UNIVERSITY OF SWAZILAND

FACULTY OF SCIENCE

DEPARTMENT OF ELECTRONIC ENGINEERING

EXAMINATION 2006 (**SUPPLEMENTARY**)

TITLE OF PAPER: **ELECTRONICS I** Paper II Practical

COURSE NUMBER: **E360**

TIME ALLOWED: THREE HOURS

INSTRUCTIONS: Make sure you have the following :

1 Digital Multimeter
1 Oscilloscope
1 Dc Power supply that may give 9 volts
1 Function generator
1 Breadboard
1 BC 109 C transistor
2 Capacitors 47 μF low voltage rating
4 Resistors (220Ω, 2.2k Ω , 100kΩ and 470 kΩ)

THIS PAPER CONTAINS 2 PAGES INCLUDING THIS PAGE

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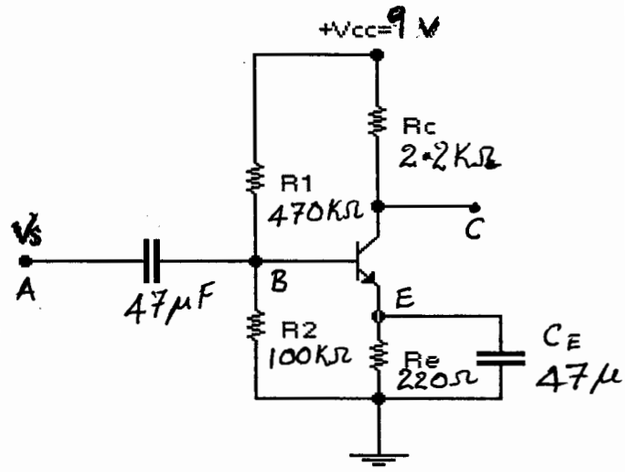
Procedure:

1 Construct the circuit shown



2 Without applying the voltage v_s :

(A) Make appropriate measurements required to obtain the collector current and the base current.

(B) Measure and record V_{CEQ} and V_{BEQ}

i) Using the oscilloscope

ii) Using the digital multimeter (19 marks)

3 Set the signal v_s to 1 volt peak-to-peak sinusoidal voltage at 1kHz.

With v_s applied to the circuit :

(A) Measure and record V_{CEQ} and V_{BEQ}

(B) Measure the peak-to-peak voltage at point A, B, and E.

(C) Draw the ac output voltage taken from point C

(D) Remove capacitor C_E and draw the peak-to-peak voltage at point E

(E) Reconnect capacitor C_E then while monitoring the output voltage (point C) reduce the amplitude of the voltage from the function generator until the output voltage (point C) is not distorted or clipped then measure and record the peak-to-peak output and input voltages v_s. Calculate and record the voltage gain of your circuit. (43 mark

Analysis

1 Compare results from part 2B i) to part 2B ii)

2 Compare results from part 2B to part 3 A

3 Examine results from part 3B and part 3D while thinking about the capacitors in this circuit

4 Write something about the voltage at point E (use results from 3B and 3D) (18 marks)

Conclusion

1 Write about the accuracy of the oscilloscope as compared to the digital multimeter

2 Write about taking measurements for the Q-point

3 Write about the functions of the two capacitors in this circuit

4 Write about the Q-point and the voltage gain for this circuit (20 Marks)