Roll No .....

EC - 601

B.E. VI Semester

Examination, June 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 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.

1. a) Explain the difference between shunt and series regulator.
   b) What is UPS? How it is classified?
   c) Draw the circuit of buck and buck-boost regulator.
   d) What is switching regulator? How is it classified? Explain the functions of each class.

OR

What is switched mode power supply? What can be possible configurations? Draw their circuits.

2. a) Name the various commutation methods for SCR.
   b) Name the various causes of overvoltages in thyristors.
   c) Compare thyristors and transistors.
   d) Draw and explain various triggering methods of SCR circuits.

OR

Fifteen thyristors are used in a string to withstand a voltage of 20kV. The maximum leakage current and recovery change differences of thyristors are 12mA and 180×10^{-6}C respectively. Each thyristor has a stabilisation resistance of 50kΩ and capacitance of 0.6×10^{-6}F. Find

i) Maximum steady state voltage rating of each thyristor,
ii) Steady state derating factor
iii) Maximum transient state voltage derating factor and
iv) Transient state derating factor

3. a) What is the difference between a Diac and a Triac?
   b) Define Quadracs.
   c) Explain IGBT.
   d) How are power diodes classified? Discuss the features of each category. Write down the applications of a power diode.

OR

With suitable diagrams explain power transistor and power MOSFET.

4. a) Draw the circuit diagram for function generator.
   b) What is relaxation oscillator?
   c) Explain the terms CMRR, unity gain frequency and output offset voltage.
   d) Draw the circuit of one pole low pass and one pole high pass filter using op-amp and derive the formulas for their gain.

OR

Explain op-amp as rectangular to triangular pulse converter and vice versa.

5. a) What are the factors used for selection of PLC?
   b) Give a comparison of PLC with process control computer system.
   c) What is the role of microprocessor in PLC?
   d) Explain with functional block diagram the working, applications, advantages and disadvantages of PLC.

OR

Explain a simple process control applications of PLC.

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