

6. Automated and emerging technologies

6.3 Artificial intelligence

1 One component of an expert system is the inference engine.

(a) Identify the **three** other components in an expert system.

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2

3 [3]

(b) Describe the role of the inference engine in an expert system.

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..... [2]

2 The rule base and the inference engine are two components of an expert system.

(a) Identify the other **two** components of an expert system.

1

2 [2]

(b) Describe the role of the rule base in an expert system.

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..... [2]

(a) State **one** of the main characteristics of an AI system.

(b) An AI system is an expert system.

[6]

(a) Complete the description about the operation of the expert system.

inference engine interface knowledge base

question base rule base

to the to reach a diagnosis for the repair of the car.

(b) The expert system has machine learning capabilities.

[4]

- (a) The expert system is an example of artificial intelligence (AI).

..... [2]

- Explain how the expert system operates and how it is used to help diagnose the problem.

[5]

6 A doctor's surgery has an expert system that helps diagnose the illnesses of its patients.

(a) Complete the paragraph about the operation of the expert system.

Use the terms from the list.

Some of the terms in the list will **not** be used. Some terms may be used more than once.

artificial binary central processing unit (CPU) data
inference engine interface knowledge base primary storage
process real read only memory (ROM) rule base

An expert system is a type of intelligence. The doctor will type data about the symptoms of the illness into the

The will decide which questions to ask the doctor.

It will do this by linking the facts in the to the

The will decide on a diagnosis and this will be output on the

[7]

(b) The expert system has the ability to automatically adapt its own processes and data.

Give the name of this ability.

..... [1]

- 7 (b) An expert system can be used to diagnose an error with a robot vacuum cleaner.

Circle **three** components that are part of an expert system.

knowledge base operating system firewall
server printer actuator inference engine
rule base encryption

[3]

- (c) Explain how the robot vacuum cleaner can make use of machine learning.

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..... [3]

- 8 (d) The plough uses artificial intelligence (AI) to navigate its way around the field.

Explain how the plough makes use of AI for this purpose.

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..... [4]