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15CS32

## Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain the working of N-channel MOSFET, with the help of neat diagram. (08 Marks)  
 b. What are applications of FET? (04 Marks)  
 c. What are the ideal characteristics of op-amp? (04 Marks)

**OR**

- 2 a. Explain the performance parameters of op-amp. (08 Marks)  
 b. Explain the relaxation oscillator, with the help of neat diagram. (08 Marks)

### Module-2

- 3 a. Minimize the following Boolean function using K-map method,  
 $F(A, B, C, D) = \sum m(0, 2, 3, 8, 10, 11, 12, 14)$  (06 Marks)  
 b. Apply Quine Mc-Cluskey method to find the essential prime implicants for the Boolean expression,  
 $F(A, B, C, D) = \sum m(0, 1, 2, 3, 10, 11, 12, 13, 14, 15)$  (10 Marks)

**OR**

- 4 a. Minimize the following Boolean function using K-map method.  
 $F(A, B, C, D) = \prod M(0, 1, 2, 3, 4) + \sum d(5, 7)$  (06 Marks)  
 b. What is Hazard? Explain its types with examples. (10 Marks)

### Module-3

- 5 a. Implement the following function using 8 : 1 multiplexer  
 $F(A, B, C, D) = \sum m(1, 2, 5, 7, 8, 10, 11, 13, 14, 15)$  (06 Marks)  
 b. Realize the following function using 3 : 8 decoder  
 (i)  $F(A, B, C) = \sum m(1, 3, 4)$   
 (ii)  $F(A, B, C) = \sum m(3, 5, 7)$  (04 Marks)  
 c. Design a priority encoder using the truth table. The order of priority for three inputs is  $X_1 > X_2 > X_3$  (06 Marks)

Truth Table

S	Input			Output	
	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	A	B
0	X	X	X	0	0
1	1	X	X	0	1
1	0	1	X	1	0
1	0	0	1	1	1
1	0	0	0	0	0

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.

OR

- 6 a. Design seven segment decoder using PLA. (08 Marks)  
b. Design Half adder and Full adder. (08 Marks)

**Module-4**

- 7 a. Explain Smith contact bounce circuit. (08 Marks)  
b. Give state transition diagram and characteristic equations for SR-FF and JK-FF. (08 Marks)

OR

- 8 a. With neat diagram, explain Ring and Johnson counter. (08 Marks)  
b. What is shift register? With neat diagram, explain 4-bit parallel in serial out shift registers. (08 Marks)

**Module-5**

- 9 a. Define counter. Design mod-8 up synchronous counter using JK-FF. (12 Marks)  
b. Write VHDL code for mod-8 up counter. (04 Marks)

OR

- 10 a. Explain the binary ladder with digital of 1000. (06 Marks)  
b. Explain with neat diagram, single slope A/D converters. (10 Marks)

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