ALL the questions

Slot: A1+TA1

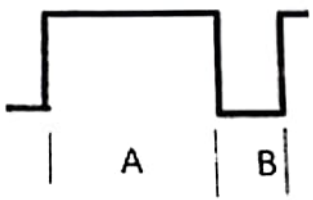
Q.No.	Sub. Sec.	Questions	Marks
1		During monsoon months, the weather monitoring station recorded the data of daily rainfall (R) for the past 10 days and stored values in internal RAM whose starting memory location is 45h. Write an 8051 assembly language program to compute the average rainfall (M) of the 10 days data. (The sum of the 10 recorded data of daily rainfall is assumed to be less than FFH). Based on the average rainfall, write an assembly language program to perform the following. Also, draw the flowchart to support your program. • If R = M, then increment the register R5 to indicate number of days with average rainfall • If R > M, then increment the register R6 to indicate number of days with above average rainfall • If R< M, then increment the register R7 to indicate number of days with below average rainfall	[15]

2	(a)	What are the contents of the A and B registers after execution of each instruction in the following program? [4 marks]
		MOV 0F0H,#12H
		MOV R0,#0F0H
		MOV A,#34H
		XCH A,0F0H
		XRL A, B
			[10]

(b) Calculate the amount of time delay generated by the following program. Assume the crystal frequency of 8051 as 11.0592 MHz. [6 marks]

LABEL	INSTRUCTIONS	NO. OF MACHINE CYCLE
DELAY:	MOV R1, #21	1
LOOP1:	MOV R2, #170	1
LOOP2:	MOV R3, #255	1
LOOP3:	DJNZ R3, LOOP3	2
	DJNZ R2, LOOP2	2
	DJNZ R1, LOOP1	2
	RET	2

3 Write an 8051 assembly language program to generate the following waveform using timers in mode 1 on port P1.2. Assume the crystal clock frequency is 11.0592 MHz. Show the necessary delay calculation. [10]



A=5 ms, B=2 ms

4 The doctor activates his entry/exit on the LCD screen that is placed on the door of the consultation room. Assume that the room door has two digital infrared (IR) sensors for monitoring the doctor's entry and exit. Both IR sensor modules are connected to the INT0 and INT1 pins of 8051 respectively. Whenever the doctor enters the room, an interruption (INT0) will be observed by the IR sensors, then the LCD should display "DOCTOR:IN" and while the doctor exits the room, an interruption (INT1) will be observed by the IR sensors the display should show "DOCTOR:OUT". Write an 8051 assembly language program for the above system. [15]