

**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  $\Omega$  load. Find the DC output voltage, PIV rating of the diode and the rms voltage of the transformer secondary.



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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.