Examination report – June 2013 series

2730-013 Fundamentals of electronic communication 3

Section 1 – Areas of good performance
Syllabus reference: 1.4 The explanation of the given regulator circuit has been asked several times in past papers but candidates still fail to give sufficient detail to obtain full marks. Syllabus reference: 1.7 This required a high value potentiometer connected across the zener diode with the variable connection connected to the transistor base instead of the diode. Syllabus reference: 2.2, 2.18 For those candidates who showed preparation for the exam, this question was answered well with a number of candidates securing full marks. Syllabus reference: 3.3, 3.4, 3.5 Most candidates ignored the prologue indicating what was required in the answers. Candidates should have demonstrated how the three parameters amplitude, frequency and phase varied in each of the forms of modulation given. No candidate realised that when frequency is varied, phase is also varied and vice-versa. Thus for example in FM, frequency is varied directly by the modulating signal, phase is varied indirectly and amplitude remains constant. Syllabus reference: 4.8 The essence of the correct response to explaining the benefits of Time Division Multiplexing (TDM) in terms of noise reduction is that TDM is a digital system, hence noise can be reduced by employing regenerators. The replies to explaining the benefits of Time Division Multiplexing (TDM) in terms of cable utilisation costs lacked detail. Most realised that there was a saving in the quantity of cables but none realised that ducting space is also saved.
Section 2 – Areas for development
Syllabus reference: 5.24 This question involved the use of the controls signals in PCM. Even stronger candidates did not secure many marks showing that further teaching in this area is needed. Syllabus reference: 5.21 Few candidates gave a good explanation of non-linear quantisation. Many thought that non-linear quantisation was just another name for quantisation. The benefits of non-linear quantisation are accuracy (or resolution) and improvement in dynamic range. Syllabus reference: 6.29, 6.32 A few candidates provided good diagrams to illustrate SPC with accompanying explanations but the majority had little or no idea of its use in telephone exchanges. Syllabus reference: 6.18, 6.21/24 This syllabus section, focusing on calculations on the parameters of telephony, was poorly answered.

Syllabus reference: 3.19
The response indicated that many candidates had no idea of what asymmetrical working is or the need for it.

Syllabus reference: 2.13
The typical dimensions for optical fibres produced correct answers in many cases.

Syllabus reference: 5.9
Few knew that the recovery of PAM is achieved by a low-pass filter.

Syllabus reference: 4.15
The lack of detail lost marks for most candidates. The essence of the answer is that guard bands are essential in FDM in order to separate the channels on reception by non-ideal filters.

Syllabus reference: 6.15
The responses to the question on numbering schemes varied from excellent to very poor.