Course Code: 23EC5T06

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(AUTONOMOUS)

III - B. Tech I-Semester Supplementary Examinations (BR23), Mar/Apr - 2026

ANALOG AND 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)	Define CMRR of an operational amplifier	(2M)	CO1	L1
b)	List any two differences between ideal and practical op-amps.	(2M)	CO1	L1
c)	What is the significance of the cut-off frequency in filters?	(2M)	CO2	L2
d)	Define duty cycle in waveform generators.	(2M)	CO2	L1
e)	What is resolution in a DAC?	(2M)	CO3	L1
f)	Mention any two types of ADCs.	(2M)	CO3	L1
g)	What is a priority encoder?	(2M)	CO4	L2
h)	Define propagation delay.	(2M)	CO4	L1
i)	Define set-up time in flip-flops.	(2M)	CO5	L1
j)	What is a shift register?	(2M)	CO5	L2

PART–B (5X10 = 50M)

2a.	Explain the AC characteristics of an op-amp.	5(M)	CO1	BL-2
b.	Describe the operation of an instrumentation amplifier.	5(M)	CO1	BL-3
	(OR)			
3a.	Derive the gain expression for an inverting amplifier.	5(M)	CO1	BL-3
b.	Compare inverting and non-inverting amplifiers.	5(M)	CO1	BL-3
4a.	Explain the characteristics of Butterworth filters.	5(M)	CO2	BL-3
b.	Derive the transfer function of a 1st-order LPF.	5(M)	CO2	BL-3
	(OR)			
5a.	Explain the working of an astable multivibrator using IC-555.	5(M)	CO2	BL-3
b.	Derive the expression for its frequency.	5(M)	CO2	BL-3
6a.	Explain the weighted resistor DAC with neat sketch.	5(M)	CO3	BL-2
b.	Write its advantages and limitations.	5(M)	CO3	BL-3

(OR)

7a.	Describe the operation of R-2R ladder DAC.	5(M)	CO3	BL-2
b.	Explain resolution in a DAC.	5(M)	CO3	BL-2
8a.	Explain the operation of 4:1 multiplexer.	5(M)	CO4	BL-2
b.	Write two applications.	5(M)	CO4	BL-2

(OR)

9a.	Describe 3-to-8 decoder.	5(M)	CO4	BL-3
b.	Explain LED/LCD decoder drivers.	5(M)	CO4	BL-3
10a	Explain SR, JK, and D flip-flops.	5(M)	CO5	BL-2
b.	Compare asynchronous and synchronous counters.	5(M)	CO5	BL-3

(OR)

11a	Describe 4-bit synchronous counter.	5(M)	CO5	BL-3
b.	State its advantages over ripple counter.	5(M)	CO5	BL-3

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