Information Technology University, Lahore, Pakistan

BS Computer and Software Engineering

Computer Organization and Assembly Language

Quiz# 7, Spring 2025

Tuesday, May 13, 2025

Name: _____ Roll Number: _____

Maximum Time Allowed: 15 minutes Maximum Marks: 10

Q. 1: A computer has:

- Main memory: 1 GB
- Cache size: 64 KB
- Block size: 32 Bytes

Assume both main memory and cache are byte-addressed. Determine the address format for accessing:

(a). A direct-mapped cache. [1]

(b). Given the memory address 0x10ABCDEF, identify the index bits (in decimal) and the tag bits (in hexadecimal) for DM cache. [2]

(c). A 4-way set-associative cache. [1]

(d). Given the memory address 0x10ABCDEF, identify the index bits (in decimal) and the tag bits (in hexadecimal) for 4-way SA cache. [2]

Q. 2: A computer system has the following memory hierarchy: [4]

L1 Cache: Hit time: 1 ns, Hit rate: 80%

L2 Cache: Hit time: 5 ns, Hit rate: 90% (0.9) (for accesses that miss L1)

Main Memory: Access time: 100 ns (required if data misses in both L1 and L2)

Calculate the Average Memory Access Time (AMAT) for this system.