



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR DEGREE IN
BACHELOR OF TECHNOLOGY IN ICT (BTech ICT 11M2)
(YR II, SEM I)

**EIT 4204 : FOUNDATIONS OF ELECTRONICS
ICS 2200 : ELECTRONICS**

END OF SEMESTER EXAMINATIONS

**SERIES: AUGUST/SEPTEMBER 2011
TIME: 2 HOURS**

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question is as shown

This paper consists of **TWO** printed pages

SECTION A (Compulsory)

Question 1

- a) Describe briefly any **TWO** types of electronic circuits (2 marks)
- b) State Kirchhoff's laws (2 marks)
- c) (i) Calculate the effective capacitance given that two capacitors of 20 pico Farads and 0.1 micro Farads are connected in parallel
- (ii) Describe briefly any **FOUR** types of Capacitors (5 marks)
- d) (i) Describe forward bias and reverse biasing of a diode with the aid of a sketch
- Explain the V/I characteristics of a diode for both forward and reverse biasing with aid of a sketch. (7 marks)

- e) Explain how a small base current is attained compared to collector or emitter current in a transistor (2 marks)
- f) Describe **THREE** classes of transistor amplifiers with the aid of a sketch (6 marks)
- g) (i) Distinguish between positive and negative feedback in electronic circuits
(ii) State any application of positive and negative feedback in electronic circuits (6 marks)

SECTION B (Attempt any TWO questions)

Question 2

- a (i) Explain how full-wave rectification of AC to DC is achieved with the aid of a diagram.
(ii) Describe briefly any other **TWO** applications of diodes. (8 marks)
- b (i) State **THREE** main bipolar transistor configurations.
(ii) Describe with the aid of a sketch how the configurations in Q2 (b) (i) are attained. (12 marks)

Question 3

- a (i) State the **TWO** types of Field effect transistors FET
(ii) Explain **THREE** main advantages of FET over Bipolar transistors (7 marks)
- b Describe MOSFET with the aid of a sketch (3 marks)
- c Describe with the aid of a diagram **FOUR** major regions of a JFET output voltage- current characteristics with the aid of a diagram (10 Marks)

Question 4

- a (i) Define the oscillator as applied to electronic devices and circuits
(ii) Describe **TWO** major types of oscillators (6 marks)
- b Outline any **SIX** LC oscillator tuned tank circuit requirements that are necessary (6 marks)
- c (i) Define Wien oscillator
(ii) Outline any **TWO** advantages of Wien oscillator over LC oscillator (3 marks)
- d) Describe the operation of Wien oscillator with the aid of a sketch (5 marks)

Question 5

- a) Describe **TWO** application of Op-amp (6 marks)
- b) Distinguish between the following types of operational amplifiers Op-amps

(i) Inverting op-amp and non-inverting Op-Amp with the aid of a sketch

(ii) Differential Op- amp and Summing Op-amp

(14 marks)