City and Guilds of London Institute

DEPARTMENT OF TECHNOLOGY

1952

55. — RADIO AMATEURS' EXAMINATION

Friday, May 2nd, 7 to 10 p.m.

Candidates should attempt as many questions as possible. Use should be made of diagrams where applicable. The maximum possible marks obtainable is affixed to each question.

1. What precautions are taken in a radio transmitter to prevent interference from (a) harmonics, (b) key clicks, (c) overmodulation ?

(15 marks)

2. Describe how a crystal of known frequency can be used to determine the frequency of a transmitter. Using a crystal having a resonant frequency of 100 kc/s, how would you determine the frequency of a transmission in the 14 Mc/s band ?

(15 marks)

3. (a) Why is a detector necessary to obtain audio-frequency signals from an amplitude-modulated radio-telephony transmission ? (b) Describe one form of valve detector circuit, illustrating your answer with a diagram.

(15 marks)

4. (a) What is meant by the resonance of a tuned circuit ? (b) If the effective series inductance and capacitance of a vertical aerial are 20 microhenrys and 100 picofarads respectively and the aerial is connected to a coil of 80 microhenrys inductance, what is the approximate resonant frequency ?

.   *(15 marks)*

5. State the conditions necessary to meet the requirements of the Post Office Licence for (a) Inspection of Station, (b) Procedure to be followed in the use of call signs when making and answering calls.

(10 marks)

6. A communications-type receiver is found to cause interference locally to both (a) reception on 14.465 Mc/s, (b) reception of the London television programmes (41.5 Mc/s sound carrier frequency; 45.0 Mc/s vision carrier frequency). Explain how the interference can be caused in each case and how it could be eliminated.

(10 marks)

7. What are "standing waves" in a feeder system connecting a transmitter to an aerial and why are they undesirable ? How can they be detected and minimised ?

(10 marks)

8. Explain the meaning of the following terms applied to a radio receiver : (a) selectivity, (b) sensitivity.

(20 marks)