K16U 0326

Reg. No. : .....

Name : .....

VI Semester B.A./B.Sc./B.Com./B.B.A./B.B.A.T.T.M./B.B.A.R.T.M./B.B.M./ B.C.A./B.S.W./B.A. Afsal-Ul-Ulama Degree (CCSS –Reg./Supple./Improv.) Examination, May 2016

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 records of the entities in a given entity set is called _____

2) Example for a data structure is _____

3) Complexity of a binary search algorithm is _____

4) In queue data structure, the insertions can take place only at one end called _____ **(Weightage 1)**

II. Fill in the blanks :

5) The process of periodic collection of all the deleted space onto the free storage list of a computer by the operating system is known as _____

6) The pointer of the last node in a linked list is _____

7) The header list where the last node contains the null pointer is called a _____

8) In a linked list, if each node is divided into three parts, then that linked list is known as _____ **(Weightage 1)**

P.T.O.

PART – B

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

9. A hospital maintains a patient file in which each record contains the following data :
   Name, Admission date, Social security number, Room, Bed number, Doctor
   which item can serve as primary keys ?

10. Distinguish between stack and queue.

11. What do you mean by linear search ? What is the limitations of this search algorithm ?

12. What are the statements used in an algorithm for input and output purposes ?

13. Write a note on subalgorithms.

14. What do you mean by linked list ? Explain with diagram.

15. What do you mean by underflow in a linked list ?

16. What is meant by free storage list ?

17. Let LIST be a linked list in memory. Write a procedure which adds a given value K to each element in LIST.

18. Discuss the advantages of a two-way list over a one-way list for inserting a node before the node with a given location LOC. **(Weightage 6×1=6)**

PART – C

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

19. Draw a tree diagram for the algebraic expression $(7x + y)(5a - b)^3$.

20. Write a note on different data types.

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 $T_2(n) = O(g(n))$. Find $T_1(n) . T_2(n)$.

22. Write an algorithm to print the prime numbers less than N.

23. Write a procedure to find the number of elements in a linked list.

24. What are the operations possible in a two way 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 LIST. **(Weightage 4×2=8)**

PART – D

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

27. Write an essay on data structures.

28. Write an essay on algorithms, subalgorithms and difference between the format of algorithm and subalgorithm.

29. Suppose NAME1 is a list in memory. Write an algorithm which copies NAME1 into a list NAME2. **(Weightage1×4=4)**