



Higher Diploma in Information Technology

Model paper
Year 2, Semester 2 (2024)

Design & Analysis of Algorithms (IT1205)

Duration: 1 Hour

Instructions to Candidates:

- ◆ This is a closed book examination.
- ◆ This paper contains 1 question on 1 page without the cover page.
- ◆ Answer all questions in the WORKBOOK provided.
- ◆ Read all questions before answering.
- ◆ The total marks obtainable for this examination is 20.

QUESTION 1

(20 marks)

- a) What is the difference between, (04 marks)
- Divide and Conquer Method and Dynamic Programming
 - Best Case Scenario and Worst case Scenario
- b) Refer the Pseudocode for an Insertion Sort Algorithm and answer the following question. **Refer the Slides for the Algorithm**

Illustrate the operation of the above algorithm for the following array (08 marks)
 $A[4] = \{5, 9, 3, 4\}$

c)
$$T(n) = 4T\left(\frac{n}{4}\right) + cn; \quad T(1) = d$$

Solve the recurrence equation using,

- Recursion Tree Method and perform the answer with Big O (O) notation. (06 marks)
- Master Theorem and perform the answer with Big Theta (θ) notation. (02 marks)

End of the Question Paper