

## B.Sc. Semester - 5 (Remedial) (CBCS) Examination

February/March. -2020

## PROGRAMMING IN C AND NUMERICAL ANALYSIS-1(CORE)

Time: 2:30 Hours

Marks: 70

## Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

**Q.1 (A) Answer any two of the following questions.****[10]**

- (1) Explain *printf* and *scanf* functions in detail.
- (2) Write and explain usage of nested if – else statement in C language with example.
- (3) Write a short note on character constants in C language.

**Q.1 (B) Answer any one of the following questions.****[04]**

- (1) Write a short note on history of C.
- (2) Write a C program to calculate volume of a sphere when radius is given.

**Q.2 (A) Answer any two of the following questions.****[10]**

- (1) Explain the syntax and usage of *for* loop in C.
- (2) Write a short note on integer signed data type in C.
- (3) Write a program to verify a number whether it is palindrome or not.

**Q.2 (B) Answer any one of the following questions.****[04]**

- (1) Explain continue statement and its syntax.
- (2) Write a C program using *goto* statement.

**Q.3 (A) Answer any two of the following questions.****[10]**

- (1) Specify the types of preprocessor derivatives in brief.
- (2) Explain file inclusion derivative in C language.
- (3) Write C program to multiply two matrixes.

**Q.3 (B) Answer any one of the following questions.****[04]**

- (1) Explain initialization of one dimensional array.
- (2) Write a C program to find transpose of a given  $3 \times 3$  matrix.

**Q.4 (A) Answer any two of the following questions.****[10]**

- (1) Explain L.U. decomposition method to solve a system of linear equations.
- (2) Explain principle of least square.
- (3) Solve the following system of linear equations by Crout's method  
 $x + y + z = 3, 2x - y + 3z = 16, 3x + y - z = -3.$

**Q.4 (B) Answer any one of the following questions.****[04]**

- (1) Obtain normal equations of parabola  $y = ax^2 + bx + c$ .
- (2) Write Gauss Seidal's method to solve a system of linear equations.

**Q.5 (A) Answer any two of the following questions.****[10]**

- (1) Derive Gregory Newton's forward interpolation formula.
- (2) Find a cubic polynomial which takes the following values  
(0,1), (1, 2), (2,1) and (3, 10). Also represent the polynomial in factorial form.
- (3) Derive Gregory Newton's backward interpolation formula.

**Q.5 (B) Answer any one of the following questions.****[04]**

- (1) Find the values of  $(2 - 3x)^{[2]}$  at  $x = 4$  and  $(-2 + 4x)^{[3]}$  at  $x = -1$ .
- (2) Prove the following in usual notations.

$$(a) \mu = \frac{2+\Delta}{2\sqrt{1+\Delta}},$$

$$(b) \Delta = \frac{1}{2} \delta^2 + \delta \sqrt{1 + \frac{\delta^2}{4}}.$$

\*\*\*\*\*