

FACULTY OF ENGINEERING
B.E. 2/4 (CSE) I Semester (New) (Main) Examination, December 2011
BASIC ELECTRONICS

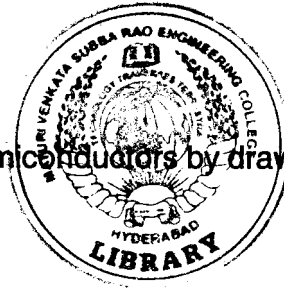
Time: 3 Hours]

[Max. Marks: 75

Note : Answer all questions from Part A. Answer any five questions from Part B.

PART – A

(25 Marks)



1. Differentiate between conductors, insulators and semiconductors by drawing energy level diagrams. 3
2. What are the applications of Hall effect ? 2
3. What is the maximum conversion efficiency of a Full wave Rectifier and on what factors does it depend upon ? 3
4. Why is that a FET has a high input impedance and is known as a unipolar device. 3
5. Define regulation and explain about the best regulation numerically. 3
6. Draw the frequency versus gain characteristics of an amplifier with and without negative feedback. 3
7. Draw the equivalent circuit of a crystal to be used in an oscillator. 2
8. What are the important characteristics of an LCD ? 2
9. What is mobility ? How does it vary with the electric field ? 2
10. Draw the truth table of an exclusive OR gate. 2

PART – B

(50 Marks)

11. a) Explain Hall effect. Explain the significance of all the terms used in the expression for Hall Voltage.
- b) A HWR circuit supplies 100 mA dc to a 250 Ω load. Find the DC output voltage, PIV rating of the diode and the rms voltage of the transformer secondary.

12. a) Draw the hybrid equivalent circuit of an npn-BJT in CE configuration. Derive expressions for A_v , A_i , R_i and R_o .
- b) Compare the characteristics of a BJT with those of FET.
13. a) Draw a neat circuit diagram of an RC phase shift oscillator using BJT and explain its working principle.
- b) In which type of Electronic circuits, positive and negative feedback are used ? Show by neat sketches the four types of connections of negative feedback amplifiers, indicating the advantages of each type of amplifier.
14. a) Describe the characteristics of an ideal op-amp. A 5 mv, 1 KHz sine signal is applied to the input of an op-amp integrator for which $R_1 = 100 \text{ k}\Omega$, and $C = 1 \text{ }\mu\text{F}$. Find the output voltage.
- b) State and prove De-Morgan's theorems. Discuss the working of half adder and full adder and give their truth tables.
15. a) What is an LVDT ? By means of a neat sketch. Explain how a LVDT is used in measurements.
- b) Give a block diagram of a CRO, explaining the importance of each block.
16. a) In connection with rectifies define ripple, efficiency and regulation for HWR and FWR circuits.
- b) Explain about an Instrumentation amplifier.
17. Write short notes on **any three** :
- a) Universal gates
- b) Crystal oscillators
- c) UJT
- d) IC regulators.