City & Guilds

**Examination report – December 2011 series**

Paper no 2730-023 Advanced Radio Systems

| Section 1 – Areas of good performance (question no/syllabus topic or reference). |
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| Question 2: Part (a): Too many candidates were far from clear as to the meaning of the terms *radiation resistance* and *free space loss*. The simple calculation for part (b) was generally done well.<br><br>Question 7: While some candidates were not too clear as to the reason for power control in WCDMA systems, both parts of the question secured good marks for many candidates.<br><br>Question 9: The explanations of the parameters for parts (a) and (b) were generally acceptable, but the calculations for part (c) provided correct answers in only a few cases. |

| Section 2 – Areas for development (question no/syllabus topic or reference) |
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| Question 1:This question is a good example of careless reading. I wanted to know how reflection, diffraction and scattering affected radio waves **within** a building, not just generally. Few candidates spoke of how physical features such as object size and surface texture affected radio waves and few made mention of the wavelength itself.<br><br>Question 3: Most candidates failed to realise why bias is important in radio transmitters: The financial cost of radio transmission is determined by the output power, that power in turn is determined by the efficiency of the amplifying stages which itself is determined by the class of bias. Hence high–efficiency class C bias is used wherever possible.<br><br>Question 4: Part (a) showed that the various blocks in the FM receiver were not too well known. The explanations for part (b) lacked detail. Candidates should realise that the limiter is to remove amplitude variations that the following discriminator would respond to creating distortion in the output.<br><br>Question 5: Part (a): Although noise factor is a simple measure of the deterioration of signal–to–noise by a unit in a system, not many candidates appear to have grasped this fact. Only a handful of candidates managed to calculate the correct answer of 1.25 in part (b). The response to part (c) lacked information in many cases.<br><br>Question 6: The concept of circuit grooming was not too well known and I do not recall any reference to backhaul, the most expensive component of the RAN.<br><br>Question 8: Part (a): A good number of candidates could not define spreading factor and could not differentiate between that parameter and processing gain. Again, the values of spreading factor, required for part (b) were also often unknown. The essence of the answer for part (c) is that orthogonal codes demand synchronisation.<br><br>Question 10: Only the odd candidate here are there could explain the meaning of the term *equivalent noise temperature* for part (a). The G/T ratio fared better in part (b), but the calculations for part (c) rarely produced the correct answers. |