BCS Level 4 Certificate in Network and Digital Communications Theory
Answer Key and Rationale - QAN 603/0703/1

Question	Answer	Explanation / Rationale	Syllabus Sections
1	**C**	The Data Link layer has two sub layers: Media Access Control and Logical Link Control.	2.2
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	**B**	A bottleneck, in a communications context, is a point in the enterprise where the flow of data is impaired or stopped entirely. Causing data to be buffered or retransmitted. Adopting Traffic shaping will allow traffic to that node to be reduced.	4.2
4	**D**	The logical address is the IP Address. IP addressing takes place at the Network layer.	2.1
5	**B**	**Advantages of OSPF:** • Changes in an OSPF network are propagated quickly. • OSPF is hierarchical, using area 0 as the top of the hierarchy. • OSPF is a link state algorithm. • OSPF supports Variable Length Subnet Masks (VLSM). • OSPF uses multicasting within areas. • After initialization, OSPF only sends updates on routing table sections which have changed, it does not send the entire routing table. • Using areas, OSPF networks can be logically segmented to decrease the size of routing tables. Table size can be further reduced by using route summarization. • OSPF is an open standard, not related to any particular vendor. **Disadvantages of OSPF:** • OSPF is very processor intensive. • OSPF maintains multiple copies of routing information, increasing the amount of memory needed. • Using areas, OSPF can be logically segmented (this can be a good thing and a bad thing). • OSPF is not as easy to learn as some other protocols.	3.1

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6	A	Changes to configurations are made by people, which can cause errors. Denial of service is deliberate act by a person, i.e. not an error. H/W Firmware incompatibility and Link failure are technical faults and not related to 'human' actions.	1.3
7	B	Checksum will only show that data is valid it can't correct data or authenticate it. Encryption is unrelated.	1.4
8	D	Contention is when 'nodes' transmit at the same time, when contention occurs nodes need to 'back-off' and retransmit.	4.1
9	B	Routing to a stub network you would use a static route. For redundancy and large networks, dynamic routing would be used.	3.2
10	B	In computer networks, bandwidth is used as a synonym for data transfer rate, the amount of data that can be carried from one point to another in a given time period (usually a second). Network bandwidth is usually expressed in bits per second (bps); modern networks typically have speeds measured in the millions of bits per second (megabits per second, or Mbps) or billions of bits per second (gigabits per second, or Gbps).	4.1
11	D	Physical layer defines the low-level network, the transmission medium but not protocols. The Data layer defines the link between 2 nodes, the protocols to establish the links.	2.2
12	C	SMTP = Simple Mail Transfer Protocol TCP / IP = Transmission Control Protocol / Internet Protocol (networking protocol) SNMP = Simple Network Management Protocol UDP = User Datagram Protocol	1.2
13	D	The normal use of a static route on a router using dynamic routing protocols is to add a default route to the routing table.	3.2
14	D	Contention is when 'nodes' transmit at the same time, when contention occurs nodes need to 'back-off' and retransmit increasing latency (the delay before a transmission occurs). Contention will cause retransmission but the effect on performance is an increase in Latency.	4.1
15	C	Traffic control is concerned with the speed of connections which is governed by latency, see above for definition.	4.2

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16	A	For a small network that is easy to manage static routing has less overhead. Human error is a disadvantage of static routing as is administration. Resilience isn't relevant.	3.2
17	B	The Application layer in the TCP/IP model is equivalent to the Application, Presentation and Session layers in the OSI model. The Transport layer is a separate layer in both models. The Data Link layer in the OSI model is part of the Physical layer.	2.1
18	A	Traffic shaping can identify types of data and specifically the route it takes. Network design provides the routes; policing drops data and rate limiting affects overall speed.	4.2
19	D	**Difference between RIPv1 and RIPv2:** RIPv1 is a classful routing protocol and it does not support VLSM (Variable Length Subnet Masking). RIPv2 is classless routing and it support VLSM (Variable Length Subnet Masking). RIPv2 has the option for network mask in the update to allow classless routing advertisements. RIPv2 the updates are sent as multicast In RIPv2, it is sent as broadcast. This feature reduces the network traffic. The multicast address RIPv2 is 224.0.0.9. RIPv2 supports authentication. Authentication helps in confirming that the updates are coming from authorized sources.	3.1
20	A	"An OSPF network may be structured, or subdivided, into routing areas to simplify administration and optimise traffic and resource utilisation. The Routing Information Protocol (RIP) is a distance-vector routing protocol which employs the hop count as a routing metric. RIP prevents routing loops by implementing a limit on the number of hops allowed in a path from source to destination. The maximum number of hops allowed for RIP is 15, which limits the size of networks that RIP can support."	3.1