MODULE G SECURITY · G3

Brute-force attacks

Original practice questions · 20 marks · ~25 minutes · OCR J277 spec 1.4.1, 1.4.2

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 **20 marks**.

1

Total: 5 marks

(a) Tick (✓) **one** box in each row to show whether each statement about brute-force attacks is true or false. **[5]**

Statement	True	False
A brute-force attack uses trial and error to find a password		
A brute-force attack works by tricking a person into telling the attacker their password		
Brute-force attacks are usually automated, so a very large number of passwords can be tried quickly		
The purpose of a brute-force attack is usually to gain unauthorised access to an account or system		
Adding one more character to a password reduces the number of possible combinations		

2 **Total: 5 marks**

A city bike-hire company lets members hire bikes through an online account. Each account is protected by a username and password, and stores the member's name, address and payment card details.

(a) Describe how a brute-force attack could be used to get into a member's account. **[3]**

(b) State **two** things an attacker might aim to do once they have got into a member's account. **[2]**

1

2

3 **Total: 4 marks**

The table shows how many different passwords are possible for some password rules. It also shows how long it would take to try every one of them, assuming the attacker's software tries 10 million passwords per second.

Characters allowed	Length	Possible passwords	Time to try them all
Lowercase letters only (26)	4	456,976	less than 0.1 seconds
Lowercase letters only (26)	6	308,915,776	about 31 seconds
Lowercase letters only (26)	8	208,827,064,576	about 6 hours
Upper and lowercase letters and digits (62)	8	218,340,105,584,896	about 253 days

(a) Using the table, explain why a longer password makes a brute-force attack less likely to succeed. **[2]**

(b) Using the table, explain why using a mix of character types helps protect against a brute-force attack. **[2]**

4 **Total: 3 marks**

An office manager is choosing a new password for the office's file server. These are the four options.

Option	Password
A	`garden`
B	`Garden26`
C	`gT8!wq#Lm2vZ`
D	`zzzz`

(a) Identify the option that would take a brute-force attack the **longest** to find. **[1]**

(b) Give **two** features of the password you identified in part (a) that make it harder to find with a brute-force attack. **[2]**

1

2

5 **Total: 3 marks**

A small accountancy firm's cloud file system locks a user's account for 30 minutes after five failed log-in attempts in a row.

(a) Explain how this rule limits the threat of a brute-force attack. **[3]**

Total for this worksheet: 20 marks