

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

COMPUTER NETWORKS

Thursday 23rd April 2026 – Afternoon

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.

Only non-programmable calculators are allowed in this examination.

Section A
Answer Section A questions in Answer Book A

A1.

In the TCP/IP reference model and the OSI 7 layer model, the application layer does the actual work for users and often requires support protocols for applications to function correctly.

- a) Legacy internet application layer protocols include HTTP and SMTP. Compare and contrast these two protocols.

(14 marks)

- b) Historically, the internet has been about communication and associated protocols (like HTTP and SMTP) have contributed to this. Still, the switch to content provision has been so pronounced that most internet bandwidth is now used to deliver stored videos.

Discuss the differences between Content Distribution Networks (CDN) and Peer to Peer Networks (P2P) and how the advantages of P2P contribute to this growth.

(11 marks)

A2.

Types of computer networks have often been categorised as PANs, LANs, WANs, or MANs.

- a) Describe the term LAN and its characteristics and typical networking devices.

(8 marks)

- b) Explain what the term WAN means, describing its characteristics and typical networking devices.

(8 marks)

- c) Explain what packet switching means, describing how packet switching is used to transmit data from one computer to another computer on a network.

(5 marks)

- d) Discuss the advantages of using packet switching instead of circuit switching to send a message between two computers on a network.

(4 marks)

A3.

For modern real-time internet-based communications, TCP/IP flows require quality of service to ensure proper network performance and meet user expectations.

- a) What is a flow in internet-based communications, and what are **four** of its main characteristics?

(5 marks)

- b) Describe the **four** primary parameters determining the Quality of Service (QoS) a flow requires.

(8 marks)

- c) In a table, for each of the following network applications, indicate the requirements for the QoS primary characteristics identified in part b) in terms of low, medium or high:

- i. File sharing.
- ii. Remote login.
- iii. Video on demand.

(12 marks)

[Turn Over]

Section B
Answer Section B questions in Answer Book B

B4.

Regardless of the design and robustness of digital transmission systems, errors will always occur, resulting in the change of one or more bits in a transmitted block of data.

- a) Explain what an error means during digital data transmission. **(3 marks)**
- b) Explain the **two** general errors in digital transmission and what causes them. Provide an example for **each** type. **(13 marks)**
- c) Describe **three** approaches for coping with data transmission errors. **(9 marks)**

B5.

- a) For the following IPv4 addresses and subnet mask pairs, identify whether each pair is:
- i. Public or private IP address as mandated by RFC1918.
 - ii. A network, host or broadcast address.

No	IP Address	Subnet Mask
1	192.168.1.43	/24
2	191.168.32.22	/24
3	10.32.18.0	/30
4	208.23.168.128	/25
5	172.16.123.255	/28
6	171.16.244.255	/30
7	172.31.254.32	/27
8	35.23.34.0	/8
9	184.32.24.99	/12

(18 marks)

- b) What is the critical differentiator between IPv4 and IPv6 addresses and what are the key advantages of IPv6 over IPv4? **(7 marks)**

B6.

a) What is meant by the term transmission media?

(3 marks)

b) Identify the following types of guided network transmission media and discuss their associated advantages and disadvantages:

i.



ii.



iii.



(15 marks)

c) Describe what Power Line Communications (PLC) means and describe the differences between narrowband and broadband PLC.

(7 marks)

END OF EXAMINATION