



বাংলাদেশ আর্মি ইন্টারন্যাশনাল ইউনিভার্সিটি অব সায়েন্স এন্ড টেকনোলজি, কুমিল্লা
 BANGLADESH ARMY INTERNATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY (BAIUST), CUMILLA

Mid Term Examination, Spring-2025

Department of Computer Science and Engineering

Level-1 Term-II

Course Code: EEE-121 (Conflicted Retake)

Course Title: Electronic Devices and Circuits

Credit Hour: 03

Exam Duration: 1 Hour 30 Minutes

Full Marks: 90

Notes:

- Figure on the right of each question indicates the marks for the respective question.
- Answer all the **THREE** questions.
- Course Learning Outcomes are

CO1: Explain the basic operation of diodes, BJT, MOSFET, JFET, Op-Amp, oscillators, TRIAC, DIAC and their characteristics to solve engineering problems.

CO2: Compare the characteristics of different types of diodes, transistors, OP-Amp and oscillators.

CO3: Solve various mathematical problems to meet specific design criteria.

CO4: Apply the knowledge of semiconductor diodes, BJT, MOSFET, JFET, Op-Amp etc to solve real life engineering problems such as rectification, switching and amplification.

- Discuss the operation of a silicon diode with I-V characteristics curve. CO1→C2 [15]
 - Determine V_L , V_R , I_Z & P_Z for the Zener diode network of Fig. A. Also determine these parameters (V_L , V_R , I_Z & P_Z) when $R_L = 3 \text{ k}\Omega$ CO3→C3 [15]

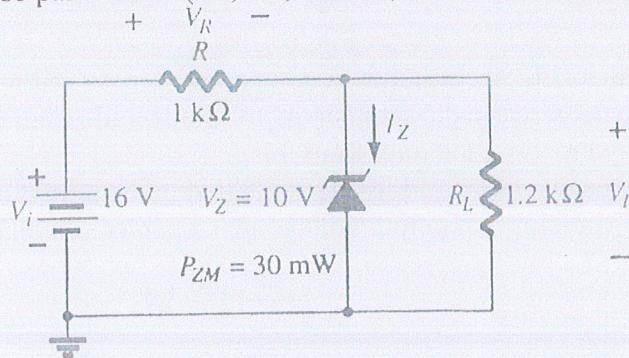


Fig. A

- Explain the operation of forward biased and reverse biased condition of semiconductor diode. CO1→C2 [15]
 - Answer any **one** question only from this section: CO3→C3 [15]
 - Determine the currents I_1 , I_2 , and I_{D2} for the network of Fig. B

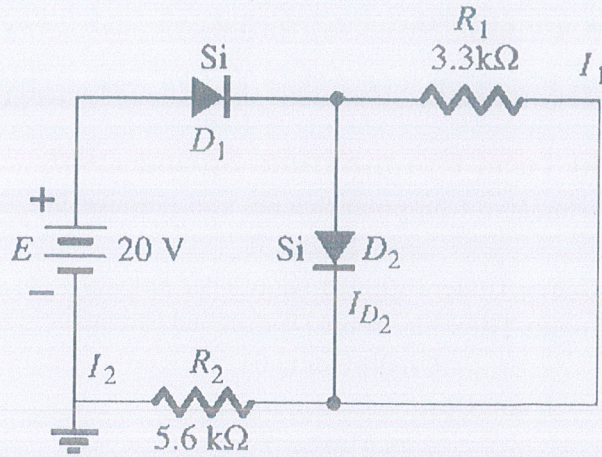


Fig. B

Or,

ii. Find the resistor R to ensure a current of 20 mA through the “on” diode for the configuration of Fig. C. Both diodes have a reverse breakdown voltage of 3 V and an average turn-on voltage of 2 V.

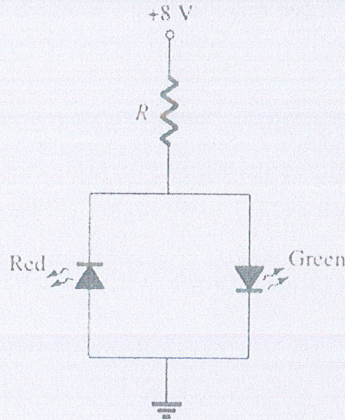


Fig. C

3. a. What are the differences between p type and n type semiconductor? CO2→C2 [15]
 Also compare between the semiconductor diode and Zener diode.
- b. Answer any **one** question only from this: CO3→C3 [15]
 i. The voltage waveform in Fig. D1 is applied in the circuit in Fig. D2.
 Sketch the waveform of output voltage v_o . Consider silicon diode.

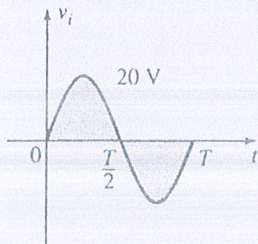


Fig. D1

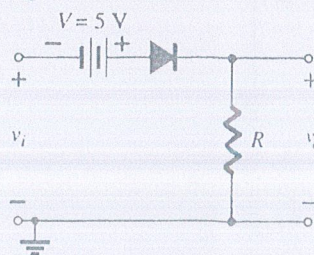


Fig. D2

Or,

ii. The voltage waveform in Fig. E1 is applied in the circuit in Fig. E2.
 Sketch the waveform of output voltage v_o .

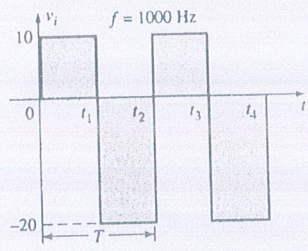


Fig. E1

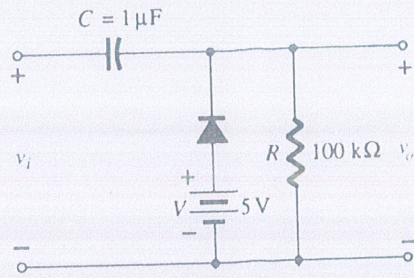


Fig. E2