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B.E. / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2011

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

FOURTH SEMESTER

EC 283-LINEAR INTEGRATED CIRCUITS

Time: 3 hr

(REGULATIONS 2004)

Max Mark: 100

Answer ALL Questions

Part-A (10 X 2 = 20 Marks)

1. What is PSRR? What is the unit in which it is expressed?
2. A 741C OP-AMP with $\pm 15V$ supplies is configured as a Non-Inverting amplifier with a gain of $10V/V$. If the ac input amplitude is $V_{in}=0.5V$, What is the maximum frequency before the output distorts?. If $f=10KHz$, What is the maximum value of V_{in} before the output distorts?.
3. Design a Schmitt trigger circuit with following parameters: $UTP=LTP=1V$, $VCC=\pm 15V$.
4. For an Op-Amp integrator with $R=100M\Omega$ and $C=1\mu F$, an input of $2\sin 1000t$ is applied. Determine the value of V_o .
5. Define Pull-in time.
6. What is VCO?. Give its function.
7. A basic step of a 9-bit DAC is $10.3 mV$. If 000000000 represents $0V$, what output is produced if the input is 101101111 ?
8. Discuss the different types of errors in DM.
9. What are the advantages of Switched capacitor filter?.
10. State Thermal noise.

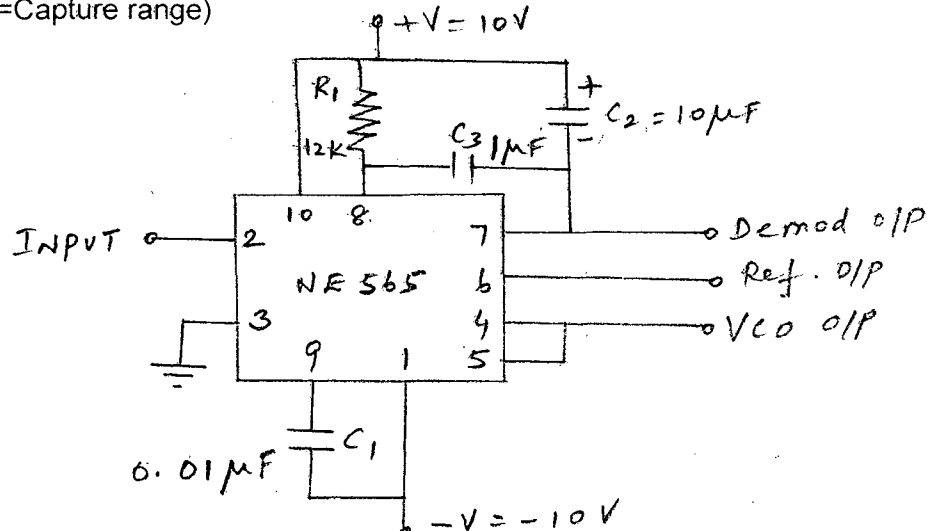
Part-B (5 X 16 = 80 Marks)

11. (a). (i). Explain the Band gap reference circuit in detail. (8)
 (ii). Write short notes on frequency compensation in an Op-Amp. (8)
12. (a). Derive the transfer function of second order Narrow Band pass filter and design the circuit with the band of frequencies is from $1KHz$ to $10KHz$. It is given that $2K=1.414$
 (or)
 (b). (i). The following components values are used in the circuit of Op-Amp astable multivibrator $C=0.1 \mu F$, $R=50K\Omega$, $R_1=10K\Omega$, $R_2=50K\Omega$. the output voltage is bounded to the limits $+10V$ and $-5V$. Calculate the timing periods t_1 and t_2 . (4)
 (ii). Draw the Op-Amp Full Wave Rectifier circuit and explain its working and derive its Output Expression. (12)

13. (a).(i). Draw the Four Quadrant Multiplier circuit and derive its output. (10)
(ii). With neat Block Diagram, Explain the applications of PLL as Frequency Multiplier, AM detection. (6)

(or)

- (b). (i). Draw the block Diagram of IC 566 Voltage Controlled Oscillator and explain its operation and derive its free running frequency. (10)
(ii). For the circuit shown in figure, determine f_{out} , f_L , f_C . (f_L =Lock range, f_C =Capture range) (6)



14. (a).(i). Draw the R-2R Ladder circuit, and Explain its operation with an Example. (12)
(ii). A 6-bit DAC has a maximum precision supply voltage of 20V. What voltage Change does each LSB represent?. What voltage does 100110 represent?. (4)
(or)

- (b).(i). Discuss the Dual slope ADC with neat block diagram and derive its output expression. (12)
(ii). An analog voltage signal whose highest significant frequency is 1KHz is to be digitally coded with a resolution of 0.01% covering the voltage range (0-10)V. determine the minimum number of bits in the digital code, Analog value of the least significant bit. (4)

15. (a).(i). Construct the Monostable Multivibrator using 555 timer, explain its operation, Derive its Pulse width. (10)
(ii). Design an Astable multiplier using 555 Timer to get output waveform at $f=10\text{KHz}$ With a duty cycle of 40%. (6)

(or)

- (b). Write short notes on
(i). Low voltage regulator using IC 723. (6)
(ii). Isolation amplifier. (5)
(iii). Opto coupler. (5)