SE-IV/6(A)

212814

COMPUTER ENGINEERING   COURSE NO. ECE – 411

(Electronics – II)

Time Allowed – 3 Hours   Maximum Marks – 100

Note: Attempt any five questions in all selecting at least two questions from each Section. Each question carries 20 marks.

SECTION – A

1. (a) Discuss with neat diagram, the classification of amplifiers and give the concept of feedback in amplifiers (negative).

    (b) Derive an expression for I/P resistance and O/P resistance in case of voltage shunt feedback amplifier.

        (10, 10)

2. (a) Discuss the steps for analyzing the feedback amplifiers.

    (b) For the circuit shown in Fig. 1, the transistors are identical and have parameters hie = 2kΩ, hfe = 5.0, hre = hoe = 0. Determine d, Arf, Aif, Rif, Rof.

        [Turn Over

fig 1
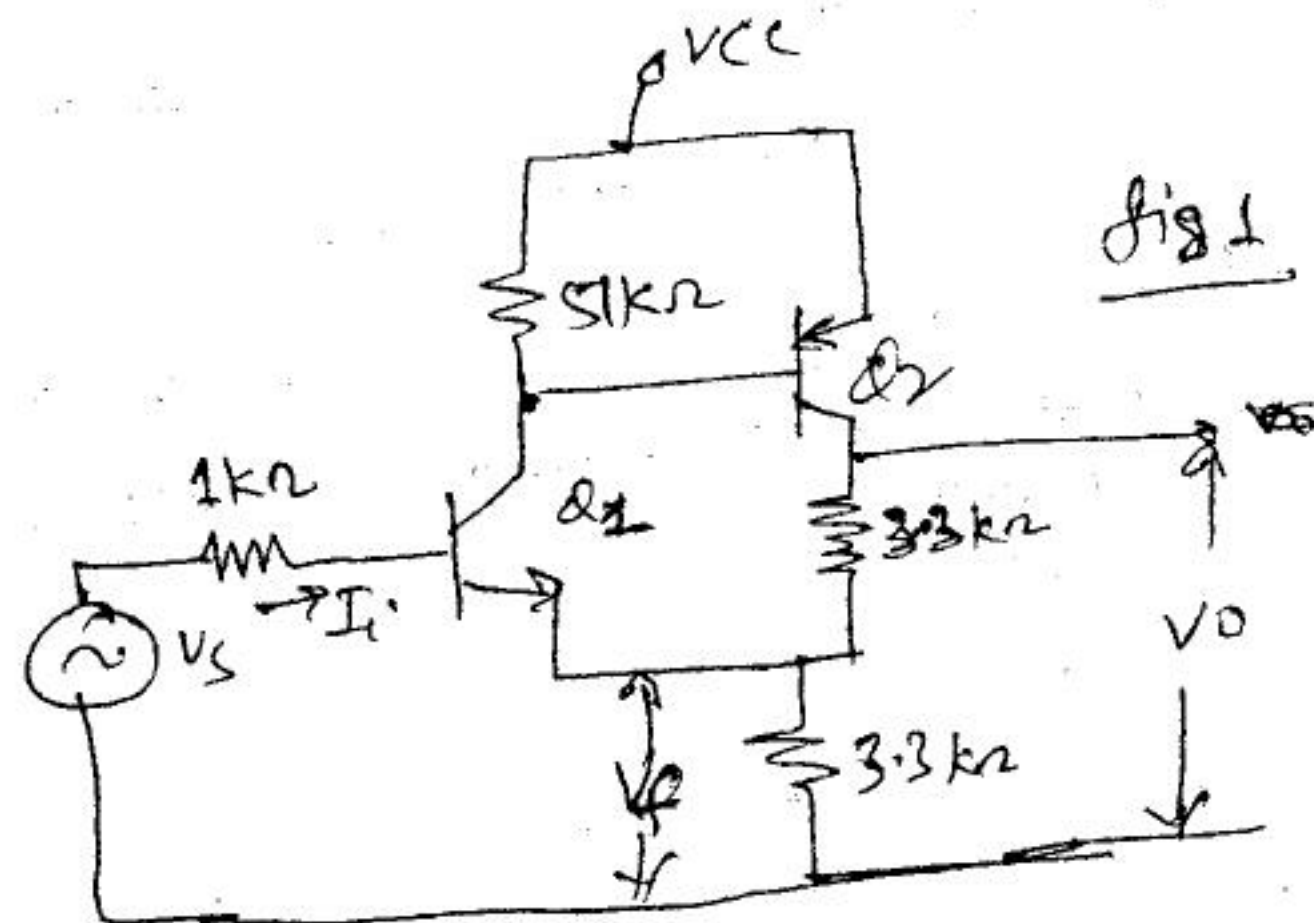
3. (a) Explain Barkhausein criteria for oscillation and derive an expression for Arf in oscillators.

(b) In Hartley oscillator, $L_1 = 15mH$, $C = 50Pf$. Calculate L_2 for a frequency of 168 KHz. The mutual inductance between L_1 & L_2 is 5 µH. Also find the required gain of transistor to be used for oscillation.

(10, 10)

4. (a) Derive an expression for Hartley oscillator in case of frequency and minimum gain required for oscillation.

(b) In Colpitt Oscillator, $C_2 = 0.001µ$ F, $C_1 = 0.01$ µF and $L = 5$ µH. Calculate.

(i)   Frequency of oscillation

(ii) If L is doubled, find new frequency

(iii) Find L to double the frequency in part (i).

SECTION – B

5. (a) Explain the use of voltage regulators. Discuss with block diagram the working of shunt and series voltage regulators.

    (b) A series voltage regulator has $Sv = 6 \times 10^{-3}$ and output resistance $(Ro) = 10^{-4} \, \Omega$. Calculate DVO when :

        (i) Unregulated DC. Voltage varies by 10V

        (ii) Load current varies by 250 mA.   (10, 10)

6. (a) Explain with neat diagram the use and working of pre-regulator.

    (b) Explain with neat diagram, the working of SMPS.

                                                    (10, 10)

7. Discuss various types of differential amplifiers with neat diagram and derive an expression for voltage gain (Ad), Input Resistance (Ri) and Output Resistance (Ro) in case of single input balanced output differential amplifier.

8. (a) Discuss the following electrical parameters of op-amp.

    (i) Slew rate (ii) CMRR

    (iii) I_{io} (iv) PSS

    (v) V_{io}

   (b) Explain with neat diagram, the working of op-am as integrater. Draw its O/p wave. (10, 10)

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