THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

083   ELECTRONIC & RADIO REPAIR

TIME: 3 hours   22 January 1999 P.M.

Instructions

This paper consists of sections A and B.
There are seven (7) questions in section A and five (5) questions in section B.
Attempt **six** questions from A and **four** questions from B

SECTION A

Attempt six questions from this section

1. Figure 1. shows the aerial circuit of a radio receiver. Study it and then answer the following questions:

(a) What will the resistance between A and chassis be when switch S1 is switched to
   (i) Position M   **(2 marks)**
   (ii) Position L?   **(2 marks)**

(b) If the resistance was infinity when set to position L, and did not alter when coil L3 was short circuited, but measured one ohm when it was set to position M, what would you suspect as being wrong? **(2 marks)**

(c) If the resistance was zero ohms in the two positions of switch S1, what would you suspect as being wrong? **(2 marks)**

(d) If the resistance was zero ohms when S1 was set to Position L, but read one ohm when set to position M, what would you suspect as being wrong? **(2 marks)**
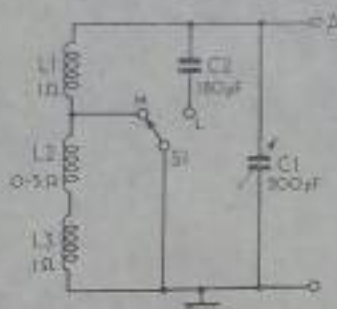

Fig.1

2. (a) Define the term shunt resistance in connection with measuring instruments.
                      (4 marks)

(b) A moving coil galvanometer has 10 ohms resistance. It is rated to measure 100mV and 10mA full scale deflection. This galvanometer is to be used as a voltmeter to measure 10 volts full scale deflection. Calculate the value of multiplier resistance required. **(6 marks)**

3. (a) Explain briefly the meaning of the term halfwave rectifier.
                      (3 marks)

(b) Draw a neat and labelled circuit diagram of the bridge rectifier.
                      (5 marks)

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(c) Supposing the input Voltage to the bridge rectifier is sinusoidal, show the waveform of the rectifier output. **(2 marks)**

4. (a) Define the term sidebands. **(3 marks)**

(b) A 500 kHz carrier wave is amplitude modulated by a baseband audio signal ranging from 0Hz to 5000Hz. Using a diagram show the following:

(i) the extend of lower and upper sidebands **(5 marks)**
(ii) the band width of the modulated wave. **(2 marks)**

5. (a) Two resistors R1 and R2 are connected in parallel. The two resistors are colour coded as follows:-

	First ring	Second ring	Third ring
Resistor R1	Brown	Green	Red
Resistor R2	Brown	Black	Red

Calculate the total resistance. **(6 marks)**

(b) Suppose the total resistance is connected across a power supply of 60 volts.
Calculate (i) total circuit current **(2 marks)**
(ii) power dissipated in resistor R2 **(2 marks)**

6. Figure 2 is a circuit of an audio frequency amplifier. Explain briefly the functions of the following components:

a) Resistor R1 **(2 marks)**
b) Resistor R2 **(2 marks)**
c) Resistor R3 **(2 marks)**
d) Capacitor C1 **(2 marks)**
e) Capacitor C2 **(2 marks)**

FIG.2

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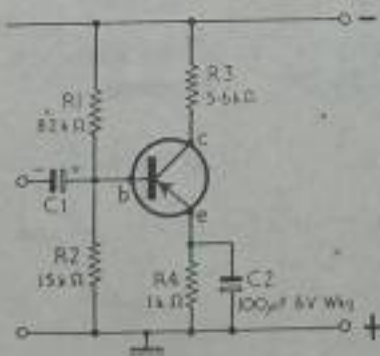
7. (a) Explain the meaning of auto-transformer. (4 marks)

(b) A transformer has 240 volts on the Primary Windings and 20 volts on the Secondary Windings. Calculate:

(i) Primary current when Secondary current is 2 Amperes (2 marks)

(ii) Secondary turns when the Primary turns are 480000 (2 marks)

(iii) Transformer's turns ratio between the Primary and Secondary (2 marks)

SECTION B

Attempt Four (4) questions from this section

8. Draw a block diagram of Superhet Radio receiver suitable for AM reception. Label each stage and show the signal waveform at each stage of the block diagram

(10 marks)

9. A camera tube and Picture tube are transducers which are used in television systems. Explain briefly the functions of each device.

(10 marks)

10. Explain briefly the differences between the following systems:-
      (i) Television Broadcasting (5 marks)
      (ii) Cable Television (5 marks)

11.(a) Define the term Scanning in connection with television.

(5 marks)

(b) In television transmission, each picture before being transmitted, is divided into a number of lines.
List three television line systems used. (3 marks)

(c) A television system transmits 15625 lines per second. What is the time duration required to transmit one line? (2 marks)

12. (a) Define the term television channel. (4 marks)

(b) A television wave propagated from the transmitting antenna towards the receiving antenna is said to contain three different pieces of information.
List them down. (3 marks)

(c) Explain briefly the meaning of monochrome television. (3 marks)