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3 (Sem-5/CBCS) STA HC 2

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.**

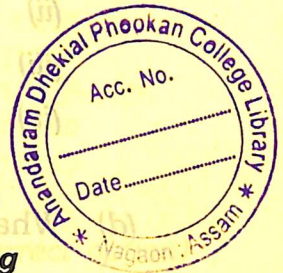
1. Answer **any seven** questions from the following : 1×7=7

(a) Use of more than one main ( ) function in a C programme is illegal.

(State True or False)

(b) \_\_\_\_\_ is a sequence of instructions written to perform a specific task in the computer. (Fill in the blank)

Contd.





(c) Every programme statement in C must end with a

- (i) dot
- (ii) colon
- (iii) semicolon
- (iv) comma

(Choose the correct option)

(d) What is a scanf function ?

(e) All variables must be initialized before they are used in the programme.

(State True or False)

(f) Which of the following is an assignment operator ?

- (i) %
- (ii) !=
- (iii) =

(iv) None of the above

(Choose the correct option)

(g) To print the data left justified, we must use \_\_\_\_\_ in the field specification.

(Fill in the blank)

(h) It is an error to place a semicolon after the 'if' expression.

(State True or False)

(i) What is an algorithm ?

(j) Which of the following statements can be used to immediately exit from the program ?

- (i) exit ( )
- (ii) break
- (iii) goto

(iv) Both (i) and (ii)

(Choose the correct option)

(k) An array  $N[3]=\{1, 2, 3\}$  has been declared and initialized in a C programme. What will be the output of the following statement ?

printf("%d", N[3]);

(l) The declaration  $\text{int } x[2]=\{1, 2, 3\};$  is illegal.  
(State True or False)

2. Answer **any four** of the following questions briefly :  $2 \times 4 = 8$

(a) Write about CPU.

(b) Define global variable and local variable.

(c) Write down the relational operators available in C.



(d) Consider the following statements :

$m = 8;$

$y = m++;$

What will be the values of  $m$  and  $y$  after execution of the given statements?

(e) Write down the equivalent C expressions of the arithmetic expressions—

(i)  $3x^2 - 9x + 4$

(ii)  $\frac{x + y + z}{c + d}$

(f) What are the functions you will use for reading a character and writing a character in C programming?

(g) Evaluate the following expressions assuming that  $k$  is a float variable :

(i)  $k = 3/2 * 4 + 3/8$

(ii)  $k = 2 * 3/4 + 4/4 + 8 - 2 + 5/8$

(h) Briefly describe the simple IF statement.

3. Answer **any three** questions from the following :  $5 \times 3 = 15$

(a) Explain the nested 'IF...ELSE' statement with the help of a flowchart.

(b) Write an algorithm to find the standard deviation of  $n$  observations.

(c) Write briefly on input and output of integer numbers in C/C++.

(d) (i) Explain briefly the WHILE statement available in C/C++.

3

(ii) Write about declaration of variables in C/C++.

2

(e) Explain the DO statement of C/C++.

(f) Describe how to 'jump out' of a loop in C/C++.

(g) Discuss initialization of one-dimensional array in C/C++.

(h) The income tax rates of a country are as follows :

IT = 0 if income is below 3,00,000/-

IT = 10% of the income above 3,00,000/-

if  $3,00,000/- \leq \text{income} < 5,00,000/-$

IT = 20% of the income above 5,00,000/- +

20,000/- if  $\text{income} \geq 5,00,000/-$

Draw a flowchart which would print the income tax to be paid by a tax payer as per the above rule.



4. Answer **any three** questions from the following :  $10 \times 3 = 30$

(a) (i) Elaborate on the basic structure of C. 5

(ii) Explain briefly the conditional operator statement available in C. 2

(iii) Write a note on 'FOR statement' as one of the loop structure. 3

(b) (i) Write a brief note on flowchart. 6

(ii) If the three sides of a triangle are given, write a C/C++ programming to find the area of the triangle. 4

(c) (i) Write a detail note on arithmetic operators in C. 4

(ii) Write a C/C++ programming to find the regression coefficients of Y on X and X on Y. 6

(d) (i) Write a note on declaration and initialization of two-dimensional array.  $2+2=4$

(ii) State the importance of C. 2

(iii) A shopping mall is offering the following discount scheme :

Let  $x$  be the total bill of a customer, then

if  $x < 3,000/-$  — no discount

if  $3,000/- \leq x < 5,000/-$  — print  $x$ -Rs. 50/-

if  $x \geq 5,000/-$  — print  $x$ -Rs. 150/-

Write down the algorithm. 4

(e) (i) What is keyword in C? 1

(ii) Define Trigraph characters. 2

(iii) Write a programme in C/C++ to find the median of  $n$  observations. 7

(f) (i) Why and when do we use the #include directive? 2

(ii) Write briefly on backslash character constants. 2

(iii) Distinguish between the following pairs :  $2+2+2=6$

getchar and scanf functions

%S and %C specifications for reading

%f and %e specifications for printing





(g) (i) Explain different data types available in C. 5

(ii) Write a programme in C/C++ to read the values of  $x$  and  $y$  and print the results of the following expressions in one line—

$$\frac{x+y}{x-y}, \frac{x+y}{2} \text{ and } (x+y)(x-y)$$

5

(h) (i) Write a note on reading strings from terminal and writing strings to screen.  $1\frac{1}{2} + 1\frac{1}{2} = 3$

(ii) Write a program in C/C++ to multiply matrix  $A$  of order  $m \times n$  with matrix  $B$  of order  $n \times l$  and store the result in a matrix  $C$  of order  $m \times l$ . 7

