

# APJ Abdul Kalam Technological University

## SIXTH SEMESTER B.TECH DEGREE EXAMINATION CE 306: COMPUTER PROGRAMMING AND COMPUTATIONAL TECHNIQUES

### MODEL QUESTION PAPER

Time: 3 hours

Maximum marks: 100

*Answer any TWO questions from each part.*

#### PART-A

1. a. What are the basic data types used in C++? (5)
- b. Write a program to sort a given set of integer numbers in descending order. (10)
2. a. Differentiate between the statements *break* and *continue* as used in C++ programming. (4)
- b. How effectively can the increment operator and decrement operator replace a programming segment in C++? (4)
- c. Write program to check if a given triplet represents a triangle or not. If so test whether it represents an equilateral or isosceles or scalar triangle. (7)
3. a. What are uses of conditional operators in C++? (5)
- b. Write a program to find the product of two matrices. (10)

#### PART-B

4. a. Explain the concept of structures within structures (5)
- b. Write a C ++ program to calculate factorial of a given number using recursion (10)
5. a. Differentiate between function definition and function declaration. (5)
- b. Define a structure to a store address of a person including PIN code. Write program to read, store and print the address of N persons. For any input name, the program shall print the corresponding address. (10)
6. a. What are main features of Object Oriented programming? Explain any two with examples. (5)

- b. Prepare a C++ program to read a list of names from two different files named as list1.txt and list2.txt and print the combined list into a new file named as combinelist.txt. (10)

**PART-C**

7. a. Explain the concept of successive approximation method (5)
- b. Write a program to evaluate  $\int_0^6 \frac{dx}{1+x^2}$  using Trapezoidal rule. (15)
8. a. What are partial differential equations? Give an example of a real life problem to be designed as a partial differential equation. (5)
- b. Solve the following system of linear equations using Gauss elimination method.  
 $4x_1+2x_2-x_3+x_4=0$ ,  $x_1-2x_2-4x_3-x_4=8$ ,  $3x_1+4x_2-3x_3+2x_4=-6$ ,  
 $2x_1-2x_2+2x_3+x_4=5$  (15)
9. a. Prepare a C++ program to find a real root of the equation  $x^3 - 3x^2 + x + 1 = 0$  using Newton Raphson method upto an accuracy of 0.001 (10)
- b. The following data gives the population of a certain town at 6 consecutive enumerations. Fit a straight line and a second degree parabola to represent the population growth. Estimate the population of the town in the year 2021. (10)

|                     |      |      |      |      |      |      |      |
|---------------------|------|------|------|------|------|------|------|
| Year                | 1951 | 1961 | 1971 | 1981 | 1991 | 2001 | 2011 |
| Population in lakhs | 2.57 | 3.21 | 3.85 | 4.42 | 4.86 | 5.10 | 6.25 |