**AEC--QUESTION BANK**

**UNIT-I**

 **SHORT ANSWER QUESTIONS**

1. Write briefly about classification of amplifiers.
2. What are the advantages & disadvantages of transformer coupled amplifier.
3. Draw high frequency equivalent Circuit of FET & explain.
4. What is the effect of cascading no. of RC coupled amplifier on BW
5. What is amplifier. Classify them.
6. What is the range of frequency upto which the hybrid-pi equivalent circuit is valid.
7. What are the advantages of transformer coupled amplifier over RC – coupled amplifier.
8. Derive the expression for high 3-dB frequency Fh\* of n identical stages in terms of fH for one stage.
9. State and explain millers theorem.
10. Describe briefly the merits and demerits of FET over BJT.
11. Voltage gain of a single stage amplifier is 20.BW=10KHz, 3 such stages are cascaded. Find over all voltage gain and band width.
12. Three identical stages have an overall upper 3db frequency of 20KHz, and lower 3db frequency of 20Hz, what are fl and fh of each stage.
13. BJT has following parameters fT=500Mhz and IC =1mA, and β=10. Calculate bandwidth.
14. Discuss the effect of bypass and coupling capacitance.
15. What is miller effect resistance and capacitance explain with example.

**LONG ANSWER QUESTIONS**

1. Draw the circuit of transformer coupled amplifier & derive expression for gain in low, high freq.
2. For RC coupled BJT amplifier derive expressions for gain at mid & high frequencies
3. Derive expression for mid gain & BW of two stage RC coupled FET amplifier
4. Explain RC coupled amplifier. Derive its frequencies & draw eqi. Circuit used in finding frequencies
5. Derive mid gain & low cutoff freq for transformer coupled BJT amplifier
6. Show the hybrid – π equivalent circuit of BJT in CE configuration. Explain significance of each parameter . Derive the expression for fβ and fT.

**UNIT-II**

 **SHORT ANSWER QUESTIONS**

1. What are the characteristics of negative feedback amplifiers
2. Write about stability of negative feedback amplifiers
3. What is effect of negative feedback on i/p & o/p resistances of trans conductance amplifier
4. Differentiate between local & global feedback
5. Explain a feedback amplifier with help of block diagram.
6. Write about stability of feedback amplifiers.
7. Draw the small signal equivalent circuit of FET amplifier in CS connection let RD= 4K Ω, b=40,rd=40KΩ.evaluate voltage gain.
8. Negative feedback improves gain stability of the amplifier, justify the statement.
9. An amplifier requires an input signal 60m Volts to produce certain output with a negative feedback to set the same output. The voltage gain with feedback is 90. Find open loop voltage gain and feedback factor.
10. An amplifier has a voltage gain of 200befor negative feedback is applied, when negative feedback is applied with β=0.25 the nominal gain changes by 10% find the percentage change in the overall gain.
11. How does negative feedback reduce distortion in amplifier.
12. Ri=1KΩ, R0=5KΩ, A=100, β=0.04 calculate Rif, R0f, of voltage shunt feedback amplifier.
13. Draw the equivalent circuit of trans resistance amplifier and mention idle values for Ri and R0

**LONG ANSWER QUESTIONS**

1. Evaluate the effect of negative feedback on i/p & o/p impedances of voltage shunt amplifier.
2. For a single stage voltage shunt feedback amplifier Rc=2K Ω, Re=1KΩ,Rf=100KΩ,Rs=1KΩ, and hfe=50,calculate Rif and Rvsf.
3. Give an example of voltage series negative feedback amplifier.Analyse the amplifier and find Avf, Rif and Rof if Re=4KΩ,Rs=1KΩ,R1=30KΩ, R2=20KΩ, hfe=100,hie=1.1kΩ and hoe= hre=0.
4. Draw current series feedback amplifier if RC=1kΩ , RE=100Ω, R2=20kΩ, R1=30KΩ, HFE=100, calculate A, Ri, Rif, Af.

**UNIT-III**

 **SHORT ANSWER QUESTIONS**

1. Compare LC & RC Oscillators
2. Derive relation between series and parallel resonant frequency of crystal
3. What are limitations of zener voltage regulator
4. State & explain barkhausen conditions
5. What are the constituent parts of an oscillator
6. In rc phase shift oscillator r=6K Ω,c=1500PF,RC=18KΩ find frequency of oscillation and condition for oscillations.
7. What are the factors which effect frequency stability of an oscillator.
8. Write short note on LC oscillator and RC oscillator.
9. Colpitts oscillator C1=.16µF, L=15.8mH, frequency of oscillation is 10KHz , calculate C2.
10. Write short note on transistorised shunt regulator.
11. Write short note on transistorised series regulator.
12. Write short note on crystal oscillator.
13. L1=5mH, L2=10mH, C=10nF, calculate f0 of a Hartley oscillator.

**LONG ANSWER QUESTIONS**

1. For RC phase shift FET osc. Explain its operation & derive expression for freq of osc.
2. Draw neat colpitts osc & explain its operation . derive its freq of operation & condition for osc.
3. Write short notes on i) transistor series regulator, ii) stability of RF amplifier
4. What is piezoelectric effect? Explain the workinh of crystal osc. What are the limitations of zener regulator
5. Draw neat hartley osc & explain its operation . derive its freq of operation & condition for osc.
6. Draw neat weinbridge& explain its operation . derive its freq of operation & condition for osc.
7. Prove that in class-A power amplifier if distortion is 10% power gain to load increases by 1%
8. Describe the operation of class B transformer less complementary symmetry amplifier.
9. Draw neat hartley osc & explain its operation . derive its freq of operation & condition for osc.
10. What factors decide amplitude and frequency stability of a oscillator.
11. Show that minimum forward gain should be 44.54 for providing sustained oscillations in RC phase shift oscillator.

**UNIT-IV**

 **SHORT ANSWER QUESTIONS**

1. Find efficiency of class-A power amplifier
2. What are the requirements of pushpull power amplifiers
3. What are the advantages of pushpull power amplifiers
4. Define conversion efficiency. & collector efficiency of power amplifier
5. Why a voltage amplifier cannot be used at radio frequencies
6. Why class AB is preferred over class B amplifier
7. What is crossover distortion. How it can be eliminated
8. Why the power transistor provided with heat sinks
9. Explain similarities between Class B & Clas AB power amplifier
10. Why a voltage amplifier cannot be power amplifier.
11. How are amplifiers classified based on the biasing condition.
12. In class A, VCEmax=25 Volts, VCEmin=5Volts. Find overall efficiency of series feed load and also transformer coupled load.
13. For a power amplifier D2=.1, D3=0.05, D4=0.02 , I1=2A, RL=15Ω, find distortion, fundamental component of power , total output power.
14. What is tuned amplifier, what is the class of tuned amplifier.

**LONG ANSWER QUESTIONS**

1. Draw the circuit of transformer coupled Class-A power amplifier & explain its operation & efficiency.
2. Explain with circuit operation of class-B push- pull audio power amplifier
3. Draw the circuit of tuned classC, power amplifier and explain its operation with wave form, derive the expression for its output power and collector circuit efficiency.
4. Draw the schematic of two transistor class B, push pull amplifier and show that Pcmax=.4Pmax.
5. Explain the performance of Class D power amplifier with neat circuit diagram.
6. For class B push pull providing 25Volts peak signal to 8Ω load and power supply Vcc=25volts find input power , output power and circuit efficiency.
7. Distinguish between Class A, B,C,AB power amplifiers.
8. Describe the operation of class B, transformer less amplifier circuit.

**UNIT-V**

 **SHORT ANSWER QUESTIONS**

1. What is staggered tuned amplifier. Its advantages
2. What are the requirements of tuned amplifier
3. State the applications of tuned amplifier
4. What is unloaded Q & loaded Q
5. What is neutralization
6. What is unilaterisation
7. Differentiate single, multi, staggered tuned amplifier
8. Define quality factor
9. A single tuned direct coupled amplifier having rc= 100k Ω f0=1MHz, L=500,Q=50,gm=1.5MA/V. Assume ro of transistor to be very large .Find gain ,band width with RL connected.

**LONG ANSWER QUESTIONS**

1. Derive expression for gain at resonance & BW for single tuned RF voltage amplifier
2. What is tuned amplifier. Explain the class of tuned amplifier. Describe the diff. types of neutralization in detail
3. Find the gain & BW of single tuned capacitance coupled amplifier
4. what is stagger tuned amplifier ?explain its working.