

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

III - B. Tech II-Semester Regular Examinations (BR23), MAY - 2026

MICROPROCESSORS AND MICROCONTROLLERS (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) List the important features of the 8086 microprocessor.	(2M)	CO1	1
b) Explain what determines whether the 8086 operates in minimum mode or maximum mode.	(2M)	CO1	1
c) What are assembler directives? Give two examples.	(2M)	CO2	1
d) Define addressing mode. List any four addressing modes of 8086.	(2M)	CO2	1
e) Examine the difference between synchronous and asynchronous communication.	(2M)	CO3	1
f) Draw the Control Word format of 8255 with each bit definition in I/O mode.	(2M)	CO3	1
g) Draw and explain PSW (Program Status Word) in 8051 with a neat diagram.	(2M)	CO4	1
h) What is the use of Bit-Set-Reset mode of 8255?	(2M)	CO4	1
i) What are ARM processor families?	(2M)	CO5	1
j) State the reason why ARM uses load/store architecture instead of memory-to-memory operations.	(2M)	CO5	1

PART-B (5X10 = 50M)

2a. Explain about the register organization of 8086.	(5M)	CO1	BL2
b. Explain about difference in Harvard and von Neumann Architecture?	(5M)	CO1	BL2
(OR)			
3a. Compare Microprocessor Unit (MPU) and Microcontroller Unit.	(5M)	CO1	BL2
b. Explain the internal Architecture of 8086 Microprocessor with a neat diagram?	(5M)	CO1	BL2
(OR)			
4a. Explain the concept of interrupts in 8086 and classify different types of interrupts	(5M)	CO2	BL2
b. Write an 8086 assembly program to find the factorial of a given number and explain the logic.	(5M)	CO2	BL3
(OR)			
5a. Explain the role of an assembler in 8086 programming and discuss different types of assembler directives.	(5M)	CO2	BL2
b. Write an ALP in 8086 to exchange a block of N bytes of data between source and destination.	(5M)	CO2	BL3

6. Design an interface between 8086 CPU and two chips of $16K \times 8$ EPROM and two chips of $32K \times 8$ RAM. Select the starting address of EPROM suitably. The RAM address must start at 00000H. (10M) CO3 BL2
- (OR)
- 7a. Draw the architecture of 8251 and explain how it operates in real-time communication. (5M) CO3 BL3
- b. Explain the interfacing of a stepper motor with the 8086 microprocessor with a neat diagram. (5M) CO3 BL2
8. Explain the internal architecture of 8051 microcontroller with a neat diagram. (10M) CO4 BL2
- (OR)
- 9a. Discuss the addressing modes of 8051 with examples (5M) CO4 BL2
- b. Describe the serial communication in 8051 (5M) CO4 BL2
- 10a. Explain the differences between CISC and RISC architectures with suitable examples (5M) CO5 BL2
- b. Discuss various ARM processor families and their applications. (5M) CO5 BL2
- (OR)
- 11a. Draw the system address map of Cortex-M3 and apply your knowledge to identify different memory regions. (5M) CO5 BL3
- b. Demonstrate the use of ARM concepts by explaining a pseudo-code for addition and memory transfer. (5M) CO5 BL3
