

MICROPROCESSORS & MICROCONTROLLERS

Time: Three Hours

Maximum Marks: 100

Answer five questions, taking ANY TWO from Group A, any two from Group B and all from Group C.

All parts of a question (a, b, etc.) should be answered at one place.

Answer should be brief and to-the-point and be supplemented with neat sketches.

Unnecessary long answer may result in loss of marks.

Any missing or wrong data may be assumed suitably giving proper justification.

Figures on the right-hand side margin indicate full marks.

Group A

1. (a) Enumerate and explain any two potential applications of microprocessor. Differentiate between 8 bit and 16 bit microprocessor. 10
- (b) Explain the 2s compliment method with an example 10
2. (a) Draw the functional block diagram/architecture of 8085 microprocessor and discuss its operation. Discuss the functions of pins of 8085 microprocessor. 10
- (b) Discuss about the interrupt structure of 8085 microprocessor along with SIM and RIM instructions. List and explain the functions of 8085 vectored interrupts. 10
3. (a) Explain data transfer in 8085 using DMA in detail. 10
- (b) Describe the programming model of 8085 microprocessor with a neat diagram. Explain the following 8085 based assembly language instructions:
(i) CNZ 5000H (ii) PCHL (iii) MOV B,M (iv) RET (v) XRAA (vi) STC
(vii) LDA F800 H (viii) XCHG (ix) DAA (x) DADB 10
4. (a) What will be the output of the following program? 10
- (i) MVI A, 50H

- (ii) ORA A
- (iii) PUSH PSW
- (iv) HLT
- (b) Give the architecture of 8253 with a neat diagram and control word format. 10

Group B

- 5. (a) Draw the pin diagram of 8279 and explain in detail. 10
- (b) Draw and discuss the internal architecture of 8051 microcontroller. 10
- 6. (a) Discuss the pins of 8051 microcontroller. 10
- (b) Draw and explain the formats of TMOD, TCON, SCON, IE and IP registers of 8051 microcontroller. 10
- 7. (a) Explain the following instructions of 8051 microcontroller: 10
 - (i) DJNZ R2, THERE
 - (ii) CJNE A, DIRECT, REL
 - (iii) PUSH 0
 - (iv) MOVX A, @DPTR
 - (v) MOVCA, @ A+DPTR
 - (vi) LJMP 4100H
 - (vii) MOV @ R0, # data
 - (viii) ORL A, @R1
 - (ix) XCH A, @R0
 - (x) SETB C
- (b) List and explain the logical group of instructions of 8051 microcontroller with examples. 10
- 8. (a) Write a program to generate a square wave of frequency 2 kHz through port P1.0 by timer 0 of 8051 microcontroller. 10
- (b) Design 8051 based stepper motor controller. Write the assembly language program. 10

Group C

9. Answer the following in brief: 20
- (i) Why is a crystal preferred clock source?
 - (ii) Why is 8085 processor called as an 8 bit processor, justify.
 - (iii) Explain the operation of CJNE instruction of 8051 microcontroller.
 - (iv) List the main functions of the BIU(Bus Interface Unit) of 8086 processor.
 - (v) How many register banks are there in 8051 internal RAM ? How to select the desired bank?
 - (vi) In 8051 microcontroller, the crystal oscillator frequency is 11.0592 MHz. Find the machine cycle frequency.
 - (vii) Discuss the role of PSEN pin in 8051 microcontroller.
 - (viii) What is the clock frequency of 8051 microcontroller ?
 - (ix) Distinguish between direct register addressing mode and indirect register addressing mode by suitable examples for 8051 microcontroller.
 - (x) What is the size of internal ROM in 8051?

(Refer our course material for answers)

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