BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)
III - B.Tech I-Semester Regular Examinations (BR23), Nov/Dec - 2025
ANALOG & DIGITAL IC APPLICATIONS (ECE)

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)	Describe the ideal characteristics of an OPAMP	(2M)	CO1	L1
b)	Define the terms (i) Slew Rate (ii) CMRR	(2M)	CO1	L1
c)	Design a circuit using OPAMP to generate output voltage $V_o = (V_1 - V_2)$	(2M)	CO2	L6
d)	Analyse an All-pass filter and obtain its characteristics	(2M)	CO2	L4
e)	Calculate the values of LSB and MSB and full scale output for an 8-bit DAC in the range of 0–10V	(2M)	CO3	L3
f)	List out the applications of PLL	(2M)	CO3	L1
g)	Write the specifications of TTL 74XX series ICs	(2M)	CO4	L1
h)	Differentiate combinational circuit with sequential circuit	(2M)	CO4	L2
i)	Develop a logic circuit with four input variables that will produce an 1 output when exactly three input variables are 1s	(2M)	CO5	L3
j)	Explain the types of RAMs & Applications	(2M)	CO5	L2

PART–B (5X10 = 50M)

		Marks	CO	BL
2a.	Draw the block diagram of an OPAMP and explain its operation	(5M)	CO1	L3
b.	What is the significance of frequency compensation techniques of OPAMP? Explain	(5M)	CO1	L1
	(OR)			
3a.	With a neat sketch explain the operation of an Instrumentation Amplifier	(5M)	CO1	L3
b.	Describe the features of 78XX/79XX and 723 IC Voltage Regulators	(5M)	CO1	L2

		Marks	CO	BL
4a.	Draw the ideal characteristics of LPF, HPF, BPF & BRFs	(5M)	CO2	L3
b.	Design a Band pass filter having $f_L = 200Hz$, $f_H = 4KZz$. Find its Q	(5M)	CO2	L6
	(OR)			
5a.	Analyse a Schmitt trigger circuit to find V_{UTP} and V_{LTP} and obtain its transfer	(5M)	CO2	L4

	characteristics	(5M	C02	L6
b.	Design a Monostable Multivibrator using IC 555 Timer to generate a pulse with gate width of 100 mSec			

6a.	With a neat circuit diagram, explain the operation of Inverted R-2R Ladder DAC	(5M)	C03	L3
b.	Explain a successive approximation type Analog to Digital Converter	(5M)	C03	L2

<div align="center">(OR)</div>

7a.	Illustrate the working principle of Dual Slope type Analog to Digital Converter. Write its advantages and limitations	(5M)	C03	L2
b.	Explain the operation of R-2R ladder type DAC	(5M)	C03	L2

8a.	Design a BCD to 7 Segment LED Decoder and explain its operation	(5M)	C04	L6
b.	Design a 4-bit Magnitude Comparator	(5M)	C04	L6

<div align="center">(OR)</div>

9a.	Design 8x1 Multiplexer	(5M)	C04	L6
b.	Explain the operation of a Parallel Binary Adder/Subtractor	(5M)	C04	L2

10a.	Design a Decade Counter	(5M)	C05	L6
b.	Explain the operation of a 4-bit Shift Register	(5M	C05	L2

<div align="center">(OR)</div>

11a	Explain the differences between Asynchronous & Synchronous Counters	(5M)	C05	L2
b.	Explain Static & Dynamic RAM Architecture	(5M)	C05	L2

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