

B. Tech. (Sem.-3rd)

ANALOG DEVICES AND CIRCUITS
Subject Code: BTEC-301

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Paper ID: [A1130]

Max. Marks: 60

Time: 3 Hrs.

INSTRUCTIONS TO CANDIDATE:
Section 4 is Compulsory.

1. Section -A, is Compulsory.
2. Attempt any four questions from Section-B
3. Attempt any two questions from Section-C.

(10x2=20)

Section - A

Q.1.

- Draw the small signal equivalent model of transistor.
- Define the term hole in context to semiconductors.
- What is meant by term saturation current in a BJT.
- What is the criterion for oscillation in oscillators.
- Draw the circuits of CB, CE and CC configurations using npn transistor.
- What do you understand by early effect in transistors.
- Give the principle of operation of LED.
- Briefly compare BJT and JFET.
- What is meant by the term load line?
- List various types of oscillators?

Section -B

(4x5=20)

- Q.2. In a fixed bias circuit determine I_{BQ} , and V_{CE} if transistor is of silicon. The values of various circuit parameters are: $V_{CC}=12\text{ V}$, $R_B=4.2\text{ M}\Omega$, $R_C=22\text{ K}\Omega$ and $\beta=100$.
- Q.3. What are the factors that are responsible for destabilizing the operating point of transistor? Discuss the various stability factors.
- Q.4. Discuss working of class B-push-pull amplifier.
- Q.5. How is zener diode used as a regulator?
- Q.6. Describe the components of current in an npn transistor.

Section -C

(2x10=20)

- Q.7. Derive the expressions for gain, input impedance and output impedance for a CE amplifier using h-parameters.
- Q.8. Derive conditions for sustained oscillations in a RC Phase shift oscillator.
- Q.9. Write short notes on:
(a) Feedback effect in amplifiers.
(b) Pinch-off in JFET.

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