

**PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)**

II B.Tech II Semester Regular/Supplementary Examinations, May-2024

**ELECTRONIC CIRCUIT ANALYSIS
(ECE)**

Time: 3 hours

Max. Marks: 70

**Answer ONE Question from each Unit
All Questions Carry Equal Marks**

Q. No.	Questions	BTL	CO	Marks
UNIT – I				
1.	a) Discuss the behavior of a transistor at high frequencies. What are the key factors that affect its performance in the high-frequency regime?	K2	CO1	7M
	b) Discuss the stability considerations for common source and common drain amplifiers at high frequencies. What factors can lead to instability, and how can it be mitigated?	K2	CO1	7M
OR				
2.	a) Explain the hybrid- π common emitter transistor model. How does it differ from other transistor models, and what are its advantages in high-frequency analysis?	K2	CO1	7M
	b) Explain the behavior of a common source amplifier circuit at high frequencies. Discuss the key factors that influence its performance in the high-frequency regime	K2	CO1	7M
UNIT – II				
3.	a) Explain the different methods of coupling used in amplifier circuits, including DC coupling, capacitor coupling, transformer coupling, and inductor coupling. Discuss the advantages and disadvantages of each method.	K2	CO2	7M
	b) Design a voltage-series feedback amplifier with a loop gain of 10 and an open-loop gain of 100. Calculate the closed-loop gain of the amplifier.	K3	CO2	7M
OR				
4.	a) Explain the operation of a two-stage RC coupled amplifier. Discuss the role of coupling capacitors and biasing resistors in the amplifier circuit. Provide an analysis of the voltage gain and frequency response of the amplifier.	K2	CO2	7M
	b) Compare the performance of feedback and non-feedback amplifiers in terms of gain, bandwidth, distortion, and stability. Discuss the advantages and disadvantages of using feedback in amplifier circuits.	K3	CO2	7M
UNIT – III				
5.	a) Explain the feedback principle in amplifiers. Discuss how feedback is used to control gain, bandwidth, and other characteristics of amplifiers. Provide examples to illustrate the concept of feedback.	K2	CO3	7M
	b) Discuss the different types of feedback used in amplifiers, including negative feedback, positive feedback, and regenerative feedback. Explain the characteristics and applications of each type of feedback.	K2	CO3	7M

OR					
6.	a)	Describe the classification of amplifiers based on feedback configuration. Discuss the differences between feedback and non-feedback amplifiers, and provide examples of each type.	K2	CO3	7M
	b)	Explain the various feedback topologies used in amplifier circuits, including voltage-series feedback, current-series feedback, voltage-shunt feedback, and current-shunt feedback. Discuss the advantages and disadvantages of each topology.	K2	CO3	7M
UNIT – IV					
7.	a)	Explain the operation of an RC phase shift oscillator using BJT	K2	CO4	7M
	b)	Explain the operation of a Hartley oscillator using BJT	K2	CO4	7M
OR					
8.	a)	Describe the Wien bridge oscillator circuit using BJT.	K2	CO4	7M
	b)	Describe the Colpitts oscillator circuit using BJT.	K2	CO4	7M
UNIT – V					
9.	a)	Define Class A power amplifiers and discuss their operating characteristics. Explain how Class A amplifiers achieve high linearity and low distortion.	K2	CO5	7M
	b)	Describe the operation of Class B push-pull amplifiers. Discuss how they achieve high efficiency by using complementary pairs of transistors.	K2	CO5	7M
OR					
10.	a)	Discuss the characteristics of Class C power amplifiers. Explain how they achieve high efficiency but with limited linearity.	K2	CO5	7M
	b)	Explain the operation of capacitance single tuned amplifiers, double tuned amplifiers, and staggered tuned amplifiers. Discuss the advantages and applications of each type of tuned amplifier configuration.	K2	CO5	7M