RV UNIVERSITY
Go, change the world
an initiative of RV EDUCATIONAL INSTITUTIONS

School of Computer Science & Engineering
B.Tech (H) Program

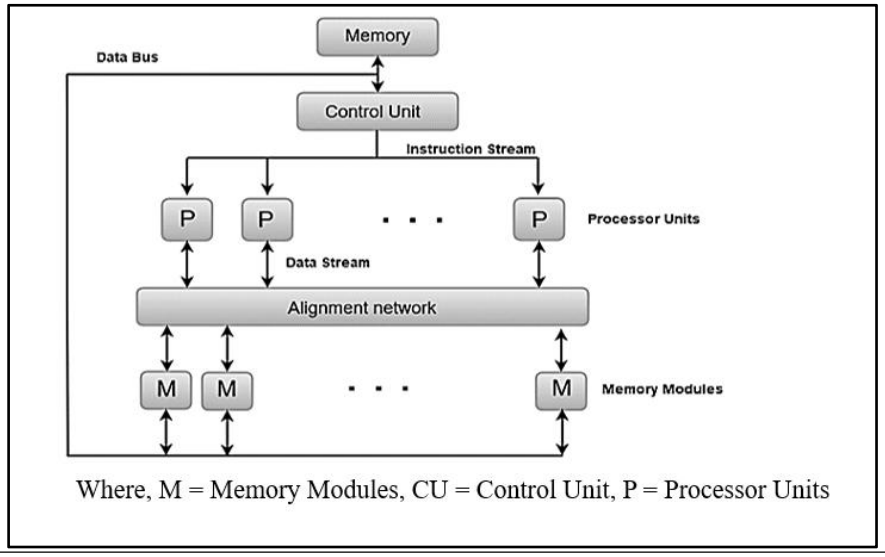
Internal Assessment - 1 - Set 1
Academic Year: 2023 - 24
Term: Jan to May 24
Semester 2 Sections: All (A - I)

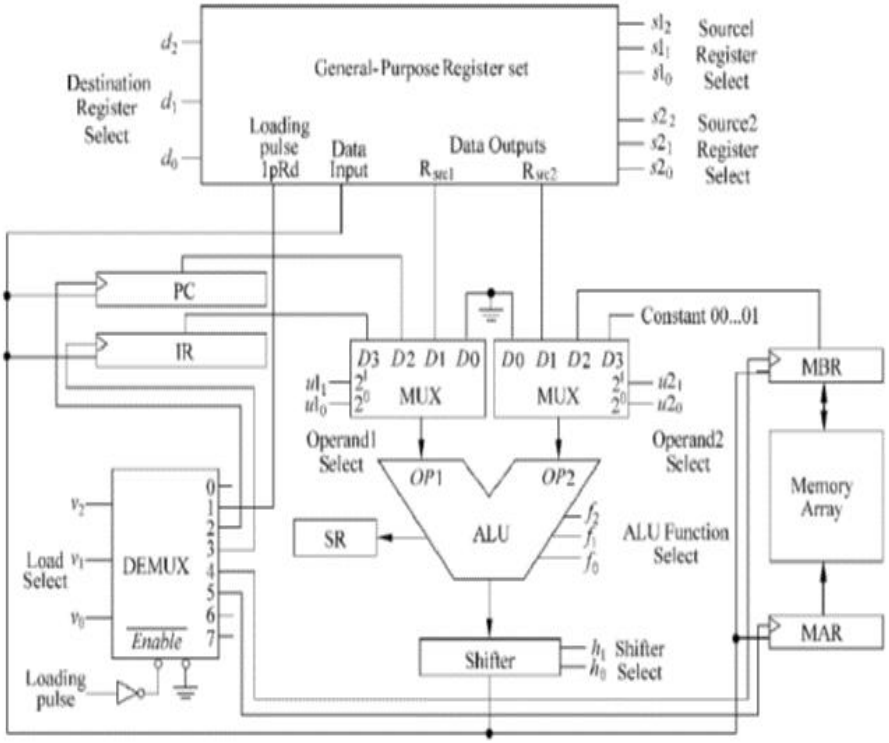
Date: 05-03-2024 **Duration: 1 hour 30 min**
Course Code: CS1120
Course Name: Embedded Systems & Microcontroller
Max Marks: 20

Mobile Phones, Smart Watches or any other internet enabled devices are treated as malpractice.

Student Name: **USN:** **Section:**

Instructions:
1. **All questions are compulsory. Part A has 4 questions of 2 Marks and Part B has 3 Questions of 4 Marks**
2. **Total = 20 Marks**

Sl. No.	Questions	Marks
	PART A	
1	Briefly explain the von Neumann Model and the Harvard Architecture and also state the differences between them.	2
2	Building a Washing Machine as an embedded system posts some challenges due to the complexity of controlling various mechanical and electrical components. Considering this, list out 4 challenges faced by the embedded system designer and explain them in brief.	2
3	Identify the Architecture Category from the diagram below according to Flynn's classification and explain it.  Where, M = Memory Modules, CU = Control Unit, P = Processor Units	2
4	Mention the contents of R3 in Hexadecimal & Binary Format for the following assembly instruction with the data given in source registers R2=0x25, R1=0x26 **Add R1,R1,R2**	2

	PART B	
5	Elaborate the different phases of Software Program Development with suitable diagram.	4
6	For the given instruction **Sub R4,R3,R4** Mention the select lines for: ● source1 register select ● source2 register select ● destination register select ● $u1_1$ and $u1_2$ for MUX, $u2_1$ $u2_0$ for mux ● ALU Function select ● Shifter select lines  	4
7	Write a program for the Raspberry Pi Pico to blink 4 LEDs at a different time using 2, 6, 10, 14 GPIO pins. (i.e., 1st two LEDs have to be ON when another two LEDs are OFF and the delay between them should be 500 ms).	4