

Solution	Marks
<p><b>Q.2 a. Draw the functional pin diagram of 8086, briefly explain the pins of 8086. (8)</b></p> <p><b>Answer: Refer Figure 1.4 and text, page 10 of Text Book-I</b></p> <p><b>b. Describe the need for templates in instruction coding of 8086 and explain the various fields used in template for data transfer between a registers. (8)</b></p> <p><b>Answer:</b>            In 8086 there are 1024 op-codes just for moving information between a register and a register/memory. So templates are used to generate op-codes, if hand assembly is being performed.            Text1 - pg.no – 37 -38 , Article 3.1</p> <p><b>Q.3 a. Explain the working of WAIT and LOCK instruction in 8086. (8)</b></p> <p><b>Answer: Refer Article 8.3 &amp; 8.4 pages 142-143 of Text Book-I</b></p> <p><b>b. Explain SCAN STRING (SCAS) instruction with example. Also describe the use of REPE and REPNE prefixes in this instruction.</b></p> <p><b>Answer: Refer Article 9.5 pages 154-156 of Text Book-I</b></p> <p><b>Q.4 a. Describe the various types of exceptions we may come across while executing 8086 instructions. (8)</b></p> <p><b>Answer:</b>            There are two types of exceptions during instruction execution. They are Divide by zero error and Single step interrupt.            Type0 – Divide By zero error            Type1 – Single step interrupt            Text1- pg.no 193 -194. Article 11.2</p>	

b. Explain the flag status under which the branch takes place for the following instructions.

- (i) JBE and JNBE
- (ii) JLE and JNLE
- (iii) JL and JNL

Answer: Refer Article 10.2 pages 164-168 of Text Book-I

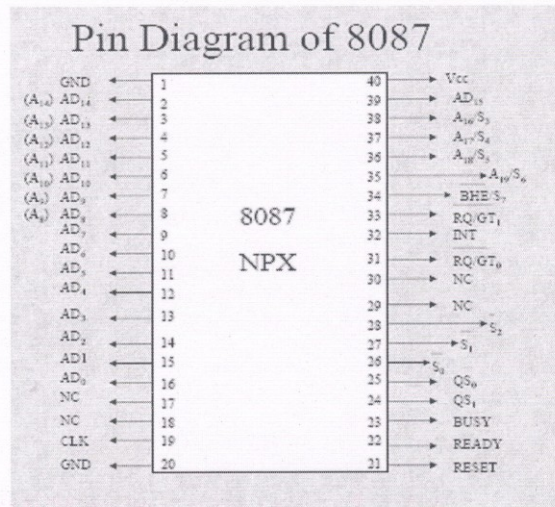
Q.5 a. What is the need for an arithmetic co-processor in a micro-computer system? With a functional pin diagram of 8087, describe the functions of various pins. (8)

Answer:

The need is to calculate many times faster than 8086-based processor:

- real numbers,
- packed BCD numbers,
- long integers. — 3-Marks

Using a general-purpose microprocessor such as the 8088/86 to perform mathematical functions such as log, sine, and others is very time consuming, not only for the CPU but also for programmers writing such programs.



The 8088 and 8087 receive the same signals, CLK, READY, and RESET, from the 8284. This ensures that they are synchronized.

2. S0, S1, and S2 are going from the 8088 or 8087 to the 8288, which allows either of these two processors to provide the status signal to the 8288.

3. The Queue Status, QS1 and QS2, from the 8088 go to the 8087, allowing it to know the status of the queue of the 8088 at any given time.

4. The TEST signal to the 8088 comes from BUSY of the 8087.

By deactivating (going low) the BUSY signal, the 8087 informs the 8088 that it finished execution of the instruction which it has been WAITing for.

5. RQ/GT1 (request/grant) of the 8088 is connected to RQ/GT0 of the 8087, allowing them to arbitrate mastery over the buses.

There are two sets of RQ/GT: RQ/GT1 and RQ/GT0. RQ/GT1 of the 8087 is not used and is connected to Vcc permanently.

This extra RQ/GT is provided in case there is a third microprocessor connected to the local bus.

*Text 1 - Pg no 199 Article 12.1*

*201*

*3 Marks Explanation*

6. Both the 8088 and 8087 share buses ADO -AD7 and A8 -A19, allowing either one to access memory.

Since the 8087 is designed for both the 8088 and 8086, signal BHE is provided for the 8086 processor.

It is connected to Vcc if the 8087 is used with the 8088.

If the microprocessor used was an 8086, BHE from the 8086 is connected to BHE of the 8087.

7. INT of the 8087 is an output signal indicating error conditions, also called exceptions, such as divide by zero. Error conditions are given in the status word. Assuming the bit for that error is not masked and an interrupt is enabled, whenever any of these errors occurs, the 8087 automatically activates the INT pin by putting high on it. In the IBM PC and compatibles, this signal is connected to the NMI circuitry as discussed in Chapter 14. Since there is only one INT for all error conditions (exceptions) of the 8087, it is up to the programmer to write a program to check the status word to see which has caused the error.

8. The 8088, often called the host processor, must be connected in maximum mode to be able to accommodate a coprocessor such as the 8087.

**b. Explain the data transfer group instructions of 8087. (8)**

**Answer:** Refer Article 13.2 pages 234-235 of Text Book-I  
*(3 Marks each for load operation and store & pop operation)*

**Q.6 a. Write an 8086 assembly language program to sort in descending order, using selection sort algorithm, a given set of 8 bit unsigned numbers in memory. (8)**

**Answer:** Refer Article 15.4, page 285 of Text Book-I

**b. Write an 8086 assembly language program which checks whether the printer is online. If it is on line, print a message on the printer using DOS interrupt, else display printer status on CRT. (8)**

**Answer:** Refer pages 337-338 of Text Book-I

**Q.7 a. Write an assembly language program by using 8087 instructions to compute the hypotenuse of a right angled triangle. (8)**

**Answer:** Refer Article 20.2 pages 356-357 of Text Book-I

**b. Write an 8086 assembly language program to find the square root of a real number. (8)**

**Answer:** Refer Article 20.3 pages 360-361 of Text Book-I

**Q.8 a. Using DOS function call, write a C program to obtain the size of given file. Message should be displayed on the screen indicating the size in hexadecimal and decimal format. If the file is not found**

<p>suitable error message should be displayed. (8)</p> <p><b>Answer:</b> Refer pages 366-367 of Text Book-I</p> <p>b. Write a C program to display the attributes of a file using DOS interrupt. If the file does not exist, display an error message on the screen. (8)</p> <p><b>Answer:</b> Refer pages 368-369 of Text Book-I</p> <p><b>Q.9 a.</b> Give the architecture and signal description of 80386 microprocessor. (8)</p> <p><b>Answer:</b> Refer article 10.2, pages 506 &amp; 507 of Text Book-II</p> <p>b. Compare and contrast the addressing modes of 80486 and 80586 microprocessor. (8)</p> <p><b>Answer:</b> Refer article 10.13.4, page 535 of Text Book-II Refer article 11.3.1, page 544 of Text Book-II</p>	
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#### TEXT BOOKS

1. Advanced Microprocessors & IBM-PC Assembly Language Programming, K. Udaya Kumar and B.S. Umashankar, TMH, 1996
2. Advanced Microprocessors and Peripherals, A.K. Ray and K.M. Burchandi, TMH, 2000