Exam No: _____

GANPAT UNIVERSITY
B. TECH SEM-IV (COMPUTER ENGINEERING/INFORMATION TECHNOLOGY/COMPUTER ENGINEERING-ARTIFICIAL INTELLIGENCE)
FIRST INTERNAL EXAMINATION – FEBRUARY-MARCH 2023
2CEIT402: Design and Analysis of Algorithms

TIME: 1 Hour **TOTAL MARKS: 20**

Instructions:
1) Figures to the right indicate full marks.
2) Be precise and to the point in your answer.
3) The text just below marks indicates the Course Outcomes Numbers, (CO) followed by the Bloom's taxonomy level of the question, i.e., R: Remembering, U: Understanding, A: Applying, N: Analyzing, E: Evaluating, C: Creating.

Q.1 Solve the recurrence relation equation $2a_r-5a_{r-1}+2a_{r-2}=0$ and find particular solutions such that $a_0=0$ and $a_1=1$. Also, write the time complexity in Big-Oh notation. **[5] 4A**

Q.2 Write an algorithm for Insertion sort and derive time and space complexity using the tabular method. **[5] 2U**

P.T.O

Q.3 Define Big-Oh, Big-Omega, and Theta notations with an example. **[5] 3U**
Explain the following statements are true or false:
$f(n) = 3n^3 + 7n^2 + 5 = \Omega(n^4)$
$f(n) = 5\ 2^n + n^2 \neq O(n^3)$

Q.4 Apply "job scheduling algorithm with deadlines" for the following instance of problem: **[5] 5A**
n = 10,
Profits (P1, P2, P3, P4, P5, P6, P7, P8, P9, P10) = (3, 5, 20, 18, 1, 6, 3,12, 8, 21)
Deadlines (D1, D2, D3, D4, D5, D6, D7, D8, D9, D10) = (1, 3, 4, 3, 2, 1, 2, 5, 4, 6).
Schedule the jobs in such a way to get maximum profit.

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