THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (BSC IT 11M)

ICS 2200: ELECTRONICS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: FEBRUARY/MARCH 2012
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 are 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) Distinguish between Thevinisn and Nortons theorems

d) Calculate the effective capacitance given that two capacitors of 20 pico Farads and 0.1 micro Farads are connected in parallel

e) Describe briefly any **FOUR** types of Capacitors (5 marks)

f) Describe forward bias and reverse biasing of a diode with the aid of a sketch

g) Explain how a small base current is attained compared to collector or emitter current in a transistor (2 marks)

h) (i) Distinguish between positive and negative feedback in electronic circuits
(ii) State any application of positive and negative feedback in electronic circuits (6 marks)

i) Describe MOSFET with the aid of a sketch (3 marks)

j) 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)

SECTION B (Answer 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 sketch how the configuration in Q2 (b)(i) are attained (12 marks)

Question 3

a) (i) State the **TWO** types of filed transistors FET
(ii) Explain **THREE** main advantages of FET over Bipolar transistors (7 marks)

b) Describe **THREE** classes of transistor amplifiers with the aid of a sketch (6 marks)

c) Explain the V/I characteristics of a diode for both forward and reverse biasing with aid of a sketch (7 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)

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 (12 marks)