

2/6/2011

S.E IT III (Rev)
Digital Logic Design Application

ws Scan Paper -2 100

Con. 3116-11.

(3 Hours)

RK-1329

[Total Marks : 100

N.B. : 1) Q.1 is Compulsory.

2) Attempt any Four out of the remaining Questions.

3) Figures to the right indicate full marks.

4) Assume suitable data whenever necessary.

1. (a) Convert $(214.32)_9$ to BCD , Excess-3, Gray Code and Base 7 5
(b) Give one application of Gray code, Why it is called as self reflecting codes? 5
(c) Justify, NOR gate is a Universal Logic Gate 5
(d) Design a Full Subtractor Using suitable Decoder 5

2. (a) Simplify the Logic Expression and draw the logic diagram for the following 12

i) $A + \overline{AB} + \overline{AB} + C + ABCD$

ii) $\overline{W}Y + \overline{\overline{W}XZ} + \overline{W}X\overline{Y}Z + W\overline{X}Y$

iii) $\overline{XYZ} + X\overline{YZ} + XY\overline{Z} + XYZ$

(b) Perform the operations without converting the base 8

i) $(ABC)_{16} * (25)_{16}$

ii) $(33)_8 - (77)_8$

iii) $(F2F.7)_H - (753..A1)_H$

3.(a) Design a two bit Magnitude Comparator circuit using Gates 10

(b) Minimize using Quine Mc Cluskey's Method . 10

$$F(A, B, C, D) = \sum m (1, 5, 7, 13, 14, 15, 17, 18, 21, 22, 25, 29) + d (6, 9, 19, 23, 30).$$

[TURN OVER

4. (a) Implement the following expression using only one 4:1 MUX and few logic gates 10

$$F(A, B, C, D) = \sum m(0, 1, 2, 3, 6, 7, 9, 10, 13, 15)$$

(b) A car manufacturing company wants to design a logic circuit to allow the car to start only on the following conditions: 10

i) Only when the driver and front seat co-passenger are sitting with their seat belt on

ii) If no passenger is sitting and only the driver is sitting with the seat belt on

Design and realize the circuit using Logic gates

5. (a) How T Flip Flop is derived from JK Flip Flop. Explain the working for both. 10

(b) Convert :

i) JK to D F/F

ii) SR to T F/F

6) (a) Design a mod 6 Up/ Down ripple counter using JK flip flops 10

(b) Design a circuit to generate the following 10.

..... 11001, 11001, 11001,

7) Write short notes on any three of the following 20

a) VHDL features

b) PAL and PLA

c) Octal to Binary encoder

d) Look ahead carry Generator

e) ALU features