

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Sixth semester B.Tech degree examinations (S), September 2020

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) Define implicit type casting with an example. | (4) |
| | b) Differentiate between <i>break</i> and <i>continue</i> statements. | (4) |
| | c) Develop a program to find the largest of three numbers. | (7) |
| 2 | a) Is the <i>switch</i> statement more advantageous than nested <i>if - else</i> statement? Explain with reasons. | (4) |
| | b) With examples, illustrate any two string functions. | (4) |
| | c) Write a C++ program to check whether a given number is a perfect number or not. (A perfect number is a positive integer that is equal to the sum of its positive divisors, excluding the number itself.) | (7) |
| 3 | a) Which are the unary arithmetic operators in C++? Explain with examples. | (4) |
| | b) Compare and contrast <i>while</i> and <i>do - while</i> . | (4) |
| | c) Write a program in C++ to find the sum of upper triangular elements of a matrix. | (7) |

PART B

Answer any two full questions, each carries 15 marks.

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|---|---|-----|
| 4 | a) Explain the relevance of function definition and declaration in C++ modular programming. | (6) |
| | b) Develop a C++ program, using structures, to read the details of <i>N</i> students in a class like Roll no., Name and marks for 5 subjects. The program should output the total marks of each student and the class average for each subject. | (9) |
| 5 | a) Describe any 3 functions used to handle files in C++. | (6) |
| | b) Write a program in C++ to check whether a number is prime or not using a user defined function. | (9) |

- 6 a) What are the advantages of object oriented programming? Explain any three features of OOP. (6)
- b) What is a recursive function? Write a program to calculate the sum of first N natural numbers using a recursive function. (9)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Find the real roots of the equation $x^3 - 2x - 5 = 0$ using Newton Raphson method correct to three decimal places. (10)
- b) Develop a program to find the integral $\int_2^3 \frac{x dx}{1+3x}$ by Simpson's 1/3rd rule. (10)
- 8 a) Solve the following set of equations by Gauss Elimination: (10)
 $2x + 3y + z = 23$, $3x + 4y + z = -14$, $6x + 7y + 2z = 26$.
- b) Develop a program to find the real roots of $\cos(x) - xe^x = 0$ by Regula Falsi Method. (10)
- 9 a) Write a program to fit a straight line to a given set of data. (10)
- b) Using Gauss Quadrature formula, compute $\int_1^2 \frac{1}{1+x^2} dx$ for $n = 3$. (10)
- Gauss points for $n = 3$ are $-0.7746, 0.0, 0.7746$ and weights are $0.5556, 0.8889$ and 0.5556 .
