Total number of printed pages–8

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

2. Answer ***any four*** of the following questions briefly : 2×4=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 : 5×3=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/- ≤ income < 5,00,000/-

IT = 20% of the income above 5,00,000/- + 20,000/- if income ≥ 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 : 10×3=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 $3{,}000/- \le x < 5{,}000/-$ — print x–Rs. 50/-

if $x \ge 5{,}000/-$ — 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. 1½+1½=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