

**FINAL EXAMINATION**

**BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN CYBER
SECURITY**

**BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN COMPUTER
APPLICATION DEVELOPMENT**

COURSE : ARTIFICIAL INTELLIGENCE

COURSE CODE : SWC3553

DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES:

1. This question paper consists of **FOUR (4)** questions.
2. Answer ALL questions in the Answer Booklet provided.
3. Please check to make sure that this examination pack consists of :
 - i. The Question Paper
 - ii. An Answer Booklet
4. Do not bring any material into the examination hall.
5. Please write your answer using permanent ink.

MYKAD/PASSPORT NO : _____

ID. NO. : _____

LECTURER : _____

SECTION : _____

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

This question paper consists of 5 printed pages including the front page

QUESTION 1

A transportation company plans to develop a self-driving car that can navigate roads, detect traffic signs, recognize pedestrians, avoid obstacles, and make driving decisions without human intervention. The self-driving car is expected to perceive its environment, process information, make decisions, and perform appropriate actions to ensure passenger safety and efficient transportation.

- a. Identify **ONE (1)** characteristic for each of the following AI perspectives:
- i. Thinking Humanly (2 marks)
 - ii. Thinking Rationally (2 marks)
 - iii. Acting Humanly (2 marks)
 - iv. Acting Rationally (2 marks)
- b. Explain how each AI perspective can support the development of the self-driving car.
- i. Acting Humanly approach (6 marks)
 - ii. Acting Rationally approach (6 marks)
- c. A self-driving car detects a pedestrian crossing the road unexpectedly. Apply **TWO (2)** AI perspectives to explain how the system would respond
- For each selected perspective:
- i. Describe the action taken by the AI system. (5 marks)
 - ii. Explain how the action reflects the selected AI perspective. (5 marks)
- (Total: 30 marks)

QUESTION 2

A company plans to implement an AI-based intelligent system to automate operational decision-making and improve efficiency.

- a. Apply the concept of intelligent agents to describe on how the system perceives information, makes decisions, and performs actions in its environment.
(10 marks)
 - b. Employ the concept of rationality, how performance measures guide the agent in making effective and optimal decisions.
(6 marks)
 - c. Interpret the environment and agent design by:
 - i. Classify the system environment (observable, static/dynamic, deterministic/stochastic)
(7 marks)
 - ii. Explain how the utility-based agent architecture by relating its characteristics to the decision-making needs of the system.
(7 marks)
- (Total: 30 marks)

QUESTION 3

Figure 1 shows a search tree consisting of nodes A to O. Assume node A is the initial state and node M is the goal state. The search process is performed using the Depth-First Search (DFS) algorithm.

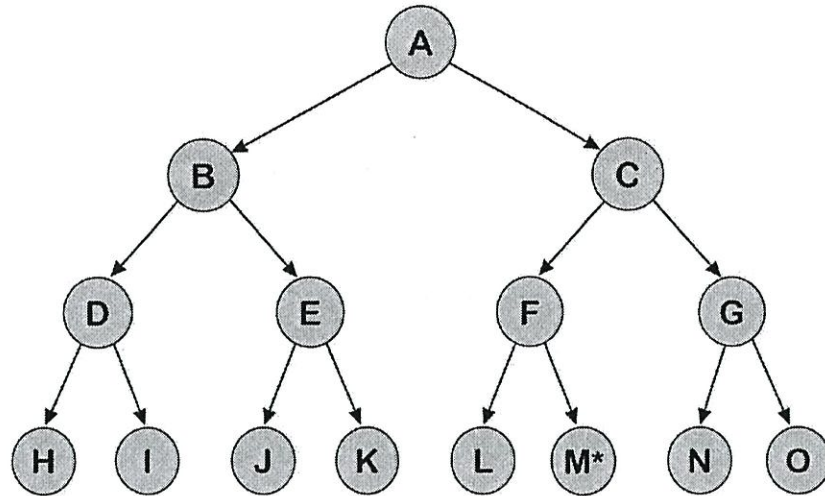


Figure 1. Search tree for determining the node expansion sequence and solution path using Depth-First Search (DFS)

- Identify **TWO (2)** characteristics of Depth-First Search (DFS).
(4 marks)
- Explain how a Last In, First Out (LIFO) queue influences the node expansion process in Depth-First Search (DFS).
(4 marks)
- Apply Depth-First Search (DFS) to determine the solution for the search tree shown in Figure 1.

In your answer:

- Determine the sequence of node expansions until node M is reached;
(4 marks)
- Construct the final solution path from node A to node M and
(4 marks)
- Determine the depth of the goal node.
(4 marks)

(Total: 20 marks)

QUESTION 4

Artificial Intelligence (AI) is expected to play an increasingly important role in addressing global challenges and improving the quality of human life.

Assume that you have been appointed as an AI consultant by a government agency to address a major environmental issue, such as climate change, waste management, or sustainable development.

Employ relevant future AI technologies to propose a practical solution for the selected issue. In your answer, discuss **FOUR (4)** aspects:

- i. The environmental issue selected.
- ii. The future AI technology that can be applied.
- iii. The expected benefits to society and the environment.
- iv. The potential risks or ethical concerns that should be considered.

(Total: 20 marks)

(TOTAL: 100 MARKS)

END OF QUESTION PAPER

