Daffodil International University

Department of Software Engineering
Faculty of Science & Information Technology
Final tern Examination, spring 2025
Course Code: SE 222; Course Title: Computer Architecture
Batch & Sections: 42 (A, B, C, D, E, F, G, H, I, J, K)
Course Teachers: SP, KBB, SC, HK, AAS

Time: 2:00 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	*a)*	**Explain** briefly what happens during a cache read operation with figure	[Marks-5]	CLO-2 *Level-2*
	b)	**Explain** with reasons: Why might Set-Associative Mapping be considered a compromise between Direct Mapping and Associative Mapping?	[Marks-5]	
2.	*a)*	**Apply** the Booth's algorithm for 2's complement multiplication for the following values: (Using 4 bits) **Multiplicand: -6** **Multiplier: -4**	[Marks-5]	CLO-3 *Level-3*
	b)	**Investigate** the following expression, representing it as coding for both three-address and one-address representations: $Z = [\{(a * b) + (c * d)\} - (a * b * c)]$	[Marks-5]	
	c)	**Calculate** the following floating point binary numbers into decimal. Assuming First 10 bits for the mantissa and Last 6 bits for the exponent, both in 2's complement. i) 0 1 0 1 1 0 0 0 0 0 1 1 1 0 1 1 ii) 1 0 1 1 1 1 0 1 0 0 1 1 1 1 0 0	[Marks-10]	
3.	*a)*	**Employ** a two-stage instruction pipelining consisting of fetch and execute stage for discussing the necessity of pipelining along with appropriate figure.	[Marks-5]	CLO-4 *Level-3*
	b)	**Modify** the pipeline architecture for an instruction set with 20 instructions, following the considerations – 5th instruction is a branch instruction which indicates 17th instruction.	[Marks-5]	