# Question Paper

Exam Date & Time: 08-Jul-2022 (09:30 AM - 12:30 PM)

## MANIPAL ACADEMY OF HIGHER EDUCATION

**INTERNATIONAL CENTRE FOR APPLIED SCIENCES**
**IV SEMESTER B.Sc.(Applied Sciences) in Engg.**
**END SEMESTER THEORY EXAMINATION- MAY/JUNE-2022**

**DESIGN AND ANALYSIS OF ALGORITHMS [ICS 244 - S2]**

**Marks: 50** **Duration: 180 mins.**

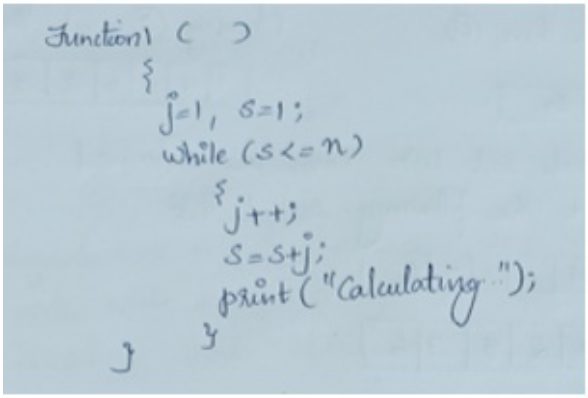
**Answer all the questions.**

**Missing data may be suitably assumed**

1) A) Mention the master theorem used for Complexity analysis of algorithms. Apply master theorem and calculate the time complexity for the below given recurrence relations. (5)

i) $T(n)=\sqrt{2}\,T(n/2) + \log n$
ii) $T(n)=2T(n/2) + \sqrt{n}$

B) List and define the asymptotic notations used in algorithms. Given an iterative algorithm below, calculate the time complexity. (5)




2) A) Given a hash table of size 7. Use the division method hash function with key values 15,47,23,34,85,97,65,89,70 to be placed in the hash table. Use separate chaining to resolve collision while hashing. Draw the table at every insertion. (5)

B) Discuss the knapsack problem and solution found using brute force technique. (5)
A thief enters a house for robbing it. He can carry a maximal weight of 5 kg