

B.E. (Information Technology) Third Semester (CBS)  
**Digital Electronics & Fundamentals of Microprocessor**

P. Pages : 2

Time : Three Hours



AHK/KW/19/2094

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Due credit will be given to neatness and adequate dimensions.
  9. Assume suitable data whenever necessary.
  10. Use of non programmable calculator is permitted.

1. a) What is Gate? Explain the basic gates with it's truth table. 6
- b) State and prove the De-Morgan's theorem. 7

**OR**

2. a) Convert the following. 8
- i)  $(675 \cdot 625)_{10} = (?)_{16}$
  - ii)  $(7BF3)_{16} = (?)_2$
  - iii)  $(1111)_2 = (?)_G$
  - iv)  $(139 \cdot 57)_{10} = (?)_{BCD}$

- b) Realize Ex-OR and AND gate using NAND gate. 5
3. a) Simplify the given function using k-map & implement using NAND gate. 7
- i)  $f(A, B, C, D) = \sum m(0, 1, 4, 5, 6, 7, 9, 11, 15) + d(10, 14)$
  - ii)  $f(W, X, Y, Z) = \pi m(1, 4, 6, 9, 10, 11, 14, 15)$ .

- b) Differentiate Analog System and Digital System. 6

**OR**

4. a) Express the given function in standard SOP form. 6
- $f(W, X, Y, Z) = \overline{W}XZ + WXY\overline{Z} + WY\overline{Z}$
- b) Simplify the given function using  $k_{map}$  & realize using NOR gate 7
- $f(A, B, C, D) = \pi m(4, 6, 10, 12, 13, 15)$ .

5. a) Design full adder using logic gates. 6  
b) Design 3 bit binary to gray code converter. 8
- OR**
6. a) Implement the following function using 4:1 Multiplexer. 7  
f (A, B, C) =  $\Sigma m(0, 2, 3, 5)$ .  
b) Explain half and full subtractor. 7
7. a) What are different types of flip flop? Explain SR F/F in details. 6  
b) What is race around condition in JK flip flop? State the ways in which it can be eliminated. 7
- OR**
8. a) Convert the following. 7  
i) SR F/F to JK F/F  
ii) T F/F to D F/F  
b) Differentiate between synchronous & asynchronous counter. 6
9. a) Draw and explain the architecture of 8085 microprocessor in details. 7  
b) Explain the following pins in  $\mu p8085$ . 7  
i) Hold ii) Reset  
iii) Ready
- OR**
10. a) Explain addressing modes of 8085 microprocessor in details. 7  
b) Draw & explain the flag register of 8085 microprocessor. 7
11. a) Draw & explain the interrupt structure of 8085 microprocessor in details. 7  
b) Draw and explain memory read machine cycles. 6
- OR**
12. a) Explain RIM & SIM instruction of 8085 microprocessor. 7  
b) Explain following logical instructions in details. 6  
i) CMA ii) RAR

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