B.E DEGREE EXAMINATIONS APRIL/MAY 2012

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS

FOURTH SEMESTER FULL TIME (R 2008)

EC9252 ELECTRONIC CIRCUITS II

TIME:3hrs MAX MARKS:100

INSTRUCTIONS:ANSWER ALL QUESTIONS

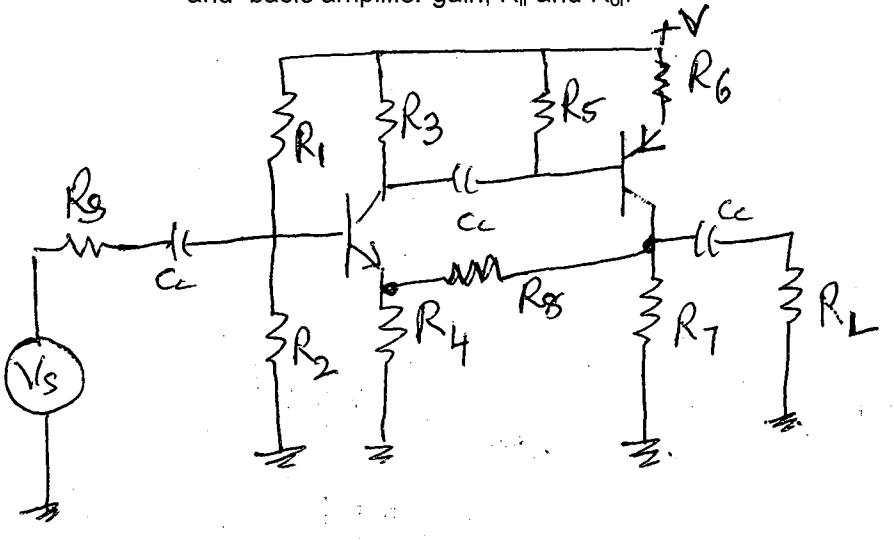
PART A (10x2=20marks)

1. Derive for series and parallel resonant frequencies of a crystal using its equivalent circuit
2. Draw the equivalent circuit of a transconductance amplifier
3. For an ac Voltage controller with $Z_L = R+jX_L$, draw the controlled ac current waveform with respect to ac input for two cycles ,showing clearly the firing and extinction angles.
4. Derive the ripple factor for a FWR with L filter.
5. A BJT RC Phase shift oscillator has f_o =10 KHz , R_{IN} =6.8K and R_O = 8K , calculate the Voltage gain and current gain of the amplifier at f_O.
6. Calculate the minimum time interval between consecutive triggers for an BJT Mona stable mulivibrator with V_{CC} = 20v , R_C =9.8k , R_B =930k, R_1 = 860k, R_2 =65k and C=0.1μF
7. A single tuned amplifier is designed to receive voice signal over AM broadcast at 1550KHz .What is the quality factor .
8. Draw and specify the features of any one configuration of tuned amplifier with multiple tuned Circuits used in video amplifier IC.
9. Justify that current shunt feedback increases the output impedance with topological diagram
10. A simple RC Circuit produces a sweep voltage of two volts from 15vsupply Find all three linearity errors.

PART B (16x5=80 marks)

11(i) A single stage transresistance amplifier having 82KHz bandwidth and R_C = 5K is given negative feedback of .02mA/v so as to increase the bandwidth to 410 KHZ. Draw the transresistance amplifier with and without feedback . Calculate A_{Vf} , A_{If}, R_{mf} and G_{mf} using negative feedback concept [Assume h_{fe} = 183 and h_{ie} =3.2k] (8)

(ii) Draw the basic amplifier of the feedback amplifier shown below. With the equivalent circuit derive expressions for feedback factor and basic amplifier gain, R_{if} and R_{of}. (8)



12a (i) Derive and explain the transfer function of a wein network and draw the bode plots. (6)

(ii)Construct an oscillator circuit using the above network and explain its working,also derive for its frequency of oscillation (10)

OR

b. With Circuit diagram of clapp oscillator and its equivalent circuit derive for its frequency of oscillation and design considerations to be met to get sustained oscillation

13a.(i) Explain with circuit diagram a Boost Convertor and derive for V_O and Critical values of inductance and capacitance. (10)

(ii) A Boost Converter has an input voltage of 6V The average load current is 0.5A ,the switching frequency is 25KHz, L = 150 µH and C = 220µF, calculate duty cycle , ripple current of inductor and critical values of inductor and capacitor (6)

OR

b.(i) Describe how output Voltage is regulated with respect to line and load variations using linear Voltage Regulator (10)

(ii) With structural diagram and equivalent circuit of IGBT, explain the V-I Characteristics of IGBT. (6)

14a. (i) Draw emitter coupled Bistable multivibrator and explain its hysteresis Characteristics. (8)

(ii)Design a BJT free running, Collector coupled multivibrator to generate a pulse waveform of (0 – 10V) with 70% duty cycle at 2KHz.Draw the waveforms at base and Collector terminals of both the active devices. (8)

OR

b.(i) Explain current sweep generator (12)

(ii)Describe the design aspects of speed up capacitor (4)

15a.(i) Draw a single tuned amplifier and with its equivalent circuit , derive for A(f) and cut-off frequencies (10)

(ii) A cascaded Synchronous tuned amplifier is designed to receive a signal centered at 10.7MHz having bandwidth of 400 KHz, using single tuned amplifiers with L = 3 µH and Q_L = 13.6 Draw the designed circuit and its frequency response [Assume Relevant data] (6)

OR

b.(i) Design a tuned amplifier shown with amplifier shown with L = 5µH , R_P = 1K to receive 455 KHZ. Find its bandwidth, tuning capacitor C_1 and current gain I_C/I_1 if Rin = 1K and Cin = 200 pf (without tapping of coil) (10)

(ii)Adjust the tapping ratio of the coil of the circuit shown to reduce the BW to 10 KHZ Also find the new value of C_1 and current gain at resonance. (6)