MODULE J HARDWARE AND EMERGING TECH · J5

Robotics

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 6.2.1, 6.2.2, 6.2.3

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. The total for this worksheet is **20 marks**.

1

Total: 4 marks

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

Statement	True	False
Robotics is a branch of computer science that includes the design, construction and operation of robots		
A machine can only be a robot if it is shaped like a human		
A robot follows a stored program, which can be changed so that the robot carries out a different task		
In a robot, the actuators take readings from the surroundings and send them to the microprocessor		

2 **Total: 4 marks**

A bakery uses a robot to decorate cakes. The robot has a jointed arm that holds a nozzle, and it pipes icing patterns onto cakes as they pass along a conveyor belt.

(a) Complete the table by describing how the cake-decorating robot shows each characteristic of a robot. **[2]**

Characteristic of a robot	How the cake-decorating robot shows this characteristic
A mechanical structure or framework	
Electrical components	

(b) The bakery changes the icing pattern on its cakes every month. The robot is programmable. Explain how this helps the bakery when it changes the pattern. **[2]**

3 **Total: 4 marks**

The cake-decorating robot must only start piping icing when a cake is directly under its nozzle. The robot uses a proximity sensor, a microprocessor and actuators to do this.

Explain how the robot uses the proximity sensor, the microprocessor and the actuators so that it only starts piping when a cake is in position. **[4]**

4 Total: 4 marks

Robots perform roles in many different areas.

Write the area that each robot is used in. Choose each area from this list. Each area may be used once or not at all. **[4]**

agriculture · domestic settings · entertainment · industry · medicine · transport

Robot	Area
A robot that picks ripe strawberries in a greenhouse	
A model dinosaur in a theme park that moves its head and roars when visitors walk past	
A driverless shuttle that carries passengers between the terminals of an airport	
A robot that cuts the grass in the garden of a house	

5 Total: 4 marks

An energy company checks the blades of its wind turbines for damage. At present, a technician climbs each turbine to check the blades. The company plans to use a drone fitted with a camera to check the blades instead.

(a) Explain **one** advantage of using the drone instead of the technician to check the blades. **[2]**

(b) Explain **one** disadvantage of using the drone instead of the technician to check the blades. **[2]**

Total for this worksheet: 20 marks