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 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 Filed 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)