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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 *switch* 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 2nd 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 2nd 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 method. (10)

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)

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