



R22 Regulation *Subject code:4E3BC*
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Regular/Supplementary Examinations, December 2025
ANALOG ELECTRONICS
(EEE)

Maximum Marks: 60

Date:19.12.2025

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)	State the ideal diode equation and sketch its V-I characteristics.	1M	1	L2
b)	Define cut-off and active regions for a BJT.	1M	1	L1
c)	Draw the structure of an N-channel enhancement MOSFET.	1M	2	L2
d)	Define load line in BJT amplifier.	1M	2	L2
e)	What is the role of emitter bypass capacitor in CE amplifier?	1M	3	L2
f)	Differentiate between common-source and common-drain amplifiers.	1M	3	L2
g)	List the classes of power amplifiers with their efficiency.	1M	4	L2
h)	Define negative feedback and its effect on input impedance.	1M	4	L1
i)	State the condition for oscillation in RC phase shift oscillator.	1M	5	L2
j)	Define slew rate in an op-amp?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Explain the operation of full-wave rectifiers with their waveforms and ripple factor expressions.	5M	1	L2 L2
	b) Explain the input and output characteristics of BJT in CE configuration.	5M		
OR				
3	Perform load line analysis for a fixed bias CE amplifier and find Q-point.	10M	1	L3
4	Derive expressions for voltage gain, input and output impedances of common-source amplifier.	10M	2	L3
OR				
5	Draw small-signal equivalent circuit for common-gate amplifier and find its transconductance.	10M	2	L2
6	a) With circuit diagram, explain the working of RC coupled multistage amplifier and its frequency response.	5M	3	L2

	b) Compare Class A, B and C power amplifiers in terms of efficiency and distortion.	5M		
	OR			
7	Explain the direct coupled multistage amplifier and discuss its advantages.	10M	3	L2
8	Explain Wien-bridge oscillator with circuit, frequency equation and amplitude stabilization.	10M	4	L2
	OR			
9	Analyze Hartley oscillator, derive its frequency and sketch output waveform.	10M	4	L4
10	a) Explain non-inverting amplifier and inverting using op-amp. b) Design inverting differentiator and integrator circuits using op-amp. Derive their transfer functions.	5M 5M	5 5	L2 L3
	OR			
11	Design a triangular wave generator using op-amp and explain its operation.	10M	5	L3