Total No. of Questions : 5] *[Total No. of Printed Pages : 3*

Roll No .....

EC-601

B.E. VI Semester

Examination, December 2016

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 question 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.

1. a) Write advantages of voltage regulators.

   b) How one can define rectifier efficiency. Give its mathematical expression.

   c) What do you understand by pulsating dc voltage, draw its waveform and how one can remove pulsations.

   d) Explain the working principle of transistorised shunt voltage regulator along with a suitable circuit diagram.

   OR

   Compare linear power supply and SMPS. Also draw their block diagrams.

a) List the different methods of turning off SCR.

b) Write the equation of forward current in SCR, explain each term.

c) Define ON state voltage and finger voltage.

d) The d*v*/*dt* rating of the SCR, as shown in the figure 1, is 100V/µs. Determine the minimum value of the capacitance C that is required so that no erratic turn-on due to *dv*/*dt* occurs. When power is switched on by closing the switch S.

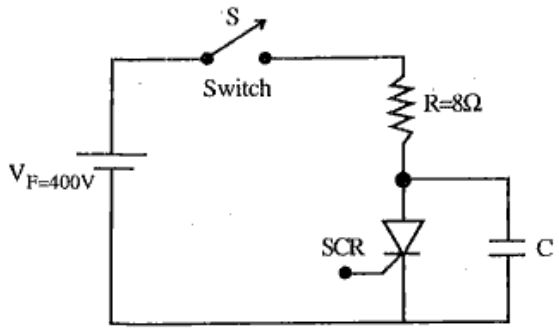

Figure 1

OR

Explain the class E commutation (External pulse commutation) along with circuit diagram and waveform.

a) What is the use of Snubber circuit?

b) List the causes of power loss in semiconductor devices.

c) List the advantages of Triac over antiparallel SCR pair.

d) Explain the working principle of Diac along with its V-I characteristics.

OR

Explain the switching characteristics of a power MOSFET along with waveforms.

4. a) Describe each pin of (µA741) Op-Amp.

b) Define the virtual ground.

c) List the classification of Op-Amps.

d) Derive the equation for V_{out} for a summing amplifier (Inverting mode). Also draw its circuit diagram.

OR

Explain the working of relaxation oscillator using op-amp, also draw its waveforms.

5. a) Why memories are used in PLC?

b) Why PLCs are better as compared to relay controllers?

c) What do you mean by ladder diagram?

d) Explain about the sequence of operations in a PLC. Describe each of them.

OR

What do you mean by input interface module. List its functions in a given PLC.

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