

3hrs

Total Marks: 80

**N.B: 1. Question no. 1 is compulsory.****2. Attempt any three questions out of remaining five questions****3. Assume suitable data wherever applicable**

Q1. Attempt any 4

[20]

- A. Why and which code is used for labeling the cells of K-Map
- B. Realize 1-bit comparator using logic gates
- C. Compare PAL and PLA
- D. Convert  $(352.7)_{10}$  into binary, octal and hexadecimal.
- E. What is race around condition in JK flipflop and how to overcome it.

Q2. A. Prove that NAND and NOR are universal gates

[10]

Q2. B. Perform the following operation using 2's complement

i)  $(35)_{10} - (45)_{10}$

ii)  $(45)_{10} - (35)_{10}$

[10]

Q3. A. Implement the 3 bit binary to gray code converter

[10]

Q3. B. Using Boolean Algebra prove the following

[10]

i)  $AB + BC + \bar{A}C = AB + \bar{A}C$

ii)  $[(C + \bar{C}D)(C + \bar{C}\bar{D})] [(AB + \bar{A}B)(\bar{A}B + AB)] = C$

Q4. A. Design a asynchronous decade counter.

[10]

Q4. B. Convert the following

[10]

i) SR flipflop to T flipflop

ii) T flipflop to D flipflop

Q5. A. Explain the 3 bit R-2R D/A converter

[10]

Q5. B. Explain the classification of memory.

[10]

Q6. Write in brief any two

[20]

- a. Compare the TTL and CMOS logic families
- b. Full adder using PLA
- c. Implement 16:1 MUX using 4:1 MUX

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