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DBK-003-1015002 Seat No. _____

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

June – 2022

Math-6(A) : Mathematics

(Programming in C & Numerical Analysis-1)

Faculty Code : 003
Subject Code : 1015002

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instruction : Write answers of any five questions.

1 (A) Answer the following questions : **4**

(1) Rewrite with filling of correct answer : Sequence of characters is known as _____.

(2) Who invented language B ?

(3) Rewrite with filling of correct answer : The operator && is known as _____ operator.

(4) In which function following is written in ()? ("Control string", &v1,&v2);

(B) Answer the question : **2**

Give the output of the following code :

```
int i, j, k;
i=7; j=2;
k=i/j;
printf("k=%d"k);
```

(C) Answer the question : **3**

Explain a goto statement in C with suitable examples.

(D) Answer the question : **5**

Write a C program to calculate area of a rectangle when length and width of the same are given.

2 (A) Answer the following questions : 4

(1) Give names of 5 secondary constants in C language.

(2) What will be the value of temp after the following code is executed ?

```
int     a = 29; b = 78;
temp = (a>b? 25: –76)
```

(3) Is getch a keyword or function or else ? Give correct name.

(4) Is "123" a character constant ? Why ?

(B) Answer the question : 2

Write a statement to print the message as follows

```
STAY
        HOME
STAY
        SAFE
```

(C) Answer the question : 3

Explain the ternary (conditional) operator statement in C language with example.

(D) Answer the question : 5

Write a C program using **nested if-else** statement to calculate the division for following criteria obtained by the student :

The marks obtained by a student in 5 different subjects are input through the keyboard. The student gets a division as per the following rules :

Percentage above or equal to 60 – First division

Percentage between 50 and 59 – Second division

Percentage between 40 and 49 – Third division

Percentage less than 40 – Fail

3 (A) Answer the following questions : **4**

(1) Type format Specification for long integer variable is :

(a) %if (b) %ld (c) %Ld (d) %Lf

(2) What is the valid range of int type data ?

(3) Which statement can be used to terminate loop prematurely ?

(4) If the user defined function f is defined as :

```
int f(int x)
{
    int y;
    y=x/2;
    return(y);
}
```

then what is return value of f(5) ?

(B) Answer the question : **2**

Write two differences between for loop and do while loop.

(C) Answer the question : **3**

Explain user defined function with suitable example.

(D) Answer the question : **5**

Explain do-while loop. Also write difference between do-while and while loop.

4 (A) Answer the following questions : **4**

(1) Give any one difference between int and long.

(2) How many loops are available in Language C ?

(3) Which statement passes control to beginning of loop without executing successor statements ?

(4) What is format specification for variable of type double ?

(B) Answer the question : **2**

Write two differences between while loop and do while loop.

(C) Answer the question : **3**

Write C program to generate Fibonacci sequence.

(D) Answer the question : **5**

Explain syntax of do-while loop with flow chart and write a C program which includes use of do-while loop.

5 (A) Answer the following questions : **4**

(1) Find error from the following statement of C program :

defne f(x) = x+sin(x/2)

(2) Which header file must be included to use fabs function in C program ?

(3) Which component of C processor converts object code and library function into executable code ?

(4) Preprocessor converts expanded source code (.l) into object file(.OBJ). (True/False)

(B) Answer the question : **2**

What is role of linker ?

(C) Answer the question : **3**

Explain One dimensional array.

(D) Answer the question : **5**

Write C program to find transpose of a matrix.

6 (A) Answer the following questions : **4**

(1) An array can be initialized at the time of type declaration. (True/False)

(2) All elements of any given array must be of the _____.

(a) same type (b) different types (c) same

(d) none of these

(3) By default the first element numbered in the array is _____.

(a) 0 (b) 1 (c) 2 (d) none of these

(4) Macro definition is never to be terminated by a semicolon. (True/False)

(B) Answer the question : **2**

Explain macro without argument.

(C) Answer the question : **3**

Print backward difference table.

(D) Answer the question : **5**

Write C program to find product of two matrices.

7 (A) Answer the following questions : **4**

(1) In Factorization Method Square Matrix A Can Be Factorized into Form A = L.U. where L is .....

(2) In Crout's Method, every Square Matrix is Expressed As The Product Of.....

(3) Write Normal Equation to Best Fit Straight Line.

(4) What is the Linear Law Of The Curve $y = ax^n$?

(B) Answer the question : **2**

Write Names Of Any Four Direct Methods.

(C) Answer the question : **3**

Explain Gauss-Seidel Method.

(D) Answer the question : **5**

Explain Triangularization Method.

8 (A) Answer the following questions : **4**

(1) Gauss Jordan Method is Modification of ..... ?

(2) Write any two names of Iterative Methods.

(3) Write any two names of Indirect Methods.

(4) In Gauss elimination method the given system is transformed into _____ matrix.

(B) Answer the question : **2**

Explain the Law to fit the Curve of the type $y = ax^b$.

(C) Answer the question : **3**

Solve The Following System Of Equations By Gauss-Jordan Method.

$10x + y + z = 12; 2x + 10y + z = 13; x + y + 5z = 7$

(D) Answer the question : **5**

Explain Principle of Least Square and obtain Normal Equations to Best Fit a Straight Line.

9 (A) Answer the following questions : **4**

(1) Write Gregory Newton forward interpolation formula.

(2) $x^{(0)}$ equals to _____.

(3) Define $x^{(-r)}$.

(4) Prove that $(1+\Delta)(1-\nabla) = 1$.

(B) Answer the question : **2**

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

(C) Answer the question : **3**

Construct a Forward Difference Table from the following data :

x	0	1	2	3	4	5
y	1	8	27	64	125	216

(D) Answer the question : **5**

Explain Gregory Newton's Backward Interpolation Formula.

10 (A) Answer the following questions : **4**

(1) Evaluate $\Delta^{10} + (1-ax)(1-bx^2)(1-cx^3)(1-dx^4)$.

(2) Fill in the blank Δx^r = _____

(3) Define Δ.

(4) Define Interpolation.

(B) Answer the question : **2**

Prove that $\Delta + \nabla = \frac{\Delta}{\nabla} - \frac{\nabla}{\Delta}$.

(C) Answer the question : **3**

Evaluate $\Delta^2\left[\frac{1}{x(x+4)(x+8)}\right]$.

(D) Answer the question : **5**

One of the values of y is incorrect and y is a cubic polynomial. Correct it :

x	0	1	2	3	4	5	6	7
y	25	21	19	19	27	45	76	123