



MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

DIPLOMA IN MECHANICAL ENGINEERING

SUPPLEMENTARY EXAMINATION

EED 206: ANALOGUE ELECTRONICS II

DATE: 30/8/2017

TIME: 2:00 – 4:00 PM

INSTRUCTIONS:

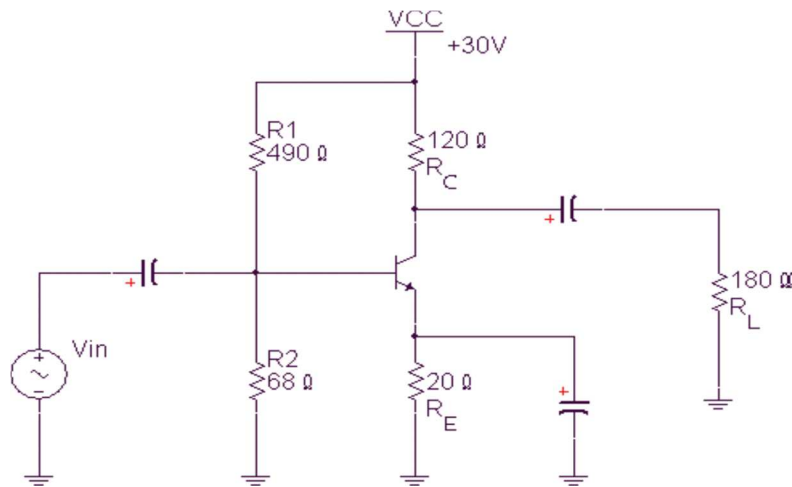
*This paper consists of **FIVE** Questions. Answer Question ONE and ANY OTHER TWO questions.*

QUESTION ONE (COMPULSORY)

- a) Explain four Factors affecting Oscillator Performance (8 marks)
- b) Explain three advantages of using LEDS in Electronics industry. (6 marks)
- c) By the aid of diagrams explain the nature of the following sinusoidal oscillations
 - i. Damped oscillations (2 marks)
 - ii. Un-damped 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)

QUESTION TWO (20 MARKS)

- a) By the aid of a well labeled diagram, explain the construction and operation of a phototransistor (10 marks)
- b) What are the values of I_{CQ} , V_{CEQ} and R_c (10 marks)

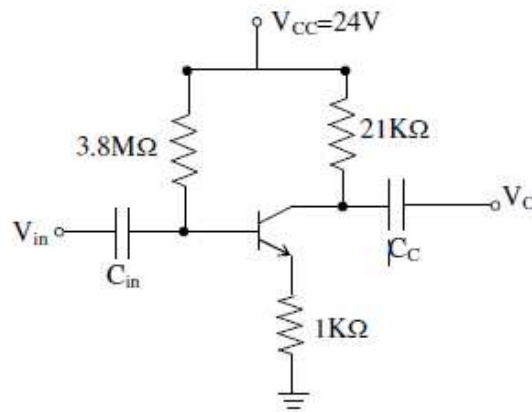


QUESTION THREE

- State any three advantages of a phase shift oscillators (6 marks)
- Highlight the common causes of drift in DC amplifiers (4 marks)
- Explain five characteristics of an ideal operational amplifier (10 marks)

QUESTION FOUR

- By the aid of clear and well labeled graph, explain the gain frequencies characteristics of an operational amplifier (10 marks)
- The transistor in the feedback circuit shown below has $\beta=200$. Determine
 - Feedback factor,
 - Feedback ratio,
 - Voltage gain without feedback and
 - 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)



QUESTION FIVE

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