CBCS SCHEME

USN | | | | | | | | | | 15NT34

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019

MOSFETs and Digital Circuits

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define JFET. Discuss the characteristics of JFET. (08 Marks)
b. Discuss the construction and characteristics of depletion type JFET. (08 Marks)

OR

2 a. With neat diagrams explain n-well MOS transistor fabrication process. (10 Marks)
b. Write a short note on second order effects in MOS. (06 Marks)

Module-2

3 a. Explain the power dissipation equation for CMOS. (06 Marks)
b. Discuss the CMOS transmission gates and multiplexer. (10 Marks)

OR

4 a. Draw and explain realization of CMOS NOR gate and NAND gate. (10 Marks)
b. Draw and explain the CMOS inverter voltage transfer characteristics. (06 Marks)

Module-3

5 a. Define sequential circuits. What are the types of sequential circuits? With neat diagram explain the operation of CMOS SR latch using NOR gate. (10 Marks)
b. With neat diagram, explain the operation of D latch. (06 Marks)

OR

6 a. Explain CMOS master-slave register. (07 Marks)
b. Briefly explain ring oscillator. (05 Marks)
c. Write a note on MUX based latch. (04 Marks)

Module-4

7 a. Define registers. Explain PISO and SIPO shift registers. (08 Marks)
b. Explain Modulus-8 synchronous up counter with neat logic diagram. (04 Marks)
c. Explain Modulus-4 synchronous Up/Down counter with neat logic diagram. (04 Marks)

OR

8 a. Explain Modulus-8 synchronous Up/Down counter with neat logic diagram. (06 Marks)
b. Using JK flip flop design synchronous counter with the sequence 1, 3, 5, 2, 0, 7. (10 Marks)

Module-5

9 a. Design a Mod-8 Asynchronous counter using JK flip flop to count number of occurrence of an input i.e. no. of times it is 1. (10 Marks)
b. Neatly draw and define Mealy and Moore machine model. (06 Marks)

OR

10 a. Design a Mod-8 synchronous counter using JK flip flop to count numbers of occurrence of an input i.e. no. of times it is 1. (10 Marks)
b. Design a Mealy state diagram for the sequence 1101. (06 Marks)

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