Examiners' commentary 2018–2019

CO2222 Data communications and enterprise networking – Zone B

General remarks

This assessment is set with the intention of determining whether candidates have achieved the principal objectives of the module, in particular, whether they have learned the key concepts and technologies that underpin data communications and if this knowledge can be applied to the solution of technical and business problems. The examination paper is divided into two parts, Parts A and B and candidates are required to attempt four questions, two from each section.

The following commentary details the main elements of the examination paper on a question by question basis, highlighting important aspects and suggesting, where appropriate, what is expected in a 'good' answer and where problems may have arisen. All questions follow a similar format, starting with a simple true/false section followed by a number of subsections, each with a specific focus.

No comment is made in respect of the true/false sections as they simply involve knowledge of specific facts contained in the subject guide. The only advice that can be given by way of help with these is to read the subject guide thoroughly.

Comments on specific questions

Question 1

This question was concerned with issues related to data transmission. It began with descriptions of some basic quantities that are important to the performance of a communications channel. They are frequently used in calculations such as Shannon's law to evaluate channel capacity.

The next part of the question concerned jitter and its significance in situations when real-time data is being transmitted (e.g. voice and video) where variable delays can cause serious problems.

Part (d) required a brief description of virtual circuits and a discussion of virtual circuit and packet switched modes of operation. This is well covered in the subject guide.

The final part of the question involved a simple calculation using Nyquist's equation for theoretical channel capacity, for which you should obtain the answer as 62.4kbs.

Question 2

This question focused on network protocols and control. It was largely descriptive, with all aspects being well covered in the subject guide but required application of this material.

The first part of the question required a description of symmetric, proprietary and connection-oriented protocols. It then moved on to issues associated with transport layer protocols with examples of applications to which they

are suited. Connection-oriented services provide a reliable channel that guarantees delivery whereas connectionless transport services are more suited to applications where speed and simplicity are more important (e.g. remote server login).

The final parts of the question were concerned with issues related to the limitations of SMTP, which assumes servers are always on and NFS, which allows remote files to appear as though they are local to a user.

Question 3

This was a largely descriptive question (as indicated by 'what' and 'how' in parts (b), (c) and (d)). All aspects are well covered in the subject guide, and the only advice here is to read it more carefully.

The final section involved a Dijkstra routing problem. These appear frequently and generally cause few problems, other than candidates simply marking the shortest path, without labelling each of the nodes. The majority of marks are awarded for these labels, with generally only a single mark for marking the shortest route.

Question 4

This was the first question on Part B of the examination paper. The question was entirely descriptive with all parts beginning with either 'what' or 'how'. The early parts of the question were concerned with business issues (five forces and PEST) and the latter parts with technical matters (Ethernets and VLANs). All aspects are well covered in the subject guide, so again, you are reminded to read the subject guide carefully.

Question 5

This question was largely concerned with aspects of routing and switching, ranging from CSMA/CA, SMDS through to hand-off in mobile networks. The question was again largely descriptive with most parts beginning with 'what' or 'how'.

The final part of the question involved a Spanning Tree Protocol problem. These appear frequently and are generally well answered. There is no substitute for practice with these problems; the solutions aren't difficult but do require a methodical approach and attention to detail.

Question 6

The final question was concerned with issues of network design. The first part concerned interconnecting different networks and, in particular, the problems of linking connection-oriented and connectionless networks where not all functions may map across.

Part (c) considered the implementation and benefits of an extranet that allows external suppliers, etc. access to an organisation's intranet. Access via a firewall would provide security but there can be problems with internal intranet addresses conflicting with externally assigned IP addresses for external users. A range of special IP addresses have been reserved to avoid this problem.

Parts (d) and (e) involved issues of performance and cost in network design. Part (d) asked why switching (i.e. VLANs) was increasingly popular and part (e) focused on costs. Both are well covered in the subject guide.

Summary

This commentary has attempted to highlight the main features and some of the common problems that arose with the 2018–2019 examination paper, in the hope that it will help candidates to prepare for future examinations. Some general issues can be identified, which are summarised here:

- Read the question carefully to understand what the examiners are asking, e.g. the difference between 'describe', 'explain', 'compare', etc.
- Note the number of marks available for individual parts of a question and provide answers of appropriate length
- Practise solutions to common practical problems (e.g. Dijkstra, Spanning Tree, etc.)
- Read the subject guide (several times, if necessary!).