



RO-003-1015002

Seat No. _____

B. Sc. (Sem. V) (CBCS) (W.E.F. 2016) Examination

February - 2019

Mathematics : Paper - VI (A)

(Programming in C & Numerical Analysis - 1)

Faculty Code : 003

Subject Code : 1015002

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

[Total Marks : 70

- 1 (A) Answer the following in **one** sentence / word : 4
- (1) Write a symbol of ampersand.
 - (2) In which laboratory language C was developed ?
 - (3) Write the general form of usage of conditional operators.
 - (4) Write a flow chart of "if" statement.
- (B) Answer any **one** the following in brief : 2
- (1) Write a hierarchy of operators in the table.
 - (2) How many bytes are required to store the character "4" in char type data ?
- (C) Answer any **one** the following in detail : 3
- (1) How many byte the variable x will take ? What will be stored at the variable x when we declare as following :

```
main( )  
{  
int x=32769;  
}
```
 - (2) Explain printf function with an example.

(D) Write a note on any **one** of the following : 5

- (1) Write a program to find grade if the score is input through keyboard. Write it using conditional statements for the following grade system :

<i>Score</i>	<i>Grade</i>
0 - 150	D
151 to 200	C
201 to 300	B
301 to 400	A

- (2) Write a program to find grade if the score is input through keyboard. Write it using nested if statements only for the following grading system :

<i>Score</i>	<i>Grade</i>
Less than 150	D
151 to 200	C
201 to 300	B
301 to 400	A

2 (A) Answer the following in **one** sentence / word : 4

- (1) Look at the following codes of C language. Answer if the loop is never ending or it stops :
while (a)
a++;
- (2) Which are unary operators ?
- (3) What is the range of unsigned char type constant ?
- (4) %Ld is the specifier of which type of data ?

(B) Answer any **one** the following in brief : 2

- (1) Explain use of break statement.
- (2) Draw a flow chart of for loop.

(C) Answer any **one** the following in detail : 3

- (1) Give an example of user defined function.
- (2) What are differences between while and for loops ?

(D) Write a note on any **one** of the following : 5

- (1) Write a program to find factorial of a number input through keyboard.
- (2) Write a program to calculate the sum of first 10 numbers using do-while loop.

3 (A) Answer the following in **one** sentence / word : 4

- (1) What is C processor ?
- (2) Which macro defines constant value and can be any of the basic data types ?

- (3) Write the syntax of the macro which defines constant value and can be any of the basic data types.
- (4) Write the syntax of one dimensional array.
- (B) Answer any **one** the following in brief : 2
- (1) What is the meaning of compile time initialization?
- (2) Describe the meaning of following declaration :
float table [5] [3];
- (C) Answer any **one** the following in detail : 3
- (1) Explain memory map of following one dimensional arrays :
int n [4] = {5, 7, 2, 6};
float a [5] = {4.1, 7.5, 0.3, 8.02, 68.5};
char c [3] = {'p', 'm', 'c'};
- (2) Write use of the following commands :
(1) Alt + x (2) Alt + F9
(3) F9 (4) F3
(5) F2 (6) Alt + F3.
- (D) Write a note on any **one** of the following : 5
- (1) Write a program to input and output 10×2 matrix.
- (2) Give an example of the programming of any one matrix operation.
- 4 (A) Answer the following in **one** sentence / word : 4
- (1) Which is the linear form of the equation
 $y = ax^2 + bx$?
(1) $Y = ax + b$ (2) $y = ax + b$
(3) $y = aX + b$ (4) $Y = aX + b$
(5) $Y = Ax + B$ (6) $y = Ax + B$
- (2) In Gauss Jordan method coefficient matrix A is reduced into which matrix.
- (3) What is convergence criteria for Gauss-Jacobi method ?
- (4) If $y = a + bx$, $\sum x = 50$, $\sum y = 80$, $\sum x^2 = 750$, $\sum xy = 1030$ and $n = 10$, then $a = \underline{\hspace{2cm}}$ and $b = \underline{\hspace{2cm}}$. Fill in the blanks.
- (B) Answer any **one** the following in brief : 2
- (1) Explain Graphical method,.
- (2) Using the "principle of least square" which curve can be fit ?

(C) Answer any **one** the following in detail : 3

(1) Solve the system : $x + y + 5z = 7$, $2x + 10y + z = 13$,
 $10x + y + z = 12$ by the modified form of Gauss
elimination method.

(2) Solve : $2x + y + z = 4$, $x + 2y + z = 4$, $x + y + 2z = 4$.

(D) Write a note on any **one** of the following : 5

(1) Explain the Triangular (Crout's) method.

(2) Fit a curve of the form $y = ax^b$ to the data given.
below in least square sense :

$x :$	1	2	3	4	5
$y :$	7.1	27.8	62.1	110	161

5 (A) Answer the following in **one** sentence / word : 4

(1) Write symbols of forward difference, backward
difference and central difference operators.

(2) State error in Newton-Forward Interpolation.

(3) Write $f(x - 2h)$ using inverse operator

(4) What is result of $E^{1/2} \nabla + E^{1/2} \Delta$?

(B) Answer any **one** the following in brief : 2

(1) Prove that $\mu^2 = 1 + \frac{\delta^2}{4}$.

(2) Prove : $\Delta \nabla = \Delta - \nabla$.

(C) Answer any **one** the following in detail : 3

(1) Find $\Delta^2 \left[\frac{1}{x(x+3)(x+6)} \right]$.

(2) Represent the function $f(x) = x^3 - 2x^2 + x - 1$
and successive differences in factorial notation in
the interval of differencing is 1.

(D) Write a note on any **one** of the following : 5

(1) Estimate the values of $f(22)$ and $f(42)$ from the
following data :

$x :$	20	25	30	35	40	45
$f(x) :$	354	332	291	260	231	204

(2) Find a cubic polynomial which takes the following
set of values :

(0, 1), (1, 2), (2, 1) and (3, 10).