

First Half

Answer any three questions. Two marks are reserved for neatness and to the point answer.

1. a) In what scenes are hardware and software equivalent? Can the sequence of states through a process passes be affected by the input data? Explain.
b) What do you understand by Von Neumann machine? With necessary diagram explain the operation of Von Neumann machine.
2. a) An certain computation is highly sequential in nature – tat is, each step depends on the on preceding it. Would an array processor or a pipeline processor be more appropriate for this computation? Explain with necessary diagram.
b) Discuss the advantages and disadvantages of storing programs and data in the same memory.
3. a) Explain the function of hypothetical machine.
b) What do you understand by interconnection structure?
c) Draw bus PCI bus structure for desktop system and server system and explain it.
4. a) What is memory hierarchy?
b) Discuss the organization of memory with necessary diagram.
c) Discuss with necessary example how error is corrected using Hamming error correcting code.
correcting code
5. Write short note on:
(a) Cache memory.
(b) Pipeline architecture.
(c) Interrupt.

2nd Half

Group - A

Answer any three questions:

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| Q1. | With an example compare BFS and DFS. | 5 |
| Q2. | Discuss different ways of representing a graph with example. | 5 |
| Q3. | Define Binary tree and prove that the height of a binary tree containing n elements $n \geq 0$, is at most n and at least $\lceil \log(n+1) \rceil$. | 5 |
| Q4. | Write down advantages of doubly and circular linked list. | 5 |
| Q5. | Compare stack and queue. What is DEQUEUE? | 5 |

Group-B

Answer any two questions:

- Q1.
- Write the algorithm for In-order, Pre-order and Post order traversal of a binary tree.
 - The order of nodes of a binary tree in Pre-order and In-order traversal is as under.
In-order: D B F E G H I A C
Pre-order: A B D E F G H I C
- Draw the tree.
- Comment about the complexity of BST. (4+4+2)
- Q2.
- Write an algorithm for deleting a node at the beginning of a linked list and reclaim the node in the available memory list and explain with a diagram.
 - Write an algorithm to insert a node at a given position of a linked list.
 - How a Polynomial can be represented using a linked list. (4+4+2)
- Q3.
- Write algorithm to show push and pop operation of a stack.
 - Write algorithm to insert and delete a number in a queue.
 - Convert the following infix expression into postfix expression using stack.
(A+B*(C+D))*E (4+4+2)
- Q4.
- Write algorithm for Merge sort and comment about its complexity.
 - Explain quick sort technique with an example. [(4+2) +4]