

GANPAT UNIVERSITY
B. TECH. SEM. V- MECHATRONICS ENGINEERING
CBCS REGULAR EXAMINATION NOV/DEC-2015
2MC-505 MICROPROCESSOR

Time: 3 Hours

Total Marks: 70

Instruction:

- 1). All questions are **compulsory**.
- 2). Figures to the **right** indicate full marks.
- 3). Answers to the two sections must be written in **separate** answer books.
- 4). Assume crystal frequency 1MHz.

Section – I

Que:-1 Attempt All.

- (A) What is a higher level language? Explain in detail.
- (B) Define microprocessor. Draw and explain basic microprocessor system.
- (C) (i) If the memory chip size is 1024 x 4 bits, how many chips are required to make up 16 K bytes of memory?
(ii) Explain the difference between SRAM vs. DRAM.

OR

Que:-1 Attempt All.

- (A) Design a SRAM chip for the address range 4888H to CFFFH.
- (B) Explain the block diagram of 8086 microprocessor.
- (C) What is a latch? Describe the procedure to form a 1x4 –bit register with diagram.

Que:-2 Attempt All.

- (A) Design a seven-segment LED output port with the device address F3H using a 74LS138 3-to-8 decoder, a 74LS20 4-input NAND gate, a 74LS02 NOR gate and a common-anode seven-segment LED. Write instructions to display 5 at the port.
- (B) Explain the timing diagram when following instruction is executed. Opcode is DBH.

Memory Location	Instruction
C000H	IN 69H

OR

Que:-2 Attempt All.

- (A) Explain LDA instruction with timing diagram. (LDA opcode-3AH)
- (B) Design an interfacing circuit for memory to meet the following specification. Also write address ranges of both chips after interfacing.
 - (i) 3 to 8 decoder
 - (ii) 2K EPROM address range should begin at 8000H and additional 4 K memory space should be available for future expansion.
 - (iii) 2K RAM

Que:-3 Attempt All.

- (A) (i) Draw the diagram showing generation of four control signals.
(ii) Define Instruction cycle and Machine cycle.
- (B) Describe in detail the demultiplexing of bus AD₀-AD₇.
- (C) Explain the assembly language of the 8085 microprocessor.

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Section – II

Que:-4 Attempt All.

- (A) A set of ten bytes is stored in memory starting with the address C050H. Write a program to check each byte, and save the bytes that are higher than 50₁₀ and lower than 100₁₀ in memory locations starting from C060H.
- (B) Write an ALP to find the number of 1's and 0's from the content of the register D. store the number of 1's in memory location C300H and number of 0's in memory location C400H.
- (C) A string of ten data bytes is stored starting from memory location C000H. Sort these data in Ascending order.

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OR

Que:-4 Attempt All.

- (A) A set of eight data bytes is stored in memory locations starting from C070H. Write a program to add two bytes at a time and store the sum in the same memory locations, low-order sum replacing the first byte and a carry replacing the second byte. If any pair does not generate a carry, the memory location of the second byte should be cleared.
- (B) A set of ten bytes store in location starting with address C150H. Write a program to add even Data byte and store the result in memory location C250H (lower byte) and C251H (higher byte).
- (C) Write an ALP to find the Quebec root of the content of memory location C200H and store the result in memory location C100H.

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Que:-5 Attempt All.

- (A) Write an ALP to generate 10 KHz square wave from counter 0 of 8254.
- (B) Explain RIM and SIM instruction.
- (C) Write an ALP to add two number store in memory location C200H and C201H. Store the result in memory location C300H (lower byte) and C301H (higher byte).

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OR

Que:-5 Attempt All.

- (A) Explain the following instruction using a table and a timing diagram. Assume SP initiate at FFFFH.

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Memory Location
C500H

Instruction
CALL C800H.

- (B) Write an ALP to provide given ON/OFF time to three traffic lights and two pedestrian Signs (WALK and DON'T WALK) connected to pin of the Port C of 8255 as shown below:

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Light	Pin	On time
Green	PC3	10 Sec.
Yellow	PC4	5 Sec.
Red	PC5	15 Sec.
WALK	PC6	10 Sec
DON'T WALKS	PC7	20 Sec

Que:-6 Attempt all.

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(A) Write an ALP to complement the even bit of the register C without using CMA instruction.(even bit means D0, D2, D4, D6 bit of Register C)

(B) Calculate the delay for the following instructions:

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MVI B,FFH
Loop3: MVI C, FFH
Loop2: MVI D, FFH
Loop1: DCR D
      JNZ Loop1
      DCR C
      JNZ Loop2
      DCR B
      JNZ Loop3

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(C) Specify the register contents and the flag status as the following instructions are executed.

	A	B	S	Z	CY
XRA A					
MVI B, 84H					
ORA B					
RAR					

(D) Identify that how many times following loops are execute.

(i) Back: MVI A, FFH
ORA A
JC Back

(ii) MVI B, F1H
Back: DCR B
JZ Back

(iii) MVI A, FFH
Back: ADI 01H
JP Back

END OF PAPER