H.T.No. | | | | | | | | | | |

Code No: CT1515 **GEC-R14**

II B. Tech II Semester Supplementary Examinations, December 2017

DESIGN AND ANALYSIS OF ALGORITHMS

(Information Technology)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. Show that f(n)+g(n)=O(n^2) where f(n)=3n^2-n+4 and g(n)=n logn+5.
2. Develop the algorithms for simple Union and simple Find.
3. Differentiate between Divide & Conquer and Greedy approaches.
4. Define Purging rules in 0/1 Knapsack problem.
5. What is Hamiltonian cycle?
6. Write a short note on LC search.

PART-B

4 × 12 = 48M

1. a) Explain the asymptotic notations with an example for each. **(**8M)

   b) If K is non negative constant then show than the solution to be given recurrence relation. T(n) = $\begin{cases} K & n=1 \\ 3T(n/2)+Kn & n>1 \end{cases}$ for n, a power of 2 is T(n) = 3K $n^{\log_2^3}$ - 2kn prove this statement. (4M)

2. a) Sort the records with the following index values in the ascending order using Quick sort algorithm.
   65,70,75,80,60,55,50,45. (8M)

   b) Explain worst case time complexity of quick-sort. (4M)

3. a) Write an General algorithm for greedy method. (4M)

   b) Find the optimal solution to the job sequencing with deadlines for the following n=5, (P1,P2,P3,P4,P5)=(20,15,10,5,1) (d1,d2,d3,d4,d5)=(2,2,1,3,3). (8M)

4. OBST to compute W (i,j), R(i,j) and C(i,j), 0<=i<j<=4, (a_1,a_2,a_3,a_4)=(Count, Float, If, While) with p(1)=1/20, p(2)=1/5, p(3)=1/10, p(4)=1/20 and q(0)=1/5, q(1)=1/10, q(2)=1/5, q(3)=1/20, q(4)=1/20 using the R(i,j)'s construct OBST. (12M)

5. a) Write an Algorithm for N Queens problem. (5M)

   b) Explain about 4Queen problem with an example. (7M)

6. Draw the portion of the state space tree generated by LCKNAP for the Knapsack instances n=4, p(1:4)=(10,10,12,18); w(1:4)=(2,4,6,9), and m=15. (12M)

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