City and Guilds of London Institute

DEPARTMENT OF TECHNOLOGY

1951

55. — RADIO AMATEURS' EXAMINATION

Friday, May 4th, 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. Give a circuit diagram of a three valve tuned radio frequency receiver for the reception of radio-telegraphy on the 1.8 and 3.5 Mc/s. amateur bands. State the functions of each stage. *(15 marks)*

2. Describe the construction of a three-electrode valve and explain the functions of the various electrodes. Illustrate your answer with a typical characteristic curve. *(15 marks)*

3. With the aid of a diagram, describe a variable frequency oscillator suitable for the frequency control of a low power transmitter. What steps are taken in the design to ensure stability of operation ? *(15 marks)*

4. How would you devise a station log to comply with the Post Office regulations ? Set out headings and show how you would enter :–

(a) an unanswered CQ call,

(b) a two-way communication with another station.

(15 marks)

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5. What steps should be taken with a receiving aerial to ensure maximum signal strength, with minimum interference from nearby electrical appliances ?

(10 marks)

6. Describe a simple type of absorption wavemeter and say how it is used to check the frequency of a radio-frequency valve oscillator. *(10 marks)*

7. What is the standing bias voltage produced by a cathode bias resistor of 1000 ohms, where the characteristics of the valve are such that the anode current is 5 mA, and the screen current is 1 mA ? What is the wattage dissipated by the resistor ? *(10 marks)*

8. What are the principal causes of loss of energy in the tank circuit of an amateur transmitter ? What steps can be taken to minimise these losses ?

(10 marks)