

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Name & Code:

Basics of Electronics- DI01000151

Unit – I: Electronic Components

Repeated Questions:

1. **Define/Compare Active components and Passive components.**
 - Appeared in: S25 (Q1b, 04 marks), W24 (Q1a, 03 marks)
2. **Classify Resistors and explain a specific type (e.g., Carbon film, Composition).**
 - Appeared in: S25 (Q1c, 07 marks), W24 (Q1c, 07 marks)
3. **Explain Faraday's laws of electromagnetic induction.**
 - Appeared in: W24 (Q1c(OR), 07 marks)

Other Important Questions:

- Explain Mica capacitor. (S25 - Q1a, 03 marks)
- Define resistance and explain composition type resistors. (S25 - Q1c, 07 marks)
- Define Capacitance and explain Aluminum Electrolytic wet type capacitor. (S25 - Q1c(OR), 07 marks)
- Discuss the classification of inductor. (S25 - Q2a, 03 marks)
- Write applications of Capacitor and Inductor. (W24 - Q1b, 04 marks)
- I. Write color band of $470\Omega \pm 10\%$ resistance. II. A color code of orange, orange, orange, golden is for what ohmic value? (S25 - Q2b, 04 marks)

Unit – II: Fundamentals of Semiconductor

Repeated Questions:

1. **Explain P-type semiconductor material and conduction of current in it.**
 - Appeared in: **S25 (Q2b, 04 marks), W24 (Q2c, 07 marks)**
2. **Explain N-type semiconductor material and conduction of current in it.**
 - Appeared in: **S25 (Q3b, 04 marks), W24 (Q2c, 07 marks)**

Other Important Questions:

- Draw the structure of atom of trivalent, tetravalent, pentavalent materials. (S25 - Q2a(OR), 03 marks)
- Explain conduction band, valence band, and energy gap with diagrams. (S25 - Q2c(OR), 07 marks)
- Build crystalline structure of tetravalent semiconductor material with a neat sketch. (W24 - Q2b, 04 marks)
- Interview effect of temperature on conductivity of semiconductor material. (W24 - Q2b(OR), 04 marks)

Unit – III: Diodes and Rectifiers

Repeated Questions:

1. **Explain the working of a full wave bridge rectifier.**
 - Appeared in: **S25 (Q2c, 07 marks), W24 (Q3c(OR), 07 marks)**
2. **Compare half wave and full wave rectifier.**
 - Appeared in: **S25 (Q3c(OR), 07 marks), W24 (Q4a(OR), 03 marks)**
3. **Explain V-I characteristics of a specific diode (PN Junction / Zener).**
 - Appeared in: **W24 (Q3a, 03 marks), W24 (Q3a(OR), 03 marks)**

Other Important Questions:

- Explain depletion region. (S25 - Q3a, 03 marks)
- Explain construction and working of PN Junction Diode. (S25 - Q3c, 07 marks)
- Define Forward and reverse bias of diode. (S25 - Q3a(OR), 03 marks)
- Explain the characteristic of Zener diode. (S25 - Q3b(OR), 04 marks)
- Write advantages and disadvantages of Light Emitting Diode (LED). (W24 - Q2a, 03 marks)
- Demonstrate reverse biasing of P-N junction diode. (W24 - Q3b, 04 marks)
- Explain construction and working of Light Emitting Diode (LED) in detail and state its applications. (W24 - Q3c, 07 marks)
- Demonstrate forward biasing of P-N junction diode. (W24 - Q3b(OR), 04 marks)
- Articulate avalanche breakdown in P-N junction diode. (W24 - Q4a, 03 marks)
- Explain working of Varactor diode. (S25 - Q4c, 07 marks)

Unit – IV: Transistors

Repeated Questions:

1. **Explain the working of a PNP / NPN transistor.**
 - Appeared in: **W24 (Q4b, 04 marks), W24 (Q4b(OR), 04 marks), S25 (Q4c(OR), 07 marks)**
2. **Explain transistor as a switch.**
 - Appeared in: **S25 (Q4a(OR), 03 marks), W24 (Q5a(OR), 03 marks)**

Other Important Questions:

- Draw the symbol and construction of PNP and NPN transistor with proper notation. (S25 - Q4a, 03 marks)
- Explain working of Transistor amplifier. (S25 - Q4b, 04 marks)
- Draw CB, CE, and CC transistor configuration circuits. (S25 - Q4b(OR), 04 marks)
- Explain input and output characteristic of common base (CB) configuration of P-N-P transistor. (W24 - Q4c, 07 marks)
- Explain input and output characteristic of common emitter (CE) configuration of P-N-P transistor. (W24 - Q4c(OR), 07 marks)
- Write applications of Transistor. (W24 - Q5a, 03 marks)

Unit – V: Introduction to 555 timer IC and its application

Repeated Questions:

1. **List/Explain applications of 555 timer IC.**
 - Appeared in: S25 (Q5a, 03 marks), W24 (Q5b, 04 marks)
2. **Draw and explain the pin diagram / functional block diagram of 555 timer IC.**
 - Appeared in: S25 (Q5a(OR), 03 marks), S25 (Q5c(OR), 07 marks), W24 (Q5b(OR), 04 marks)

Other Important Questions:

- Draw and Explain Astable Multivibrator. (S25 - Q5b, 04 marks)
- Draw and Explain characteristics of CE amplifier. (S25 - Q5c, 07 marks)
- Draw and Explain Monostable Multivibrator. (S25 - Q5b(OR), 04 marks)
- Sketch pin diagram of 555 timer IC and explain each pin. (W24 - Q5c, 07 marks)
- Use IC 555 to build pulse generator. (with neat sketch) (W24 - Q5c(OR), 07 marks)
