

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CE306
Course Name: COMPUTER PROGRAMMING AND COMPUTATIONAL
TECHNIQUES (CS)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- | | | |
|---|---|------|
| 1 | a) Explain the various conditional statements in C++. | (5) |
| | b) Write a program to find the sum, average and product of a set of N numbers, using arrays. | (10) |
| 2 | a) What are the different unformatted console I/O functions? | (5) |
| | b) Write a program to read a matrix, replace all negative elements of the matrix by zero and print the resulting array. | (10) |
| 3 | a) Give the purpose of following functions with examples. i) strcmp() ii) strcat() iii)strupr() | (5) |
| | b) Write a program to check whether given string is palindrome. | (10) |

PART B

Answer any two full questions, each carries 15 marks.

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|---|--|------|
| 4 | a) What are function prototypes and what is its purpose? | (5) |
| | b) Write a program to read an array of integer numbers and display its mean and standard deviation. Note: Computation of mean and standard deviation needs to be performed in a separate function. | (10) |
| 5 | a) Discuss various file Input / Output statements in C++ with examples. | (5) |
| | b) Prepare a C++ program to enter the details of 'N' books like title, author's name, number of pages, price of the book and year of publishing and print them in tabular form using a structure. | (10) |
| 6 | a) Explain function overloading in C++ with suitable examples. | (7) |
| | b) Explain in detail the difference between procedural programming and object oriented programming. | (8) |

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Find the root for the equation $f(x) = \ln x - \cos x = 0$ using Regula Falsi method (10)
b) Write a program to find any one root of a given function using Newton-Raphson method. Note: the function may be taken as $\ln x - \cos x = 0$ (10)
- 8 a) Use three point Gauss quadrature to integrate the following function (10)
$$\int_0^2 e^{-2(x^2+2x)} dx$$

b) Write a program to numerically integrate a given function (with the tabulated values of function at equal intervals available) using trapezoidal rule. (10)
- 9 a) Solve the following set of simultaneous equations by Gauss elimination: (10)
 $2x_0+3x_1+5x_2=23$; $3x_0+4x_1+x_2=14$; $6x_0+7x_1+2x_2=26$
b) Explain the finite difference method for solution of partial differential equations (10)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 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) Write short notes on usage of Preprocessor directives in C++ (4)
 b) What are manipulators in C++. Explain with suitable examples. (4)
 c) Write a program to accept the height of a person in centimetres and convert and display the height in feet and inches (7)
- 2 a) Explain in detail the use of *break* and *continue* statements in C++ with suitable examples. (7)
 b) Write a program to read a 2D array of size m x n and prepare a 1 D array that will store all the elements of the 2D array as if they were stored in the row major form. (8)
- Sample: if the 2 D array is $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ the 1 D array having the elements of 2D array in row major form is [1 2 3 4 5 6 7 8 9]
- 3 a) Explain any four string handling functions. (8)
 b) Write a program to check whether a given character is a vowel, using switch statement. (7)

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

- 4 a) Explain the call by value and call by reference methods of function invoking. (5)
 b) Write a program using functions to find the largest and smallest number in a 2D array. Note: The function should accept the 2D array from the main function and return the maximum and minimum number. (10)
- 5 a) Write and explain the general form of a structure definition, declaration & initialisation with proper examples. (7)

- b) Write a program (using structure) to read the details of m students in a class (8) including Roll no., name and marks of 3 subjects and print average mark of each student.
- 6 a) Explain the various file input and output streams commonly used in C++? (7)
- b) Bring out the difference between procedure oriented programming and object oriented programming (8)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Using method of successive approximations find a real root of the equation (10)
 $x - \sin x - \frac{1}{2} = 0$. For iteration the trial value of root may be taken as 1.0.
- b) Develop a program to fit a straight line to a given set of coordinates. (10)
- 8 a) The following table gives the results of the measurements of resistance felt by a (10)
 running train, where V the velocity of travel in km/hr and R is the resistance in kN.

V	20	40	60	80	100	120
R	5.5	9.1	14.9	22.8	33.3	46

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

- b) Write a program to perform numerical integration using Trapezoidal rule when (10)
 the function is tabulated as data points.
- 9 a) Solve the following simultaneous system of equations using Gauss elimination (10)
 method. $3x_1 - 0.1x_2 - 0.2x_3 = 7.85$;
 $0.1x_1 + 7x_2 - 0.3x_3 = -19.3$; $0.3x_1 - 0.2x_2 + 10x_3 = 71.4$.
- b) Demonstrate the finite difference method of numerical solution of partial (10)
 differential equations for the case of a Laplace equation given by $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} = 0$

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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.

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|---|---|------|
| 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 (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)

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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.

- | | | |
|---|---|-----|
| 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 .
