

UNIVERSITY OF SWAZILAND  
FACULTY OF SCIENCE  
DEPARTMENT OF ELECTRONIC ENGINEERING

MAIN EXAMINATION    May    2006

TITLE OF PAPER: **ELECTRONICS I**

( Paper I I Practical)

COURSE NUMBER: **E360**

TIME ALLOWED: THREE HOURS

INSTRUCTIONS: MAKE SURE YOU HAVE THE FOLLOWING :

- 1 Oscilloscope
- 1 Dc Power supply that may give 5 volts
- 1 Function generator (with frequency range up to 2MHz)
- 1 Breadboard
- 1 BC 107 transistor
- 2 Capacitors: 4.7  $\mu$ F and 22  $\mu$ F
- 3 Resistor 390 K $\Omega$ , 1 K $\Omega$ , and 100  $\Omega$  ( All rated 1/4 W )

THIS PAPER HAS 3 PAGES, INCLUDING THIS PAGE

DO NOT OPEN THE PAPER UNTIL PERMISSION HAS BEEN GIVEN BY THE  
INVIGILATOR

A.

**Problem:**

Obtain the maximum gain, frequency bandwidth, and estimate the short circuit current gain-bandwidth product ( $f_T$ ) for the circuit shown below

**Procedure:**

Make appropriate measurements required to obtain

the current gain  $\beta$ ,

the maximum mid-band frequencies gain, and

lower and upper 3dB frequencies.

**Report**

(Please note: **DO NOT WRITE ANY THEORY FOR THIS EXPERIMENT**)

write a report consisting of but not limited to

A) Objectives

B) Measured data

C) Analysis

D) Conclusion

Note: You will be assessed on

*Report presentation in general*

8 marks

*Measured data*

16 marks

*Analysis of data*

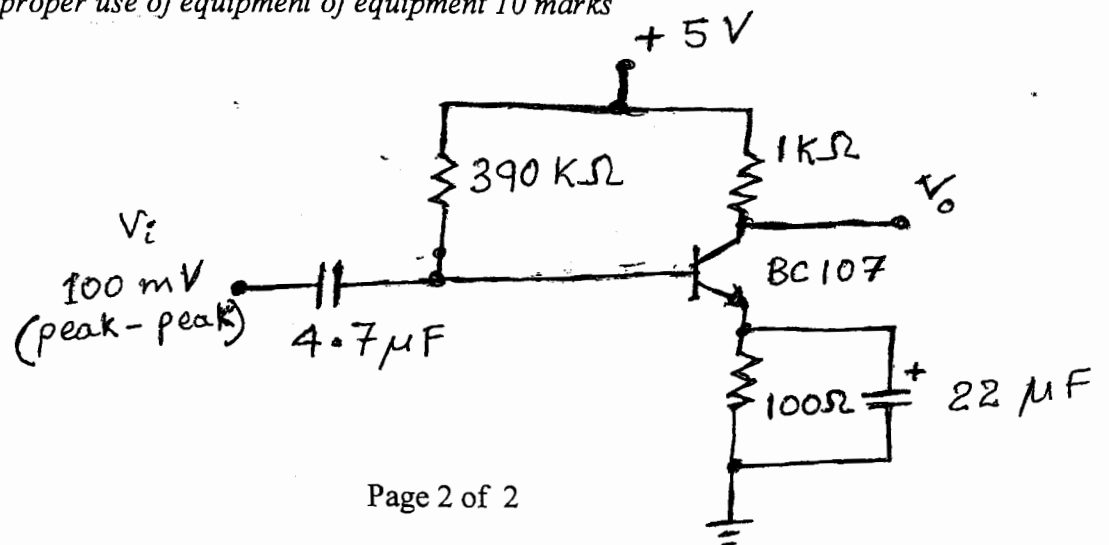
10 marks

(Total marks 50)

*Conclusion*

5 marks

*Handling and proper use of equipment of equipment* 10 marks



B

**Question 1**

- a) Why are resistors colour coded and what do the bands represent? ( 6 marks )
- b) How is frequency of a signal measured when using an oscilloscope? (6 marks )

**Question 2**

Write a procedure on how to obtain a graph of the Volt-Ampere relationship of a diode. Include circuit diagrams (well labeled) and equipment required. (19 marks )

**Question 3**

Write a procedure on how to obtain the pinch off voltage ( $V_p$ ) and the current  $I_{DSS}$  for a JFET transistor. Include circuit diagrams (well labeled) and equipment required. (19 marks )

