

City and Guilds of London Institute

1962

55.—RADIO AMATEURS' EXAMINATION

Friday, May 11th, 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 this part

1. (a) What conditions are imposed on the licensee of an Amateur (Sound) Radio station as regards aerials and masts in relation to:
 - (i) aerodromes,
 - and (ii) overhead power lines?
 - (b) For how long does an Amateur (Sound) Licence remain in force after issue, and what must the licensee do to renew it?
 - (c) In what circumstances can the Post Office be expected to demand the closing down of an amateur transmitting station?
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2. Describe three safeguards which can be incorporated in an amateur radio transmitter to ensure that the radiation of harmonics is kept to a minimum.

Radio Amateurs' Examination

PART II

SIX questions only to be attempted in this part

3. Describe and explain the action of a quartz crystal controlled oscillator.
4. Describe and explain the action of the frequency-changer stage of a superheterodyne receiver.
5. Describe the construction of a two-gang variable capacitor suitable for use in a superheterodyne receiver. State typical values for the capacitor you have described.
6. What is an *alternating current of sine waveform*? What is meant by voltage and current being *out of phase* and what factors in an a.c. circuit would cause the current to (a) lead, and (b) lag on the voltage?
7. Three resistances having values of 10 ohms, 20 ohms and 40 ohms respectively are joined (a) in series and (b) in parallel. What is the total resistance in each case and what current would flow if the combinations were connected to a source of d.c. having an e.m.f. of 10 volts and negligible internal resistance?
8. With the aid of diagrams explain the effects of the ionospheric layers on signals radiated in (a) the 1.8 Mc/s band, and (b) the 14 Mc/s band.
9. Describe a frequency meter having crystal check points.
10. What is meant by standing waves on an aerial feeder? How may they be detected and what can be done to reduce them?