

**EC - 601**  
**B.E. VI Semester**  
 Examination, June 2014  
**Industrial Electronics**  
*Time : Three Hours*

*Maximum Marks : 70*

**Note:** Attempt one question from each unit. All questions carry equal marks. Assume suitable data if necessary.

**Unit - I**

1. a) A series voltage regulator is required to supply a current of 1 A at constant voltage of 6V. If the supply voltage is 10V and the zener operates in the breakdown region, design the circuit. Assume  $\beta=50$ ,  $V_{BE} = 0.5V$  and minimum zener current = 10 mA.
- b) Explain the action of a zener voltage regulator with a neat diagram.

OR

2. a) What are the limitations of unregulated power supply? What do you understand by regulated power supply.
- b) Explain the working of SMPS with diagram.

**Unit - II**

3. a) Describe single phase full wave controlled rectifier with inductive load. Draw the circuit diagram and waveform.
- b) Write the different turn on methods of SCR.

OR

4. a) Describe single phase half wave controlled rectifier with resistive load with waveform and circuit diagram.

- b) What is commutation? Describe operation of class C commutation with circuit diagram.

**Unit - III**

5. a) Draw the V-I characteristic of a TRIAC and describe four operating mode of TRIAC.
- b) Draw neat sketch of IGBT showing its construction detail. Also draw its V-I characteristic.

OR

6. a) Draw the V-I characteristic of DIAC. Write four operation of it.
- b) What do you understand by power transistor? Draw and explain the switching characteristic of power transistor.

**Unit - IV**

7. a) What is an OP-AMP. List the four basic building blocks of an OP-AMP.
- b) Draw Wien bridge oscillator using OP-AMP. Explain its working.

OR

8. a) Explain in detail frequency response of OP-AMP.
- b) Write a short note on power supplies using OP-AMP.

**Unit - V**

9. a) Write the advantages and disadvantages of PLC over conventional relay controllers.
- b) Discuss about the programming formats of PLC.

OR

10. a) Draw the schematic of input modules of PLC and explain them.
- b) Draw the functional block diagram of PLC and explain it.