Unit 1:

Question 1 0 / 1 point

In the following options, which is not an exact number?

- ○ 1
- ○ 0.5
- ○ 43864
- ➡ ○ **44/14**

There are two kinds of numbers, exact and approximate numbers. The numbers like 1, 2, 3,..., 1/2 (= 0.5), 2/3(= 1.5), ... are treated as exact numbers. But there are numbers 2/7(=0.285714....), π (= 3.14159....), √2 (= 1.4142....), e (= 2.71828....) which cannot be expressed by a finite number of digits.

Question 2 0 / 1 point

Which of the following number has the greatest precision?

- ○ 4.2301
- ○ 4.23
- ➡ ○ **4.230106**
- ○ 4.01

Precision depends on more number of digits after decimal point

Question 3 0 / 1 point

The quantity of error which is present in the statement of the problem itself, before finding its solution is termed as

- ○ Numerical error
- ○ Round of error
- ➡ ○ **Inherent error**
- ○ Truncation error

Question 4 0 / 1 point

Error is defined as

- ➡ ○ **True value - computed value**
- ○ True value + computed value
- ○ True value - approximated value
- ○ True value * computed value

Question 5 0 / 1 point

Taylor's series at the origin can be termed as

- **Maclaurin's expansion**
- Taylor's expansion
- Lagrangian expansion
- None of the above

Question 6 0 / 1 point

Rolls theorem states that

- if f[x] is (i) continuous in [a, b], [ii] differentiable in [a,b] and (iii) f[a] = f[b] then c ? [a,b] such that f'[c] ? 0
- if [x] is [ii]continuous in [a,b], [ii] differentiable in [a,b] and [iii] f[a] ? f[b] then c ? [a,b], such that f'[c] = 0
- **if f[x] is [i] continuous is [a,b], [ii] differentiable in [a,b] and [iii] f[a] = f[b] then c ∈ [a,b], such that f'[c] = 0**
- if f[x] is [i] continuous is [a,b], [ii] differentiable in [a,b] and [iii] f[a] = f[b] then c?[a,b] such that f'[c] = 0

Question 7 0 / 1 point

In the below statement, which is wrong statement :

- **all non zero statements are not significant.**
- All zero occurring between non-zero digits are significant digits
- Trailing zeros following a decimal points are significant
- Zero between the decimal point and preceding a non zero digit are not significant

Question 8 0 / 1 point

If 2/3 is approximated by 0.667 then the absolute and relative error will be.

- 1/3 * 10-3 and 1/3 * 10-3 respectively
- **1/4 * 10-3 and 1/2 * 10-3 respectively**
- 1/4 * 10-3 and 1/3 * 10-3 respectively
- 1/2 * 10-3 and 1/3 * 10-3 respectively

x = 2/3 = 0.6667(up to 4 decimal places), approximate value y = 0.667,

Absolute Error = |y-x| = |0.667-0.6667| = 3 X 10^{-4} = 0.0003

Relative Error = |y – x|/ |x| = 0.0003/0.6667 = 0.0004499

Question 9 0 / 1 point

The truncation error in the result of the following function for x = 1/5 , when we use

- 0.1402755*10-2 0.36789*10-4 0.275555*10-5
- 0.0827697*10-2 0.54278*10-4 0.1567*10-5
- **0.1402755*10-2 0.694222*10-4 0.275555*10-5**

- 0.5869*10-2 0.76*10-4 0.13567*10-5

i) first three terms

ii) first four terms

iii) first five terms

$e^x = 1 + x + x^2/2! + x^3/3! + x^4/ 4 ! + x^5/ 5 ! + x^6/6!$

i) The truncation error when first three terms are added

$= e^x – (1 + x + x^2/2!) = + x^3/3! + x^4/ 4 ! + x^5/ 5 ! + x^6/6!$

$= (0.2)^3/3! + (0.2)^4/4! + (0.2)^5/5! + x^6/6! = 0.0013333 + 0.000066667 + 0.0000026667 + 0.00000008888889$

$= 0.1402755 \text{ X } 10^{-2}$.

ii) Truncation error when first four terms are added.

Truncation error $= e^x –(1 + x + x^2/2! + x^3/3!) = + x^4/ 4 ! + x^5/ 5 ! + x^6/6!$

$= (0.2)^4/4! + (0.2)^5/5! + x^6/6! = 0.000066667 + 0.0000026667 + 0.00000008888889$

$= 0.694222 \text{ X } 10^{-4}$.

iii) The truncation error when first five terms are added

Truncation error $= e^x – (1 + x + x^2/2! + x^3/3! + x^4/ 4 !)$

$= + x^5/ 5 ! + x^6/6! =0.0000026667 + 0.00000008888889$

$= 0. 275555 \text{ X } 10^{-5}$.

Question 10 0 / 1 point

The percentage error if 625.483 is approximated to 3 significant digits will be.

- **0.0772**
- 0.0562
- 0.0652
- 0.0712

Absolute Error = Ea = | True value – Approximate value | = | 625.483 – 65 | = 0.483

Relative Error = Er = Absolute Error / True value = Ea/True value = 0.483/625.483

$= 7.722032 \text{ X } 10^{-4}$

Percentage error =Ep = Er X 100 $= 7.722032 \text{ X} 10^{-2}$

Question 11 0 / 1 point

The value √102 - √101 will be,

- 0.02566
- **0.04963**
- 0.03986
- 0.05463

Unit 2:

Question 1 0 / 1 point

Let z = x+ y be the addition of two different numbers x & y and $z_A = x_A + y_B$ be the sum of approximated volume of x & y, so the error in z and zA is given as:

- ez = z + zA
- ez = z * zA
- **ez = z- zA**
- ez = z �zA

ıestion 2 0 / 1 point

The Total numerical error is defined as the

- sum of truncating error and relative error
- product of truncating error and round-off error
- product of truncating error and relative error
- **sum of truncating error and round-off error**

Question 3 0 / 1 point

the errors which can be either due to human imperfection or computer malfunctioning are called as

- significant error
- round of error
- **blunders**
- truncating errors

Question 4 0 / 1 point

error which is known as noise is

- blunders
- **data uncertainty**
- round off error
- truncating error

Question 5 0 / 1 point

round off errors decreases by

- **increasing the number of significant digits**
- decreasing the number of significant digits
- approximation
- subtractive cancellation

Question 6 0 / 1 point

formulating or formulation errors are due to

- complete mathematical modeling
- **incomplete mathematical modeling**
- due to ancient model
- none of the above

Question 7 0 / 1 point

for the function f[x] = x3, the error in f[x] will be [for the given data, xa = 2.5 and Δxa=0.01]

- **0.1875**
- 0.09
- 0.2375
- 0.1435

$\Delta f(x_a) = |\, f(x) - f(x_a)\, |$

$f'(x_a) = 3x^2$

$= |\, 3 \text{ X } (2.5)^2\, |$

$= 18.75$

$f(x_a) = 18.75 \text{ X } 0.01 = 0.1875$

Question 8 0 / 1 point

In the following figure A & B represents

- **Point of diminishing returns and truncating respectively**
- Point of diminishing returns and blunder respectively
- Point of enlarging returns and truncating respectively
- Point of enlarging returns and blunder respectively

Question 9 0 / 1 point

The relative maximum error in f is Where f = (5x2y/z3) given that Δx =Δy = 0.001 & x = y = 1

- 0.029
- **0.004**
- 0.0036
- 0.0052

$f = (5x^2y)/(z^3)$

$$\frac{\partial f}{\partial x} = \frac{\partial}{\partial x}\left(\frac{5x^2y}{z^3}\right) = \frac{10xy}{z^3}$$

$$= \frac{\partial f}{\partial y} = \frac{\partial}{\partial x}\left(\frac{5x^2y}{z^3}\right) = \frac{5x^2}{z^3}$$

x=1, y=1, Δx=0.001, Δy=0.001

$$\frac{\partial f}{\partial x} = \frac{\partial}{\partial x}\left(\frac{5x^2y}{z^3}\right) = \frac{10(1)(1)}{z^3} = \frac{10}{z^3}$$

$$\frac{\partial f}{\partial y} = \frac{\partial}{\partial x}\left(\frac{5x^2y}{z^3}\right) = \frac{5x^2}{z^3} = \frac{5(1)^2}{z^3} = \frac{5}{z^3}$$

$$\Delta f = \left|\frac{\partial f}{\partial x}\right| \Delta x + \left|\frac{\partial f}{\partial y}\right| \Delta y$$

$$\Delta f = \left|\frac{10}{z^3}\right| X0.01 + \left|\frac{5}{z^3}\right| X0.001$$

$$\Delta f = \frac{(10X0.001) + (5X0.001)}{Z^3}$$

$$\Delta f = \frac{0.015}{Z^3}$$

$$f = \frac{5x^2y}{z^3}$$

$$f = \frac{5(1)^2(1)}{z^3} = \frac{5}{z^3}$$

$$Relative\ maximum\ error = \frac{\Delta f}{f} = \frac{0.015}{5} = 0.003$$

Question 10 0 / 1 point

The taylor's series of the function f[x]=3x^5-2x^4+15x^3+13x^2-12x-5 at point c=2 will be

- ○ 207 + 396[x-2]2 + 295[x-2]3 + 101[x-2]4 +26[x-2]5
- ○ 207 + 396[x-2]2 + 295[x-2]2 + 101[x-2]3 +26[x-2]4+3[x-2]5
- ○ 200 + 326[x-2]2 + 295[x-2]3 + 119[x-2]4 +28[x-2]5+3[x-2]5
- → ○ **207 + 396[x-2] + 295[x-2]2 + 119[x-2]3 +28[x-2]4+3[x-2]5**

$f[x]=3x^5-2x^4+15x^3+13x^2-12x-5$
$f^{(1)}(x) = 15x^4 – 8x^3 + 45x^2 + 26x -12$
$f^{(2)}(x) = 60x^3 – 24x^2 +50x +26$
$f^{(3)}(x) = 180x^2 – 48x + 50$
$f^{(4)}(x) = 360x$
$f^{(5)}(x) = 360$
at x=2, f(x) = 207, $f^{(1)}(x) = 396$, $f^{(2)}(x) = 590$, $f^{(3)}(x) =714$,
$f^{(4)}(x)=672$
from taylor series,
207 + 396(x-2) +295 $(x-2)^2 +$ 119 $(x-2)^3 + 28(x-2)^4 +$
$3(x-2)^5$

Question 11 0 / 1 point

The relative error for the function f[x,y,z] = $3x^2y^2 + 5y^2z^2 - 7x^2z^2 + 38$ [where x = y = z = 1 & Δ x = -0.05, Δy = 0.001, Δz=0.02

- **0.029**
- 0.019
- 0.036
- 0.1

Where x = y = z = 1and Δx = −0.05, Δy = 0.001, Δz = 0.02
Solution: Given that f(x, y, z) = $3x^2y^2 + 5y^2z^2 - 7x^2z^2 + 38$

At (x, y, z) = (1,1,1)

f(x, y, z) = 3 + 5 − 7 + 38 = 39

$$\frac{\partial f}{\partial x} = 6xy^2 - 14xz^2$$
$$\frac{\partial f}{\partial y} = 6x^2y + 10yz^2$$

$$\frac{\partial f}{\partial z} = 10y^2z - 14x^2z$$

|Δf| = $\sum \frac{\partial f}{\partial xi} = \Delta x_i = |(6xy^2 - 14xz^2)\Delta x| + |(6x^2y + 10yz^2)\Delta y| + |(10y^2z - 14x^2z)\Delta z|$

= |(−8)(0.05)| + |(16)(0.001)| + |(−4)(0.02)| = |-0.4| + |0.016| + |-0.08| = 0.496

Relative error = $\frac{|\Delta f|}{f} = \frac{0.496}{39} = 0.0127$

Question 12 0 / 1 point

The taylors series of the function (1/(1-x)) at x0 =2 is

- 1/5{1-([x-3]/5)+([x-3]2/5)-([x-2]3/5)+.............}
- 1/5{1-([x-2]/5)+([x-2]2/5)-([x-2]3/5)+.............}
- **1/5{1-([x-2]/5)+([x-2]/5)2-([x-3]/5)3+.............}**
- 1/5{1-([x-3]/5)+([x-2]2/5)-([x-2]3/5)+.............}

Unit 3:

Question 1 0 / 1 point

The solution for Δa^x is. (refer page no. 7 in notes)

- ax(1-ah)
- ah(1-ax)

- ax(1-ax)
- **$a^x(a^h-1)$**

Question 2 0 / 1 point

The solution for $\Delta^2 e^x$ will be (refer page no.7 in notes)

- (1-ex)2eh
- **$(e^h-1)^2 e^x$**
- (eh-1)2ex
- (ex-1)2eh

Question 3 0 / 1 point

If $f(x)=3x^2+1$, then $\Delta^2 f(x)$ and h=1 is, (refer page no. 8 in notes)

- 6
- **1**
- 2
- 3

Question 4 0 / 1 point

Let a function f(x) is given at a point (0,7),(4,43),(8,367) then the forward difference of the function at x=4 is, (refer page no 8 in notes)

- 364
- 492
- **324**
- 298

Question 5 0 / 1 point

The solution of $\Delta((x+1)(x+2))$ is, (refer page no 8 in notes)

- **h(2x+h+3)**
- h(3x+h+3)
- h(1x+2h+4)
- h(4x+h+3)

Question 6 0 / 1 point

Evaluate $\Delta^2 0^3$ (refer page no.23 in notes)

- 7
- **6**
- 5
- 3

Question 7 0 / 1 point

Let a function f(x) is given at a point (0,2),(2,10),(4,15),(6,18),(8,22),(10,10), then $\nabla y_4, \nabla^3 y_3$

- 2 and 4 (refer page no 11 in notes)
- 1 and 6
- **4 and 1**
- 4 and 3

Question 8 0 / 1 point

For the following set of values ?6 will be (Backward difference) (solution not found)

- 0.7 (for backward difference refer page no.10)
- 0.6
- 0.9
- **0.8**

Question 9 0 / 1 point

$\Delta f(x)$, $\Delta^2 f(x)$, $\Delta^3 f(x)$ for the following x^2+2x+3 with h=2. Will be (SAQ)

- **4x+8,8,0**
- 8+4x,4x+8,0
- 6x+9,6,0
- none of the above

Unit 4:

Question 1 0 / 1 point

The root for the equation $x^2-1=0$ are

- 1 & 0
- **1 & -1**
- -10
- none of the above

Question 2 0 / 1 point

The degree of the equation $x^3-3x^2+4x-5=0$

- 1
- 2
- **3**
- 4

Question 3 0 / 1 point

The solution of the equation f[x]=0 is called a

- **root of f[x]=0**
- 0
- both a & b
- none of the above

Question 4 0 / 1 point

The equation of the form x- $\frac{1}{e^x}$is called as the

- Linear equation
- **transcendental equation**
- both a & b
- polynomial equation

Question 5 0 / 1 point

Bisection Method is

- **iterative method**
- finite difference method
- integral method
- differential method

Question 6 0 / 1 point

The false position method can be much farther than the Bisection method

- **TRUE**
- FALSE
- Partially true
- True with some conditions

Question 7 0 / 1 point

The real root of the equation 8[x] = x^3-3x-5 lie between

- **2 & 3**
- 1 & 2
- 0 & 3
- 0 & 2

Question 8 0 / 1 point

which of the statement is wrong

- Newton- raphson formula converges provided the initial approximation is chosen sufficiently Close to the root zeta.
- Newton raphson method generally used to improve the result obtained by other methods it is applicable to the solution of both algebraic and transcendental equation.

- The Newton raphson method has the fastest convergence . it is an excellent method if one is already near the root. It is useful in case of large value of [x]
- **It is applicable to the solution for only alzebraic equation.**

Question 9 0 / 1 point

The real root of the equation x sin x + cos x=0 [by taking the initial approximation as x = π and by using the Newton's Raphson method] (Refer page no. 27)

- **2.7984**
- 2.3684
- 2.5908
- 2.1623

Question 10 0 / 1 point

The real root of the equation x^3-4x-9 =0 [by using the bisection method]

- **2.7051** (refer page no 9)
- 2.164
- 2.2345
- 2.9808

Question 11 0 / 1 point

The double root of the equation x^3- x^2 + x + 1 = 0 is (refer page no 29)

- Double root is 1 with multiplicity 3
- **Double root is 1 with multiplicity 2**
- Double root is 2 with multiplicity 1
- Double root is 2 with multiplicity 3

Question 12 0 / 1 point

The real root of 2x - log 10 x = 7 is (refer page no. 20)

- 2.9808
- 3.9682
- **3.7892**
- 3.3482

Unit 5

Question 1

In a system of m linear equations in n unknowns

- Heterogeneous system (Refer page no. 4)
- Non- homogenous system
- **Homogeneous system**

- Non- heterogeneous system

Question 2

An identity matrix is the one in which

- A square matrix in which all the elements are 1
- A square matrix in which all the elements are 0
- **A square matrix in which all the elements of principal diagonal are ones (1's) & all other elements are 0**
- A square matrix in which all the elements of principal diagonal are zero's (0's) & all other elements are 1

Question 3

When you multiply a matrix by its inverse matrix, you get

- **Identity matrix**
- Diagonal matrix
- Zero matrix
- Scalar matrix

Question 4

In the given equation AX=B, if A is a non- singular matrix the equation AX=B has

- Infinite solution
- **Unique solution**
- No solution
- None of the above

Solution: Theorem 1: If A is a non-singular matrix, then the system of equations given by AX=B has the unique solution given by $X = A^{-1}B$.

Question 5

Crammer's rule is usually considered as not suitable for large system, he when the number equation exceeds

- Five
- **Four**
- Three
- Six

Question 6

Test for consistently & solve. (refer page no 5)

x+y+z = 6 x-y+2z = 5 3x+y+z = 8

- **x=1, y=2, z=3**

- x=-1, y=2, z=3
- x=1, y=-2, z=-3
- x=-1, y=-2, z=-3

Question 7

Test for consistently & solve. (Refer page no. 5, values are different)

2x+2y+2z = 0   4x +6y + 2z = 0 6x + 12y + 10 z = 0

- **x = y = z = 0**
- x=0, y=0, z=1
- x=1, y=0, z=0
- x=1, y=1, z=0

Question 8

Solve by guess elimination method (Refer page no. 16)

2x+y+4z = 12
4x+11y-z = 33
8x -3y+2z=20

- x=3, y=2, z=2
- x=1, y=2, z=3
- x=1, y=2, z=3
- **x=3, y=2, z=1**

Question 9

Solve the following equation by applying crammer's rule (Refer Page no. 26)

2x+4y+6z=34
6x+4y+2z=22
4x-10y+2z=-10

- X=2, y=2, z=4
- X=1, y=-2, z=4
- **X=1, y=2, z=4**
- X=1, y=2, z=3

Question 10

Solve the following equation by LU decomposition method (Refer Page no. 29)

9x-3y+6z=36
3x+6y+9z=33
6x+6y-3z=6

- X=3, y=-1, z=-2
- **X=3, y=1, z=2**
- X=-3, y=-1, z=-2

- X=-3, y=1, z=2

Question 11

The values of x, y &z when this equation below solved by matrix inversion method is

9x+3y+6z=9
6x-9y-3z=-9
3x+6y+3z=12

- X=-1, y=2, z=-1
- **X=1, y=2, z=-1**
- X=1, y=2, z=1
- X=-1, y=2, z=1

Unit 6:

Question 1

A Matrix is called as Diagonally Dominant System When

- **large numerical Co-efficient are along Leading Diagonal**
- Co-efficient along the Leading Diagonal are Same
- Co-efficient along the Leading Diagonal are One
- Co-efficient along the Leading Diagonal are of Less Value

Question 2

The Process of Re-arranging the Equations in a system to Make it Diagonally Dominant & to Solve It by Iterative Method is called as

- Complete Pivoting
- **Partial Pivoting**
- Incomplete Pivoting
- None Of the Above

Question 3

Jacobs Method Is Also Called As

- **Simultaneous Displacement Method**
- Partial Pivoting
- Convergence Method
- Gauss-Seidel Method

Question 4

Convergence in Guass-Seidel Method is ________________ as Fast as Guass-Jacob's Method

- Thrice
- Four Times

- **Twice**
- Five Times

Question 5

Power Method Is Used to Find

- Nth Degree Polynomial
- **Largest Eigen Value & The Corresponding Eigen Vector**
- Eigen Vector Only
- None Of the Above.

Question 6

To apply JacobIs Method, The Co-efficient Matrix Must Be

- Always 1
- Same Except 1
- **Strictly Diagonally Dominant**
- Must not be diagonally Dominant

Question 7

Apply Gauss - Seidal Iteration Method to Solve the below Equations (refer page no 12)

3X1 + 20X2- X3 = -18

2X1- 3X2 + 20X3 = 25

20X1 + X2- 2X3 = 17

- X1=1, X2= -1, X3= -1
- **X1=1, X2= -1, X3= 1**
- X1=1, X2= 1, X3=1
- X1=-1, X2= 1, X3= -1

Question 8

Solve By Gauss- Elimination Method (refer page no 32 Terminal question)

X1 + X2 + X3 + X4 = 2

2X1- X2 +2X3-X4 = -5

3X1 + 2X2 +3X3 +4X4 = 7

X1 - 2X2- 3X3 + 2X4 = 5

- **(0,1, -1,2)**
- (0, -1, -1,2)
- (0,1,1,2)

- (0, -1,1,2)

Question 9

Solve the Following System of Equation by Jacobi's Iteration Method

2X1 + X2- 3X3 +9X4 = 31 (refer page no 32 Terminal Question)
3X1- 4X2 + 10X3 + X4 X29
2X1 +12X2 + X3 -4X4 +13
13X1 + 5X2 -3X3 +X4 =18

- **(0.9805,1.9516, 3.008, 3.9364)**
- (0.9805,1.9516,3.9364,3.0084)
- (-0.9805,1.9516, -3.0084,3.9364)
- (-0.9805, -1.9516, -3.0084,3.9364)

Unit 7:

Question 1

In Below which equation, reduce form of the equation y = m xn +c. is

- Logy=mn logx + log c
- **Y=mx + c where x= xn**
- Y= nmlogx
- Y=m (x + c) where x= xn

Question 2

Find the average from the given values (refer page no. 20)

X	1	2	3	4	5
Y	10	12	113	16	19

- 13
- 12
- 16
- **14**

Question 3

they Reduce the form of y = abx is

- logy = loga + blogx
- logey=logea+xlogeb
- **y = ax + c where x = bx and c = 0**
- log10y=log10a-xlog10b

Question 4

By the method of moments find the value of ?1 based on following data

X	2	3	4	5
Y	27	40	55	68

(refer page no 26)

- 199
- 192
- **190**
- 184

μ1 value need to find, in question printing mistake.

Question 5

Formula to find gama1 and gama2 are, (refer page no 25)

- **gama1=rho f(x)dx gama2=rho xf(x)dx**
- gama1=rho f(x)dx gama2=rho x2f(x)dx
- gama1=rhox f(x)dx gama2=rho x2f(x)dx
- gama1=rho y dx gama2=rho x 2y dx

Question 6 (1 point)

Find the value of x2 and xy from following data (refer page no 14)

X	0.5	1.0	1.5	2.0	2.5	3.0
Y	15	17	19	14	10	7

- 28.86,138
- 30,21.122
- **22.75,127**
- 21.24,127

Question 7 (1 point)

Reduce the equation for the following xy = ax + by

- y= ax+b
- **y= bx+a**
- x= by+a
- x=ay+5

Question 8 (1 point)

Find the value of? x2 and ?xy from following data (refer page no 14)

X	0.5	11.0	1.5	2.0	2.5	3.0
Y	15	17	19	14	10	7

- Y = -3.2x + 20.2
- Y = -2.87x + 21.34
- Y = -3.7714x + 19.66
- **Y = -3.7714x + 20.667**

Question 9 (1 point)

If p is the pull required to lift a load W by means of a pulley block, find a linear law from p= mw + c connecting p and w using the following data (refer page no 17)

P	12	15	21	25
W	50	70	100	120

Where p & w are taken in the kilogram weight compute p when w = 150 kg

- **P=30.46 kg**
- P= 29.99 kg
- P= 30.2 kg
- P= 25 kg

Unit 8:

Question 1 (1 point)

If $f(x) = 2^x$, then what is the value of f(x) when x=2? (refer page no. 166)

- 1
- **4**
- 8
- 2

Question 2 (1 point)

The sales in a department store for five years are given in the following data

Year	1974	1976	1978	1980	1982
Sales(in Lakh)	40	43	48	52	57

Estimate the sales for the year 1979. (refer page no 174)

- **50.1172**
- 60.421
- 35.413
- 55.414

Question 3 (1 point)

The area of a circle of diameter d is given for the following values

X	80	85	90	95	100
F(X)	5026	5674	6362	7088	7854

Calculate the area of the circle diameter 105 by Gauss Forward Formula

- 8993 (refer page no. 187)
- 8745
- **8660**
- 8960

Question 4 (1 point)

Using Stringling's formula, Find the f(1.63) from the following table

X	1.5	1.6	1.7	1.8	1.9
F(X)	17.609	20.412	23.045	25.27	27.875

(SAQ 11)

- 305
- 385
- **395**
- 415

Question 5 (1 point)

? y 0 can be found using ______________

- **y1- y0**
- y0 � y1
- ? y 0 � y 1
- Y1 + y 0

Unit 9:

Question 1 (1 point)

In the below option, which formula employs the concept of divided differences

- **Newton's divided differences formula**
- Taylor's divided differences formula
- Maclaurence formula
- None of the above

Question 2 (1 point)

The disadvantage of the lagrange's interpolation formula is,

- Another interpolation point cannot be inserted.
- If another interpolation point were inserted, then we have to recomputed the interpolation coefficients.

- **Option a and b.**
- None of the above.

Question 3 (1 point)

The first divided difference table for the following table is

X	-1	0	2	4	5
Y	0	1	9	65	125

(refer page no. 213)

- **1,4,28,61**
- 2,8,11,55
- 3,6,9,62
- 4,10,22,56

Question 4 (1 point)

The value of x at y=7, for the following table (refer page no. 222)

X	1	3	4
f(x)	4	12	19

- 1.6571
- **1.8571**
- 1.9641
- 12671

Question 5 (1 point)

The difference with the arguments 2,4,9,10. of the function $f(x)=x^3-2x$ is

(refer page no 214)

- 3
- 2
- **1**
- 4

Question 6 (1 point)

For the given table, second divided differences are (refer page no. 213)

X	-1	0	2	4	5
Y	0	1	9	65	126

- **1 6 11**
- 1
- 1 3 12
- 3 6 11

Question 7 (1 point)

The third differences with the arguments 2, 4, 9, 10 of the function $f[x] = x^3-2x$ is

- 6
- 4
- 8
- **None of the above**

Question 8 (1 point)

The lagrange's interpolation polynomial fitting the points, y[1] = -3, y[3] = 0, y[4] = 30, y[6] = 132, is (refer page no 206)

- Y[x] =(1/3) [-x3 + 27x2- 92x + 60]
- **Y[x] =(1/2) [-x3 + 27x2- 92x + 60]**
- Y[x] =(1/2) [x3 - 27x2- 92x + 60]
- Y[x] =(1/2) [x4 + 27x2- 92x + 60]

Question 9 (1 point)

For the given value of t when A = 85 will be [using lagrange's inverse interpolation formula]

T	2	5	8	14
A	94.8	87.9	81.3	68.7

- 6.8946
- **6.5928**
- 5.9879
- 7.123

x0= 2, x1 = 5, x2 = 8, x3 = 14

y0 = 94.8, y1= 87.9, y2 = 81.3, y3= 68.7

and y = 85

By inverse Lagrange interpolation, we have

$$x = \frac{(y-y1)(y-y2)(y-y3).....(y-yn)}{(y0-y1)(y0-y2)(y0-y3)...(y0-yn)}x_0 + \frac{(y-y0)(y-y2)(y-y3).....(y-yn)}{(y1-y0)(y1-y2)(y1-y3)...(y1-yn)}x_1 + \frac{(y-y0)(y-y1)(y-y3).....(y-yn)}{(y2-y0)(y2-y1)(y2-y3)...(y2-yn)}x_2 + \cdots + \frac{(y-y0)(y-y1)(y-y2).....(y-yn-1)}{(yn-y1)(yn-y2)(yn-y3)...(yn-yn-1)}x_n$$

$$x = \frac{(85-87.9)(85-81.3)(85-68.7)}{(94.8-87.9)(94.8-81.3)(94.8-68.7)}(2) + \frac{(85-94.8)(85-81.3)(85-68.7)}{(87.9-94.8)(87.9-81.3)(87.9-68.7)}(5) + \frac{(85-94.8)(85-87.9)(85-68.7)}{(81.3-94.8)(81.3-87.9)(81.3-68.7)}(8) + \frac{(85-94.8)(85-87.9)(85-81.3)}{(68.7-94.8)(68.7-87.9)(68.7-81.3)}(14)$$

$$x = \frac{-174.899}{2431.215}(2) + \frac{(-591.038)}{(-874.368)}(5) + \frac{463.246}{1122.66}(8) + \frac{105.154}{-6314.112}(14)$$

= -0.14388 + 3.3798 + 3.30106 – 0.2331

=6.5915

Unit 10

Question 1 (1 point)

The equation which involves the relationship between independent variables, dependent variables and the successive difference of the dependent variables is called as the

- Integral equation
- **Difference equation**
- Both a & b
- None of the above

Question 2 (1 point)

The degree of difference equation is defined as the

- Lowest power of y
- Intermediate power of y
- **Highest power of y**
- None of the above

Question 3 (1 point)

The equation in which the number of arbitary constants is equal to the order of the difference equation called as the

- Solution of difference equation
- **General solution of a difference equation**
- Particular solution
- None of the above

Question 4 (1 point)

The solution which is obtained from the general solution by giving particular values to the constant is called as the

- Solution of difference equation
- General solution of a difference equation
- **Particular solution**
- None of the above

Question 5 (1 point)

The solution for a differential equation is

- Particular integral - complementary integral
- complementary integral - Particular integral
- complementary integral X Particular integral
- **complementary integral + Particular integral**

Question 6 (1 point)

The solution for the difference equation $y_{n+2} - 2_{yn+1} - 8_{yn} = 0$ is

- **Yn=$c_1 2^n + c_2 4^n$** (Refer page no. 257)
- complementary integral X Particular integral
- Yn= c1(-2)n+c2(3)n
- Yn= c1(-3)n+c2(4)n

Question 7 (1 point)

The solution for the difference equation (question incomplete)

- Yn=(c1+c2+c3n)(-2)n
- Yn=(c1+c2n)(-2)n+c33n
- Yn=(c1+c3n)(-2)n+c33n
- Yn=(c1-c2n)(-2)n+c33n

Question 8 (1 point)

The difference equation $\Delta^3 y_n$+$\Delta^2 y_n$+Δy_n+y_n=0 in terms of E is (SAQ -8)

- (1-x)yx+3-(6x-2)yx+1+2xyx=0
- (1-x)yx+3-(3x-2)yx+1+2xyx=0
- (1-x)yx+2-(3x-2)yx+1+2xy=0
- **(1-x)yx+2-(3x-2)yx+1+2xyx=0**

Question 9 (1 point)

The dy/dx at x=1 for the following Table is (refer page no 231)

X	0	2	4	6	8
Y	7	13	43	145	367

- ○ **2**
- ○ 3
- ○ 5
- ○ 8

Question 10 (1 point)

The population of certain town is shown in the Following Table (refer page no 236)

Year X	1931	1941	1951	1961	1971
Year Y	40.62	60.80	79.95	103.56	132.65

The Rate of growth of Population in 1961 is

- ○ 2.95
- ○ 2.35
- ○ 2.76
- ○ **2.65**

Unit 11:

Simpson's one third rule can be applied only when the given interval [a,b] is subdivided into

- ○ 5 numbers of subintervals
- ○ only 6 numbers of subinterval
- ○ **even number of subinterval**
- ○ odd number of subinterval

Unit 12:

Question 1 (1 point)

Choose correct definition below statements

- ○ The general solution of a differential equation is that in which the number of arbitrary constants is not equal to the order of the differential equation.
- ○ The general solution of a differential equation is that in which the number of arbitrary constants is greater than the order of the differential equation.
- ○ **The general solution of a differential equation is that in which the number of arbitrary constant is equal to the order of the differential equation.**
- ○ The general solution of a differential equation is that in which the number of arbitrary constants are lesser than the order of the differential equation.

Question 2 (1 point)

What is the value of y(x1) when dy/dx= 1-y, y(0)=0 using Euler's method at x1=0.1.

- 0.01 (refer page no.308)
- 1
- **0.1**
- 0.2

Question 3 (1 point)

$\left(\frac{dy}{dx}\right)^3$ + xy= sinx is a_____________________.

- Third order and first degree Differential equation
- Third order and third degree Differential equation
- First order and first degree Differential equation
- **First order and third degree Differential equation**

Question 4 (1 point)

If y(0)= 1 and dy/dx= x^2y-1, then the value of y04 is (refer page no 305, different y)

- 2
- -4
- -6
- -5

Question 5 (1 point)

Find the value for y11 by using modified Euler's method (incomplete question)

- 2.246
- 1.948
- 1.10605
- 2.104

Question 6 (1 point)

Use Picard's method to solve $\frac{dy}{dx}$ =3x + y^2 for x=0.1 given y=1 at x=0

- 2.3641 (refer page no 301)
- **1.1272**
- 1.843
- 0.08

Question 7 (1 point)

Find y at x=1.02 given x=1.02, (incomplete question)

- 1.824
- 2.968
- 1.127

- 2.02061

Question 8 (1 point)

Given $\frac{dy}{dx}$= 1+xy, y(0)=2 Find y(0.1) ,modified Euler's method

- 1.8451 (refer page no 311)
- **2.1105**
- 3.4561
- 2.6542

Unit 13:

Question 1 **(1 point)**

Which method is not used for solving differential equations?

- **Simphson's**
- Runge kuttta method
- Taylor's series method
- Euler's method

Question 2 **(1 point)**

The second order Runge kuttta method's formula_________________.

- yi+2=yi+1/3[k1+k2]
- **yi+1=yi+1/2[k1+k2]**
- yi+3=yi+1/2[k1+k2]
- yi+1=yi+1/2[k1+k2]

Question 3 **(1 point)**

Which formula is used to find the k1 value in Runge kuttta method?(refer page no 319)

- k1=f(x0, y0)
- k1=h/2f (x0, y0)
- k1=hf (x0/2, y0/2)
- **k1=hf (x0, y0)**

Question 4 **(1 point)**

If f (x, y) =0.2x+0.1y find the value of f (x2, y2) when x2=0.10 and y2=2.0211?

- 0.322
- 0.222
- 0.333
- **0.244**

Question 5 **(1 point)**

If f (x, y) =y-x^2=dy/dx and x_0 =0 and y_0=1 find y_0^1 (refer page no 335)

- 0.8
- **1**
- 0.9
- 1.08

Question 6 **(1 point)**

Given dy/dx=1+y^2& h= 0.2, x_0=0, y_0=0 & k2=0.202 then find value of k3 in Runge kutta method? (refer page no 321)

- 0.214
- 0.208
- **0.202**
- 0.21

Question 7 **(1 point)**

Using the second order Runge kutta method, (incomplete question)

- 1.435
- 1.02
- 1.224
- 1.645

Question 8 **(1 point)**

Compute y (0.1) by Runge kutta method of fourth order for the differential equation

(incomplete question)

- 2.134
- 0.99
- 1.1169
- 1.652

Question 9 **(1 point)**

Solve the initial value problem (incomplete question)

- 1.85
- 1.942
- 2.01
- 1.99

Unit 14:

Question 1 **(1 point)**

If y & y ' are specified at a certain Value of X the Differential Equation together with initial Condition is Called as

- Boundary Value Problems
- **Initial Value Problems**
- Intermediate Value Problems
- None Of the Above

Question 2 **(1 point)**

If Y & Y' or their Combination is Prescribed at two different Values of X, then the Conditions are Called As

- **Boundary Conditions**
- Initial Conditions
- Both A & B
- None Of the Above

Question 3 **(1 point)**

The one-dimensional Heat Equation ULc2Uxx is (refer page no 355 SAQ)

- **Parabolic**
- Hyperbolic
- Elliptic
- Both B& C

Question 4 **(1 point)**

The Equation Uxx+ 2Uxy+ Uyy=0 is (SAQ)

- Hyperbolic
- **Parabolic**
- Eliptic
- Both B & C

Question 5 **(1 point)**

The Equation [1+x2]Uxx+[5+2x2] Uxl+[u+x2]Uxx=0 is (SAQ)

- **Hyperbolic**
- Parabolic
- Eliptic
- None of the Above

Question 6 **(1 point)**

U ij = 1/4[u (i+1, j) +U(i-1j) +U (i, j+1) + U (i j-1)] Is Called As (refer page no 355)

- **Standard Five Point Formula**

- Standard Four Point Formula
- Standard Three Point Formula
- Standard Six Point Formula

Question 7 **(1 point)**

Solution For (d^2 u)/dx^2 +(d^2 u)/dy^2 =0 in the given region with indicated boundary conditions is (refer page no 355)

- a=30.33; b-42.33
- a=31.33; b-43.33
- a=33.33; b-43.33
- **a = 43.33; b = 33.**

Question 8 **(1 point)**

The Solution for

[x3+1] y'' + x2y'- 4xy = 2 (refer page no 346 & 347)

Y [0] =0, y [2] =4 With h=0.5 is

- **Y1 = 0.25; y2 =1.00; Y3=2.25**
- Y1 = 1.00; y2 =2.25; Y3=0.25
- Y1 = 0.36; y2 =0.86; Y3=1.99
- Y1 = 0.18; y2 =0.86; Y3=2.3

Question 9 **(1 point)**

AUxx+2BUxy+CUyy + F [X, Y, U, UX, UY] =0 is said to Be Parabolic if

(refer page no 352)

- AC-B2> 0
- **AC-B2= 0**
- AC-B2< 0
- AC + B2= 0

Question 10 **(1 point)**

The Solution for the differential equation (incomplete question)

- Y0=1.6552 y1=1.56
- Y0=1.6552 y1=1.4482
- Y0=1.56 y1=1.65
- Y0=1.8 y1=1.3

Question 11 **(1 point)**

The Solution Of y +xy -2y=0 (refer page no 348)

- **y1=3.25; y0=2**

- y1=2; y0=3.25
- y1 = 3.05; y0 = 3
- y1 = 3.15; y0 = 2.5