

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019**

**Course Code: CE306**

**Course Name: COMPUTER PROGRAMMING AND COMPUTATIONAL TECHNIQUES**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

Marks

- |   |  |      |
|---|--|------|
| 1 | a) Explain the use of <i>switch</i> statement in C++ with suitable example.  | (5)  |
|   | b) Write a C++ program to sort an array of integers in ascending order using selection sorting concept.                    | (10) |
| 2 | a) Explain in detail the three looping statements used in C++, with example for each.                                      | (10) |
|   | b) Write a C++ program to read a single word as a string and count the number of characters without using string function. | (5)  |
| 3 | a) Differentiate between input stream & output stream. Explain any two stream functions used for console I/O operation.    | (7)  |
|   | b) Write a program to read a one dimensional array of integers and print the odd & even numbers separately.                | (8)  |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |   |      |
|---|---|------|
| 4 | a) What are the key features of an object oriented programming? Explain any two features in detail.   | (5)  |
|   | b) Write a program to read an array from the user, pass it to a user defined function and print the even numbers present in it.   | (10) |
| 5 | a) Explain various storage classes used in C++.   | (8)  |
|   | b) Explain the concept of file. Explain the file input and output streams (any three) commonly used in C++?   | (7)  |
| 6 | a) What is recursion? Explain with an example.  | (5)  |
|   | b) Write a C++ program to define a structure to store the student roll number, and the marks obtained in 6 subjects and display each roll number & Total mark of corresponding student. Accept the number of students, roll number and the marks from the user. | (10) |

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) Using Newton-Raphson find a real root of the equation  $e^{-x} = 3 \log x$ . (10)
- b) Develop a program to fit a linear model (straight line) to a given set of data using linear regression equations. (10)
- 8 a) Fit a 2<sup>nd</sup> degree polynomial of the form  $y = a + b x + c x^2$  to the following data (10)

x	-3	-2	-1	0	1	2	3
y	4.63	2.11	0.67	0.09	0.63	2.15	4.58

Develop a 2<sup>nd</sup> degree polynomial (parabola) relationship connecting  $R$  and  $V$  using the method of least squares.

- b) Develop a program to solve transcendental equation using Regula falsi method (10) method.
- 9 a) Evaluate the following integral using 2 point and 3 point Gauss quadrature and compare the results. (10)

$$I = \int_1^3 \frac{dx}{(x^4 + 1)^{1/2}}$$

Gauss points for n=2 are 0.5773, -0.5773 and weights are 1.0, 1.0

Gauss points for n=3 are -0.7746, 0.0, 0.7746 and weights are 0.5556, 0.8889 and 0.5556.

- b) Demonstrate the finite difference method of numerical solution of partial differential equations for the case of a Laplace equation given by  $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} = 0$  (10)

\*\*\*\*