

Report on multiple-choice Question Paper

Paper: **7650-010 Radio Amateurs' Examination**

Examination date: **1 December 2003**

Syllabus Topic or Objective	Number of items	Comments on performance of candidates
1 Licensing conditions	18	<p>Questions on the Licence were very well answered by most of the candidates. The only question requiring specific comment was one on the entries required in the Log. Several candidates thought that it was necessary to enter the exact frequency. While this may be regarded as good practice, it is not a Licence requirement.</p>
2 Operating procedures and practices	7	<p>All the questions in this section were very well answered by most of the candidates.</p>
3 Electronic principles and practice	6	<p>26% of the candidates thought that a series tuned circuit presented a maximum, rather than a minimum impedance at resonance.</p> <p>A question that required a calculation of the primary current in a transformer caused difficulty for 46% of the candidates, most of whom did not calculate the current correctly, given the power and voltage.</p> <p>Only 30% of the more able candidates answered correctly a question which required a calculation of the power dissipated in a transistor through which a current of 5mA was flowing. Most of the candidates did not take into consideration resistors totalling 1200Ω, which effectively reduced the voltage across the transistor from 12V to 6V.</p> <p>A question on the definition of the peak inverse voltage of a diode was not well answered by 58% of the candidates.</p>
4 Receivers, transmitters and transceivers	8	<p>All the questions on receivers, transmitters and transceivers were well answered by nearly all of the candidates.</p>
5 Transmitter interference	14	<p>Three questions require comment, all the others being well answered.</p> <p>34% of the candidates thought that the reason for avoiding excessive sidebands was to prevent over modulation, rather than to make the most efficient use of the r.f. spectrum.</p> <p>A question that required candidates to identify an r.f. filter in the input circuit of an amplifier was answered correctly by 50% of the candidates. 27% of the candidates thought that its purpose was to match a crystal microphone to the amplifier.</p> <p>Some candidates continue to misunderstand why the frequency of an incoming signal cannot be measured merely by coupling a digital frequency meter to the receiver antenna. This illustrates an urgent need for the frequency measurement of incoming signals to be demonstrated in practical courses.</p>

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6 Electromagnetic compatibility	14	<p>In a question on interference to an audio system, one third of the candidates chose to place ferrite ring filters close to the speaker, rather than as close as possible to the audio unit.</p> <p>On the purpose of an a.t.u., 68% of the candidates did not appreciate that its main function was to present a resistive load to the transmitter.</p>
7 Propagation and antennas	7	<p>27% of the candidates thought that a vertically polarised radio wave would have a vertical magnetic component. There was evidently some confusion between the electric and magnetic components.</p> <p>In a question about the maximum radiation from an antenna, 29% of candidates thought that it would be from the point of maximum voltage rather than from the portion where maximum current flows.</p>
8 Measurements	6	<p>All the questions on measurements were very well answered by most of the candidates.</p>
General comments on the paper		<p>Compared with recent papers, the December 2003 examination was not an easy one. It was moderated to determine an accurate and appropriate pass mark.</p> <p>There was a total of 648 entries for this examination. These included overseas entries from Hong Kong (68), Malta (5), and Trinidad and Tobago (44). This report was prepared from a detailed item analysis of the results of 471 candidates whose answer papers were available at the time of writing. Of the 471 candidates, 404 (85.8%) of them were successful.</p> <p>It is evident from the results that many candidates doubled their efforts to obtain a success in this final Radio Amateurs' Examination offered by City and Guilds and hence receive the equivalent to an NVQ Level II award. Future examinations for the Amateur Licence are being arranged by the Radio Society of Great Britain on behalf of Ofcom.</p> <p>City and Guilds wishes to thank all radio amateurs and others who have assisted and cooperated in the administration of the Radio Amateurs' Examination since its introduction in May 1946. Their valuable help is acknowledged and greatly appreciated.</p>