



R22 Regulation **Subject code: 4E3DD**
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
 (Autonomous, Accredited by NAAC with 'A+' Grade)

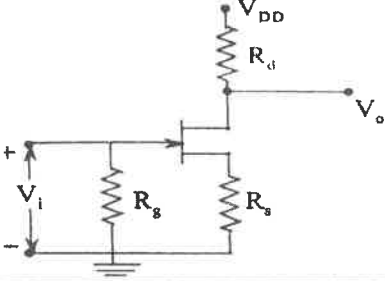
B.Tech III Semester Regular Examinations, February 2024
ELECTRONIC CIRCUIT ANALYSIS
(ECE)

Maximum Marks: 60

Date: 23.02.2024 Duration: 3 hours

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

Part-A		CO	Bloom Tx
All the following questions carry equal marks (10x1M=10 Marks)			
1.a)	What are the types of distortion in amplifiers	1	L1
b)	What is a Cascode amplifier	1	L1
c)	Why the h parameter model is not suitable to analyze transistors at high frequencies	2	L1
d)	What is meant by gain-bandwidth product	2	L1
e)	Define FET parameters	3	L1
f)	Draw the small signal model of MOS amplifier	3	L1
g)	Classify amplifiers based on the feedback	4	L2
h)	How does the frequency stability of an LC oscillator depend upon the Q-factor of the LC circuit	4	L1
i)	What is crossover distortion.	5	L1
j)	What are the requirements of a tuned amplifier	5	L1
Part-B			
Answer All the following questions. (5X10M=50Marks)			Bloom Tx level
2	Analyze general transistor CE amplifier circuit using h parameter model and Derive the expressions for A_i , A_v , R_i , R_o . [10M]	1	L4
	OR		
3	a. Compare CB, CE, CC amplifiers. [5M]	1	L3
	b. Explain about Different coupling schemes used in amplifiers. [5M]	1	L2
4	a. In hybrid 'pi' model of a transistor at high frequencies, analyze CE short circuit current gain. [7M]	2	L4
	b. An amplifier has $R_i = 0.5K$ and $R_o = 0.05K$. The amplifier gives an output voltage of 1 V peak for an input voltage of 1mV peak. Find A_v , A_i A_p in db [3M]	2	L3
	OR		
5	The h-parameters of a transistor used in a CE circuit are $h_{ie} = 1 K$, $h_{re} = 2 \times 10^{-4}$, $h_{fe} = 50$, $h_{oe} = 25 \mu A/V$. The load resistance for the transistor is 1 K in the collector circuit. Determine A_i , A_v , R_i , R_o using exact and approximate	2	L3

	analysis (Assume $R_s = 800 \Omega$)? [10M]		
6	a. Derive Voltage gain, Input Impedance and output impedance for CS amplifier. [5M]	3	L4
	b. A common source FET amplifier with unbypassed resistor R_s has the following circuit parameters : $R_d = 15 \text{ K}$, $R_s = 0.5 \text{ K}$, $R_g = 1 \text{ M}$, $r_d = 5 \text{ K}$, $g_m = 5 \text{ m mhos}$ and $V_{DD} = 20 \text{ V}$. Calculate A_v , A_i , R_i and R_o . [5M]	3	L3
			
	OR		
7	a. Compare CS, CD and CG amplifiers. [5M]	3	L3
	b. Sketch the MOS small signal high frequency model. [5M]	3	L1
8	Derive the expressions for input and output resistance of voltage series feedback amplifier. [10M]	4	L3
	OR		
9	Explain the principle and operation of the Wein bridge oscillator with neat diagram. [10M]	4	L2
10	a. Derive the equation for maximum efficiency of a class A transformer-coupled amplifier. [5M]	5	L3
	b. Compare the push-pull class B and complementary symmetry class B amplifier. [5M]	5	L3
	OR		
11	a. Define Q-Factor in tuned amplifiers and Analyze the expression for gain & bandwidth of a single tuned Amplifier at resonance. Explain its importance. [8M]	5	L4
	b. Compare capacitive coupling and inductive coupling tuned amplifier. [2M]	5	L3