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15CS32

Third Semester B.E. Degree Examination, Dec.2019/Jan.2020 Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the construction and principles of operation of JFET. (08 Marks)
- b. Explain with neat sketches, the operation and parameter of n-channel depletion type MOSFET. (08 Marks)

OR

- 2 a. Discuss characteristics of an ideal op-amp and compare with practical op-amp. (08 Marks)
- b. For the circuit shown in Fig.Q2(b) determine the value of drain source voltage (V_{DS}). Assume $V_{GS} = -0.8V$.

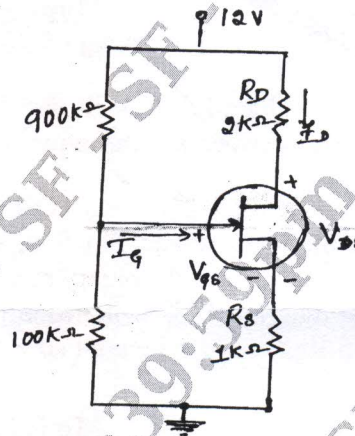


Fig.Q2(b)

(08 Marks)

Module-2

- 3 a. What are universal gates? Draw the logic circuit for $y = (A + B + C)(A + B + C)$ using universal gates. (05 Marks)
- b. Find the minimal SOP of the following Boolean function using K-Map.
 $F(a, b, c, d) = \sum m(7, 9, 10, 11, 12, 13, 14, 15)$ (05 Marks)
- c. Define Hazards? How to design a static 1 hazard free circuit? Explain with an example. (06 Marks)

OR

- 4 a. Simplify the expression $y = f(A, B, C, D) = \sum m(1, 2, 8, 9, 10, 12, 13, 14)$ using Quine – McClusky Method. (10 Marks)
- b. What is the need of HDL? Write the verilog code for the circuit. Shown in Fig.Q4(b)

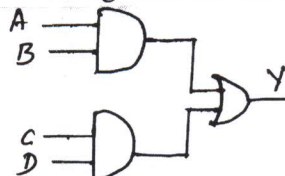


Fig.Q4(b)

(06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.



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Module-3

- 5 a. What is multiplexer? Write the logic circuit and truth table of 4:1 multiplexer. (05 Marks)
b. Explain BCD to Decimal decoder along with circuit diagram. (05 Marks)
c. What is magnitude comparator? Design and explain 1 bit magnitude comparator. (06 Marks)

OR

- 6 a. Implement the following function using PLA
 $A(x, y, z) = \sum m(1, 2, 4, 6)$
 $B(x, y, z) = \sum m(0, 1, 6, 7)$
 $C(x, y, z) = \sum m(2, 6)$ (06 Marks)
b. Implement the Boolean function expressed by
SOP $f(a, b, c, d) = \sum m(1, 3, 4, 5, 9, 11, 12)$ using 8:1 MUX. (06 Marks)
c. Write a note on parity Checker. (04 Marks)

Module-4

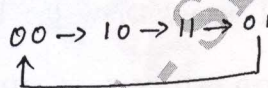
- 7 a. What is flip flop? Explain the working of JK-master slave flip flop using NAND gates. (08 Marks)
b. Write the Execution table of SR, D, JK and T flip flop. (04 Marks)
c. Write the difference between synchronous and Asynchronous counter. (04 Marks)

OR

- 8 a. Using Positive edge triggered D flip flop, draw the logic diagram of 4bit SISO Register. Draw the timing diagram to shift binary number 1110 into Register. (05 Marks)
b. Explain with neat diagram 4 bit switched tail counter (05 Marks)
c. Explain how shift Register can be applied for sequence detector. (06 Marks)

Module-5

- 9 a. Explain a 3 bit binary Rippledown counter. Give block diagram, truth table and output waveforms. (08 Marks)
b. Design a sequences, a module – 4 Irregular counter with following counting sequence using D flip flop. (08 Marks)



OR

- 10 a. Explain 4 bit D/A converter. (10 Marks)
b. What is binary ladder? Explain the binary ladder with digital input of 1000. (06 Marks)
