

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, APRIL - 2025**

**BASIC ELECTRONICS**

[Maximum marks: 100]

[Time: 3 Hours]

**PART – A**

**Maximum marks: 10**

**I.** (Answer *all* the questions in one or two sentences. Each question carries **2** marks)

1. Draw the symbol of inductor and transformer.
2. Write the effective capacitance of parallel combination of two capacitors.
3. Define doping.
4. Define the terms TUF.
5. Write the transistor current equation.

(5 x 2 = 10)

**PART – B**

**Maximum marks: 30**

**II.** (Answer any *five* of the following questions. Each question carries **6** marks)

1. Distinguish between Active and Passive components.
2. Explain the application of Zener diode as voltage regulator.
3. Explain the avalanche breakdown in p-n junction diode.
4. Explain the working of full wave voltage doubler.
5. Explain the working of half wave rectifier with waveforms.
6. Define current gain of three transistor configuration.
7. Derive the relation between  $\alpha$  and  $\gamma$ .

(5 x 6 = 30)

**PART – C**

**Maximum marks: 60**

(Answer *one full* question from each unit. Each full question carries **15** marks)

**UNIT – I**

- III.** (a) Explain 4 band colour coding of resistor with example. (8)
- (b) Explain the charging & discharging of a capacitor. (7)

**OR**

- IV.** (a) Explain the working principle of transformers. (8)  
(b) List the specifications of the inductor. (7)

**UNIT - II**

- V.** (a) Explain the formation of PN junction and define potential barrier. (9)  
(b) Describe the working of Varactor diode. (6)

**OR**

- VI.** (a) Explain formation of P-type semiconductor and mention its majority & minority carriers. (8)  
(b) Draw and explain the V-I characteristics of a PN junction diode in forward & reverse biased condition. (7)

**UNIT - III**

- VII.** (a) Explain the working of a center tapped rectifier and draw the waveforms with and without filter circuits. (9)  
(b) Illustrate the working of a positive clipper circuit. (6)

**OR**

- VIII.** (a) Compare half wave, center tapped and bridge rectifier (8)  
(b) Explain the working of a combination clipper with relevant waveforms. (7)

**UNIT – IV**

- IX.** (a) Describe the physical structure of BJT. (7)  
(b) Explain the input and output characteristic of BJT in CE configuration and identify the three regions. (8)

**OR**

- X.** (a) Explain the working principle of an NPN transistor. (8)  
(b) Compare three transistor configurations and write the applications of each. (7)

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