

## Advance Algorithms

**Q. P. Code : 27849****[Time : 3 hours]****[Marks : 80]**

N.B.

1. Attempt any Four from the following questions.
2. Assume suitable data if necessary.
3. Figures to right indicate full marks.

- Q.1 A) Explain in detail with example maximum bipartite matching using Ford-Fulkerson method. 10
- B) Explain Graham's Algorithm to find convex hull. 10
- Q.2 A) Explain in detail the Dijkstra's Algorithm with suitable example. 10
- B) Explain all cases of Master method to solve recurrences. 10
- Q.3 A) Explain Johnson's all pair shortest path algorithm with suitable example. 10
- B) Explain insertion and deletion in red-black with example. 10
- Q.4 A) If  $f(n)$  denotes the number of moves in tower of Hanoi puzzle when  $n$  disks are involved, give a recurrence relation for  $f(n)$  and solve the recurrence relation. 10
- B) Explain push relabel Algorithm with suitable example. 10
- Q. 5 A) What is Binary Heap, Binomial tree and Binomial Heap? List the properties of Binomial Heap. 10
- B) Explain line segment properties. 10
- Q. 6 A) Compare dynamic programming and divide and conquer approach. Suggest the solution using both approaches for generating Fibonacci series. 10
- B) Explain Bellman - Ford Algorithm with suitable example. 10

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