



GENERAL POST OFFICE,  
RADIO AND ACCOMMODATION DEPARTMENT,  
HEADQUARTERS BUILDING, ST. MARTIN'S-LE-GRAND,  
LONDON, E.C. 1.

**1959**

**RADIO AMATEURS' EXAMINATION**

**Saturday, 3rd October, 1959 2.30 p.m. to 5.30 p.m.**

**Part 1**

*Both questions in this part MUST be answered.*

1. (a) What are the conditions under which recorded messages may be retransmitted ?
- (b) What are the Licence requirements for the receiver at an amateur transmitting station ?
- (c) What are the conditions under which an amateur transmitting station may be operated by persons other than the licensee ?
- (d) Who may inspect an amateur transmitting station ?
- (e) What records shall be kept in the log of an amateur transmitting station ?

*(15 marks)*

2. With the aid of diagrams explain the precautions that are taken in the construction of a transmitter for use at an amateur station in order to minimize the radiation of harmonics.

*(15 marks)*

**Part 2**

*Answer SIX of the eight questions in this Part.*

3. Describe the construction of an aerial and its associated feeder for use on the 3.5 Mc/s band. Explain its action.

*(10 marks)*

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4. A battery of cells, whose e.m.f. is 12 volts on open circuit, has a potential difference of 9 volts between its terminals when it is connected to a resistor of 24 ohms. Calculate the value of the current flowing in the resistor. Why does the terminal p.d. of the battery fall when current is being taken from it ?

*(10 marks)*

5. Explain the superheterodyne principle of reception.

*(10 marks)*

6. Describe, with the aid of diagrams, a method of keying a telegraphy transmitter. Why is it not advisable to key the oscillator stage ?

*(10 marks)*

7. Describe the construction and action of a meter suitable for measuring radio frequency currents at frequencies between 2 and 10 Mc/s.

*(10 marks)*

8. Draw a diagram of a low-power amplifier using a pentode valve. Indicate the values of the chief components. What value of cathode bias resistor would be required if the anode current is to be 12 mA, screen current 3 mA and grid bias 5 volts ? What would be a safe wattage rating for the resistor ?

*(10 marks)*

9. What is meant by "an alternating current of sine waveform" ? What is the effect of (a) inductance, and (b) capacitance in which an alternating current is flowing ?

*(10 marks)*

10. Explain how the anode volt/anode current and grid volts/anode current curves of a thermionic valve are plotted.

How are the mutual conductance, anode resistance and amplification factor of a valve calculated ?

*(10 marks)*