = \vec{b} \times \vec{a}$ and

$\vec{c} \cdot \vec{a} = 0$, then $\vec{c} \cdot \vec{b}$ is equal to :

Options :

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

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

3. -1

4. $-\frac{3}{2}$

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

માના દો સદિશ $\vec{a} = \hat{i} - 2\hat{j} + \hat{k}$ તથા

$\vec{b} = \hat{i} - \hat{j} + \hat{k}$ હૈં। યદિ ઇક સદિશ $\vec{c}$ ઇસ

પ્રકાર હૈ કિ $\vec{b} \times \vec{c} = \vec{b} \times \vec{a}$ તથા

$\vec{c} \cdot \vec{a} = 0$ હૈં, તો $\vec{c} \cdot \vec{b}$ બરાબર હૈ :

Options :

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

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

3. -1

4. $-\frac{3}{2}$

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

ધારો કે $\vec{a} = \hat{i} - 2\hat{j} + \hat{k}$ અને

$\vec{b} = \hat{i} - \hat{j} + \hat{k}$ બે સદિશો છે. જો $\vec{c}$ એ એવો

સદિશ હોય કે જેથી $\vec{b} \times \vec{c} = \vec{b} \times \vec{a}$ અને

$\vec{c} \cdot \vec{a} = 0$ થાય, તો $\vec{c} \cdot \vec{b} =$

Options :

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

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

3. -1

4. $-\frac{3}{2}$

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

Correct Marks : 4 Wrong Marks : 1

The mean and variance of 20 observations are found to be 10 and 4, respectively. On rechecking, it was found that an observation 9 was incorrect and the correct observation was 11. Then the correct variance is :

Options :

1. 3.98

2. 3.99

3. 4.01

4. 4.02

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

Correct Marks : 4 Wrong Marks : 1

20 પ્રેક્ષણોં કે માધ્ય તથા પ્રસરણ ક્રમશઃ 10 તથા 4 પાયે ગયે। પુનઃ જાંચ કરને પર પાયા ગયા કિ એક પ્રેક્ષણ 9 ગલત થા તથા સહી પ્રેક્ષણ 11 થા। તો સહી પ્રસરણ હૈ :

Options :

1. 3.98

2. 3.99

3. 4.01

4. 4.02

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

Correct Marks : 4 Wrong Marks : 1

20 અવલોકનોનાં મધ્યક અને વિચરણ અનુક્રમે 10 અને 4 જોવા મળે છે. પુનઃચકાસણીમાં માલૂમ પડ્યું કે એક અવલોકન 9 ખોટું છે અને સાચું અવલોકન 11 છે. તો સાચું વિચરણ શું થશે?

Options :

1. 3.98

2. 3.99

3. 4.01

4. 4.02

Question Number : 69 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

Let A and B be two events such that the probability that exactly one of them occurs is $\frac{2}{5}$ and the probability that A or B occurs is $\frac{1}{2}$, then the probability of both of them occur together is :

Options :

1. 0.01

2. 0.02

3. 0.10

4. 0.20

Question Number : 69 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

माना A तथा B दो घटनायें इस प्रकार हैं कि दोनों में से मात्र एक के होने की प्रायिकता $\frac{2}{5}$ है तथा A या B के होने की प्रायिकता $\frac{1}{2}$ है, तो दोनों के एक साथ होने की प्रायिकता है :

Options :

1. 0.01

2. 0.02

3. 0.10

4. 0.20

Question Number : 69 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

ધારો કે A અને B એવી ઘટનાઓ છે કે જેથી તેમાંની

બરાબર એક ઘટના બનવાની સંભાવના $\frac{2}{5}$ થાય અને

A અથવા B બનવાની સંભાવના $\frac{1}{2}$ થાય તો બન્ને

ઘટનાઓ સાથે બનવાની સંભાવના કેટલી થાય?

Options :

1. 0.01

2. 0.02

3. 0.10

4. 0.20

Question Number : 70 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

Which of the following statements is a tautology ?

Options :

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

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

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

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

Question Number : 70 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

નિમ્ન મેં સે કૌન સા કથન ઇક પુનરુક્તિ હૈ?

Options :

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

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

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

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

Question Number : 70 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 4 Wrong Marks : 1

નીચેનામાંથી કયું વિધાન નિત્યસત્ય છે?

Options :

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

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

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

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

Sub-Section Number:

2

Sub-Section Id:

405036109

Question Shuffling Allowed :

Yes

Question Number : 71 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of 4 letter words (with or without meaning) that can be formed from the eleven letters of the word 'EXAMINATION' is _____.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

2454 to 2454

Question Number : 71 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

शब्द 'EXAMINATION' के ग्यारह अक्षरों से बन सकने वाले 4 अक्षरों के शब्दों (अर्थ वाले तथा अर्थविहीन) की संख्या है _____।

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

2454 to 2454

Question Number : 71 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

शब्द 'EXAMINATION' नां अगियार अक्षरोमांथी 4 अक्षरो वाणा केटला शब्दो (अर्थ सभर के अर्थ रहित) बनावी शकिय _____.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

2454 to 2454

Question Number : 72 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The sum, $\sum_{n=1}^7 \frac{n(n+1)(2n+1)}{4}$ is equal to _____.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

504 to 504

Question Number : 72 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

योगफल $\sum_{n=1}^7 \frac{n(n+1)(2n+1)}{4}$ बराबर है _____।

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

504 to 504

Question Number : 72 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

संख्याओं $\sum_{n=1}^7 \frac{n(n+1)(2n+1)}{4} = \text{_____}$.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

504 to 504

Question Number : 73 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $f(x)$ be a polynomial of degree 3 such that $f(-1) = 10$, $f(1) = -6$, $f(x)$ has a critical point at $x = -1$ and $f'(x)$ has a critical point at $x = 1$. Then $f(x)$ has a local minima at $x = \text{_____}$.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

3 to 3

Question Number : 73 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

माना घात 3 का एक बहुपद $f(x)$ इस प्रकार है कि $f(-1)=10$, $f(1)=-6$, $f(x)$ का एक क्रांतिक बिन्दु $x=-1$ है तथा $f'(x)$ का एक क्रांतिक बिन्दु $x=1$ है। तो $f(x)$ का एक स्थानीय निम्ननिष्ठ है $x=_____$ ।

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

3 to 3

Question Number : 73 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારો કે $f(x)$ એ ત્રિઘાત બહુપદી છે કે જેને માટે $f(-1)=10$, $f(1)=-6$, $f(x)$ ને $x=-1$ આગળ નિર્ણાયક બિંદુ છે અને $f'(x)$ ને $x=1$ આગળ નિર્ણાયક બિંદુ છે. તો $f(x)$ ને સ્થાનીય ન્યૂનતમ, $x=_____$ આગળ મળશે.

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

Let a line $y=mx$ ($m > 0$) intersect the parabola, $y^2=x$ at a point P, other than the origin. Let the tangent to it at P meet the x -axis at the point Q. If area $(\Delta OPQ)=4$ sq. units, then m is equal to _____.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

0.5 to 0.5

Question Number : 74 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

माना एक रेखा $y=mx$ ($m > 0$), परवलय $y^2=x$ को मूल बिन्दु के अतिरिक्त एक बिन्दु P पर काटती है। माना P पर इसकी स्पर्श रेखा x -अक्ष को बिन्दु Q पर मिलती है। यदि ΔOPQ का क्षेत्रफल 4 वर्ग इकाई है, तो m बराबर है _____।

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

0.5 to 0.5

Question Number : 74 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ધારો કે રેખા $y = mx$ ($m > 0$) એ પરવલય $y^2 = x$ ને ઉદ્ગમ બિંદુ સિવાયના બિંદુ P માં છેદે છે અને તેને P બિંદુ આગળનો સ્પર્શક x -અક્ષને બિંદુ Q માં મળે છે. જો ΔOPQ નું ક્ષેત્રફળ=4 થો.એકમ હોય તો $m =$ _____.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

0.5 to 0.5

Question Number : 75 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $\frac{\sqrt{2} \sin \alpha}{\sqrt{1 + \cos 2\alpha}} = \frac{1}{7}$ and $\sqrt{\frac{1 - \cos 2\beta}{2}} = \frac{1}{\sqrt{10}}$,
 $\alpha, \beta \in \left(0, \frac{\pi}{2}\right)$, then $\tan(\alpha + 2\beta)$ is equal to
_____.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

1 to 1

Question Number : 75 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

यदि $\frac{\sqrt{2} \sin \alpha}{\sqrt{1 + \cos 2\alpha}} = \frac{1}{7}$ तथा
 $\sqrt{\frac{1 - \cos 2\beta}{2}} = \frac{1}{\sqrt{10}}$, $\alpha, \beta \in \left(0, \frac{\pi}{2}\right)$ हैं, तो
 $\tan(\alpha + 2\beta)$ बराबर है _____ ।

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

1 to 1

Question Number : 75 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

જો $\frac{\sqrt{2} \sin \alpha}{\sqrt{1 + \cos 2\alpha}} = \frac{1}{7}$ અને

$\sqrt{\frac{1 - \cos 2\beta}{2}} = \frac{1}{\sqrt{10}}$, જ્યાં $\alpha, \beta \in \left(0, \frac{\pi}{2}\right)$ હોય

તો $\tan(\alpha + 2\beta) =$ _____ થાય.

Response Type: Numeric

Evaluation Required For SA: Yes

Show Word Count: Yes

Answers Type: Range

Possible Answers :

1 to 1