



Continuous Assessment Test (CAT) – I - AUGUST 2024

Programme	:	B.Tech. (CSE)	Semester	:	Fall 2024-25
Course Code & Course Title	:	BECE2041. & Microprocessors and Microcontrollers	Class Number	:	CH2024250100369
Faculty	:	Dr. M. Jagannath	Slot	:	G1 + TG1
Duration	:	90 Minutes	Max. Mark	:	50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.
- Only non-programmable calculator without storage is permitted

Answer all questions

Q. No	Sub Sec.	Description	Marks	Blooms Taxonomy Level																																														
1.		Compare and contrast the Von-Neumann and Harvard architectures of computer memory with schematic diagrams.	5	L2																																														
2.		<p>The initial values stored in the registers of 8051 are given in Table 1.</p> <p style="text-align: center;">Table 1</p> <table border="1"> <tr> <th>A</th><th>B</th><th>R0</th><th>R1</th><th>R2</th><th>R3</th><th>R4</th><th>R5</th><th>R6</th><th>R7</th><th>PSW</th></tr> <tr> <td>02H</td><td>05H</td><td>02H</td><td>ECH</td><td>30H</td><td>06H</td><td>00H</td><td>35H</td><td>0FH</td><td>08H</td><td>00H</td></tr> </table> <p>Check the program given in column 1 of Table 2 and answer column 2, column 3 and column 4. (Note: The register values will get updated after executing each instruction).</p> <p style="text-align: center;">Table 2</p> <table border="1"> <thead> <tr> <th></th><th>Addressing Mode</th><th>PSW Register Value</th><th>Output</th></tr> </thead> <tbody> <tr> <td>MUL A, B</td><td></td><td></td><td></td></tr> <tr> <td>ADD A, R7</td><td></td><td></td><td></td></tr> <tr> <td>SUBB A, 06H</td><td></td><td></td><td></td></tr> <tr> <td>XRL 05H, #06H</td><td></td><td></td><td></td></tr> <tr> <td>ORLA, @R0</td><td></td><td></td><td></td></tr> </tbody> </table>	A	B	R0	R1	R2	R3	R4	R5	R6	R7	PSW	02H	05H	02H	ECH	30H	06H	00H	35H	0FH	08H	00H		Addressing Mode	PSW Register Value	Output	MUL A, B				ADD A, R7				SUBB A, 06H				XRL 05H, #06H				ORLA, @R0				15	L3
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3.		<p>Write an 8051 assembly language program to control the 4-way traffic signals as per the sequence.</p> <p>Sequence 1: Lane-1 and Lane-3 are GREEN, Lane-2 and Lane-4 are RED</p> <p>Sequence-2: Lane-1 and Lane-3 are GREEN, Lane-2 and Lane-4 are YELLOW</p> <p>Sequence-3: Lane-1 and Lane-3 are RED, Lane-2 and Lane-4 are GREEN</p>	15	L4																																														

Sequence-4: Lane-1 and Lane-3 are YELLOW, Lane-2 and Lane-4 are RED

Repeat the sequence indefinitely. (Note: Every sequence will have a delay. The delay time of RED and GREEN will be 5 times greater than YELLOW). Table 3 gives the details of ports used for connecting coloured LEDs to all lanes.

Table 3

	RED	YELLOW	GREEN
Lane-1	P0.0	P0.1	P0.2
Lane-2	P1.0	P1.1	P1.2
Lane-3	P2.0	P2.1	P2.2
Lane-4	P3.0	P3.1	P3.2

4.

Write an 8051 assembly language program to generate a square wave signal shown in Figure 1 at pin P1.0 using Timer 0 in Mode 1. Assume that the crystal frequency of the 8051 microcontroller is 12 MHz.

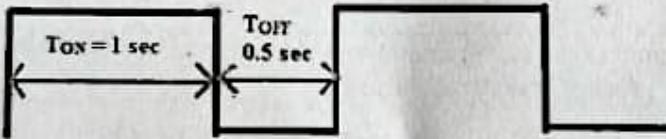


Figure 1

15 L3

***** All the best *****