Examination report – June2012 series

2730-016 Radio Systems

Section 1 – Areas of good performance
Syllabus reference: 1.12, 1.35, 1.42. Many candidates failed to see that the last two ranges section 1.35 had to be expressed in terms of wavelength. Identification of the appropriate frequency band for the different propagation modes in section 1.42 indicated that candidates, in many cases, were possibly guessing. Syllabus reference: 1.108, 1.109. Many candidates struggled to adequately explain the purpose of a frequency discriminator within section 1.108. Suitable diagrams and accompanying explanation in regard of non-linearity were absent from the answers in section 1.109. Syllabus reference: 1.115, 1.116, 1.118. The descriptions within section 1.115 and 1.116 regarding the principles and properties of mobile telecommunication systems were varied. One essential fact was absent from all descriptions, namely, that the medium has to be radio. Differentiation between the main two groups of mobile networks provided reasonable answers in many cases. Syllabus reference: 1.138. Many candidates struggled to adequately explain cell splitting and sectorisation, with the lack of relevant detail.
Section 2 – Areas for development
Syllabus reference: 1.7, 1.8, 1.78. The necessary detail required for the description of EM radiation in section 1.7, 1.8 was lacking in most cases. Ganged filters in sectionor 1.78 should have alerted candidates that the figure depicted the first stage of a radio receiver. Some candidates thought that the amplifier symbol represented a diode. Syllabus reference: 1.29, 1.32. Section 1.29 required detail in the description differentiating balanced from unbalanced feeders. For section 1.32 there are no lack of matching methods. Syllabus reference: 1.53, 1.74. There were few accurate block diagrams for the frequency-modulated transmitter section 1.53. In section 1.74 few candidates realised that frequency multipliers multiply the frequency deviation as well as the carrier frequency. Syllabus reference: 1.58, 1.59. The key factor around which the explanation required for section 1.58 had to centre is the fact that in DSB the signal information is duplicated in the sidebands. Few candidates had a clear idea of how to demodulate SSBSC in section 1.59. Most candidates incorrectly thought that a diode demodulator would suffice. Syllabus reference: 1.101. The majority of candidates had struggled with the purpose of a.g.c. Few candidates could adequately describe how it is implemented, which was the requirement for 1.101.

Syllabus reference: 1.16, 1.156. The majority of candidates managed some response for section 1.16 which dealt with the weather conditions that affect satellite communication. The response to top capacitance in section 1.156 was generally good.
Section 3 – Recommendations
• Candidates must read questions carefully.