



B.Tech III Semester Supplementary Examinations, February 2024

**ANALOG ELECTRONIC CIRCUIT ANALYSIS
(ECE)**

Maximum Marks: 70

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 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	BTL
1	Define harmonic distortion.	CO1	L1
2	List out different types of coupling used in multistage amplifiers.	CO1	L1
3	Write short notes on Hybrid π capacitances.	CO2	L1
4	What is thermal runaway?	CO2	L1
5	Why FET is called a voltage operated device?	CO3	L1
6	Draw the structure of an n-channel JFET?	CO3	L1
7	What is effect of negative feedback on amplifier gain? Prove it	CO4	L1
8	Write the expression for input and output resistance of current shunt feedback amplifier.	CO4	L1
9	Classify power Amplifiers	CO5	L2
10	Give the classification of tuned amplifiers	CO5	L2

Part-B

Answer All the following questions.		(5X10M=50Marks)	M	CO	BTL
11	A. Draw the circuit diagram & small signal equivalent of CB amplifier using accurate h-parameter model. Derive expressions for A_V , A_i , R_i and R_o ?	5M	5M	CO1	L3
	B. The h-parameters of a transistor used in a CE circuit are $h_{ie} = 1.0 \text{ K}$, $h_{re} = 10 \times 10^{-4}$, $h_{fe} = 50$, $h_{oe} = 100 \text{ K}$. The load resistance for the transistor is 1 K in the collector circuit. Determine R_i , R_o , A_V & A_i in the amplifier stage (Assume $R_s = 1000$)?				
	OR				
12	Derive expressions for overall voltage gain and overall current gain of a Transformer Coupled Amplifier	10M	10M	CO1	L3
13	Draw the high frequency equivalent circuit of a BJT and explain the same.	10M	10M	CO2	L2
	OR				
14	Derive expression for CE short circuit current gain	10M	10M	CO2	L3
15	Derive gain, input resistance and output resistance of JFET Amplifier in CS Configuration	10M	10M	CO3	L3

	OR			
16	Derive the expression for voltage gain for CS amplifier with resistive load.	10M	CO3	L3
17	A. Explain current shunt and voltage shunt feedback amplifiers? B. An amplifier has a gain of 50 with negative feedback. For a specified output voltage, if the input required is 0.1V without feedback and 0.8V with feedback, Compute β and open loop gain.	5M 5M	CO4	L2 L3
	OR			
18	Derive frequency of oscillation of colpitts oscillator.	10M	CO4	L3
19	Explain the operation of class B pushpull power Amplifier and calculate its efficiency.	10M	CO5	L3
	OR			
20	Explain Single tuned and Double tuned Amplifiers.	10M	CO5	L2