Examination report – June 2014 series

2730-012 Communication Systems and Digital Networks 2

Section 1 – Areas of good performance
Syllabus reference: 1.3 / 1.5 / 1.11 – Identify the components of a simple communication system. Explain the difference between digital and analogue signals. Describe the difference between connectionless (eg datagram) and connection-oriented (eg virtual circuit) packet switched networks. These sections were answered reasonably well. Syllabus reference: 2.5 / 2.7 – List the layers of the OSI and describe the function of each layer as well as giving an example of layer implementation. Explain the terms 'encapsulation', 'segmentation' and 'fragmentation' with reference to data and the layers of the OSI. Answered fairly accurately by most candidates. Sometimes, in regards to explaining the meaning of encapsulation and fragmentation, candidates confused encapsulation with fragmentation. Syllabus reference: 3.7 / 3.24 – Produce a concise outline of the main features of the TCP/IP protocol, referencing the DOD protocol model and compare with it the ISO/OSI model. Explain the purpose and use of DHCP and DNS. These sections were answered very well showing a good understanding in these areas. Sometimes candidates confused DHCP with DNS. Syllabus reference: 3.16 / 3.17 – Explain base 2 and base 10 numbering systems and convert from one to the other using binary and dotted decimal notation of IP addresses. Explain the classful Internet addressing scheme, identifying the classes and their default subnet masks, network and host ranges. Both sections were answered very well showing a good understanding in these areas. Syllabus reference: 3.13 – List the 'well-known' TCP port numbers and state the function of each port. This section was answered reasonably well by most candidates. Syllabus reference: 3.22 – Give reasons for the allocation of reserved IP addresses. This section was answered reasonably well by most candidates. Syllabus reference: 4.11 – Explain the difference between synchronous and asynchronous transmissions and between half-duplex and full duplex transmissions. This section was answered reasonably well by most candidates. Syllabus reference: 4.16 / 4.17 – Explain error detection and control in data transmission and give examples of error-detection schemes. Describe in detail the HDLC protocol explaining basic characteristics, frame structure and operation. Answered reasonably well, although quite often all sections of the HDLC frame structure were not identified. Syllabus reference: 4.8 – Explain transmission impairments and how they are tackled. This section was answered well, but often candidates described the impairments rather than how they could be overcome, costing marks. Syllabus reference: 5.4 / 5.6 – Describe a LAN switch and list the different switching methods employed. Describe the fundamentals of the STA and its application in switched networks. Both sections were answered well, but explanations and descriptions lost marks because of the lack of detail. Quite often basic statements were given.

Syllabus reference: 5.15 / 5.24 – Create a configuration file for a give router. Include routing protocols, device name, interface configuration to permit router operation (simulation is acceptable). Describe routing metrics in the context of routing protocols. Generally, these sections were answered accurately. Syllabus reference: 5.19 – Explain subnetting in the context of logical segmentation of networks and localisation of network traffic. This section was answered well, showing a good understanding of subnetting.
Section 2 – Areas for development
Syllabus reference: 3.8 – Outline in detail, the function and operation of the TCP protocol. There was a lack of knowledge of data segmentation and port allocation with reference to TCP evident by incorrect answers. Syllabus reference: 3.16 – Explain base 2 and base 10 numbering systems and convert from one to the other using binary and dotted decimal notation of IP addresses. Very few candidates calculated correctly subnets from a given subnet mask. Syllabus reference: 4.10 – Explain data encoding and list examples of encoding schemes. Mostly incorrect answers given in this section where candidates failed to identify correctly data encoding schemes. Syllabus reference: 4.15 – Understand how flow control is implemented at the data link layer as well as listing and explaining the different flow control methods. Very vague and mostly incorrect explanations given, showing a lack of the understanding of the sliding window concept. Syllabus reference: 4.14 – Explain the role of the data link layer in the OSI and give examples of data link layer protocols. Very few candidates could identify the sublayers or explain their roles. Syllabus reference: 5.12 – Describe connectors and interfaces used for connecting routers to a network. Very few candidates identified the connections listed, and because of this could not describe them.
Section 3 - Recommendations
Read questions carefully and when diagrams are called for, produce them in a clear neat manner. If descriptions or explanations are required, make sure they are detailed enough.