Examination report – December 2010 series

Paper no 2730 – 011 Fundamentals of electronic communication 2

Section 1 – Areas of good performance (question no/syllabus topic or reference)
Syllabus section: 1.22, Statistics - Many answers were very good, with method being shown clearly. Syllabus sections: 1.9, 1.12, Plot cumulative frequency curve and determine median - This part was generally well answered from most centres. Unfortunately some candidates had miss read the question and drawn histograms. Syllabus section: 1.4, Number systems - Mainly well answered, the main problem was the question being wrongly copied from the exam paper. Syllabus section: 2.5, Boolean Algebra - Most candidates answered this well. Some incorrectly used a logic gate instead of a switch arrangement. Syllabus sections: 2.18, 2.22, Boolean Algebra - This section was reasonably well answered indicating a good knowledge of De Morgans. Syllabus sections: 2.13, 2.19, Boolean Algebra - Many very good answers to the use of De Morgans. Syllabus section: 2.27, Monostable - Many good waveform sketches but some candidates had misread the question and drawn the monostable circuit and explained its operation. Syllabus section: 2.23, Logic Network - Well answered with some good methods of derivation given. Syllabus section: 3.11, Transmission links - Most answers were correct. Syllabus section: 3.20, Bandwidth - This section was answered reasonably well. Syllabus sections: 3.19, 4.4, Communication Terminology - Generally well answered. Syllabus section: 4.15, Logarithms and Noise - Most centres answered this question well. Syllabus sections: 5.20, 5.24, Decibels - Generally well answered, most common error for candidates that lost marks was not using the dBm formula correctly. Syllabus section: 6.2, Transmission Lines - This section was well answered; most sketches were clear and accurate. Syllabus section: 6.7, Rise time and Sag - Generally well answered, main problem was actually indicating the rise time on the sketch, many indicated the slope and did not refer to the time axis. Syllabus section: 6.25, Characteristic Impedance - Many good answers to this section.

Syllabus section: 7.1, Filters - Majority of answers were good, main problem was labelling of the y axis. It is possible to use gain or attenuation on this axis but they must be labelled as the responses are opposite. Both responses were used by different centres and labels were missing in some cases.

Syllabus sections: 7.3, 7.4, Filters - Most answered these sections well.

Syllabus section: 7.7, LCR Circuits - Many good answers.

Syllabus sections: 8.12, 8.19, Amplitude Modulation - Some very good answers.

Section 2 – Areas for development (question no/syllabus topic or reference)
Syllabus sections: 1.18, 1.19, Number Systems - This gave numerous problems. Some candidates were able to complete part i) but many incorrectly converted to binary. Parts ii) and iii) were attempted in most cases by splitting the binary or BCD conversion from part i) into groups of four for hexadecimal and groups of three for octal. Syllabus section: 1.1, Number systems - The fraction caused many problems in this question. Various incorrect methods were used to remove the fraction. Some candidates tried multiplying all the numbers. This was very surprising as it seemed that there was a lack of knowledge of fractions. Syllabus section: 1.10, Number systems - Even though there were a large amount of correct answers many candidates struggled with this question. Some converted the numbers to decimal first, then to binary, which is a long method open to error, others ignored the suffix for octal and used a decimal number. Syllabus sections: 2.13, 2.19, Boolean Algebra - This part which involved constructing truth tables gave many problems with the structure of truth tables lacking method and order. Syllabus section: 3.1, Meaning of ‘conditioning’ - This question caused some problems, answers relating to maintenance of equipment and transmission lines were prevalent. Syllabus section: 4.13, Amplifier Calculation - This question caused some problems mainly due to the lack of understanding of the Noise Figure formula. Syllabus sections: 5.20, 5.24, dBm - This section caused problems with most candidates relating the answer to dB. This could possibly be due to not reading the question carefully. Syllabus section: 6.3, Transmission Line - There were mixed responses to this section some were good but many quoted all the coefficients. At audio frequency only Resistance and Capacitance should be considered. Syllabus sections: 7.3, 7.4, Filter - This section caused problems in most cases. The relationship between dB and ratio caused confusion many could not see that the output should have decreased. Syllabus section: 8.5, Amplitude Modulation - Scaling was an issue with this question; many did not label the axes. Many calculated the correct scale but did not answer the actual question by sketching the waveform. Syllabus section: 8.1, Modulation - Most candidates explained what modulation ‘is’, not ‘the need’ for modulation. Syllabus section: 8.25, F M Modulation - Many described the operation of the discriminator not its purpose.

Section 3 – Recommendations (these should relate to the points made under section 2).
Candidates are advised to revise thoroughly their numbering systems as marks were lost too easily for relatively straightforward tasks, syllabus sections 1.9, 1.12 and 1.4, 1.1 and 1.10. Questions should be read carefully, it must be understood that no marks can be allocated to answers which are in the correct topic area but do not give the required answer. An example is the modulation question, syllabus section 8.1, in which the question asks for an explanation of the need for modulation not what it is. Syllabus sections 5.20 and 5.24 are other potential examples. Candidates should always check to make sure that graph axes are suitably labelled. An example of this is syllabus section 8.5 where the shape of the filter response is dependent on the label on the y axis. No label means the answer is wrong. This question also required indication of the 3dB points, which meant a scale was necessary in particular indication of the 0db level so that the 3dB point is suitably positioned The presentation of graphs and sketches in most cases is good, however this is not so in all cases. Candidates should ensure they have reasonable drawing equipment and practice their graphical communication skills.