



**B.Tech III Semester Supplementary Examinations, July 2024**

**ELECTRONIC CIRCUIT ANALYSIS**  
(ECE)

**Maximum Marks: 60**

Date: 25.07.2024 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)			
I.a)	Classify the amplifiers according to the method of coupling.	1	1
b)	How darlington provides high input impedance.	1	1
c)	What are the elements in the Hybrid 'II' model	2	1
d)	Write the current gain equation of high frequency model CE Amplifier	2	1
e)	Sketch the small signal Low frequency model of JFET	3	2
f)	Sketch MOS small signal model and give the equations for $r_o$	3	2
g)	What are the features of the current shunt feedback amplifier	4	1
h)	Mention the features of the crystal oscillator	4	2
i)	Define harmonic distortion.	5	1
j)	What is the use of the heat sink in power amplifiers	5	1
Part-B			Bloom Tx
Answer All the following questions. (5X10M=50Marks)			
2	a. Explain with the help of neat sketches " how BJT act as Amplifier. [5]	1	3
	b. Explain the need of bypass capacitor in CE amplifier. [5]	1	2
OR			
3	Explain two stage RC coupled amplifier and derive its parameters. [10]	1	4
4	A single-stage CE amplifier is measured to have a voltage gain-bandwidth $f_H$ of 5 MHz with $R_L=500 \Omega$ . Assume $h_{fe}=100$ , $g_m=100 \text{ mA/V}$ , $r_{bb}'=100\Omega$ , $C_C=1\text{pF}$ and $f_T=400 \text{ MHz}$ . (i) find the value of source resistance that will give the required bandwidth. (ii) with the value of $R_s$ found in (i), find the mid-band voltage gain $V_0/V_s$ . [10]	2	6
OR			
5	a. Derive Gain-bandwidth product. [5]	2	3
	b. Derive the critical frequencies of BJT CE Amplifier due to various RC networks. [5]	2	3
6	a. Derive Voltage gain, Input Impedance and output impedance for CG amplifier. [5]	3	3

	b. Compare FET amplifiers and BJT amplifiers. [5]	3	2
	OR		
7	a. A common drain FET amplifier with circuit parameters $R_s = 0.5\text{ K}$ , $R_g = 1\text{ M}$ , $r_d = 5\text{ K}$ , $g_m = 5\text{ m mhos}$ and $V_{DD} = 20\text{ V}$ . Calculate $A_v$ and $R_o$ . [5]	3	6
	b. Explain source follower in detail. [5]	3	2
8	Compare the features of four topologies in negative feedback amplifiers. [10]	4	2
	OR		
9	Draw the R-C phase shift oscillator and obtain the expression of frequency of oscillation. [10]	4	3
10	Draw and explain the frequency response of the tuned amplifier. [10]	5	2
	OR		
11	Design a class B power amplifiers to deliver 25w to a load resistor $R_L = 8\text{ ohms}$ , using transformer coupling. $V_m = V_{cc} = 25\text{ V}$ . Assume necessary data. [10]	5	6