



**B.E. Sem. IV (Mech/Auto) (Regular)**  
 June - 2009  
**Computer Programming & Numerical Method**  
 (New Course)

44 JUN 2009

**Time : 3 Hours]**

**[Max. Marks : 100**

1. (a) Write a C program to find the greatest common divisor for 2 positive integer numbers. (16)  
 (b) Write a function to reverse a string.  
 (c) Write a program to print the Armstrong no. between 1 to 1000.  

**OR**

 (a) Write a recursive function that will generate and print (16)  

$$1 - \frac{1}{1!} + \frac{2}{2!} - \frac{3}{3!} + \dots + \frac{n}{n!}$$
 (b) Write a C program to convert a given string to UPPER CASE.  
 (c) Write a C program to find whether a no. is prime or not.
  
2. (a) Write a C program to add two matrices. (16)  
 (b) Write a C program using pointers to read an array of integers and print elements in reverse order.  
 (c) Explain structure with a suitable example and what is its advantage over array.  

**OR**

 (a) Write a C program to read an array of names and sort them in an alphabetical order. (16)  
 (b) Write a C program using pointers to calculate roots of quadratic equation  $ax^2 + bx + c = 0$ .  
 (c) Explain difference between structure and union.
  
3. Attempt any six. (18)  
 (a) Give any three functions of string manipulation with examples.  
 (b) Distinguish between local variable and global variable.  
 (c) Explain fseek() and ftell().  
 (d) What are command line arguments and how are they accessed.  
 (e) Write C Program to print the following output.  

```
AAAAA
   BBBB
     CCC
      DD
       E
```

 (f) Explain datatypes in C.  
 (g) Explain difference between nested structure and array of structure.

4. (a) Write C++ program to calculate perimeter of a rectangle. (16)  
 (b) Write C++ program to calculate  
 $1 + 2 + 3 + 4 + \dots + n$

OR

- (a) Write a C program for Newton's Forward Difference Formula. (16)  
 (b) Draw flow chart for Gauss Jordan Method for solving linear simultaneous equation.
5. (a) Find a root upto 4 decimal places for the following equation using method of false position  $x \log_{10} x - 1.2 = 0$ . (16)  
 (b) Using Newton-Raphson Method, perform 4 iterations to find smallest positive root of equation :  $x^3 - 5x + 1 = 0$ .  
 (c) Consider the function given below :

x	0	0.25	0.5	0.75	1.0
f(x) = 1/(1+x)	1.0	0.8	0.6667	0.5714	0.5

Evaluate  $\int_0^1 \frac{1}{(1+x)} dx$  using trapezoidal rule.

OR

- (a) Solve the following equations by Picard's method  $dy/dx = x^2 + y^2$  where  $y(0) = 0$ . Estimate the value of  $y(0.1)$ . (16)  
 (b) Solve the following equations by Gauss Jacobi Method.  
 $20x_1 + x_2 - 2x_3 = 17$   
 $3x_1 + 20x_2 - x_3 = -18$   
 $2x_1 - 3x_2 + 20x_3 = 25$
6. Attempt any six. (18)

- (a) Write an algorithm for Lagrange's Interpolation Polynomial Formula.  
 (b) The following table gives the velocity  $v$  of the particle at time  $t$  :

t(sec)	0	2	4	6	8	10	12
V(m/s)	4	6	16	34	60	94	136

- Find distance moved by the particle in 12 sec and also acceleration at  $t = 2$  sec.  
 (c) Draw flow chart of Crout's Method of solving differential equations.  
 (d) Write C program for Gauss Elimination Method.  
 (e) Describe three basic types of errors in numerical computation.  
 (f) Find by Taylor's series method the value of  $y$  at  $x = 0.1$ , if  $dy/dx = x - y^2$  and  $y = 1$  at  $x = 0$ .  
 (g) Write C program for Simpson's 3/8 rule.