B. TECH. SEM -III (E & TC ENGG.) (2014 COURSE) (CBCS) :
WINTER - 2017
SUBJECT: DIGITAL CIRCUITS &APPLICATIONS

Day: **Friday** Time: **10.00 AM TO 01.00 PM**
Date: **19/01/2018** Max Marks. 60

W-2017-2060

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of non – programmable calculator is **ALLOWED**.
4) Assume suitable data, if necessary.

Q.1 **a)** Minimize the following function using K – map and obtain the logic diagram from equation **(05)**

$f(A,B,C) = \Sigma m\,(1, 2, 3, 5, 7)$

b) Convert Binary numbers 10110 and 1001011 to Grey code. **(05)**

OR

Q.1 **a)** State and prove Demorgan's Theorem. **(05)**

b) Simplify the expression and draw the logic diagram. **(05)**

$Y = AB + A\overline{B}\ \overline{(\overline{A}\,\overline{C})}$

Q.2 **a)** Explain full subtractor with truth table. **(05)**

b) What is Demultiplexer? Explain 4:1 Demux. **(05)**

OR

Q.2 **a)** What is priority encoder? **(05)**

b) What is ALU? **(05)**

Q.3 **a)** Explain CMOS NAND Gate. **(05)**

b) Differentiate TTL, ECL and CMOS. **(05)**

OR

Q.3 **a)** Define the following terms: **(05)**

i) Power dissipation
ii) Propagation delay
iii) Noise margin
iv) Operating temperature
v) Fan – in

b) List out various logic families and explain any one in detail. **(05)**

P.T.O

Q.4	**a)**	Explain operation of Master slave flip - flop and show how the race around condition is eliminated.	**(05)**
	b)	Differentiate between Synchronous and Asynchronous circuit.	**(05)**
		OR	
Q.4	**a)**	What is JK flip – flop? Explain it with truth table.	**(05)**
	b)	Differentiate between a Latch and a flip – flop.	**(05)**
Q.5	**a)**	Design MOD – 4 Asynchronous counter.	**(05)**
	b)	Differentiate between Synchronous and Asynchronous counter.	**(05)**
		OR	
Q.5	**a)**	Define following terms: i) Setup time ii) Hold time iii) Rise time iv) Fall time	**(05)**
	b)	What is Universal shift register?	**(05)**
Q.6	**a)**	Explain MOSFET RAM cell.	**(05)**
	b)	What is PROM and explain types of PROM?	**(05)**
		OR	
Q.6	**a)**	What is meant by Static and Dynamic memory?	**(05)**
	b)	Compare features of PROM, PAL and PLA.	**(05)**

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