[Time: 3 Hours] [Marks:80]

Instructions: 1) Question **No. 1** is compulsory.
2) Answer **any three** from **remaining five.**
3) Assume data where ever needed.

1	a)	Draw the circuit diagram of fixed voltage regulator using IC 78XX series	5
	b)	Explain the block diagram of Opamp in brief	5
	d)	Convert JK to T flip flop.	5
	e)	Explain and mention universal gates	5
2	a)	Explain the operation of Monostable multivibrator using IC 555 .Draw the circuit diagram and waveforms.	10
	b)	Explain with the help of circuit diagram the operation of an OPAMP as inverting amplifier. Derive expression for the voltage gain of this amplifier	10
3	a)	Design a mod-9 asynchronous counter using JK flip flop	10
	b)	Minimize the expression using K map and implement using AND gates only. $F = \Sigma(0,5,9,12,13,14,15)$	10
4	a)	With the help of neat diagram explain the operation of any DAC.	10
	b)	Explain briefly the operation of TTL NAND gate in tristate output configuration	10
5	a)	Implement following expression using (i) 16:1 Mux (ii) 8:1 Mux $F(A,B,C,D) = \Sigma(0,2,5,6,7,9,12,15)$	10
	b)	With neat circuit diagram and waveforms explain inverting Schmitt trigger using opamp	10
6	a)	Explain look ahead adder.	10
	b)	Derive the filter gain of first order high pass filter and draw its frequency response characterisitcs	10
