



M 8256

Reg. No. : .....

Name : .....

VI Semester B.A./B.Sc./B.Com./B.B.A./B.B.A.T.T.M./B.B.M./B.C.A./B.S.W./  
B.A. Afsal-UI-Ulama Degree (CCSS – Reg./Supple./Improv.)

Examination, May 2015

OPEN COURSE

6D02 MAT : Principles of Computer Science

Time : 2 Hours

Max. Weightage : 20

PART – A

I. Fill in the blanks :

- 1) The collection of a field values of a given entity is called a \_\_\_\_\_
- 2) A data structure which contain a hierarchical relationship between various elements is \_\_\_\_\_
- 3) The data structure operation which combine the records in two different sorted files into a single sorted file is known as \_\_\_\_\_
- 4) In queue data structure, the deletions can take place only at one end called \_\_\_\_\_ (Weightage 1)

II. Fill in the blanks :

- 5) Data elements of a linked list are called \_\_\_\_\_
- 6) The situation where new data are to be inserted into a data structure but there is no available space is called \_\_\_\_\_
- 7) The header list where the last node points back to the header node is called a \_\_\_\_\_
- 8) Example for a linked list operation is \_\_\_\_\_ (Weightage 1)

P.T.O.



## PART – B

Answer **any six** from the following : **(Weightage 1 each)**

9. A professor keeps a class list containing the following data for each student : Name, Major, Student number, Test scores, Final grade. Describe the field values, records and file.
10. What do you mean by an array ?
11. Explain the term binary search. What is the complexity of binary search ?
12. What do you mean by the worst case complexity of an algorithm ? What is the worst case complexity of linear search algorithm ?
13. Distinguish between function subalgorithms and procedure subalgorithms.
14. Write a note on different types of linked lists.
15. What do you mean by overflow in a linked list ?
16. What do you mean by list of available space in memory ?
17. Let LIST be a linked list in memory. Write a procedure which finds a number NUM of nonzero elements in LIST.
18. Discuss the advantages of a two-way list over a one-way list for searching a sorted list for a given ITEM. **(Weightage 6×1=6)**

## PART – C

Answer **any four** from the following : **(Weightage 2 each)**

19. List and explain different data structures.
20. Briefly describe the notions of the complexity of an algorithm and the space-time tradeoff of algorithms.
21. Suppose that  $T_1(n)$  and  $T_2(n)$  are the time complexities of two program fragments  $P_1$  and  $P_2$  where  $T_1(n) = O(f(n))$  and  $T_2(n) = O(g(n))$ . What is the time complexity of program fragment  $P_1$  followed by  $P_2$  ?



- 22. Write an algorithm to find the largest element in an array.
- 23. Write a procedure to print the information at each node of a linked list.
- 24. Write a note on garbage collection in linked list.
- 25. Write an algorithm to traverse a circular header list.
- 26. Write an algorithm to find the location LOC of the node where ITEM first appears in a sorted LIST. **(Weightage 4x2=8)**

PART – D

Answer **any one** from the following : **(Weightage 4 each)**

- 27. Explain control structures with details.
- 28. Briefly describe different components which are used to present algorithms.
- 29. Write an algorithm which deletes the last node from a list. **(Weightage 1x4=4)**