

(i) Printed Pages : 3

Roll No. ....

(ii) Questions : 9

Sub. Code : 

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Exam. Code : 

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**Bachelor of Computer Application (FYUP) 3<sup>rd</sup> Semester  
(2125)**

**COMPUTER ORIENTED NUMERICAL METHODS**

**Paper : NBCA303**

**Time Allowed : Three Hours]**

**[Maximum Marks : 45**

- Note :—**
- (i) Question Paper consists of **NINE** questions comprising **TWO** questions in each of Sections A, B, C, D and **ONE** compulsory question of short answer type in Section E.
  - (ii) The students are required to attempt any **ONE** question each from Sections A, B, C, D and Section E is compulsory.
  - (iii) The student can only use Basic Scientific (Non-programmable and Non-storage) Calculator.
  - (iv) Log tables are allowed for computation.

**SECTION—A**

1. Explain how floating point numbers are stored in computers and the various consequences of normalized floating point representation of numbers.

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2. (a) Differentiate between numerical analysis vs numerical methods. 5
- (b) Define error and explain its different types that can occur in numerical computations with example. 4

### SECTION—B

3. Find the value of  $\sqrt{13}$  by using Newton Raphson method. 9
4. Find a real root of equation  $x^3 - 5x - 7$  correct up to three decimal places by Bisection method. 9

### SECTION—C

5. Solve the Gauss elimination method:

$$2x + 5y - z = 8$$

$$x + 3y - z = 3$$

$$3y - 2z = -1 \quad 9$$

6. (a) Differentiate between interpolation vs extrapolation. 3
- (b) Estimate from the following table the number of students who obtained marks between 40 and 45 by Newton's forward interpolation formula:

Marks	30-40	40-50	50-60	60-70	70-80
No. of Students	31	42	51	35	31

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### SECTION—D

7. Evaluate  $\int_0^1 \sqrt{1-x^2} dx$  by

(a) Simpson 1/3<sup>rd</sup> rule

(b) Simpson 3/8<sup>th</sup> rule, taking six intervals.

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8. Given  $\frac{dy}{dx} = 1 + y^2$  and  $y(0) = 0$

Find  $y(0.4)$  using Runge-Kutta fourth order method with step-size of 0.2.

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### SECTION—E

(Compulsory)

9. Elaborate:

(a) Prepare the divided difference table for the following data:

x	1	3	4	6	10
f(x)	0	18	58	190	920

(b) Lagrange Inverse interpolation.

(c) Numerical integration.

3+3+3