SE374

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S.E. (Computer) (Semester- III) (Revised Course 2007-08)
EXAMINATION MAY/JUNE 2019
Logic Design

[Duration : 3 Hours] **[Max. Marks : 100]**

Instructions:- Answer any 05 Questions by selecting atleast 01 Question form each Module.

Module - I

Q.1 a) Perform the following number conversion. **(8)**
i) $(3A7)_{16}$ to Gray
ii) $(532)_{10}$ to Excess – 3
iii) $(FABD \cdot 74F)_{16}$ to octal.
iv) $(164 \cdot 34)_8$ To Decimal.

b) State and Prove Associative laws of Boolean Algebra. **(6)**
c) Realize the following expression using NOR gates only **(6)**
$Y = \bar{A}BC + A\bar{B}C + AB\bar{C}$

Q.2 a) Implement AB+C'D' using three NAND gates only. Draw the logic diagram. Assume inverted input is available. **(6)**
b) Obtain the minimal POS expression for $\pi_m(0,1,2,4,5,6,9,11,12,13,14,15)$ using k – map. **(8)**
c) Why is 2421 code called self complementing code? Explain with the help of an example. **(6)**

Module – II

Q.3 a) Implement a full subtractor with two 4:1 multidexers. **(8)**
b) What is the difference between an excitation table and truth table of a flip flop? Give examples. **(6)**
c) List and illustrate any three applications of flip – flops. **(6)**

Q.4 a) Draw and describe the operations performed by the Encoder. Design a 2 bit comparator and explain with the help of a Logic Circuit. **(7)**
b) Realize the J-K flip – flop using D – flip flop. **(6)**
c) Explain the working of a parallel adder. What are the advantages and disadvantages over serial adder. **(7)**

Module – III

Q.5 a) Design and Explain the working of a Asynchronous decode counter using J-Flip-Flop using its timing diagram. **(7)**
b) Explain the different applications of a counter? **(6)**
c) Design a synchronous counter to produce the following binary sequence 1, 3, 5, 7, 1..... using JK flip flops **(7)**

Q.6 a) Explain with the help of a diagram the working of serial-in-parallel-out shift resister. **(7)**

b) Discuss the difference between the shift register counter and the basic shift resister. Give one example each. **(6)**

c) Design and explain the working of a 4-bit bidirectional shift register with the help of a logic diagram. **(7)**

Module – IV

Q.7 a) Explain the steps involved in design procedure for synchronous sequential circuits. **(8)**

b) Explain the features of each classification of memory according to their principles of operation. **(6)**

c) Explain and list the applications of a finite state model **(6)**

Q.8 a) Write short note on **(8)**

i) Field programmable logic Array (FPLA)

ii) Complex programmable logic devices and its applications

b) Describe the difference between RAM and ROM **(6)**

c) Differentiate between PAL and FPAL. **(6)**