



**WEST BENGAL STATE UNIVERSITY**

B.Sc. Honours Part-I Examination, 2019

**COMPUTER SCIENCE**

**PAPER-CMSA-IIA**

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.  
All symbols are of usual significance.*

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

1. Answer any **four** questions from the following: 2×4 = 8
- (a) Differentiate between Linker and Loader.
  - (b) What is the meaning of using %g in printf( )?
  - (c) Differentiate between ++i and i++.
  - (d) If  $x = -13$  and  $y = -4$  then what is the value of  $x \% y$ ?
  - (e) If  $a = 10$ ,  $b = 15$ , then calculate value of **a & b** (Bitwise-and operator of C).
  - (f) What is difference between 'x' and "x" in C?
  - (g) Mention two applications of stack.
  - (h) What is the advantage of using postfix or prefix notations in computers?

**GROUP-A**

2. (a) Compare between Absolute and Relocatable Loader, mentioning their relative merits and demerits. 4
- (b) (i) What are the utilities of having an assembler? 3+4
- (ii) Make a comparative study between One-phase and Two-phase assembler.
- (c) What are the primary and secondary tasks of Lexical Analysis Phase? 3
3. (a) Distinguish between Data Structure and Abstract Data Type (ADT). 3
- (b) (i) Differentiate between Linear Search and Binary Search. 3+2
- (ii) Why Binary Search could not be applied on Linked List?
- (c) (i) Differentiate between Recursion and Iteration. 3+3
- (ii) "Recursion is not always advantageous as compared to iteration" — Justify.
4. (a) An integer array of size **6×8** is stored in row-major order, starting from base address 3000 in memory. Calculate the address of the element at position (**3, 2**). Assume that each integer takes two bytes and 0 is the lower bound of the array. 4

- (b) Write algorithms for **doubly linked list** to perform the following operations: 2+4
- Insert a new node at the beginning of the list
  - Delete node at the  $n$ th position.
- (c) Convert from infix to postfix using stack:  $a + b * c + d * e$  4

**GROUP-B**

5. (a) Write a program in C that reads a text file and converts all lowercase characters to uppercase and stores the result in a separate text file. 6
- (b) What is the purpose of the **typedef** feature? How is typedef used in conjunction with structures? 2+2
- (c) Explain difference between 'call-by-value' and 'call-by-reference'. 4
6. (a) Consider the following C-structure: 6

```
struct bal{  
  
    float balance;  
    char name [80];  
  
} person;
```

Now write a program in C that declares a **structure pointer** to input and display the value of balance and name.

- (b) Illustrate the difference between static and auto variable with an example. 2+2
- (c) What is union? How does a union differ from a structure? For what kinds of applications are union useful? 1+1+2
7. (a) When and why we get the error message "L value Required"? What do you mean by R value? 2+2
- (b) What are the special operators in C? Explain the use of sizeof( ) operator. 2+2
- (c) What is type casting? What is its utility? 2+2
- (d) What is Dangling Else problem? 2

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