



Daffodil International University

Faculty of Science and Information Technology

Department of CSE

Final Examination, Semester: Fall 2022

Course Code: CSE 411 Course Title: Computer Architecture & Organization

Section: All

Time: 02:00H

Full marks: 40

Answer All the Questions. Figure in the right-side margin indicate full marks

1.	a.	Multiply the given unsigned binary numbers $1101 * 1010$ and demonstrate the AND array for this multiplier.	[4]	CO2
	b.	Calculating exponentiation and trigonometric functions are harder to implement. Illustrate the technique which is used to solve this problem and show its working procedure in the pipeline processing where the input capacity is 4 words.	[4]	
2.	a.	Construct the Pipeline for a situation where instruction 4 is a conditional branch to instruction 10 . Mention till when the branch cannot be determined and in which time unit no instructions are completed in the pipeline.	[4]	CO3
	b.	Identify the Hazard which will occur in the given instruction with Hazard Diagram: I ₁ : ADD R1, R2, R3 I ₂ : SUB R4, R1, R2	[4]	
	c.	Suppose you have 11 instructions to process with no-branch . Assume that the instruction cycle time without pipeline is 7 milliseconds . Now identify the total time required for a pipeline with 4 stages to execute all the instructions and find out the speedup factor .	[2]	
3.	a.	Discover the performance factors with the memory hierarchy. State the Cache Read Operation with flowchart.	[4]	CO4
	b.	Assume you have a Main Memory which is size of 128 Byte and a Cache Memory size of 16 Byte . Each line of cache memory can hold a block of 32 bits at a time and each block contain 4 data . Now sketch the Associative Mapping from Cache to Main Memory with example of Address Structure . Also mention two advantages and disadvantages of Set-Associative Mapping .	[8]	
4.	a.	Discover the necessity of virtual memory and prepare the Address Translation technique of virtual memory with proper figures.	[4]	CO4
	b.	Construct transfer of a Paged Memory to Contiguous Disk Space (Swap in/out) with figure.	[4]	
	c.	Analyze the sharing process of virtual memory with proper diagrams.	[2]	