

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE – RAIGAD -402 103
Semester Examination – December - 2019**

Branch: M.Tech Computer Engineering
Subject:- Computer Algorithms (MTCE1101)
Date:- 10/12/2019

Sem.:- I
Marks: 60
Time:- 3 Hrs.

Instructions to the Students

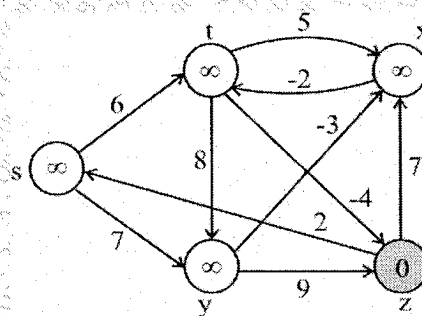
1. Each question carries 10 marks.
2. Attempt all question are compulsory.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

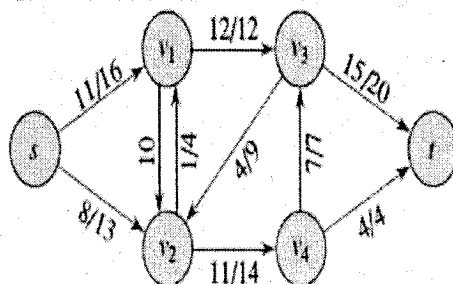
Q.1. a) Create the Fibonacci heap for following data items . (5)
 {20,16,4,8,19,15,14,12,6,30 }. Delete node with key = 8 from this Fibonacci heap.

b) Write the algorithm of Left Rotation and explain with the help of an(5)
 example.

Q.2. a) Find the shortest path using Bellman Ford algorithm for following (5)
 graph.



b) Apply Ford Fulkerson algorithm on following flow network. (5)



Q.3. a) What is convex hull ? Explain incremental approach, divide and conquer approach and prune and search method to determine convex hull. (5)

b) Explain Graham Scan algorithm with suitable example. (5)

Q.4. a) Working modulo $q=13$ how many spurious hits does the Rabin Karp matcher encounters in the text $T= 2359023141526739921$ when looking for the pattern $P = 31415$? (5)

b) Write and explain Knuth Morris Pratt matching algorithm. What is the time complexity of algorithm? (05)

Q.5. a) Show the results of multiplying following matrices using Strassen's matrix multiplication algorithm. (05)

$$\begin{Bmatrix} 1 & 2 \\ 3 & 4 \end{Bmatrix} \begin{Bmatrix} 5 & 6 \\ 7 & 8 \end{Bmatrix}$$

b) Explain forward substitution .Using forward substitution solve the following.(5)

$$\begin{Bmatrix} 1 & 2 & 0 \\ 3 & 4 & 4 \\ 5 & 6 & 3 \end{Bmatrix} x = \begin{Bmatrix} 3 \\ 7 \\ 8 \end{Bmatrix}$$

Q.6. a) Explain Extended Euclid's algorithm for GCD computation . Apply Extended Euclid's algorithm on inputs 99 and 78. (5)

b) Explain co-efficient and point value representation of polynomials. Explain how divide and conquer strategy is used by Fast Fourier Transform (FFT)method. (5)
