



R22 Regulation

Subject code:4E5DB

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

**B.Tech V Semester Regular/Supplementary Examinations, November 2025**

## MICROPROCESSORS AND MICROCONTROLLERS (ECE)

Maximum Marks: 60

Date: 20.11.2025

Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A				
All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BloomTx
1.a)	How many address and data lines does the 8086 have?	1M	1	1
b)	What is the function of the BIU (Bus Interface Unit)?	1M	1	1
c)	What is the width of the data bus in 8051?	1M	2	1
d)	What is the role of the Program Status Word (PSW) register?	1M	2	1
e)	How many ports are available in the 8255 PPI and what is the size of each port?	1M	3	1
f)	What does UART stand for, and what type of data transmission does it use?	1M	3	1
g)	What is the meaning of "Load/Store" architecture in ARM?	1M	4	1
h)	What is the Thumb instruction set?	1M	4	1
i)	How many general-purpose registers are available in the ARM Cortex-M processor, and what is the size of each register?	1M	5	1
j)	What is the function of the Link Register (LR)?	1M	5	1
Part-B				
Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) What do you mean by pipelined architecture? Draw and discuss the internal block diagram of 8086 Microprocessor. b) Draw the read and write cycle timing diagrams of 8086 in minimum mode.	5M 5M	1	2
OR				
3	a) If the content of DS =9980H and the offset of a data in the data segment is 4200H, what is the physical address of the data? b) Explain the concept of segmented memory. What are the advantages?	5M 5M	1	2
4	a) Draw the architecture of 8051 microcontroller and List all the registers used in 8051 microcontroller in brief.	5M	2	2

	b) Write an 8051 ALP to find the sum of numbers in the array of 10 elements.	5M		
	OR			
5	a) What is difference between mode-1 and mode-2 timer operation and Write an ALP to generate a symmetrical square wave of frequency $f=1\text{kHz}$ at P2.1 using Timer-1 in mode-1. Use clock frequency $=12\text{MHz}$ . b) Explain Data transfer, arithmetic and branch instructions.	5M 5M	2	3
6	Draw the interface circuit diagram of LCD with 8051 and Write a Program to Display "I WILL STUDY DAILY" on the LCD screen.	10M	3	3
	OR			
7	Describe the functionality of SPI on board serial communication Interfaces with neat sketches.	10M	3	3
8	Explain the register organization of ARM processor with a neat diagram.	10M	4	2
	OR			
9	Differentiate between ARM and Thumb instruction sets.	10M	4	3
10	Describe the features and advantages of ARM Cortex processors over traditional ARM7 processors.	10M	5	2
	OR			
11	What is an OMAP processor? Explain its architecture and main components.	10M	5	2