R22 Regulation *Subject code:4E3ED*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, June 2026

COMPUTER ARCHITECTURE AND ORGANIZATION

(Common to CSE & CSE(AI&ML))

Maximum Marks: 60 Date:20.06.2026 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	BTL
1.a)	What is an instruction code?	1M	1	L1
b)	Differentiate between hardware and software interrupts.	1M	1	L1
c)	List the stages of an instruction cycle.	1M	2	L1
d)	What is memory-mapped I/O?	1M	2	L1
e)	What is signed magnitude representation	1M	3	L1
f)	What are data transfer instructions	1M	3	L1
g)	What is the function of a peripheral controller?	1M	4	L1
h)	What is daisy chaining	1M	4	L1
i)	What is parallel processing	1M	5	L1
j)	What is instruction prefetching	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Define computer organization, computer architecture and computer design. Explain the differences among them with suitable examples. b) Explain the instruction cycle in a basic computer and describe each phase in detail.	5M 5M	1	L2
	OR			
3	a) Explain the different types of computer instructions and their significance in CPU operation b) Explain instruction codes and instruction formats in detail with examples.	5M 5M	1	L2
4	a) Describe the data path and control path in a basic processor organization. b) Compare hardwired control and microprogrammed control.	5M 5M	2	L2
	OR			
5	a) Describe different types of registers and explain how registers participate in instruction execution. b) Explain the 8086 processor architecture with a neat block diagram.	5M 5M	2	L2

6	a) Describe arithmetic and logic micro-operations performed by an ALU. b) Discuss any common multiplication algorithm used in computer arithmetic.	5M 5M	3	L2
	OR			
7	a) Write short notes on data manipulation instructions. b) Draw the flowchart for decimal division and explain with an illustrative examples.	5M 5M	3	L2
8	a) Explain the working of an I/O interface with a neat block diagram b) Write a short note on Cache memory	5M 5M	4	L2
	OR			
9	a) Differentiate between Main Memory and Auxiliary Memory. b) Explain the architecture and functions of an Input–Output Processor (IOP).	5M 5M	4	L2
10	a) Describe the architectural classifications of parallel processing systems. b) State and explain the characteristics of multi-processors.	5M 5M	5	L2
	OR			
11	a) Explain RISC characteristics with its advantages. b) Write short notes on Interprocess communication and synchronization.	5M 5M	5	L2