**55/1 (Nov.)**

# City and Guilds of London Institute

## 1962-3

## 55.—RADIO AMATEURS' EXAMINATION

***Thursday, November 8th, 1962, 6.30 to 9.30 p.m.***

**EIGHT questions in all are to be attempted, as under :**

**Both questions in Part I (which are compulsory) and SIX others from Part II.**

**Failure in either part will carry with it failure in the examination as a whole.**

**Mathematical tables are supplied : they must be given up at the close of the examination. Slide rules may be used.**

### PART I

*Both questions must be attempted in the part*

1. (a) What is meant by :
(i) the main address;
(ii) the temporary alternative address or location;
and (iii) the alternative address
of an amateur station ?

(b) What are the special conditions which the licensee must observe if he wishes to operate the station from (ii) or (iii) above ?

(c) When and by whom may the station be inspected to ensure that the licence conditions are being observed ?

(d) What is meant by the expression 'Wireless Telegraphy' when it is used in relation to the Amateur (Sound) Licence ?

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2. (a) Describe an oscillator circuit suitable for use in an amateur radio transmitter and explain features of its design which ensure frequency stability.

(b) Describe a method of accurately checking the frequency of a transmitter.

## PART II

SIX *questions only to be attempted in this part*

3. With the aid of a circuit diagram explain the action of a typical superheterodyne detector/a.g.c. stage.

4. Two equal resistors are joined in parallel and connected to a battery having an e.m.f. of 12 volts and 2 ohms internal resistance. The current taken from the battery is one milliampere. What is the value of each resistor ?

5. Describe the construction of a small receiver type r.f. pentode valve. Explain the function of each electrode. What is meant by the *amplification factor* of a valve ?

6. With the aid of a circuit diagram describe a simple tuned radio frequency receiver. Explain the function of each stage.

7. (a) What is meant by the Q-factor of a coil in a tuned circuit ?

(b) What is the Q-factor of a coil having an inductance of 10 microhenrys and 10 ohms resistance at a frequency of 2 Mc/s ?

8. (a) Describe either (i) a directional aerial for transmission on 28 Mc/s, or (ii) one for reception on 2 Mc/s.

(b) Explain the directional properties.

9. Describe, with a block diagram, an amplitude modulated telephony transmitter. Explain, with the aid of a diagram, the method of modulation used.

10. Describe the construction and action of ONE of the following :

(a) a magnetic relay

(b) a pair of headphones

or (c) a microphone.