

Roll No .....

**EC - 601**

**B.E. VI Semester**

Examination, December 2015

**Industrial Electronics**

**Time : Three Hours**

**Maximum Marks : 70**

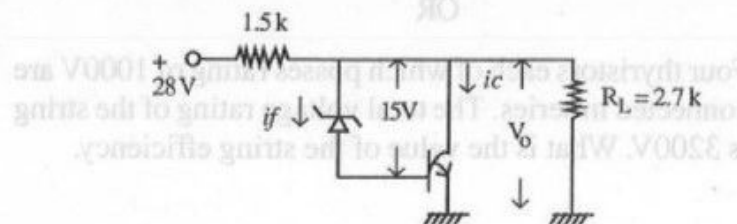
- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.  
ii) All parts of each questions are to be attempted at one place.  
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.  
iv) Except numericals, Derivation, Design and Drawing etc.

**Unit - I**

1. a) Draw fullwave rectifier diagram and discuss it in brief.  
b) What do you know about SMPS?  
c) What is a switching regulator?  
d) Describe working of basic Op-Amp shunt regulator circuit.

OR

Calculate the O/P voltage and current in the following current.



**Unit - II**

- What is SCR? Discuss it in brief.
- Discuss types of commutation.
- Compare between thyristor and transistor.
- In a unijunction transistor the value of the base current = 2mA,  $V_{BB} = 15V$ . Find the value of the intrinsic stand off ratio if  $R_{BI} = 6k\Omega$ . Determine also value of peak voltage.

OR

Find the power rating of an SCR if the rms value of current through the SCR is 50 amp when connected across a voltage  $230 \sin 314 t$  supply.

**Unit - III**

- What is triacs and diacs?
- How IGBT works? Explain.
- Compare between power MOSFET and power transistor.
- Calculate the cycle surge current rating and  $I^2t$  rating of an SCR having half cycle surge current rating of 2000 amperes for 50Hz supply.

OR

Four thyristors each of which possess rating of 1000V are connected in series. The total voltage rating of the string is 3200V. What is the value of the string efficiency.

**Unit - IV**

- What is CMRR in Op-Amp?
  - What is the application?
  - What is a tracking regulator?
  - In the astable mode of operation of an IC555 timer if  $R_1 = 1.5 k\Omega$   $R_2 = 2.2 k\Omega$ . Calculate the duty cycle.

OR

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.

**Unit - V**

- What are the advantages of PLC over conventional relays?
  - What are the factors for selecting PLC?
  - Discuss the role of microprocessors in PLC memory.
  - Discuss in detail the process control application of the PLC.

OR

Discuss ladder logic language with suitable example.

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