MERU UNIVERSITY COLLEGE
OF SCIENCE & TECHNOLOGY
P.O. Box 972-60200 Meru - Kenya. Tel: 020-2092048, 020 2069349
Fax: 020-8027449

University Examinations 2010/2011

FIRST YEAR, SPECIAL/SUPPLEMENTARY EXAMINATIONS FOR THE DEGREE OF BACHELOR SCIENCE IN INFORMATION TECHNOLOGY/BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE

ICS 2200: ELECTRONICS

DATE: DECEMBER 2010 **TIME: 2 HOURS**

INSTRUCTIONS: *Answer Questions O**ne** and any other T**wo** Questions*

QUESTION ONE – (30 MARKS)

(a) Differentiate between intrinsic and extrinsic semi conductors. (6 Marks)
(b) What is a p-n junction? (2 Marks)
(c) State three uses of Zener dioxides. (3 Marks)
(d) A transistor has a collector current of 2MA. If the current gain is 135, what is the base current? (4 Marks)
(e) With the aid of a graph, explain the variations of current with voltage for a function diode. (6 Marks)
(f) The following current readings are obtained in a transistor connected in C-B configuration. I_E = 2MA and I_B = 20μA. Compute the values of $\propto$ and I_C. (5 Marks)
(g) Define the following terms in relation to OP-AMPS.
  (i) output impedance (2 Marks)
  (ii) transition frequency (2 Marks)

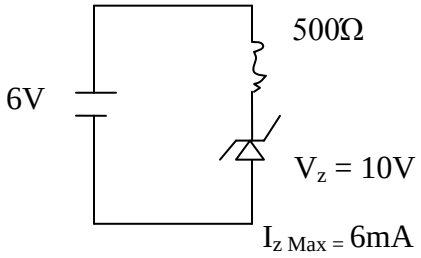
QUESTION TWO – (20 MARKS)

(a) Name two types of transistors. (2 Marks)
(b) Define the following terms:
  (i) Base transport factor (2 Marks)
  (ii) Current gain (2 Marks)
(c) Prove that $\frac{\propto}{1-\propto} = \beta$ where β in the current gain of a BJT (8 Marks)
(d) A transistor has a collector current of 10MA and a base current of 40μA. Calculate the current gain of the transistor. (6 Marks)

QUESTION THREE – (20 MARKS)

(a) (i) What is a Zener diode? (4 Marks)

(ii) Find out if the Zener diode in the figure below is properly biased. Explain. (6 Marks)



(b) Sketch and explain a JFET drain characteristic when $V_{GS} = 0$ (10 Marks)

QUESTION FOUR – (20 MARKS)

(a) Define the following terms: