R20 Regulation *Subject code:3P3DC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, December 2024

ELECTRONIC CIRCUIT ANALYSIS

(Electronics & Communication Engineering)

Maximum Marks: 70 Date:04.12.2024 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A		
All the following questions carry equal marks (10X2M=20) Marks)		CO	Bloom Tx
1	List the various possibilities of inter-stage coupling of amplifiers.	1	L1
2	Draw a small signal low frequency model of a transistor.	1	L1
3	Draw simplified high frequency model of CE amplifier.	2	L1
4	Define a short circuit Gain of a transistor in CE configurations at high frequencies.	2	L1
5	Draw the small signal model of JFET.	3	L1
6	Draw the characteristics of MOSFET.	3	L1
7	List out the different topologies in feed back amplifiers with their sample and mixing signals.	4	L1
8	Define Barkhausen criteria.	4	L1
9	What are the drawbacks of transformer coupled power amplifiers?	5	L1
10	What are different types of tuned amplifiers?	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	A) Draw the circuit diagram of a common Emitter amplifier along with its equivalent circuit by using approximate analysis. Derive expressions for A_V ,R_I,A_I and R_0. [7M] B) What is non-linear distortion? List the causes for this type of distortion in amplifiers. [3M]	1	L2
	OR		
12	Draw the circuit for Cascode Amplifier. Explain its working, obtaining overall values of the circuit in terms of h-parameters [10M]	1	L2
13	Derive the expression for the CE current gain A_i with resistive load in hybrid π model [10M]	2	L2
	OR		
14	A. Prove that (i) $h_{fe}=g_m * r_{b'e}$ for a Hybrid -π model of CE amplifier [3M]	2	L2

	B. Derive the expression for the CE short current gain A_i in hybrid π model [7M]		
15	Explain the Analysis of CG JFET Amplifier [10M]	3	L2
	OR		
16	common source amplifier uses a MOSFET with the following parameters gm=1.5mA/V, r_d=40kohms, Cgs=3pF, Cds=1pF, Cgd=3.2pF. The value of Rd=200Kohms. The amplifier operates at 30KHz. Find Voltage gain, input resistance, output resistance. [10M]	3	L2
17	Give the equivalent circuits, and characteristics of ideal and practical amplifiers of the following types (i) Voltage amplifier, (ii) Current amplifiers, (iii) Trans-resistance amplifier, (iv) Trans-conductance amplifier [10M]	4	L2
	OR		
18	Draw the circuit and explain the principle of operation of RC phase-shift oscillator circuit. What is the frequency range of generation of oscillations? Derive the expression for the frequency of oscillations [10M]	4	L2
19	Draw the circuit and explain the working principle of Single tuned amplifier and calculate its voltage gain at resonance. [10M]	5	L2
	OR		
20	Draw the circuit and explain the working principle of a complementary symmetry push-pull power amplifier and state its disadvantages? [10M]	5	L2