B.E. Electrical (Electronics & Power) Engineering (Model Curriculum) Semester - IV

SE202 - Digital Electronics

P. Pages : 2 **GUG/S/23/13804**

Time : Three Hours * 3 1 0 7 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Assume suitable data wherever necessary.
3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) State De-Morgan's theorems. **4**

b) Convert the following binary numbers into decimal, octal and hexadecimal: **6**

i) $(11010101)_2$

ii) $(11010011)_2$

c) Prove NOR gate is universal gate. **6**

OR

2. a) Subtract 14-25 using 1's compliment. **4**

b) Find the complement of the function. **4**

i) $F1 = XYZ' + X'YZ$

ii) $F2 = X(YZ' + Y'Z)$

c) Explain CMOS NAND gate **8**

3. a) Minimize using K-Map $F = \Pi M$ (0, 6, 9, 10, 13). d (1, 3, 8) **4**

b) Realize Full Adder using two half Adder. **6**

c) Design 1-bit comparator. **6**

OR

4. a) Design 3-bit Binary to Grey Code Converter. **8**

b) Minimize the function using QuineMcClusky F=S (1, 2, 5, 6, 7, 9, 10, 11, 14) **8**

5. a) What is race around condition in JK flip flop? How it can be avoided. **4**

b) Convert D flip flop to T Flip Flop. **6**

c) Explain 3-bit ring counter. **6**

OR

6.	a)	Explain SR Flip Flop give its Characteristics Table, Characteristic Equation and Excitation table.	**8**
	b)	Design a type T synchronous counter that goes through states 0, 3, 5, 6, 0 ----. Is the counter self starting? If the counter is not self starting suggest a suitable modification to remove the lock-out	**8**
7.	a)	Explain 3 bit R-2R ladder DAC.	**8**
	b)	Explain different specification of DAC.	**8**

OR

8.	a)	Explain flash type ADC with its advantage and disadvantages.	**8**
	b)	Describe Dual slope type ADC.	**8**
9.	a)	Explain the classification and characteristic of memory.	**8**
	b)	Explain how read and write operation is performed in memory with suitable diagram.	**8**

OR

10.	a)	Design a 3-bit binary to excess-3 convertor using PROM.	**8**
	b)	What is PLA? Implement the following function using PLA	**8**
		i) $F1 = \Sigma m(0,3,4,7)$	
		ii) $F2 = \Sigma m(1,2,5,7)$	

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