MODULE J HARDWARE AND EMERGING TECH · J6

What artificial intelligence is

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 6.3.1, 6.3.2

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. Do not give brand names of software or hardware. The total for this worksheet is **20 marks**.

1

Total: 4 marks

Tick (✓) **one** box in each row to show whether each statement about artificial intelligence (AI) is true or false. **[4]**

Statement	True (✓)	False (✓)
AI is a branch of computer science.		
AI deals with the simulation of intelligent behaviours by computers.		
A computer system must have a mechanical structure before it can use AI.		
An AI system needs a collection of data, but it does not need any rules for using that data.		

2

Total: 2 marks

Give **two** examples of intelligent behaviours that a computer could simulate using AI. **[2]**

1

2

3

Total: 2 marks

Identify the type of AI system described by each statement. **[2]**

Statement	Type of AI system
A program that has the ability to automatically adapt its own processes and/or data	
A system made up of a knowledge base, a rule base, an inference engine and an interface	

4 **Total: 4 marks**

A parcel delivery company uses an AI system to plan which van carries each parcel each day.

Identify the characteristic of AI shown by each action of the system. A characteristic may be used more than once. **[4]**

Action of the AI system	Characteristic of AI
It stores the weight and delivery address of every parcel, and the rule "a parcel over 20 kg must go on a van with a lift".	
It applies its rules to today's parcels to decide which van each parcel is loaded on.	
It records that deliveries to one town are often late, then changes its own rule so that this town is given an earlier van.	
It uses traffic data and its rules to reach the conclusion that one route will be quicker than another.	

5 **Total: 5 marks**

A board-game program lets an adult play a strategy game against the computer. The computer player uses AI to choose its moves.

(a) Explain how the computer player uses the ability to reason when it chooses its next move. **[2]**

(b) The computer player also has the ability to learn and adapt. **[3]**
Explain how this ability could help the computer player to win more games over time.

6 **Total: 3 marks**

A hotel has an AI system that answers guests' typed questions about its restaurant, such as opening times and which dishes are vegetarian. Staff wrote all of its rules. The system never changes its rules or its data by itself. The hotel manager says: "This system cannot be AI, because it does not learn."

Explain why the manager is **not** correct. **[3]**

Total for this worksheet: 20 marks