



KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF
BACHELOR OF SCIENCE IN BIOMETRY AND INFORMATICS /
MATHEMATICS WITH COMPUTING
FIRST SEMESTER 2022/2023
[SEPTEMBER-DECEMBER, 2022]

COMP 302: ANALYSIS OF ALGORITHMS

STREAM: Y3S1

TIME: 2 HOURS

DAY: MONDAY, 3:00 – 5:00 PM

DATE: 05/12/2022

INSTRUCTIONS

- 1. Do not write anything on this question paper.**
- 2. Answer question ONE and any other TWO questions.**

QUESTION ONE (30MARKS)

- a. Jane wanted to develop an efficient algorithm for time and resource usage. Explain two ways in which she can evaluate the time taken by an algorithm. (4 marks)
- b. Name and explain any four types of analysis of algorithms. (8 marks)
- c. Explain two expectations of an algorithm. (4 marks)
 - i. Correctness
 - ii. Less resource usage
- d. State five advantages of insertion sort algorithm (5 marks)
- e. Explain two reasons for analysing algorithms. (4 marks)
- f. Name any five characteristics of an algorithm. (5 marks)

QUESTION TWO (20MKS)

- a. When Deleting a node from a tree it is essential that any relationships, implicit in the tree can be maintained. Explain three distinct areas to be considered cases to be considered when deleting a node. (6 marks)

- b. Name any four problems which are solved using divide and conquer approach. (4 marks)
- c. Write a simple algorithm for demonstrating bubble sort algorithm. (5 marks)
- d. Name any five problem types in the analysis of algorithms. (5 marks)

QUESTION THREE (20MKS)

- a. State and explain four characteristic of a good Hash function. (8 marks)
- b. Explain algorithm efficiency. (3 marks)
- c. The choice of greedy approach is based on three factors. Name the factors. (3 marks)
- d. Explain any three types of algorithms. (6 marks)

QUESTION FOUR (20MKS)

1

- a. Name and explain four major algorithm control structures. (4 marks)
- b. Explain the circumstance under which you can apply bubble sort technique. (6 marks)
- c. Explain four steps of analyzing algorithms. (8 marks)
- d. Name four functions of hash function (2 marks)

QUESTION FIVE (20MARKS)

- a. Explain the concept of Greedy algorithm. (4 marks)
- b. Differentiate between dynamic programming and greedy approach. (6 marks)
- c. Explain the working of merge sort algorithm works. (6 marks)
- d. Name any four applications of dynamic programming. (4 marks)