Code No: RR10106 **Set No.1**

I B.Tech. Regular Examinations, June -2005
INTRODUCTION TO COMPUTERS
(Common to Civil Engineering, Mechanical Engineering, Chemical Engineering, Mechatronics, Metallurgy & Material Technology and Production Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Enumerate various components of a computer system. Give brief description of each component
   (b) What is CGA?
   (c) What are the advantages of laser printer over dot matrix printer?
2. (a) Define operating system
   (b) Enumerate various types of operating systems
   (c) Write the following decimal numbers into 8 bit sign-magnitude form and 8 bit 2's complement form
      i. 87
      ii. -123
3. (a) What is a Data type? Describe the basic data types of C with an example.
   (b) List out the valid and invalid identifiers from the following:
      i. internet
      ii. DD9
      iii. Total-amt
      iv. 123sum
      v. *sal_net*
      vi. read
4. (a) Define a file. How does it differ from a structure?
   (b) Write a C program to accept employee information and store it in an output file a "emp.rec" .
5. (a) Write an algorithm for Bisection method
   (b) Compute the real root of $xlog_{10}x = 1.2$ which lies between 2 and 3 correct to 3 decimal places using Bisection method.
6. (a) Solve the following equations using Gauss- Jordan method.
   2X+Y+5Z+T=5
   X+Y-3Z+4T=-1
   3X+6Y-2Z+T=8
   2X+2Y+2Z-3T=2

(b) Write an algorithm for Gauss - Jordan method.

7. (a) Derive the formula to estimate the polynomial of degree n using Lagrange interpolation method.

   (b) Find the 3rd polynomial to fit the following points:

i	1	0	1	3
F(X)	6	2	2	10

   Using Newton's forward formula.

8. (a) Use simple Runge-Kutta 4^{th} order method of order 2 to obtain solution to differential equation $\frac{dy}{dx} = xy^2$; y(1) = 2 at the points x=1.2,x=1.4 taking h = .2.

   (b) Using trapezoidal rule, approximately calculate the value of $\int_1^3 dx/\sqrt{(1+x)}$ with

      i. four intervals and

      ii. six intervals.

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1. (a) Explain ALU of computer
   (b) Compare and contrast CISC and RISC processors
   (c) What is a system bus?
2. (a) What is ASCII?
   (b) Give advantages of multitasking operating systems
   (c) Convert the following numbers into hexadecimal
      i. 6452.42_8
      ii. 7245.51_8
3. (a) What is an Algorithm? What are the basic characteristics of an algorithm? Briefly explain them.
   (b) Write the different algorithmic notations. Give an example algorithm using these notations.
   (c) Write an algorithm to find the smallest of three numbers.
4. (a) What is a function? Explain the difference between user defined and library functions
   (b) Write a user defined function to compare two strings in C
5. (a) Write an algorithm for Bisection method
   (b) Find the root of the equation $x^2 - 4x - 10 = 0$ using Newton Raphson method.
6. (a) Solve the following system of equation by Gaussian Elimination method
   $2X_1 + 4X_2 + 2X_3 = 15$,
   $2X_1 + X_2 + 2X_3 = -5$,
   $4X_1 + X_2 - 2X_3 = 0$.
   (b) Write an algorithm for Gaussian Elimination method.
7. (a) Given the following table find approximately the value of y-0.5.

x:	0	1	2	3	4	5
y:	27	32	25	36	32	41

   Using Newton's forward difference formula.

(b) Fit a straight line for the following data.

x:	1	2	3	4	5
y:	3	4	5	6	8

8. (a) Derive the formula to evaluate $\int_a^b ydx$ using trapezoidal rule.

(b) Use the trapezoidal rule with n=4 to estimate $\int_0^1 \frac{dx}{1+x^2}$ Correct to four decimal places.

(c) Tabulate the values of y at x=.1 to .5 using Eulers method given that $\frac{dy}{dx} = x + y, y(0) = 1$

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Code No: RR10106 **Set No.3**

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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe various components of a computer
   (b) Explain working principle of magnetic disk
2. (a) What is multitasking operating system? Give an example.
   (b) Give the range of integers that can be represented in 16 bit 2's complement form
   (c) Convert the following into decimal
      i. $9C2.FC_{16}$
      ii. $234.AC_{16}$
3. (a) Differentiate between:
      i. Algorithm and Flowchart
      ii. Syntax error and Logical error.
   (b) Write an algorithm to generate prime numbers between the two given limits
4. (a) Define a file. How does it differ from a structure?
   (b) Write a C program to accept employee information and store it in an output file a "emp.rec" .
5. (a) Write an algorithm for Newton - Raphson method
   (b) If an approximate root of the equation x $(1 - log_e x)$=0.5 lies between 0.1 & 0.2 find the value of the root correct to 3 decimal places.
6. (a) Solve the following equations using Gauss- Jordan method.
   10X+Y+Z=12
   2X+10Y+Z=13
   X+Y+5Z=7
   (b) Write an algorithm for Gauss - Jordan method.
7. (a) Explain the difference between the forward difference table and backward difference table?
   (b) Construct difference table for the following data:

x	0.1	0.3	0.5	0.7	0.9	1.1	1.3
F(x)	0.003	0.067	0.148	0.248	0.370	0.518	0.697

And find F(0.6) using a cube that fits at x=0.3, 0.5, 0.7 and 0.9 using Newton's forward formula.

8. (a) By dividing the range into ten equal parts, evaluate $\int_0^{\pi} Sinxdx$ by Simpsons rule. Verify your answer with integration.

   (b) Solve the following differential equation by Euler modified method $\frac{dy}{dx} = 2xy, y(0) = 0.5$ solution for $1 \geq x \geq 0$

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Code No: RR10106 **Set No.4**

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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is a register? What is its purpose in CPU?
   (b) Distinguish between the following
      i. Mouse and light pen
      ii. Magnetic disk and optical disk
2. (a) What is multitasking operating system? Give an example.
   (b) Give the range of integers that can be represented in 16 bit 2's complement form
   (c) Convert the following into decimal
      i. $9C2.FC_{16}$
      ii. $234.AC_{16}$
3. (a) Write and explain the structure of a C program.
   (b) Write a program to find the roots of a quadratic equation for all the cases.
4. (a) What is a structure? Explain the components of a structure.
   (b) Differentiate struct and Union constructions in C.
   (c) Write a C program to accept the empcode, empname, *basic_salary*, of the employees and compute their gross salary. The gross salary should be computed using the following formula.
   $Grosssalary = basic\_salary + DA + HRA$
5. (a) Write an algorithm for Newton Raphson method
   (b) Find a real root of 3x-cos x - 1=0 by bisection method.
6. Solve the following system of equations using.
   (a) Jacobis and
   (b) Gauss Seidal iteration methods
   $6X_1 - X_2 - X_3 = 11.33$
   $-X_1 + 6X_2 - X_3 = 32$
   $-X_1 - X_2 + 6X_3 = 42.$
7. (a) Explain the difference between the forward difference table and backward difference table?

(b) Construct difference table for the following data:

x	0.1	0.3	0.5	0.7	0.9	1.1	1.3
F(x)	0.003	0.067	0.148	0.248	0.370	0.518	0.697

And find F(0.6) using a cube that fits at x=0.3, 0.5, 0.7 and 0.9 using Newton's forward formula.

8. (a) Use Eulers modified method to find approximate values of the solution of $\frac{dy}{dx}$ = y-x + 5 at the points x = 2.1, 2.2. with initial condition y(2) = 1

(b) State the trapezoidal rule and describe the algorithmic procedure for the trapezoidal rule.

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