

Reg. No.

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Fourth Semester B.C.A.3 Degree Examination, May/June 2017
DESIGN AND ANALYSIS OF ALGORITHMS
(Regular) (2014-2015 Onwards)

Time : 3 Hours

Max. Marks : 80

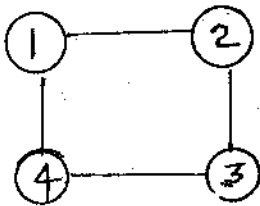
- Instructions :** i) Write answer to the particular Section problems together.
 ii) Draw diagrams wherever necessary.

PART – A

1. Solve any ten questions :

(10×2=20)

- As per computational theory, identify the distinguishing factor between algorithm and program.
- What is the importance of expressing an algorithm using pseudo code ?
- What is debugging ?
- Define algorithm.
- What is the precondition for list of numbers, if binary search is to be carried out ?
- Define feasible solution and optimal solution.
- Differentiate between Greedy method and dynamic programming.
- What are the two basic types of graph ? Draw their figure.
- For an undirected graph shown below, draw two spanning trees.



- What is meant by tree traversal ? Draw tree.
- Define implicit and explicit constraints.
- What is m-colorability decision problem ?

P.T.O.

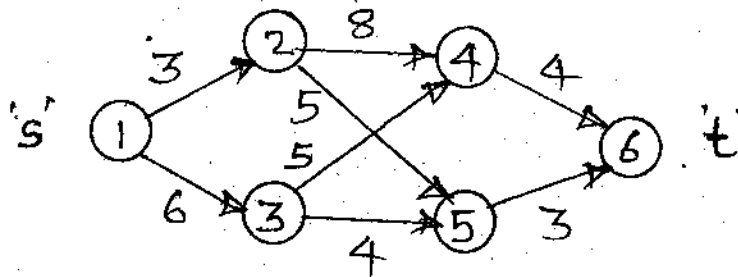


PART - B

Solve any four questions :

(4×5=20)

2. Explain the four study areas of algorithm.
3. What is Strassen's matrix multiplication ? Solve $A \times B$, where, matrix
 $A = \begin{bmatrix} 1 & 2 \\ 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} 8 & 7 \\ 1 & 2 \end{bmatrix}$ using Strassen method.
4. What is the concept of optimal storage on tapes ? For $n = 3$ and $(l_1, l_2, l_3) = (10, 20, 15)$. Show all possible ordering and their respective 'd' values. Identify optimal ordering.
5. Draw a tree and explain three important traversal techniques.
6. What is multistage graph ? Find the minimum cost and path from source 's' to the sink 't' using forward approach.



7. Write short note on any one :
 - i) 4×4 Queen's problem.
 - ii) Hamiltonian cycle.

PART - C

Solve any four full questions :

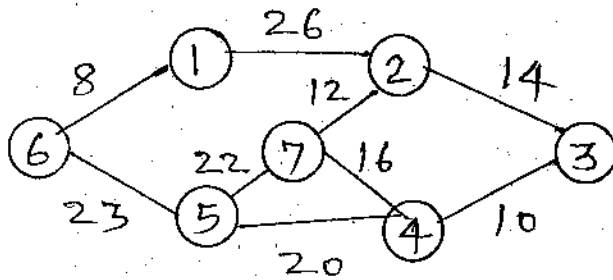
(4×10=40)

8. a) Discuss in brief factors contributing to
 - i) Time efficiency
 - ii) Space efficiency.
- b) Explain the characteristics of a good algorithm.
9. a) Draw a diagram and explain divide and conquer strategy to solve a problem.
- b) Distinguish between linear search and binary search.



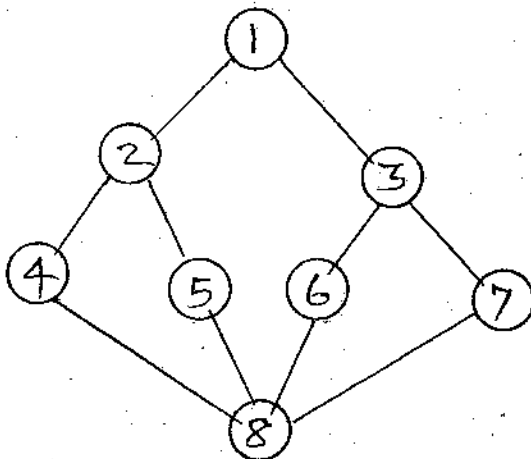
- 10. a) Identify differences and similarities between Divide and Conquer strategy and dynamic programming. 5
- b) Explain the flow shop scheduling problem w.r.t.
 - i) Preemptive scheduling.
 - ii) Non-preemptive scheduling. 5

- 11. a) Find the minimum cost spanning tree for given graph using prime algorithm. 5



- b) Explain subset paradigm and ordering paradigm with one example each. 5

- 12. a) Define graph. For an undirected graph given below, show adjacency list. 5



- b) Write short note on **any one** : 5
 - i) Sum of subset problem.
 - ii) Graph search and traversal techniques.
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