Paper Id: 130317 Roll No: | | | | | | | | | | | | | |

B.TECH
(SEM-III) THEORY EXAMINATION 2019-20
SWITCHING THEORY & LOGIC DESIGN

Time: 3 Hours *Total Marks: 100*

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. Name the two forms of Boolean expression?
b. What is Half-Adder?
c. What are Minterm and Maxterm?
d. What is a Multiplexer?
e. Write down the Characteristics of Digital ICs?
f. Define fall time?
g. For the hamming code 1001101001 received at the receiver end, correct this code for error if any.
h. Convert the hexadecimal number (BE86) in binary and convert it from binary to octal.
i. What is synchronous sequential circuit?
j. Distinguish between weighted binary codes and unweighted binary code.

SECTION B

2. Attempt any *three* of the following: 10x3=30

a. Design MOD 11 synchronous counter using T flip flop.
b. Implement 4 bit magnitude comparator.
c. Design a BCD counter with JK flip flops.
d. Draw truth table and circuit of JK flip flop using NAND gates.
e. A 6:64 decoder is to be implemented using 3:8 decoders only. Show the block diagram of 6:64 decoder.

SECTION C

3. Attempt any *one* part of the following: 10x1=10

a. With the help of logic diagram, explain working of Master slave JK Flip-Flop along with waveforms. Explain race around condition. How is it eliminated?
b. Write the truth table of the SR, D & T flip-flops.

4. Attempt any *one* part of the following: 10x1=10

a. Construct Moore and Mealy state diagram that will detect input sequence 10110, when input pattern is detected, z is asserted high. Give state diagram for each state.
b. Solve the following Boolean functions by using K-Map : F (w,x,y,z) = $\Sigma(0,1,4,5,6,8,9,10,12,13,14)$

5. Attempt any *one* part of the following: 10x1=10

a. Write a short note on Encoders. Discuss their applications. Design an 8- Input Priority Encoder using basic gates.
b. What is number system? Explain 1's complement and 2's complement with example.

6. Attempt any *one* part of the following: 10x1=10

a. Simplify following logic function and realize using NOR gates. $f(w,x,y,z)=\pi M(1,2,3,7,10,11)+d(0,15)$
$f(w,x,y,z) = \pi M (3,4,5,6,7,10,11,15)$
b. What is the function of binary multiplier? Explain.

7. Attempt any *one* part of the following: 10x1=10

a. Explain about ROM and PROM.
b. Draw the basic circuit of the RTL NOR gate. Explain the operation.