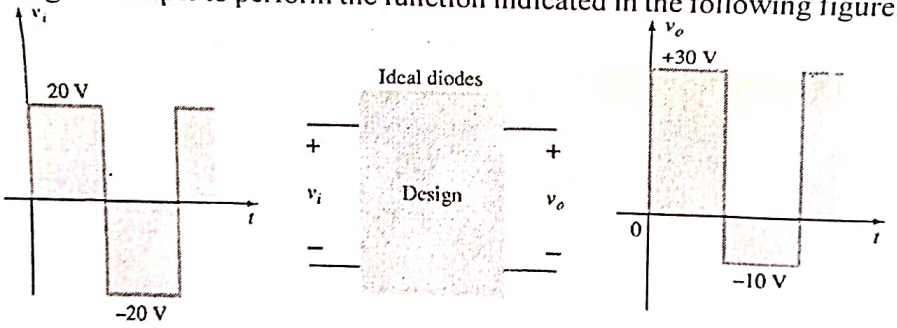
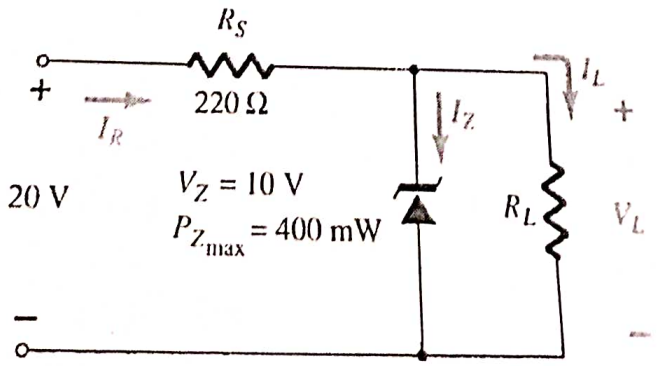
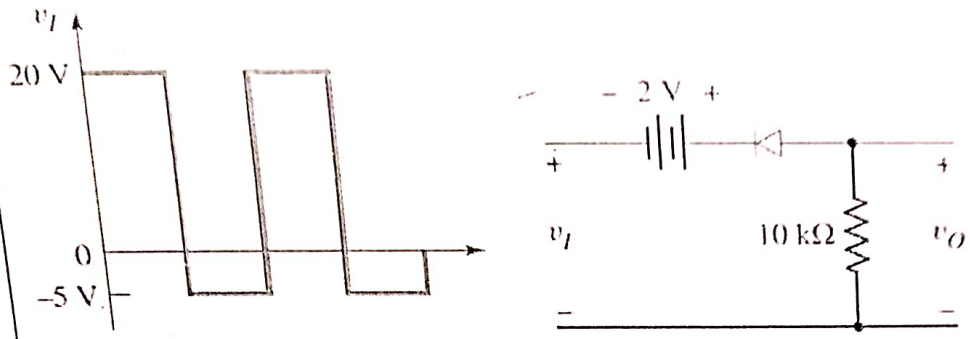
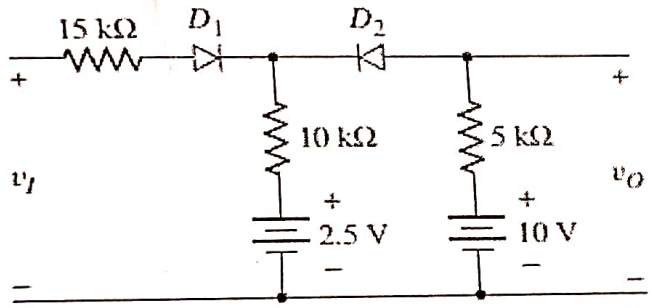
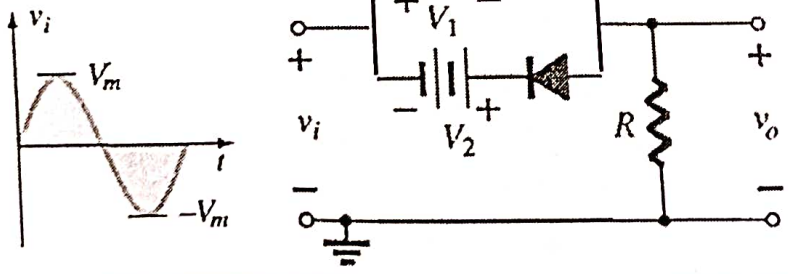
National Institute of Technology Silchar
Mid-Semester (UG) Examinations, October 2023

Subject Code: EC 101
Semester: 1
Duration: One Hour

Subject: Basic Electronics
Department: ECE, EE, CSE
Total Marks: 30

Note: All questions are compulsory.

		Marks	CO
1. (a)	Determine the rectification efficiency, ripple factor, and PIV for a half-wave rectifier circuit.	6	3
(b)	Explain the effect of doping on the depletion layer in PN Junction Diode?	2	1
(c)	What are the differences between Normal PN junction diode and Zener diode in terms of: 1. Constructional point of view? 2. Reverse bias operation?	2	1
2.(a)	Design a clamper to perform the function indicated in the following figure: 	3	3
(b)	For the following circuit (i) Determine the value of R_L that will establish maximum power conditions for the Zener diode. (ii) Determine the minimum value of R_L to ensure that the Zener diode is in the "on" state. 	4	2

(c)	Plot V_O for the following circuit considering the given input as shown below. 	3	2
3. (a)	Plot v_o versus v_I for $-30 \le v_I \le 30$ V (sinusoidal) for the following circuit. Indicate the breakpoints and give the state of each diode in the various regions of the plot. 	5	2
(b)	Draw the v_o versus v_i and v_o versus time (t) characteristics for the following clipper circuit. Consider the diode to be an ideal diode. 	5	3