MODULE K ALGORITHM DESIGN · K6

Flowcharts: symbols and how to read them

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

Name _____ Date _____

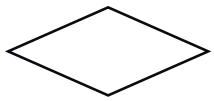
Instructions. Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. Draw flowcharts in pencil. The total for this worksheet is **21 marks**.

1

Total: 4 marks

The table shows four symbols that are used in flowcharts.

(a) Identify the name of each flowchart symbol A to D. Write each name in the table. **[4]**

	Symbol	Name of symbol
A		
B		
C		
D		

2 **Total: 4 marks**

A machine tests bouncing balls. A ball is dropped from a height, in cm, that is input. After each bounce the ball reaches half of its previous height. The machine counts the bounces until the height is less than 10 cm. The algorithm is shown in Fig. 1.

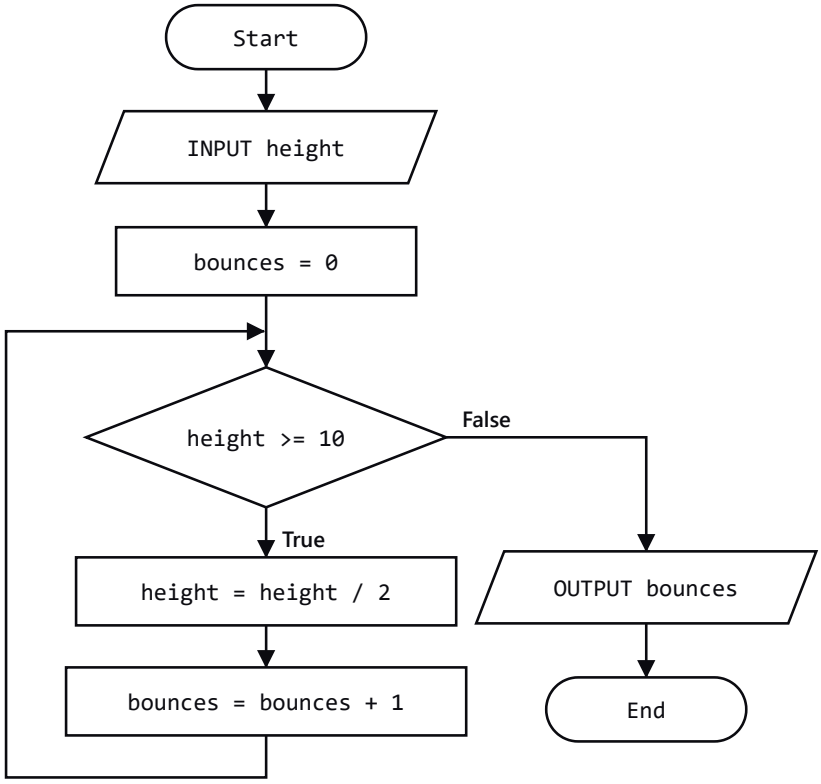


Fig. 1

(a) Complete the trace table for the flowchart in Fig. 1 when the input is `100`. You may not need to use all the rows. **[3]**

height	bounces	Output

(b) State the output of the flowchart in Fig. 1 when the input is `8`. **[1]**

3 **Total: 4 marks**

A swimming pool heater is controlled by an algorithm. The algorithm must:

- take the water temperature, in °C, as input
- set `heater` to `"On"` if the temperature is less than 27
- otherwise set `heater` to `"Off"`
- output the value of `heater`.

(a) The flowchart in Fig. 2 is incomplete. Complete the flowchart by writing the correct statement in each of the boxes **A**, **B**, **C** and **D**. **[4]**

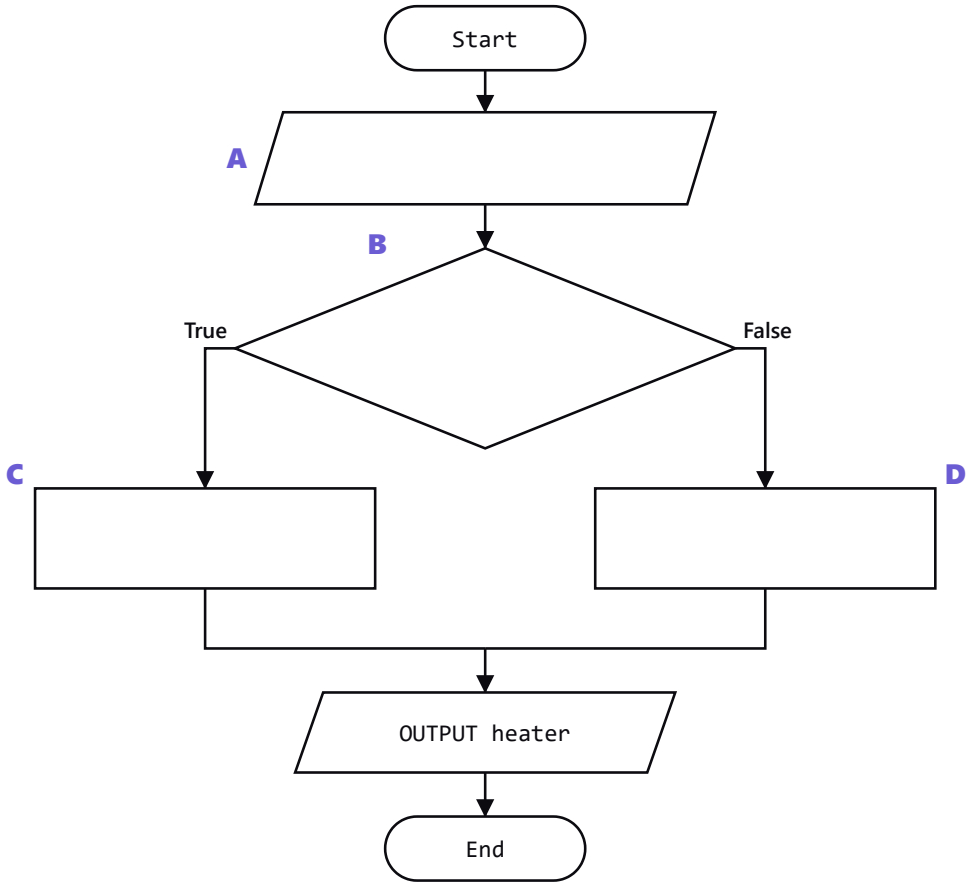


Fig. 2

4 **Total: 4 marks**

An electric scooter shows a message about its battery. The algorithm should:

- input the battery level as a whole-number percentage
- output `"Charge now"` if the battery level is 20 or less
- otherwise output `"Ready"`.

A programmer has drawn the flowchart in Fig. 3. The flowchart contains **two** errors.

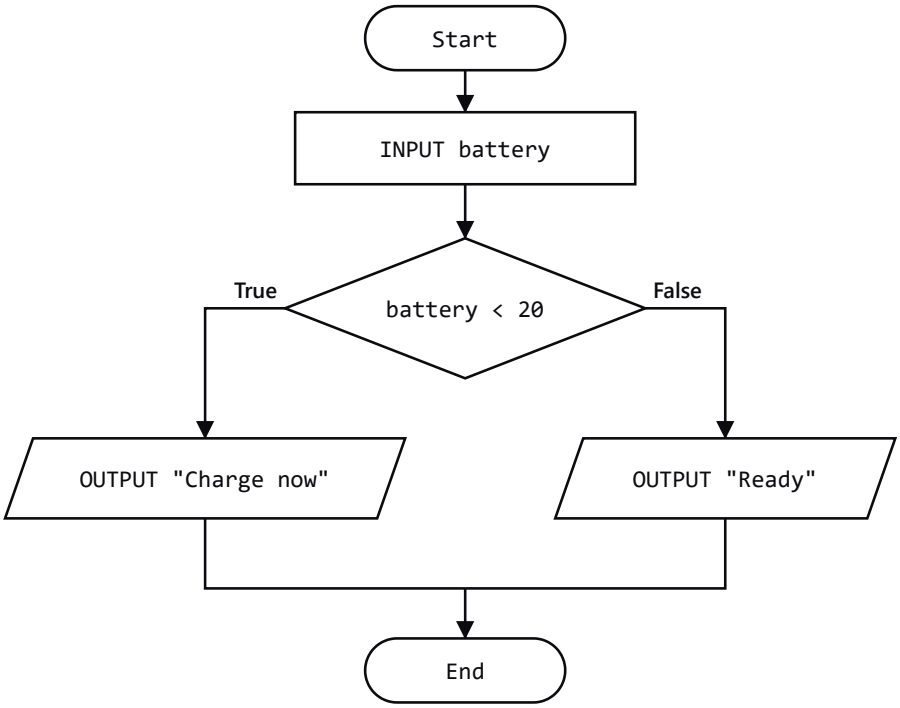


Fig. 3

(a) Identify the **two** errors in the flowchart in Fig. 3 and describe how to correct each one. **[4]**

Error 1	
Correction	
Error 2	
Correction	

5 **Total: 5 marks**

A climbing centre takes bookings for groups of climbers. An algorithm is needed that:

- inputs the number of climbers in a group
- checks that the number is between 1 and 8 inclusive; if it is not, outputs `"Invalid"` and asks for the number again
- calculates the cost at £15 per climber
- outputs the cost.

(a) Design the algorithm using a flowchart. **[5]**

Total for this worksheet: 21 marks