

JK Lakshmipat University, Jaipur

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term make up Examination, November 2024

B. Tech, Semester-III/BCA, Semester-V

Roll No.....

Course Code: CS1134/CS1117

Time:2.5 Hours Total Marks – 30

Course Name: Computer Organization and Architecture/Computer Organization and Systems

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.

Q 1	A. Draw a transistor level circuit diagram for NAND gate. B. Consider the multiplicand B is 10010 and the multiplier Q is 10110, then perform multiplication process using Booth's Algorithm showing the steps clearly to reach final product	03 04 CO 1 CO 2
Q 2	A. In case of scaled direct register indexed addressing, effective address of operand is calculated as <i>displacement + contents of a base register + contents of index register * scaling factor</i>. Explain the various terms used in it (displacement, base register, index register and scaling factor) with example.	04 CO 4
Q3	A. State the advantages and disadvantages of hardwired and micro-programmed control? B. Define Subroutine Linkage. What will you prefer Link Register or Stack in case of nested calls and why? (1+2)	03 03 CO 4
Q4	A. Consider a program with only 4 instructions in a loop repeated 2 times Repeat 2 times: I1, I2, I3, I4 We are using a pipeline processor with 4 stages S1, S2, S3, S4. Time taken (in cycles) in these stages for instructions are I1: 1,4,2,3; I2: 1, 2, 2, 1; I3: 2,1,2,1; I4: 1,2,1,2.	05 CO 5

	Draw the space time diagram for execution for the program and calculate the number of cycles needed for execution of the program. Assume that there is no data dependence among the instructions.	
Q5	A. Consider a cache memory with line address of 7 bits. Given a memory address of 16 bits with each block containing 4 words. What is the length of the tags in direct, associative and 2 way set associative cache mapping?	04 CO 6
Q6	A. How is the memory segmentation accomplished in 8086 microprocessors? B. Execute the following computation using one and two address instructions. $Y = (A - B) / [C + (D \times E)]$..	02 02 CO 3