BANKURA UNIVERSITY

B. Sc. (HONOURS) FOURTH SEMESTER EXAMINATIONS, 2022

Subject: Computer Science **Course ID: 41511**

Course Title: ANALYSIS AND DESIGN OF ALGORITHMS **Course Code: SH/CSC/401/C-8**

Full Marks: 25 **Time: 1 Hr 15 min**

The figures in the margin indicate full marks

Answer the question(s) unit-wise as instructed

UNIT-I

1. **Answer any five of the following questions:** **(1× 5 = 5)**
   a. Symbolic analysis of run time is advantageous over estimating the actual run time – Justify.
   b. Why big-Omega (Ω) notation is used?
   c. Name an algorithm design paradigm that necessarily involves heuristics?
   d. Name a sorting algorithm which yields the same time complexities both in average case and worst case.
   e. State a real life example of decision tree.
   f. Define tree as a graph.
   g. Name an inventor of AVL tree.
   h. What do you mean by spanning tree?

UNIT-II

2. **Answer any two of the following questions:** **(2× 5 = 10)**
   a. Describe any one technique used for algorithmic complexity analysis in brief
   b. Analyze the average case time complexity of quick sort algorithm
   c. Describe AVL-tree formation technique in brief with at least four nodes
   d. Describe depth first search algorithm for a graph having at least four vertices

UNIT-III

3. **Answer any one of the following questions:** **(1× 10 = 10)**
   a. State some distinguishing features of insertion sort.
   Write insertion sort algorithm and trace its execution sequence with a suitable example.
   b. Write KMP algorithm for string processing and trace its execution sequence with a suitable example.