City and Guilds of London Institute

1962-3

Radio Amateurs' Examination

Friday, November 1st, 1963, 6.30 to 9.30 p.m.

EIGHT questions in all are to be attempted, as under:

Both questions in Part I (which are compulsory) and SIX others from Part II.

Failure in either part will carry with it failure in the examination as a whole.

Mathematical tables are supplied: they must be given up at the close of the examination. Slide rules may be used.

PART I

Both questions must be attempted in this part

1. What conditions are laid down in the amateur (Sound) licence regarding the class, frequency and power of emission from an amateur radio station?

   In what circumstances and under what conditions may messages be recorded and retransmitted by an amateur radio station?

   How must the station be identified as to location when it is being used at a temporary alternative address? (15 *marks*)

2. Explain what is meant by parasitic oscillations in the power amplifier stage of a transmitter. Describe, with the aid of diagrams, how such spurious oscillations can be suppressed. (15 *marks*)

PART II

Answer SIX *questions from this part*

3. Describe, with the aid of a circuit diagram, an efficient method of keying a c.w. transmitter. (10 *marks*)

4. Three capacitors of 200 picofarads, 500 picofarads and 300 picofarads respectively are connected in parallel. What is the total capacitance?

   What r.m.s. current would flow in the circuit if an e.m.f. of 10 V r.m.s. at 1 Mc/s is applied to the combination? (10 *marks*)

5. What is meant by:

   (*a*) a TRF receiver

   and (*b*) a superheterodyne receiver?

   What are the relative advantages and disadvantages of each type? (10 *marks*)

6. Describe a unit suitable for coupling an amateur radio transmitter to an aerial. Explain its purpose and operation. (10 *marks*)

7. What are the main causes of signal fading on the h.f. amateur bands? (10 *marks*)

8. Explain what is meant by the terms *Wavelength, Frequency, Velocity, Critical Frequency, Maximum Usuable Frequency* and *Skip Distance* as applied to the transmission of radio waves. (10 *marks*)

9. With the aid of a circuit diagram and valve characteristic curves, explain the operation of a resistance-capacitance-coupled amplifier. (10 *marks*)

10. With the aid of a diagram describe and explain the operation of a power pack supplying the following voltages for use in a transmitter:

    L.T.—6·3 volts a.c.

    H.T.—200 volts d.c., stabilised

    H.T.—500 volts d.c. (10 *marks*)