**B.Sc. DEGREE EXAMINATION, APRIL 2016.**

**I YEAR — II SEMESTER**

**Allied II — ALLIED MATHEMATICS —II**

**Time : 3 hours Max. Marks : 75**

**SECTION A — (10 × 2 = 20 marks)**

**Answer any *TEN* questions.**

1. Give the iterative formula for Newton-Raphson method.
2. What is Gauss elimination method?
3. Prove that .
4. Define a central difference operator.
5. Prove that the first order divided difference operator is linear.
6. Name any two methods to find interpolation with unequal intervals.
7. Give the first derivative value of Newtons forward difference.
8. Give the Trapezoidal rule.
9. Give the formula for Euler’s algorithm.
10. Name any two methods to numerically solve an ordinary differential equation.
11. Show that root of the equation y = x 3 - 9x + 1 lies between 2 and 3 .
12. Define a backward difference operator.

**SECTION B — (5 × 5 = 25 marks)**

**Answer any *FIVE* questions.**

1. Using Newton-Raphson method, find the root between 0 and 1

of x 3 = 6x – 4 correct to 5 decimal places.

1. Fit a polynomial of degree four which takes the values

x : 2 4 6 8 10

y : 0 0 1 0 0

1. Using Newton’s divided difference formula , find the value of

f (2 ) from the following table:

x : 4 5 7 10 11 13

f(x) : 48 100 294 900 1210 2028

1. Evaluate using Simpson’s one – third rule.
2. Solve = x + y , given y ( 1 ) = 0 . Find the value of y ( 1.1)

by Taylor series method.

1. Solve the system of equations by Gauss elimination method
2. Find the age corresponding to the annuity value 13.6 from the

table below:

Age( x) : 30 35 40 45 50

Annuity value ( y ) : 15.9 14.9 14.1 13.3 12.5

[P.T.O.]

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions.**

1. Solve the system of equations by Gauss Seidal method
2. Find the values of y at x = 21 and x = 28 from the following data.

x : 20 23 26 29

y : 0.3420 0.3907 0.4384 0.4848

1. Using Lagrange’s interpolation formula , find y ( 10 ) from the

following table

x : 5 6 9 11

y : 12 13 14 16

1. Evaluate using Trapezoidal rule with h = 0.2.
2. Apply the fourth order Runge-Kutta method to find y ( 0.2 )

given that  .

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