MODULE K ALGORITHM DESIGN · K3

Structure diagrams

Original practice questions · 21 marks · ~25 minutes · OCR J277 spec 2.1.1, 2.1.2

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
The box at the top of a structure diagram represents the whole problem.		
Each box can be broken down into smaller sub-problems shown on the level below it.		
A structure diagram uses a diamond-shaped box to show each decision.		
A structure diagram is used to record the value of each variable as an algorithm runs.		

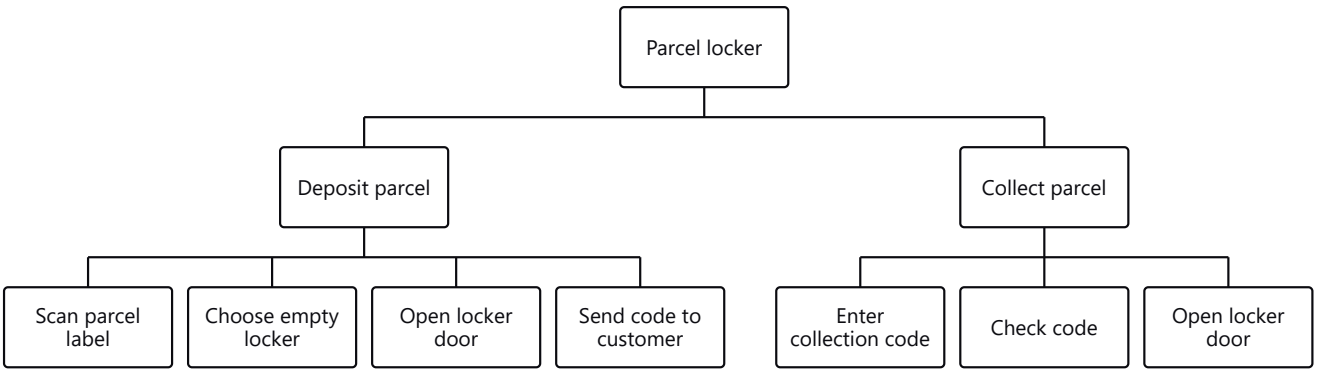
2

Total: 2 marks

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

3 **Total: 6 marks**

A delivery company is writing a program for its parcel lockers. A courier puts a parcel into an empty locker, and the customer is sent a code. Later, the customer types in the code to collect the parcel. The programmers have drawn this structure diagram.



(a) State the name of the subsection that **Check code** is part of. **[1]**

(b) Identify **one** input to the program that is shown on the structure diagram. **[1]**

(c) **Open locker door** appears in two different subsections. Explain how the programmers can make sure the code to open a locker door is only written once. **[2]**

(d) Three programmers will write the program. Explain **one** way that breaking the problem down like this helps the team. **[2]**

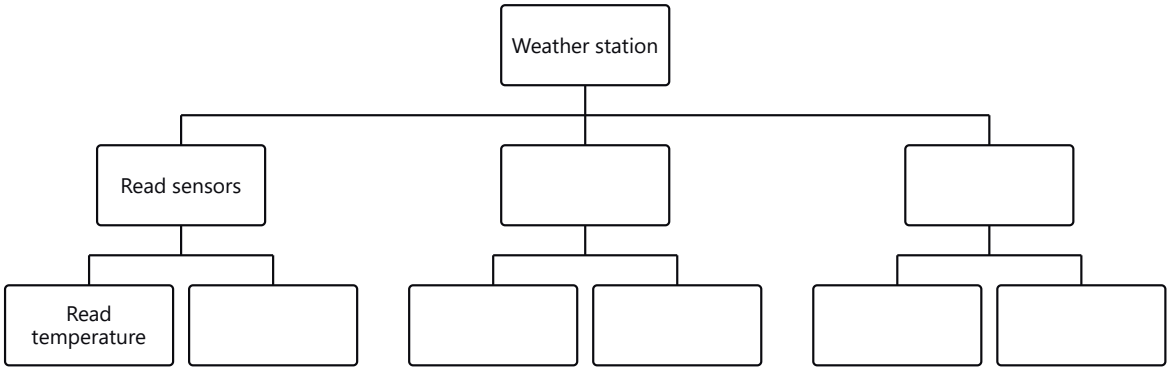
4

Total: 4 marks

A weather station program:

- reads two sensors: temperature and wind speed
- processes the readings: it calculates the average temperature for the day and finds the highest wind speed
- outputs the results: it displays them on a screen and saves them to a file.

(a) Complete the structure diagram for the weather station program. Write **one** sub-problem in each empty box. **[4]**



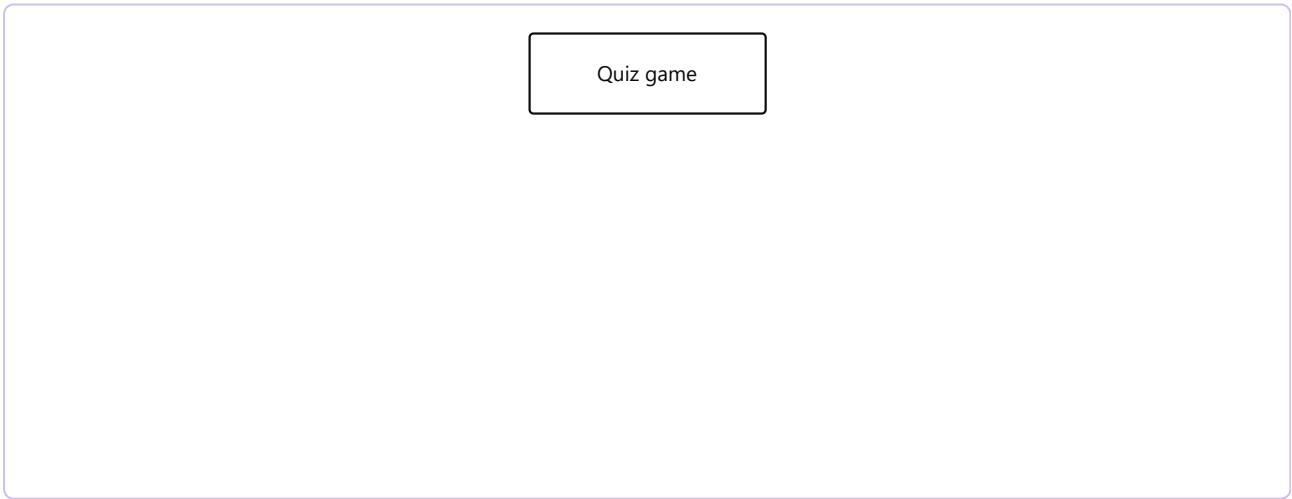
5

Total: 5 marks

A community centre wants a quiz program for its adult quiz nights. The program:

- sets up the game: the player enters their name and chooses a topic
- plays ten rounds: each round shows a question, gets the player's answer, then checks the answer and adds 1 to the score if it is correct
- ends the game: it displays the final score and saves it as a high score.

(a) Draw a structure diagram for the quiz program. The top box has been drawn for you. **[5]**



Total for this worksheet: 21 marks