Examination report – December 2013 series

2730-011 Fundamentals of electronic communication 2

Section 1 – Areas of good performance
Syllabus reference: 1.18 and 1.19 - Plot cumulative frequency curve and determine median. This part was generally well answered from most centres. Syllabus reference: 2.9 - Logic diagram. Many excellent answers. Syllabus reference: 2.22 - Logic diagram. Many good answers. Syllabus reference: 2.28 - Bistable device. Majority of candidates gave an application for the device. Syllabus reference: 2.14, 2.18, 2.9 - Logic system. This part was reasonably answered in most cases. Syllabus reference: 5.11 - Logarithms. Mainly well answered although some candidates incorrectly attempted solutions without using logarithms. Syllabus reference: 5.24 - Amplification. Many good answers to this section. Syllabus reference: 4.9, 4.10. 4.15 - Noise. Majority of answers were very good, but powers still give problems in this type of calculation. Syllabus reference: 3.4/3.6, 3.22 – Attenuation. Majority answered this part correctly. Syllabus reference: 3.9 – Interference. Many good answers to this section. Syllabus reference: 3.11 - Communication Links. Many good attempts to this part. Syllabus reference: 3.15 - Frequency Ranges. Most candidates had a good knowledge of the ranges involved. Syllabus reference: 6.23 - Travelling and Standing Waves. Some good attempts at this section. Syllabus reference: 6.13, 6.17 - Loss free transmission line. Many correct answers but some candidates did not draw the loss free line. Syllabus reference: 6.13, 6.17 - Characteristic Impedance. Many good answers to this section. Syllabus reference: 7.1 - High Pass Filter. Many correct answers, however some candidates omitted the labelling of the frequency response characteristic.

Syllabus reference: 7.7 - Parallel LC circuit.
Majority of answers were good. Some had difficulty with prefixes on component values.

Syllabus reference: 8.4, 8.7, 8.11 - Amplitude Modulation.
This section was reasonably well answered in most cases. Surprisingly the part that caused most problems was defining modulation depth, where candidates related the answer to a frequency modulated system.

Syllabus reference: 8.14, 8.23, 8.24 - Single Sideband System.
Some very good answers.

Section 2 – Areas for development

Syllabus reference: 1.21 - Statistics.
Many candidates were unable to define ‘variance’ or ‘standard deviation’. Many confused standard deviation with frequency deviation.

Syllabus reference: 1.4, 1.7 - Number systems.
Many correct answers but no working shown. If candidates answer the question using a calculator the calculator keys used should be correctly listed. Unfortunately this was not the case.

Syllabus reference: 1.1 - Number Systems.
This gave numerous problems. Not many candidates could calculate the decimal fraction.

Syllabus reference: 1.10, 1.11 - Number systems.
Many correct answers but no working shown.

Syllabus reference: 2.13
Some candidates answered this section really well, however many candidates had difficulty in drawing the truth table from the arrangement given.

Syllabus reference: 2.10, 2.26 - Bistable Device.
Most candidates had difficulty with this section. Explanations of the operation were vague, symbol diagrams were poor.

Syllabus reference: 5.24 - Attenuation.
Even though this section had some good answers, problems arose for many candidates because they omitted the minus sign from the loss value. Many incorrectly used the power gain formula instead of the voltage gain formula.

Syllabus reference: 5.2, 5.12 – Logarithms.
Defining the logarithm caused problems for most candidates.

Syllabus reference: 4.2 – Noise.
Many candidates confused ‘effects’ of noise with ‘sources’ of noise.

Syllabus reference: 3.1 – Conditioning.
Most candidates assumed wrongly that coding was the answer, but the question asked for an explanation of conditioning.

Syllabus reference: 6.8 - Bandwidth and Rise time.
This caused numerous problems due to the fact that the there was lack of knowledge of the relationship.

Syllabus reference: 6.4, 6.13 - Attenuation and Phase-change coefficients.
Many candidates assumed wrongly this question referred to attenuation and phase-change.

Syllabus reference: 7.11, 7.12 - L.C. Oscillator.
This caused numerous problems. Candidates had problems identifying the circuit, answers included, modulator, demodulator and common emitter amplifier.

Section 3 – Recommendations

Syllabus reference: 2.13
Candidates are advised to revise the construction of truth tables from given Boolean expressions.

Syllabus reference: 4.2
Questions should be read carefully. A question asked for the **effects** of noise not the cause of noise in telecommunication systems.

Syllabus reference: 7.1
Candidates should always check to make sure that graph axes are suitably labelled. In one question, the labels were omitted in many cases. Labelling of the Y axis in this type of question is essential as some centres may teach attenuation/frequency and some gain/frequency. Both graphs are acceptable but axes must be labelled as the graphs are different.

Syllabus reference: 4.9, 4.10, 4.15, 7.7
More practice is required on unit prefixes, micro, milli, nano and pico. Marks are lost in calculations questions due to the inability to represent these in a numerical form.

Syllabus reference: 1.4, 1.7
Methods of calculation (or electronic calculator steps) should be shown in answers. In one question, many candidates just gave an answer. If the answer is wrong then no marks can be awarded, however if a candidate copies the question incorrectly but has the correct method, the marks would be awarded.

Section 4 – Tips

Units are often omitted from the answers to calculations and the importance of these should be emphasised

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.