Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Mid-Term Examination, Spring – 2025

Course Code: 0714-211	Course Title: Electronics I	
Section: A, B, C	Level-Term: L2-T1	Teacher's Initial: SD
Full Marks: 25	Exam Date: March 15, 2025	Time: 1.5 Hours

[There are five (05) questions, answer all of them.]
[The figures in the right-hand margin indicate the allocated marks.]
[COs represent learning outcomes of the course.]

Q1. (a) **Justify** the statement - "Semiconductor materials have a negative temperature co-efficient of resistance". CO-1 C(2) [2]

(b) Suppose you need to construct a counter for counting products in a factory setup. **Find** the type of Diode you will need for this case. Also, **explain** its working principle. CO-1 C(2) [3]

Q2. **Describe** the operation of a Diode Bridge Full Wave Rectifier with necessary diagrams. If the input to a diode bridge full wave rectifier is $20 \sin 60t$ V, **determine** the output dc voltage and PIV rating of the diodes used in the rectifier. CO-2 C(2) [5]

Q3. **Determine** I_{D1}, I_{D2} and the voltage at node **E** for the following circuit in Fig. Q3. Here, both the diodes are made of Silicon. CO-2 C(3) [5]

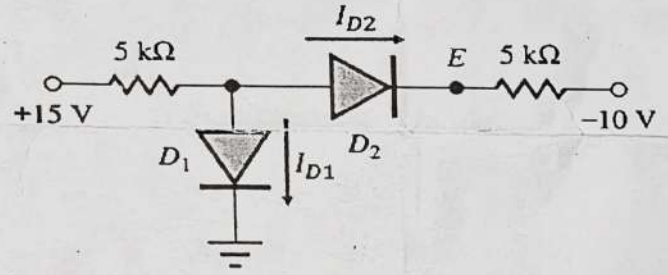

Fig. Q3

Q4. **Determine** and **sketch** the output signal of the following clipper circuit in Fig. Q4 for the given input signal. CO-2 C(3) [5]

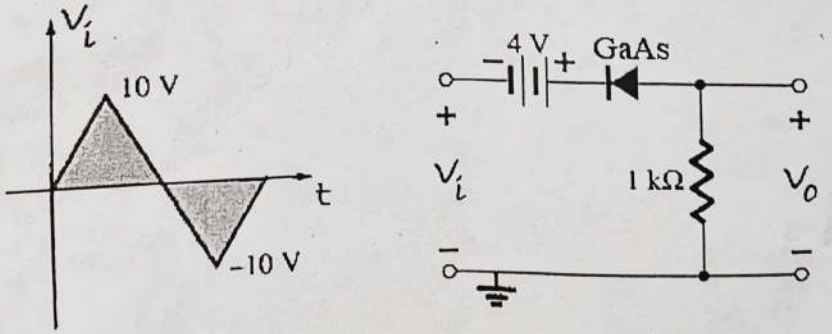

Fig. Q4

Q5. For the following circuit in Fig. Q5: CO-2 C(3) [5]

(i) **Determine** the range of V_i that will maintain V_L at 8 V and not exceed the maximum power rating of the Zener diode.

(ii) **Find** the value of V_L if V_i is within the range found in (i), but the polarity of the Zener diode is reversed in Fig. Q5.

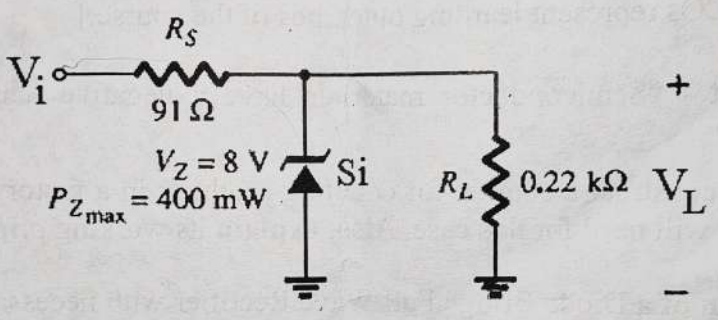

Fig. Q5