SRM Institute of Science and Technology
College of Engineering and Technology

DEPARTMENT OF ECE

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

SET A

Academic Year: 2022-2023 (ODD)

Test: CLAT- 2 **Date: 14/10/2022** **Duration: 2 Periods (12:30-02:10 PM)**

Course Code & Title: 18ECC203J - Microprocessor, Microcontroller and Interfacing Techniques

Year & Sem: III / V **Max. Marks: 50**

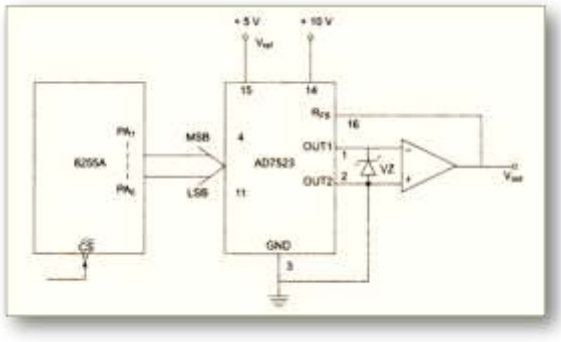
Course Articulation Matrix:

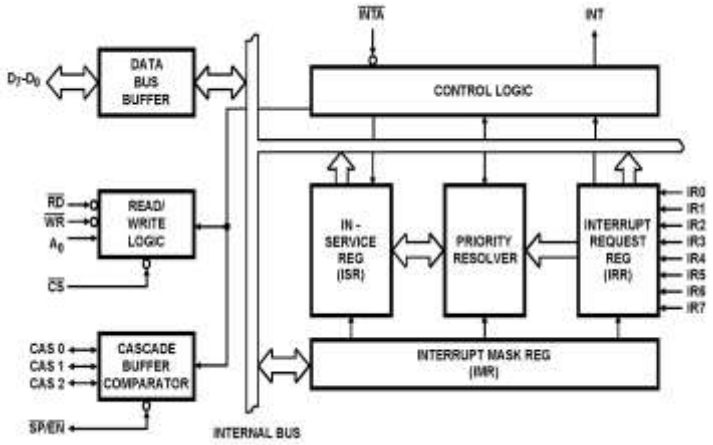
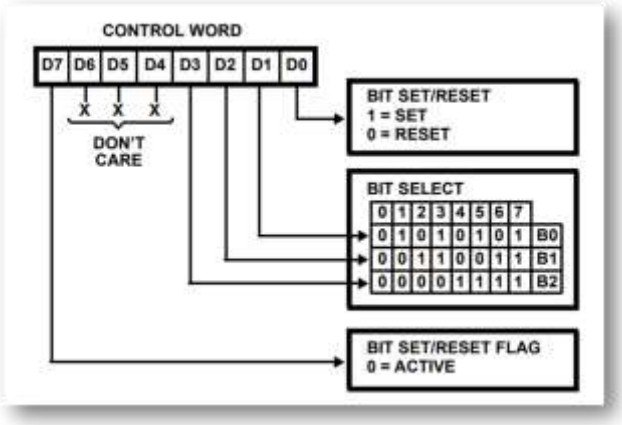
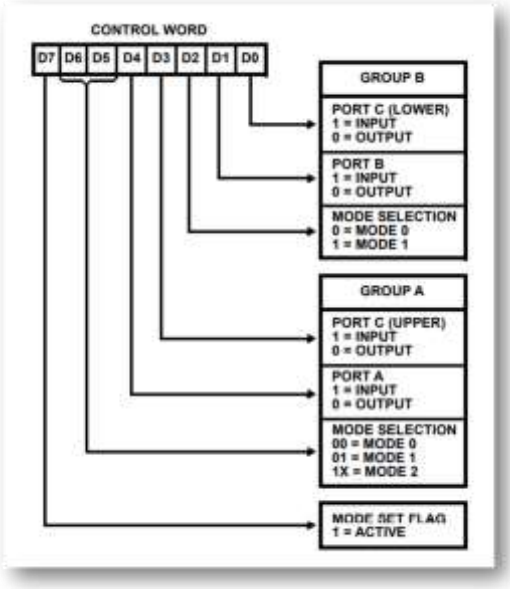
	18ECC203J - Microprocessor, Microcontroller and Interfacing Techniques	**Program Outcomes (POs)**														
		Graduate Attributes												**PSO**		
Cos	**Course Outcomes (COs)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO-1 :	Apply a basic concept of digital fundamentals to Microprocessor based personal computer system	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO-2 :	Demonstrate programming proficiency using the various addressing modes of the 8086 microprocessor	-	3	-	-	2	-	-	-	-	-	-	2	-	-	-
CO-3 :	Develop interfacing techniques using various peripheral chips with microprocessor	-	2	3	-	3	-	-	-	-	-	-	-	-	-	1
CO-4 :	Evaluate programming proficiency using the various addressing modes of the 8051 microcontroller	-	3	-	-	2	-	-	-	-	-	-	2	-	-	-
CO-5 :	Construct a system to interface various peripheral chips with microcontroller	-	2	3	-	3	-	-	-	-	-	-	-	-	-	3
CO-6 :	Implement the practical knowledge through laboratory experiments using microprocessor and microcontroller	-	-	3	-	3	-	-	-	-	-	-	2	1	-	2

Part – A (10x1 = 10 Marks) **Answer all the questions**					
Q. No	**Question**	**Marks**	**BL**	**CO**	**PO**
1.	Option D: Register addressing mode	**1**	**1**	**2**	**12**
2.	Option A: IP,CS	**1**	**2**	**2**	**2**
3.	Option C: 31000H	**1**	**3**	**2**	**2**
4.	Option A: Last in first out memory	**1**	**1**	**2**	**12**
5.	Option A: Input a byte from the port with address 80H to AL	**1**	**1**	**2**	**2**
6.	Option A: Port A to Data Bus	**1**	**2**	**3**	**2**
7.	Option C: 7523	**1**	**1**	**3**	**3**
8.	Option C: 3	**1**	**1**	**3**	**3**
9.	Option B: Mode 2	**1**	**2**	**3**	**2**
10.	Option C: In service register (ISR)	**1**	**2**	**3**	**12**
Part – B Section B1 (2 x 10 = 20 Marks) **Instructions: Answer ANY 2 Questions**					
11.	Ans: The following instructions come under data copy / transfer instructions: 1. MOV	**10**	**3**	**2**	**2**

<table>
<tr><td></td><td>2. PUSH, POP,
3. IN, OUT,
4. PUSHF POPF,
5. LEA, LDS/LES,
6. XLAT, XCHG,
7. LAHF, SAHF
Any five each 2marks</td><td></td><td></td><td></td><td></td></tr>
<tr><td>12.</td><td>Ans: The flag manipulation instructions and their functions are as follows: (6 Marks)

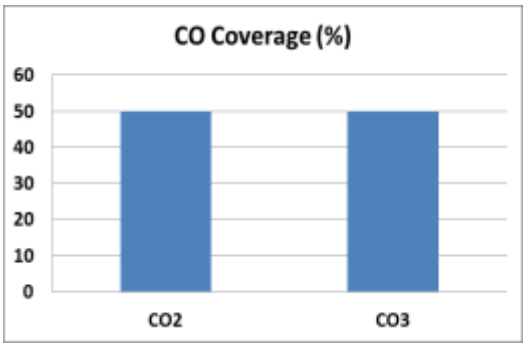
CLC – clear carry flag
CMC – Complement carry flag
STC – Set carry flag
CLD – clear direction flag
STD - Set direction flag
CLI – clear interrupt flag
STI – Set interrupt flag
The machine control instructions supported by 8086/8088 are listed as follows along with their functions (4 Marks)
WAIT – Wait for Test input pin to go low
HLT – Halt the processor
NOP – No operation
ESC – Escape to external device like NDP
LOCK – Bus lock instruction prefix.</td><td>10</td><td>2</td><td>2</td><td>2</td></tr>
<tr><td>13.</td><td>
<table>
<tr><td>Ascending Order Program</td><td>MOV SI, 1200H</td></tr>
<tr><td></td><td>MOV CL, [SI]</td></tr>
<tr><td></td><td>DEC CL</td></tr>
<tr><td>LOOP3</td><td>MOV SI, 1200H</td></tr>
<tr><td></td><td>MOV CH, [SI]</td></tr>
<tr><td></td><td>DEC CH</td></tr>
<tr><td></td><td>INC SI</td></tr>
<tr><td>LOOP2</td><td>MOV AL, [SI]</td></tr>
<tr><td></td><td>INC SI</td></tr>
<tr><td></td><td>CMP AL, [SI]</td></tr>
<tr><td></td><td>JC LOOP1</td></tr>
<tr><td></td><td>XCHG AL, [SI]</td></tr>
<tr><td></td><td>XCHG [SI-1], AL</td></tr>
<tr><td>LOOP1</td><td>DEC CH</td></tr>
<tr><td></td><td>JNZ LOOP2</td></tr>
<tr><td></td><td>DEC CL</td></tr>
<tr><td></td><td>JNZ LOOP3</td></tr>
<tr><td></td><td>HLT</td></tr>
<tr><td>Descending Order Program</td><td>MOV SI, 1200H</td></tr>
<tr><td></td><td>MOV CL, [SI]</td></tr>
<tr><td></td><td>DEC CL</td></tr>
</table>
</td><td>10</td><td>3</td><td>2</td><td>2</td></tr>
</table>

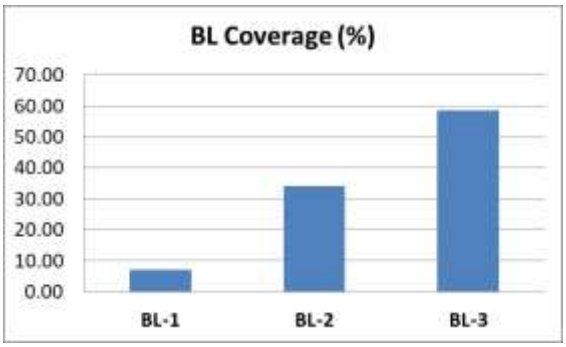
	LOOP3	MOV SI, 1200H				
		MOV CH, [SI]				
		DEC CH				
		INC SI				
	LOOP2	MOV AL, [SI]				
		INC SI				
		CMP AL, [SI]				
		JNC LOOP1				
		XCHG AL, [SI]				
		XCHG [SI-1], AL				
	LOOP1	DEC CH				
		JNZ LOOP2				
		DEC CL				
		JNZ LOOP3				
		HLT				
14.			**10**	**3**	**3**	**3**
	Interfacing diagram and explanation 5 Marks ASSUME CS: CODE CODE SEGMENT START : MOV AL,80h ;make all ports output OUT CWR, AL AGAIN : MOV AL,00h ;start voltage for ramp BACK : OUT PA, AL INC AL CMP AL, 0FFh JB BACK JMP AGAIN CODE ENDS END START **Program 5 Marks**					
Part – B Section B2 (2 x 10 = 20 Marks) **Instructions: Answer ANY 2 Questions**						
15.			**10**	**2**	**3**	**3**

	 **Block diagram 4 Marks Explanation of each block 6 Marks**				
16.	BSR Mode  I/O Mode  **Above two CWDstructures 8 Marks** Port A input Mode 0 Port C Upper input Mode 0 Port B output Mode 0 Port C Lower Mode 0	**10**	**3**	**3**	**3**

	Above answer 2 marks				

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Course Coordinator **Signature of the Question paper setter**

Evaluation Sheet

Name of the Student: **Register No.:**

Part- A (10 x 1= 10Marks)					
Q. No	**CO**	**PO**	**Maximum Marks**	**Marks Obtained**	**Total**
1	**2**	**12**	**1**		
2	**2**	**2**	**1**		
3	**2**	**2**	**1**		
4	**2**	**12**	**1**		
5	**2**	**2**	**1**		
6	**3**	**2**	**1**		
7	**3**	**3**	**1**		
8	**3**	**3**	**1**		
9	**3**	**2**	**1**		
10	**3**	**12**	**1**		
Part- B (2 x 10= 20 Marks)					
11	**2**	3	**10**		
12	**2**	2	**10**		
13	**2**	3	**10**		
14	**3**	3	**10**		
15	**3**	3	**10**		
16	**3**	2	**10**		

Consolidated Marks:

CO	Maximum Marks	Marks Obtained
2	**25**	
3	**25**	
Total	**50**	

PO	Maximum Marks	Marks Obtained
2	**25**	
3	**42**	
12	**3**	
Total		

Signature of Course Teacher

Signature of the Course Coordinator **Signature of the Academic Advisor**