NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCES
DEPARTMENT OF INFORMATICS AND ANALYTICS
DECISION SUPPORT SYSTEMS
SIA 2201

EXAMINATION PAPER
SECOND SEMESTER 2025

This examination paper consists of 3 pages

Time Allowed:	**3 hours**
Total Marks:	**100%**
Examiner's Name:	**Dr S. Moyo**
External Examiner:	**Dr L. C. Sakala**

1. This paper contains five (5) Questions.
2. Answer any four (4) questions
3. Each question carries 25 marks
4. Use of calculators is permissible

MARK ALLOCATION

QUESTION	MARKS
1.	**25**
2.	**25**
3.	**25**
4.	**25**
5.	**25**

QUESTION ONE

a) Tabulate the difference between breadth first search and depth first search. [10]

b) Use the Bidirectional search method to show how the Goal in the problem below can be obtained; [15]

Initial position

1		3
2	5	4
7	6	8

Goal

1	2	3
8		4
7	6	5

QUESTION TWO

a) What is the best option for a neutral decision-maker considering options of where to go under these conditions? Assume the decision maker is using Minimax regret criteria, and returns of the decisions are as shown in Table 1.

Table 1: Decision Options

Option	**Optimistic**	**Pessimistic**
School	8	7
Church	20	5
Club	70	10

[5]

b) Organizations across various sectors increasingly rely on Decision Support Systems (DSS) to navigate complex problems and make informed choices. Discuss the key components of a typical DSS, and illustrate your answer with a detailed example of how a specific type of DSS such as a Data-Driven DSS could be applied to address a real-world decision-making challenge in a chosen industry. [10]

c) Critically evaluate the potential benefits and limitations of using a DSS in the context projected in 2 (b). [10]

QUESTION THREE

a) Consider a network of interconnected cities represented as a graph. Each connection between two cities has an associated cost, representing the travel time in hours. You are given the following information about the cities:

A -(5) -B; A - (2) - C; B - (3)- D; C-(4) -D; C - (1) -E; D - (2) - F; E- (6) - F, where A - (5) -B, shows that the path between A and B is 5 units.

Using Uniform Cost Search, find the shortest path (least travel time) from city A to city F. Show all steps of the search. [5]

b) Discuss the importance of knowledge management in enhancing decision-making in an organization. [10]

c) How can text-mining ensure that organizations reward their employees for patents that solely belong to them? [10]

QUESTION FOUR

Use appropriate examples to discuss any five types of models studied in this course. [25]

QUESTION FIVE

a) Explain the distinguishing features of a predictive model. [5]
b) Discuss Simon's phases of decision making clearly outlining information systems that can assist decision-makers at each phase. [20]

END OF QUESTION PAPER

