0478

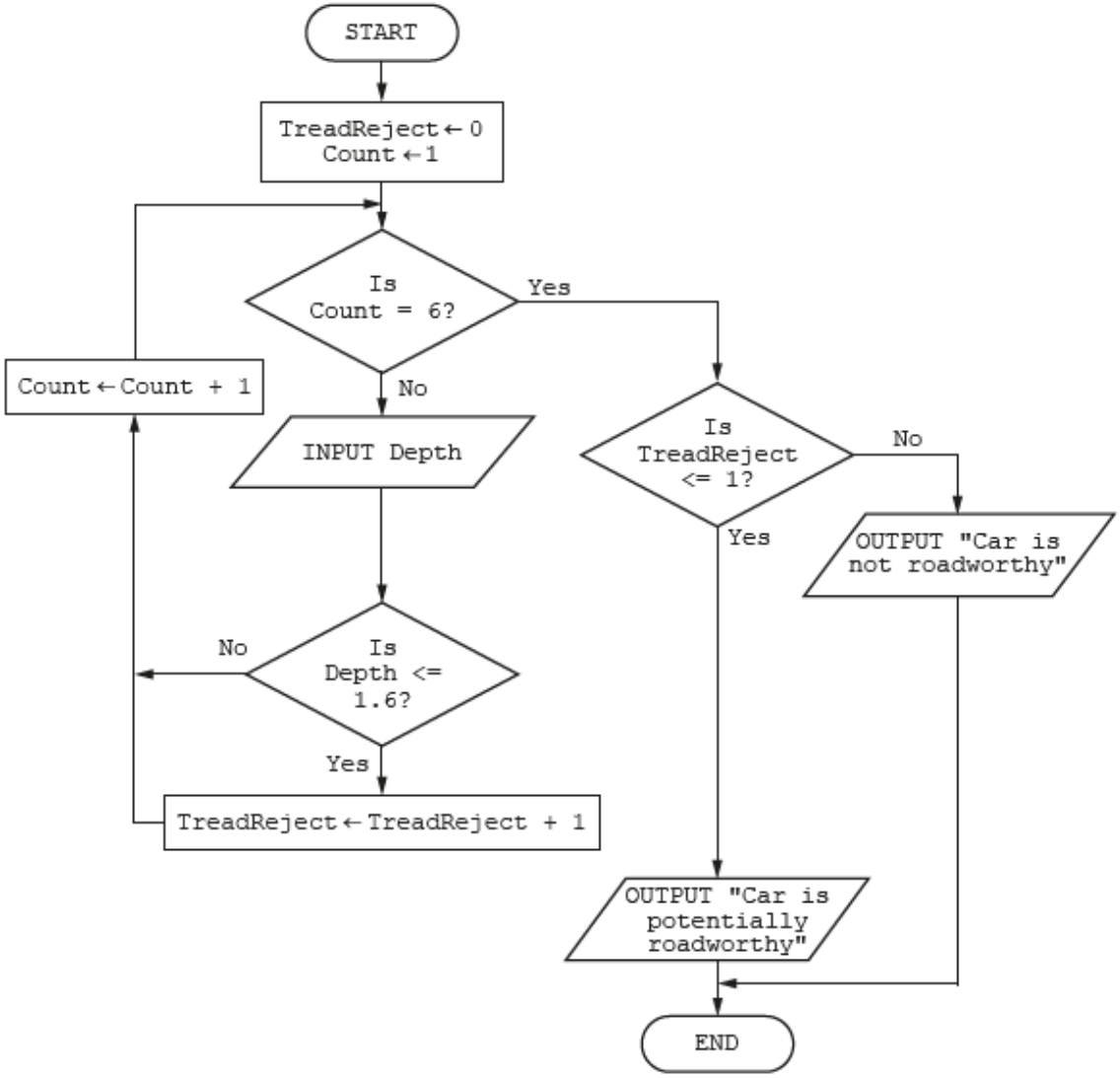
COMPUTER SCIENCE

TOPIC QUESTION PAPER-2 SET- 8

SMART EXAM RESOURCES

Unit 7 Algorithm Design and Problem Solving

1. This flowchart inputs the tread depth of five tyres, four on the car and a spare tyre. Any tread depth of 1.6 mm or less is rejected. To be potentially roadworthy, a car must have four tyres with a tread depth greater than 1.6 mm.



Complete Trace table 1 for the tread depth input data: 1.7, 1.9, 1.4, 1.8, 2.0

TreadReject	Count	Depth	OUTPUT

Trace table 1

Complete Trace table 2 for the tread depth input data: 1.2, 1.9, 1.4, 1.8, 2.4

TreadReject	Count	Depth	OUTPUT

Trace table 2

[4]

2. For each of the **four** checks in the table, place a tick in the correct column to show whether it is an example of a **validation** or **verification** check.

Statements	Validation	Verification
Range check		
Double entry		
Check digit		
Presence check		

[4]

3. Examine the following pseudocode:

```
INPUT A
INPUT B
INPUT C
INPUT D
INPUT E
INPUT F
INPUT G
INPUT H
INPUT I
INPUT J
INPUT K
INPUT L
T ← A + B + C + D + E + F + G + H + I + J + K + L
OUTPUT "The average equals ", T/12
```

(a) Describe what happens in this pseudocode.

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.....[3]

(b) Describe how this pseudocode could be altered to allow any number of values to be input.

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.....[3]

(c) Re-write the given pseudocode to allow any number of values to be input.

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.....[5]

4. An algorithm has been written in pseudocode to select a random number using the function RandInt(n), which returns a whole number between 1 and the argument n. The algorithm then allows the user to guess the number.

```
Number ← RandInt(100)
TotalTry ← 1
REPEAT
  PRINT "Enter your guess now, it must be a whole number"
  INPUT Guess
  IF TotalTry > Number
    THEN
      PRINT "Too large try again"
  ENDIF
  IF Guess > Number
    THEN
      PRINT "Too small try again"
  ENDIF
  TotalTry ← Guess + 1
UNTIL Guess <> Number
TotalTry ← TotalTry - 1
PRINT "Number of guesses ", TotalTry
```

Find the **four** errors in the pseudocode and suggest a correction to remove each error.

Error 1

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Correction.....

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Error 2

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Correction.....

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Error 3

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Correction.....

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Error 4

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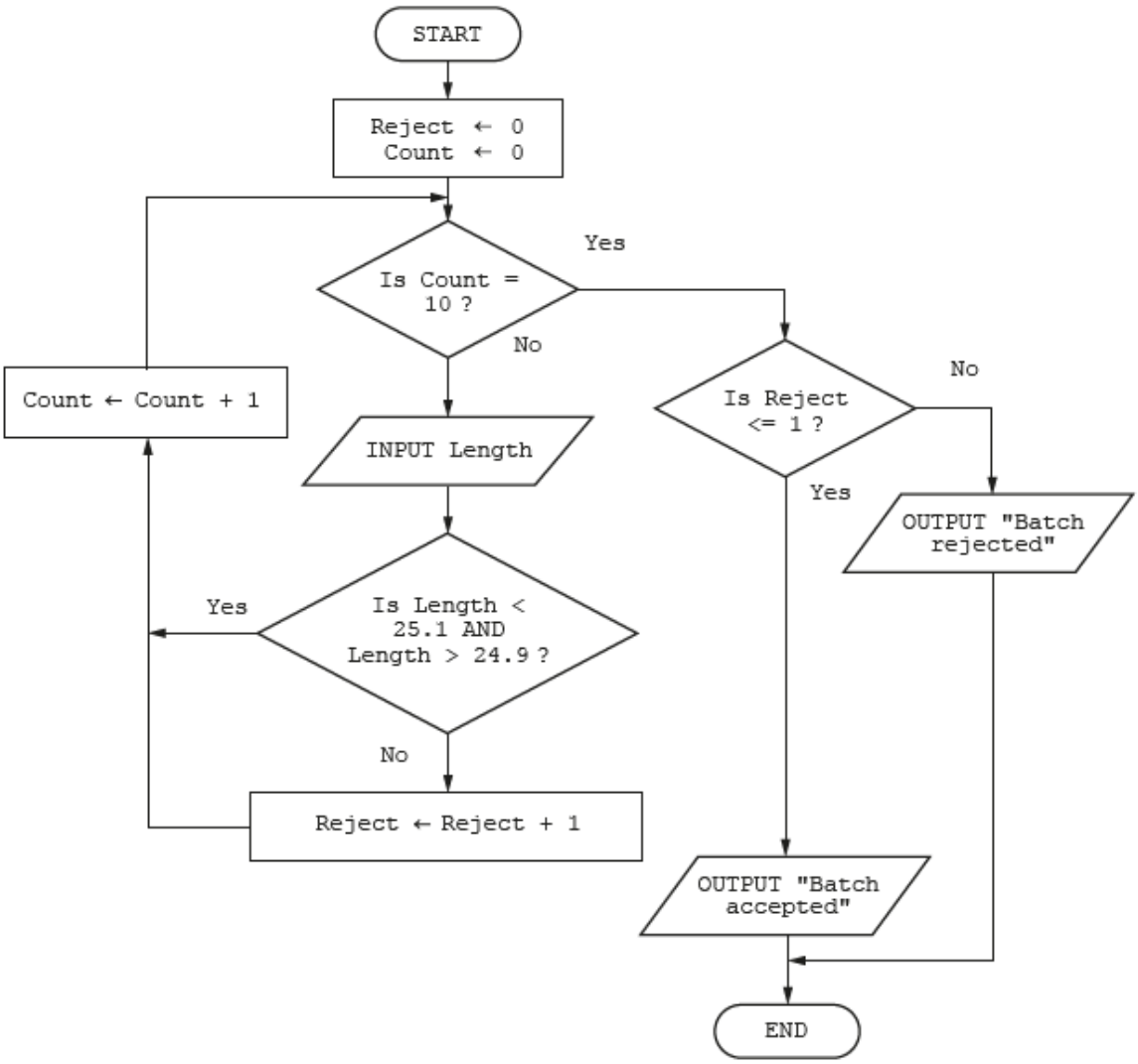
Correction.....

.....[4]

5. **(a)** The flowchart checks the lengths of a batch of 10 ropes. For the batch to be accepted 90% of the lengths need to be between 24.9 and 25.1 metres.



Complete the trace table for the input data:

24.88, 25.01, 24.98, 25.00, 25.05, 24.99, 24.97, 25.04, 25.19, 25.07

Reject	Count	Length	OUTPUT

[4]

(b) (i) It has been decided to only reject batches of rope that contain ropes that are too short.

State the change required to the algorithm.

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..... [1]

(ii) Explain how the algorithm to reject batches could be improved to make it more effective.

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..... [2]

6. **Four** validation checks and **four** descriptions are shown.

Draw a line to connect each validation check to the correct description.

Validation Check	Description
Range check	Checks that some data is entered.
Presence check	Checks for a maximum number of characters in the data entered.
Length check	Checks that the characters entered are all numbers.
Type check	Checks that the value entered is between an upper value and a lower value.