

2008

2008 PUNJAB TECHNICAL UNIVERSITY
B.E ELECTRICAL AND ELECTRONICS ENGINEERING
DATA STRUCTURES

TIME: 3 HOUR
MARK: 100

Answer ALL questions.

PART A – (10×2=20 marks)

1. Define : Algorithm.
2. What is an asymptotic notation? Mention its types.
3. Write the address calculation formula for locating a in an array.
4. What is a Priority Queue?
5. What are siblings?
6. Define hash function.
7. What is the total number of comparisons and total number of exchanges in Bubbler sort for the worst case situation?
8. What is the need for external sorting?
9. What is a directed graph?
10. Define Biconnectivity.

PART B – (5×16=80 marks)

11. (a) How Top-down design is different from normal method of problem solving?
(b) Write an algorithm to print all prime numbers upto 100.
Or
12. (a) How an algorithm is verified? Explain.
(b) Write an algorithm to print Fibonacci series.
13. (a) Explain how the storage representations can be performed in 2-D array.
(b) Explain how the given expression is converted into postfix expression using stack.
 $A+((B*D+E/F)^G-H)/C+E*F)-B*E$
Or
14. (a) Give an algorithm for inserting a node in a linked list.
(b) Explain how linked list is used for polynomial multiplication.
15. Explain in detail the Hashing functions and collision handling techniques.
Or
16. (a) Explain AVL trees with representations.
(b) Explain the priority queues with array representations.
17. (a) Explain Shell sort algorithm with suitable example.
(b) Explain the time complexity of the above algorithm.
Or
18. Explain Heap sort algorithm for HEAP tree constructions with example.
19. (a) Explain Dijkstra's Algorithm and find the shortest path for the graph.

50

10

10

30 20 100

60

(b) Explain linked list representation of graph.

Or

20. (a) Discuss in detail the depth first search traversal algorithm for graph.

(b) Write a brief note on applications of graphs with suitable example.

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