

University of Sargodha

BS 2nd Term Examination 2018

Subject: Computer Science

Paper: Digital Logic Design (CMP-2210)

Time Allowed: 2:30 Hours

Maximum Marks: 80

Note: Objective part is compulsory. Attempt any three questions from subjective part.

Objective Part (Compulsory)

- Q.1.** Write short answers of the following in 2-3 lines each on your answer sheet. (16*2)
- Obtain the 1's & 2's complement of the following binary function 10110110, 11010101
 - Represent the decimal number 1122 in a. excess-3 b. 8,4,-2,-1
 - Define Minterms and Maxterms.
 - Simplify the function
 $F(w,x,y,z) = \sum(0,1,3,4,8,10,14)$ $D(w,x,y,z) = \sum(2,5,7,15)$
 - Simplify the following Boolean function to minimize the number of literal.
 $F(x,y,z) = \sum(0,1,3,5,7)$
 - Convert the following into Standard form
 $F(w,x,y,z) = \pi(0,1,2,3,4,5,6,12)$
 - What is don't Care condition?
 - What is S-R Latch? Draw logic diagram using NAND gates
 - What is ROM also draw logic Circuit for ROM?
 - What is difference b/w Combinational & Sequential circuit?
 - What is 4-bit binary parallel Adder?
 - What is Carry propagation time?
 - What is difference b/w Encoder and Decoder?
 - What is T flip flop? Define graphics symbol, characteristics table & equation.
 - What are difference b/w Synchronous and Asynchronous logic Circuits?
 - What is parallel in/ parallel out register?

Subjective Part (3*16)

- Q.2.** What is Tabulation method? Simplify the following Boolean function by using this method
 $F(A,B,C,D) = \sum(0,1,2,4,6,8,9,12,14,15)$
- Q.3.** Design a synchronous BCD counter using JK flip flop.
- Q.4.** Implement the block diagram of Boolean function
 $F = A \cdot (B + C) \cdot (D + E)$ with universal NAND gates
- Q.5.** Discuss role of don't care condition also implement following function in K map.
 $F(w,x,y,z) = \sum(0,2,5,6,7,8,10,12)$
 $D(w,x,y,z) = \sum(9,14,15)$
- Q.6.** Suppose you are working as a lead engineer in Ferrari Corporation it is observed that in hilly areas Ferrari is experiences fatal accidents due to break failure of all four wheels. You are requested to design a simple and cost effective safety strategy to overcome and reduce chances of accidents.
It is an advice given by your higher management that if two or more than two breaks of wheels fail an alarm must be triggered for the driver. This alarm will help driver to reduce speed or visit workshop for maintenance.



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