ST. LAWRENCE HIGH SCHOOL

27, BALLYGUNGE CIRCULAR ROAD

Class : 11 **Subject : MATHEMATICS** **Term : FIRST TERM** **Max Marks : 60**

Q 1 : $\sin(45° - \theta) = ?$ **Marks :** 1

a) $\frac{1}{\sqrt{3}}(\sin\theta - \cos\theta)$

b) $\frac{1}{\sqrt{2}}(\sin\theta - \cos\theta)$

c) $\frac{1}{\sqrt{3}}(-\sin\theta + \cos\theta)$

d) $\frac{1}{\sqrt{2}}(-\sin\theta + \cos\theta)$

1 . a

2 . b

3 . c

4 . d ☑ (This Answer is Correct)

Q 2 : $\tan A = \frac{3}{4}$ & $\tan A \tan B = 1$, then the value of (A+B) = ? **Marks :** 1

a) $\frac{\pi}{4}$

b) $\frac{3\pi}{4}$

c) π

d) $\frac{\pi}{2}$

1 . a

2 . b

3 . c

4 . d ☑ (This Answer is Correct)

Q 3 : 1

Marks :

$$\frac{\cos 9^\circ + \sin 9^\circ}{\cos 9^\circ - \sin 9^\circ} = ?$$

a) $\sin 54^\circ$
b) $\cos 54^\circ$
c) $\tan 54^\circ$
d) $\cot 54^\circ$

1 . a
2 . b
3 . c (This Answer is Correct)
4 . d

Q 4 : If $A \cap B = \phi$, then $n(A \cup B)$ =

a) $n(A) + n(B)$
b) $n(A) - n(B)$
c) 0
d) None of these.

Marks : 1

1 . a (This Answer is Correct)
2 . b
3 . c
4 . d

Q 5 : Let A = {0, 1, 2, 3, 4} and $f : A \to \mathbb{Z}$ be defined by $f(x) = x^2 - 5x + 2$, Then the range of f is ?

a) {2 , 4} ; b) {2, -2, 4} ; c) {0, 2, 4} ; d) None of these.

Marks : 1

1 . a
2 . b (This Answer is Correct)
3 . c
4 . d

Q 6 : 1

Three numbers are in A.P. and their sum is 21, then the middle number is _

Marks :

a) 5
b) 6
c) 6.5
d) 7

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 7 : If $z = -2 - \sqrt{-5}$ then $\bar{z} = ?$

Marks : 1

a) $-2 + \sqrt{-5}$
b) $2 - \sqrt{-5}$
c) $2 + \sqrt{-5}$
d) $2i - \sqrt{5}$

1 . a (This Answer is Correct)

2 . b

3 . c

4 . d

Q 8 : Which one is true ?

Marks : 1

a) $2 + 3i > 1 + 4i$
b) $5 + 9i > 9 + 5i$
c) $5 - 9i > 9 + 5i$
d) None of these.

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 9 : The modulus of the complex number $1 + \sqrt{-8}$ =?

Marks : 1

a) 2
b) -5
c) 8
d) 3

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 10 : **Which of the followings is false ?** **Marks :** 1

a. $n < 2^n$
b. $3^n > 2^n$
c. $3^n < n^3$, *where* $n \geq 4$
d. None of these.

1 . a

2 . b

3 . c (This Answer is Correct)

4 . d

Q 11 : $\forall n \in \mathbb{N}$, $3^{(2n+2)} - 8n - 9$ **is divisible by –** **Marks :** 1

a. 67 ; b. 76 ; c. 46 ; d. 64

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 12 : **Find the solution set where,** $|2x - 3| \leq 5, x \in \mathbb{R}$. **Marks :** 1

a) $[-1, 4)$; b) $(-1, 4]$; c) $[-1, 4]$; d) $(-1, 4)$

1 . a

2 . b

3 . c (This Answer is Correct)

4 . d

Q 13 : **If one root the quadratic equation** $4x^2 + 4x + 7 = 0$ **is** $-\frac{1}{2}(1 + \sqrt{6}i)$ **, then the other root is ?** **Marks :** 1

a) $-\frac{1}{2} - \sqrt{6}i$; b) $-\frac{1}{2} + \frac{1}{2}\sqrt{6}i$; c) $\frac{1}{2} + \frac{1}{2}\sqrt{6}i$; d) None of these.

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 14 : The condition for which the straight line $ax + by + c = 0$ will be parallel to x-axis is –

Marks : 1

a. $a \neq 0, b = 0$
b. $a = 0, b \neq 0$
c. $a \neq 0, b \neq 0, c = 0$
d. $c \neq 0, b = 0$

1 . a
2 . b (This Answer is Correct)
3 . c
4 . d

Q 15 : The area of the triangle which the straight line $3x + 4y - 12 = 0$ makes with the coordinate axes is –

Marks : 1

a. 4 sq. units
b. 5 sq. units
c. 6 sq. units
d. 6.5 sq. units

1 . a
2 . b
3 . c (This Answer is Correct)
4 . d

Q 16 : The perpendicular distance of the st. line $6x - 8y = 25$ from the point $(-2, -4)$ is –

Marks : 1

a. 0.5 units
b. 0.25 units
c. 1 unit
d. 2 units

1 . a (This Answer is Correct)
2 . b
3 . c
4 . d

Q 17 : The equation $x^2 + y^2 + 2gx + 2fy + c = 0$ represents a point-circle when –

Marks : 1

a. $g^2 + f^2 = -c$
b. $g^2 - f^2 = c$
c. $g^2 + f^2 = c$
d. $-g^2 + f^2 = c$

1 . a
2 . b
3 . c (This Answer is Correct)
4 . d

Q 18 : The value of $\lim_{y \to 0} \frac{7^y - 5^y}{y} = ?$

Marks : 1

a) $\log_e\left(\frac{5}{7}\right)$; b) $\log_e\left(\frac{7}{5}\right)$; c) 0 ; d) 1

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 19 : If $\sin\theta = -\frac{1}{2}$, then $\theta = ?$ **Marks :** 1

a) $30°$ **b)** $120°$ **c)** $150°$ **d)** $210°$

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 20 : $\sin(\theta - 540°) = ?$ **Marks :** 1

a) $\sin\theta$ **b)** $-\sin\theta$ **c)** $\cos\theta$ **d)** $-\cos\theta$

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 21 : If $\sin\theta = \frac{3}{5}$, then the value of $\cos 2\theta = ?$ **Marks :** 1

a) $\frac{7}{15}$
b) $\frac{8}{25}$
c) $\frac{2}{5}$
d) $\frac{7}{25}$

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 22 : Which of the following sets is null ? **Marks :** 1

a) $\{0\}$
b) $\{\phi\}$
c) $\{x : x \text{ is an integer and } 1 < x < 2\}$
d) $\{x : x \text{ is a real number and } 1 < x < 2\}$

1 . a

2 . b

3 . c (This Answer is Correct)

4 . d

Q 23 : If $A \subseteq B$ and $B \subseteq A$ then –

Marks : 1

a) $A = \phi$
b) $A \cap B = \phi$
c) $A = B$
d) None of these.

1 . a
2 . b
3 . c (This Answer is Correct)
4 . d

Q 24 : $x \in A \cup B$, then –

Marks : 1

a) $x \in A \wedge x \in B$
b) $x \in B$
c) $x \in A \vee x \in B$
d) $x \notin A$

1 . a
2 . b
3 . c (This Answer is Correct)
4 . d

Q 25 : If R = { (3,9) , (5, 25) , (7, 49), (2, 8), (4, 64) } be a given relation then range of R is –

Marks : 1

a) {2, 3, 4, 5, 7} ; b) {2 , 4} ; c) {3, 5 , 7} ; d) { 8, 9, 25, 49, 64 }

1 . a
2 . b
3 . c
4 . d (This Answer is Correct)

Q 26 : 1

Total number of relations can be defined from set A = {a, b, c} to set B = {1, 2} ?

a) 2^3 ; b) 2^6 ; c) 2^9 ; d) 2^4

Marks :

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 27 : $2 \sin 10° \sin 40° = ?$

a) $\cos 30° - \cos 50°$; b) $\cos 30° + \cos 50°$; c) $\cos 50° - \cos 30°$; d) None of these

Marks : 1

1 . a (This Answer is Correct)

2 . b

3 . c

4 . d

Q 28 : $\cos 36° = ?$

a) $\frac{\sqrt{5}-1}{4}$; b) $\frac{\sqrt{5}+1}{4}$; c) $\frac{1}{4}\sqrt{10-2\sqrt{5}}$; d) $\frac{1}{4}\sqrt{10+2\sqrt{5}}$

Marks : 1

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 29 : The 5^{th} term of the sequence $\left\{3, 1, \frac{1}{3}, \frac{1}{9}, \ldots\right\}$ is –

a) $\frac{1}{27}$
b) $\frac{1}{15}$
c) $\frac{1}{81}$
d) $\frac{1}{12}$

Marks : 1

1 . a (This Answer is Correct)

2 . b

3 . c

4 . d

Q 30 : If three unequal real numbers are in GP, then their reciprocals are in -

a) AP
b) GP
c) Arithmetico-Geometric series
d) None of these.

Marks : 1

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 31 : The relation between AM & GM of two unequal positive number is –

Marks : 1

a. $AM > GM$
b. $AM \leq GM$
c. $AM \geq GM$
d. $AM > GM$

1 . a
2 . b
3 . c
4 . d (This Answer is Correct)

Q 32 : If 7 is multiplied to each term of a GP, Then the resulting series is a -

Marks : 1

a) AP
b) GP
c) Arithmetico-Geometric series
d) None of these.

1 . a
2 . b (This Answer is Correct)
3 . c
4 . d

Q 33 : If 9 is added to each term of a GP, Then the resulting series is a -

Marks : 1

a. AP
b. GP
c. Arithmetico-Geometric series
d. None of these.

1 . a
2 . b
3 . c
4 . d (This Answer is Correct)

Q 34 : $\text{If } \bar{z} = -3 + 5i \text{ then } z = ?$

Marks : 1

a) $-3 - 5i$
b) $3 + 5i$
c) $5 + 3i$
d) $5 - 3i$

1 . a (This Answer is Correct)
2 . b
3 . c
4 . d

Q 35 : $1 + i + i^2 + i^3 + i^4 = ?$ **Where** $i = \sqrt{-1}$ **Marks :** 1

a) 0
b) 1
c) i
d) 2

1 . a
2 . b (This Answer is Correct)
3 . c
4 . d

Q 36 : The Sum of the cubes of the first n natural numbers is – **Marks :** 1

a. $n^3 + 1$
b. $\left(\frac{n(n+1)}{2}\right)^2$
c. n^3
d. *None of these.*

1 . a
2 . b (This Answer is Correct)
3 . c
4 . d

Q 37 : $\forall n \in \mathbb{N}$, $4^n + 15n - 1$ **is a multiple of –** **Marks :** 1

a. 9 ; b. 7 ; c. 5 ; d. 13

1 . a (This Answer is Correct)
2 . b
3 . c
4 . d

Q 38 : The sum of the roots of the equation $3x^2 - 5x + 7 = 0$ is ? **Marks :** 1

a) 5 ; b) $-\frac{5}{3}$; c) -5 ; d) $\frac{5}{3}$

1 . a
2 . b
3 . c
4 . d (This Answer is Correct)

Q 39 : If the intercepts on the x-axis and y-axis of a straight line be (-4) and 6 respectively, then the equation of the line is – **Marks :** 1

a. $3x - 2y = 12$
b. $3x - 2y + 12 = 0$
c. $3x + 2y = 12$
d. $3x + 2y + 12 = 0$

1 . a

(This Answer is Correct)

2 . b

3 . c

4 . d

Q 40 : The straight line joining the points (-3 , -4) & (2 , 5) is – **Marks :** 1

a. $5x - 9y = 21$
b. $x - 2y + 8 = 0$
c. $9x - 5y = -7$
d. $4x - 3y = -7$

1 . a

2 . b

3 . c (This Answer is Correct)

4 . d

Q 41 : The angle between the lines x = a and y = b is – **Marks :** 1

a. 0 degree
b. 90 degree
c. 180 degree
d. None of these.

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 42 : Which of the following is the slope of any line parallel to the line $ax + by + c = 0$ (a & b are non zero) ? **Marks :** 1

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

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 43 : The radius of the circle $x^2 + y^2 + 4x - 8y = 5$ is – **Marks :** 1

a. 5 unit
b. 4 unit
c. 3 unit
d. 6 unit

1 . a (This Answer is Correct)

2 . b

3 . c

4 . d

Q 44 : The position of the point (-3 , -2) with respect to the circle $x^2 + y^2 - 3x + 2y - 19 = 0$ is –

a) Inside the circle b) Outside the circle

c) On the Circle d) None of these.

Marks : 1

1 . a (This Answer is Correct)

2 . b

3 . c

4 . d

Q 45 : The value of $\lim_{x \to 0} \frac{e^{3x}-1}{2x} = ?$

a) $\frac{3}{2}$, b) $\frac{1}{6}$, c) $\frac{2}{3}$, d) $\frac{3}{4}$

Marks : 1

1 . a (This Answer is Correct)

2 . b

3 . c

4 . d

Q 46 : The value of $\lim_{x \to 0} \frac{\log(1+4x)}{3x} = ?$

a) 4 , b) 3 , c) $\frac{4}{3}$, d) $\frac{1}{12}$

Marks : 1

1 . a

2 . b

3 . c (This Answer is Correct)

4 . d

Q 47 : $\frac{d}{dx}(a^x) = ?$ (Where , $a > 0$)

a) $\log_e(a^x)$; b) $a^x \log_e(a^x)$; c) $a \log_e(a^x)$; d) $a^x \log_e(a)$

Marks : 1

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 48 : 1

$\frac{d}{dx}(e^x) = ?$

Marks :

a) $\log_e(a^x)$; b) $a^x \log_e(a^x)$; c) e^x ; d) $a^x \log_e(a)$

1 . a

2 . b

3 . c (This Answer is Correct)

4 . d

Q 49 : **Minimum value of $2^{(\sin\theta)^2} + 2^{(\cos\theta)^2}$ is –**

Marks : 1

a) 1 b) $\sqrt{3}$ c) $\sqrt{2}$ d) $2\sqrt{2}$

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 50 : **$\tan 70° - \tan 50° + \tan 10° = ?$**

Marks : 1

a) $\sqrt{1}$
b) $\sqrt{2}$
c) 3
d) $\sqrt{3}$

1 . a

2 . b

3 . c

4 . d (This Answer is Correct)

Q 51 :

Marks : 1

$$\frac{1}{\sin 10°} - \frac{\sqrt{3}}{\cos 10°} = ?$$

a) 2
b) 4
c) 6
d) 8

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 52 : If $3f(x) + 2f(-x) = 5(x-2)$, then the value of $f(0)$ is ?

Marks : 1

a) 1 ; b) 0 ; c) -2 ; d) 2

1 . a

2 . b

3 . c (This Answer is Correct)

4 . d

Q 53 : Given $2\cos\theta = x + \frac{1}{x}$. Then the value of $\cos 2\theta = ?$

Marks : 1

a) $x^2 + \frac{1}{x^2}$
b) $\frac{1}{2}(x^2 + \frac{1}{x^2})$
c) $x^3 + \frac{1}{x^3}$
d) $\frac{1}{2}(x^3 + \frac{1}{x^3})$

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 54 : The sum of three numbers in an A.P. is 12 and the sum of their squares is 56. The set of the numbers is –

Marks : 1

a) {2, 3, 7}
b) {2, 4 , 6}
c) {4, 3 , 5}
d) {1, 4, 7}

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 55 : The argument of the complex number $z = 3i$ is –

Marks : 1

a) π ; b) $\frac{\pi}{2}$; c) $\frac{\pi}{3}$; d) $\frac{\pi}{6}$

1 . a

2 . b (This Answer is Correct)

3 . c

4 . d

Q 56 : 1

Find the solution set where, $|x+2| \geq 3, x \in \mathbb{R}$.

Marks :

a) $[-5,1]$ b) $(-5,1)$

c) $(-\infty,-5] \cup [1, \infty)$ d) $(-\infty,-5] \cup (1, \infty)$

1. a
2. b
3. c (This Answer is Correct)
4. d

Q 57 : The circle $(x+2)^2+(y-3)^2=4$ touches –

Marks : 1

a. Both the axes.
b. The x-axis
c. The y-axis.
d. None of these.

1. a
2. b
3. c (This Answer is Correct)
4. d

Q 58 : The diameter of the circle concentric to the circle $x^2+y^2+4x-2y=20$ and passes through the origin is –

Marks : 1

a. 10 unit
b. $\sqrt{20}$ unit
c. $\sqrt{5}$ unit
d. None of these.

1. a
2. b (This Answer is Correct)
3. c
4. d

Q 59 : The value of $\lim_{x \to 1} \frac{(x+x^2+x^3+ \ \ldots \ +x^n)-n}{x-1}$ = ?

Marks : 1

a) n ; b) $\frac{n(n+1)}{2}$; c) $\frac{n(n-1)}{2}$; d) $\frac{(n+1)}{2}$

1. a
2. b (This Answer is Correct)
3. c
4. d

Q 60 : Let $5f(x)+3f\left(\frac{1}{x}\right)=x+2$ and $y=xf(x)$. Then $\left(\frac{dy}{dx}\right)_{x=1}$ = ?

Marks : 1

(a) $\frac{7}{6}$ (b) 1 (c) $\frac{7}{8}$ (d) $\frac{7}{9}$

1. a

2 . b

3 . c (This Answer is Correct)

4 . d

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