Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE/ETE) (E-I 2011 Onwards) (Sem.–6)

INDUSTRIAL ELECTRONICS

Subject Code : BTEC-903

Paper ID : [A2391]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Q1. Answer briefly :

(a) What is the physical significance of industrial electronics?

(b) What is an inverter? List a few industrial applications of inverters.

(c) Define firing angle, extinction angle, and conduction angle by showing appropriate waveform.

(d) What is pulse width modulation? List the various PWM techniques.

(e) What are fast recovery diodes? What are its applications?

(f) Why TRIAC is preferred over DIAC?

(g) What is intrinsic stand-off ratio?

(h) Discuss the advantages of AC motors over DC motors.

(i) The reverse biased junction capacitance of an SCR is 60 picofarads. The device can be turned on if the charging current flowing through the junction capacitor is 25 mA. Calculate the dV/dt capability of the device.

(j) Explain the basic difference between voltage-source inverter and current-source inverter.

SECTION-B

Q2. What is UJT? Explain the working of an oscillator employing an UJT.

Q3. Outline the various methods for reduction of harmonics in inverters.

Q4. What is the need of ac voltage controllers? Discuss the different types of ac voltage controllers. Which one of these is preferred and why?

Q5. Explain in detail the operation of a single phase semi converter bridge rectifier with RLE load. Describe with circuit diagram and appropriate waveforms.

Q6. What are equalization circuits? Why these are needed for series connected SCRs?

SECTION-C

Q7. Draw and explain static V-I characteristics of SCR with the help of its operating modes.

Q8. Describe the basic principle of choppers. Also explain the working principle of step-up and step-down choppers.

Q9. Draw and explain three-phase bridge inverter using 180° mode VSL Draw its waveforms upto six steps along with relevant circuits. Also draw waveforms for Vab, Vbc, Vca.