VINAYAKA MISSION'S UNIVERSITY

V.M.K.V ENGINEERING COLLEGE, SALEM

DEPARTMENT OF ELECTRONICS & COMMUNICATION

ELECTRONICS CIRCUITS II
(COMMON TO ECE & ETCE)

V SEMESTER

QUESTION BANK

UNIT I
PART A

1. Define Negative and Positive Feedback.
2. Define Feedback factor.
3. Explain Desensitivity
4. Explain Sampling Network
5. What are the advantages of Negative Feedback over Positive Feedback?
6. Draw the frequency response of amplifier with feedback and without feedback.
7. What are the effects of negative feedback on distortion and gain?
8. Explain the term Sensitivity.
9. Distinguish between Voltage and Current feedback.
10. Distinguish between shunt and series feedback.
11. List the four types of negative feedback?
12. Draw the equivalent circuit of a Transconductance amplifier?
13. Draw the equivalent circuit of a voltage amplifier?
14. Find closed loop gain of a negative feedback amplifier with open loop gain 600, β=0.01?
15. What are the effects of negative feedback on input and output impedance of amplifier?
16. Explain the effect of noise and distortion in feedback amplifier?
17. Write the formula for closed loop gain?
18. What type of feedback connection?
19. What is the basic difference between feedback in biasing circuits and amplifier circuits?
20. What is open loop gain?
21. Why negative feedback is employed in high gain amplifiers?
22. Define (i) Gain Margin and (ii) Phase Margin.
23. Distinguish positive and negative feedback amplifier.
24. What type of feedback has been used in an emitter follower circuit?
25. An amplifier with stage gain 200 is provided with negative feedback of feedback ratio 0.05.

Find the new gain.

Part – B

1. Explain with relevant information how the negative feedback amplifier improves stability, reduces noise and increases input impedance.

2. a). Draw the block diagram of amplifier with negative feedback and explain.
   b). Explain the consequences of introducing negative feedback in small signal amplifiers .

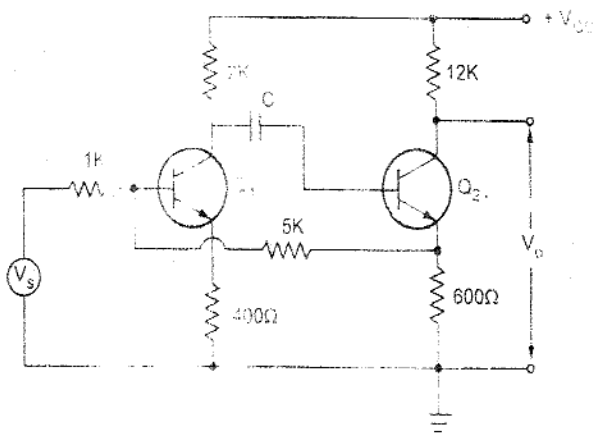
3. What type of feedback is employed in emitter follower amplifier derive an expression for A_{if}, A_{vf}, R_{if}, R_{of}

4. What is the effect of negative feedback on input and output resistance of current shunt feedback amplifier.

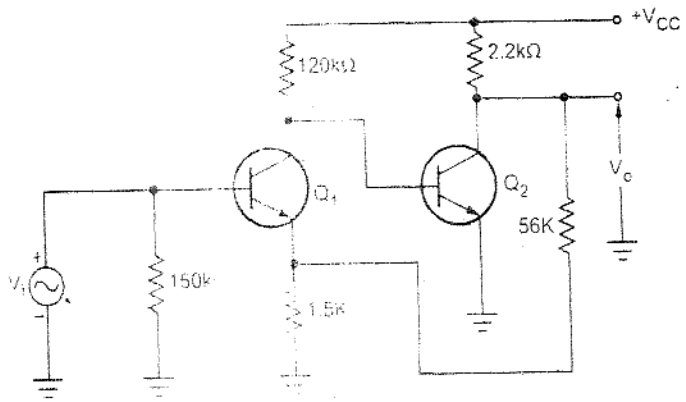
5. What type of feedback is employed in a common emitter circuit with unbypassed emitter resistance explain.

6. Explain the effect of negative feedback on current shunt feedback amplifier derive an expression for A_{if}, A_{vf}, R_{if}, R_{of}.

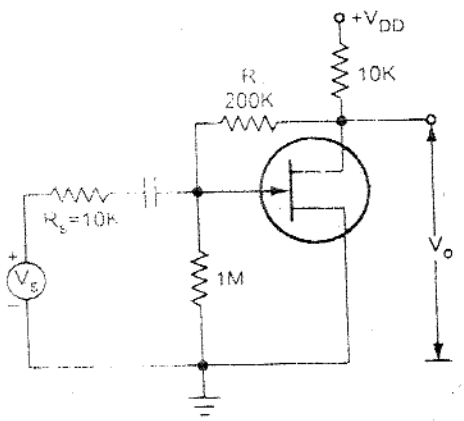
7. For the circuit shown in the figure.
   (a). Identity the topology of feedback with proper reasoning.
   (b). Find A_{if}, A_{vf}, R_{if}, R_{of}, A_i



8. For the feedback amplifier shown in the figure.
   Identity the topology of feedback with proper justification. The transistors used are identical with the following parameters.
   $h_{fe} = 200$, $h_{ie} = 2K$, $h_{re} = 10^{-4}$, $h_{oe} = 10^{-6}$ A/V
   Calculate i) A_{vf} ii) R_{if} iii) R_{of}



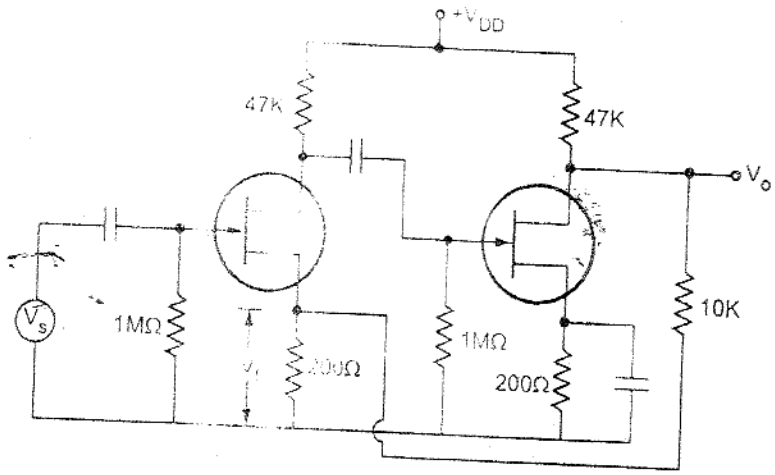
9.In the FET amplifier shown in fig. has the following parameters rd = 40 K g_m = 2.5A/V. Assume all capacitors to be arbitrarily large. Calculate D,R_{Mf}, A_{vf}, R_{if},R_{of} and R'$_{of}$.



10.The two stage feedback shown in fig. uses FET.The parameters are rd = 10 K and μ = 40.

i) Identify the topology of feedback.

ii) Calculate D, A_{vf}, R_{if},R_{of} and R'$_{of}$.


+V_DD
47k
47K
V_o
V_s
1MΩ
1MΩ
200Ω
10K

UNIT II

1. Specify the range of quality factor (Q) for crystal.
2. What are the classifications of Oscillators?
3. Define Barhausen Criterion.
4. What are the types of feedback oscillators?
5. State the conditions for oscillation.
6. Define piezoelectric effect.
7. Draw the equivalent circuit of crystal oscillator.
8. What is the principle of Miller crystal oscillator?
9. State the frequency for RC phase shift oscillator.
10. Define Oscillator
11. Differentiate amplifier and oscillator.
12. What are the advantages of crystal oscillator?
13. Draw the circuit diagram of a twin - T RC oscillator.
14. What is the advantage of a Clapp oscillator over Colpitt's oscillator?
15. What type of feedback is used in oscillators, why?
16. Why a crystal oscillator has a higher degree of frequency stability?
17. What is negative resistance oscillator? Give an example.
18. Distinguish between LC and RC oscillators.
19. Name any two low frequency oscillators.
20. Name any two high frequency oscillators.
21. What is a damped oscillation?
22. What is sustained oscillation?
23. Why it is difficult to have a variable frequency operation in a RC phase shift oscillator?
24. Give expression for frequency of oscillation for colpitts and Hartley oscillator.
25. In an Hartley oscillator, if $L_1 = 0.2$ mH, $L_2 = 0.3$ mH and $C = 0.003$ μF, calculate the frequency of its oscillation.

Part - B

1. With simple diagrams explain the operation of negative resistance oscillator using tunnel diode.
2. Draw the circuit diagram of RC phase shift oscillator and explain its operation.
3. Explain Clapp's oscillator and derive the expression for frequency of oscillation. Also explain

how frequency stability can be improved Clapp's oscillator.

4. Explain Hartley oscillator and derive the equation for oscillation.

5. Explain the resonance frequency of crystal. And draw the pierce crystal oscillator circuit and derive the equation for oscillation?

6.a).Explain with suitable example how logic gates are used as linear amplifier.
b).Explain in brief the Barhausen Criterion for oscillation in feedback oscillator.

7.a).What are the advantages and disadvantages of wein bridge oscillator.
b).Briefly explain the general diagram of LC oscillators with relevant expressions.

8. Draw the circuit diagram of transistorized colpitts oscillator. Obtain the expression for the frequency of operation of colpitts oscillator.

9. With a neat diagram explain Wein-bridge oscillator, and derive the expression for frequency of oscillation.

10. Derive the frequency of oscillation for Twin-T oscillator, and explain its operation with neat circuit diagram.

UNIT III
Part – A

1. What do you mean by Tuned Amplifiers?
2. What is a synchronously Tuned amplifier?
3. Mention the need of Stagger Tuned amplifier.
4. What is meant by Unloaded and Loaded Q of tank circuit.
5. Write a short notes on Coil losses.
6. Define Q.
7. List the advantages and disadvantages of tuned amplifier.
8. What is Neutralization?
9. List the various types of tuned amplifier.
10. What is the effect of Cascading single tuned amplifier on bandwidth.
11. Draw the circuit diagram of class C tuned amplifier?
12. Draw the circuit diagram of a stagger tuned amplifier?
13. . List the various types of neutralization.
14. Draw the equivalent circuit of a single tuned amplifier.
15. How is miller capacitor reflecting on input and output side of a tuned amplifier?
16. Mention the bandwidth of a double tuned amplifier?
17. Point out the different methods of coupling the load to a tuned amplifier?
18. Compare the advantages of double tuned amplifier over single tuned amplifier?
19. Draw the frequency response of single and double tuned amplifier.
20. Mention the applications of Class C tuned amplifier?
21. Write short notes on coil losses in tuned amplifier?
22. What do you understand by instability of tuned amplifiers?
23. Mention some stabilization techniques in tuned amplifiers?
24. Write about the efficiency of Class C tuned amplifier?
25. What is meant by narrowband neutralization?

Part - B

1.With a circuit diagram explain the performance of single tuned inductively coupled amplifier.

2.a).Explain Hazeltine method of neutralization.
b).Brief the principle of Stagger tuning.

3.Explain with circuit diagram the operation of double tuned amplifier.

4.Compare and explain the frequency response of single tuned , double tuned & stagger tuned amplifier.

5.Draw the circuit diagram of a Class-C transistor mixer circuit and describe its operation. List few application of the circuit .

6.a). Explain the concept of stagger tuned amplifier with the help of frequency response
b).Explain Hazeltine neutralization circuit with the help of neat diagram.

7.Derive an expression for tunning frequency of a single tuned amplifier in terms of quality factor and bandwidth of amplifier.

8.What is the effect of cascading a single tuned and double tuned amplifiers on bandwidth?. Derive the expression for it.

9.Explain the various Neutralization techniques.

10.a).Discuss instability of tuned amplifier.
b).Explain the basic mixer circuit with neat diagram.

UNIT IV

Part - A

1. What do you understand by Symmetrical triggering?
2. Why Commutating capacitors are used in bistable Multivibrator?
3. Draw the typical waveform at base and collector of a collector coupled astable multivibrator.
4. What are the applications of Schmitt trigger circuit?
5. What is Bistable multivibrator?
6. State the application of astable multivibrator.
7. What is hysteresis?
8. What is meant by unsymmetrical triggering?
9. Give the difference between ideal and practical emitter coupled astable multivibrator.
10. What is resolving time?
11. What is the function of commutating capacitance in multivibrator?
12. Draw the circuit diagram of a collector coupled astable multivibrator using complementary transistors.
13. Sketch the output wave form of a Schmitt trigger circuit for sine wave input of 12 V peak to peak if UTP=5V and LTP=3V.
14. What is a Schmitt trigger circuit?
15. What are the applications of bistable multivibrator?
16. Why an astablemultivibrator is called as free running oscillator?
17. What is the difference between astable multivibrator and monostable multivibrator?
18. Draw the typical waveforms at base and collector of a collector coupled monostable multivibrator.
19. Define resolving time of bistable multivibrator.
20. Define storage time of multivibrator.
21. Define symmetrical triggering.
22. What is meant by linear wave shaping circuits?
23. Define transition time of bistable multivibrator.
24. What are the applications of Schmitt trigger circuit?
25. What are the triggering methods of multivibrators?

Part - B

1.Describe the circuit diagram of emitter coupled Monostable Multivibrator and explain its operation with relevant waveform.

2.Explain the unsymmetrical and symmetrical triggering of bistable multivibrator.

3.a).Draw the circuit diagram of complementary transistor monostable multivibrator and explain its operation.

b).Explain UTP & LTP of Schmitt triggering.

4.Describe the performance of collector coupled astable multivibrator with relevant diagram.

5.With a neat diagram explain the operation of Schmitt trigger circuit.

6.Derive the expression for the frequency of the emitter coupled astable multivibrator circuit .

7.a).Draw the transfer characteristics of Schmitt trigger and explain what is hysteresis.

b). Write a note on complementary multivibrator circuit.

8.The circuit parameter of a fixed bias bistable multivibrator are $V_{cc}=V_{bb}=5V$, $R_c=1k$, $R_1=5K$, $R_2=2.5K$.The npn silicon transistor used have $(h_{fe})_{min}=20$.Assume all junction voltages to be zero

a).Calculate stable state currents and voltages. verify that one transistor is in saturation and other in cutoff.

b).find the maximum Icbo at which the circuit satisfactorily.

9.a).What is the effect of loading in fixed bias binary? Explain the procedure of calculating heaviest load which binary can derive.

b).Write a note on free running multivibrator.

10.Design a collector coupled monostable multivibrator for following specification:

I_{CBO} and voltage across saturated transistor are negligible.

For transistor $(h_{fe})_{min} = 20$ and base-emitter cut off voltage for transistor normally to be OFF is –1V.The base drive to transistor in saturation is 50% in excess of minimum required. The collector supply ic $V_{cc} = 6V$ and collector current is 2mA.The delay time is 3000μsec. Chose $R_1=R_2$.find R_c,R,V_{BB},R_1 and C

UNIT V

Part A

1. Mention the application of blocking oscillator.
2. How the linearity of current sweep generator can be improved.?
3. Draw the circuit diagram of astable blocking oscillator.
4. Mention the features of Millers saw tooth generator.
5. What is the effect of saturation voltage on pulse width?
6. Define duty cycle.
7. state the condition for high pass RC circuit as a differentiator.
8. Give the features of Millers sweep circuit.
9. Which portion of UJT characteristics is used in UJT saw tooth generator.
10. How linearization is achieved in current time based circuit?
11) Draw the circuit diagram of a free running blocking oscillator?
12) What is a blocking oscillator?
13) What are two types of blocking oscillators?
14) Mention few methods of controlling the pulse.
15) Draw the equivalent circuit of pulse transformer.
16) How is the total pulse of pulse transformer divided?
17) What are the characteristics of diode controlled circuit?
18) What are applications of pulse transformers?
19) Draw the circuit diagram of simple current time base generator.
20) Draw the circuit diagram of an astable blocking oscillator (RC controlled).
21) Draw the monostable blocking oscillator using emitter based timing.
22) What is frequency control using core saturation?
23) Write short notes on push pull operation of astable blocking oscillator?
24) What is meant by linearization using constant current circuit?
25) Where is bootstrap generators used?

Part B

1.Explain with suitable diagram the performance of Monostable blocking oscillator.

2.a).Explain how saw tooth waveform are generated using UJT.
b).Discuss about linearization using constant current source.

3.With a neat diagram explain the operation of Bootstrap circuit .

4.Draw the circuit diagram of monostable transistor blocking oscillator with emitter timing. Explain its operation with equivalent circuit during pulse formation .

5.Explain the basic principles of miller sawtooth generator circuit with the help of neat diagram.

6.Derive the expression for slop error and sawtooth generator speed for bootstrap sawtooth generator circuit.

7.Draw and explain the operation of diode controlled astable blocking oscillator .

8.What is the condition on RL required for the successful operation emitter timing block oscillator.

9.Explain how darlington pair reduces the slop error in bootstrap saw tooth generator circuit.

10.Explain the following methods of controlklinng the pulse width in monostable blocking oscillator

a).core saturation method

b).shorted delay line method.