B.E.(with Credits)-Regular-Semester 2012-Electrical (Electronics & Power) Engineering Sem V

EP502 - Microprocessors and Microcontrollers

P. Pages : 2 **GUG/S/18/3721**

Time : Three Hours * 0 8 9 1 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.

1. a) Why $AD_1 - AD_0$ lines of microprocessor 8085 are multiplexed? How these lines are demultiplexed? **8**

b) Define Addressing modes. Explain it in detail along with examples. **8**

OR

2. a) Draw and explain timing diagram for PUSH R_P instruction. **8**

b) Explain the following instructions by giving addressing mode, type of instruction, Flags affected and required number of T-States: **8**

i) POP R_P
ii) XCHG
iii) RLC
iv) CMP R
v) JMP 16 bit address

3. a) Explain types of instructions. Explain linear decoding and absolute decoding with examples. **8**

b) Draw a schematic diagram to show generation of separate control signals for reading and writing operations performed by 8085 with respect to memory and I/O devices using $\overline{RD}$, $\overline{WR}$ and $IO/\overline{M}$ signals. Also explain the same. **8**

OR

4. a) Write a program to multiply two 8-bit numbers stored in memory locations 8060H and 8061H. Store the result of multiplication in memory locations 8062H and 8063H. Also explain logic used by drawing a neat flowchart. **8**

b) Write an assembly language program to separate Even and Odd data bytes out of 100 data bytes which are stored in 4000H. **8**

5. a) Interface 8KB EPROM and 4KB RAM with 8085 using full decoding. Use following memory ICs, **8**

$4K \times 8 \rightarrow$ EPROM

$2K \times 8 \rightarrow$ RAM

Assume starting address of EPROM as 0000H and that for RAM 4000H. Draw schematic with address enable logic.

b) Explain SIM and RIM instruction with their standard format. **8**

OR

6. a) Write an assembly language program to generate 200 pulses on SOD pin of up at the rate of 100 pulses/sec. The pulse ON time is 3msec. **8**

b) Describe clearly the steps that takes place when INTR pin receives a pulse. **8**

7. a) Explain Bi-directional mode of 8255 PPI with its operation, control word and status word. **8**

b) Interface 8 bit DAC 1408 with μp 8085 for the port address FFH using 74373 IC. The reference voltage should be 5V. Find its resolution. Find the O/P voltage for the digital I/Ps 00H, 80H, FFH. What is the conversion time of DAC. **8**

OR

8. a) Draw and explain block diagram of 8255 PPI. **8**

b) Interface 8 LEDs and 8 switches to 8085 Use Buffer and Latch as I/P and O/P device respectively. Also write a program to display switch condition on LED e.g. if S1 switch is closed then LED D1 will be ON. Use suitable addresses. **8**

9. a) Discuss the differences between microprocessors and microcontrollers. List the applications of microcontrollers. **8**

b) Define the term 'programming model'. Draw the programming model of the 8051. **8**

OR

10. a) Explain the significance of PSW. What are the applications of carry and overflow flags. **8**

b) Differentiate between mnemonics MOV, MOVX and MOVC. Explain operation of MOVC A, @ A+DPTR instruction. **8**

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