AS–1387

B.Sc. (Part–I) Semester–II Examination

COMPUTER SCIENCE/COMPUTER APPLICATIONS/INFORMATION TECH.

(Data Structure and Advance 'C')

Time : Three Hours] [Maximum Marks : 80

N.B. :– (1) **All** questions are compulsory.

(2) Question No. **1** carries **8** marks and all other questions carry **12** marks each.

(3) Assume suitable data wherever necessary.

1. (a) Fill in the blanks :

(i) FIFO stands for _____.

(ii) The insertion of an element in queue is called as _____.

(iii) The _____ is a process in which a function calls itself.

(iv) String is a collection of _____. 2

(b) Choose correct alternative :

(i) The strings always end with :

(a) '\' character (b) '0\' character

(c) '\0' character (d) '0' character

(ii) A keyword _____ is used for a function not returning any value.

(a) int (b) void

(c) float (d) char

(iii) Finding the position of a particular element is called :

(a) traversal (b) insertion

(c) deletion (d) searching

(iv) STACK is a type of data structure :

(a) FIFO (b) LIFO

(c) FILO (d) None 2

(c) Answer in **one** sentence each :

(i) What is Circular Queue ?

(ii) What is Array ?

(iii) What is Union ?

(iv) What is Recursion ? 4

2. (a) What do you mean by Data Structure ? Explain the types of Data Structure. 6

(b) What is Queue ? Write an algorithm to insert an element into queue. 6

OR

3. (a) Write PUSH and POP algorithms. 6

(b) What is a Stack ? Explain representation of stack in memory. 6

4. (a) Explain in detail the implementation of circular queue in memory. 6

(b) State and explain the differences between a queue and circular queue. 6

OR

5. (a) Draw and explain linked list with suitable example. 6

(b) Write an algorithm to insert an element into linked list. 6

6. (a) Explain the following :

(i) Insertion sort

(ii) Bubble sort

(iii) Linear search. 6

(b) What is Binary tree ? Explain the representation of binary tree in memory. 6

OR

7. (a) What is tree ? Describe the various types of tree. 6

(b) Explain the difference between binary search and linear search. 4

(c) Explain selection sort. 2

8. (a) What is Function ? Explain function prototype with example. 6

(b) Write a program to find the smallest element in one-dimensional array and also print its position. 6

OR

9. (a) Describe recursive function with suitable example. 6

(b) Write a program in C for multiplication of 2 matrices. 6

10. (a) What is string ? What operations can be performed on string ? 6

(b) Write a program in C to calculate sum and average of n array elements using pointer. 6

OR

11. (a) What is a pointer ? Explain pointer arithmetic with suitable example. 6

(b) Explain the following functions with suitable example :

(i) strcat ( )

(ii) strcmp ( )

(iii) strcpy ( ) 6

12. (a) What is structure ? How it differs from an array ? Explain with suitable example. 6

(b) Explain the various I\O operation modes for sequential file. 6

OR

13. (a) Explain the following functions :

(i) fgets ( )

(ii) fputs ( )

(iii) fwrite ( ) 6

(b) What is Union ? Explain it with suitable example. 6