

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

PRINCIPLES OF INTERNET TECHNOLOGIES

Friday 21st April 2023 - Morning

Answer **any** FOUR questions out of SIX. All questions carry equal marks.

Time: TWO 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 difference between accessibility guidelines and accessibility standards? Provide an example of **ONE** accessibility guideline and an example of **ONE** accessibility standard for web site design in your answer.

(6 marks)

b) What is node.js? State **ONE** example of how it aids a website developer in the creation of a web application.

(4 marks)

c) Below is an example of HTML code that will produce a static webpage. Outline **THREE** web development techniques you would use to make the webpage dynamic.

```
<html>
<title>My web page</title>
<h1>Name</h1>
<p>My name is Jim Smith</p>
<h1>Time</h1>
<p>The time is 9pm</p>
</html>
```

(6 marks)

d)

i) What is website maintenance?

(4 marks)

ii) State **THREE** issues that a developer may encounter when carrying out website maintenance.

(3 marks)

iii) State **TWO** ways that a web developer may carry out website maintenance

(2 marks)

A2.

a) What are the **THREE** types of e-commerce?

(6 marks)

b) How did COVID-19 impact studying online in 2020? How did this affect the use of applications used for studying online? Provide an example of such an application in your answer.

(7 marks)

c) State **TWO** benefits of using a search engine.

(4 marks)

d) What is 'mobile first' web development? State **TWO** advantages of using this approach.

(8 marks)

A3.

a) In relation to XML, briefly explain what the following terms mean:

- i) web services;
- ii) SOAP;
- iii) DTD;
- iv) Element;
- v) Schema.

(10 marks)

b) What is the difference between a CSS element selector and a CSS id selector?
Provide an example of **each** in your answer.

(6 marks)

c) State **TWO** advantages of using CSS when designing a web site.

(4 marks)

d) What is 'mobile-first design' and why is it so important when it comes to web site design?

(5 marks)

[Turn Over]

Section B
Answer Section B questions in Answer Book B

B4.

- a) For **each** of the following acronyms, explain what they stand for and map them on to the appropriate layer of the TCP/IP model.
- i) HTTP;
 - ii) ARP;
 - iii) RSVP;
 - iv) OSPF;
 - v) SMTP;
 - vi) IPsec.
- (12 marks)**
- b) The transport layer of the TCP/IP model includes the UDP and TCP protocols.
- i) What do the acronyms TCP and UDP stand for?
(2 marks)
 - ii) Compare and contrast these protocols, explain the technologies that make use of them and why their usage within these technologies is appropriate.
(5 marks)
 - iii) Use a diagram to illustrate the three-way handshake when TCP establishes a connection between a client and a server.
(6 marks)

B5.

- a) Network administrators use network utility tools to identify performance issues. State **FOUR** network utility tools, describe their purpose and explain how they help in determining performance issues within a computer network.
(12 marks)
- b) What is the use of Telnet and SSH and what is the main difference between them?
(4 marks)
- c) Explain the importance of NAT in the context of IPv4 addressing.
(3 marks)
- d) Explain what is meant by:
- i) A packet switched network.
 - ii) A circuit switched network.
 - iii) Which of these applies to the Internet?
- (6 marks)**

B6.

'Smart energy meters' that monitor energy usage within a home are examples of Smart IoT devices.

- a) Use a diagram to show how a home automation system enables universal access for the monitoring and control of devices within a domestic home.
(7 marks)
- b) Evaluate the technologies chosen in a).
(6 marks)
- c) Wireless communication technologies are used to connect nodes in an IoT system. Explain **FOUR** wireless communication technologies and provide **ONE** advantage and **ONE** disadvantage for **each**.
(12 marks)

END OF EXAMINATION