R22 Regulation *Subject code:4E3BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Regular Examinations, February 2024

ANALOG ELECTRONICS

(EEE)

Maximum Marks: 60 Date: 21.02.2024 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)	Define forward static and dynamic resistances of diode.	1	1
b)	Why is BJT a current controlled Transistor	1	1
c)	Why the input impedance of FET is higher than BJT	2	1
d)	Give the classification of FETs	2	2
e)	What are the different types of couplings in amplifiers? Write about R-C Coupling.	3	1
f)	What is the purpose of coupling a device	3	1
g)	What is meant by positive and negative feedback?	4	1
h)	For a phase shift oscillator, the feedback network uses R=6 KΩ and C=1500 pF. The transistorized amplifier used, has a collector resistance of 18 KΩ. Calculate the frequency of oscillation and minimum value of h_{fe} of the transistor	4	3
i)	Explain the concept of virtual ground	5	2
j)	Define an Op-amp	5	1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			Bloom Tx
2	A. With a neat diagram explain the working of a PN junction diode in zero Biased forward bias and reverse bias and draw its characteristics. [5]	1	2
	B. Explain in detail about the operation of NPN transistor. [5]	1	2
	OR		
3	A. Explain I_{dc}, I_{rms}, ripple factor, Efficiency and PIV of Full Wave Rectifier.[5]	1	2
	B. Compare of CB, CE, CC configurations. [5]	1	2
4	A. With the help of a neat diagram explain the operation of an n-channel enhancement type MOSFET. [5]	2	3
	B. Derive the relation between u and gm of JFET amplifier. [5]	2	2
	OR		
5	Draw the small signal equivalent circuit of JFET and Derive gain, input	2	3

	resistance and output resistance. [10M]		
6	Classify the configurations of differential amplifiers with diagrams and explain modes of operations. (10M)	3	4
	OR		
7	A. Explain a crossover distortion in power amplifiers, how it can be eliminated. [5]	3	2
	B. Compare the push-pull class B and complementary symmetry class B amplifier. [5]	3	3
8	A. Draw the four types of feedback amplifiers and explain them briefly. [5]	4	3
	B. Establish the condition for frequency of oscillation in an RC phase shift oscillator. [5]	4	4
	OR		
9	Derive the frequency of oscillation of Colpitts oscillator. [10m]	4	3
10	A. An op-amp has a differential gain 80 dB and CMRR of 95dB. If V 1 =2 μV and V 2 = 1.6 μV then calculate the differential and common mode output values. [5]	5	5
	B. Derive the expression for voltage gain A V of non – inverting amplifier. [5]	5	3
	OR		
11	Explain the internal block schematic of an operational amplifier. [10]	5	2