



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Honours Part-I Examination, 2021

**COMPUTER SCIENCE**

**PAPER: CMSA-II-A**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.*

**Answer Question No. 1 and any three questions from the rest taking at least one question from each group**

1. Answer any **four** questions from the following: 2×4 = 8
- (a) What are the differences between malloc() and calloc()?
  - (b) What is O/P restricted Deque?
  - (c) What is the difference between variable declaration and definition in C?
  - (d) Write down the functionality of a cross compiler.
  - (e) Can we run a program without main()?
  - (f) How will you check the validity of an expression containing nested parentheses?
  - (g) 'A pointer is an unsigned integer variable' – Justify the statement.
  - (h) Define Bootstrap loader?

**GROUP-A**

2. (a) What are the phases of Compilation process? Among them which phase may not be considered as mandatory? Write in brief about this phase with a suitable example. 1+1+3
- (b) What are the advantages and disadvantages of Absolute loader? 3
- (c) Define Operating System. What are the basic tasks of an Operating System? 2+1
- (d) Distinguish between Linking loader and Linkage editor. 3
3. (a) Convert the following expression into prefix and postfix notation: 2+2  
 $a*(b+d)/e-f*(g+h/k)$ .
- (b) What is row-major and column-major ordering of an array? Explain with a suitable example. 5
- (c) What are the differences between recursion and iteration? 2
- (d) 'Recursion is a feature of operating system not of programming language' – Justify. 3
4. (a) Let  $Z = (z_1, z_2, z_3, \dots, z_n)$  and  $Z' = (z'_1, z'_2, z'_3, \dots, z'_m)$  be two single linked lists. Write an algorithm to merge the two lists together to obtain the linked list 5  
 $X = (z_1, z'_1, z_2, z'_2, z_3, z'_3, \dots, z_m, z_{m+1}, \dots, z_n)$  if  $m \leq n$  and  
 $X = (a_1, b_1, a_2, b_2, a_3, b_3, \dots, a_n, b_n, b_{n+1}, \dots, b_m)$  if  $m > n$ . You cannot use any additional node.

- (b) Given a single circular linked list containing a set of data. Write an algorithm that finds the distance (number of nodes) between two given elements in the list. 4
- (c) Define Sparse matrix. Explain the concept of 3-tuple representation of Sparse Matrix with a suitable example. 5

**GROUP-B**

5. (a) What are the different Macros that can be used as a reference for the file pointer while using fseek(). 6
- (b) Would the following code compile correctly? Give reasons in support to your answer. 2

```
main()
{
#ifdef NOTE
    /*unterminated comment
    int a;
    a = 10;
#else
    int a;
    a=20;
#endif
    printf("%d".a);
}
```

- (c) What is recursion? How does it differ from normal function call in C? Describe the steps a C file goes through in order to get executed with a proper diagram. 2+4
6. (a) "C does not do boundary checking on the elements of an array" – Do you agree with this statement? Explain how an array reference is resolved by C. 5
- (b) What is the meaning of # include <stdio.h> and why this line is given in a C program? 3
- (c) Briefly describe different types of storage classes in C with suitable examples. 4
- (d) What do you mean by (·) and (→) operator in C with example. 2
7. (a) What do you mean by "Call by Value" and "Call by Reference"? 4
- (b) Explain the following: 4
- (i) rewind 3
- (ii) feof
- (c) What is null string? What is it's length? 4
- (d) What is type casting? Explain it with suitable example. 2+1

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*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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