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3 (Sem-5/CBCS) STA HC 2

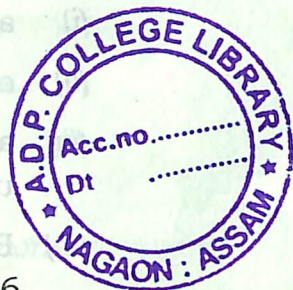
2021

(Held in 2022)

STATISTICS

(Honours)

Paper : STA-HC-5026



**(Statistical Computing using C/C++
Programming)**

Full Marks : 60

Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

1. Answer the following as directed :

1×7=7

(a) The brain of any computer system is :

(i) ALU

(ii) memory

(iii) CPU

(iv) control unit

(Choose the correct option)

Contd.

(b) Evaluate $10\% 2$.

(c) A C-variable cannot start with

(i) an alphabet

(ii) a digit

(iii) a special character other than underscore

(iv) Both (ii) and (iii)

(Choose the correct option)

(d) The expression $a = 22/7 * 5/3$ would evaluate the value of a as _____.

(Fill in the blank)

(e) Which of the following escape sequences moves the cursor position to the new line?

(i) `\r`

(ii) `\n`

(iii) `\t`

(iv) `\v` (Choose the correct option)

(f) State whether the following declaration is allowed in C :

`Char str[3] = "GOOD";`

(g) Array can be considered as a set of elements stored in consecutive memory locations having

(i) different data type

(ii) same data type

(iii) same scope

(iv) None of the above

(Choose the correct option)

2. Answer the following questions briefly :

$$2 \times 4 = 8$$

(a) Differentiate between hardware and software.

(b) Write the output of the following C-programme segment :

```
{  
    int a = 45;  
    float b = 3.5;  
    a = a + b;  
    b = a - b;  
    a = (a + b)/2;  
    b = (a - b)/2;  
    printf("%d%f", a, b);  
}
```


(c) What does the statement
`int A [50];`
 represent in C/C++ language?

(d) Write the following algebraic
 expressions in C/C++ :

(i) $3x^2 + 2x + 5$

(ii) $\frac{2by}{d+1} - \frac{2}{3(y+x)}$

3. Answer **any three** questions from the
 following: 5×3=15

(a) Draw a flowchart for calculating mean
 deviation from mean.

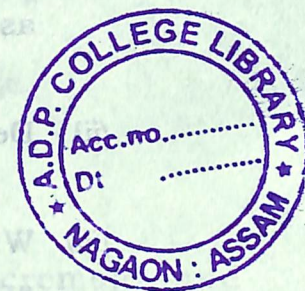
(b) Write a C/C++ program to find
 arithmetic mean and harmonic mean
 of n observations.

(c) Describe the 'switch' statement.

(d) (i) Write a note on overflow and
 underflow of data. 3

(ii) What will be the output of the
 following program segment? 2

```
main ()
{
    int i = 2, j = 3, k, l;
    float a, b;
    k = i/j * j;
    l = j/i * i;
    a = i/j * j;
    b = j/i * i;
    printf ("%d %d %f %f\n", k, l, a, b);
}
```



(e) Write a C/C++ program to determine
 the transpose of an $n \times n$ matrix A.

4. Answer **either (a) or (b)** :

(a) (i) Write briefly on 'C tokens'. 2

(ii) Write a note on 'else-if' ladder. 3

(iii) Write a C/C++ programme to
 determine the value of $n!$ 5

- (b) (i) Evaluate float type variable x such that

$$x = a * b / 2 + 3 / 2 * b + 2 + c$$

assuming $a = 4$, $b = 1$, $c = 3.2$

2

- (ii) Describe the 'for loop' briefly.

3

- (iii) Write a C/C++ programme to arrange n numbers in ascending order.

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5. Answer **either** (a) **or** (b) :

- (a) (i) What are different relational operators available in C?

2

- (ii) State the precedence rule of arithmetic operators.

2

- (iii) Write a C/C++ programme to find the correlation coefficient of n pairs of observations.

6

- (b) (i) What is an algorithm?

1

- (ii) Briefly explain the 'do...while' loop.

2

- (iii) Write a programme in C/C++ to obtain an approximate value of

the integral $\int_0^2 \frac{e^x}{1+x}$ by using

Simpson's $\frac{1}{3}$ rd rule.

7

6. Answer **either** (a) **or** (b) :

- (a) (i) Elaborate on increment and decrement operators.

2

- (ii) Describe the procedure of initialization of one-dimensional array.

2

- (iii) Write a C/C++ programme to find the variance and coefficient of variation of n observations.

6

- (b) (i) Write an explanatory note on 'for' loop.

3

- (ii) Write a C/C++ programme to find an approximate solution of

the equation $\frac{1}{x} - e^{-x} = 0$ using

Newton-Raphson method.

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