



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF HEALTH, SCIENCE AND TECHNOLOGY

DEPARTMENT OF DIGITAL TECHNOLOGY

EXAMINATION PAPER

COURSE CODE : CDT 115
COURSE TITLE : Electronics II
DURATION : 3 Hours
LEVEL : 1.2
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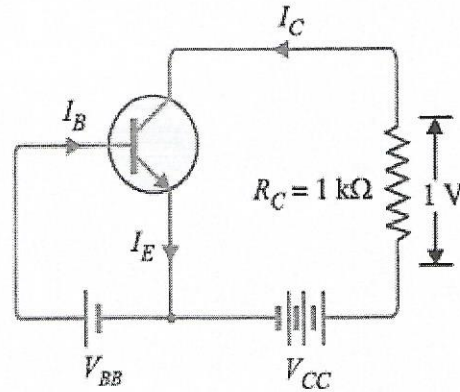
INSTRUCTIONS TO CANDIDATES:

1. Answer all questions.
2. The paper carries 100 marks.

Question 1

- Explain what is meant by the common emitter connection? [4]
- In a transistor if $I_C = 4.9\text{mA}$ and $I_E = 5\text{mA}$, what is the value of α ? [3]
- Calculate I_E in a transistor for which $\beta = 30$ and $I_B = 15\mu\text{A}$. [3]

Question 2



- For a transistor, $\beta = 50$ and voltage drop across $1\text{k}\Omega$ which is connected in the collector circuit is 1 volt. Find the base current for common emitter connection. [6]
- Given that the value of $\alpha = \Delta I_C / \Delta I_E$ and $\beta = \Delta I_C / \Delta I_B$ determine the relationship between α and β . [4]

Question 3

- Explain the term ROM [3]
- What are the applications of ROM. [7]

Question 4

The logic families are classified into two types: (i) Bipolar logic families, and (ii) Unipolar logic families.

- Explain the two terms? [4]
- Give **three** examples of bipolar logic family. [3]
- Give **three** examples of unipolar logic family. [3]

Question 5

- Explain what meant by a common base connection as used in transistors? [4]
- In a common base connection, $I_E = 1\text{mA}$, $I_C = 0.95\text{mA}$. Calculate the value of I_B . [3]
- In a common base connection transistor, current amplification factor is 0.7. If the emitter current is 1mA , determine the value of I_B . [3]

Question 6

- How does a transistor work as an amplifier? [5]
- A common base transistor amplifier has an input resistance of 20 Ohms and output

resistance of $100\text{ k}\Omega$. The collector load is $1\text{ k}\Omega$. If a signal of 500 mV is applied between emitter and base, find the voltage amplification. Assume α_{ac} to be nearly one. [5]

Question 7

- a. Explain what is meant by the term faithful amplification. [4]
- b. i) What are the basic minimum conditions that can be met for faithful amplification? [3]
ii) Explain each. [3]

Question 8

Define the following terms as used in the transistors:

- a. Thermal runaway. [2]
- b. Temperature dependence. [2]
- c. Stabilization. [2]
- d. Operating point. [2]
- e. Stability. [2]

Question 9

- a. Explain how a pnp transistor work. [5]
- b. Compare the working of the pnp transistor and of the npn transistor. [5]

Question 10

Define the following terms as used in the logic family

- a. Fan in. [2]
- b. Propagation delay. [2]
- c. Fan out. [2]
- d. Power dissipation. [2]
- e. Noise immunity. [2]