



**PAQ-003-1015002** Seat No. \_\_\_\_\_

**Third Year B. Sc. (Sem. V) (CBCS) Examination**

October / November - 2018

**Mathematics (Theory) : MATH - 06 (A)**

*(Programming in C and Numerical Analysis - I)*

*(New Course)*

**Faculty Code : 003**

**Subject Code : 1015002**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :** (1) All the questions are compulsory.  
(2) Numbers written to the right indicate full marks of the question.

- 1 (a) Attempt the following : 1+1+1+1=4
- (1) Who invented the B language? where`?
  - (2) What is the range of integer constant in C language ? (w.r.t. 32 bit compiler)
  - (3) The exponent must have at least one digit, which must be a positive or negative integer. TRUE or FALSE ?
  - (4) Write a scanf ( ) statement to input one integer, one float and one character value through keyboard.
- (b) Attempt any **one** in brief : 2
- (1) Explain the ternary (conditional) operator statement in C language with example.
  - (2) Explain integer division in C with examples.
- (c) Attempt any **one** in detail : 3
- (1) Explain type declaration instruction (variable declaration) in C language.
  - (2) Explain the "if - else statement" in C language with example.
- (d) Attempt any **one** : 5
- (1) Explain the syntax of the printf ( ) statement in C language with multiple examples.
  - (2) Write a C programme to reverse the number entered through keyboard.

- 2 (a) Attempt the following : 1+1+1+1=4
- (1) Give the list of loop control structures in C.
  - (2) What will be the output of the following code in C language  

```
int i, j;  i=8;
i--;
printf("\n\ti = %d", i);
```
  - (3) Write a for loop which will print integers 20, 18, 16, ..., 6, 4, 2
  - (4) Specify memory requirement and format specification for long integer data type.
- (b) Attempt any **one** in brief : 2
- (1) Explain the meaning of goto statement in C, also give proper examples for the same.
  - (2) Explain what is the return value with respect to user defined functions with an example program ?
- (c) Attempt any **one** in detail : 3
- (1) Write a C programme using a user defined function without any arguments and without any return values.
  - (2) Explain the difference between while and do-while loop in C ?
- (d) Attempt any **one** : 5
- (1) Explain the syntax of the for statement in C language with example.
  - (2) Write a C programme to find factorial of any positive integer entered through key board.
- 3 (a) Attempt the following : 1+1+1+1=4
- (1) Explain file inclusion directives in C language.
  - (2) Find errors in the following statement if there are any *#define count = 100;*
  - (3) Find errors in the following statement if there are any *Flaot a(2)(2) = [5, 7, 3, 4]*
  - (4) Write an input statement to read a 5×4 matrix Using a two dimensional array.
- (b) Attempt any **one** in brief : 2
- (1) Explain with examples and diagrams how values of ONE dimensional integer arrays are allocated space in the memory of computer.
  - (2) Explain symbolic constants in C language with syntax and examples.

- (c) Attempt any **one** in detail : **3**
- (1) Explain the meaning of array in C language with proper example.
  - (2) Explain Macro with arguments in C language with syntax and examples.
- (d) Attempt any **one** : **5**
- (1) Explain the syntax of the ONE (single) dimensional array in C language with multiple examples.
  - (2) Write a C programme to input a 3×3 matrix using two dimensional array and print the transpose of the matrix entered.
- 4 (a) Attempt the following : **1+1+1+1=4**
- (1) Which method is more rapid than Jacobi method ?
  - (2) Define empirical equation.
  - (3) What is L in factorisation method.
  - (4) Write normal equations for fitting a straight line.
- (b) Attempt any **one** in brief : **2**
- (1) Explain Linear law.
  - (2) Write name of any four direct methods..
- (c) Attempt any **one** in detail : **3**
- (1) Explain principle of least squares.
  - (2) Explain Gauss Seidel method.
- (d) Attempt any **one** : **5**
- (1) Explain Crout's method..
  - (2) Explain Gauss elimination method.
- 5 (a) Attempt the following : **1+1+1+1=4**
- (1) Define : Forward difference operator.
  - (2) Write Gregory forward difference formula.
  - (3) Define reciprocal factorial polynomial.
  - (4) Write relation between central difference operator and shift operator.

(b) Attempt any **one** in brief : 2

(1) In usual notation prove that  $E = e^{hD}$ .

(2) Express  $p(x) = x^4 - 12x^3 + 24x^2 - 30x + 9$  as a factorial polynomial.

(c) Attempt any **one** in detail : 3

(1) Explain Error propagation in difference table.

(2) Find the missing value in the following table.

$x$	16	18	20	22	24	26
$y$	43	89	–	155	268	388

(d) Attempt any **one** : 5

(1) Derive Gregory backward difference formula.

(2) Consider the following data table and find value of I when  $V = 9$ , using Newton's forward interpolation formula.

V	8	10	12	14	16
I	1000	1900	3250	5400	8950

\_\_\_\_\_