

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017**

**Course Code: ME305**

**Course Name: COMPUTER PROGRAMMING & NUMERICAL METHODS**  
**(MA, ME, MP, PE)**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any three full questions, each carries 10marks.*

Marks

- |   |   |      |
|---|---|------|
| 1 | a) Explain how integer number and floating numbers are represented internally in a computer.            | (5)  |
|   | b) Write an algorithm and draw a neat flowchart to find all the possible roots of a quadratic equation. | (5)  |
| 2 | a) Explain with examples the tokens in C++  | (5)  |
|   | b) Describe the structure of a C++ program with an example.   | (5)  |
| 3 | a) Explain the use of a switch statement with an example.   | (5)  |
|   | b) Explain the C++ declaration and initialization of 2-D arrays with suitable examples.                 | (5)  |
| 4 | What are the different types of functions supported by C++ ? Give examples for each function.           | (10) |

**PART B***Answer any three full questions, each carries 10marks.*

- |   |  |      |
|---|--|------|
| 5 | a) Discuss the advantage of using pointers with examples.  | (5)  |
|   | b) Write a program to input two nxn matrices and display their product.  | (5)  |
| 6 | a) Write a program to generate N <sup>th</sup> Fibonacci number using arrays .   | (5)  |
|   | b) Write a function big to find largest of two numbers and use this function in the main program to find largest of three numbers. | (5)  |
| 7 | a) Explain different types of inheritances in C++  | (5)  |
|   | b) Explain public inheritance and private inheritance with suitable examples   | (5)  |
| 8 | Explain major features of OOP  | (10) |

**PART C***Answer any four full questions, each carries 10marks.*

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|----|--|------|
| 9  | a) Give the step by step procedure for solving algebraic equations by Gauss elimination method | (6)  |
|    | b) What are the sources of error in numerical computations? Explain.                           | (4)  |
| 10 | Using Lagrange's formulae find the values of   | (10) |
|    | i) $y_x$ if $y_1 = 4, y_3 = 120, y_4 = 340, y_5 = 2544$  |      |
|    | ii) if $y_{-30} = 30, y_{-12} = 34, y_3 = 38, y_{18} = 42$                                     |      |
| 11 | Solve by Gauss Siedel method the following system of equations                                 | (10) |

$$8x - 3y + 2z = 20$$

$$6x + 3y + 12z = 35$$

$$4x + 11y - z = 33$$

- 12 a) Prepare a C++ program for fitting a parabola to a given set of data. (5)
- b) In an organization, systematic efforts were introduced to reduce the employee absenteeism and results for the first 10 months are shown below. Fit a straight line to the data and from this equation, estimate the average weekly reduction in absenteeism. (5)

$x$	1	2	3	4	5	6	7	8	9	10
$y$	10	9	9	8.5	9	8.5	8	7	8	7.5

- 13 a) Interpolate the value of  $f$  at  $x = 0.25$  using Newton's forward interpolation formula using the following data. (5)

$x$ :	0.1	0.2	0.3	0.4	0.5
$f$ :	0.11246	0.22270	0.32863	0.42839	.52050

- b) What numerical methods are available for the solution of partial differential equations? (5)
- 14 a) Write a complete program to fit a straight line using  $n$  data values. (5)
- b) Explain the terms: correlation and regression. (5)

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