

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

II- B. Tech II-Semester Supplementary Examinations (BR23), Aug - 2025

ANALOG CIRCUITS (EEE)

Time: 3 hours

Max. Marks: 70

*Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B*

PART-A (10X2 = 20M)

	Marks	CO	BL
1. a) Define the function of a clamper circuit.	(2M)	CO1	BL1
b) What is meant by operating point in a BJT?	(2M)	CO1	BL1
c) Write the h-parameter model for a transistor.	(2M)	CO2	BL1
d) List the characteristics of negative feedback.	(2M)	CO2	BL1
e) State Barkhausen's criterion for oscillations.	(2M)	CO3	BL1
f) What are the ideal characteristics of an Op-Amp?	(2M)	CO3	BL1
g) What is the use of a sample and hold circuit?	(2M)	CO4	BL1
h) Define a Schmitt trigger and its use.	(2M)	CO4	BL1
i) What is the function of a PLL?	(2M)	CO5	BL1
j) Compare weighted resistor DAC and R-2R ladder DAC.	(2M)	CO5	BL3

PART-B (5X10 = 50M)

2a. Explain the working of positive and negative clamper circuits with neat diagrams.	(5M)	CO1	BL2
b. Explain thermal runaway and how it is avoided in BJT circuits.	(5M)	CO1	BL2
(OR)			
3a. Discuss the self-bias configuration and derive the expression for stability factor.	(5M)	CO1	BL4
b. Explain the concept of bias compensation using diode and thermistor.	(5M)	CO1	BL2
(OR)			
4a. Derive the input and output resistance for CE amplifier using h-parameter model.	(5M)	CO2	BL4
b. Explain the current-series feedback amplifier with a block diagram.	(5M)	CO2	BL2
(OR)			
5a. Compare CE, CB and CC amplifier configurations.	(5M)	CO2	BL4
b. Derive the expression for voltage gain of CE amplifier using exact model.	(5M)	CO2	BL4
(OR)			
6a. Explain the working of a Wien Bridge Oscillator and derive the condition for oscillation.	(5M)	CO3	BL2
b. Draw the block diagram of a typical Op-Amp and explain each block briefly.	(5M)	CO3	BL4
(OR)			
7a. Explain the AC and DC characteristics of Op-Amp 741.	(5M)	CO3	BL2
b. Design an R-C Phase Shift Oscillator and explain its operation.	(5M)	CO3	BL5
(OR)			
8a. With suitable circuits, explain the applications of Op-Amps in AC amplification and signal conversion.	(5M)	CO4	BL2
b. Design and explain a triangular wave generator using Op-Amp.	(5M)	CO4	BL5

(OR)

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| 9a. | Explain the working of an instrumentation amplifier with neat diagram. | (5M) | CO4 | BL2 |
| b. | Design and explain an ideal integrator and differentiator using Op-Amp | (5M) | CO4 | BL5 |

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| 10a. | Describe the functional diagram of 555 timer and explain its monostable operation. | (5M) | CO5 | BL4 |
| b. | Explain the working of 565 PLL with a block diagram. | (5M) | CO5 | BL2 |

(OR)

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| 11a. | Compare parallel comparator type ADC and successive approximation ADC. | (5M) | CO5 | BL4 |
| b. | Explain the working of R-2R ladder type DAC. | (5M) | CO5 | BL2 |
