R22 Regulation *Subject code: 4E5DB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, May 2025

MICROPROCESSORS AND MICROCONTROLLERS

(ECE)

Maximum Marks: 60 Date: 19.06.2025 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	Bloom Tx
1.a)	Define flag register	1M	1	L1
b)	How many bits is the data bus of the 8086 microprocessor?	1M	1	L1
c)	Explain PSW of 8051 microcontroller	1M	2	L2
d)	Explain the alternate function of Port 3 in 8051	1M	2	L2
e)	What is the purpose of using RS 232?	1M	3	L1
f)	What type of display is commonly interfaced with microcontrollers for output purposes?	1M	3	L1
g)	What is 'Thumb' in ARM processor?	1M	4	L1
h)	Explain the purpose of the Program Counter (PC) in ARM architecture.	1M	4	L2
i)	How does the ARM Cortex-R series ensure real-time performance?	1M	5	L1
j)	What are the main differences between the ARM Cortex-A, Cortex-R, and Cortex-M series?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a. Describe the memory segmentation and instruction queue.	5M	1	L2
	b. Define addressing mode and explain the different addressing modes presented in 8086 Microprocessor with example.	5M	1	L1
	OR			
3	Draw and explain the architecture of 8086 with neat sketch.	10M	1	L6
4	a. State various modes available for timers in 8051.	5M	2	L1
	b. Explain the memory organization of 8051 microcontroller with neat diagram.	5M	2	L2
	OR			
5	Draw the pin Diagram of 8051 microcontroller and explain the function of each pin in detail.	10M	2	L2
6	a. Explain the operation of 8255 PPI Port A programmed as input and output in Mode 1 with necessary handshaking signals.	5M	3	L2

	b. Show and explain the ADC interfacing with 8086 microprocessors.	5M	3	L2
	OR			
7	a. Explain how D/A and D/A interfacing is done with 8086 with an application.	5M	3	L2
	b. Develop an assembly language program for key identification and key-code generation.	5M	3	L3
8	a. What is Pipelining? Explain in detail schematically with respect to ARM processor.	5M	4	L1
	b. Which are the different features of ARM instruction set that make it suitable for embedded applications.	5M	4	L1
	OR			
9	a. List out different Branch instructions of ARM Processor and explain.	5M	4	L1
	b. With a neat diagram, explain the different general-purpose registers of ARM Processors.	5M	4	L2
10	a. Describe the architecture of the OMAP processor. What are its main components?	5M	5	L2
	b. Describe the key features of the Cortex processor.	5M	5	L2
	OR			
11	a. List and describe the various types of registers in a Cortex processor.	5M	5	L1
	b. What are the advantages of OMAP processors?	5M	5	L1