Code No: R5100306

R5

I B.Tech Year(R05) Supplementary Examinations, May/June 2010
COMPUTER PROGRAMMING AND NUMERICAL METHODS
(Mechanical Engineering)

Time: 3 hours
Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) What is the difference between short integer and long integer in terms of memory, range, control string and variable declaration.

   (b) Distinguish between float and double in terms of storage and range. [8+8]

2. (a) Write a program to demonstrate passing an array argument to a function. Consider the problem of finding largest of N numbers defined in an array.

   (b) Write a recursive function power (base, exponent) that when invoked returns base exponent. [8+8]

3. (a) Explain the I/O operations on files.

   (b) Write a C program to read numbers from a file DATA, contains a series of integer numbers, and then write all odd numbers to a file to be called ODD and all even numbers to a file to be called EVEN. [8+8]

4. (a) What is structure within structure? Give an example for it.

   (b) Write a C program to illustrate the concept of structure within structure.

   [8+8]

5. Write a recursive function that accepts a prefix expression consisting of binary operators and single-digit integer operands and returns the value of expression. [16]

6. (a) Find a real root of the equation $\log_{10} x$=1.2 which lies between 2 and 3 by bisection method.
   (b) Find a root of the equation xe^x-cosx=0 using iteration method [8+8]

7. (a) Find f(8) using Newton's forward difference formula from the following table

x	4	5	7	10	11	13
f(x)	48	100	294	900	1210	2028

   (b) Find the unique polynomial P(x) of degree2 or less such that P(1)=1, P(3)=27, P(4)=64 using Lagrange interpoaltion formula and Newton divided difference formula. [8+8]

8. (a) Find y(.1) and y(.2) using Taylor's series method given that $\frac{dy}{dx} = x^2 - y$, $y(0) = 1$

   (b) Tabulate the values of y(.2), y(.4),y(.6),y(.8) and y(1) using Euler's method given that $\frac{dy}{dx} = x^2 - y, y(0) = 1$ [8+8]

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