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

1957

RADIO AMATEURS' EXAMINATION

Saturday, 5th October, 1957 2.30 p.m. to 5.30 p.m.

Part 1

All four questions to be attempted from this Part.

1. Licence Conditions.

(a) State what kinds of transmission are prohibited,

(b) State the requirements in respect of the use of crystals for frequency control and/or measurement. When should the transmitter frequency be checked ?

(c) Say what precautions you would observe when operating within the following bands and why : 7–7.3 Mc/s, 144–144.5 Mc/s and 1.8–2.0 Mc/s.

(15 marks)

2. Draw a diagram of a simple valve oscillator incorporating inductive anode-grid feedback, with provision for microphone modulation. Explain its action and say what modification would be advisable for actual operation.

(15 marks)

3. What is meant by "over modulation" and "harmonics" ? Describe how these could arise and how they may be minimized in practice.

(15 marks)

4. Describe a satisfactory method of ensuring frequency stability in a transmitter. Sketch and describe a wavemeter which would be capable of verifying that your transmitter is operating within the required tolerance.

(15 marks)

[SEE OVER]

Part 2

Four questions only to be attempted from this Part.

5. Sketch and describe the construction of an electrolytic capacitor. Why should this type not be used on a.c. supplies ?

What factors determine the capacity of a capacitor ?

(10 marks)

6. (a) Calculate the reactance of a coil of two Henrys inductance at the frequencies of $100/\pi$ c/s and $100/\pi$ kc/s.

(b) How would the reactance be affected in each case if the resistance of the coil is 300 ohms ?

(10 marks)

7. Describe the propagation of radio waves of *Medium* and *High* frequency. Say why reception may vary with the time of day and night over a given distance.

(10 marks)

8. Draw a circuit diagram incorporating a double-diode-triode valve and explain its action fully.

(10 marks)

9. Differentiate between the mixer stage and the b.f.o. stage of a superheterodyne receiver by describing how each stage functions.

(10 marks)

10. Describe the construction of a simple directional transmitting aerial for transmitting in the 70 Mc/s band and show by sketches and component values how such an aerial should be matched to the transmitter output stage.

(10 marks)