

## FACULTY OF ENGINEERING

B.E. 2/4 (EE/Inst.) I – Semester (Main) Examination, December 2013

Subject: Electronic Engineering – I

Time: 3 Hours

Max.Marks: 75

*Note: Answer all questions from Part A. Answer any five questions from Part B.***PART – A (25 Marks)**

1. A silicon diode has reverse saturation current of  $2.5\mu\text{A}$  at  $300^\circ\text{K}$ . Find forward voltage for a forward current of  $10\text{ mA}$ . (2)
2. What is early effect in a BJT? (2)
3. Give reasons why common emitter configuration is widely used in amplifier circuits. (2)
4. What is operating point? Explain its physical significance? (3)
5. Define pinch-off voltage for a JFET. (3)
6. Compare DIAC and TRIAC. (3)
7. List out the salient features of low frequency BJT amplifier circuits. (3)
8. What are small signal amplifiers? (3)
9. State Millers theorem. (2)
10. Why a bypass capacitor is used on the bottom of each secondary winding in a transformer coupled amplifier. (2)

**PART – B (50 Marks)**

- 11.(a) What is a rectifier? Explain the operation of a full wave centre-tapped rectifier with necessary diagrams and waveforms. (6)  
(b) List out the differences between half wave, full wave and bridge rectifiers. (4)
- 12.(a) Explain the temperature dependence on V-I characteristics of a p-n junction diode in forward and reverse bias conditions. (6)  
(b) Differences between avalanche breakdown and zener breakdown. (4)
- 13.(a) Design a self bias circuit for an NPN silicon transistor having  $h_{fe} = 100$  and  $V_{BE} = 0.6\text{ V}$ . The desired Q point is  $V_{CE} = 5\text{V}$  and  $I_c = 1\text{mA}$  and  $S \leq 8$ . Assume  $V_{CC} = +10\text{V}$  and  $R_E = 1\text{k}\Omega$ . Draw the circuit diagram with all the component values. (7)  
(b) Explain transistor as an amplifier. (3)
- 14.(a) Explain the construction, operation and characteristics of depletion mode MOSFET. (7)  
(b) Draw the small signal equivalent model of JFET. (3)
- 15.(a) Explain the construction, working and characteristics of a SCR. (7)  
(b) How do you classify amplifiers? (3)
- 16.(a) Explain the need for cascading amplifiers. What are the different types of cascading? (6)  
(b) Explain distortion in amplifiers. (4)
17. Draw and explain in detail the working and frequency response curve of RC – coupled amplifier. (10)