This question paper contains 4 printed pages.

3106 *Your Roll No.* _____

MEE **J**

Paper – EE.601

MICROPROCESSORS

Time : 3 hours ***Maximum Marks*** : **100**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory. Attempt any four questions from the rest.

Assume missing data suitably, if any.

1. (*a*) Why is ROM always interfaced towards higher end of memory address space in 8086 based system? 2

(*b*) Write a program to move a string of length 10 words from one location to another location of your choice (only code segment) 4

(*c*) Explain the following instructions:

(*i*) LES BX, Code

(*ii*) LEA DI, data

(*iii*) SCASB Text_string

(*iv*) SAR CL. 4

Turn over

(*d*) Express the following decimal numbers in short real format of 8087 NDP:

+113·875

−225·0625 2

(*e*) Differentiate between near call and far call. What are the different ways in which near call can be done? Explain with suitable example. 4

(*f*) Identify the addressing mode and calculate the physical address of the operand in the following instructions:

(*i*) MOV AX, Word PTR (BX+8)

(*ii*) MOV AX, [BP] [DI]

The contents of the registers are as follows:

CS=5000H DS=2000H SS=1000H

BX=1021H BP=2012H 4

2. (*a*) Design a memory interfacing circuit to connect 16 KB EPROM and an 8KB RAM to 8086 in minimum mode using 4KB EPROM and 4KB RAM. 10

(*b*) Write an assembly language program to sort 20 numbers in descending order using bubble sort. 5

(*c*) Explain how 8086 reads a word using single read cycle. Write down the status of all required control signals. 5

3. (*a*) Write a far procedure to compute the following series:

$$\sum_{i=1}^{100} x_i^2.$$

10

(*b*) Write a near procedure to logically shift a 64 bit number twice to the right. 5

(*c*) Write a near procedure to multiply DI by SI and divide the result by 100H. 5

4. (*a*) Name all Hardware and Software interrupts of 8086. Explain the interrupt response sequence of 8086.s 4

(*b*) Explain the interrupt structure of 8086 in detail. 4

(*c*) Explain all ICWs and OCWs of 8259. 6

(*d*) Write an assembly language program for multiplying two 32 bit numbers and result 64 bit. 6

5. (*a*) Explain the Data types of 8087 coprocessor. 10

(*b*) Explain Control word and Status word of 8087. 5

(*c*) Explain the pipeline architecture of 8086. 5

6. (*a*) Discuss how to solve the critical section problem when

(*i*) using 8089 in a multiprocessor system

(*ii*) using 8087 in a multiprocessing system. 10

(*b*) What is critical region? With the help of necessary program explain how a semaphore is implemented in 8086 to protect the critical region. 10

7. (*a*) What are assembler directives? Explain the following directives?—

(*i*) EVEW

(*ii*) ASSUME

(*iii*) ENDP

(*iv*) ORG 5

(*b*) Explain stack structure of 8086 and write instructions to initialize stack segment. 7

(*c*) Explain minimum mode operation and maximum mode operation of 8086 with the help of a block diagram. 8

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