Question Paper

Exam Date & Time: 29-May-2023 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.TECH. (INFORMATION TECHNOLOGY) DEGREE EXAMINATIONS - MAY/JUNE 2023
SUBJECT: ICT 2256/IT-2256 COMPUTER ORGANIZATION & MICROPROCESSOR SYSTEMS

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

1A)	Provide a neat diagram of 8086 architecture and explain the use of various registers of 8086 in detail.	(5)
1B)	Explain the Mode 0, Mode 1, Mode 2 operations of 8254 with necessary waveforms.	(3)
1C)	Explain the addition of four 4-bit binary numbers using carry save addition concept.	(2)
2A)	Illustrate memory and IO addressing modes available in 8086 with an example for each.	(5)
2B)	How is the block transfer method more efficient in DMA based IO data transfer? Explain.	(3)
2C)	Write an assembly language program to perform equivalent of AAM instruction.	(2)
3A)	List the advantages and disadvantages on direct mapping techniques. A computer system uses 16-bit memory addresses. It has a 2K-byte cache organized in a direct-mapped manner with 64 bytes per cache block. Assume that the size of each memory word is 1 byte. Calculate the width of Tag, Block, and Word fields of the memory address.	(5)
3B)	Explain with the neat diagram on cascading of 8259 IC's.	(3)
3C)	Provide an assembly language program to display 2 digit hex decimal number available in the register DL.	(2)
4A)	Write an assembly language program to convert a 4-digit decimal number available in the data segment to an equivalent hexadecimal number and store it to the data segment.	(5)
4B)	Write an assembly language program using recursive procedure to solve ${}^{n}C_{r}$, where n and r are both single digit numbers.	(3)
4C)	The 4-bit shifter has four data inputs, A_0 through A_3 and four data outputs, H_0 through H_3. There are two serial inputs, one for shift left (I_L) and the other for shift right (I_R). Design according to the requirements given in Table 4C. Table 4C	(2)

Select	output			
S	Ho	H1	H2	H3
0	I_R	A0	A1	A2
1	A1	A2	A2	I_L

5A)	Explain and illustrate booths algorithm for multiplying $(-7)_{10}$ and $(-5)_{10}$. Show all the steps.	(5)
5B)	Illustrate the role of following pins of 8086 i) TEST, ii) IO/M', iii) RESET	(3)
5C)	Explain the following assembler directives: i) ENDP ii) OFFSET iii) PROC iv) DQ	(2)

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