ST. LAWRENCE HIGH SCHOOL

27, BALLYGUNGE CIRCULAR ROAD

Class : 12 **Subject : MATHEMATICS** **Term : SECOND TERM** **Max Marks : 80**

Q 1 : If I be the unit matrix of order 10X10, then the determinant of I is equal to **Marks :** 1

1 . 1 (This Answer is Correct)

2 . 9

3 . 10

4 . none of these

Q 2 : If the tangent to the continuous curve y=f(x) at P(a, b) is parallel to x-axis, then the slope of the tangent at P is **Marks :** 1

1 . 0 (This Answer is Correct)

2 . 1

3 . 0.5

4 . none of these

Q 3 : The slope of the normal to the rectangular hyperbola xy=4 at (2t, 2/t) is **Marks :** 1

1 . $- t^2$

2 . t^2 (This Answer is Correct)

3 . 2t

4 . none of these

Q 4 : The angle between the tangents to the curves $y=x^2$ and $x= y^2$ at (1, 1) is **Marks :** 1

1 . π/5

2 . π/3

3 . π/2

4 . none of these (This Answer is Correct)

Q 5 : Let R = {(a , a) , (b , b) , (c , c) , (a , b)} be a relation on a set A = {a , b , c}. Then, R is **Marks :** 1

1 . Transitive

2 . Reflexive (This Answer is Correct)

3 . symmetric

4 . none of these

Q 6 : The greatest integer function f(x)= [x] is **Marks :** 1

1 . Continuous at all real values of x

2 . Continuous only at non integralvalues of x (This Answer is Correct)

3 . Continuous at all integral values of x

4 . none of these

Q 7 : The set of points where the function f(x) = Ix-3Icosx is differentiable, is **Marks :** 1

1 . R

2 . R-{3} (This Answer is Correct)

3 . (0,∞)

4 . none of these

Q 8 : The differential equation whose solution is V = A/r + B , where A, B are constant is of order **Marks :** 1

1 . 4

2 . 3

3 . 2 (This Answer is Correct)

4 . 1

Q 9 : The differential equation whose solution is V = A/r + B , where A, B are constant is of degree **Marks :** 1

1 . 2

2 . 3

3 . 4

4 . 1 (This Answer is Correct)

Q 10 : Let R be a relation over the set of all straight lines in a plane such that lRm⇔l⊥m, where l and m are the straight lines. Yhen R is **Marks :** 1

1 . symmetric (This Answer is Correct)

2 . reflexive

3 . transitive

4 . equivalence

Q 11 : If A = {a , b , c} , then the relation R = {(b,c)} on A is **Marks :** 1

1 . symmetric

2 . reflexive

3 . transitive (This Answer is Correct)

4 . equivalence

Q 12 : The order of differential equation obtained by the elimination of the arbitrary constants a, b, c from the equation ax + by + c = 0 is **Marks :** 1

1 . 2 (This Answer is Correct)

2 . 3

3 . 1

4 . none of these

Q 13 : The differential equation whose solution is $(x-a)^2+(y-a)^2=r^2$ for all a and b where r is a constant is of order **Marks :** 1

1 . 1

2 . 2 (This Answer is Correct)

3 . 3

4 . 4

Q 14 : The critical points of the function $f(x)= (2/3)x^3 - x^2-2x+5$ are **Marks :** 1

1 . 1/2, -2

2 . (-)1/2,2

3 . 1/2,2

4 . none of these (This Answer is Correct)

Q 15 : Integrate the function f(x) = sin2xln(tan x) with respect to x in the interval 0 to π/2 **Marks :** 1

1 . 0 (This Answer is Correct)

2 . 1

3 . 2

4 . none of these

Q 16 : Integrate the function $f(x) = x\sqrt{(2 - x)}$with respect to x in the interval 0 to 2 **Marks :** 1

1 . 1

2 . 2

3 . 3

4 . none of these (This Answer is Correct)

Q 17 : Solution of $dx +xdy = \exp(-y). \text{cosec}^2y\ dy$ is **Marks :** 1

1 . $x.\exp(y)=\tan y + c$

2 . x.exp(x)=tany + c

3 . x.exp(y)=tanx + c

4 . none of these (This Answer is Correct)

Q 18 : Integrate the function f(x)=sec³x. with respect to x **Marks :** 1

1 . tanx + c

2 . sinx + c

3 . cosx + c

4 . none of these (This Answer is Correct)

Q 19 : The value of integral 1/(2x+1) with respect to x in the interval 2 to 4 is **Marks :** 1

1 . ln(7/5)

2 . null matrix

3 . (1/2)ln(7/5)

4 . none of these (This Answer is Correct)

Q 20 : limit x→0 of the function $(x^7 - a^7)/(x + a) = 7$, then the value of a is **Marks :** 1

1 . 1

2 . -1

3 . 1 or -1

4 . none of these (This Answer is Correct)

Q 21 : The probability of getting 9 dots with two unbiased dice is **Marks :** 1

1 . 1/9 (This Answer is Correct)

2 . 1/6

3 . 1/18

4 . none of these

Q 22 : If A,B,C are equally likely, exhaustive and mutually exclusive, then P(A) = **Marks :** 1

1 . 0

2 . 1

3 . 1/3 (This Answer is Correct)

4 . none of these

Q 23 : The probability of getting a ‘heart’ in drawing from a full pack of cards in second trial when in first trial a spade appeared **Marks :** 1

1 . 0

2 . 13/51 (This Answer is Correct)

3 . 12/51

4 . none of these

Q 24 : If P(B/A) = P(B), then A and B are **Marks :** 1

1 . equal

2 . dependent

3 . idependent (This Answer is Correct)

4 . none of these

Q 25 : A room has 3 electric points. Form a lot of 12 electric lamps of which 7 are good, 3 are selected at random and put in the points. Find the probability that the room is lighted **Marks :** 1

1 . 1/21

2 . 1/22 (This Answer is Correct)

3 . 1/23

4 . none of these

Q 26 : The probability of having a total of 9 from throw of 2 unbiased dice is **Marks :** 1

1 . 1/9 (This Answer is Correct)

2 . 7/36

3 . 5/36

4 . none of these

Q 27 : Two players A and B throw an unbiased die one after another to get the '6' first and wins the game. A starts the game. Probability that A wins **Marks :** 1

1 . 5/11

2 . 6/11 (This Answer is Correct)

3 . 7/11

4 . none of these

Q 28 : Each of two boxes contain 5 white and 4 black balls. One ball is transferred from 1st to the 2nd box. Find the probability that it is white **Marks :** 1

1 . 4/9

2 . 5/9 (This Answer is Correct)

3 . 1

4 . none of these

Q 29 : Using Baye's theorem we find the probability of **Marks :** 1

1 . posterior event

2 . prior event

3 . prior given posterior event (This Answer is Correct)

4 . none of these

Q 30 : Two non null mutually exclusive events can independent. The statemrnt is **Marks :** 1

1 . always true

2 . never true (This Answer is Correct)

3 . sometimes true

4 . none of these

Q 31 : Each of n boxes contain 5 white and 4 black balls. One ball is transferred from 1st to the 2nd, 2nd to 3rd, .., (n-1) to nth box.A ball is drawn from nth box Find the probability that it is white **Marks :** 1

1 . 4/9

2 . 5/9 (This Answer is Correct)

3 . 1

4 . none of these

Q 32 : limit x→0 of the function (exp(5x) - 1)/(3x) is **Marks :** 1

1 . (5/3) (This Answer is Correct)

2 . (3/5)

3 . $\sqrt{(a^2 - b^2)}$

4 . none of these

Q 33 : The area bounded by the line 2x-3y=0, x axis and the ordinates x=3, x=5 is **Marks :** 1

1 . 16

2 . 8

3 . 64/9

4 . none of these (This Answer is Correct)

Q 34 : The area bounded by the the curve $y^2 = x$, x axis ,x=1 and x=9 is **Marks :** 1

1 . 49/3

2 . 52/3 (This Answer is Correct)

3 . 9/2

4 . none of these

Q 35 : The area bounded by the the curve $y=x^3- 8$and coordinate axis in the fourth quadrant is squnits **Marks :** 1

1 . 10

2 . 11

3 . c^2ln3 (This Answer is Correct)

4 . none of these

Q 36 : The area bounded by the the curve $xy=c^2$, the x axisand two coordinates x=c and x=2c is **Marks :** 1

1 . c^2 ln2 (This Answer is Correct)

2 . c.ln2

3 . 2

4 . none of these

Q 37 : The area bounded by the the curve y= Ix-1I and y= 3 - IxI is **Marks :** 1

1 . 4 (This Answer is Correct)

2 . 3

3 . 3

4 . none of these

Q 38 : The area S bounded by the the curve $y= \sqrt{(1 - x^2)}$ and $y = x^3-x$, then the value of π/S **Marks :** 1

1 . 1

2 . 2 (This Answer is Correct)

3 . 6

4 . none of these

Q 39 : The area inside the parabola $5x^2- y=0$ and outside the parabola $2x^2-y+9=0$ is $2k\sqrt{3}$ squnits, then the value of k **Marks :** 1

1 . 4

2 . 5

3 . 8 (This Answer is Correct)

4 . none of these

Q 40 : If the area enclosed between the curves $|y| = 1 - x^2$ and $x^2 + y^2 = 1$ is $(3\pi - 8)$ squnits, then k is equal to **Marks :** 1

1 . 2

2 . 4

3 . 3 (This Answer is Correct)

4 . none of these

Q 41 : If the area enclosed between the curves y=ln(x+e), x= ln(1/y) is k squnits. K= **Marks :** 1

1 . 1

2 . 2 (This Answer is Correct)

3 . 2/3

4 . none of these

Q 42 : If the area enclosed between the curves x=0, y=0, $y=x^2+1$ and x=1 is A squnits, then A= **Marks :** 1

1 . 5/6

2 . 4/3 (This Answer is Correct)

3 . 2/3

4 . none of these

Q 43 : The area of the region bounded by y=4x+5, y=5-x and 4y=x+5 is **Marks :** 1

1 . 5.5

2 . 6.5

3 . 7.6 (This Answer is Correct)

4 . none of these

Q 44 : For a matrix A, and the product of A and transpose of A is an identity matrix, the A is known as **Marks :** 1

1 . orthogonal (This Answer is Correct)

2 . symmetric

3 . idempotent

4 . none of these

Q 45 : The product of a identity matrix with its inverse is **Marks :** 1

1 . Identity matrix (This Answer is Correct)

2 . Null matrix

3 . Diagonal matrix

4 . none of these

Q 46 : The length of tangent from the point (7, 2) to the circle $2x^2+2y^2+5x+y-15=0$ is k, then k= **Marks :** 1

1 . 2

2 . 4

3 . 8 (This Answer is Correct)

4 . none of these

Q 47 : The principal value of cos inverse (-1/2) is **Marks :** 1

1 . π/3

2 . 2π/3 (This Answer is Correct)

3 . π/2

4 . none of these

Q 48 : The principal value of cosec inverse (-√2) is **Marks :** 1

1 . - π/4 (This Answer is Correct)

2 . 2π/3

3 . π/2

4 . none of these

Q 49 : The function f(x) = x-[x], where [.] denotes the greatest integer function is **Marks :** 1

1 . Continuous everywhere

2 . Continuous only at non integralvalues of x (This Answer is Correct)

3 . Continuous at all integral values of x

4 . none of these

Q 50 : The function f(x) = 1+ Icos xI is **Marks :** 1

1 . Continuous nowhere

2 . Continuous everywhere (This Answer is Correct)

3 . Not differentiable at x=0

4 . none of these

Q 51 : The minimum value of the function $y=x^2-6x+17$ is **Marks :** 1

1 . 2

2 . -2

3 . 3

4 . none of these (This Answer is Correct)

Q 52 : Integrate the function f(x) = cosx/ (sinx - cos x) with respect to x **Marks :** 1

1 . (x/2)+(1/2).lnlsinx - coxl+c

2 . (x/2)-(1/2).lnlsinx - coxl+c

3 . (x/2)+(1/4).lnlsinx - coxl+c

4 . none of these (This Answer is Correct)

Q 53 : If the vectors a= 2i - j and b= 3i- 2j +4k, i, j and k are the unit vectors then the value of aXb **Marks :** 1

1 . 4i-8j-k

2 . (-)4i - 8j +k

3 . 4i-8j+k

4 . none of these (This Answer is Correct)

Q 54 : If the sets A and B are equally likely then (AB) is **Marks :** 1

1 . symmetric

2 . ∅

3 . 0

4 . none of these (This Answer is Correct)

Q 55 : If A and B are independent events and P(A) = 0.5, P(B) = 0.7, then P(A–B) **Marks :** 1

1 . 0.15 (This Answer is Correct)

2 . 0.25

3 . 0.35

4 . none of these

Q 56 : P(A)=3/8, P(B)=5/8 and P(A+B) =3/4, then P(A/B) = **Marks :** 1

1 . 1/3

2 . 2/3

3 . 1/5

4 . none of these (This Answer is Correct)

Q 57 : If A, b, C are mutually exclusive, mutually independent and exhaustive,then the probability that A,B and C occur simultaneously is **Marks :** 1

1 . 1/3

2 . 0

3 . 1

4 . none of these (This Answer is Correct)

Q 58 : When 4 letters are placed in 4 addressed envelopes then find the probability that all letters go to the wrong envelope **Marks :** 1

1 . 9/24 (This Answer is Correct)

2 . 11/24

3 . 13/24

4 . none of these

Q 59 : If P(neither A nor B occurs) is 1 , what is the probability of occurrence of at least one of the two events? **Marks :** 1

1 . 1/2

2 . 1/3

3 . 1/4

4 . none of these (This Answer is Correct)

Q 60 : The area bounded by the the curve $2y^2 - 3x = 0$, y axis , y=1 and t=4 is **Marks :** 1

1 . 7

2 . 14 (This Answer is Correct)

3 . 1

4 . none of these

Q 61 : The area bounded by the the curve y= cos x, x axis and two ordinates $x = -\pi/2$ and $x = \pi/2$ **Marks :** 1

1 . 2 (This Answer is Correct)

2 . -2

3 . -3

4 . none of these

Q 62 : The area bounded by the the curve y=0, one arc of sinx, between (0, 0) and (π, 0) is squnits **Marks :** 1

1 . 2 (This Answer is Correct)

2 . 3

3 . 3

4 . none of these

Q 63 : The area bounded by the the curve y= cos x, x axis and two ordinates $x = \pi/2$ and $x = 3\pi/2$ is squnits **Marks :** 1

1 . 1

2 . 2 (This Answer is Correct)

3 . 12

4 . none of these

Q 64 : If the area enclosed between the curves $y=x^2+1$and $y=2$ is A squnits, then A= **Marks :** 1

1 . 5/6 (This Answer is Correct)

2 . 4/3

3 . 2/3

4 . none of these

Q 65 : If the area enclosed between the curves $x=0$, $y=x^2+1$and $y=2$ is A squnits, then A= **Marks :** 1

1 . 5/6

2 . 4/3

3 . 7.5 (This Answer is Correct)

4 . none of these

Q 66 : Matrix A is known as nilpotent matrix iff AXA = **Marks :** 1

1 . I

2 . A

3 . A^2

4 . none of these (This Answer is Correct)

Q 67 : Which of the following systems of equations has infinite number of solutions ? i. x-3y+4z=7, 3x-4y+5z=8, 4x-5y+6z=9; ii. 3x+4y+5z=2, x+2y+3z=1, 5x+6y+7z=3 **Marks :** 1

1 . only i

2 . only ii

3 . both I and ii (This Answer is Correct)

4 . none of these

Q 68 : The slope of the normal to the circle $x^2+y^2=a^2$ at (a.cosP, b.sinP) is **Marks :** 1

1 . -cot P

2 . -tanP

3 . tan P (This Answer is Correct)

4 . none of these

Q 69 : When $y=x(c-x)$ and $y = x^2 + ax + b$ touch each other at the point (1, 0), then **Marks :** 1

1 . a+b+c=0 (This Answer is Correct)

2 . a-b=2

3 . b-c=1

4 . none of these

Q 70 : f(x+y)=f(x)+f(y), for all real x,y. if f(x) is continuous at x=0, then f(x) is **Marks :** 1

1 . Continuous at all real values of x (This Answer is Correct)

2 . Discontinuous at x=1

3 . Continuous only at x=1

4 . none of these

Q 71 : The function f(x) = Ix+1I is **Marks :** 1

1 . Continuous at x=-1 (This Answer is Correct)

2 . Differentiable at x=1

3 . Differentiable at x=±1

4 . none of these

Q 72 : The function f(x) = IxI is **Marks :** 1

1 . not continuous

2 . continuous but not differentiable everywhere (This Answer is Correct)

3 . Differentiable but not Continuous

4 . none of these

Q 73 : Solution of (dy/dx)-y tanx=-2 is **Marks :** 1

1 . ysinx= (1/2)cos2x +c

2 . ycosx= (1/2)cos2x +c

3 . ysinx= (1/2)cosx +c

4 . none of these (This Answer is Correct)

Q 74 : Solution of ydx-(x+ $2y^2$)dy= 0 is **Marks :** 1

1 . $x=y^2 +cy$

2 . $x= 2y^3 +cy$ (This Answer is Correct)

3 . $x= 2y^2 +cy$

4 . none of these

Q 75 : 1

In a throw of two unbiased dice, a boy gets a total of 5. Find the probability that he will not get a total of 5 in the next throw **Marks :**

1 . 7/81

2 . 2/81

3 . 3/81

4 . none of these (This Answer is Correct)

Q 76 : What is the probability that a number selected at random from 1, 2, 3, .., 100 has a digit 4? **Marks :** 1

1 . 0.18 (This Answer is Correct)

2 . 0.19

3 . 0.2

4 . none of these

Q 77 : The minimum value of the function (a.sinx + b.cosx) is **Marks :** 1

1 . $\sqrt{(a^2 + b^2)}$

2 . $(-)\sqrt{(a^2 + b^2)}$ (This Answer is Correct)

3 . 4

4 . none of these

Q 78 : The area bounded by the the curve y= sin x, x axis and x= π/2 and x=2 π **Marks :** 1

1 . 1

2 . -1

3 . 55/4

4 . none of these (This Answer is Correct)

Q 79 : The area bounded by the the curve x-2y+4=0, x=3 and x=6 is **Marks :** 1

1 . 49/4

2 . 51/4 (This Answer is Correct)

3 . 55/3

4 . none of these

Q 80 : The area bounded by the the curve y=2, y=5 and $y=3x^2$ is **Marks :** 1

1 . 3/2

2 . 5/2

3 . 4

4 . none of these (This Answer is Correct)
