

3<sup>rd</sup> SEMESTER

B.Tech.

2K21/CE/95

Sept-2022

# MID TERM EXAMINATION

COURSE CODE: EC251 COURSE TITLE: BASIC ELECTRONICS AND INSTRUMENTATION

Time: 1:30 Hours

Max. Marks: 20

Note : All questions are compulsory.  
All questions carry equal marks.  
Assume suitable missing data, if any.

Q.1 Assume that each diode in circuit shown in Fig. 1 has a cut-in voltage of 0.65 V. [M=4] [CO1]

i) If the input voltage is  $V_I = 5V$ , determine the value of  $R_1$  such that  $I_{D1}$  is one-half of  $I_{D2}$ . What are the values of  $I_{D1}$  and  $I_{D2}$ ?

ii) If  $V_I = 8V$  and  $R_1 = 2 k\Omega$ , determine  $I_{D1}$  and  $I_{D2}$ .

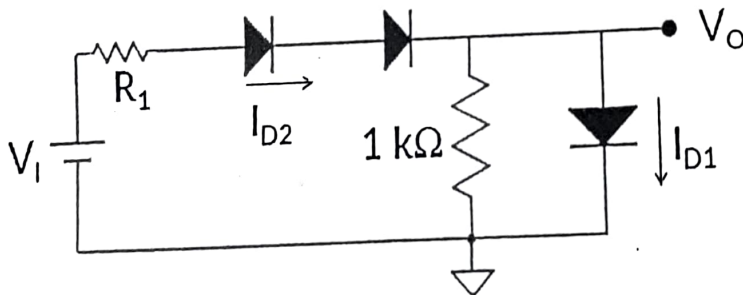


Fig. 1

Q.2 Consider the circuit shown in Fig. 2. Given that, the voltage drop across  $R_L$  is 12 V,  $V_{in}$  ranges between 20 V and 35 V. The minimum current through  $R_L$  is 100 mA and the minimum current through the Zener diode is 8 mA. Answer the following questions. [M=4][CO1]

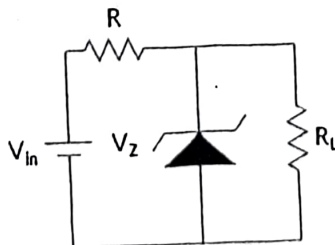


Fig. 2

- What is the rating of the Zener diode?
- What is the minimum voltage dropped across R?

- c. What is the minimum current through  $R$ ?
- d. Calculate the value of  $R_L$ .
- e. Calculate the value of  $R$ .

Q.3 a) Design a clamper circuit to perform the function given below:  
[M=2][CO1]



Fig. 3

b) Sketch  $V_o$  of the network, shown in Fig.4. [M=2][CO1]

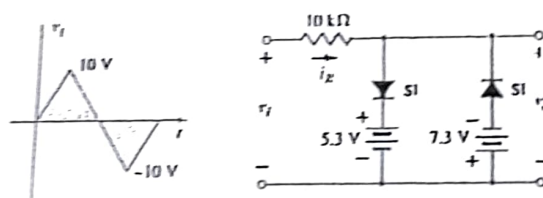


Fig. 4

Q.4 Explain the working of full wave rectifier and compute the dc value of current, RMS value of current and Peak inverse voltage of full wave rectifier.  
[M=4][CO1]

Q.5 Draw and Explain the input output characteristics of common emitter configuration of transistor.  
[M=3][CO2]

(b) Comparison between three configurations of transistor. [M=1][CO2]