[03 – 3123]

III/IV B.E. DEGREE EXAMINATION

First Semester

Mechanical Engineering

INDUSTRIAL ELECTRONICS

(Common with Marine Engineering and Naval Architecture Engineering)

(w.e.f. admitted batch of 2010–2011)

Time : Three hours Maximum : 70 marks

First question is compulsory.

Answer any FOUR questions from the remaining.

All questions carry equal marks.

1. (a) What is meant by doping in semi conductors? What is the need for doping?

   (b) Define the knee voltage of a PN junction diode.

   (c) What are the differences between open loop and closed loop systems?

   (d) Convert $(197)_{10}$ to octal and Hexadecimal.

   (e) Write DeMorgan's laws.

(f) Represent $(97)_{10}$ in BCD and gray codes.

(g) What determines that a microprocessor is an 8,16 or 32 bit?

2. (a) With a neat diagram, explain the working of a PN junction diode in forward and in reverse bias? (10)

(b) State the applications of PN junciton diode. (4)

3. (a) Explain the working of an NPN transistor with a neat diagram. (10)

(b) What are the differences between PNP and NPN transistor. (4)

4. (a) What is a rectifier? Explain the Bridge rectifier with a neat diagram. (9)

(b) Write the postulates and theorems of Boolean algebra. (5)

5. (a) Discuss about different types of polyphase rectifiers. (7)

(b) Explain the resistane welding in detail. (7)

6. (a) Convert the given decimal number into Binary and Hexa decimal $(125.48)_{10}$. (4)

(b) Perform the binary subtraction using 2's complement method. (10)

(i) $(98)_{10} - (123)_{10}$

(ii) $(47)_{10} - (25)_{10}$.

7. (a) Design a Full adder circuit with basic gates and draw the logic diagram. (8)

(b) What are the types of memories? Explain EPROM. (6)

8. (a) Design a modulo-6 counter with D-flip flops. (7)

(b) Explain the architecture of 8085 with a neat diagram. (7)