

MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

.....SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND
ELECTRONICS ENGINEERING

EED 206: ANALOGUE ELECTRONICS II

DATE:

TIME:

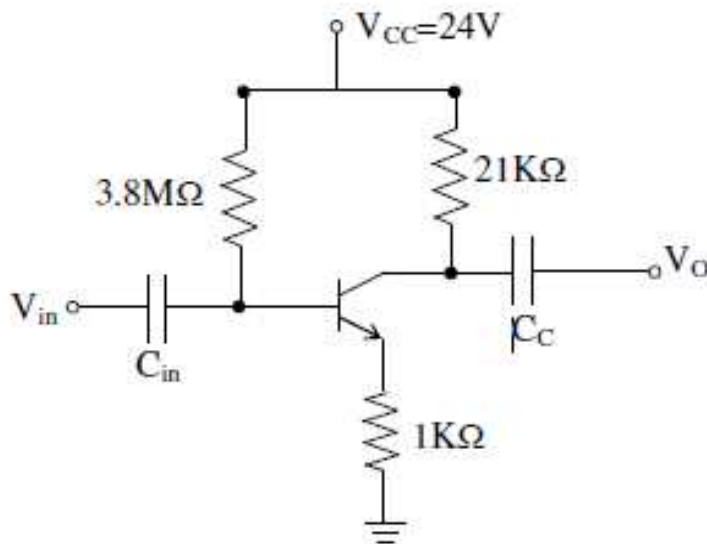
INSTRUCTIONS:

Answer question ONE and any other two questions from section B

SECTION A

1.
 - a) Explain four Factors affecting Oscillator Performance (8 marks)
 - b) Explain three advantages of using LEDS in Electronics industry. (6 marks)
 - c) With the aid of diagrams explain the nature of the following sinusoidal oscillations
 - i) Dumped oscillations (2 marks)
 - ii) Un-dumped oscillations (2 marks)
 - d) The collector voltage of a Class B push pull amplifier with $V_{CC}=40$ Volts swings down to a minimum of 4 volts. The total power dissipation in both the transistors is 36 watts. Compute the total dc power input and conversion efficiency of the amplifier. (10 marks)

2.
 - a) With the aid of a well labeled diagram, explain the construction and operation of a phototransistor (10 marks)
 - b) What is the fundamental difference between audio amplifiers and tuned amplifiers? How is bandwidth related to resonant frequency (f_r) and the quality factor (Q). (10 marks)
3.
 - a) State any three advantages of a phase shift oscillators. (6 marks)
 - b) Highlight the common causes of drift in DC amplifiers (4 marks)
 - c) Explain five characteristics of an ideal operational amplifier (10 marks)
4.
 - a) With the aid of clear and well labeled graph, explain the gain frequencies characteristics of an operational amplifier. (10 marks)
 - b) The transistor in the feedback circuit shown below has $\beta=200$.



Determine

- (i) Feedback factor,
- (ii) Feedback ratio,
- (iii) Voltage gain without feedback and
- (iv) Voltage gain with feedback in the circuit. In the transistor, under the conditions of operation, V_{BE} may be assumed to be negligible.

(10 marks)

5. a) Discuss the terminal properties of an ideal operational amplifier. (10 marks)
- b) With the aid of a circuit diagram of a collector tuned amplifier and derive the expression for the voltage gain at the tuned frequency. (10 marks)