WEST BENGAL STATE UNIVERSITY

B.Sc. Honours PART-I Examinations, 2018

COMPUTER SCIENCE-HONOURS

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 $Z=(z_1,z_2,z_3,....,z_n)$ and $Z'=(z'_1,z'_2,z'_3,...,z'_m)$ be two single linked lists. 5
   Write an algorithm to merge the two lists together to obtain the linked list
   $X=(z_1,z'_1,z_2,z'_2,z_3,z'_3,...,z_m,z'_m,z_{m+1},...,z_n)$ if $m\le n$ and
   $X=(a_1,b_1,a_2,b_2,a_3,b_3,...,a_n,b_n,b_{n+1},...,b_m)$ 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: 3

(i) rewind

(ii) feof

(c) What is null string? What is it's length? 2+1

(d) What is type casting? Explain it with suitable example. 4

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