Instructions: 1) Question **No. 1** is compulsory.

2) Answer **any three** from **remaining five.**

3) Assume data where ever needed.

1		**Answer any four**	
	a)	State and prove Demorgans theorem.	5
	b)	Explain in brief CMRR, slew rate.	5
	c)	Convert following	5
		(i)　　101101 to gray code	
		(ii)　　$(CD8.4)_{16}$ to octal	
	d)	Convert SR to JK flip flop.	5
	e)	Explain in brief types of registers.	5
2	a)	Explain 555 timer working as astable multivibrator.	10
	b)	Explain first order low pass filter. Design a low pass filter at a cut off frequency of 1kHz with a pass band gain of 2. Also plot the frequency response curve. Assume $C=0.01\mu F$.	10
3	a)	Design a mod-5 synchronous counter using JK flip flop without lockout.	10
	b)	Minimize the expression using K map and implement using NAND gates only. $F = \Sigma(0,5,9,12,13,14,15) + d(1,2,3,4)$	10
4	a)	Explain successive approximation type ADC.	10
	b)	Explain TTL logic families.	10
5	a)	Implement following expression using (i) 8:1 Mux (ii) 4:1 Mux $F(A,B,C) = \Sigma(0,2,5,6,7)$	10
	b)	Explain ideal and practical differentiator.	10
6	a)	Design and implement 3bit gray to binary code converter.	10
	b)	Explain Schmitt trigger with necessary waveforms.	10