MODULE K ALGORITHM DESIGN · K3

Structure diagrams

Original practice questions · 21 marks · ~25 minutes · Cambridge 0478 syllabus 7.1, 7.2(a), 7.2(b), 7.2(c)

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 **21 marks**.

1

Total: 4 marks

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

Statement	True	False
A structure diagram shows how a system is broken down into sub-systems.		
The box at the top of a structure diagram represents the whole system.		
A structure diagram uses the decision symbol to show a choice between two outcomes.		
A sub-system in a structure diagram can be broken down into further sub-systems.		

2

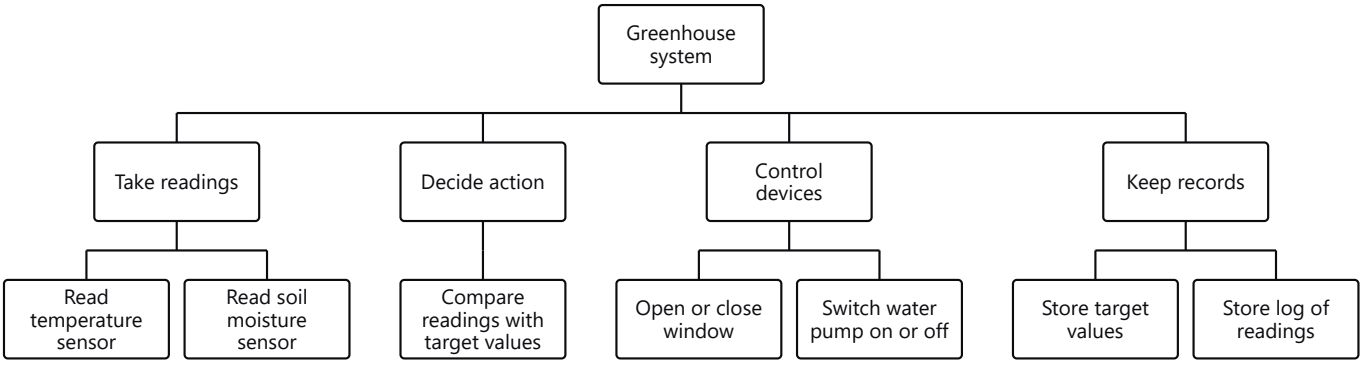
Total: 3 marks

(a) State the stage of the program development life cycle in which structure diagrams are used. **[1]**

(b) Describe what a structure diagram shows. **[2]**

3 **Total: 7 marks**

A grower uses a computer system to look after the plants in a greenhouse. This structure diagram shows the system.



(a) Identify the sub-system that **Compare readings with target values** is part of. **[1]**

(b) A problem can be decomposed into inputs, processes, outputs and storage. Tick (✓) **one** box in each row to show which component part each sub-system is. **[4]**

Sub-system	Input	Process	Output	Storage
Read soil moisture sensor				
Compare readings with target values				
Switch water pump on or off				
Store target values				

(c) The grower wants the system to also send a text message to their phone when the greenhouse is too hot. Describe how the structure diagram should be changed to show this. **[2]**

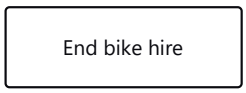
4

Total: 5 marks

A city council runs a bike hire scheme. Each docking station has a computer system. One part of this system ends a hire when a rider returns a bike. This part of the system:

- identifies the rider: the rider either scans a membership card or types in a membership number
- works out the charge: it calculates the length of the hire, then the cost
- stores the details of the hire
- outputs a receipt: it shows the receipt on the dock screen and also sends it by email.

(a) Draw a structure diagram for this part of the system. The top box has been drawn for you. **[5]**



5

Total: 2 marks

(a) Using the bike hire system in Question 4 as an example, explain what is meant by: "every computer system is made up of sub-systems, which are made up of further sub-systems". **[2]**

Total for this worksheet: 21 marks