BITS-Pilani Dubai, International Academic City, Dubai

II sem :Year:2007-2008

Evaluation Component : Comprehensive examination **(Closed Book)**

III Year EIE

EEE UC 364 ANALOG ELECTRONICS

Date: 22ND May. 2008 **Max. Marks: 60**

Duration: 3hrs **Weightage: 30%**

Instructions:

Assume suitable data if required

I Answer All Questions (5x2=10)

1 Design an OPAMP inverting amplifier with gain 1000

2. Design an active OPAMP filter for passing frequency upto 5Khz.

3 Design OPAMP logarithmic amplifier.

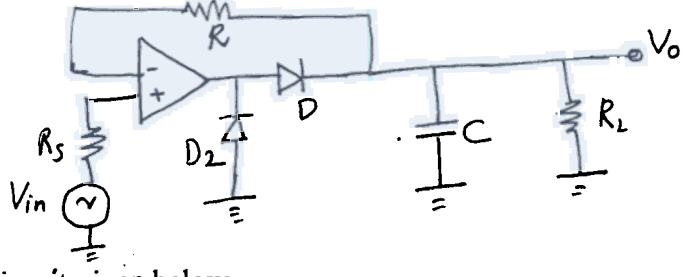
4 Design an OPAMP circuit to convert square wave into spike.s

5. What is staggered tuned amplifier? Write its advantage

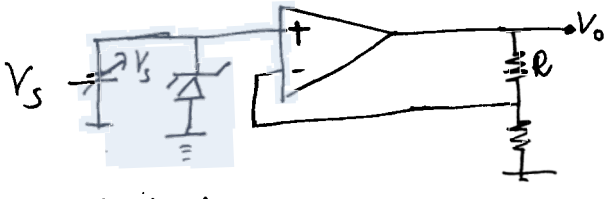
II Answer All Questions (5x4=20)

6. Design an OPAMP circuit for $V_o = V_x . V_y . \sin^2 wt$

7. Explain the operation of the following circuit



8. Explain the operation of circuit given below



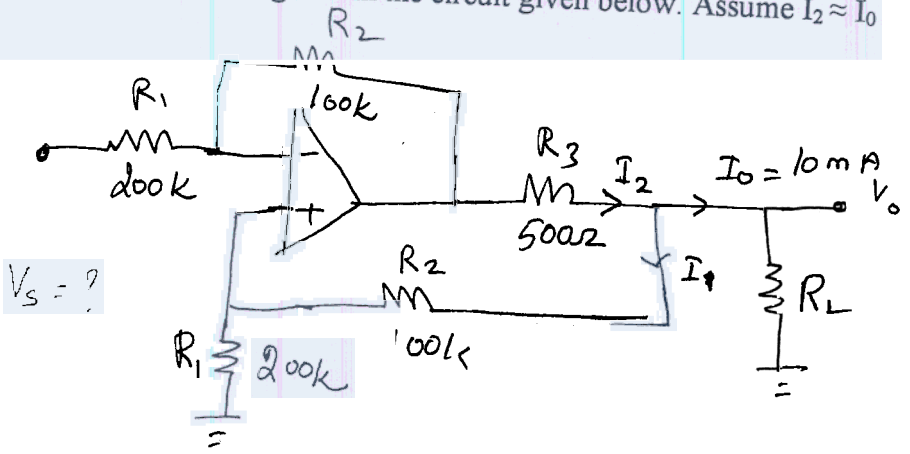
9. Design a Zener diode tester circuit using opamp

10. Explain in detail about successive approximation method of converting analog to digital signal

PTO

III Answer All Questions (5x6=30)

11. Find out input voltage Vs in the circuit given below. Assume $I_2 \approx I_0$

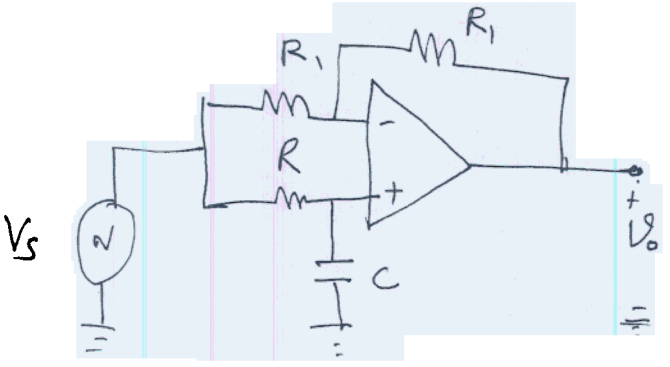


12. Design an analog circuit using 741 ICs to solve the following differential equation by integrator and summation. Assume all initial conditions to be zero

$$A\frac{d^2Vo}{dt^2} + B\frac{dVo}{dt} + CVo = Vi$$

13. Design an OPAMP RC phase shift oscillator for generating 100 Hz sinusoidal signal. Assume the capacitor value to be 0.1μF

14. Design the given opamp circuit to produce the phase shift of -135° at frequency of 2 kHz. Assume the capacitor value to be 0.1μF.



15. Propose your own IC sensor for measuring current passing in the network without any changes in the connection of the circuit.

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III YEAR EIE

Evaluation Component : TEST-II(Open Book)

INSTR UC 364 ANALOG ELECTRONICS

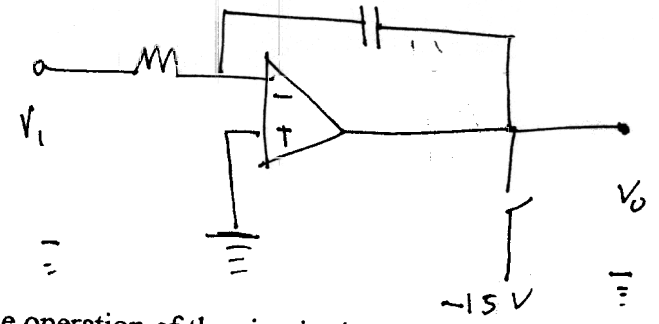
Date : 10th Apr. 2008
Duration: 50 mts

Max. Marks: 20
Weightage: 10%

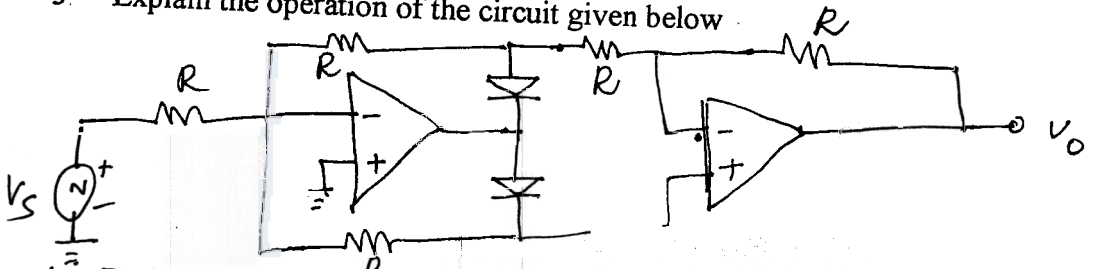
Note:- 1. ANSWER All QUESTIONS
2. Make assumptions, if any, but explicitly indicate the assumptions made
3. **TEXT BOOK ONLY ALLOWED**

Combine low pass and high pass filter to construct band pass filter. Analyze the condition required for it [3 M]

2. The operational amplifier shown is used as an integrator. Assume that the capacitor is charged to +15V.It is to changed to -15 V by closing the switch 'S'. This blow out the opamp. Explain Why and give the way to avid this. [3M]



3. Explain the operation of the circuit given below



4. Design an opamp circuit to solve the differential equation $A\frac{d^2V_o}{dt^2}+B\frac{dV_o}{dt}+CV_o=V_i$, where A B and C are the constants. Use only integrator and summing amplifier. [4M]

5. Design an operational amplifier circuit to find the cube root of give signal

6. The inputs $V_x = 4.47SIN(2\pi X1000t)$ and $V_y = 4.47SIN(2\pi X1000t+\theta)$ S are given to multiplier. If a dc voltmeter pf (0-1)V is connected to the output, find the meter readings at $\theta = 30^0, 60^0, 90^0$. [3M]

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III YEAR EIE

Evaluation Component : **TEST-I (Closed Book)**

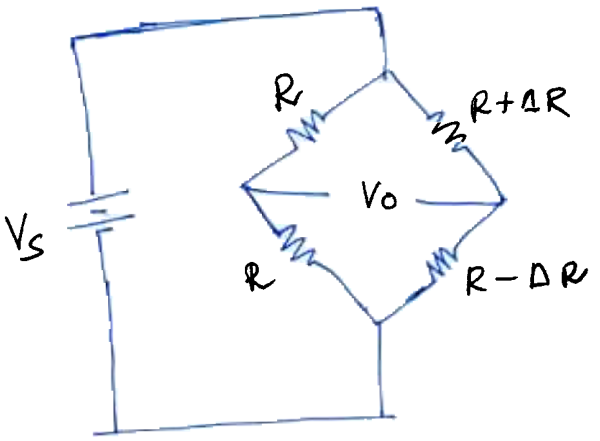
INSTR UC 364 ANALOG ELECTRONICS

Date : 24th Feb. 2008
Duration: 50 mts

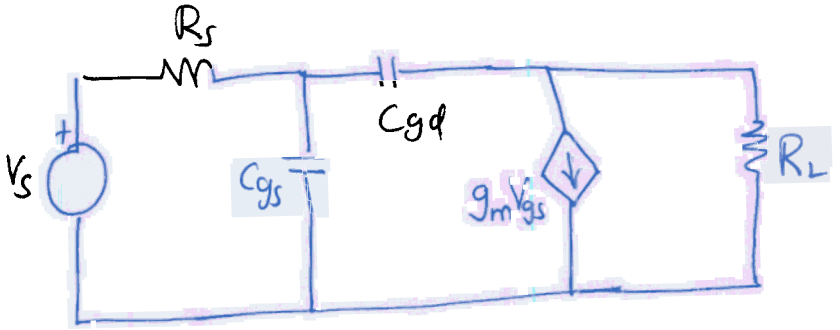
Max. Marks: 30
Weightage: 10%

Note:- 1. ANSWER any 6 QUESTIONS
2. Make assumptions, if any, but explicitly indicate the assumptions made
3. Write all necessary steps for solving problems

1 a) Prove that $|V_0| = (V_s/2)(\Delta R/R)$ in the following bridge circuit having changes in resistance due to strain gauge (2.5 M)

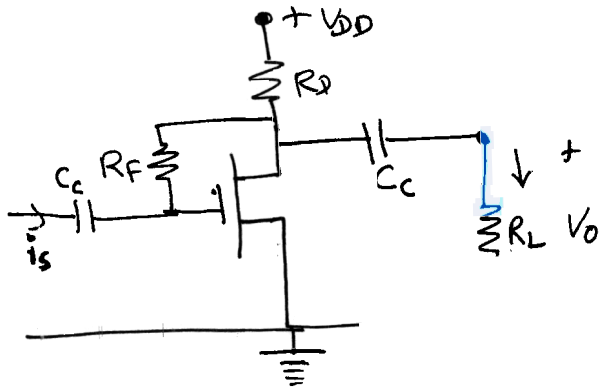


b) Consider FET amplifier equivalent circuit as shown in figure. Given Cgs=Cgd=1 pF, gm=4 mA/V, R_l=10k Ω. Find the values of the effective input and output capacitances, using miller's theorem (2.5M)



2. Consider a CS amplifier circuit with feedback biasing arrangement as shown in figure.Given VDD = 15V,R_F=1 M Ω,R_d=4 K Ω, k'n=20 μA/V,L=10 μ meter,W=400 μ meter,Va=100 V and V_t=2V.Assume all capacitors as short at the given signal frequency. Determine the dc operating point and the performance parameters of the voltage amplifier . (5.0 M)

(PTO)



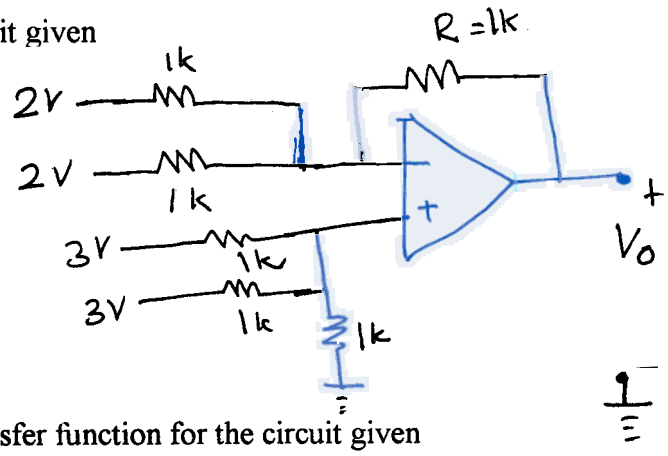
3 a) Draw operational amplifier internal block diagram and write their function (2.5M)

b) Write the characteristics of an ideal OPAMP (2.5M)

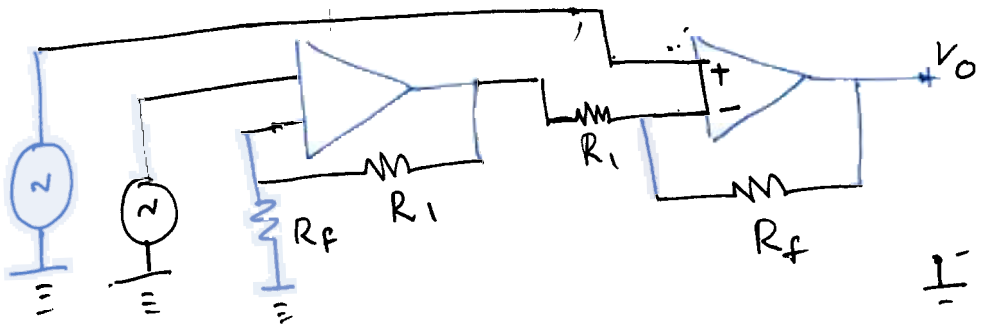
4 a) Draw the transfer characteristics of operational amplifier under open loop condition. When does operational amplifier operate in linear mode (2.5M)

b) Write the significance of CMRR in operational amplifier (2.5M)

5 Find Vo for the circuit given (5.0M)



6. Find the voltage transfer function for the circuit given (5.0M)



7 Write all conditions to make inverting amplifier as a summer (5.0M)
Write how to convert a summer into an inverting amplifier having gain N