Ch17

Communication and Internet Technologies

CHAPTER ASSIGNMENT · 39 MARKS

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Show your working. You may use the chapter page to help you.

Questions from *Computer Science for Cambridge International AS & A Level Coursebook*, 2nd edition, Sylvia Langfield and Dave Duddell (Cambridge University Press), for classroom use.

Tasks and questions from the chapter

Q17.01 Can you find out some details about the format of a packet that TCP would send to IP?

Q17.02 Which protocols are being used in your email system? Does your email system give you any choices?

Q17.03 If you were setting up a website, you would need to upload files to a server. Do you know how you can use FTP for this from the system you normally use?

Q17.04 Who runs the tracker server? Are there alternative approaches for BitTorrent?

RP **Reflection Point:** Networking is a large subject area with many interconnected concepts. Have you considered how you might make some structured notes to help with revision later?

Exam-style questions

1 The following represents the structure of an IP datagram.

IP Header	TCP Header	TCP Content

Using the code IP for IP Header, TCP for TCP Header and Content for TCP Content identify where the following data will be found:

(a) Destination address [1]

(b) Sender address [1]

(c) Destination port [1]

(d) Sender port [1]

(e) Packet sequence number [1]

(f) Acknowledgement. [1]

2 Ethernet can be used in conjunction with the TCP/IP protocol suite.

(a) Draw a diagram to illustrate how the combination of Ethernet and the TCP/IP suite provides support for data communication. [5]

(b) Explain the meaning of the term 'MAC address'. [3]

3 One end-system with an Internet connection has a file. A user on another end-system connected to the Internet needs a copy of the file. There are different methods that might be used to enable the user to obtain a copy of the file.

(a) Identify **three** possible methods with a brief explanation for each. [6]

(b) Identify the application-layer protocols that each method will use with a brief explanation for each one. [8]

4 For sending and receiving emails the following application protocols might be used:

- SMTP
- POP3
- IMAP
- HTTP

For each of these protocols give a brief explanation as to how they might be used in association with an email application. You might find it useful to include a diagram for some of your account. [12]

5

(a) Four descriptions and three protocols are shown below.

Draw a line to connect each description to the appropriate protocol. [4]

Description	Protocol used
email client downloads an email from an email server	HTTP
email is transferred from one email server to another email server	POP3
email client sends email to email server	SMTP
browser sends a request for a web page to a web server	

(b) Downloading a file can use the client-server model. Alternatively, a file can be downloaded using the BitTorrent protocol.

Name the model used. [1]

(c) For the BitTorrent protocol, explain the function of each of the following:

(i) tracker [2]

(ii) seed [2]

(iii) swarm [2]

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6 An email is sent from one email server to another using packet switching.

(a) State **two items** that are contained in an email packet apart from the data. [2]

(b) Explain the role of routers in sending an email from one email server to another. [3]

(c) Sending an email message is an appropriate use of packet switching.

Explain why this is the case. [2]

(d) Packet switching is not always an appropriate solution.

Name an alternative communication method of transferring data in a digital network. [1]

(e) Name an application for which the method identified in **part (d)** is an appropriate solution. Justify your choice. [3]

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End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/computer-science/as-a-level/communication-internet-technologies/