

**II B.Tech II Semester Supplementary Examinations,
November/December 2005
BASIC ELECTRONICS
(Common to Metallurgy & Material Technology and Production
Engineering)**

Time: 3 hours**Max Marks: 80**

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

1. (a) With the help of neat diagrams explain the two biasing techniques of a diode. Draw the V-I characteristics and indicate V_γ .
(b) Obtain the static and dynamic resistances of the p-n junction germanium diode, if the temperature is 27°C and $I_o=1\mu\text{A}$ for an applied forward bias of 0.2 V. Assume $\bar{k} = 1.38 \times 10^{-23} \text{ J}/^\circ\text{K}$. [8+8]
2. (a) Explain how the transistor acts as an amplifier.
(b) Define
 - i. Emitter efficiency
 - ii. Transport factor
 - iii. Large signal current gain and
 - iv. Emitter resistance. [6+10]
3. (a) Draw the block diagram of a general purpose feedback system and prove that, $A_f = \frac{A}{1+A\beta}$
(b) Draw the schematic block diagram of Oscillator and explain its operation. [8+8]
4. (a) Classify the timers according to the function and the technique used to achieve the industrial timing.
(b) List the electronic welding controls used in resistance welding. [8+8]
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. [8+8]
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. [8+8]
7. (a) What is RVDT? How it different from LVDT? Explain the working principle of RVDT with neat diagram.

- (b) Explain the concept of parallel plate capacitive transducer. [8+8]
8. (a) What are ultrasonic waves? Give range of wave length of ultrasonic waves in air, liquids and solids.
- (b) Which property of ultrasonic waves made use of them in various applications
- (c) Discuss briefly the methods of generation of ultrasonic waves [5+5+6]

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