

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MTech
BRANCH: CS/IT/IS

SEMESTER : II
SESSION : SP/19

SUBJECT: CS509 ADVANCED COMPUTER ALGORITHM

TIME: 3.00 Hrs.

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) If you wish to find LCS between $\langle 1,0,0,1,0,1,0,1 \rangle$ and $\langle 0,1,0,1,1,0,1,1,0 \rangle$. Identify the strategy you will apply for this and how? [5]
- Q.1(b) Differentiate between Greedy and branch and bound. [5]
- Q.2(a) Design a nondeterministic algorithm for sorting. [5]
- Q.2(b) Demonstrate that 3-Sat can be reduced to vertex cover. [5]
- Q.3(a) Suppose there are 15m tall drums are available we wish to accommodate items of boxes into drums so that they can be accommodated optimally in drums. The items in boxes are taking:-
Box A B C D E F G H I J
Height 8 6 7 5 9 4 3 6 5 6
Find optimal number of drums required. [5]
- Q.3(b) Defend that approximation algorithm of 0/1 knapsack is fully polynomial time algorithm. [5]
- Q.4(a) Formulate that min cut is computing correct mincut with probability $O(2/n(n-1))$. [5]
- Q.4(b) Defend that expected number of comparisons by randomized quicksort are $O(n \lg n)$. [5]
- Q.5(a) Explain maximum speed up achieved by any number of processors is $1/f$, where f is the section of algorithm that must be executed serially. [5]
- Q.5(b) Design $O(\log \log m)$ time algorithm for merging of two sorted list. [5]

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