WEST BENGAL STATE UNIVERSITY

B.Sc. Honours PART-I Examinations, 2017

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* from the rest taking at least *one* question from each group.

1. Answer any ***four*** questions from the following: 2×4 = 8

   (a) What is the difference between auto and static variable in C?

   (b) What is macroprocessor?

   (c) What do you mean by ‘L value’ and ‘R value’?

   (d) Write down the functionality of fscanf function.

   (e) What do you mean by ADT?

   (f) What is the difference between break and goto?

   (g) What do you mean by Pointer of Pointer?

   (h) What is ‘Divide-and-conquer’ Algorithm?

   (i) What is the value of *x* below?

   x = 5[“VIRUS”];

   (j) What do you mean by pre processor directives?

Group-A

2. (a) Describe and draw the flowchart of a one-pass assembler. 3

   (b) How two-pass assembler is advantageous? 3

   (c) Differentiate assembler and interpreter. 3

   (d) What are the advantages of dynamic linking? 3

   (e) Differentiate compiler and cross compiler. 2

3. (a) Write an algorithm that deletes duplicate valued nodes from a linked list. The algorithm should remove all but two nodes of every duplicate valued nodes. 4

   E.g.- Input: 2, 7, 0, 7, 3, 1, 7, 3, 2, 3, 1

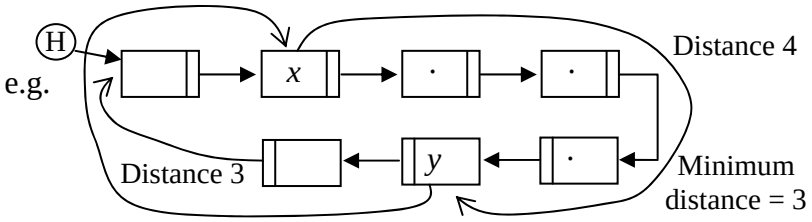
   Output: 2, 7, 0, 7, 3, 1, 3, 2, 1

   (b) Write an algorithm to merge two arrays. A and B, taking elements alternatively and saving in a third array C. 4

   E.g.- Input: A- 1, 3, 5, 7, 9
   B- 2, 4, 6

   Output: C- 1, 2, 3, 4, 5, 6, 7, 9

   (c) Write an algorithm to find the minimum distance between two nodes *x* and *y* in a singly circular linked list. 6



4. (a) Define tail recursion. Differentiate Non-tail and tail recursion, using a suitable example. 4

(b) Convert the following expression into its equivalent prefix and postfix notations 4

$$(F + G) * C\hat{}((A + B) - (D - E))$$

(c) Write a recursive function to calculate the HCF of two numbers. Hence convert it into an iterative function. 6

Group-B

5. (a) What is expected to happen when the following C code is executed on two given integers A and B? Justify how you achieve to the conclusion. 3

```
A = A ^ B;
B = A ^ B;
A = A ^ B;
```

(b) Differentiate exit control loop and entry control loop. 3

(c) What do you mean by dangling else problem? How do you solve this problem? 3

(d) Write the advantage of short hand operator. 2

(e) Compare variable and constant in C. 3

6. (a) What is difference between ‘A’ and “A”? 2

(b) Distinguish between structure and union. 3

(c) Are the expression x[m+n] and m+n[x] equivalent? Give reasons for your answer. 3

(d) “Whatever we can do using an array can also be achieved using pointers in C.” – Justify the statement. 4

(e) What do you mean by Dynamic storage class? 2

7. (a) Differentiate the following: 2×4

   (i) # include <stdio·h>, # include “stdio·h”

   (ii)

int i = 32768;	unsigned int i = 32768;
printf (“%d”, i);	printf (“%u”, i);

   (iii) malloc( ) and calloc( )

   (iv) fscanf( ) and fread( ).

   (b) What are the different modes available in C for file I/O? Briefly explain. 4

   (c) What are *argc* and *argv* in C? 2