

**II B.Tech I Semester Supplementary Examinations, May 2005**  
**BASIC ELECTRONICS**  
( Common to Mechanical Engineering, Mechatronics and Production Engineering)

**Time: 3 hours**

**Max Marks: 70**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. (a) Define
  - i. Drift current
  - ii. Diffusion current
  - iii. Diffusion capacitance and
  - iv. Transition capacitance as applied to semi conductor diodes.(b) Draw half wave rectifier circuit with inductor filter and explain its operation.
2. (a) Explain the various current components in a p-n-p transistor with forward biased emitter junction and reverse biased collector junction.  
(b) Explain the V- I characteristics of SCR
3. (a) An amplifier with open loop voltage gain  $2000 \pm 150$  is available. It is necessary to have an amplifier whose voltage gain varies by no more than  $\pm 0.2$  percent. Find the average transmission factor  $\beta$  of the feedback network and gain with feedback  $A_f$ .  
(b) List five characteristics of an amplifier which are modified by negative feed back. Explain in detail.
4. (a) Draw the block diagram of timer system. Briefly explain the constituents of industrial timing circuits.  
(b) Briefly explain all types of resistance welding.
5. (a) Give the principle of Induction heating. What are the merits of Induction heating.  
(b) Explain the application of Induction heating for
  - i. surface hardening of steel.
  - ii. Annealing of brass and iron.
6. (a) What is the necessity of time base in cathode ray oscilloscope? Draw any one type of time base circuits employed in CRO and explain how it produces the saw-tooth wave  
(b) List the applications of C R O.
7. (a) Describe the construction and working principle of Infrared pyrometer with neat sketch.

- (b) Explain how spiral type bimetallic strip is used to measure the temperature.
- 8. (a) Explain Piezo-electric effect in crystals.
- (b) Explain the method of generating ultra sonic waves using Piezo- electric generator.
- (c) Explain the application of ultrasonic waves in dispersing metals.

★ ★ ★ ★ ★