1383

April 2025

Time – Three hours
(Maximum Marks: 100)

[N.B. Answer all the questions, choosing any two subdivision from each question. Each subdivision carries 10 marks.]

1. (a) Describe the operation of half wave rectifier with neat circuit diagram and waveform.

(b) Explain the working principle of positive and negative clampers.

(c) Explain the working principle of LED with necessary diagrams.

(d) (i) What is the function of clipper circuit? Mention its types. (5)
(ii) Write a short note on photo diode. (5)

2. (a) Explain the fixed bias transistor circuit with neat sketch.

(b) (i) Define biasing. Mention its types. (7)
(ii) List out the three modes of BJT. (3)

(c) Write the working principle of PNP transistor with a neat sketch.

(d) Explain the input and output characteristics of common collector (CC) configuration with neat circuit diagram.

3. (a) Describe the operation of differential amplifier with neat circuit diagram.

(b) Write a note on the following:
(i) Darlington pair configuration. (7)
(ii) CMRR. (3)

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(c) Discuss the operation of transistor as a switch with necessary circuit diagram.

(d) Describe the working principle of common emitter amplifier with a neat diagram.

4. (a) (i) Differentiate positive and negative feedback. (5)
(ii) State Barkhausen criterion. (5)

(b) What is a negative feedback amplifier? Mention its types.

(c) (i) Draw and explain the tank circuit. (7)
(ii) List the types of oscillator circuits. (3)

(d) Explain the operation of RC phase shift oscillator with neat sketch.

5. (a) Explain the operation of N channel JFET.

(b) (i) Compare FET and BJT. (5)
(ii) Draw the equivalent circuit of the UJT. (5)

(c) Explain the working of N channel depletion mode MOSFET with neat sketch.

(d) Discuss the operation of UJT with neat sketch.
