

City and Guilds of London Institute

DEPARTMENT OF TECHNOLOGY

1948

55. — RADIO AMATEURS' EXAMINATION

Friday, May 7th, 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. How is a low-power transmitter likely to interfere with broadcast reception ?
What steps would you take to prevent such interference ? *(15 marks)*

2. What steps should be taken by the holder of an amateur transmitting licence to ensure full compliance with the requirement that a full record should be kept of all transmissions ? *(15 marks)*

3. Give a brief description of a suitable receiver for the 58.5 to 60 Mc/s. frequency band, and explain how it works. *(15 marks)*

4. How is the input power to the last stage of a transmitter measured ? What is understood by the "efficiency of operation" of this stage and how is this connected with the permissible anode dissipation ? *(15 marks)*

[SEE OVER]

5. Describe briefly how the ionosphere influences the propagation of radio waves, and how propagation differs between the 1.7 to 2.0 Mc/s. band and the 58.5 to 60 Mc/s. band. *(10 marks)*

6. What advantage is gained from using a piezo-electric crystal oscillator in a radio transmitter? Give a diagram of a crystal controlled stage for a short-wave transmitter. *(10 marks)*

7. Describe a transmitting aerial suitable for one of the amateur bands, indicating the main features of the design and any directional properties. Illustrate your answer with a diagram. *(10 marks)*

8. What is the effect of connecting two capacitors (a) in series, and (b) in parallel?

What is the total effective capacitance when four capacitors, each of $100\mu\mu\text{F}$ are connected in a series-parallel arrangement consisting of two parallel paths, each of which contains two capacitors in series? *(10 marks)*