BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 6 Professional Graduate Diploma in IT

NETWORK INFORMATION SYSTEMS

Tuesday 15th April 2025 - Morning

Answer **any** THREE questions out of FIVE. All questions carry equal marks.

Time: THREE hours

Answer any Section A questions you attempt in Answer Book A
Answer any Section B questions you attempt in Answer Book B

The marks given in brackets are **indicative** of the weight given to each part of the question.

Calculators are **NOT** allowed in this examination.

Section A
Answer Section A questions in Answer Book A

A1.

a) What is the Domain Name System (DNS)?

(4 marks)

b) You are an IT specialist in a start-up company. Your task is to set up a company website and you are given the domain name “MyCompany” within the .co.uk domain. You are to set up an internal DNS server. Your line manager instructs you to install a DNS server and give it a domain name dns.MyCompany.co.uk.

Would you be able to do that on the company infrastructure? Give reasoning for your answer.

(6 marks)

c) The records shown in Figure 1_c below represent an example of a CNAME record, an MX record and an A record found in a typical DNS set of entries of a company called “example” in the “.com” domain. Explain the purpose of each record and what information they contain.

Figure 1_c

NAME	TYPE	VALUE
mail.example.com	MX	foo.example.com
bar.example.com	CNAME	foo.example.com
foo.example.com	A	192.0.2.23

(9 marks)

d) For the example given in question c) above, create another record which gives an alias called “newAlias” for the company server called “foo” and another name for the mail server to be called “mail1”.

(6 marks)

A2.

a) What is the main difference between LAN and WAN and what is the hierarchy between them?

(7 marks)

b) What are the similarities between the two types of networks? In your answer, include an explanation of basic topology, data transmission and basic security.

(6 marks)

c) What are the differences between the two types of networks? In your answer, include an explanation of components, connections and speed.

(6 marks)

d) Explain the relationship between cloud and WAN. In your answer, include an explanation of the terms Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).

(6 marks)

Section B
Answer Section B questions in Answer Book B

B3.

a) Explain what HTTP is and how it works. In your answer, mention as many of the HTTP request methods you are aware of (e.g., GET, PUT, etc.).

(8 marks)

b) When using the internet and HTTP, the main addressing structure is the Uniform Resource Locator (URL**)**. Consider the following URL:

https://www.domainname.com:80/subdirectory1/subdirectory2/file.html?key1=value1&value1&key2=value2

Explain all the different fields you can find in this URL address.

(10 marks)

c) Explain what the difference between HTTP and HTTPS is and why you need an SSL certificate for HTTPS to work.

(7 marks)

B4.

a) RESTful is a stateless communications protocol, such as HTTP. Explain what is meant by a stateless communications protocol, and what implications this has for the design of REST, particularly with respect to scalability, reliability and simplicity.

(10 marks)

b) What is the difference between idempotent and non-idempotent operations? In your answer, give examples of each.

(5 marks)

c) What is meant by reliable messaging in web services, and what delivery guarantee is provided by REST?

(5 marks)

d) Consider and explain why the guarantee provided by REST is sufficient, and the relevance of idempotent operations in ensuring this is so.

(5 marks)

[Turn Over]

B5.

a) What are the **four** types of delay in a packet-switched network? For each, describe the cause of the delay.

(8 marks)

b) What is meant by the capacity of a network, and how is this related to the network latency? In your answer, consider whether low-latency networks have a higher or lower capacity than high-latency networks.

(6 marks)

c) The Trivial File Transfer Protocol (TFTP) is a simple network protocol used to transfer files using the User Datagram Protocol (UDP) transport layer protocol. When a file transfer is begun, the file is packetised, and packets are sent sequentially. Each packet is acknowledged by the receiver before the next packet is sent.

Why would TFTP be the wrong protocol to transfer files on a Wide Area Network (WAN)? In your answer, consider and describe a suitable better means of file transfer.

(11 marks)

END OF EXAMINATION