NagpurStudents

www.nagpurstudents.org

B.E. (Computer Science & Engineering (New)) Third Semester (C.B.S.)

Digital Circuits & Fundamentals of Microprocessor

P. Pages : 2 **NJR/KS/18/4379**

Time : Three Hours * 0 1 1 4 * 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. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Obtain following conversion : **8**

i) $(110110)_2 = (?)_{10}$

ii) $(48)_{10} = (?)_2$

iii) $(101011)_{Gray} = (?)_{Binary}$

iv) $(IFEC)_{16} = (?)_8$

b) Reduce the following boolean expression. **6**

i) $\overline{B}(A+C)+C(\overline{A}+B)+AC$

ii) $\overline{A}BC+A\overline{B}C+AB\overline{C}+ABC = AB+BC+AC$

OR

2. a) Realize all basic logic gate using NAND gate. **8**

b) State and prove Demorgan's theorem. **6**

3. a) Design 4 Bit binary to Gray code converter. **7**

b) Implement following function using 8:1 MUX **6**

$f(A,B,C,D) = \sum m(0,1,2,4,5,8,10,12,13).$

OR

4. a) Draw and explain full adder using two half adder and one OR gate. **6**

b) Design the 2-bit Priority encoder and implement it. **7**

5. a) Explain the working of master slave JK Flip Flop. What is race around condition? **9**

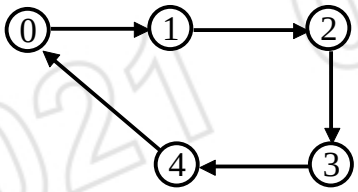
b) Explain preset and clear terminal of Flip Flop. **4**

OR

6. a) Differentiate between combinational circuit and sequential circuit. **7**

b) Draw and explain SR Flip Flop using NAND gate. **6**

7. a) Design synchronous counter using JK Flip Flops. The state diagram of counter is **7**



b) Draw and explain 4-bit serial input parallel output (SIPO) shift register. **7**

OR

8. a) Convert the following. **8**
i) SR to JK Flip Flop. ii) D to SR Flip Flop.

b) Draw and explain 3-bit ripple counter with waveforms. **6**

9. a) Draw and explain the architecture of 8085 microprocessor. **9**

b) Explain the classification of memories and their characteristics. **4**

OR

10. a) Explain in detail different addressing modes of 8085. **5**

b) A combinational circuit defined by the functions. **8**
$f_1(A,B,C) = \sum m(0,1,3,4)$
$f_2(A,B,C) = \sum m(0,5,6,7)$
Implement the circuit with PLA and PAL having three inputs and two outputs.

11. a) Explain with neat diagram the 8085 interrupt structure with vector location, priority and characteristics. **8**

b) Write ALP to multiply two 8-bit number. Two numbers are stored on memory location 4050H and 4051H respectively. Store the result on 4052H. **5**

OR

12. a) Write ALP to transfer 10 bytes of data from memory location 8000H to 9000H. **5**

b) Explain the following. **8**
i) XRA A ii) LHLD 8000H
iii) STA 8030H. iv) DAA

****

NagpurStudents

www.nagpurstudents.org

The best time to plant a tree was 20 years ago. The second best time is now.

~ Chinese Proverb