53 (EC 201) BSEL

2021

BASIC ELECTRONICS

Paper : EC 201

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions out of **seven**.*

1. *(a)* Describe the operation of Common base configuration, draw the input, output characteristics. 10

   (b) Derive the closed-loop gain for Inverting, Non-inverting amplifier. 10

2. *(a)* Classify the LC Oscillators, describe the operation of each oscillator with proper circuit diagram and derive the expression for frequency of oscillation. 10

Contd.

(b) Classify the various types of filters used after rectification, describe the operation of Diode-C filter and derive the expression for ripple voltage. 10

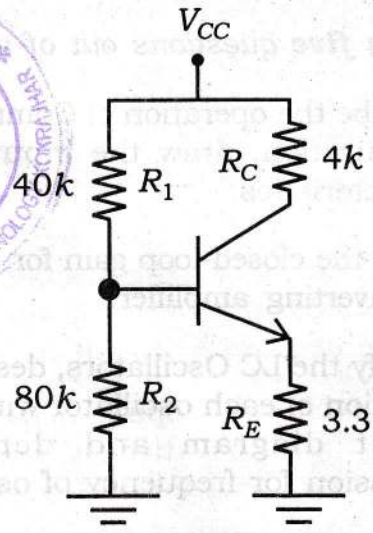
3. (a) Write short notes on : 10

(i) Depletion region

(ii) Avalanche Breakdown.

(b) Give a detailed comparison between negative and positive feedback. 10

4. (a) Calculate the DC terminal voltages and branch currents for the circuit below, for $\beta = 100$ and $V_{CC} = 15V$. 10



(b) Describe the operation of n-channel enhancement type of MOSFET, draw the input and output characteristics. 10

5. (a) Derive the expression for average value of a half-wave rectifier. 5

(b) Mention ideal features of an operational amplifier. 5

(c) Compare the features of BJT and FET. 5

(d) Draw the circuit diagrams, showing various types of biasing techniques used for a transistor in Common Emitter Configuration. 5

6. (a) Describe the operation of LCD display with proper diagram. 10

(b) Draw the circuit diagram of biased clippers

(i) capable of clipping positive half at a fixed positive DC level, while leaving the negative half as it is. 5

(ii) capable of clipping negative half at a fixed negative DC level, while leaving the positive half as it is. 5

7. *(a)* Describe the operation of BJT in active mode for a p-n-p transistor. 10

(b) Write a short note on Light Emitting Diode. 5

(c) Write a short note on n-type semiconductor. 5