

Code: 9A04502

B.Tech III Year I Semester (R09) Supplementary Examinations June 2017

LINEAR IC APPLICATIONS

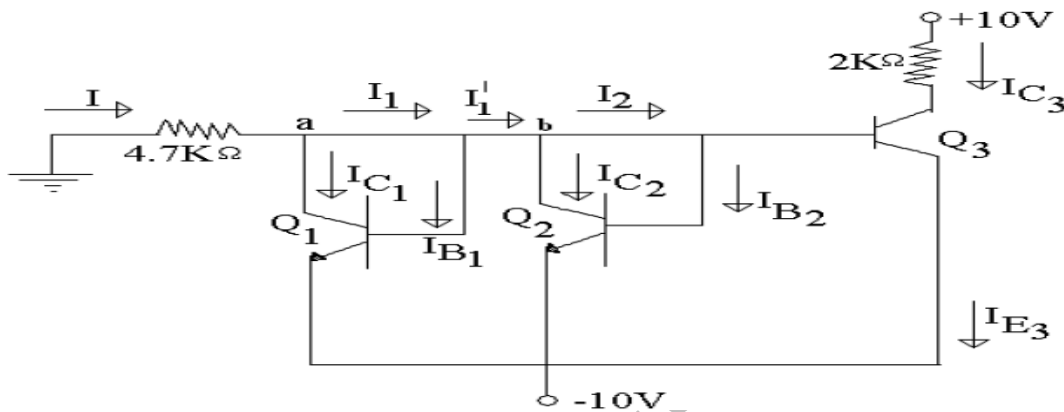
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw the circuit diagram of level translator and explain the operation with suitable examples.
(b) Explain how the voltage gain of a differential amplifier be increased without the increase of very high voltage collector resistors with necessary circuits.
- 2 (a) Draw the equivalent circuit of an OP-AMP, explain the operation.
(b) Determine the emitter current in transistor Q_3 of figure below. If $V_{BE} = 0.7 \text{ V}$ and $\beta = 100$.



- 3 (a) Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to 1 KHz. If a sine wave of 1 V peak at 1000 Hz is applied to the differentiator draw its output waveform.
(b) What is an instrumentation amplifier? List any three applications of the instrumentation amplifier.
- 4 (a) What is clipper? Draw the schematic of positive clipper and explain its operation.
(b) What is the necessity of log amplifier? Derive the expression for the output voltage.
- 5 (a) Design a notch filter to eliminate 50 Hz frequency signal.
(b) Draw and explain the frequency response of notch filter.
- 6 Write short notes on:
 - (a) Saw tooth waveform generator.
 - (b) Voltage-to-Frequency converter.
- 7 (a) Explain the operation of an op-amp based weighted resistor digital to analog converter through a neat circuit diagram.
(b) Draw the block diagram of a converting 4-bit A/D converter and explain its operation. Sketch the output waveform.
- 8 What are all basic blocks of analog multiplexer? Explain how the data selection process is performed it.