ourdiu.com | Shared by Md. Mahid Alam Marin

Daffodil International University

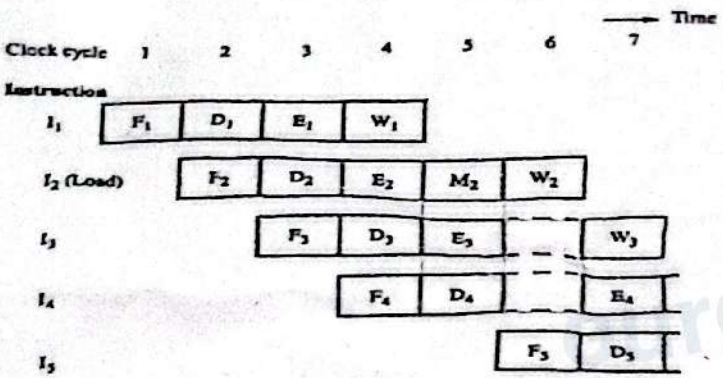
Department of Computing and Information System
Faculty of Science and Information Technology (FSIT)
Final Examination, Semester: Summer 2025
Program: B.Sc. in Computing and Information System (CIS)
Course Code: CIS131 **Course Title:** Computer Architecture and Organization
Section: 21_A , 21_B **Teacher:** SN, MFH

Time: 2 Hours **Total Marks: 40**

(Answer all the followings questions sequentially*)

Sl.	Question	Mark	CLO
1.	a. Describe your knowledge about computer's basic architecture with briefly description.	5	CLO1 Level 2
	b. Share the knowledge about virtual memory and classify the types of it? Also mention the reason of using virtual memory.	4	
	c. What do you know about cache memory? Explain how many ways are there for mapping data from main memory to cache memory.	4	
2.	Apply number system techniques to find out a. Multiplication value of 10001_b and 11011_b using number system techniques b. The decimal value of the hexadecimal value $7A5B_h$	2 + 2	CLO1 Level 3
3.	A benchmark program is run on a 90 MHz processor. The executions, with the following instruction mix and clock cycle count: Instruction | Instruction counts | Cycles per instructions Integer arithmetic | 35000 | 3 Data transfer | 20000 | 2 Floating point | 15000 | 2 Control transfer | 4500 | 1 Determine the effective CPI, MIPS rate and execution time for this above program.	3	CLO2 Level 4
4.	Apply k-map techniques for find out the minimization of SoP and MPoS of the following function $f(x,y,z) = xy\bar{z} + x\bar{y}\bar{z} + x\bar{y}z + xyz$. Draw the circuit diagram of that minimized - SoP and PoS	6	CLO3 Level 6
5.	Apply the 0-Operand and 1-Operand instruction operation technique in the computer architectures for the following instruction: $x \leftarrow (a * b + c - d) / (e + f)$	5	CLO4 Level 3

ourdiu.com | Shared by Md. Mahid Alam Marin

6.	a. Describe the reasons behind a pipeline being stalled.  Figure: 01 b. From the above figure 01 what kind of problem are there and why?	3 2	CLO 1 Level 2
7.	Consider a process with 4 stages with 12 instructions I_1, I_2, I_3, I_4, I_5 ....., I_{12}. Each stages takes 5 minutes. a) Compute the total clock cycle time required to execute those 12 instructions. (pipeline and non-pipeline both) b) Determine the speed up and efficiency achieved by using the pipeline execution over non-pipelining execution. c) Determine the throughput for both pipeline and non-pipeline process.	4	CLO2 Level 4