



Code No. : 6207

FACULTY OF ENGINEERING
B.E. 2/4 (CSE) I Semester (Suppl.) Examination, July 2010
LOGIC AND SWITCHING THEORY

Time : 3 Hours]

[Max. Marks : 75

Note : 1) Answer all questions from Part A.

2) Answer any five questions from Part B.

PART – A

25

1. Convert the decimal number 6789 to hexa decimal number and convert the hexa decimal number to its decimal equivalent. 2
2. What do you understand by universal gates ? Prove that NAND gate is a universal gate. 3
3. Implement $F = \bar{x}y + x\bar{y} + z$ using NAND gates. 2
4. Define prime implicants and essential prime implicants. 2
5. Design a full adder using full adders and other logic gates. 3
6. Distinguish between a combinational logic circuit and sequential logic circuit. 3
7. Distinguish between a latch and flipflop. 2
8. Compare the performance of sequential synchronous circuits and asynchronous sequential circuits. 3
9. Give the block diagram of a 8 bit shift register with serial in serial out and parallel in parallel out facilities. Explain the diagram. 3
10. State the conditions for a function to be symmetric. 2

PART - B

50

11. a) Given that $R = P\bar{Q} + \bar{P}Q$, prove that $P = Q\bar{R} + \bar{Q}R$.
 b) Implement $Q = R = P\bar{Q} + \bar{P}Q + S$ using NAND gates.
 c) Explain with an example, the corrections used in BCD addition. 3+3+4
12. a) Give a circuit for the generation of odd parity of 8 bit character and explain its operation.
 b) Simplify $F(A,B,C,D,E) = \sum (2,3,7,9,11,18,23,31)$ using karnaugh map method. 3+7
13. a) Design a BCD to decimal decoder using only NAND gates.
 b) Give the truth table of a full subtractor. Design a suitable circuit using only NOR gates. 5+5
14. a) Given a SR flipflop(s), design a JK flipflop, D flipflop and T flipflop using only SR flipflops.
 b) Distinguish between synchronous and asynchronous logic circuits. 8+2
15. a) Determine whether the following function is symmetric ? Identify its number and variables of symmetry.
 $f(A,B,C) = \sum (0,2,3,4,5,7)$
 b) What do you understand by a hazard in a contact network ? Explain with an example. 6+4
16. Using tabulation method, generate a set of prime implicants and find all minimal expressions for the following function.
 $f(P,Q,R,S,T) = \sum m(0,1,3,8,9,13,14,15,16,17,19,24,25,27,31)$ 10
17. Write short notes on the following : 10
 a) Serial in parallel out shift register
 b) ASCII character set
 c) Binary multiplier (two bit)