CBCS Scheme

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15CS32

# Third Semester B.E. Degree Examination, Dec.2017/Jan.2018
## Analog and Digital Electronics (ADE)

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 operation and characteristics of N-channel JFET. **(08 Marks)**

b. With block diagram, explain the operation of a Astable multivibrator using IC 555. **(08 Marks)**

**OR**

2 a. With circuit diagram, explain the operation of a Relaxation oscillator. **(06 Marks)**

b. Fig. Q2(b), shows a Biasing configuration using DEMOSFET given that the saturation drain current is 8mA and the pinch off voltage is -2V.

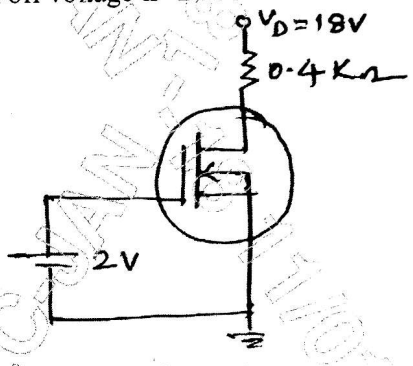


Fig. Q2(b)

Determine the value of gate source voltage drain current of drain source voltage. **(06 Marks)**

c. Write the advantages of MOSFET over JFET. **(04 Marks)**

### Module-2

3 a. Give the simplest logic circuit for following logic equation where d represents don't care condition for following locations:

$F(A, B, C, D) = \sum m(7) + d(10, 11, 12, 13, 14, 15)$. **(06 Marks)**

b. Simplify the following Boolean function by using Quine – McClusky method.

$F(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 8, 10, 12, 13)$. **(10 Marks)**

**OR**

4 a. What are Hazards? Explain the types of Hazards and it covers. **(08 Marks)**

b. Discuss Briefly an HDL Implementation models. **(04 Marks)**

c. Explain the concept of Duality in Digital circuits. **(04 Marks)**

## Module-3

5 a. What is multiplexer? Design a 32:1 multiplexer using 16:1 MUX and one 2:1 multiplexer. **(05 Marks)**

b. Show how using a 3 to 8 Decoder and multi input OR Gates following Boolean Expressions can be realized simultaneously. **(06 Marks)**

$F(A, B, C) = \sum m (0, 4, 6)$

$F(A, B, C) = \sum m (1, 2, 3, 7)$

$F(A, B, C) = \sum m (0, 5)$

c. Show how two 1 to 16 DEMUX can be connected to get 1 to 32 DEMUX. **(05 Marks)**

**OR**

6 a. Explain parity Generators and checkers using suitable examples. **(05 Marks)**

b. What is Magnitude Comparator? Explain 1 bit magnitude comparator. **(05 Marks)**

c. What is PLA? Design seven segment Display using PLA. **(06 Marks)**

## Module-4

7 a. Explain 4 bit serial in parallel out register. **(04 Marks)**

b. Explain a 3 bit binary Ripple up counter. Give the block diagram, truth table and output waveforms. **(06 Marks)**

c. Explain the working of JK master slave Flip Flop along with implementation using NAND Gates. **(06 Marks)**

**OR**

8 a. Design synchronous MOD – 6 counter with truth table and state diagram. **(06 Marks)**

b. What is universal shift Register? Explain any one application of universal shift register with block diagram and truth table. **(06 Marks)**

c. Write the comparison between Synchronous and Asynchronous counter. **(04 Marks)**

## Module-5

9 a. Explain 5 bit Resistive divider with diagram. **(06 Marks)**

b. Explain with neat diagram the working principle of Digital clock. **(05 Marks)**

c. Explain the terms Accuracy and Resolution for D/A converter. **(05 Marks)**

**OR**

10 a. Explain with Block diagram the operation of successive approximation converter. **(08 Marks)**

b. Explain counter type A/D converter with diagram. **(08 Marks)**

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