Tribhuwan University

Institute of Science and Technology

Digital Logic

2069

Full Marks : 60

Pass Marks : 24

Time : 3 hrs.

Long answer questions :

Attempt any two questions : (2*10=20)

1.) What is decoder? Implement the following using decoder.
   a.) F (W X Y Z) = ∑ (0,1,3,4,8,9,10)
   b.) F (W X Y Z) = ∑ (1,3,5,6,11,13,14)

2.) What do you mean by asynchronous counter? Design a mod-6 synchronous counter using T flip-flops.

3.) Explain the Master-slave S-R flip-flop with logic diagram, truth table and timing diagram.

Short answer questions :

Attempt any eight questions : (8*5=40)

4.) Design a half subtractor using only NOR gates.

5.) Convert the following decimal numbers into hexadecimal and octal number.
   a.) 220
   b.) 1020

6.) Design a multiplexer 4*1 using only universal gates.

7.) What is J-K flip flop? Explain.

8.) Write a procedure to reduce K-maps.

9.) What are the various types of shift registers?

10.)Draw a logic diagram of a 4 bit ripple counter using D-flip flop.

11.)Differentiate between combinational logic and sequential logic. List some applications of sequential logic.

12.)Explain the decimal adder.

13.)Write short notes on :
   a.) Programmable Logic Array
   b.) Triggering at flip-flop
   c.) Memory Unit