

**2103**

**B. E. 4th Semester (ECE) Examination,  
May-2010**

**ANALOG ELECTRONICS**

**Paper-EE-202-E**

*Time allowed : 3 hours ] [Maximum marks : 100*

*Note : Attempt any five questions.*

1. (a) Draw and explain energy band diagram of
  - (i) Conductor
  - (ii) Semiconductor. 10
- (b) Draw and explain clipper and clamper circuit. 10
  
2. (a) A germanium diode has reverse saturation current of  $30\mu\text{A}$  at  $125^\circ\text{C}$ . What are its dynamic forward and reversed resistance for a bias of  $0.2\text{V}$  at this temp. 10
- (b) Draw a bridge rectifier and derive the expression for its o/p voltage and Ripple factor. 10
  
3. (a) Explain working of a voltage multiplier. 10
- (b) Derive the expressions for  $\alpha$ ,  $\beta$ ,  $I_c$  and  $I_E$  in common emitter configuration for an MPN transistor. 10

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**P.T.O.**

4. (a) Given  $I_E = 2.5\text{mA}$ ,  $h_{fe} = 140$ ,  $h_{oe} = 20\ \mu\Omega$  and  $h_{ob} = 0.5\ \mu\Omega$ . Determine.
- The Common Emitter Hybrid Equivalent circuit
  - The base  $\gamma_e$  model. 10
- (b) Explain self bias configuration for JFET and derive the expression for  $I_D$ ,  $V_D$ . 10
5. (a) Explain enhancement and depletion type of MOSFETS. 10
- (b) Input impedance to a common emitter transistor amplifier is  $1.2\text{ku}$ ,  $\beta = 140$ ,  $r_o = 50\text{ku}$ ,  $R_L = 2.7\text{kn}$ . Determine :
- $\gamma_e$
  - $I_b$  if  $V_i = 30\text{mV}$
  - $I_C$
  - $A_i$
  - $A_v$  10
6. (a) Draw the equivalent circuit for one stage RC coupled CE Amplifier valid for high frequency. 10
- (b) Explain working of a series and shunt regulator. 10

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7. (a) Explain Foldback Limiting Series Regulator used in power supply. 10
- (b) Design a 24V power supply using a 3 pin regulator. 10
8. Write short notes on : 20
- (i) Peak Detector
  - (ii) Miller's Theorem
  - (iii) Thermistor Compensation
  - (iv) VVR.