



# Daffodil International University

Faculty of Science & Information Technology  
Department of Computer Science & Engineering  
Mid Term Examination, Fall 2025

Course Code: CSE215      Course Title: Electronic Devices and Circuits  
Level:2      Term:1      Batch: 67

Time: 01:30 Hrs

Marks: 25

## Answer ALL Questions

*[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]*

|    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |
|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1. | a) | Mention the types of transistor configurations used in circuits.                                                                                                                                                                                                                                                                                                                                                                                                                                                       | CO1<br>5x1=5  |
|    | b) | State the negative temperature coefficient of resistance property of semiconductors.                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |
|    | c) | Recall the purpose of using a clipper circuit in waveform shaping.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |
|    | d) | List the advantages of silicon compared to germanium for making semiconductor devices.                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |
|    | e) | Define Ripple Factor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |
| 2. | a) | Explain with circuit and waveforms how a Full-wave bridge rectifier converts AC into pure DC.                                                                                                                                                                                                                                                                                                                                                                                                                          | CO2<br>4x2=8  |
|    | b) | Explain the working principle of NPN and PNP transistor in detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |
| 3. | a) | The two semiconductor diodes used in a rectifier circuit have forward resistance which can be considered constant at $0.1 \Omega$ and infinite reverse resistance. They supply a mean current of 10 A to a resistive load from a sinusoidally varying alternating supply of 20 V (RMS).<br>Solve for:<br>i) The resistance of the load<br>ii) The efficiency of the circuit                                                                                                                                            | CO3<br>4x3=12 |
|    | b) | In the laboratory, you are provided with a 72 V DC power supply, 16 V Zener diodes, series resistors of $2 \text{ k}\Omega$ , and a load resistor of $4 \text{ k}\Omega$ . You are required to design a voltage stabilizer to provide a stable voltage of approximately 48 V for a sensitive device using only the available Zener diodes, resistors, and power supply. Also, Solve for<br>(i) the output voltage<br>(ii) the voltage drops across series resistance and<br>(iii) the current through the Zener diode. |               |

- c) The transistor shown in figure 1 is of silicon and has  $\beta = 150$   
**Solve for:**

- i. Base Current,  $I_B$ .
- ii. Collector Current,  $I_C$
- iii. Collector-Emitter Voltage,  $V_{CE}$ .

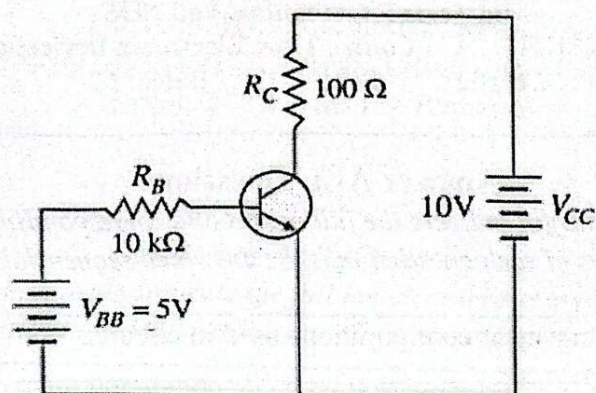


Fig. 1

*Good Luck!*