

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -1 SEMESTER – OLD PAPER – W24 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Electronics Devices & Circuits- DI01009011

Unit 1: Basics of semiconductor and its applications

Repeated Questions:

1. **Explain / Draw the V-I characteristics of a PN junction diode.**
 - **Appeared in:** S25 (Q1a, 03 marks), W24 (Q3c OR, 07 marks)
2. **Explain the working of a Half Wave Rectifier.**
 - **Appeared in:** W24 (Q2c, 07 marks), S25 (Q1b - Compare, 04 marks)
3. **Explain the working of a Full Wave Rectifier (Center Tap / Bridge).**
 - **Appeared in:** W24 (Q3c, 07 marks), W24 (Q2c OR, 07 marks), S25 (Q1b - Compare, 04 marks), S25 (Q1c, 07 marks)
4. **Explain intrinsic and extrinsic semiconductors.**
 - **Appeared in:** W24 (Q3a, 03 marks), W24 (Q4b OR, 04 marks), S25 (Q4b OR, 04 marks)
5. **Explain P-Type and N-Type semiconductors.**
 - **Appeared in:** W24 (Q4a, 03 marks), W24 (Q3a OR, 03 marks), S25 (Q4c, 07 marks)
6. **Explain/Draw the circuit and working of a Zener Diode as a Voltage Regulator.**
 - **Appeared in:** W24 (Q4b OR, 04 marks), S25 (Q4a OR, 03 marks)
7. **List and explain types of filter circuits.**
 - **Appeared in:** W24 (Q1a, 03 marks), S25 (Q1c OR, 07 marks)

Other Important Questions:

English List:

1. Write various applications of P-N Junction Diode. (W24 - Q1b, 04 marks)
2. Draw symbol with proper nomenclature: 1) Diode 2) Transistor 3) Zener Diode. (W24 - Q2a, 03 marks)
3. Draw a neat circuit of P-N Junction Diode in forward Biased conduction mode. (W24 - Q2b, 04 marks)
4. Explain intrinsic semi-conductors using at least 02 examples. (W24 - Q2a OR, 03 marks)

5. Draw a neat circuit of P-N Junction Diode in Reverse Biased mode. (W24 - Q2b OR, 04 marks)
6. Draw symbol with proper nomenclature 1) UJT 2) SCR 3) LDR. (W24 - Q4a OR, 03 marks)
7. Draw symbol with proper nomenclature 1) LED Diode 2) Photo Diode 3) Photo Transistor. (W24 - Q5a OR, 03 marks)
8. Compare Half wave rectifier and full wave center tap rectifier. (S25 - Q1b, 04 marks)
9. Draw and Explain full wave rectifier circuit with its advantage and disadvantage. (S25 - Q1c, 07 marks)
10. State the Advantages and disadvantages of Photo Diode. (S25 - Q3a, 03 marks)
11. Draw and compare energy band diagram of conductor, semiconductor and insulator material. (S25 - Q4a, 03 marks)
12. Compare LCD with LED. (S25 - Q5a, 03 marks)

Unit 2: Transistor and amplifiers

Repeated Questions:

1. **Explain the working of an NPN Transistor.**
 - Appeared in: W24 (Q1c, 07 marks), S25 (Q2e, 07 marks)
2. **Explain the working of a PNP Transistor.**
 - Appeared in: W24 (Q1c OR, 07 marks), S25 (Q5b OR, 04 marks)
3. **Explain the working of a transistor as a Switch.**
 - Appeared in: W24 (Q5b OR, 04 marks), S25 (Q5c, 07 marks)
4. **Explain the working of a transistor as an Amplifier.**
 - Appeared in: W24 (Q5b, 04 marks)
5. **List various biasing methods of a transistor.**
 - Appeared in: W24 (Q5a, 03 marks), S25 (Q5a OR, 03 marks)
6. **Compare CB, CE, and CC configurations of a transistor.**
 - Appeared in: W24 (Q4b, 04 marks), S25 (Q2c, 04 marks)
7. **Derive the relation between α and β for transistors ($\beta = \alpha / (1-\alpha)$ or $\alpha = \beta / (1+\beta)$).**
 - Appeared in: W24 (Q4c OR, 07 marks), W24 (Q5c OR, 07 marks)

Other Important Questions:

1. List various operating modes of transistor along with their configuration. (W24 - Q3b, 04 marks)
2. Draw CB (Common Base) & CE (Common Emitter) configuration of transistor with proper nomenclature. (W24 - Q4c, 07 marks)
3. Explain any one method of transistor biasing. (S25 - Q4b, 04 marks)
4. Explain the need of biasing of transistor and state the methods of biasing. (S25 - Q5a OR, 03 marks)
5. Explain DC load line and define Operating point. (S25 - Q2a, 04 marks)
6. **Numerical:** β for a Transistor is 50 and the base current is 20 micro ampere. Find emitter current and α . (S25 - Q2a OR, 03 marks)

Unit 3: Semiconductor and Opto electronic devices

Repeated Questions:

1. **Explain the construction and working of an Optical Fibre Cable.**
 - **Appeared in:** W24 (Q3b OR, 04 marks), S25 (Q3b OR, 04 marks)
2. **Explain the construction and working of a Photovoltaic Cell.**
 - **Appeared in:** S25 (Q3c, 07 marks)
3. **Compare FET with BJT.**
 - **Appeared in:** S25 (Q3b, 04 marks)
4. **Explain the working of a Zener Diode as a Voltage Regulator.**
 - **Appeared in:** W24 (Q4b OR, 04 marks), S25 (Q4a OR, 03 marks) *(Also listed in Unit 1 due to its fundamental nature in applications)*
5. **State the applications of FET.**
 - **Appeared in:** S25 (Q3a OR, 03 marks)

Other Important Questions:

1. Draw symbol with proper nomenclature 1) UJT 2) SCR 3) LDR. (W24 - Q4a OR, 03 marks)
2. Draw symbol with proper nomenclature 1) LED Diode 2) Photo Diode 3) Photo Transistor. (W24 - Q5a OR, 03 marks)
3. Draw and explain optocouplers in detail. (S25 - Q3c OR, 07 marks)
4. State the Advantages and disadvantages of Photo Diode. (S25 - Q3a, 03 marks)
5. Explain construction and working of Photo transistor. (S25 - Q5b, 04 marks)
6. Compare LCD with LED. (S25 - Q5a, 03 marks)
7. Explain the construction and working of N-channel JFET. (S25 - Q5c OR, 07 marks)
