V.S.B. ENGINEERING COLLEGE, KARUR
Department of Electronics and Communication Engineering
Academic Year: 2017-2018 (EVEN Semester)
Assignment Questions

Year/Semester & Branch: II/IV Semester & ECE 'A' &'B'
Name of Subject: EC6401- Electronic Circuits-II
Name of Faculty member: Mr.T.Sivalingam / Mr.S.Keerthika

1. A newly constructed feedback amplifier undergoes a performance test with the following results: With the feedback connection removed, a source signal of 2mV is required to provide a 10 V output to the load; with the feedback connected, a 10 V output requires a 200 mV source signal. For this amplifier, indentify values of A, β, Aβ, closed loop gain, and the amount of feedback in dB.

2. A Colpitts oscillator is designed with C_1 = 100 pF and C_2 = 7500 pF. The inductance is variable. Determine the range of inductance values, if the frequency of oscillations is to vary between 950 kHz to 2050 kHz.

3. Consider the design of an IF amplifier for an FM radio receiver. Using two synchronous tuned stages with f_0 = 10.7 MHz, find the 3-dB bandwidth of each stage so that the overall bandwidth is 200 kHz. Using 3 µH inductors find C and R for each stage.

4. Design a Schmitt trigger circuit to have V_{CC} = 12 V, UTP = 5 V, LTP = 3 V and I_C = 2 mA, using two silicon NPN transistors with $h_{FE(min)}$ = 100 and $I_2 = 0.1\ I_{C2}$.

5. Design a saturated collector coupled multivibrator for the following specifications: output voltage 12 V peak; Output to be a positive pulse; the duration is 10 µs; the time between pulses to be 20 µs. For the BJTs is used, h_{FE} (min) = 100; I_{CBO} = 0 and $I_{C(ON)}$ = 1 mA.

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Name of Subject: Communication Theory
Name of Faculty member: Mr.R.R.Jegan/Mrs.S.Yuvarani

1. A transmitter radiates 10.125 kW with the unmodulated carrier of 9 kW. Calculate the modulation index and percent of modulation. If another sine wave, corresponding to 40 percent modulation, is transmitted simultaneously determine the total radiated power?

2. A modulating signal 20 sin (2π x 103 t) is used to modulate a carrier signal 40sin (2π x 104 t).find out

(i) Modulation index

(ii) Percentage modulation

(iii) Frequencies of the sideband components and their amplitudes

(iv) Bandwidth of the modulating signal

(v) Draw the spectrum of the AM wave

3. A 107.6 MHz carrier signal is frequency modulated by a 7 kHz sine wave. The resultant FM signal has a frequency deviation of 50 kHz. Determine the following:

(i) the carrier swing of the FM signal

(ii) the highest and the lowest frequencies attained by the modulated signal.

(iii) the modulation index of the FM wave.

4. For a discrete memoryless source 'S' with 5 symbols S1, S2, S3, S4 ,S5 construct a Shannon Fano code, Huffman code and also calculate any one of its efficiency if the probability distribution is given as, P(S1)=0.4; P(S2)=0.15; P(S3)=0.15; P(,S4)=0.15; P(S5)=0.15

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ASSIGNMENT PLAN

Year/Semester & Branch: II/IV Semester & ECE 'A','B' & 'C'

Name of Subject: Electromagnetic Fields

Name of Faculty member: Dr.P.S.Gomathi & Mrs.S.Anitha

1. A vector field is specified as $G = 24xya_x + 12(x2 + 2)a_y + 18z^2a_z$. Given two points, P (1, 2, −1) and Q(−2, 1, 3), find: a) G at P b) a unit vector in the direction of G at Q c) a unit vector directed from Q toward P d) the equation of the surface on which |G| = 60.
2. A parallel plate capacitor is filled with a non uniform dielectric characterized by $\varepsilon_r=2+2x10^6x^2$, where x is the distance from on plate. If $S=0.02m^2$ and d=1mm, find C.
3. Let a filamentary current of 5 mA be directed from infinity to the origin on the positive z axis and then back out to infinity on the positive x axis. Find H at P (0, 1, 0).
4. A toroidal core has a circular cross section of 4 cm^2 area. The mean radius of the toroid is 6 cm. The core is composed of two semi-circular segments, one of silicon steel and the other of a linear material with $\mu_R = 200$. There is a 4mm air gap at each of the two joints, and the core is wrapped by a 4000-turn coil carrying a dc current I_1.
5. Let $\mu = 3 \times 10{-}5$ H/m, $\varepsilon = 1.2 \times 10{-}10$ F/m, and $\sigma = 0$ everywhere. If $H = 2\cos(10^{10}t - \beta x)a_z$ A/m, use Maxwell's equations to obtain expressions for B, D, E, and β.

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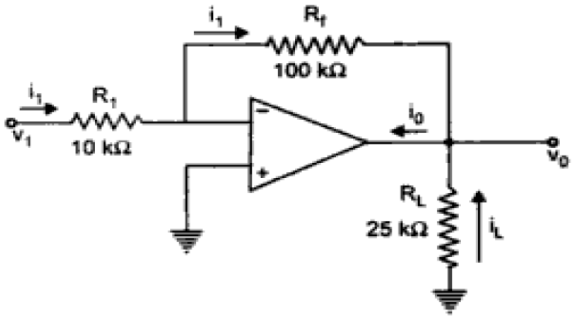
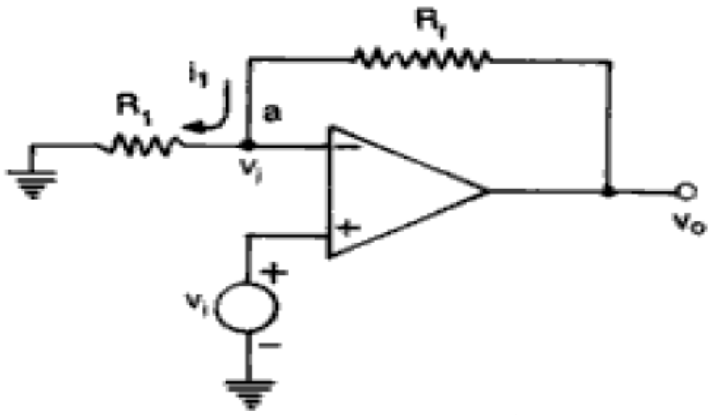
Assignment Questions

Year/Semester & Branch: II/IV Semester & ECE 'A', 'B' & 'C'
Name of the Subject: Linear Integrated Circuits
Faculty Name: Mrs.S.Sri Shanmugapriya &Mrs.D.S.Priyanka

1. In the figure shown, R_1=10 kΩ, R_f=100kΩ, V_i=1V. A load of 25kΩ is connected to the output terminal. Calculate (i) i_1 (ii) v_o (iii) i_L and total current i_0 into the output pin.



2. A differential amplifier has a differential voltage gain of 2000 and a common mode gain 0f 0.2. Calculate the CMRR in dB.
3. Design a Widlar current source for generating a constant current I_0 = 10μA. Assume V_{CC} = 10V, V_{BE} = 0.7 V, β = 125. Use V_T = 25 mV.
4. In the figure shown, R_1=5 kΩ, R_f=20 kΩ, V_i=1V. A load of 5kΩ is connected to the output terminal. Calculate (i) Vo (ii) A_{CL} (iii) i_L (iv) the output current io indicating proper direction of flow.



5. A non-inverting amplifier with a gain of 100 is nulled at 25°C. What will happen to the output voltage if the temperature rises to 50°C for an offset voltage drift of 0.15 mV/°C ?

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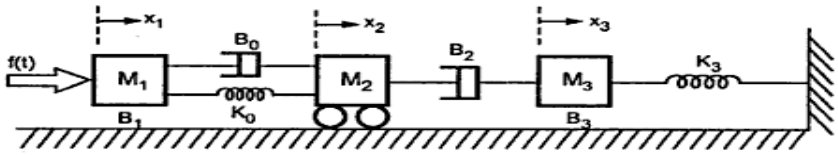
Assignment

Year/Semester & Branch: II/IV Semester & ECE 'A' &'B'& 'C'

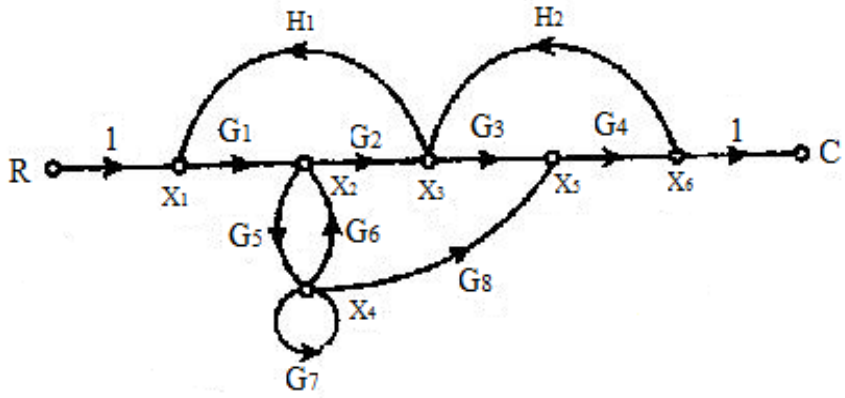
Name of Subject: EC 6405 - Control System Engineering

Name of Faculty member: Mr.R.Pari / Dr.K.Arun

1. Obtain Transfer function.



2. Find the transfer function using Mason's formula



3. Derive the transfer function of armature controlled and field controlled DC motor.

4. Obtain C/R Using mason's gain formula and Block diagram reduction technique.