

Code: 23EC3501

III B.Tech - I Semester - Regular Examinations - NOVEMBER 2025**ANALOG AND DIGITAL IC APPLICATIONS
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.

2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.

3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.

4. All parts of Question paper must be answered in one place.

BL – Blooms Level

CO – Course Outcome

PART – A

		BL	CO
1.a)	Define ideal op-amp.	L2	CO1
1.b)	List two applications of op-amp.	L2	CO1
1.c)	Define CMRR of op-amp.	L2	CO5
1.d)	Write two advantages of active filters over passive filters.	L2	CO1
1.e)	Write the different types of ADC and DAC.	L2	CO3
1.f)	Write the function of IC555 in monostable mode.	L2	CO2
1.g)	Define multiplexer.	L2	CO4
1.h)	Give one application of a Schmitt Trigger.	L2	CO5
1.i)	Write the difference between Static and Dynamic RAM.	L2	CO4
1.j)	Write the purpose of EPROM.	L2	CO4

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	List in detail the DC & AC characteristics of Op-Amp.	L2	CO5	4 M
	b)	Analyze the subtractor amplifier and derive the expression for output.	L4	CO5	6 M
OR					
3	a)	Design an Op-Amp circuit to produce an output voltage that is proportional to the derivative of the input voltage with neat circuit and output diagrams.	L3	CO5	5 M
	b)	Design a comparator circuit using an Op-Amp. Explain how the output changes for an input signal.	L3	CO5	5 M
UNIT-II					
4	a)	Design first order High Pass Filter for cutoff frequency of 10 KHz.	L3	CO5	5 M
	b)	Design the Square Wave Generator for frequency of 10KHz by assuming necessary data.	L3	CO5	5 M
OR					
5	a)	Design first order Low Pass Filter for cutoff frequency of 1 KHz.	L3	CO2	5 M
	b)	Design a monostable multivibrator using IC 555 to generate a pulse width of 2 ms	L3	CO2	5 M

		when triggered by an external input. Assume a supply voltage of 5 V and choose suitable values of resistor and capacitor. Draw the circuit diagram and explain the working.			
UNIT-III					
6	a)	Demonstrate the operation of Counter Type ADC with circuit diagram.	L3	CO3	5 M
	b)	Design and explain the operation of a Dual Slope ADC for converting Analog to Digital.	L3	CO3	5 M
OR					
7	a)	Demonstrate the operation of Weighted Resistor DAC with circuit diagram.	L3	CO3	6 M
	b)	Discuss the key specifications of DAC and ADC.	L2	CO3	4 M
UNIT-IV					
8	a)	Demonstrate the logic symbol and function table of comparator IC 7485.	L3	CO4	5 M
	b)	Explain the operation of the BCD-to-7-segment code converter with function table.	L2	CO4	5 M
OR					
9	a)	Realize 32:1 Multiplexer using 74151 ICs.	L3	CO4	5 M
	b)	Design a circuit to perform 8-bit binary addition using two 4 bit adder IC 7483s connected in cascade.	L3	CO4	5 M

UNIT-V					
10	a)	Discuss in detail about the differences between a latches and a flip-flops.	L2	CO4	4 M
	b)	Explain the architecture of Random Access Memory (RAM). Highlight the differences between Static RAM and Dynamic RAM.	L2	CO4	6 M
OR					
11	a)	Discuss the Principle of operation of ROM.	L2	CO1	5 M
	b)	Design and explain the working of a decade counter using IC 7490. Draw its internal block diagram and truth table.	L3	CO1	5 M