

Enroll No

K.E. Society's
Rajarambapu Institute of Technology, Rajaramnagar
 (An Empowered Autonomous Institute, affiliated to SUK)
Unit Test -III(2025-26)

Q.P. Code
UT 3155

T.Y. B.Tech.-Electronics & Telecommunication Engineering

Course Code: EC3154

Course Name: Computer Architecture and Organization

Day & Date: *Friday 19/09/2025*

Time: *2:30 To 3:30*

Max Marks- 25

Instructions:

- 1) All questions are compulsory.
- 2) Figures in rounded () brackets within the question, indicate the scheme of marking for respective part of the question, whereas, figures in the first right column indicate total marks for that whole question.
- 3) CO is the index number of the Course Outcome statement.
- 4) The Bloom's taxonomy level (BL) for 1,2,3,4,5 and 6 is remember, understand, apply, analyze, evaluate and create respectively.
- 5) Assume suitable data if necessary.
- 6) Use of non-programmable calculators is allowed

		Marks	BT Level	COs
Q.1	Solve any two questions			
A	Given the instruction <code>ADD R1, R2</code> , identify (3 Mark) and describe the sequence of micro-operations required for its execution in a single-bus CPU architecture.	7	BL2	CO1
B	Illustrate the fetch-decode-execute cycle, (3 Mark) showing the role of micro-operations at each stage and their impact on CPU performance.	7	BL4	CO4
C	Evaluate the advantages and disadvantages of hardwired control units versus microprogrammed control units. (4 Mark) Which control unit would you recommend for a CPU designed to support a large instruction set?	7	BL5	CO3
Q.2	A For the instruction sequence given below, identify all types of hazards (3 Mark) and determine the stall cycles required without forwarding. Suggest how forwarding could reduce these stalls. I1: <code>LOAD R1, 0(R2)</code> I2: <code>ADD R3, R1, R4</code> I3: <code>MUL R5, R3, R6</code> I4: <code>SUB R1, R5, R7</code>	6	BL4	CO4



- B Define Instruction Level Parallelism (ILP) (2 Mark). How does it improve CPU performance? 5 BL2 CO4

OR

- B Design a basic pipelined Datapath for a 5-stage instruction pipeline (3 Mark). Indicate the role of pipeline registers and propose a method to handle control hazards 5 BL3 CO3

