Code No: R1621053 **R16** SET - 1

II B. Tech I Semester Supplementary Examinations, May - 2019
DIGITAL LOGIC DESIGN
(Com to CSE & IT)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Convert the following (i) $(AB)_{16} = (\_\_\_)_{10}$ (ii) $(1234)_8 = (\_\_\_\_)_{10}$ (3M)
   b) Find the 2's complement and 1's complement of 101101 (2M)
   c) Convert the following expression SOP into POS (AB + C) (B+C^{l}D). (3M)
   d) What are the Universal gates? Why they called as universal gates. (2M)
   e) Define Toggle condition. (2M)
   f) Classify the register with respect to serial and parallel input-output. (2M)

PART -B

2. a) The binary numbers listed have a sign bit in the leftmost position and if negative numbers are in 2's complement form. Perform the arithmetic operations indicated and verify the answers. (7M)
   (i) 101011 + 111000 (ii) 001110 + 110010 (iii) 111001 – 001010
   (iv) 101011 – 100110
   b) Convert the following to Decimal and then to octal. (7M)
   (i) (125F)16 (ii) (10111111)2(iii) (4234)10

3. a) Find the complement and duality of given function below and then reduce minimum number of literals in each case F =$\left[\left(\overline{ab}\right).a\right]\left[\left(\overline{ab}\right).b\right]$ (7M)
   b) Simplify the following to minimum number of literals. (7M)
   (i)$\bar{A}$B($\bar{D} + \bar{C}$D)+B(A+$\bar{A}CD$) (ii)$\bar{x}\bar{y}$+xy+$\bar{x}y$

4. a) Design a full adder by using two half adders. (7M)
   b) Explain about decoder circuit and implement the 4×16 decoder by using two 3×8 decoders. (7M)

5. a) What is a flip-flop? Design the basic flip-flop using NOR gates and explain. (7M)
   b) What is an excitation table? Write the excitation tables for JK and T flip-flops. (7M)

6. a) Write the differences between synchronous and Asynchronous Counters. (7M)
   b) Explain the operation of the 4-bit asynchronous counter. (7M)

7. a) Write the difference between mealy and moore machines. (6M)
   b) Convert the given mealy machine to moore machine by using translation diagram. (8M)

State	Input		Out put
	a	b	
A	B	A	0
B	B	C	0
C	B	D	0
D	B	A	1

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