ST. LAWRENCE HIGH SCHOOL

27, BALLYGUNGE CIRCULAR ROAD

Class : 11   **Subject : MATHEMATICS**   **Term : 2nd Term**   **Max Marks : 80**

Q 1 :   The value of A for which sinA.sin(A - π/3) is maximum   **Marks :** 1

1 . 2π/3   ☑ (This Answer is Correct)

2 . 4π/3

3 . π/3

4 . none of these

Q 2 :   tan A = 3/4 and tan A .tan B =1, then the value of tan (A+B)=   **Marks :** 1

1 . π/4

2 . 3π/4

3 . π/2   ☑ (This Answer is Correct)

4 . none of these

Q 3 :   If 2cos A = x + (1/x), then cos 2A =   **Marks :** 1

1 . $x^2 + (1/x^2)$

2 . $(1/2)(x^2 + (1/x^2))$ ☑ (This Answer is Correct)

3 . $(1/2)(x^2 - (1/x^2))$

4 . none of these

Q 4 :   (1/sin 10º)- (√3/cos 10º) =   **Marks :** 1

1 . 4   ☑ (This Answer is Correct)

2 . 5

3 . 6

4 . none of these

Q 5 :   If sinA= 3/5, then cos3A =   **Marks :** 1

1 . 2/5

2 . 7/15

3 . 8/25

4 . none of these   ☑ (This Answer is Correct)

Q 6 :   The number of subsets that a set of 5 distinct elements has   **Marks :**   1

1 . 24

2 . 25   ✅ (This Answer is Correct)

3 . 26

4 . none of these

Q 7 :   If x and y are real, and x + iy = 0, then   **Marks :**   1

1 . x=0, y=1

2 . x=1, y=0

3 . x=1, y=1

4 . none of these   ✅ (This Answer is Correct)

Q 8 : $1 + I + i^2 + i^3 + i^4 =$ **Marks :**   1

1 . 0

2 . 1   ✅ (This Answer is Correct)

3 . i

4 . none of these

Q 9 :   If a series with 10 terms ,the first term is 1 and the common ratio is one, then the sum of those terms is   **Marks :**   1

1 . undefined

2 . 1

3 . 10   ✅ (This Answer is Correct)

4 . none of these

Q 10 :   The 8th term of the sequence {-8, -6, -4, -2, . . . } is The 8th term of the sequence {-8, -6, -4, -2, . . . } is   **Marks :**   1

1 . 2

2 . 4

3 . 6   ✅ (This Answer is Correct)

4 . none of these

Q 11 :   The GM of two numbers is= ±12. If one number is 16, then the other number is   **Marks :**   1

1 . 3

2 . 6

3 . 8

4 . none of these   ✅ (This Answer is Correct)

Q 12 : limit x tends to 0 on the function cos(1)/x) is **Marks :** 1

1 . 2/3

2 . 1/2

3 . 3/4

4 . none of these ✅ (This Answer is Correct)

Q 13 : If the straight lines 2x – 3y + 5 = 0 and px +2y – 6 = 0 be parallel to each other , state which of the following is the value of p **Marks :** 1

1 . (4/3)

2 . (3/4)

3 . (-4/3) ✅ (This Answer is Correct)

4 . none of these

Q 14 : The equation of the directrics of the parabola 3y²=-4x is **Marks :** 1

1 . 3y-1=0

2 . 3x-1=0 ✅ (This Answer is Correct)

3 . 3y+1

4 . none of these

Q 15 : The coordinates of the vertex of the parabola (x+1)² =-9 (y+2) are **Marks :** 1

1 . (1,2)

2 . (-1,2)

3 . (1,-2)

4 . none of these ✅ (This Answer is Correct)

Q 16 : The axis of parabola (y+1)²= -4(x-3) is parallel to **Marks :** 1

1 . positive X axis

2 . negative x axis ✅ (This Answer is Correct)

3 . positive y axis

4 . none of these

Q 17 : The length of latus rectum of the ellipse 9x² + 25y² = 225 is **Marks :** 1

1 . 18/5 ✅ (This Answer is Correct)

2 . 16/5

3 . 14/5

4 . none of these

Q 18 :   The coordinates of the vertices of the ellipse $9x^2 - 16y^2 = 144$ are   **Marks :**   1

1 .   (0,2) & (0, -2)

2 .   (0, 3) & (0, -3))

3 .   (0,4) & (0, -4)   ✅ (This Answer is Correct)

4 .   none of these

Q 19 :   The coordinates of the centre of the ellipse $4x^2 +9y^2- 16x + 18y-11=0$ are   **Marks :**   1

1 .   (2, -1)   ✅ (This Answer is Correct)

2 .   (-2, 1)

3 .   (1, -2)

4 .   none of these

Q 20 :   The sum of the focal distances of any point on the Ellipse $4x^2 +25 y^2 =100$ is   **Marks :**   1

1 .   4

2 .   5

3 .   6

4 .   none of these   ✅ (This Answer is Correct)

Q 21 :   The length of transverse axis of the hyperbola $9y^2 - 4x^2 = 36$ is   **Marks :**   1

1 .   2 units

2 .   3 units

3 .   4 unita   ✅ (This Answer is Correct)

4 .   none of these

Q 22 :   The distance between the focii of the hyperbola x= 6. secφ , y= 6. secφ is   **Marks :**   1

1 . $16\sqrt{2}$

2 . $12\sqrt{2}$ ✅ (This Answer is Correct)

3 .   16

4 .   none of these

Q 23 :   The middle term of the expansion of $(2x -3y)^{12}$ is   **Marks :**   1

1 .   6th

2 .   7th   ✅ (This Answer is Correct)

3 .   8th

4 .   none of these

Q 24 :　　In the expansion of $(2x + y)^{15}$, the indices of x and y in the 8th term are respectively　　　　**Marks :**　1

1 . 8 &7　　　　　　　　　　　　　　　☑ (This Answer is Correct)

2 . 6 & 9

3 . 9 & 6

4 . none of these

Q 25 :　　$(11^n) - 10n - 1$ is divisible by　　　　　　　　　　　　　　　　**Marks :**　1

1 . 98

2 . 99

3 . 100　　　　　　　　　　　　　　　☑ (This Answer is Correct)

4 . none of these

Q 26 :　　Numerically the greatest term in the expansion $(1+(2/3))^9$ is　　　　**Marks :**　1

1 . 4th　　　　　　　　　　　　　　　☑ (This Answer is Correct)

2 . 5th

3 . 6th

4 . none of these

Q 27 :　　How many different algebric expressions can be made combining a, b, c, d, e with the + and - signs,　　**Marks :**　1
all the letters taken together?

1 . 32　　　　　　　　　　　　　　　☑ (This Answer is Correct)

2 . 34

3 . 36

4 . none of these

Q 28 :　　Find the number of combinations in the letters of the word STATISTICS taken 5 at a time.　　**Marks :**　1

1 . 34

2 . 35

3 . 36

4 . none of these　　　　　　　　　　☑ (This Answer is Correct)

Q 29 :　　t(n) denotes the number of diagonals of the polygon of n sides. If t(n+1) - t(n) = 9, find n.　　**Marks :**　1

1 . 4

2 . 5　　　　　　　　　　　　　　　☑ (This Answer is Correct)

3 . 6

4 .   none of these

Q 30 :   In how many ways can a committee of 5 can be formed by 4 teachers and 6 students so as to include   **Marks :**   1
                 atleast two teachers?

1 .   185

2 . 186   ✅ (This Answer is Correct)

3 .   187

4 .   none of these

Q 31 :   In how many ways 7 men be selected from 16 men so that 4 particular men will not be there ?   **Marks :**   1

1 . 792   ✅ (This Answer is Correct)

2 .   793

3 .   794

4 .   none of these

Q 32 :   In how many ways can a man invite one or more of his 7 friends in a party   **Marks :**   1

1 .   121

2 .   124

3 . 127   ✅ (This Answer is Correct)

4 .   none of these

Q 33 :   How many numbers of 4 digits can be formed with the digits 1, 1, 2 2, 3, 3,4 and 5 ?   **Marks :**   1

1 .   350

2 .   352

3 . 354   ✅ (This Answer is Correct)

4 .   none of these

Q 34 :   In how many ways 10 articles can be drawn from 14 articles among which 10 are similar and   **Marks :**   1
                 remaining 4 are different?

1 . 16   ✅ (This Answer is Correct)

2 .   18

3 .   20

4 .   none of these

Q 35 :   How many different permutations can be made taking all the letters of the word DRAUGHT so that   **Marks :**   1
                 vowels are always together ?

1 . 1450

2 . 1340

3 . 1440　　　　　　　　　　　✅ (This Answer is Correct)

4 . none of these

Q 36 :　How many different permutations can be made by taking all the letters of the word STATISTICS ?　　**Marks :**　1

1 . 50400　　　　　　　　　　✅ (This Answer is Correct)

2 . 40500

3 . 54004

4 . none of these

Q 37 :　In how many ways can 4 boys and 3 girls be arranged in a row so that no two girls come together ?　　**Marks :**　1

1 . 1040

2 . 1440　　　　　　　　　　✅ (This Answer is Correct)

3 . 1443

4 . none of these

Q 38 :　How many different arrangements can be made by taking all the letters of the word COSTING so that the vowels may appear in the odd places ?　　**Marks :**　1

1 . 1444

2 . 1044

3 . 1404

4 . none of these　　　　　　✅ (This Answer is Correct)

Q 39 :　How many numbers not more than 4 digits can be formed with the digits 1, 2, 3 and 4 , repetitions being allowed ?　　**Marks :**　1

1 . 340　　　　　　　　　　✅ (This Answer is Correct)

2 . 320

3 . 330

4 . none of these

Q 40 :　If none of the digits 2, 4, 5, 7, 8, 0 be repeated, how many different numbers of 4 digits canbe formed with them?　　**Marks :**　1

1 . 100

2 . 200

3 . 300　　　　　　　　　　✅ (This Answer is Correct)

4 . none of these

Q 41 : Permutation of r items in 10 places is more than permutation of 5 items in 9 places by 5times the permutation of 4 items in 9 places. Find r.

Marks : 1

1. 3

2. 4

3. 5 ☑ (This Answer is Correct)

4. none of these

Q 42 : The equation of the smallest degree with real coefficients having 1+I as one of the roots is

Marks : 1

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

2. $x^2 - 2x + 2 = 0$ ☑ (This Answer is Correct)

3. $x^2 + 2x + 2 = 0$

4. none of these

Q 43 : If n(A)=3, n(B)=4, then n(AXAXB)=

Marks : 1

1. 12

2. 36 ☑ (This Answer is Correct)

3. 48

4. none of these

Q 44 : limit x tends to 0 on the function ln(e^ (ax) -1)/sin bx is

Marks : 1

1. a/b ☑ (This Answer is Correct)

2. b/a

3. ab

4. none of these

Q 45 : The intercepts of the st. line 7x+8y+56=0 on x and y axes are respectively

Marks : 1

1. (-8) & (-7) ☑ (This Answer is Correct)

2. 8 & 7

3. (-8)&7

4. none of these

Q 46 : The circle $(x+2)^2 + (y-3)^2 = 4$ touches

Marks : 1

1. both axes

2. x-axis

3. y-axis ☑ (This Answer is Correct)

4 . none of these

Q 47 : The coordinates of the extremities of a diameter are (x,3) and (3,5) and the centre is at (2,y). The values of x and y are respectively   **Marks :**   1

1 . 2,3

2 . 3,2

3 . 1,4   ☑ (This Answer is Correct)

4 . none of these

Q 48 : The coordinates of the focus of the parabola $3y^2 = 8x$ are   **Marks :**   1

1 . (2/3 , 0)   ☑ (This Answer is Correct)

2 . (8/3 , 0)

3 . (0, 8/3)

4 . none of these

Q 49 : The length of latus rectum of the parabola $(y-1)^2 = -(x+2)$ is   **Marks :**   1

1 . 5

2 . 6   ☑ (This Answer is Correct)

3 . 7

4 . none of these

Q 50 : The eccentricity of a rectangular hyperbola is   **Marks :**   1

1 . $\sqrt{3}$

2 . $\sqrt{2}$ ☑ (This Answer is Correct)

3 . 3/2

4 . none of these

Q 51 : The length of latus rectum of the hyperbola $9x^2 - 25y^2 = 225$ is   **Marks :**   1

1 . 9/5 units

2 . 11/5 units

3 . 18/5 units   ☑ (This Answer is Correct)

4 . none of these

Q 52 : The coordinates of the vertices of the hyperbola $9x^2 - 16y^2 = 144$ are   **Marks :**   1

1 . (0,4) & (0, -4)

✅ (This Answer is Correct)

2 . (4,0) & (-4 , 0))

3 . (0,8) & (0, -8)

4 . none of these

Q 53 : The number of terms in the expansion (x - 2/x)^ 11 is

Marks : 1

1 . 10

2 . 11

3 . 12   ✅ (This Answer is Correct)

4 . none of these

Q 54 : (3^2n) - 8n -1 is divisible by

Marks : 1

1 . 62

2 . 63

3 . 64   ✅ (This Answer is Correct)

4 . none of these

Q 55 : Value of (999)^3 is

Marks : 1

1 . 997002999   ✅ (This Answer is Correct)

2 . 997022999

3 . 99972999

4 . none of these

Q 56 : The term free of x in the expansion of (x + (1/x))^8 is

Marks : 1

1 . 4th

2 . 5th   ✅ (This Answer is Correct)

3 . 6th

4 . none of these

Q 57 : (n + 1)(n! n + (n - 1)! (2n - 1) + (n - 2)! (n - 1)) =

Marks : 1

1 . (n - 1)!

2 . n!

3 . (n + 2)!   ✅ (This Answer is Correct)

4 . none of these

Q 58 : In how many ways in which a bowler can take four wickets in a single 6-ball over

Marks : 1

1 . 6

2 . 15 ✅ (This Answer is Correct)

3 . 30

4 . none of these

Q 59 : From 8 boys and 5 girls how many different selections can be made so as to include atleast one boy and one girl? **Marks :** 1

1 . 7900

2 . 7905 ✅ (This Answer is Correct)

3 . 7908

4 . none of these

Q 60 : In how many ways 7 men be selected from 16 men so that 4 particular men will aiways be there ? **Marks :** 1

1 . 200

2 . 220 ✅ (This Answer is Correct)

3 . 240

4 . none of these

Q 61 : How many different permutations can be made by taking all the letters of the word BENGALI ? **Marks :** 1

1 . 6!

2 . 7! ✅ (This Answer is Correct)

3 . 8!

4 . none of these

Q 62 : An unbiased coin is tossed 5 times in succession. How many different outcomes are possible ? **Marks :** 1

1 . 30

2 . 32 ✅ (This Answer is Correct)

3 . 25

4 . none of these

Q 63 : How many different arrangements can be made by taking all the letters of the word ORION so that the consonants are never together ? **Marks :** 1

1 . 35

2 . 36 ✅ (This Answer is Correct)

3 . 37

4 . none of these

Q 64 :   How many different arrangements can be made by taking all the letters of the word LOGARITHM ?   **Marks :**   1

1 . 36280

2 . 356880

3 . 347880

4 . none of these   ☑ (This Answer is Correct)

Q 65 :   If none of the digits 3, 5, 7, 8, 9 be repeated, how many different numbers greater than 7000 can be   **Marks :**   1
formed with them ?

1 . 190

2 . 191

3 . 192   ☑ (This Answer is Correct)

4 . none of these

Q 66 :   Find the rank of the letter MOTHER when its letter are arranged as in a dictionary.   **Marks :**   1

1 . 396

2 . 169

3 . 309   ☑ (This Answer is Correct)

4 . none of these

Q 67 :   In how many ways a calender of a leap year can be formed so that it contains 53 Sundays ?   **Marks :**   1

1 . 2   ☑ (This Answer is Correct)

2 . 3

3 . 4

4 . none of these

Q 68 :   If permutation of 5 items in 9 places is equal to x times the permutation of 3 items in 9 places , then   **Marks :**   1
find x.

1 . 30   ☑ (This Answer is Correct)

2 . 42

3 . 56

4 . none of these

Q 69 :   Given permutation of 2 items in (n+r) places is 110 and permutation of 2 items in (n-r) places is 2. Find   **Marks :**   1
n and r.

1 . n=7,r=3

2 . n=8,r=3   ☑ (This Answer is Correct)

3 . n=8,r=4

4 . none of these

Q 70 :   If one root of the equation $x^2 + i x + 1 = 0$ is 2+3i, then the other root is   **Marks :**   1

1 . 2-3i

2 . 3+2i

3 . 3-2i

4 . none of these   ✅ (This Answer is Correct)

Q 71 :   If R = { (3,9), (3,12), (4, 8), (4, 12), (5, 10), (6, 12)} be a given relation then domain of R=   **Marks :**   1

1 . {3, 4, 5, 6}   ✅ (This Answer is Correct)

2 . {8, 9, 10, 12}

3 . {3, 5}

4 . none of these

Q 72 :   Total number of squares can be formed in a chess board is   **Marks :**   1

1 . 200

2 . 204   ✅ (This Answer is Correct)

3 . 208

4 . none of these

Q 73 :   The index of y in 10th term in the expansion of $(x + y)^{19}$ is   **Marks :**   1

1 . 9   ✅ (This Answer is Correct)

2 . 10

3 . 19

4 . none of these

Q 74 :   In how many ways 3 numbers can be selected from first 30 natural numbers such that those are in AP?   **Marks :**   1

1 . 201   ✅ (This Answer is Correct)

2 . 220

3 . 230

4 . none of these

Q 75 :   How many different factors can 2160 have?   **Marks :**   1

1 . 37

2 . 38

3 . 39 ✅ (This Answer is Correct)

4 . none of these

Q 76 :   If n parallel lins intersect with m parallel lines on a plane, how many parallelograms will be formed ?   **Marks :**   1

1 . mn(m-1)(n-1)

2 . mn(m-1)(n-1)/4 ✅ (This Answer is Correct)

3 . mn(m-1)(n-1)/6

4 . none of these

Q 77 :   Find the rank of the letter MAKE when its letter are arranged as in a dictionary   **Marks :**   1

1 . 24

2 . 40

3 . 45

4 . none of these ✅ (This Answer is Correct)

Q 78 :   In how many ways 4 letters can be put in 4 addressed envelopes so that no letter goes to the correct envelope?   **Marks :**   1

1 . 9 ✅ (This Answer is Correct)

2 . 24

3 . 23

4 . none of these

Q 79 :   Find the remainder when (np)! Is divided by $(n!)^p$ **Marks :**   1

1 . 2

2 . 0 ✅ (This Answer is Correct)

3 . n

4 . none of these

Q 80 :   Find the sum of all the four digited numbers formed by the digits 1, 2, 3, 4 without repetition   **Marks :**   1

1 . 66660 ✅ (This Answer is Correct)

2 . 66760

3 . 67660

4 . none of these