

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

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|---|---|------|
| 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.

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|---|--|------|
| 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 th 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)
