Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (R) (FT/WP) Examination November 2025 (2024 Scheme)

Course Code: PBEET304

Course Name: ANALOG ELECTRONICS

Max. Marks: 40 Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 2 marks)

		CO	Marks
1	With neat diagrams explain DC load lines in transistor. What is the significance of Q point?	1	(2)
2	Explain the role of coupling capacitors and bypass capacitor in CE amplifier.	1	(2)
3	Write short notes on Complementary MOSFET.	1	(2)
4	Explain the Barkhausen Criteria of oscillations.	2	(2)
5	Draw the circuit diagram of a differential amplifier using Op-Amp and write the expression for output voltage.	3	(2)
6	Draw the circuit diagram and waveform of a voltage level detector.	3	(2)
7	What is Butterworth filter? Mention its special characteristics.	4	(2)
8	Explain the effect of slew rate on waveform generation.	3	(2)

PART B

(Answer any one full question from each module, each question carries 6 marks)

Module -1

9	A CE amplifier has the h-parameters given by *hie* = 1000Ω, *hre* = 2 x 10^{-4}, *hfe* = 50, *hoe* = 25 μʊ. If both the load and source resistances are 1k Ω, determine the (a)Input impedance, (b) current gain and (c) voltage gain	1	(6)
10	Explain the operation of class B power amplifier. Draw the load line and derive the expression for maximum efficiency.	1	(6)

Module -2

11	Draw the frequency response characteristics of RC coupled amplifier and explain why gain falls at very high frequencies & very low frequencies.	1	(6)
12	Draw and explain a series operated crystal oscillator and shunt excited crystal oscillator.	2	(6)

Module -3

13	With neat circuit diagram, explain the operation of an Instrumentation amplifier and derive an expression for its voltage gain.	3	(6)
14	Explain the practical integrator circuit with relevant diagrams.	3	(6)

Module -4

15	Draw and explain three-pole Butterworth lowpass filter and write the expression for cutoff frequency.	3	(6)
16	With the help of internal functional diagram, explain the working of astable multivibrator using 555 timer.	3	(6)

***