

2125
B.E. (Electrical and Electronics Engineering)
Third Semester
PC-EE-304: Digital Electronics

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

1. Attempt the following:-

- a) Simplify the following Boolean function using a 2-variable K-map:
 $F(A,B)=\Sigma m(1,3)$
- b) Draw a logic diagram for exclusive OR gate with its truth table.
- c) List two problems with using binary ladder.
- d) Design 1:4 demultiplexer.
- e) List any two characteristics of memories. (5x2)

UNIT - I

2. a) For the 3-variable function below, use K-map to find the simplified expression:

$$F=A'B'C+AB'C+ABC$$

b) Simplify with don't cares:

$$F(A,B,C,D)=\Sigma m(0,1,2,5,7) + d(8,9,10) \quad (2x5)$$

3. a) Sketch the logic diagram for a 5 bit comparator and indicate the meaning of the output?
- b) Draw a SR flip flop diagram using NAND gates. (7,3)
4. Explain in detail, the synchronous UP-DOWN counter. (10)

UNIT - II

5. Define the following terms:-

- a) Explain Coding, quantization and quantization error in ADCs. What is the need of quantization and how it can be done?
- b) List the various specifications of convertors. (7,3)

6. Explain the working principle of a Successive Approximation ADC. Draw and describe the block diagram, timing diagram and algorithm used during conversion. Discuss its advantages, limitations and applications. (10)

7. Discuss in detail the concept of Memory Organization. Explain memory words, byte addressability, interleaving, memory mapping and the role of memory controllers in large-scale digital systems. (10)

x-x-x