



Reg. No. : .....

Name : .....

**Fourth Semester B.Tech. Degree Examination, April 2011**  
**(2008 Scheme)**  
**P 10.202/08.402 COMPUTER PROGRAMMING AND NUMERICAL**  
**METHODS (MNP)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. What are enumerated data types in C++ ?
2. What are the bitwise operators supported in C++ ?
3. What are escape sequences ? Write code for displaying menage in double quotes.
4. Explain friend functions.
5. What are 'new' and 'delete' operators in C++ ?
6. Explain private and public inheritance.
7. What are the input and output streams in C++ ?
8. Explain the rate and order of convergence of numerical methods.
9. Write the normal equations for fitting a quadratic curve to a set of data on x and y.
10. Derive the finite difference formula for Laplace equation.

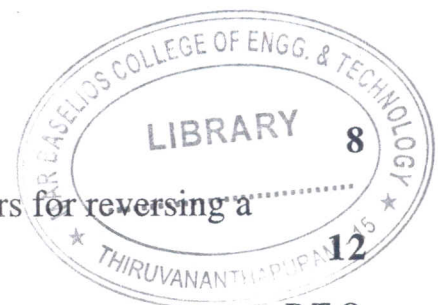
(10×4=40 Marks)

PART – B

Answer **one** full question from **each** Module.

MODULE – I

11. a) Explain various data types supported in C++.
- b) What are pointers and their uses ? Illustrate use of pointers for reversing a string and find its length.



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12. a) What is meant by function overloading ? Illustrate function over loading by sorting integer array and character array. 12
- b) What are inline functions ? 8

### MODULE – II

13. a) Make a class program to illustrate
- i) Default constructor
  - ii) Parametric constructor
  - iii) Copy constructor. 10
- b) What is meant by operator overloading ? Create a class string and create objects of this class namely  $S_1, S_2, S_3$ . Write program to
- i) Concatenate strings using '+' operator u ;  $S_3 = S_1 + S_2$
  - ii) Compare strings using '=' operator. 10
14. a) What is the difference between multiple and multilevel inheritance ? Explain with diagrams and class declarations. 10
- b) Illustrate how an object of a derived class can access protected member of the base class in public inheritance. 10

### MODULE – III

15. a) Using Logrange's interpolation, find  $f(8.5)$  for following data :
- |               |   |   |   |    |
|---------------|---|---|---|----|
| <b>x :</b>    | 7 | 8 | 9 | 10 |
| <b>f(x) :</b> | 3 | 1 | 1 | 9  |
- 10
- b) Find the number of students who obtained less than 45 marks using following data Newton's formula :
- |                        |   |       |       |       |       |       |
|------------------------|---|-------|-------|-------|-------|-------|
| <b>Marks</b>           | : | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
| <b>No. of students</b> | : | 31    | 42    | 51    | 35    | 31    |
- 10
16. a) Derive the finite difference approximation equation to represent Laplace's equation. 10
- b) Determine whether the following PDEs are elliptic, parabolic or hyper bolic. 10
- i)  $3 f_{xx} + 4 f_{yy} = 0$
  - ii)  $f_{xx} + 6 f_{xy} + 9 f_{yy} = 0$
  - iii)  $f_{xx} - 2 f_{xy} + 2 f_{yy} = 2x + 5y$
  - iv)  $f_{xy} - f_y = 0$