Total No. of printed pages = 3 EE 1816PE22 19/6/23 Roll No. of candidate BINA CHOWDHURY CENTRAL LIBRARY (GIMT & GIPS) Azara, Halkhowapara 2023 Guwahati - 781017 B.Tech. 6th Semester End-Term Examination Electrical Engineering EMBEDDED ENGINEERING (New Regulation (w.e.f. 2017-18) & New Syllabus (w.e.f. 2018-19)) Full Marks - 70 Time - Three hours The figures in the margin indicate full marks for the questions. Answer question No. 1 and any four from the rest. 1. Answer the following: $(10 \times 1 = 10)$ What is the order decided by a processor or the CPU of a controller to execute an instruction? decode, fetch, execute (b) execute, fetch, decode fetch, execute, decode (d) fetch, decode, execute (ii) How many bytes of bit addressable memory are present in 8051 based microcontrollers? (a) 8 bytes 32 bytes (b) (c) 16 bytes (d) 128 bytes (iii) MOV A, @ R1 will

copy the contents of memory whose address is in R1 to the accumulator

(a)

(b)

(c)

copy R1 to the accumulator

copy the accumulator to R1

(d) copy the accumulator to the contents of memory whose address is in R1

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(iv)	Wha	What is internal RAM memory of 8051 microprocessor?				
	(a)	32 bytes	(b)	64 bytes		
	(c)	128 bytes	(d)	256 bytes		
(v)	Which operations are performed by stack pointer during its incremental phase?					
	(a)	Push	(b)	Pop		
	(c)	Return	(d)	All of the above		
(vi)		ich of the following is the over the on-chip RAM?	ddressing range of addressable individual			
	(a)	OOH to 7FH	(b)	01H to 7FH		
	(c)	OOH to FFH	(d)	80H to FFH etion MOV A,05H? umulator t to one accumulator Accumulator		
(vii) What is the meaning of the instruction MOV A,05H?						
	(a)	Data 05H is stored in th	e acc	umulator (CERS) MAR ON TO SHOW THE SHOW		
	(b)	Fifth bit of accumulator	is set	t to one HONOKEIN LEWIS 18		
	(c)	Address 05H is stored in	the a	umulator t to one accumulator A,05H: A,05H: A,05H: ACCUMULATION		
	(d)	None of the mentioned				
(viii) Which operations are performed by the bit manipulating instructions of Boolean processor?						
	(a)	Complement bit	(b)	Set bit		
	(c)	Clear bit	(d)	All of the above		
(ix) How does the microcontroller communicate with the external periph memory?						
	(a)	Via I/O ports	(b)	Via register array		
	(c)	Via memory	(d)	All of the above		
(x)	Which operator is the most important while assigning any instruction register indirect instruction?					
	(a)	\$	(b)	#		
	(c)	@	(d)	&		
(a)	State some difference between Microprocessor and Microcontroller. (5)					
	What is meant by Bus? Draw the neat diagram of Bus architecture of a microprocessor unit like the 8085 microprocessor. $(1+4=5)$					
(b)						

2.

3.	(a)	Explain the action of μC 8051, after it executes the following instructions					
		(i) MOV R1, 56H (ii) MOV02, #86H	(5)				
		(iii) SETB R0 (iv) MOVX A, A+DPTR (v) DJNZ R5, L2					
	(b)		/ - \				
			(5)				
	(c)	Explain the action of μC 8051, when it executes the instructions given below. Also show the status of the registers used in the instructions. (5)					
		MOV R2, #03H					
		MOV A, #02H					
		ADD A, 02H BINA CHOWDHURY CENTRAL LIBRARY					
		MOV R2,A (GIMT & GIPS) Azara, Hatkhowapara					
		DJNZ R2, L3 Guwahati – 781017					
		Assume $RS_0 = 0$ and $RS_1 = 1$.					
4.	(a)	Draw the functional block diagram of 8051 and explain the function of different units of the device. (10)					
	(b)	What are the operating modes of timer/counter of 8051? Explain the TMOD register. (5)					
5.	(a)	Generate a square wave of 2 mSec time period using an AT89C51 microcontroller with timer 0 in model on the P1.0 pin of port1. Assume Xtal oscillator frequency of 11.0592 MHz. The program can be written in assembly or in C language.					
	(b)	Write a program in assembly or C language to transfer a letter 'Y' serially 4800 baud continuously, and also to send a letter 'N' through port 0, which is connected to a display device.					
6.	(a)	Interface a 16×2 LCD unit to a 8051 μC in 4-bit mode. Provide program assembly or C language to display "8051 MICRO" from the $2^{\rm nd}$ column of the $2^{\rm nd}$ row of the LCD unit.					
	(b)	Develop a microcontroller based system to measure RMS value of a voltal source having source specifications 220V, 50 Hz. Explain the function of the interfacing circuit(s) used for this purpose. Develop the software using assembly or C language to implement the task.	he				
7.	(a)	What is a AVR? Draw a neat sketch of the block diagram of any of At mes $8/16/32$ and label the different units. $(2 + 5 =$					
	(b)	Write a AVR program in assembly or C language to transmit the letter "El serially at 9600 baud, 8 bit data and 1 stop bit. Do it forever.	E" 8)				