BACHELOR OF COMPUTER SCIENCE AND ENGINEERING EXAMINATION, 2016

(2nd Year, 1st Semester)

DIGITAL CIRCUITS

Time : Three Hours **Full Marks : 100**

Answer any *five* questions.

1.	a)	With the help of a circuit diagram explain the operations of a DTL gate.	8
	b)	Estimate the reverse recovery current.	4
	c)	How is the circuit modified for Integrated version? What are its advantages over the discrete version?	8
2	a)	Explain the operation of a TTL gate.	12
	b)	Estimate the no-load Power Supply Currents of the same.	4
	c)	Why do you require open-collector gates?	4
3.	a)	Explain the operation of an n-MOS Inverter.	8
	b)	How can the NAND and NOR gates be implemented using n-MOS FET?	4
	c)	Estimate the rise time of an n-MOS gate.	8
4.	a)	With the help of a block diagram explain the operations of a 555 IC-Timer chip.	6
	b)	How can you connect the same for generating a clock?	4
	c)	Deduce the expressions for frequency and duly cycle for the same.	6
	d)	How can a clock with 50% duly cycles be generated?	4
5.	a)	With the help of a circuit diagram explain the operations of a bipolar memory cell using two dimensional selection technique.	10
	b)	How the same may be implemented by using MOS FET ?	10
6.	a)	Explain the operation of a R-2R Ladder Type DAC.	10
	b)	How can the effect of R_L be eliminated? What will be the modified output?	2+4
	c)	What are its relative merits and demerits?	4
7.	a)	Explain the operation of a 3-bit direct comparison type ADC.	8
	b)	Design the encoder circuit.	4
	c)	How can a 6-bit ADC be implemented using 3-bit ADC's?	8
8.		Write notes on any four of the following :	4x5 =20

a) HTL gates;
b) Tristate gates;
c) C-MOS gates;
d) Frequency Multiplication;
e) EPROM's;
f) 1's complement DAC;
g) Sample/Hold circuits;
h) Analog Multiplexers.