2018

BCA 3rd Semester Examination
MICROPROCESSOR AND NUMERICAL LAB

PAPER—2197 (Set-II)

(Practical)

Full Marks : 100

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group-A

(Microprocessor and System Programming Lab)

Answer any *one* question (On Lottery Basis) :   1×25

1. Write a program to transfer a block of data from the memory location XX40H to XX60H in reverse order. The location XX3AH contains the numbers of data.

2. Write a program to find the factorial of 8 bit number.

3. Design a program with 8085 instruction set to convert any binary number to its corresponding gray code.

4. Write a program to convert an 8 bit decimal number to its octal equivalent.

5. Write a program to print first 10 Fibonacci numbers.

6. Write an assembly language program to add two 8 bit data. Note that the sum may be a 16 bit data.

(Turn Over)

7. Write an assembly language program to check whether a year is a leap year or not.

8. Write an assembly language program to print prime numbers from 1 to 100.

Group-B

(Numerical Lab)

Answer any *one* question (On Lottery Basis) :   1×25

1. Find the real root of $x3 - 3x - 8 = 0$ using Bisection method.

2. Find out the approximation value of $\int_1^2 \dfrac{dx}{1 + x^2}$ by Simpson's 1/3 rule with 6 subintervals.

3. The following table gives the value of x and y :

x	1.2	2.4	2.9	4.2	4.8	6.1
y	4.2	5.8	9.6	12.8	15.6	18.8

   Write a program to find the values of x corresponding to y = 10, using Lagrange interpolation.

4. Calculate y(2.5) using Runga-Kutta method of order four of the initial value problem

$$\frac{dy}{dx} = \cos^2 x + 2x - y^2, \ y(1) = 0 \ \text{using} \ h = 0.1$$

5. Evaluate $\int_0^1 (3x - 2x^2) dx$, taking 10 intervals by Simpson's 1/3 rule.

6. Evaluate the integral by Tapezoidal rule with sub-interval n = 10

$$\int_0^{\frac{\pi}{4}} \sqrt{1 - 0.154 \sin^2 x} \ dx$$

7. Find a root of the following using Regula-Falsi method :

$$x^3 + 3x - 8 = 0$$

8. Compute the solution of the system by Gauss-Seidal method :

$$5.2x_1 + 1.2x_2 + 2.3x_3 = 18.2$$
$$3.2x_1 + 9.4x_2 - 1.5x_3 = 22.8$$
$$2.1x_1 - 1.6x_2 + 8.6x_3 = 28.4$$

9. Solve the following using Gauss elimination method :

$$x_1 - x_2 + 2x_3 = 0$$
$$-x_1 + 4x_2 + 2x_3 = 4$$
$$2x_1 + x_2 + 6x_3 = 2$$

10. Compute the positive root of the equation $3x^2 + 2x = 9$ using Newton-Raphson method.

Viva — 15

P.N.B. — 05

Internal Assessment — 30

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