SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai

II Semester

B.E – Department of Computer Science and Engineering

(Internet of Things & Cyber Security including Block Chain Technology)

23ECT102 – ELECTRONIC DEVICES AND CIRCUITS

Regulations -2023

PUZZLES

☑ UNIT I – Transistor Biasing and Stabilisation

1. Match the Terms

Term	Definition Letter
A. Q-point	a. Graphical method to find transistor operation
B. Fixed Bias	b. Collector current stable against temperature
C. Self Bias	c. Set operating point of the transistor
D. Load Line	d. Uses one resistor from base to Vcc

Answer: A→c, B→d, C→b, D→a

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2. Fill in the Blanks

1. The _____ bias offers the best thermal stability.
2. _____ is the point of intersection of DC and AC load lines.
3. Stabilization factor denotes the change in _____ current due to temperature.
4. In fixed bias, base resistor connects between _____ and base.

Answer:

1. Voltage divider

2. Q-point
3. Collector
4. Vcc

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3. True or False

1. Self-bias requires only one resistor. ✗
2. DC load line is independent of the transistor parameters. ✓
3. Operating point should lie in saturation region. ✗
4. Stabilization factor S should be as low as possible. ✓

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4. Word Search

Find these hidden words: **QPOINT, BIAS, STABILITY, FIXED, THERMAL**

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5. Anagram Puzzle

Unscramble the biasing method:

1. **DEXFI** = _____
2. **LOLVAGET RIVEDID** = _____
3. **LECTROLOC-OT-BASE** = _____

Answer: Fixed, Voltage Divider, Collector-to-Base

✓ UNIT II – P-N Junction Diode

1. Crossword Puzzle Clues

- **Across**:
  2. Sharp increase in current under reverse bias (**Zener**)
- **Down**:
  1. Diode used for tuning circuits (**Varactor**)

2. Region where no free carriers exist (**Depletion**)

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2. Word Match

Diode Type	Use Case
A. Zener	a. Light detection
B. Varactor	b. Voltage regulation
C. Photodiode	c. Tuning circuits

Answer: A→b, B→c, C→a

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3. True or False

1. A diode conducts in reverse bias. ✗
2. Varactor diodes work as variable capacitors. ✓
3. Photodiode requires forward bias to operate. ✗
4. Zener diodes can regulate voltage. ✓

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4. Fill in the Blanks

1. Zener diode operates in _____ breakdown region.
2. The _____ voltage is the threshold for conduction.
3. _____ diodes emit light when forward biased.
4. In reverse bias, the current is due to _____ carriers.

Answer:

1. Zener
2. Knee
3. LED
4. Minority

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5. Find the Odd One Out

Which is not a special-purpose diode?

- A. Zener
- B. Varactor
- C. Resistor
- D. Photodiode
  Answer: C. Resistor

✅ UNIT III – BJT and Amplifier Analysis

1. Label the Configuration

Given a transistor circuit with the base as common terminal, identify:

- Input between ___ and ___
- Output between ___ and ___
  Answer: Emitter and Base, Collector and Base (Common Base configuration)

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2. Matching

Parameter	Symbol
A. Current gain	a. β
B. Input impedance	b. Zin
C. Voltage gain	c. Av
D. Output impedance	d. Zout

Answer: A→a, B→b, C→c, D→d

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3. Word Search

Find these: **HYBRID, GAIN, BETA, CE, SATURATION**

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4. Crossword Clues

- **Across**:
    1. Current gain in CE configuration
- **Down**:
  2. Region where both junctions are forward biased
  3. Base current is minimal in this configuration

Answer: Beta, Saturation, CB

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5. True or False

1. β = IC/IE. ✗
2. Hybrid model simplifies amplifier analysis. ✓
3. Common collector has highest voltage gain. ✗
4. CB configuration is used in RF amplifiers. ✓

✓ UNIT IV – FET and FET Amplifier

1. Fill in the Blanks

1. FETs are _____ controlled devices.
2. In JFET, drain current becomes constant after _____ voltage.
3. The region where FET behaves like a resistor is called _____ region.
4. MOSFET has _____ input impedance.

Answer: Voltage, Pinch-off, Ohmic, High

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2. Word Match

Term	Description
A. JFET	a. Uses gate voltage for control
B. MOSFET	b. Insulated gate
C. Pinch-off	c. Voltage at which current saturates

Answer: A→a, B→b, C→c

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3. Word Search

Find: **PINCHOFF, MOSFET, SOURCE, GATE, ENHANCEMENT**

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4. Crossword Clues

- **Across**:
    1. Terminal of FET controlling current (**Gate**)
    2. Output terminal (**Drain**)
- **Down**:
    1. Region after which current saturates (**Saturation**)
    2. FET where gate is insulated (**MOSFET**)

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5. True or False

1. FETs have low input impedance. ✗
2. MOSFET can operate in enhancement mode. ✓
3. Source and drain are interchangeable in all FETs. ✗
4. Pinch-off voltage is important in JFETs. ✓

✓ UNIT V – Rectifiers and Filters

1. Matching

Component	Function
A. Rectifier	a. Smooth output voltage
B. Filter	b. Converts AC to DC
C. Zener Diode	c. Regulates voltage

Answer: A→b, B→a, C→c

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2. Fill in the Blanks

1. A _____ rectifier allows current in one half cycle.
2. Ripple factor indicates _____ in output.
3. π-filter contains _____ and _____.
4. Bridge rectifier uses _____ diodes.

Answer: Half-wave, AC components, Inductor, Capacitor, 4

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3. True or False

1. A capacitor filter charges during conduction. ✅
2. Full-wave rectifiers have higher ripple than half-wave. ❌
3. Zener diodes work in forward bias for regulation. ❌
4. PIV is maximum voltage a diode can block in reverse bias. ✅

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4. Word Search

Find: **RECTIFIER, FILTER, RIPPLE, ZENER, BRIDGE**

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5. Crossword Clues

- **Across**:
    1. Diode used in voltage regulation

2. Filter using L and C components

- **Down**:

1. Converts AC to pulsating DC
2. Output of full-wave rectifier is _____ than half-wave

Answer: Zener, LC, Rectifier, Smoother