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# Daffodil International University

## Faculty of Science & Information Technology

## Department of Computer Science & Engineering

**Mid Examination, Summer 2025**

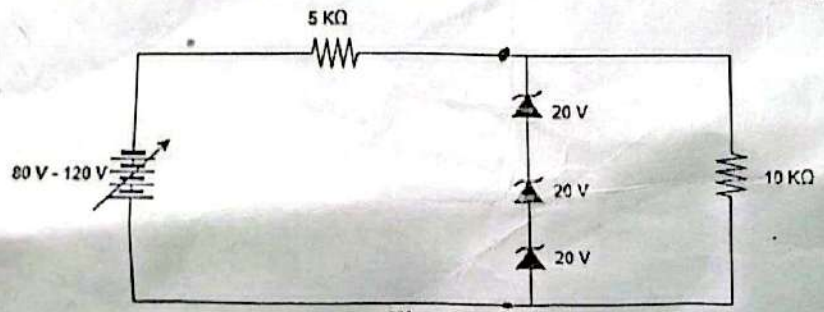
**Course Code: CSE215 Course Title: Electronic Devices and Circuits**

**Level: 2 Term: 2 Batch: 66**

**Time: 1.50 Hrs** **Full Marks: 25**

**Answer all the following questions**

***[All portions of each question must be answered sequentially]***

| | | | | |
|---|---|---|---|---|
| Q1. | *a.* | **Define** hole current. | 1 | CO1 |
| | *b.* | **Recall** collector-base current with emitter open ($I_{CBO}$). | 1 | |
| | *c.* | **Name** the components required to convert pulsating DC into pure DC. | 1 | |
| | *d.* | **Recall** the input and output characteristics of common base connection. | 1 | |
| | *e.* | **Define** a clipper circuit and a clamper circuit with respect to their function. | 1 | |
| Q2. | *a.* | **Show** by deriving the relevant expressions that the ripple factor in half-wave rectification exceeds that of full-wave rectification by approximately 2.5 times. | 4 | CO2 |
| | *b.* | **Explain** the formation of potential barrier in a pn junction with necessary figure. | 4 | |
| Q3. | *a.* | A transistor is operating in a common-emitter configuration. The collector supply voltage is 12 V, and the voltage drop across the collector resistor $R_C$ (which has a resistance of 1 kΩ) is 2 V. Given that the transistor's common-base current gain is $\alpha$=0.98. **Solve** for:<br>i) The collector-emitter voltage $V_{CE}$<br>ii) The base current $I_B$ | 4 | CO3 |
| | *b.* | A Full-Wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant at 20 Ω. If the peak inverse voltage is 150 V & load resistance is 980 Ω then **solve** it to get the followings:<br>i) Mean load current<br>ii) R.M.S. value of load current | 4 | |
| | *c.* | **Solve** for the maximum and minimum values of Zener diode current for the given circuit below. Here, three Zener diodes of 20V are connected in series in Fig.1.<br><br><br>Fig. 1 | 4 | |