B.TECH/CSE/5THSEM/AEIE 3105(BACKLOG)/2020 MICROPROCESSORS & MICROCONTROLLERS (AEIE 3105)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and <u>any 5 (five)</u> from Group B to E, taking <u>at least one</u> from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A (Multiple Choice Type Questions)

1. Choose the correct alternative for the following: $10 \times 1 = 10$

(i)	Address bus of 8085 μP is- (a) 8 bit unidirectional (c) 16 bit bi-directional		(b) 8 bit bi-directional (d) 16 bit unidirectional.	
(ii)	Control signal used to de-multiplex address and data bus in 8085 μ is-			ıs in 8085 μP
(iii)	(a) ALE DAD B is a ins	(b) <i>I(/M̄</i> struction	(c) HOLD	(d) INTA.
	(a)1 byte	(b) 2 byte	(c) 3 byte	(d)4 byte.
(iv)	If the operating free execute ANA M ins (a) 3.5 μsec	equency of 8085 struction is- (b) 7 μsec	is 2 MHz, then the tim (c) 10 μsec	e required to (d) 14 μsec.
(v)	Which pin of 8085 (a) HLDA	μP is used to ac (b) <i>I</i> (/ M	cknowledge INTR? (c) HOLD	(d) INTA.
(vi)	For 8255 PPI the b (a) BSR Mode	oi-directional mo (b)Mode 0	ode of operation is sup (c) Mode 1	ported in- (d)Mode 2
(vii)	The instruction qu (a) 2	eue length of 80 (b)4	986 μP is byte. (c)5	(d)6.

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- (viii) MOV BX, [2001] instruction transfer -
 - (a) 8 bit data from 2001 offset address
 - (b) 8 bit data from 2000 offset address
 - (c) Lower 8 bit data from 2001 and higher 8 bit from 2002 offset address
 - (d) Lower 8 bit data from 2000 and higher 8 bit from 2001 offset address
- In 8051 μ C if RS₁=1 and RS₀=0 then the selected register bank is-(ix) (b) Bank 1 (a) Bank 0
 - (c) Bank 2

- (d) Bank 3
- (x) 8051 µC will read instruction from its internal program memory if-(b) RST pin is at logic 1 (a) RST pin is at logic 0 (d) EA pin is at logic 1
 - (c) EA pin is at logic 0

Group – B

- 2. (a) Write the name of different programmable registers of 8085 μ P. Write one instruction where DE register pair is used as memory pointer.
 - (b) What is the function of READY signal? With suitable diagram discuss the function of ALE signal.
 - (c) Store the last two digits of your registration number in memory location 8000_{H} . Write a program to count the number of 1's and 0's present in the content of memory location 8000H. Store the result in memory location.

(3+1) + (1+3) + 4 = 12

- 3. (a) Draw the timing diagram of ANI $4F_{\rm H}$ instruction. Assume that the opcode of the instruction is XX_H and it is stored in memory location $9000_{\rm H}$. Also calculate the time required to execute the instruction where the clock frequency is 3 MHz.
 - (b) What do you mean by maskable and vectored Interrupt?
 - (c) Write a program to enable the interrupts in 8085 μ P and to mask RST 5.5, RST 6.5 and unmask RST 7.5 interrupts.

(6+1)+2+3=12

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Group – C

- 4. (a) Draw and discuss the internal architecture of 8086 μ P.
 - (b) Discuss the function of following signals of 8086 μ P (any two) (i) TEST (ii) D / \overline{R} (iii) BHE
 - (c) What is segment address and offset address?

8+2+2=12

- 5. (a) If the content of CS and IP registers in 8086 μ P is 2000_H and 1FFFH, respectively, then calculate the 20 bit physical address.
 - (b) Write a program for $8086 \ \mu P$ to compare two blocks of data. If both the blocks are same then store FFH in memory location $2000_H : 1000_H$, otherwise store 00_H .
 - (c) Write the name of different addressing modes of 8086 μ P with one suitable example.

2+6+4=12

Group – D

- 6. (a) What are the differences between microprocessor and microcontroller?
 - (b) Write the main features of $8051 \ \mu$ C.
 - (c) Discuss the function of following signals of 8051 μ C (any two) (i) RST (ii) \overline{EA} (iii) RXD
 - (d) Explain the function of following instructions of 8051 μC (any three)
 (i) DJNZ L1
 (ii) SETB C
 (iii) CPL A
 (iv) SJMP L1
 3+4+2+3=12
- 7. (a) Draw the interfacing circuit (including power on reset, crystal oscillator and power supply) to connect one LED to P1.0 pin of 8051 μ C. Write an assembly level program to add two 8 bit numbers and blink the LED if addition generates a carry, otherwise LED is OFF. Let the delay subroutine is available at XXXXH memory location.
 - (b) Write short notes on (any one)
 - i) Internal RAM organization of $8051 \ \mu C$
 - ii) Serial data communication in 8051 μC

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Group – E

- 8. (a) Draw and discus the control word register (CWR) format of 8255 PPI in I/O mode.
 - (b) Describe the purpose of various bits of port-C of an 8255 PPI when port A and port B both are set as output port in mode 1.
 - (c) Two LEDs are connected at PC_1 and PC_2 line of 8255 PPI. Write an assembly language program for 8085 μ P to periodically turn ON and OFF two LEDs by setting 8255 PPI in BSR mode.

3 + 5 + 4 = 12

- 9. (a) Design an interface between 8085 μ P and one 8KB ROM memory chip. Select suitable memory map.
 - (b) Write short notes on (any one) (i) 8251 (ii) 8259

6+6 = 12

Department & Section	Submission Link
CSE	https://classroom.google.com/c/MjcxMDI5MzAzMzMy/a/MjcxMDI5MzAzMzUy/details