

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER – I • EXAMINATION – WINTER 2012**

**Subject code: X 11101****Date: 23/01/2013****Subject Name: Basic Electronics****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Classify the clipper circuit & discuss with necessary waveforms. **07**  
(b) Define the following terms. **07**  
1) Electron Volt (eV).  
2) Thermal resistance.  
3) Ripple factor.  
4) Stabilization.  
5) Fermi Level.  
6) Barrier Potential.  
7) PIV.
- Q.2** (a) Draw & explain the input & output characteristics of a CB transistor configuration. **07**  
(b) Compare intrinsic & extrinsic semiconductor. **07**  
**OR**  
(b) Explain the half wave rectifier with necessary circuit diagram & derive the rectifier efficiency. **07**
- Q.3** (a) Explain transistor as a switch with circuit diagram. **07**  
(b) What are the requirements of biasing circuit? Enlist the different biasing method & explain any one in brief. **07**  
**OR**
- Q.3** (a) Compare zener & avalanche breakdown. **07**  
(b) Derive expressions for  $A_i$ ,  $R_i$ ,  $A_v$ , &  $Y_o$  in terms of CE h-parameters for emitter follower circuit. **07**
- Q.4** (a) Give the construction detail of JFET and its characteristics. Why JFET is called voltage controlled device. **07**  
(b) Define stabilization factors:  $S$ ,  $S'$  &  $S''$ . Also derive the expression for  $S$  &  $S'$  for self bias transistor circuit. **07**  
**OR**
- Q.4** (a) Answer the followings. **07**  
1) A full wave rectifier uses two diodes the internal resistance of each diode may be assumed to be 20 ohm constant. The transformer rms secondary voltage from center tap to each end of secondary is 50 V and load resistance is 980 ohm. Find the main load current & rms value of load current.  
2) For circuit shown in the Fig. 1. Determine output voltage, the voltage drop across series resistance & the current through the zener diode.
- Q.4** (b) Explain the concept of potential barrier & Bohr's postulates. **07**

- Q.5** (a) Fig. 2 shows a silicon transistor biased by feedback resistor method. **07**  
Determine the operating point for  $\beta = 100$ .
- (b) Sketch the cross section of P Channel enhancement MOSFET & discuss in brief. **07**

**OR**

- Q.5** (a) State the role of voltage regulators in power supplies? Discuss the working of a series voltage regulator. **07**
- (b) Draw circuit of idealized class B push pull power amplifier & explain its operation with necessary waveforms. **07**

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