BCS Level 4 Award in Network and Digital Communications Theory QAN 603/0703/1

Specimen Paper Answer Key

Version 5.0
July 2020

Change History

Any changes made to the specimen paper shall be clearly documented with a change history log. This shall include the latest version number, date of the amendment and changes made. The purpose is to identify quickly what changes have been made.

Version Number	Changes Made
Version 1.0 September 2017	Document created.
Version 2.0 February 2018	Updates to question rationales.
Version 2.1 July 2018	Edit to title and formatting
Version 3.0 November 2018	Answer key undergone major editing, so the answers match the questions in the specimen paper.
Version 4.0 July 2019	Major changes to questions to match Syllabus question weightings.
Version 4.1 August 2019	Changes to rationales for questions 4 and 14.
Version 5.0 July 2020	Major changes to questions to match updated syllabus (V3.0). Paper size reduced to 20 questions. Title page, change history table and related syllabus section added.

Related Syllabus

This specimen paper and answer key are related to the following syllabus:

BCS Level 4 Award in Network and Digital Communications Theory Syllabus V3.0 March 2020

Question	Answer	Explanation / Rationale	Syllabus Sections
1	**C**	The Data Link layer has two sub layers: Media Access Control and Logical Link Control.	1.1
2	**A**	802.3 is a standard specification for Ethernet (which is maintained by the Institute of Electrical and Electronics Engineers (IEEE)).	1.1
3	**D**	HTTPS is the only protocol listed that uses encryption. The others all send information in plain text.	1.2
4	**A**	A frame under 64 octets is known as a runt frame and may be the result of a rogue device or a network collision. Switches drop runt frames on processing.	1.3
5	**C**	Generally, parity is single bit error detection; an even number of errors will cancel out and the error will be missed. Multi-bit parity would be a more resilient option to use.	1.4
6	**B**	Routing to a stub network would best be achieved by defining static routes to that network. For redundancy and large networks like a WAN, dynamic routing would be best.	1.5
7	**B**	Advantages of OSPF include that it is hierarchical, uses multicasting and participating devices have a single copy of the routing information. One disadvantage of OSPF is that it is very processor intensive.	1.6
8	**D**	Contention is when 'nodes' transmit at the same time, when contention occurs nodes need to 'back-off' and retransmit. If this is done properly packets won't get dropped or corrupted. There is no limit on the number of connections	2.1
9	**D**	Contention is when 'nodes' transmit at the same time on a busy network, when contention occurs nodes need to 'back-off' and retransmit increasing latency (the delay before a transmission occurs). Contention will decrease the apparent speed but will have no effect on integrity or data loss.	2.1
10	**B**	Traffic shaping is a technique for managing bandwidth by delaying certain network packets in favour of higher priority ones. Application-based traffic shaping works by fingerprinting packets to identify the application. Once the application is known you can then limit or prioritize the traffic such as throttling file sharing and increasing latency sensitive applications such as VoIP. Route-based traffic shaping examines the source and destination of the packet and may adjust the route.	2.2