



**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.

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.

**FACULTY OF ENGINEERING****B.E. 2/4 (CSE) I-Semester (Main) Examination, November / December 2012****Subject : Data Structures Using C++****Time : 3 Hours****Max. Marks: 75****Note:** Answer *all* questions of Part - A and answer any *five* questions from Part-B.**PART – A (25 Marks)**

1. What is the time complexity of insertion into an array? Compare the time complexity with insertion into linked list. (3)
2. What is a sparse matrix? Explain the sparse matrix representation. (3)
3. What are the applications of stacks? (2)
4. Evaluate the given post fix evaluation:  $6\ 2\ 3\ +\ -\ 3\ 8\ 2\ /\ +\ * \ 2\ 3\ /\ +$   
What is the stack top after evaluating the given expression? (2)
5. Write down the code snippet to count the number of nodes in a single linked list. (3)
6. What is the graph called in which every node  $u$  in  $G$  is adjacent to every other node  $v$  in  $G$ ? (2)
7. What is minimum and maximum number of elements in an  $m$ -way search tree of height  $h$ ? (2)
8. What is meant by minimum-cost spanning tree? (2)
9. Explain LL and LR rotation to balance the AVL tree with an example. (3)
10. Consider an array of 100 sorted numbers. Atmost how many searcher are needed to search an element using Binary Search. Justify your answer. (3)

**PART – B (5x10=50 Marks)**

11. Write a function to add two polynomials using arrays. (10)
- 12.(a) Convert the given infix expression into postfix expression and explain the representation of stacks used for conversion.  $A \uparrow B * C - D + E / (F + (G + H))$  (5)  
(b) What is a circular Queue? Explain the need of taking an array of size one more than the size of Queue. (5)
13. Write a function to insert and delete the element in a sorted single linked list. (10)
- 14.(a) Consider an array of size  $N - 1$  that contains all numbers except one. Design an algorithm that finds the missing number. (5)  
(b) What is BFS and DFS? Explain with an example. (5)
15. Consider the Hash function  $H(i) = (2i + 5) \% 11$  Insert the keys 3, 8, 102, 23, 4, 10, 9, 12, 44, 23 and construct the 11 item hash table by using Dynamic hashing. (10)
16. Construct a B-tree of order 5 by inserting the following items one by one. (10)  
C N G A H E K O M F W L T Z D P R
17. Write short notes on : (5+5)  
(a) Splay trees (b) Threaded Binary Trees

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