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

Digital Circuits & Fundamentals of Microprocessor

P. Pages : 2 **NKT/KS/17/7239**

Time : Three Hours * 0 2 7 6 * 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. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Convert the following. **8**

i) $(132)_0 \rightarrow (\ )_H \rightarrow (\ )_B$

ii) $(110110.11)_B \rightarrow (\ )_D$

iii) $(1010110)_G \rightarrow (\ )_B$

iv) $(132.67)_H \rightarrow (\ )_D$

b) Explain and prove De-Morgan's Theorem. **6**

OR

2. a) Minimize using k-map and implement using logic gates. **6**

$f(ABCDE) = \Sigma m(0,2,6,7,9,13,25,26,27,29,31) + d(1,3,4,30)$

b) Express the following function in standard POS form. **4**

$f(a,b,c) = ab + bc + ac$

c) Express the following function in standard SOP form : **4**

$f(A,B,C,D) = (\overline{A} + BC)(B + \overline{C}D)$

3. a) Design 4 bit binary to Gray code converter using logic gates. **8**

b) Draw & Explain full adder using two half adders and one OR gate. **5**

OR

4. a) Design the 2 bit priority encoder and implement it. **7**

b) Implement the following function using 4 : 1 MUX. **6**

$f(a,b,c,d) = \Sigma m(0,1,2,4,6,9,12,14)$

5.	a)	Draw and explain the D flip-flop using NAND Gates.	**5**
	b)	What do you mean by sequential circuit? Explain with suitable example.	**4**
	c)	Explain Preset and Clear terminal of flip-flop.	**4**

OR

6.	a)	Explain the working of JK flip-flop. What is race around condition and explain how it is eliminated.	**9**
	b)	Explain level triggered and edge triggered signal in flip flop.	**4**
7.	a)	Draw the logic diagram of 4 bit serial IN serial OUT shift register and explain its operation.	**7**
	b)	Design Mod - 5 synchronous counter using J-K flip-flop.	**7**

OR

8.	a)	Convert the following. i) SR to T flip-flop ii) JK to SR flip-flop.	**8**
	b)	Design 3 bit Ripple Up-Down counter using T flip-flop.	**6**
9.	a)	Draw and explain the architecture of μp8085.	**8**
	b)	Differentiate between PAL and PLA.	**5**

OR

10.	a)	Explain all addressing modes of μp8085.	**7**
	b)	Write a short note on : i) Stack Memory ii) ROM	**6**
11.	a)	Draw and explain Memory Read Machine cycle in detail.	**9**
	b)	Explain EI and DI instruction of μp8085.	**4**

OR

12.	a)	Write a program to shift 10 bytes of data from memory location 8000 H to 9000 H.	**5**
	b)	Explain Hardware Interrupt structure of μp8085.	**8**

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All our dreams can come true if we have the courage to pursue them.

~ Walt Disney