CODE: A1EC501T | **R23**

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN: KURNOOL

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations June 2026

Subject Name**: Analog and Digital IC Applications**

Time: 3 Hours | Branch: ECE | Max. Marks: 70

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Define open-loop gain.	2M	CO1	BTL1
	b	Define input offset voltage	2M	CO1	BTL1
	c	Voltage gain expression for an inverting amplifier?	2M	CO2	BTL3
	d	What is the function of a sample and hold circuit?	2M	CO2	BTL2
	e	Write the function of IC 555 timer.	2M	CO3	BTL1
	f	Calculate the free running frequency of an as table multi vibrator using 555 timer if R_A = 8.8kΩ,R_B = 1kΩ, C=0.25μF.	2M	CO3	BTL1
	g	Define accuracy and resolution of the DACs.	2M	CO4	BTL1
	h	Define conversation time and settling time of ADC.	2M	CO4	BTL1
	i	What is the difference between a latch and a flip-flop?	2M	CO5	BTL2
	j	Explain the function of multiplexer (MUX) and demultiplexer (DEMUX).	2M	CO5	BTL1
PART-B					
UNIT-I					
2	a	Draw the internal Block diagram of IC 741 and explain the function of various stages.	10M	CO1	BTL2
OR					
3	a	Derive the expression for the output voltage of a differential amplifier used in Op-Amps.	5M	CO1	BTL2
	b	Derive the expression for common-mode rejection ratio (CMRR) and explain how IC 741 achieves high CMRR.	5M	CO1	BTL2
UNIT-II					
4	a	Explain the working of a precision rectifier with neat diagram	5M	CO2	BTL2
	b	Describe the operation of a square wave oscillator using Op-Amp.	5M	CO2	BTL4
OR					
5	a	Define a comparator. Explain how an Op-Amp can be used as a comparator.	5M	CO2	BTL3
	b	Discuss about current to voltage converter.	5M	CO2	BTL2
UNIT-III					
6	a	Design a first order low pass filter for a high cut off frequency of 2 KHz and pass band gain of 2.	5M	CO3	BTL3
	b	Draw the circuit diagram of monostable multivibrator by using 555 timer and explain its operation	5M	CO3	BTL2
OR					
7	a	Explain about electrical specifications of PLL	5M	CO3	BTL2
	b	Draw and explain the circuit of a $2nd$ order low-pass Butterworth filter.	5M	CO3	BTL2

UNIT-IV					
8	a	Explain the basic principle of a voltage regulator.	5M	CO4	BTL2
	b	Consider a 10 bit D/A converter having a reference voltage of 10 V. What is the Binary digital input needed to get 4.5 V output? What outputs are obtained from the converter for the inputs of (i) binary 0010110101, (ii) decimal 520?	5M	CO4	BTL2
OR					
9	a	Draw and explain the functional block diagram of IC 723 general purpose regulator	5M	CO4	BTL2
	b	Determine the output voltages caused by each bit in a 6-bit ladder if the input levels are 0 = 0v and 1 = +16v. Determine the resolution and full-scale output of this circuit. Find out the voltage from the above ladder for a digital input of 101011.	5M	CO4	BTL3
UNIT-V					
10	a	Explain the working of a 4-bit comparator using a logic circuit.	5M	CO5	BTL2
	b	Design a parallel adder using IC 7483 and explain its operation.	5M	CO5	BTL4
OR					
11	a	Explain the operation of 3 to 8 decoder with functional table.	5M	CO5	BTL4
	b	Analyze the implementation of OR-AND-INVERT (OAI) logic using CMOS logic.	5M	CO5	BTL3

CODE: A1EC502	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations June 2026

Subject Name**: ANTENNAS & WAVE PROPAGATION**

Branch: ECE

Time: 3 Hours **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

		PART-A			
1	a	Why a short dipole is also called an elemental dipole?	2M	CO1	BTL2
	b	Define directivity on an Antenna.	2M	CO1	BTL3
	c	State the applications of loop antennas	2M	CO2	BTL1
	d	Define the front-to-back ratio of a Yagi–Uda array.	2M	CO2	BTL2
	e	List various losses in reflector antenna?	2M	CO3	BTL1
	f	What is aperture efficiency of a parabolic reflector?	2M	CO3	BTL2
	g	Define Uniform Linear Array (ULA).	2M	CO4	BTL1
	h	Define Uniform Linear Array (ULA).	2M	CO5	BTL2
	i	Define critical frequency.	2M	CO6	BTL1
	j	What are the modes of radio wave propagation?	2M	CO6	BTL2
		PART-B			
		UNIT-I			
2	a	Explain Effective Height and Effective Length of an antenna with necessary derivations?	5M	CO1	BTL2
	b	State and explain reciprocity theorem with suitable example for antenna.	5M	CO1	BTL4
		OR			
3	a	Derive the relation between beam efficiency and antenna radiation pattern.	5M	CO1	BTL3
	b	Calculate Effective length, Radiation resistance and Directivity for a dipole antenna of length $\lambda/2$ operates at a frequency of 100 MHz	5M	CO2	BTL2
		UNIT-II			
4		Explain the structure of a folded dipole antenna with diagrams and derive the expression for input impedance.	10M	CO2	BTL2
		OR			
5		Explain the principle of operation of a Yagi-Uda array antenna and derive the condition for maximum directivity.	10M	CO2	BTL2
		UNIT-III			
6	a	Explain the construction and working of dielectric lens antenna?	5M	CO3	BTL2
	b	Find the beam width and gain of a parabolic reflector with diameter D = 2.5 m and operates at 5 GHz.	5M	CO3	BTL4
		OR			
7	a	Draw and explain the radiation pattern of a parabolic reflector.	5M	CO3	BTL2
	b	A micro strip antenna with substrate thickness h=0.158 cm and $\varepsilon r = 4.4$ is designed for 5 GHz. Calculate effective dielectric constant and bandwidth?	5M	CO3	BTL4
		UNIT-IV			
8	a	Derive the expression for the array factor of a linear broadside array of n elements.	5M	CO4	BTL3
	b	Compute approximate directivity and condition for maximum directivity for an end fire array of 4 elements with $\lambda/2$ spacing is fed with progressive phase shift.	5M	CO4	BTL3

		OR			
9	a	Derive the expression for antenna directivity measurement using radiation intensity and total radiated power.	5M	CO4	BTL2
	b	Distinguish between uniform arrays and binomial arrays with respect to directivity and side lobes.	5M	CO4	BTL3
		UNIT-V			
10	a	Discuss the general classification of wave propagation modes with examples.	5M	CO6	BTL3
	b	Derive the relation between MUF and skip distance			
		OR			
11	a	Derive the expression for field strength variation with distance and height in space wave propagation	5M	CO5	BTL2
	b	A wave of frequency 5 MHz is propagated through the ionosphere at an angle of 45°. If the virtual height of the layer is 300 km, calculate the MUF.	5M	CO6	BTL4

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CODE: A1EC504a	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations June 2026

Subject Name: **Computer Architecture and Organization**

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

		PART-A			
1	a	Represent -63 using 16-bit, 2's complement representation.	2M	CO1	L1
	b	What are the differences between RISC and CISC?	2M	CO1	L2
	c	Draw basic computer instruction format.	2M	CO2	L1
	d	Define CPU execution time.	2M	CO2	L1
	e	Define the difference between Static RAM (SRAM) and Dynamic RAM (DRAM)	2M	CO3	L1
	f	Define cache miss and cache hit.	2M	CO3	L1
	g	Define NaN in the context of IEEE 754 floating-point standard.	2M	CO4	L1
	h	What is cache memory?	2M	CO4	L1
	i	Define pipelining.	2M	CO5	L1
	j	What is DMA?	2M	CO5	L1
		PART-B			
		UNIT-I			
2		Compare CISC and RISC architectures with advantages and disadvantages	10M	CO1	L4
		OR			
3		Explain the evolution of computer systems and discuss different computer architectures	10M	CO1	L2
		UNIT-II			
4	a	Explain how CPU performance is measured and name two important metrics used in evaluating it.	5M	CO2	L2
	b	Differentiate between hardwired control and microprogrammed control units with suitable diagrams.	5M	CO2	L3
		OR			
5	a	Explain the MIPS32 instruction execution cycle with a neat Datapath diagram.	5M	CO2	L2
	b	Describe the steps involved in simulating a MIPS program using SPIM, highlighting input and output operations	5M	CO2	L2
		UNIT-III			
6	a	Discuss the limitations of ripple-carry adders and why faster adders are needed.	5M	CO3	L2
	b	Explain any two mapping functions in Cache memories in brief.	5M	CO3	L3
		OR			
7		Analyze cache memory organization and techniques for improving cache performance.	10M	CO3	L4
		UNIT-IV			
8		Compare restoring and non-restoring division algorithms, and explain how arithmetic pipelining improves the performance of arithmetic units.	10M	CO4	L3
		OR			
9	a	Explain the working principle of a carry look-ahead adder and how it improves over ripple carry adders.	5M	CO4	L2
	b	Describe the key steps in multiplication design using the array multiplier approach.	5M	CO4	L2
		UNIT-V			
10		Investigate the causes of structural, data, and control hazards in the MIPS pipeline and explain the mechanisms used to resolve them.	10M	CO5	L4
		OR			
11	a	Describe the role and features of the Universal Serial Bus (USB) standard.	5M	CO5	L2
	b	Explain the interrupt handling process step-by-step, from interrupt request to return to the main program.	5M	CO5	L2

CODE: A1EC503T | **R23** | **H.T.No:** | | | | | | | | | | |

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations June 2026

Subject Name: Microprocessors and Microcontrollers

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Write two salient feature of 8086?	2M	CO1	L1
	b	How did the 20-bit physical address generate in 8086?	2M	CO1	L1
	c	What are different types of addressing modes in 8086	2M	CO2	L1
	d	What is meant by software interrupt?	2M	CO2	L1
	e	Identify the function of Intel 8255 in peripheral interfacing.	2M	CO3	L2
	f	Draw the Pin diagram of DAC Controller	2M	CO3	L1
	g	Define addressing mode in 8051.	2M	CO4	L1
	h	What is program memory and data memory?	2M	CO4	L2
	i	Mention any two sensors that can be interfaced with 8051.	2M	CO5	L1
	j	Mention any two features of ARM processors.	2M	CO5	L2
PART-B					
UNIT-I					
2		Elaborate maximum mode operation of 8086 with signals?	10M	CO1	L4
OR					
3		Explain the internal architecture of the 8086 microprocessor and show how the execution unit and bus interface unit work together during instruction processing.	10M	CO1	L2
UNIT-II					
4		Explain the steps involved in 8086 program development and illustrate how assembly language tools support program execution.	5M	CO2	L3
OR					
5		Write an assembly language program to add a series of N 8-bit numbers.	10M	CO2	L5
UNIT-III					
6	a	Explain data transmitting procedure using 8251 and draw the internal structure of 8251.	10M	CO3	L4
OR					
7	a	Explain interfacing of A/D and D/A converters with 8086.	5M	CO3	L4
	b	Explain the architecture and modes of Intel 8255 PPI.	5M	CO3	L4
UNIT-IV					
8	a	Explain the architecture of the 8051 microcontroller and show how internal blocks interact during program execution.	10M	CO4	L3
OR					
9	a	Discuss various instructions of 8051?	5M	CO4	L2
	b	Explain various software and hardware interrupts of 8051 microcontroller.	5M	CO4	L3
UNIT-V					
10	a	List out different serial communication standards of 8051 Microcontroller and explain.	5M	CO5	L2
OR					
11	a	Interface LCD to 8051 and write an 8051 assembly/8051 C program to send MASTER to LCD display using busy flag.	5M	CO5	L4
	b	Draw the basic PIC microcontroller architecture?	5M	CO5	L2

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