CITY AND GUILDS OF LONDON INSTITUTE

PAPER NUMBER	EXAMINATION	
765–1–01/02	RADIO AMATEURS	Monday 6 December 1976
SERIES DECEMBER 1976	PAPER WRITTEN	6.30 to 9.30 pm 3 hours

YOU SHOULD HAVE THE FOLLOWING FOR THIS EXAMINATION

one answer book

'Castle's Logs'

This examination is divided into two parts; failure in either part will carry with it failure in the examination as a whole.

Each question in Part I carries 15 marks; each question in Part II carries 10 marks.

Answer EIGHT of the following ten questions as follows: BOTH questions in Part I and SIX questions from Part II.

PART I – Answer BOTH questions in this part. Each question in this part carries 15 marks.

1. (a) State FOUR types of transmitting licence available to radio amateurs.
   (b) In the case of the Amateur (Sound) Licence A what is meant by EACH of the following
   (i) the main address
   (ii) temporary premises
   (iii) temporary location
   (iv) alternative premises?
   (c) What persons may operate an amateur station?

2. (a) Draw the circuit diagram of a variable frequency oscillator suitable for use in an amateur radio transmitter.
   (b) Describe carefully the steps that should be taken to ensure satisfactory frequency stability.

PART II – Answer ANY SIX questions from this part. Each question in this part carries 10 marks.

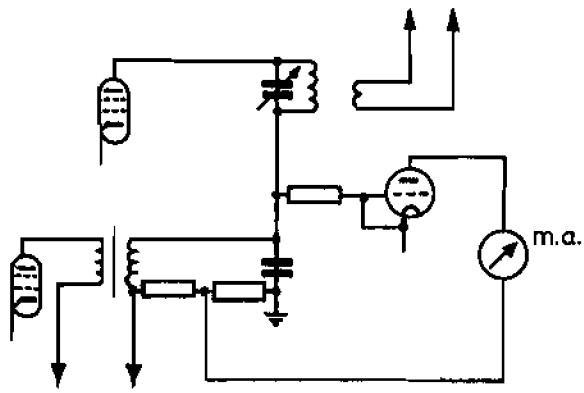
3. (a) (i) State Ohm's Law.
   (ii) Define the units of current, e.m.f. and resistance.
   (b) What total power would be dissipated by two resistors of 50 ohms each, connected in parallel and having a p.d. of 10 volts between their ends?

4. (a) What is meant by impedance in an a.c. circuit?
   (b) A choke of 2 Henry inductance and 100 Ohms resistance is connected to
   (i) a source of d.c. at 10 V
   (ii) a source of a.c. at 10 V r.m.s. 50 Hz.
   What current will flow in EACH case?

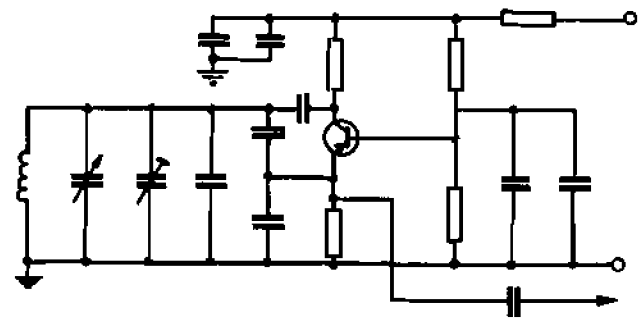
5. (a) Draw the circuit diagram of a voltage stabilising circuit suitable for use in the power supply of an amateur radio transmitter.
   (b) Describe its action.

See next page

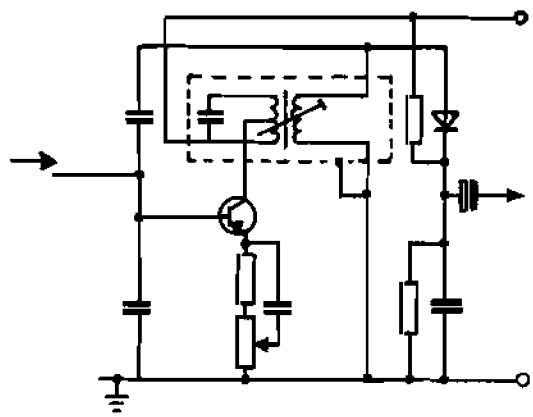
6. Refer to Figs. 1 (a), (b) and (c).
Name ONE of the circuits shown and explain its action. State ONE application of such a circuit in amateur radiocommunications.



(a)



(b)



(c)

FIG. 1

7. (a) Explain briefly what is meant by the term 'frequency modulated transmission' and state ONE advantage of its use over amplitude modulation.
(b) What bandwidth is required for a speech quality frequency modulated signal and what is meant by the term 'deviation' in relation to a frequency modulated transmission?

8. Describe TWO causes of fading of high frequency radio waves.

9. Describe a directional aerial system for the 14 MHz band and explain how the directional effect is achieved.

10. (a) Describe with the aid of a circuit diagram the power output stage of a typical amateur radio transmitter, including all necessary meters.
(b) Explain how the power input of the stage is measured.