WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 3rd Semester Examination, 2021-22

ELSACOR07T-ELECTRONICS (CC7)

C PROGRAMMING AND DATA STRUCTURES

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

GROUP-A

1.   Answer any *five* questions from the following: 2×5 = 10

    (a) What is an infinite loop? Explain with an example.

    (b) What is an operator? What are the operators used in 'C'?

    (c) Compare the use of switch statement with nested if-else statement. Which is more convenient?

    (d) Why do you use # define in C?

    (e) Define array. Why is it called an subscripted variable?

    (f) Explain the use of a NULL pointer.

    (g) Define 'structure' in C language.

    (h) What is the remainder for 5.0% 2? Explain.

GROUP-B

2.   Answer any *six* questions from the following: 5×6 = 30

    (a) Write a 'C' program to test the singularity of a 3×3 matrix.   5

    (b) Explain clearly the meaning of the statement " include<conio.h>". Write a C-program to generate and count prime numbers from 2 to 100.   1+4

    (c) Write a C program to find the roots of the quadratic equation $ax^2 + bx + c = 0$.   5

    (d) Write a C program to find the value of $\sin\theta$ expressing it in a infinite series.   5

    (e) What is the significance of link-listing in data structure? What are the advantages and drawbacks of circular linked list? $2\frac{1}{2} + 2\frac{1}{2}$

    (f) Explain Bubble sorting with algorithm. Compare Bubble sorting with Quick sorting.   3+2

(g) Write a C source code file to print the following pattern   3+2

$$A$$
$$B \quad A$$
$$C \quad B \quad A$$
$$D \quad C \quad B \quad A$$
$$E \quad D \quad C \quad B \quad A$$

Write down the hierarchy of different logical and relational operators used in C language.

(h) Print and calculate the following series using C   5

$$1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \cdots \cdots \text{ up to } 10^{\text{th}} \text{ term}$$

(i) Write a 'C' source code file to sort ten integer numbers in ascending order. Hence, find their average.   3+2

(j) State the differences between float and double. Write down the necessity of return statement. Clearly explain how 'break' differs from that of "exit".   5

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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