BRAC UNIVERSITY
Department of Computer Science and Engineering

CSE 340: Computer Architecture

Name: Solution	ID:	Section: 07

1. PC = 0x0040ABCD123045B1 → *Address of the current instruction to fetch. Instructions are stored in instruction memory.*

Instruction Memory: *memory locations*

Address	Content
0x40ABCD123045AD	0111 0101
40ABCD123045AE *(+1)*	1011 1110
40ABCD123045AF *(+1)*	1001 0001
40ABCD123045B0 *(+1)*	1100 0000
40ABCD123045B1 *(+1)*	0000 0001
40ABCD123045B2 *(+1)*	1001 0101
40ABCD123045B3 *(+1)*	0000 0101
40ABCD123045B4	0011 0011

Data Memory:

Address	Content
0x40ABCD123045AD	0111 0101
	0111 0100
	1000 0000
	1000 0001
	0000 0000
	0001 0111
	1000 0101
	1111 0011

Fetch the instruction from memory. **Convert** your answer to Hex. [2]

instruction = 0000 0001 1001 0101 0000 0101 0011 0011

$$\underbrace{0000}_{0} \ \underbrace{0001}_{1} \ \underbrace{1001}_{9} \ \underbrace{0101}_{5} \ \underbrace{0000}_{0} \ \underbrace{0101}_{5} \ \underbrace{0011}_{3} \ \underbrace{0011}_{3}$$

⟹ 0x01950533 (Ans)

2. Identify the necessary resources or components from the list provided to construct the datapath for each of the following instructions. Just put a tick(✓) sign in the respective cells to show your selection.[3]

		PC	Instruction Memory	Data Memory	Register File	ALU	Immediate Generation Unit	Control Unit	ALU Control
i	ADD X21, X22, X23	✓	✓		✓	✓		✓	✓
ii	Slli X21, X22, 23	✓	✓		✓	✓	✓	✓	✓
iii	SB X21, 10(X22)	✓	✓	✓	✓	✓	✓	✓	✓