



Continuous Assessment Test (CAT) – I - AUGUST 2025

Programme	: B.Tech. (CSE and its Specialization)	Semester	: Fall 2025-2026
Course Code & Course Title	: BECE204L & Microcontroller and its Applications	Slot	: A2+TA2
Faculty	: Dr.Manoj Kumar R Dr.Subhashini.N Dr,Vigneswaran T Dr.Sourabh Paul Dr.Berlin Hency V Dr,Sivasubramanian A Dr,Vydeki D Dr.Sindhuja Dr.Richards Joe Stanislaus Dr.Suhasini S Dr.Mohamed Aarif K O	Class Number	: CH2025260102228 CH2025260102235 CH2025260102242 CH2025260102247 CH2025260102253 CH2025260102257 CH2025260102260 CH2025260102266 CH2025260102268 CH2025260102272 CH2025260102277
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

Answer all questions

Q. No	Sub Sec.	Description	Marks	CO	BT Level																										
1		A company is developing a smart home thermostat that requires real-time temperature monitoring, control of heating & cooling systems, and a user-friendly interface with a touchscreen display. Given these requirements, would you recommend using a microcontroller or a microprocessor? Justify your choice by considering factors such as processing power, cost, power consumption, and integration of peripherals.	5	1	K2																										
2		For the assembly language program given below, find the register content value after executing each line of the program. Assume the value in Memory location D:10H=0AH, D:20H=05H, D:25H= 11H <table><tr><th>Program</th><th>Register Content</th></tr><tr><td>ORG 0000H</td><td></td></tr><tr><td>SETB PSW.7</td><td></td></tr><tr><td>MOV A, #45H</td><td></td></tr><tr><td>MOV B, #12H</td><td></td></tr><tr><td>MUL AB</td><td></td></tr><tr><td>MOV B, #10H</td><td></td></tr><tr><td>DIV AB</td><td></td></tr><tr><td>MOV A, #-100</td><td></td></tr><tr><td>SWAP A</td><td></td></tr><tr><td>MOV R0, #20H</td><td></td></tr><tr><td>ORL A, @R0</td><td></td></tr><tr><td>END</td><td></td></tr></table>	Program	Register Content	ORG 0000H		SETB PSW.7		MOV A, #45H		MOV B, #12H		MUL AB		MOV B, #10H		DIV AB		MOV A, #-100		SWAP A		MOV R0, #20H		ORL A, @R0		END		10	3	K3
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3

a)

Find the time delay of the given 8051 assembly language program. Assume the crystal frequency as 12 MHz. [4 Marks]

Instruction	No. of Machine Cycle
MOV R1, #250	1
LABEL: MOV R2, #250	1
HERE: NOP	1
DJNZ R2, HERE	2
DJNZ R1, LABEL	2
RET	2

10

4

K3

b)

Write an 8051 assembly language program to create the delay found in Q. No. 3(a) using Timer 0 in Mode 1. Assume the crystal frequency as 12 MHz. [6 Marks]

4

Write an 8051 assembly language program to perform multiplication of two sets of 8-bit numbers stored in internal RAM. The first set of 5 numbers begins at memory location 40H, and the second set of 5 numbers begins at 50H. Multiply the corresponding elements from each set, complement each result, and store the complemented products in external RAM starting from address 3000H.

10

3

K3

5

A switch is connected to pin P1.2. If the switch is pressed (logic low), an LED connected to P1.7 should be turned ON. If the switch is not pressed (logic high), the LED should be turned OFF while simultaneously generating a square wave in P1.4 with a period 200 μ s. Use interrupts for handling the square wave generation using timer 0 in mode 2. Assume XTAL frequency as 11.0592 MHz.

15

4

K3