Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Mid-Term Examination, Summer'26

Course Code: 0714-211 | Course Title: Electronics I
Section: A, B, C, D, E, F, G | Level-Term: L2-T1 | Teacher's Initial: SD, KNA, KAH, MH
Full Marks: 25 | Exam Date: July 01, 2026 | Time: 1.5 Hours

[There are five (05) questions, answer all of them.]
[The second right most column indicates the COs with respective Bloom's level.]
[The right most column indicates the assigned marks.]

Q1. Suppose you need to construct a counter for counting products in a factory setup. **Which** type of Diode will you use for this case? **Explain** its working principle and how the diode is used for counting products with necessary diagrams. CO-1 C(2) [5]

Or

Describe the working principle of an n channel JFET with necessary diagrams. CO-1 C(2) [5]

Q2. **Describe** the operation of a Center-tapped Transformer Full Wave Rectifier with necessary diagrams. If the input to a Center-tapped Transformer [turns ratio 1:2] full wave rectifier made with Si diode is $120\sin 60t$ V, **determine** (i) Average dc output voltage, (ii) PIV of the diodes. CO-2 C(2) [5]

Q3. **Determine** I_{D1}, I_{D2}, I_{D3} and V_O for the following circuit in Fig. Q3. CO-2 C(3) [5]

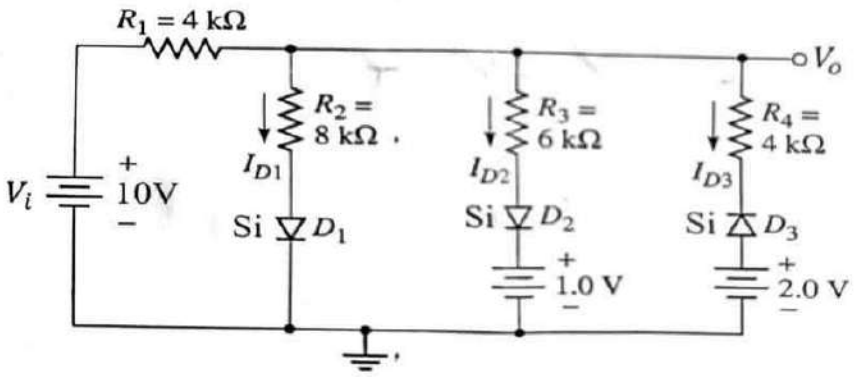

Fig. Q3

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]

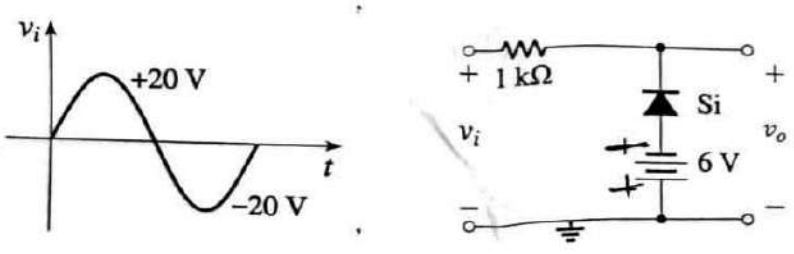

Fig. Q4

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

(i) The minimum value of R_L to ensure that the Zener Diode is in the "on" state.

(ii) The value of R_L that will establish maximum power conditions for the Zener diode.

(iii) The range of I_L when V_L is being maintained at 24V.

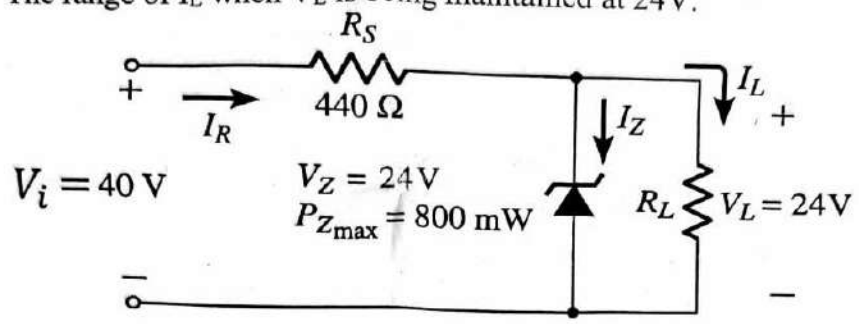

Fig. Q5