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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 EXAMINATION- February, 2020

B. Tech VI Semester

COURSE CODE: 10B11CI411   MAX. MARKS: 15

COURSE NAME: FUNDAMENTALS OF ALGORITHMS

COURSE CREDITS: 3   MAX. TIME: One Hour

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

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1. Solve the given recurrence relation using substitution method.   3   CO-1
   a. $T(n) = 2T(n/2) + n^2$,   if $n>1$ b. $T(n) = T(n) = T(n-2) + n^2$ if $n>1$
       $= 1$ otherwise $= 1$ otherwise

2. Solve the given recurrence relation using recurrence tree: $T(n) = 2T(n/2) + cn^2$.   3   CO-1

3. Solve the given recurrence relation using Master Theorem.   3   CO-1
   a. $T(n) = 2T(n/4) + n^2$ a. $T(n) = 2T(n/2) + 1/n$

4. Write the Quick sort algorithm and find out the recurrence equation and worst case running time.   CO-3   3

5. Write the pseudo code for the procedure MAX-HEAPIFY (A, i) and Illustrate the operation of MAX-HEAPIFY(A, 3) on the array A = [27, 17, 3, 16, 13, 10, 1, 5, 7, 12, 4, 8, 9, 10].   CO-3   3