MODULE D DATA TRANSMISSION · D5

Echo checks, check digits and ARQ

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 2.2.2 (echo check), 2.2.3, 2.2.4

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. No calculator. The marks for each part are shown in brackets [ ]. The total for this worksheet is **20 marks**.

1

Total: 5 marks

A weather station sends its readings to a central computer. The station uses an echo check.

(a) Describe how the echo check is used to detect errors in the readings after transmission. **[4]**

(b) Give **one** drawback of using an echo check. **[1]**

2 **Total: 4 marks**

A garden centre gives each plant a 5-digit code. The first four digits identify the plant and the fifth digit is a check digit. The check digit is calculated like this:

- multiply the four digits, from left to right, by the weights 5, 4, 3 and 2
- add the four results together
- divide the total by 11 and find the remainder
- the check digit is 11 minus the remainder (a remainder of 0 gives a check digit of 0).

(The codes used in this question never give a check digit of 10.)

(a) Calculate the check digit for the plant digits **3 7 1 9**. Show your working. **[2]**

Working:

Check digit: .....

(b) An employee types the code **3 7 9 1 2**. Use the method to show whether the computer accepts this code. Show your working. **[2]**

Working:

Accepted / rejected: .....

3 **Total: 4 marks**

(a) Describe how a check digit is used to detect an error when a code is entered into a computer. **[2]**

(b) Identify **two** examples of where a check digit is used. **[2]**

1

2

4 **Total: 4 marks**

A ticket office sends booking data to a print centre. It uses an automatic repeat query (ARQ).

(a) Describe how ARQ is used to establish that the booking data is received without error. **[4]**

5 **Total: 3 marks**

(a) Tick (✓) **one** box in each row to show which method each statement describes. **[3]**

Statement	Echo check	Check digit	ARQ
The sender compares the data it sent with a copy sent back by the receiver.			
It detects an error made when data is typed in.			
If no acknowledgement arrives before a set time, the data is sent again.			

Total for this worksheet: 20 marks