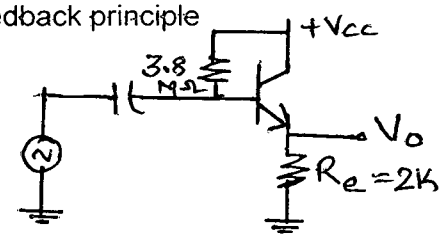
B.E.(Full Time)Degree Examinations April 2011
Electronics and Communication Engineering
III Semester (R-2008)
EC9252 – Electronic Circuits II

Time : 3 Hours **Max.marks :100**

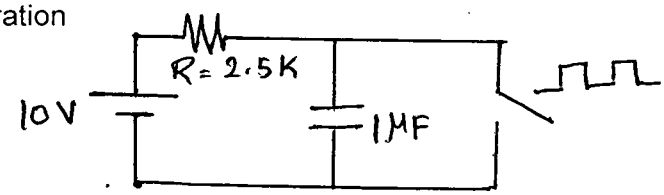
Answer All Questions

PART-A **(10x2=20marks)**

1. Prove that overdriving BJT reduces its rise time
2. In a crystal oscillator L=0.5mH, R=5K,C=0.06pf and C_m=1pf, calculate fs and fp
3. Justify the statement that negative feedback desensitizes the changes in the amplifier gain
4. Find R_{of} using feedback principle



5. What must be the loaded Q of single tuned amplifier so as to receive a speech signal broadcast at 93.5 MHz using FM
6. Mention the special features of IGBT
7. Briefly explain any one method of neutralization used in tuned amplifier.
8. The circuit shown has displacement error of 2.5 %.Find the sweep voltage and sweep duration

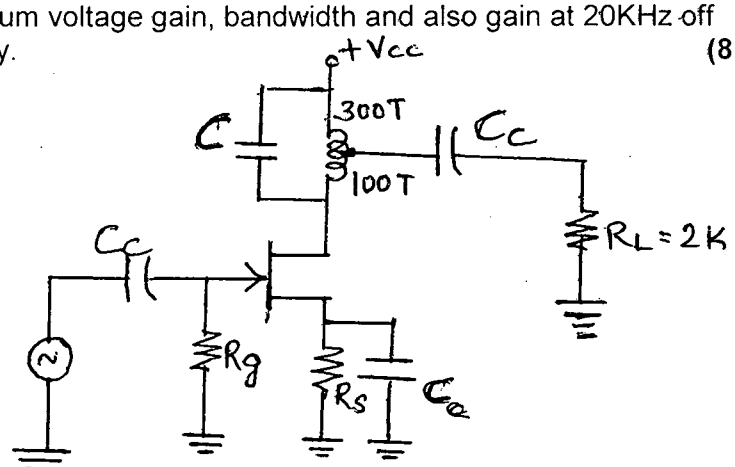


9. Calculate the capacitance value to be used in FWR with C filter to produce an output voltage with 6% ripple across a load of 1.5K(assume f=50Hz)
10. Draw and briefly explain Franklin oscillator

PART-B **(5x16=80marks)**

11. i) Explain synchronous and stagger tuned amplifiers **(8)**
(ii) Find the maximum voltage gain, bandwidth and also gain at 20KHz off centre frequency. **(8)**

L = 1mH
R_s=25 Ω
C = 1nF
G_m = 5mA/V
r_d = 20K
R_L = 2K



12. (a)(i) Derive the transfer gain of phase lead-lag network. With bode plots of the above network, explain how amplitude and phase conditions are satisfied in Wein bridge oscillator using bipolar transistor. **(12)**

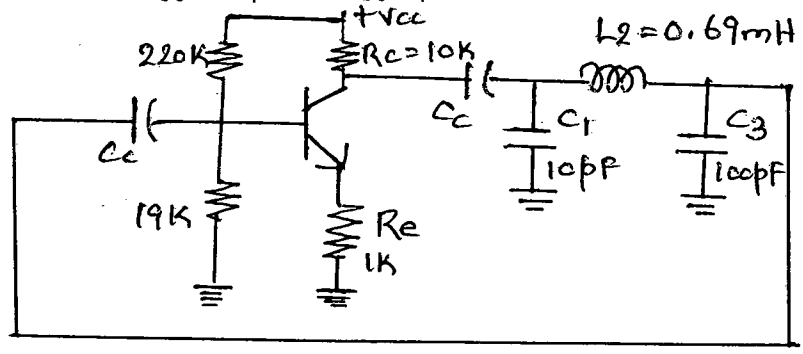
(ii) Determine the voltage gain and current gain required in a BJT RC Phase Shift Oscillator for the following specifications: R_o of the amplifier =8 KΩ; R_{in} of the amplifier =6.8 KΩ ; Frequency of Oscillation =10KHz. **(4)**

(OR)

(b)(i) Draw Armstrong oscillator and explain how the condition for oscillation is satisfied. **(6)**

(ii) In the Colpitts oscillator shown calculate the frequency of oscillation **(6)**

- With $C_{b'e}$=0 and C_{bc}=0
- With $C_{b'e}$=100pf and $C_{b'c}$=3pf



(iii) Modify the above β network so as to convert Colpitts oscillator to Clapp oscillator without changing C_3 and C_1 to generate 2MHz sine wave independent of interelectrode capacitance. Draw the modified Clapp oscillator circuit. **(4)**

13. a) (i) Draw a discrete collector coupled astable multivibrator in both unstable states indicating the current flow in all the branches. .Explain with relevant waveforms, how a pulse waveform is produced Derive for the frequency of the generated waveform. **(12)**

(ii) Calculate the minimum time interval between consecutive triggers in a collector coupled Monostable Multivibrator.
Data given Rc1=Rc2= 4KΩ; R_B= 543K ; R_1=853K ;R_2=6MΩ and C=26μF. **(4)**

(OR)

b) (i) Describe current time base generator with circuit and waveforms. **(8)**

(ii) Draw emitter coupled monostable multivibrator and explain its function. Derive for its ON period **(8)**

14. a) (i) Explain buck converter and derive expression for its output voltage also derive for critical values of inductance and capacitances. **(12)**

(ii) In a buck converter output voltage of 5V is obtained across resistance of 0.5K from input voltage of 12V with ripple voltage of 20mV and ripple current of 0.8A. Assuming switching frequency of 25KHz find duty cycle, filter inductance and critical values of inductance and capacitance. **(4)**

(OR)

b) (i) Describe line and load regulation of series voltage regulator. **(8)**

(ii) Derive the ripple factor for FWR with two LC filters connected in Cascade. **(8)**

15. a))(i) Negative feedback extends the bandwidth by de-sensitivity factor. Prove the above statement. **(8)**

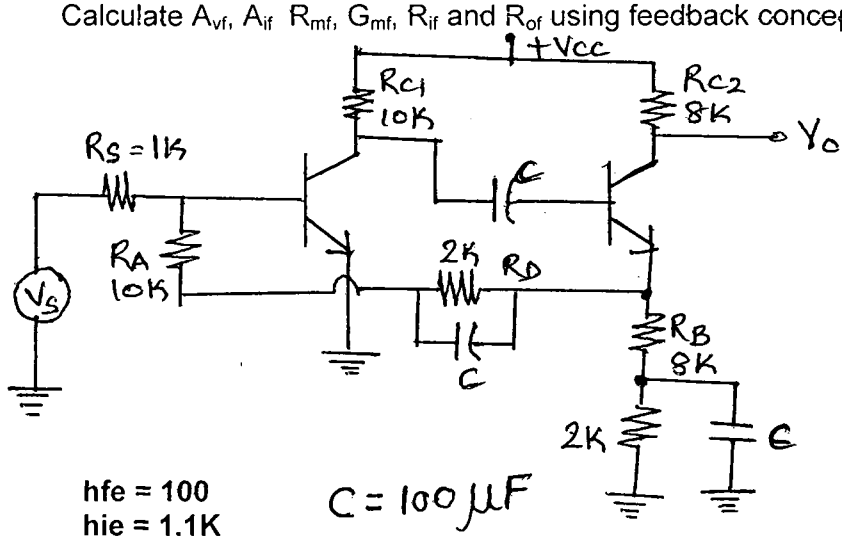
(ii) • Draw a single stage current series feedback amplifier and find its β.

• Draw the basic amplifier without feedback taking the loading effect of β network.

• Draw the equivalent circuit of the above basic amplifier and derive the expression for its transfer gain Gm and desensitivity factor. Hence obtain expressions for Gmf and Avf. **(8)**

(OR)

b) For the feedback amplifier shown draw the basic amplifier and its circuit. Calculate A_{vf}, A_{if} R_{mf}, G_{mf}, R_{if} and R_{of} using feedback concept.



hfe = 100
hie = 1.1K

C = 100 μF

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