



B.Tech III Semester Regular/Supplementary Examinations, December 2025
ELECTRONIC CIRCUIT ANALYSIS
(ECE)

Maximum Marks: 60

Date:22.12.2025

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

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a)	What is effect of Coupling and bypass capacitors?	1M	1	1
b)	Define Millers Theorem.	1M	1	1
c)	Define f_a and f_b .	1M	2	1
d)	Explain the terms: Frequency response and Decibel.	1M	2	1
e)	Explain different regions of FET operation.	1M	3	1
f)	Draw the small signal model of a MOSFET.	1M	3	1
g)	Define sensitivity and desensitivity.	1M	4	1
h)	What is Barkhausen Criterion.	1M	4	1
i)	List the drawbacks of transformer coupled power amplifiers?	1M	5	1
j)	Define Q factor of tuned amplifier.	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Derive the expression for Current gain, input impedance, Voltage gain and output impedance for CC amplifier using h parameter model.	6M	1	3
	b) Explain in detail the effect of coupling capacitor in RC coupled amplifier.	4M	1	2
OR				
3	Explain in detail about different coupling schemes used in amplifiers.	10M	1	2
OR				
4	Derive CE short circuit current gain with resistive load with hybrid pi model.	10M	2	3
OR				
5	a) Sketch the Hybrid-pi (π)–Common Emitter transistor model and explain the parameters.	5M	2	4
	b) Derive Gain Bandwidth Product of CE circuit.	5M	2	3
OR				

6	a) Explain about MOSFET CG amplifier and derive the expression for gain, input impedance output impedance. b) Compare CB, CE, CC amplifiers.	5M 5M	3 3	2 4
OR				
7	a) Explain about FET CS amplifier and derive the expression for gain, input impedance output impedance. b) Differentiate BJT and FET.	5M 5M	3 5	2 4
OR				
8	a) Explain current shunt feedback amplifier. b) The gain of an amplifier is decreased to 1000 with negative feedback from its gain of 5000. Calculate the feedback factor and the amount of negative feedback in dBs.	5M 5M	4 4	2 5
OR				
9	a) Explain the working of Wein bridge oscillator in detail with a neat sketch. b) The RC network of a Wein bridge oscillator consists of resistors and capacitors of values $R_1=R_2=220\text{ k}\Omega$ and $C_1=C_2=250\text{ PF}$. Determine the frequency of oscillations.	5M 5M	4 4	2 5
OR				
10	a) Draw the Class-A Power Amplifier and explain operation and derive the expression for maximum conversion efficiency. b) Determine the component values of class A series fed amplifier to deliver 75mW of output power to a load of 4Ω , $V_{cc}=16\text{ V}$. At the operating point $I_B=200\text{ }\mu\text{A}$, $P_d(\text{max})=200\text{ mW}$. Assume reasonable values of data wherever necessary.	5M 5M	4 5	2 5
OR				
11	Draw the Class-B Power Amplifier and explain operation and derive the expression for maximum conversion efficiency.	10M	5	2