R22 Regulation *Subject code:4E3BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, June 2026

ANALOG ELECTRONICS

(EEE)

Maximum Marks: 60 Date:16.06.2026 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 breakdown voltage in diodes?	1M	1	L2
b)	Define thermal runaway in BJT biasing	1M	1	L1
c)	Sketch high-frequency equivalent circuit of FET.	1M	2	L2
d)	What is h-parameter in small-signal analysis?	1M	2	L2
e)	Differentiate CB and CC amplifiers.	1M	3	L2
f)	Draw drain characteristics of MOSFET.	1M	3	L2
g)	Explain Darlington pair in amplifiers.	1M	4	L2
h)	What is bootstrap in feedback circuits?	1M	4	L1
i)	Compare Colpitts and Hartley oscillators.	1M	5	L2
j)	Define input offset current in op-amps.	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Derive small-signal voltage gain for common-emitter amplifier. b) Explain BJT biasing circuits: fixed, emitter and collector feedback with stability analysis.	5M 5M	1 1	L2 L3
	OR			
3	a) Draw common-base amplifier characteristics and equivalent circuit. b) Compare half-wave and full-wave rectifiers with transformer utilization factor.	5M 5M	1 1	L3 L2
4	Discuss JFET biasing techniques and small-signal model.	10M	2	L3
	OR			
5	Analyze common-drain amplifier for gain and impedances.	10M	2	L2
6	Discuss frequency response of multistage RC coupled amplifiers.	10M	3	L2
	OR			

7	Derive the efficiency for the Push-pull class-B power amplifier.	10M	3	L2
8	Explain Wien-bridge oscillator with circuit, frequency equation and amplitude stabilization.	10M	4	L2
	OR			
9	Classify oscillators and explain LC tank circuit analysis.	10M	4	L3
10	a) Explain non-inverting amplifier and voltage follower 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 op-amp based square wave generator and explain operation.	10M	5	L3