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**EC-601****B.E. VI Semester**

Examination, June 2017

**Industrial Electronics****Time : Three Hours****Maximum Marks : 70**

**Note:** i) Attempt any five questions.  
ii) All question carry equal marks.

1. Discuss the working of a Buck-boost regulator with suitable diagram.
2. In a full-wave rectifier, the load resistance is  $5k\Omega$ . The input voltage is  $200\sin(100\pi t)$ . Calculate the average current, rms current, form factor and ripple factor.
3. Discuss the constructional details and dynamic characteristics of a SCR.
4. A three-phase full-wave controlled rectifier is fed from 400V, 50Hz supply. The average load current is 150A and the load is highly inductive. The firing angle is  $60^\circ$ . Calculate the output power, average and peak current flows through the SCR. Also find the PIV rating of the SCR.

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5. Classify the IGBT structures available in the market and discuss any one structure along with its characteristics.
6. Explain the constructional details and working of the enhancement type power MOSFET. Why VMOS/UMOS structures able to withstand higher power rating.
7. Discuss the working of a Wien bridge oscillator using Op-Amp with appropriate diagram and derive the minimum condition for getting the sufficient loop gain for oscillation.
8. Answer any four of the following:
  - a) What is the function of Bleeder Resistor? Explain.
  - b) Discuss the SCR overvoltage protection circuit.
  - c) Compare the features of 3-layer and 5-layer DIAC.
  - d) Draw the circuit diagram and response of the second-order high pass active filter using Op-Amp.
  - e) What programming languages are used to program a PLC?
  - f) What are the factors to be considered when choosing a PLC?

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