WORKSHEET

F10.7 Protocols

Networks · GCSE · OCR J277 1.3.2, AQA 8525 3.5, Edexcel 1CP2 4.1.6 · about 15 min

BugBotLab

Name _____ Class _____ Date _____

What this lesson is about

Standards, and TCP, UDP, IP, HTTP, HTTPS, FTP, SMTP, POP and IMAP.

- Standards
- The protocols on the exam
- Requests and responses

Questions

6 marks in all

1. Which protocol sends email to a mail server? [1 mark]

- ☐ **A** SMTP
- ☐ **B** IMAP
- ☐ **C** POP
- ☐ **D** HTTP

2. Why is HTTPS used for logins and payments? [1 mark]

- ☐ **A** The data is encrypted, so it cannot be read if intercepted
- ☐ **B** It is faster than HTTP
- ☐ **C** It compresses the page
- ☐ **D** It stops the page loading twice

3. How is IMAP different from POP? [1 mark]

- ☐ **A** IMAP keeps email on the server so it stays in sync on every device
- ☐ **B** IMAP sends email; POP receives it
- ☐ **C** IMAP is for files; POP is for email
- ☐ **D** There is no difference

4. Why are standards needed? [1 mark]

- ☐ **A** So equipment and software from different makers work together
- ☐ **B** So all devices are made by one company
- ☐ **C** So networks are faster
- ☐ **D** So data is encrypted

5. Which protocol is used to transfer files between computers? [1 mark]

- ☐ **A** FTP
- ☐ **B** SMTP
- ☐ **C** IMAP
- ☐ **D** UDP

6. What does this program print? [1 mark]

```
reply = "404 Not Found"
code, rest = reply.split(" ", 1)
print(int(code) == 200, rest)
```

The task: a tiny web client

Write `request(path)`, which sends `GET <path>`, waits up to a second for the reply, and returns the status code as a number and the rest of the reply as text. Request `/battery`, `/camera` and `/lights`. For a status of 200, print `<name>: <rest>` (for example `battery: 87`, without the `OK`); otherwise print `<name>: error <status>`. Turn the LED green if the battery is above 50, and red if not.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()
```

Plan your program here, then type it in and press Run.

Do it on the robot

www.bugbotlab.com/learn/f10-7-protocols/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Add a timeout: if no reply comes, print `<name>: no reply`.
2. What status code would mean "you are not allowed"? Look up 403.
3. For each of these, say which protocol is used: uploading a website to a server; reading email on a phone and a laptop; a live video call.