CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR
(Deemed to be University)
KOKRAJHAR :: BTR :: ASSAM :: 783370
END – SEMESTER EXAMINATION
DEGREE

Session: July-December, 2024 Semester: 5th Time: 3Hrs. Full Marks: 100
Course Code: **UIE 501** Course Title: **Microprocessor & Microcontroller**

QUESTION NO. 1 IS COMPULSORY AND ANSWER ANY FOUR (4) FROM THE REST

Q1:

a) Match the following: **5**

Column-A	**Column-B**
Bits of PSW, responsible for selection of register banks	“ ”
In 8051, oscillations periods of one machine cycle is	2-bytes
Directives used for ASCII strings	128-bytes
Size of the Instruction “MOV A, #44H”	RS1 & RS0
Size of RAM in 8051	12

b) State **True** or **False**. If false, write the **correct statement**. **5**

i) No value can be moved directly into registers R0-R7.

ii) The source file of 8051 program has the extension “asm” or “src”, depending on the assembler used.

iii) Every member of the 8051 family wakes up at the memory 0000H when it is powered up.

iv) The “END” directive is the last line of the 8051 program.

v) The instruction PUSH A in 8051 is valid.

c) Fill in the blanks: **5**

i) The 8051 has _____bytes of on chip ROM.
[64/128/256/512]

ii) The vast majority of registers in 8051 are _____bits.
[4/8/12/16]

iii) With each PUSH instruction in 8051, the Stack Pointer is _____.
[incremented/decremented/no change]

iv) The mnemonics DJNZ stands for_____
[jump/ decrement and jump if R=0 / decrement and jump if R ≠ 0]

v) In “JZ NEXT” instruction of 8051, _____ registrar’s content is checked to see if it is zero.
[A/ B/ R0/ R1]

d) State the contents of the memory locations 050H-056H for the following: **5**

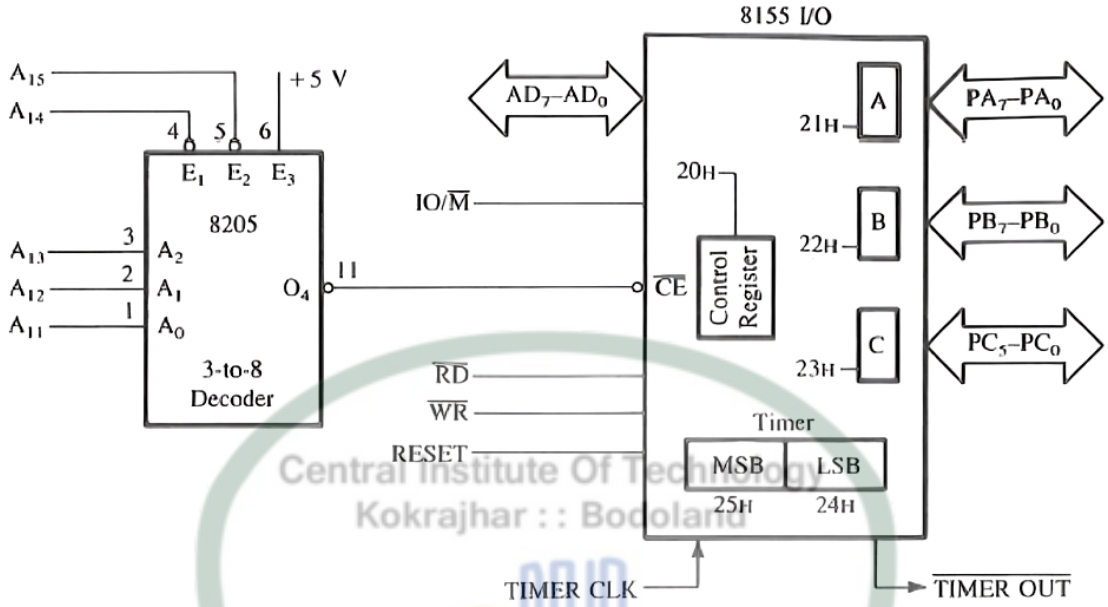
```
ORG 050 H
DB   0FC H, 05 H, 76 H, 1C H
DB   “DIP”
```

Q2:

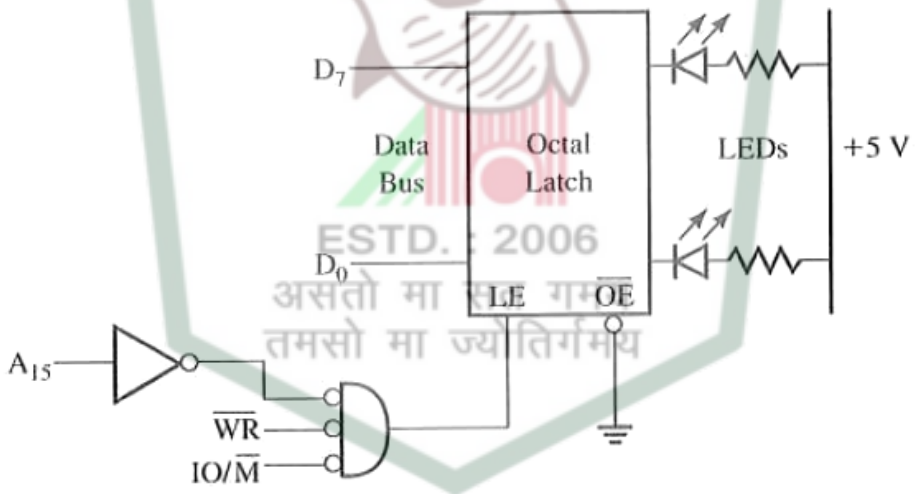
a) The decode logic and port addresses of 8155 interfacing with 8085 is shown in the figure below. Now, you have to design a square wave generator with a pulse width of 200 µsec by using the 8155 timer and, **10**

i) Calculate the timer count value *(the given clock frequency is 3MHz)* ,

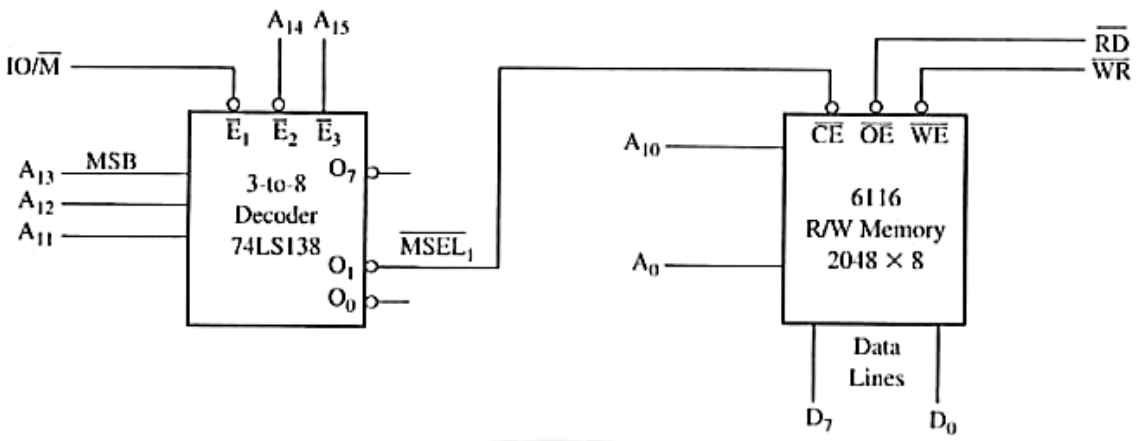
		ii)	State the timer LSB & MSB values *(Set the timer in Mode-1),*	
		iii)	Write the control word for 8155,	
		iv)	Write down the initialization instructions to generate the square wave.	



	b)	Can you recognize whether the below is I/O mapped I/O or memory mapped I/O scheme? What is the PORT address if all the don't care lines are assumed to be zero?	**5**



	c)	In the figure below, exchange the address lines A_{11} and A_{15}, and identify the memory map.	**5**



Q3:				
	a)		Write an assembly language program for 8085 to find largest number in an array of twenty numbers of data which is store in memory location starting from E123H and store your result in F000H.	**7**
	b)		Compare the similarities and differences between PUSH/POP and CALL/RET instruction.	**6**
	c)		Describe the interpretation of the accumulator bit pattern for the SIM-instruction.	**4**
	d)		What is meant by maskable interrupts?	**1**
	e)		What is the maximum number of input-output devices that can be connected in 8085 using I/O mapped I/O technique?	**2**
Q4:				
	a)		Write an assembly language program for 8085 Microprocessor to multiply two 8-bit Data.	**6**
	b)		Draw and explain the bus timing diagram of the instruction LDA D050H. Also, find the time required by the microprocessor to execute this instruction, if the clock frequency is 3 MHz	**7**
	c)		List the major components of the 8279 keyboard/display interface, and explain their functions.	**7**
Q5:				
	a)		What do you mean by de-multiplexing of lower order address - data bus? How it is done?	**4**
	b)		Draw an interfacing circuit for a 4Kbyte EPROM using a 3 to 8 decoder such that the memory address range will be C000H-CFFFH.	**5**
	c)		Discuss EI and DI instructions.	**4**
	d)		Write an assembly language program to calculate the following expression on 8085: **Y + 2Z - 3W** The data Y, Z and W (as 06H, 07H and 02H) are stored in memory locations D008H to D00AH.	**7**
Q6:				
	a)		For the given program below:	**6**

Mnemonics	Operand
LDA	2100 H
CMA	
INR A	
STA	2101 H
HLT	

i) Assemble it starting from ML: C000H

ii) How many bytes are consumed in memory to write this program?

iii) State the function that the program is going to perform.

b) Write a program in assembly language for 8085 to mask off the least significant 4 bits of a given hexadecimal number. The answer should be stored in memory location 2200 H. Let the given number is B3 H **5**

c) Write a delay subroutine program for 8085 to introduce a time delay of 1 millisecond using only one register. (Assume the system frequency is 2 MHz) **6**

d) Describe with examples one byte, two byte and three byte instructions of 8085. **3**

Q7:

a) For the given program below: **4**

Mnemonics	Operand
PUSH H	
PUSH PSW	
LXI H,	0000 H
PUSH H	
POP PSW	
POP H	
MOV A,	H
POP H	

i) What will be the condition of flags after the execution of this program?

ii) Is there any arithmetic or logical operations performed in this program?

b) What is difference between *CMP reg* and *SUB reg* instructions? Explain with suitable examples. **4**

c) An *ORA reg* or *ORI data* instruction can be used to make a selected bit of a specified register as 1. Justify this statement. Also write the mnemonic of an instruction that will set bit 6 of the accumulator without changing any of the other bits in the register. **4**

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%