(14)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1674 **G**

Unique Paper Code : 2343012003

Name of the Paper : Microprocessors (DSE)

Name of the Course : **B.Sc. (Hons.) Computer Science (NEP)**

Semester : III

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The paper has two sections. All questions in **'Section A'** are compulsory.
3. Attempt any **four** questions from **'Section B'**.
4. Parts of a question must be answered together.

Section A

1. (a) In the real mode, show the starting and ending addresses of each segment located by the following segment register values :

P.T.O.

(i) 1000H

(ii) 1234H

(b) What is a displacement? How does it determi the memory address in a MOV DS:[2000H], A instruction?

(c) Describe the operation of each of the followin instructions : (3

(i) PUSH AX

(ii) POP ESI

(d) If AX = 1001H and DX = 20FFH, list the sum and the contents of each flag register bit (C, A, S, Z, and O) after the ADD AX, DX instruction executes. (3)

(e) Differentiate between the operation of a JMP DI with a JMP [DI]. (3)

(f) Which microprocessor pins are used to request and acknowledge a DMA transfer? (3)

(g) Describe the operation of the INTO instruction. (3)

(h) How is the interrupt request pin (INTR) enabled in the strobed input mode of operation of the 82C55? (3)

(i) Evaluate the address lines and data lines required to map 32K x 8 memory. (3)

(j) Explain the concept of memory banks in 8086 microprocessors. Which 8086 pin is used to enable even-bank memory? (3)

Section B

2. (a) Differentiate between the following instructions :

(i) DAA and AAA

(ii) MUL and IMUL (5)

(b) What is 8237 DMA controller? Discuss t three software commands used to control i operation.

(c) Give the functions of the following pins 8086 :

(i) NMI

(ii) READY

(iii) INTR

(iv) ALE

(v) TEST (5)

3. (a) What is the purpose of a segment register in the real mode operation of the microprocessor? Determine the memory location addressed by the following real mode 80286 register combinations:

(i) SS = 2300H and BP = 3200H

(ii) DS = A000H and BX = 1000H (5)

(b) Explain the following instructions : **(any two)**

(i) MOVS

(ii) LAHF

(iii) ROL (5)

(c) Differentiate between the architectures of Pentium and Pentium-pro microprocessor. (5)

4. (a) What are the steps followed whenever a software interrupt instruction executes? (5)

(b) Explain register indirect addressing mode with the help of an example. Also, explain the following instructions :

(i) MOV [BP], DL

(ii) MOV [DI], [BX] (5)

(c) Why is demultiplexing of buses required in 8086? How is demultiplexing done using ALE pin? Explain. (5)

P.T.O.

5. (a) Draw and explain the Read Bus Cycle for 8086, 8088 microprocessor. (5)

(b) Explain PUSH and POP operations with respect to Stack addressing mode. What values appear in SP and SS if the stack is addressed at memory location 02200H? (5)

(c) Describe any two Operation Command Words (OCW) for 8259A Programmable Interrupt Controller. (5)

6. (a) Select the correct instruction to perform each of the following tasks : (5)

(i) Shift DI right three places, with zeros moved into the leftmost bit

(ii) Rotate all the bits of AL left three places

(iii) OR DX with SI and save the result in SI

(iv) Subtract BX from CX

(v) XOR the data stored 30 words after the location addressed by BP with DI and save the result in DI

(b) List the different pins in Minimum mode and Maximum mode operation of 8086/8088 microprocessors. (5)

(c) Draw a descriptor that describes a memory segment that begins at location 03000000H and ends at location 05FFFFFFH. This memory segment is a data segment that grows upward in the memory system and can be written. The descriptor is for a Pentium 4 microprocessor. (5)

7. (a) Consider a memory device, 256K x 8 DRAM:

(i) Specify the number of data pins, address pins, selection pins and control pins of the given memory device.

(ii) Explain diagrammatically how address pins are demultiplexed in the given memory device? (5)

P.T.O.

(b) List and explain any three conditional jump instructions which follow the comparison of unsigned numbers. (5)

(c) What is the purpose of the Direction Flag? Write arithmetic instructions to set and reset this flag. (5)