R20 Regulation *Subject code: 3P3BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, July 2024

ANALOG ELECTRONICS

(Electrical and Electronics Engineering)

Maximum Marks: 70 Date:23.07.2024 **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 10 questions. Answer any 5 questions which carries 10M.
4. Each question carries 12marks 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	Define various hybrid parameters.	1	L1
2	What are the types of distortion in amplifiers?	1	L1
3	Distinguish the negative feedback and positive feedback.	2	L1
4	State the Barkhausen criterion for oscillations.	2	L1
5	What is heat sink?	3	L1
6	Mention the achievable Maximum Efficiency of Class - A Amplifier.	3	L1
7	Define step wave form mathematically.	4	L1
8	What are the applications of clamping circuit?	4	L1
9	Define storage time of a transistor.	5	L1
10	What is a multivibrator? List different types of multivibrators.	5	L1

Part-B

Answer all the questions (5X10M=50Marks)			
11	Draw the AC equivalent circuit of CB amplifier using h-parameter model and derive the equations for input impedance, output impedance, voltage gain and current gain. [10M]	1	L2
	OR		
12	A. Explain the effect of coupling capacitor on low frequency response of BJT amplifiers? [7M] B. List out some applications of BJT amplifiers. [3M]	1	L2
13	What are the different types of negative feedback? Explain how the input and output impedances of an amplifier are affected by the different types of negative feedback? [10M]	2	L3
	OR		
14	A. Describe the construction of phase shift oscillator and explain its working. [7M] B. In an RC phase shift oscillator, if its frequency of oscillation is 955 Hz and $R_1=R_2=R_3=680$ KΩ. Find the value of capacitors. [3M]	2	L2

15	Derive the equation for efficiency of a class B Push pull amplifier. [10M]	3	L3
	OR		
16	A. Show that the transformer coupled class A amplifier maximum efficiency is 50%. [5M] B. Write short notes on Thermal Runway. [5M]	3	L2
17	Derive the expression for rise time of integrating circuit and prove that it is proportional to time constant and inversely proportional to upper 3 dB frequency. [10M]	4	L2
	OR		
18	A. With the help of neat circuit diagram and waveforms explain the working of positive & negative clamping circuit. [6M] B. State and prove clamping circuit theorem. [4M]	4	L2
19	A. Explain switching times in a transistor. [7M] B. Design a high speed common emitter transistor switch operating with 2 power supplies V_{CC} = 12 V and $-V_{BB}$ = -10 V. The transistor is expected to operate at I_C=8 mA, I_B=0.75 mA. The static current gain h_{fe} of the transistor is 30, V_{BE} (sat) = 0.9 V, V_{CE}(sat)=0.3 V and $R_2 = 3R_1$. Determine the values of three resistors R_C, R_1 and R_2. [3M]	5	L2
	OR		
20	A. With a neat sketch, explain the operation of a bistable multivibrator. [7M] B. List some applications of bistable multivibrator. [3M]	5	L2