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**13.503 : MICROPROCESSORS AND MICROCONTROLLERS (AT)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions.

1. Clearly mention the difference between direct addressing mode and Register indirect addressing mode in 8085.
2. Distinguish between the following pair of instructions  
XTHL and SPHL instruction in 8085.
3. What are the flag bits available in 8085 ? Mention the condition for setting each flag.
4. Mention the differences between 8051 and 8085 stack implementation.
5. What is PSW in 8051 ? What is the role of  $RS_0$  and  $RS_1$  bits in PSW ?
6. What is the role of GATE bit in TMOD register of 8051 ?
7. What is the role of RI and TI flags located in SCON register in serial communication using 8051 ?
8. Why level converters are required when interfacing 8051 serial port with serial communication port of a PC ?
9. List any four features of a RISC processor.
10. List the modes of operation of ARM 7 processor. (10×2=20 Marks)

P.T.O.



## PART – B

Answer 1 question from **each** Module. **Each** question carries 20 marks.

**Module – I**

11. a) How 8085 instructions are classified ? Explain each type with two examples for each type. 10
- b) Write a 8085 program to perform sort 10 single byte numbers in descending and ascending order based on a value stored in one memory location. If the location contains 00h sort the number in ascending order. If the memory location contains 01h perform the sorting in descending order. 10

OR

12. a) Write a 8085 program to exchange 10 bytes of data stored from location X with 10 bytes of data stored from location Y. 10
- b) What is interrupt ? Distinguish between interrupt and polling method. Explain the interrupt structure of 8085. 10

**Module – II**

13. a) Explain the interrupt structure of 8051 clearly mentioning the role of configuration registers involved in interrupt programming. 10
- b) Compare the mode 1 and mode 2 operation of timer in 8051. 5
- c) Write an assembly language program to generate a square wave at P1.0 pin. 5

OR

14. a) Write the procedure to program 8051 timer in mode-1 clearly indicating the formula for calculating initial values that is to be loaded in timer registers. 5
- b) Write the steps involved in programming 8051 to send data serially. 5
- c) Write a program to transfer a message "YES" serially at 9600 baud, 8 bit data, 1 stop bit continuously through the serial port. 10





**Module – III**

15. a) With a neat diagram explain how a stepper motor can be interfaced with 8051. 10  
b) With a neat diagram explain how a LCD module can be interfaced with 8051. 10

OR

16. a) With a neat diagram, explain how a DAC 0808 can be interfaced with 8051. 10  
b) Explain how a 4×4 matrix keyboard can be interfaced with 8051. How can we avoid Switch bounce while interfacing keyboard. 10

**Module – IV**

17. a) Draw the architecture of a typical PIC microcontroller and explain the blocks. 10  
b) List the main features of an ARM7 processor. Explain the register organization of ARM 7 processor. 10

OR

18. a) Explain how the exception handling is done in ARM 7 processors. 5  
b) Explain the instruction pipelining in ARM 7 TDMI. 5  
c) Explain the ARM data flow model with the help of a block diagram. 10