City and Guilds of London Institute

DEPARTMENT OF TECHNOLOGY

1955

55.—RADIO AMATEURS' EXAMINATION

Friday, May 6th, 6.30 to 9.30 p.m.

***Eight** questions in all are to be attempted, as under :*
***All four** in Part 1 (which carry higher marks) and **four** others from Part 2.*

Part 1

All four questions to be attempted from this Part

1. State the conditions laid down by H.M. Postmaster-General in respect of the licensing requirements for
(*a*) Frequency control and measurement,
(*b*) Non-interference,
(*c*) Receiver. (*15 marks.*)

2. Compare the advantages and disadvantages of absorption and heterodyne frequency meters and state under what conditions each type is used. (*15 marks.*)

3. State what precautions should be taken in a radio transmitter to avoid :
(*a*) Harmonics,
(*b*) Spurious oscillations,
(*c*) Key clicks and thumps. (*15 marks.*)

4. (*a*) Describe, with the aid of a diagram, the circuit of a full-wave rectifier, with smoothing, to provide the high tension d.c. supply for a transmitter.
(*b*) Show how the output voltage is affected by the insertion of a smoothing circuit. (*15 marks.*)

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Part 2

Four questions only to be attempted from this Part

5. Explain the meaning of
(*a*) self inductance
(*b*) mutual inductance.
Define the unit of inductance. (*10 marks.*)

6. Give the circuit diagram and state the functions of the stages of a three-valve tuned-radio-frequency receiver suitable for telephony reception on the lower frequency amateur bands. (*10 marks.*)

7. If the effective series inductance and capacitance of an aerial is 70 microhenrys and 100 picofarads respectively and an inductor of 30 microhenrys is connected in series with the aerial, what is the resonant frequency? (*10 marks.*)

8. Explain the following terms in relation to alternating current :—
(*a*) peak value,
(*b*) effective (r.m.s.) value,
(*c*) instantaneous value. (*10 marks.*)

9. Describe, with the aid of a diagram, tuned and untuned aerial feeders and state their relative advantages and disadvantages. (*10 marks.*)

10. Describe the construction of any receiving or transmitting multi-grid valve, stating the function of each electrode. (*10 marks.*)