



SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES

(Autonomous)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

QUESTION BANK (II B. TECH II SEM) (2019-20)

ANALOG OF ELECTRONIC CIRCUITS (18ECE228):

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S.NO	QUESTION	PO Attainment
UNIT-1 BJT AMPLIFIERS		
PART A(TWO MARK QUESTIONS)		
1	How transistors act as amplifier?	PO1
2	Define amplifier?	PO1
3	Why are common emitter amplifiers more popular?	PO1
4	How are amplifiers classified according to the transistor configuration?	PO1
5	Write the voltage gain equation for CE configuration including source resistance.	PO1
6	Give the current gain equation of CE amplifier?	PO1
7	What are the characteristics of common emitter amplifier?	PO1
8	What are the characteristics of common collector amplifier?	PO1
9	What are the characteristics of common base amplifier?	PO1
10	Define – Miller's Theorem	PO1
11	Based on the transistor configuration how amplifiers are classified.	PO1,PO2
12	Draw a CE amplifier & its hybrid equivalent circuit.	PO1
13	Draw a CC amplifier & its hybrid equivalent circuit	PO1
14	Draw a CB amplifier & its hybrid equivalent circuit	PO1
15	Write the Hybrid parameters equation for transistor amplifier?	PO1
16	Write the CE amplifier Current gain, Voltage gain, Input Impedance, Output Impedance in terms of h-parameters.	PO1
17	Which amplifier is called as voltage follower? Why?	PO1
18	Why hybrid parameters are called so? Define them?	PO1
19	Two amplifiers having gain 20 dB and 40 dB are cascaded. Find the overall gain in db?	PO1
20	Which amplifier is called as voltage follower? Why?	PO1,PO2
1	Draw and explain the input and output characteristics of a transistor in CE amplifier.	PO1
2	Draw and explain the input and output characteristics of a transistor in CB configuration.	PO1,PO2
3	Distinguish between the different types of transistor configurations with necessary circuit diagrams.	PO3
4	Draw and explain the input and output characteristics of a transistor in CC configuration	PO1,PO2
5	Derive the expression for A_i , A_v , R_i and R_o for CB amplifier using h-parameter model.	PO1,PO2
6	Derive the equations for voltage gain, current gain, input impedance and output admittance for a BJT using low frequency h-parameter model for CE configuration	PO1,PO2

7	Derive the equations for voltage gain, current gain, input impedance and output admittance for a BJT using low frequency h-parameter model for CB configuration	PO1,PO2
8	Analyze general transistor amplifier circuit using h-parameter model. Derive the expressions for A_I , A_v , R_i , R_o , A_{vs} , A_{is} .	PO1,PO2
9	Derive the expression for voltage gain, current gain, input impedance, output impedance of CE amplifier using exact and approximate model.	PO1,PO2
10	Draw the hybrid π - equivalent of transistor in CE configuration at low frequency. Discuss the significance of different parameters of the equivalent circuit.	PO1,PO2,PO4
11	Draw and explain the general shape of the frequency response of amplifiers.	PO1,PO2
12	Explain about low frequency analysis	PO1,PO2
13	Derive the expression for lower 3dB frequency of a CE amplifier due to C_e	PO1,PO2
14	Derive all the components in the hybrid π model in terms of h-parameters in CE configuration.	PO1,PO2,PO4
15	State and explain miller's theorem in detail. Discuss the effect of coupling capacitor on low frequency response.	PO1,PO2
16	Draw and explain the input and output characteristics of a transistor in CE configuration.	PO1,PO2
17	Draw and explain the input and output characteristics of a transistor in CB configuration.	PO1,PO2

S.NO	QUESTION	PO Attainment
UNIT-2 FET AMPLIFIERS		
PART A(TWO MARK QUESTIONS)		
1	How FET work as an amplifier?	PO1
2	Why FET is called as a voltage control device.	PO1
3	Draw the equivalent circuit of FET	PO1
4	Write two reasons why a hybrid parameter model is used in small signal analysis.	PO1
5	What are the basic circuit configurations used in FET?	PO1
6	Sketch the simple common gate amplifier circuit of JFET?	PO1
7	State the general advantage of using JFET rather than BJT?	PO1
8	Draw the small signal equivalent circuit of JFET.	PO1
9	Write the expressions of small signal voltage gain and output resistance of the common gate circuit?	PO1
10	Draw general frequency response curve of an amplifier	PO1
11	What is bandwidth of an amplifier?	PO1
12	What are the effects of emitter bypass capacitor on high frequency response?	PO1
13	Draw general frequency response curve of an amplifier	PO1
14	Draw a CB amplifier & its hybrid equivalent circuit	PO1
15	Write the Hybrid parameters equation for transistor amplifier?	PO1
16	Which amplifier is called as voltage follower? Why?	PO1
17	Why hybrid parameters are called so? Define them?	PO1
18	Two amplifiers having gain 20 dB and 40 dB are cascaded. Find the overall gain in db?	PO1
19	Which amplifier is called as voltage follower? Why?	PO1
20	State the general advantage of using JFET rather than BJT?	PO1
PART B (TEN MARKS QUESTIONS)		
1	Explain about low frequency response of FET amplifier.	PO1,PO2

2	Explain about high frequency response of FET amplifier.	PO1,PO2
3	Explain about FET model at high frequency.	PO1,PO2
4	Explain the operation of high frequency common source FET amplifier with neat diagram. Derive the expression for (i) voltage gain (ii) input admittance (iii) input capacitance (iv) output admittance.	PO1,PO2
5	Drive the approximate analysis of CS amplifier.	PO1,PO2,PO4
6	Draw and explain the high frequency model of FET amplifier.	PO1,PO2
7	Define miller theorem and explain miller effect capacitance CS amplifier.	PO1,PO2,PO4
8	Explain about low frequency response of FET amplifier.	PO1
9	Derive the expression for AI, AV, Ri and Ro for CS amplifier using h-parameter model.	PO1
10	Draw general frequency response curve of an amplifier	PO1
11	Explain Square wave testing of amplifier.	PO1
12	What is low frequency analysis of FET amplifier explain in detail?	PO1
13	What is high frequency analysis of FET amplifier explain in detail?	PO1
14	How Square wave testing related to amplifier topic explain?	PO1
15	In detail explain the working of Common Source amplifier?	PO1

S.NO	QUESTION	PO Attainment
UNIT-3 FEEDBACK AMPLIFIERS		
PART A (TWO MARK QUESTIONS)		
1	Define feedback?	PO1
2	Define positive feedback?	PO1
3	Define negative feedback?	PO1
4	Define sensitivity?	PO1
5	What are the types of feedback?	PO1
6	What are the basic amplifiers?	PO1
7	What are the components of feedback amplifier?	PO1,PO2
8	What are two types of sampling?	PO1
9	State the two types of mixing?	PO1
10	List out the characteristics of feedback amplifier?	PO1
11	What is the effect of input resistance due to series mixing?	PO1
12	What is the effect of input resistance due to shunt mixing?	PO1,PO4
13	What happens to output resistance due to current sampling?	PO1
14	What happens to output resistance due to voltage sampling?	PO1
15	Write the expression for input and output resistance of voltage series feedback amplifier.	PO1
16	Give the properties of negative feedback.	PO1
17	Give the effect of negative feedback on amplifier characteristics.	PO1
18	What are the effects of negative feedback? (Or) What are the advantages of negative feedback?	PO1
19	Define the feedback factor β ?	PO1
20	Define feedback?	PO1
PART B (TEN MARKS QUESTIONS)		
1	Draw the block diagram and circuit diagram for current series feedback amplifier.	PO1
2	Explain General block diagram of feedback amplifier.	PO1,PO4

3	Derive the expressions for gain with positive and negative feedback.	PO1
4	What is the effect of negative feedback on stability, distortion, noise, input and output impedance of a feedback amplifier?	PO1,PO2
5	What is the effect of a voltage series feedback on input and output resistance of a BJT amplifier? Explain the same, with necessary circuit, equivalent circuit and equations.	PO1,PO2
6	Draw the circuit diagram of voltage shunt feedback amplifier and derive the expressions for R_{if} and R_{of} .	PO1,PO2
7	Explain thermal stability and discuss the factor in detail?	PO1,PO2
8	Derive the expressions for Sensitivity and De sensitivity	PO1
9	What is the nature of input and output resistance in negative feedback?	PO1
10	Draw the block diagram of feedback system And explain the stability factors?	PO1
11	Explain Voltage series feedback ad derives the expression without feed back?	PO1,PO2
12	With block diagram of current series feedback and derive the expressions for R_{if} and R_{of} .	PO1,PO2
13	Explain Voltage shunt feedback ad derive the expression amplifier without feed back?	PO1,PO2
14	For current series feedback derive the derivation of amplifier without feed back?	PO1,PO2
15	For current shunt feedback derive the derivation of amplifier without feed back?	PO1,PO2

S.NO	QUESTION	PO Attainment
UNIT-4 OSCILLATORS		
PART A(TWO MARK QUESTIONS)		
1	What is an oscillator?	PO1
2	What is the difference between open loop and closed loop gain of the circuit?	PO1
3	State the Barkhausen criterion for an oscillator.	PO1
4	Give the over all classification of oscillators?	PO1
5	What is the gain requirement in the wein bridge oscillator	PO1
6	How to obtain Hartley oscillator from the basic form of LC oscillator	PO1
7	How to obtained colpitt's oscillator form basic form of LC oscillator?	PO1
8	Write down the advantages of RC phase shift oscillator.	PO1
9	Write down the advantages, disadvantages and applications of Hartley oscillator.	PO1
10	Write down the advantages, disadvantages and applications of colpitt's oscillator	PO1
11	Write down the advantages, disadvantages and applications of crystal oscillator.	PO1
12	How does an oscillator differ from an amplifier?	PO1
13	What are the types of sinusoidal oscillator? Mention the different types of sinusoidal oscillator?	PO1,PO2
14	Name two low frequency Oscillators.	PO1
15	Name two high frequency Oscillators.	PO1,PO2
16	What are the essential parts of an Oscillator?	PO1

17	Why RC phase shift is needed in a RC phase shift Oscillator?	PO1
18	Write down the comparison between LC oscillators and crystals oscillators.	PO1
19	What is an oscillator?	PO1
20	What is the difference between open loop and closed loop gain of the circuit?	PO1
PART B (TEN MARKS QUESTIONS)		
1	Explain RC phase shift oscillator?	PO1,PO2
2	Explain Clapp's oscillator and derive the expression for frequency of oscillation. Also	PO1
3	Explain how frequency stability can be improved Clapp's oscillator.	PO1
4	Explain Hartly oscillator and derive the equation for oscillation?	PO1
5	Explain pierce crystal oscillator and derive the equation for oscillation	PO1,PO4
6	Derive the general condition for oscillation for a LC oscillator and derive the frequency of oscillation for a colpitts oscillator.	PO1,PO2
7	Explain the working of a Hartley oscillator with a neat circuit diagram and derive the frequency of oscillation.	PO1,PO2
8	Derive the expressions for frequency of oscillation and condition for sustained oscillation of Hartley oscillator with neat circuit diagram.	PO1
9	A Hartley oscillator has $L_1 = 5 \text{ mH}$, $L_2 = 25 \text{ mH}$ and frequency of oscillation ranging from 700 KHz to 1 MHz. Determine the value of Cover this frequency range.	PO1,PO2
10	What is a Wien Bridge? How is it used as an oscillator? Derive the necessary equations.	PO1
11	Draw the circuit diagram and explain the working principle of RC phase shift oscillator. Also derive the expression for frequency of oscillation and condition for sustained oscillation.	PO1
12	Explain the working of Clap oscillator with neat circuit diagrams. Give two applications.	PO1,PO2,PO4
13	Explain RC phase shift oscillator?	PO1,PO2
14	Explain Clapp's oscillator and derive the expression for frequency of oscillation. Also	PO1,PO2
15	Explain the working of Clap oscillator with neat circuit diagrams. Give two applications.	PO1,PO2

S.NO	QUESTION	PO Attainment
UNIT-5 LARGE SIGNAL AMPLIFIERS		
PART A(TWO MARK QUESTIONS)		
1	What is theoretical maximum conversion efficiency of class A power amplifier?	PO1
2	What is 'distortion' in power amplifiers?	PO1,PO2,PO4
3	What is cross over distortion?	PO1
4	Draw the circuit of Class-D amplifier	PO1
5	What is meant by cross over distortion in class B power amplifier and how it is corrected?	PO1
6	List the disadvantages of push pull amplifier.	PO1
7	Define Harmonic distortion and inter modulation distortion	PO1

8	Define large signal amplifier	PO1,PO2,PO4
9	What are applications of power amplifier?	PO2
10	What are the features and classifications of large signal amplifiers?	PO2
11	What is class A amplifier? What are the advantages of directly coupled class A amplifier?	PO1
12	What are the advantages of push pull amplifier?	PO1
13	What is the configuration used in complementary symmetry power amplifier? How does it help?	PO1
14	What is frequency distortion?	PO2
15	What are the classifications of Class A amplifier?	PO4
16	Define heat sink.	PO2
17	List any two advantages of transformer coupled class A amplifier circuit.	PO1
18	Why class A amplifier must not be operated under no signal conditions?	PO1
19	What is theoretical maximum conversion efficiency of class A power amplifier?	PO1
20	What is frequency distortion?	PO2
PART B (TEN MARKS QUESTIONS)		
1	Derive the theoretical max conversion efficiency of class B power amplifier.	PO1,PO2
2	Describe the distortion in power amplifier and the methods to eliminate the same.	PO1,PO2,PO4
3	Explain the operation of the transformer coupled class A audio power amplifier.	PO1,PO2
4	Explain the terms conversion efficiency and maximum value of efficiency used in audio power amplifiers.	PO1,PO2
5	Explain the operation of the class-B push pull power amplifier with neat diagram and list its advantages	PO1,PO2,PO4
6	Explain class A power amplifier with circuit diagram and derive for its efficiency.	PO1,PO2
7	Explain complementary – Symmetry class B power amplifier and derive for its efficiency.	PO1,PO2
8	Draw the circuit diagram of class B push pull amplifier and discuss its merits.	PO1,PO2
9	Compare class A, class B and class C power amplifier in their performance and efficiency.	PO2
10	Explain how power amplifier works with neat diagram.	PO1
11	Describe the operation of class c amplifier and derive the efficiency	PO1,PO2,PO4
12	Explain class D power amplifier with necessary sketches.	PO1
13	Define Thermal runaway and explain the role of	PO1
14	What is Heat sink explain how it is useful for amplifier circuits?	PO1
15	What is the difference between a voltage amplifier and a power amplifier?	PO1