

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S,FE) Examination January 2022 (2015 Scheme)

Course Code: ME305**Course Name: COMPUTER PROGRAMMING & NUMERICAL METHODS**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer any three full questions, each carries 10marks.*

Marks

- 1 a) What are the rules to be followed while writing identifiers in C++? Give any four valid examples for identifiers. (5)
- b) Explain how can you replace for loop with while loop by writing programs to print all odd numbers between 0 and 50 using for and while loops. (5)
- 2 a) With the help of a block diagram, explain the internal representation of a floating point number as mantissa and exponent. (5)
- b) Write a C++ program to find the standard deviation of N values using array. (5)
- 3 a) Compare procedural and object oriented programming concepts. (5)
- b) Explain the terms function prototype, function definition and function call with the help of an example. (5)
- 4 a) Discuss any five fundamental data types in C++ giving its keyword, size, limitations and examples. (5)
- b) What is the purpose of inline functions in C++? Write the syntax for creating an inline function. Also give any four reasons that the compiler may reject the request for inlining. (5)

PART B*Answer any three full questions, each carries 10marks.*

- 5 a) Demonstrate the usage of 'address of' and 'indirection' operators in relation to pointers with the help of examples and block diagrams. (5)
- b) Illustrate encapsulation in C++ with the help of an example. (5)
- 6 a) Write a program to find the factorial of a number using a recursive function. (5)
- b) Explain friend class in C++ with the help of an example. (5)
- 7 a) Write a program to find the sum of the series $\frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \dots + \frac{1}{n!}$ upto n terms. (5)
- b) What are the access specifiers in a class? Give the usage of each one of them. (5)

- 8 a) Write a C++ program to search a given number in an array. (5)
 b) Discuss multiple inheritance giving its syntax and an example. (5)

PART C

Answer any four full questions, each carries 10marks.

- 9 Define the following terms: i) Inherent errors, ii) Rounding errors, iii) Truncation errors, iv) Absolute errors and v) Relative errors. (10)
- 10 Write a C++ program to solve simultaneous equations (n equations in n unknowns) using Gauss-Seidal method. (10)
- 11 Determine the value of y corresponding to $x = 210$ using Aitken's method using the following table. (10)

x	201	207	212	215	216
y	2.6732	2.8352	2.9132	2.9501	2.9576

- 12 Fit a second degree parabola to the following data. (10)

x	1969	1970	1971	1972	1973	1974	1975	1976	1977
y	452	456	457	458	460	461	461	460	458

- 13 Researchers interested in determining if there is a relationship between anxiety and physical fitness conducted a study and come up with the following data. (10)

Anxiety index	39	41	28	32	27	16	25	15	20	12	9	17	4
Health index	5	4	12	5	8	7	13	10	9	16	20	16	14

Find the correlation coefficient for this sample data and interpret the result.

- 14 Solve the Laplace equation for the following square mesh with boundary values as shown in fig. 1. (10)

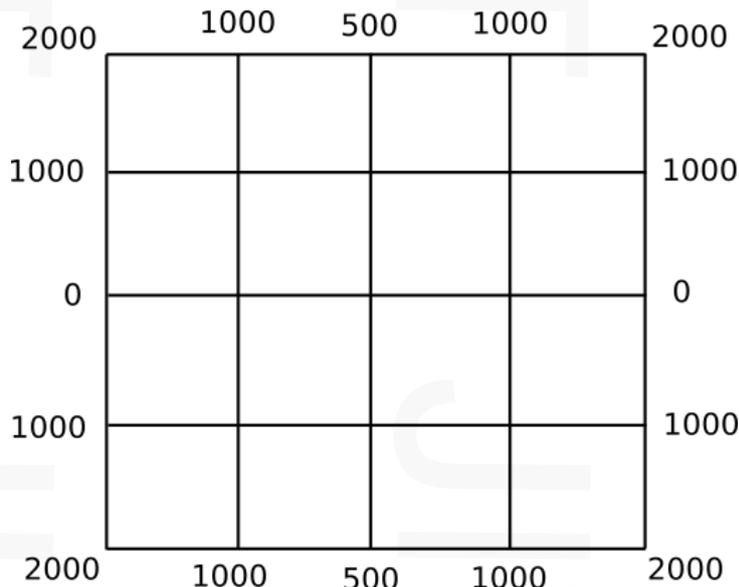


Fig. 1