Examination report – December 2013 series

2730-013 Fundamentals of electronic communication 3

Section 1 – Areas of good performance
Syllabus reference: 2.4, 2.10 Most candidates managed to state three material combinations used for the core and cladding of optical fibres but the explanations for the optical fibre losses, absorption and Rayleigh scattering, generally lacked essential details. Syllabus reference: 4.19 The diagram produced to show how three information channels can be interleaved and transmitted over a single communication link using Time Division Multiplexing (TDM) varied from excellent to very poor. Detail was lacking in the explanations given for the operation of the diagram.
Section 2 – Areas for development
Syllabus reference: 1.10, 1.11 An example of a question not read carefully enough. Provision of a.c. mains was asked for, firstly from a d.c. source and then secondly by rotating machines. The rotating machine part should have provided a motor mechanically coupled to an a.c. generator. No details of either machine was required and accordingly earned no marks. Syllabus reference: 3.22 Most candidates appeared to have no concept of a dedicated data network. Few realised it was a leased line with its attendant consequences. Syllabus reference: 5.3, 5.22 Another misread question was; with the aid of a block schematic diagram, describe the basic technique for producing single channel Pulse Code Modulation (PCM). Few candidates managed the calculation correctly for the minimum bandwidth for the PCM system. Syllabus reference: 5.18, 5.26 Most candidates had the general idea of the relationship between the number of information bits required in a PCM system and the number of quantisation levels but the explanations were not comprehensive enough. The essence for the explanation of how the frame structure of PCM permits the transmission of data signals in addition to encoded speech was simply that each speech channel in PCM requires a bit rate of 64kbits/s. The information source could be speech or data, it doesn't matter. Syllabus reference: 6.9, 6.10 Many candidates had no real idea of what is meant by central battery working, required for the explanations of the principles of central battery working and the descriptions of one short coming of the system. The use of a regulator for the explanations of the purpose of a regulator in a telephone instrument was generally known. Syllabus reference: 6.16/38 The extra services provided by digital exchanges were fairly well known, but in some cases marks were lost through lack of detail.

Syllabus reference: 4.12, 6.13 The difficulties for demultiplexing in TDM centre around the problem of synchronisation was a misread question. Few provided correct details to show that the PSTN is an example of a circuit-switched network.
Section 3 – recommendations
Candidates should be fully prepared for the examination and should spend some time at the beginning of the examination reading the question paper carefully to see what each question requires. This would prevent candidates providing information that is not required and that secures them no marks.