Examination report – December 2010 series

Paper no 2730 – 013 Fundamentals of Electronic Communication 3

Section 1 – Areas of good performance (question no/syllabus topic or reference)
Syllabus sections: 2.12, 2.13, 2.5 - Something of a mixed response to all parts of this question. The needed diagrams ranged from excellent to atrocious.
Section 2 – Areas for development (question no/syllabus topic or reference)
Syllabus section: 1.2 - No candidate knew the correct definition for the output resistance of a power supply: the ratio of the open–circuit output voltage to the short-circuit output current. Syllabus section: 1.6 - Was poorly done, few candidates actually describing the operation of the IC. Syllabus sections: 3.21, 3.22 - Surprisingly, few candidates could give three clear benefits for syllabus section 3.22 and accordingly the description for syllabus section 3.21 lacked sufficient detail in the majority of cases. . Syllabus section: 2.5 - Too many candidates could not explain reflection. Syllabus section: 3.14 - While the effect of noise was known, few candidates could describe the effect of bit rate on signal errors. Syllabus section: 5.11 - The relationship is that the sampling must be **at least** twice the highest baseband frequency. Syllabus section: 4.6 - The required formula was well known although too many could not perform the simple calculations required. While most realised that for a constant capacity, signal-to-noise is inversely proportional to bandwidth, none mentioned the non-linearity of this relationship. Syllabus section: 5.7/14 - This question completely threw most candidates. Some managed to calculate the minimum and maximum frequencies of 500Hz and 8kHz respectively and one or two got the sampling frequency of 20kHz. However, many candidates assumed that the sampling frequency was twice the highest baseband frequency instead of the correct frequency of 20kHz, derived from the graph. Hence the frequency spectrum suffered accordingly. Syllabus section: 5.29 - The bits rates and the number of channels were correctly given by many candidates but few realised that the key to the answer for part (c) was synchronisation. Syllabus section: 4.14 - There were six marks available for the explanation for FDM. Hence to secure full marks, I expected six distinct points to be made in the explanation and not just a single sentence which is all that I was offered in many cases. Syllabus section: 6.9 - There were few correct answers regarding the purpose of a regulator in a telephone. Syllabus sections: 6.6, 6.7, 6.8 - This question was entirely about the sidetone in a telephone. Syllabus sections 6.6 and 6.7 generally received correct answers. Few gave the correct diagram for syllabus section 6.8 and even fewer gave anywhere near a correct detailed explanation.

Syllabus section: 6.37 - Space and time switching were badly explained - for example no candidate seemed to realise that time switching requires delays. Hence the explanations as to why both types of switching are needed for PCM signals also was vague and indefinite.
Section 3 - Additional comments
A very poor set of results. Too many candidates were ill–prepared for this examination. Too many candidates lacked the ability to describe or explain when called to do so. In many cases where formulas were known, the mathematical ability to apply them was absent.