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
<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)
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