




UTHM

Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION SEMESTER I SESSION 2022/2023

- COURSE NAME : ARTIFICIAL INTELLIGENCE
- COURSE CODE : DAT21003
- PROGRAMME CODE : DAT
- EXAMINATION DATE : FEBRUARY 2023
- DURATION : 3 HOURS
- INSTRUCTIONS :
1. ANSWER **ALL** QUESTIONS.
 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.
 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.


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THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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- Q1** State the **THREE (3)** different categories of artificial intelligence. (3 marks)
- Q2** List **FOUR (4)** applications of artificial intelligence. (4 marks)
- Q3** List and explain **FOUR (4)** different kinds of knowledge representation in artificial intelligence. (8 marks)
- Q4** An intelligent agent makes a decision or perform a service based on its environment, user input and experiences. Based on **Figure Q4**, explain how the sensors, agent function and actuators make an intelligent agent work.

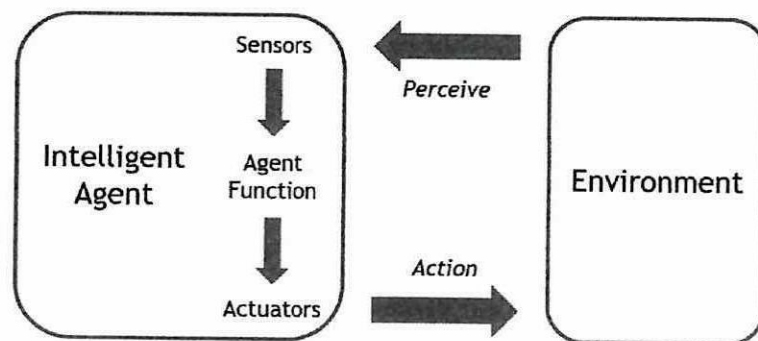


Figure Q4

(3 marks)

- Q5** The machine learning algorithms can be broadly categorised into three broad categories. Briefly compare those **THREE (3)** categories. (6 marks)
- Q6** Machine learning gives the computers capabilities to learn without being explicitly programmed. List **SIX (6)** applications that is made possible by machine learning. (6 marks)
- Q7** Determine whether each of the following statement is a proposition or not a proposition.
- (a) Putrajaya is the seat for the Federal Government of Malaysia. (1 mark)
 - (b) Machine learning is a subset of artificial intelligence. (1 mark)
 - (c) The name of the Malaysian flag is Jalur Gemilang. (1 mark)

- (d) What are the member states that make up the Federation of Malaysia? (1 mark)
- (e) Terrain ahead, pull up! (1 mark)
- (f) Khazanah Nasional is the sovereign wealth fund of the Malaysian Government. (1 mark)

Q8 Construct a truth table for each of the following propositions.

- (a) $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p)$ (10 marks)
- (b) $(\sim p \vee q) \wedge \sim r$ (18 marks)

Q9 Let the propositional function $P(x)$ be the statement “ $x = x^2$ ” and the domain of the function be the set of all possible integers. Determine whether each of the following logical expression is true or false.

- (a) $P(0)$ (1 mark)
- (b) $P(1)$ (1 mark)
- (c) $P(2)$ (1 mark)
- (d) $P(-1)$ (1 mark)
- (e) $\exists x P(x)$ (1 mark)
- (f) $\forall x P(x)$ (1 mark)

Q10 Let the propositional functions $P(x)$ be the statement “ x likes artificial intelligence”, $Q(x)$ be the statement “ x knows Python”, and the domain of the function is the set of all people. Translate each of the following logical expression into English.

- (a) $\forall x P(x)$ (1 mark)

(b) $\exists x P(x)$

(1 mark)

(c) $\exists x (P(x) \wedge Q(x))$

(2 marks)

Q11 Explain the **TWO (2)** major components of natural language processing (NLP), together with an example of the application for each component.

(6 marks)

Q12 One of the first steps in natural language processing (NLP) is to preprocess the input data.

(a) State **TWO (2)** importance of data preprocessing.

(2 marks)

(b) Explain the **SIX (6)** common stages of the data preprocessing pipeline.

(12 marks)

(c) Apply stemming to the words *obstructions* and *consultative*.

(2 marks)

Q13 After the data has been preprocessed, the data needs to be converted into vectors of numbers. List **FOUR (4)** common techniques to convert data into vectors of numbers.

(4 marks)

– END OF QUESTIONS –

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