Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) / S4 (PT) (S, FE) Examination January 2024 (2015 Scheme)

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 various data type modifiers available in C++ language. (7)

b) Develop a program to check if a character is a vowel or a consonant. (8)

2 a) Give the differences between entry controlled and exit controlled loops. (7)

b) Develop a program to count the number of characters in a word without using the library function. (8)

3 a) How are multiple branching operations carried out in in C++? Explain with an example. (7)

b) Develop a program to check whether a matrix is an identity matrix or not. (8)

PART B

Answer any two full questions, each carries 15 marks.

4 a) What is a function definition in C++? How is it different from function prototype? Illustrate with an example. (5)

b) Define a structure called *cricket* that contain the following information: Player name, Team name and Batting average. Using array of structures, write a program to read the information about 50 players. After accepting the name of a given team, the program should display the list of players of the selected team with their batting average. (10)

5 a) Is it possible to nest the structure? Explain with example. (5)

b) Design a function *prime* to check whether a number is prime or not. Develop a program, employing this function, to print all prime numbers within a specified limit input by the user. (10)

6 a) Distinguish between 'call by value' and 'call by reference' with suitable examples. (7)

b) Differentiate between procedural and object oriented languages. Highlight the importance of OOP by explaining any three features of object oriented languages. (8)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Evaluate $\int_{0.4}^{1.6} \frac{x}{\sin(x)} dx$ using Simpson's 1/3rd rule taking $h = 0.10$. (10)

b) Develop a program to find the real root of the equation $x^3 - 4x - 10 = 0$ lying between $x = a$ and $x = b$ by Regula Falsi Method. (10)

8 a) Fit a second degree parabola of the form $y = a x^2 + bx + c$ to the following data. (10)

x	0	2	4	6	8	10
y	1	3	13	31	57	91

b) Develop a C++ program to evaluate $\int_a^b e^{x\tan(x)}\, dx$ using trapezoidal rule. (10)

9 a) Develop a C++ program to find the cubic root of a number N using Newton-Raphson method. (10)

b) Given $\log_{10}$ 125=2.0969, $\log_{10}$ 127=2.1038, $\log_{10}$ 128=2.1072, $\log_{10}$ 132=2.1206, and $\log_{10}$ 135=2.1303, using Lagrange's formula, find the value of $\log_{10}$ 130. (10)

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