

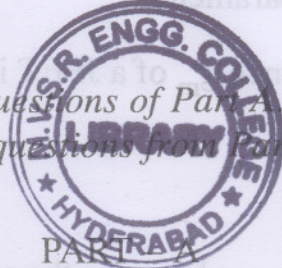


**FACULTY OF ENGINEERING**  
**B.E. 2/4 (E & EE/Inst.) I Semester (Main) Examination, December 2010**  
**ELECTRONIC ENGINEERING – I**

Time : 3 Hours]

[Max. Marks : 75

*Note : 1) Answer all questions of Part A.  
2) Answer five questions from Part B.*



(25 Marks)

1. Determine ac resistance for a semiconductor diode having a forward bias of 200 mV and reverse saturation current of  $1\mu\text{A}$  at room temperature. 3
2. What do you mean by the terms 'forward-recovery time and reverse-recovery time' of a junction diode? 2
3. What are 'emitter injection efficiency' and 'base transport factor' and how do they influence the transistor operation? 3
4. What do you mean by punch through effect? 2
5. How the forced turn-off of an SCR is different from natural turn off? 3
6. Differentiate between diac and triac. 2
7. State the Miller's theorem. 2
8. Give the difference between cascading and cascade configuration. 3
9. List out the classification of amplifiers. 2
10. Define the terms lower cut-off frequency, upper cut-off frequency and Band width. 3

PART – B

(50 Marks)

11. a) A single phase full-wave rectifier makes use of  $\pi$ -section filter with two  $10\mu\text{F}$  capacitors and a choke of 10 H. The secondary voltage is  $280\text{ V}_{\text{rms}}$  with respect to centre tap. If the load current is 100 mA, determine the dc output voltage and percentage ripple in the output. Assume supply frequency of 50 Hz. 7
- b) Explain about the temperature dependence of P-N diodes. 3

12. a) In a self biased CE amplifier circuit comprising  $R_2 = 90 \text{ k}\Omega$ ,  $R_1 = 10 \text{ k}\Omega$ ,  $V_{cc} = 22.5 \text{ V}$ ,  $R_c = 5.6 \text{ k}\Omega$  and  $R_E = 1.0 \text{ k}\Omega$  and a BJT with  $B_o = 55$  and  $V_{BE} = 0.7 \text{ V}$ . Find the operating point and stability factor  $S$  of the circuit. 8

b) List out the limitations of h-parameters. 2

13. a) Prove that the transconductance  $g_m$  of a JFET is given by

$$g_m = \frac{2}{|V_p|} \sqrt{I_{DS} \cdot I_{DSS}}$$

b) What is the significant difference between the construction of an enhancement type MOSFET and a depletion type MOSFET? 6

14. a) Explain briefly about various coupling schemes used in cascade amplifiers. 4

b) Discuss the operation of the High input impedance transistor circuit. 5

15. a) In an amplifier the maximum voltage gain is 1500 and occurs at 1 kHz. It falls to 1060.5 at 20 Hz and 20 kHz. Determine (i) lower cut-off frequency (ii) upper cut-off frequency and (iii) band width. 5

b) List out the merits, demerits and applications of transformer coupled transistor amplifier. 5

16. a) Explain why MOSFETs are never connected or disconnected in the circuit when power is ON. Draw the diagram of EMOSFET. 6

b) Bring out the differences between JFETs and MOSFETs. 4

17. Write short notes on **any two** of the following : 10

a) UJT

b) Difference amplifier

c) CC amplifiers.