Unique Paper Code: 32347504

Name of the Course: BSc(H) Computer Science
Name of the Paper: Microprocessors
Semester: V
Duration:3 Hours
Maximum Marks:75
Attempt any four out of six questions. All questions carry equal marks.

Q1. Differentiate between real mode and protected mode memory addressing. Describe the role of descriptor in protected mode memory addressing. What do you mean by program invisible registers? Discuss the role of program invisible registers. Determine the memory location addressed by the following real mode 80286 register combinations:

- DS = 1000H and DI = 2000H
- DS = 2000H and SI = 1002H
- SS = 2300H and BP = 3200H
- DS = A000H and BX = 1000H
- SS = 2900H and SP = 3A00H

Q2. What is Base-indexed addressing mode? How is base-indexed addressing mode used for accessing arrays? Give an example.
Give the machine equivalent of the following assembly language instruction:

- MOV AX, BX
- MOV [BX+100], CX

Assume opcode of MOV is 100010.
What is the difference between an intersegment and intra-segment jump?
Suppose that SS = 1000H, DS = 0200H, BX = 0300H, and DI = 400H. Determine the memory address accessed by each of the following instructions, assuming real mode operation:

- MOV AL, [1234H]
- MOV EAX, [BX]
- MOV [DI], AL

Q3. Give the role of direction flag in string instructions. With an example show the usage of LODS and STOS to transfer a block of memory from one area to another in the memory. What is REP prefix? How REP prefix is used? Give the function of following instructions:

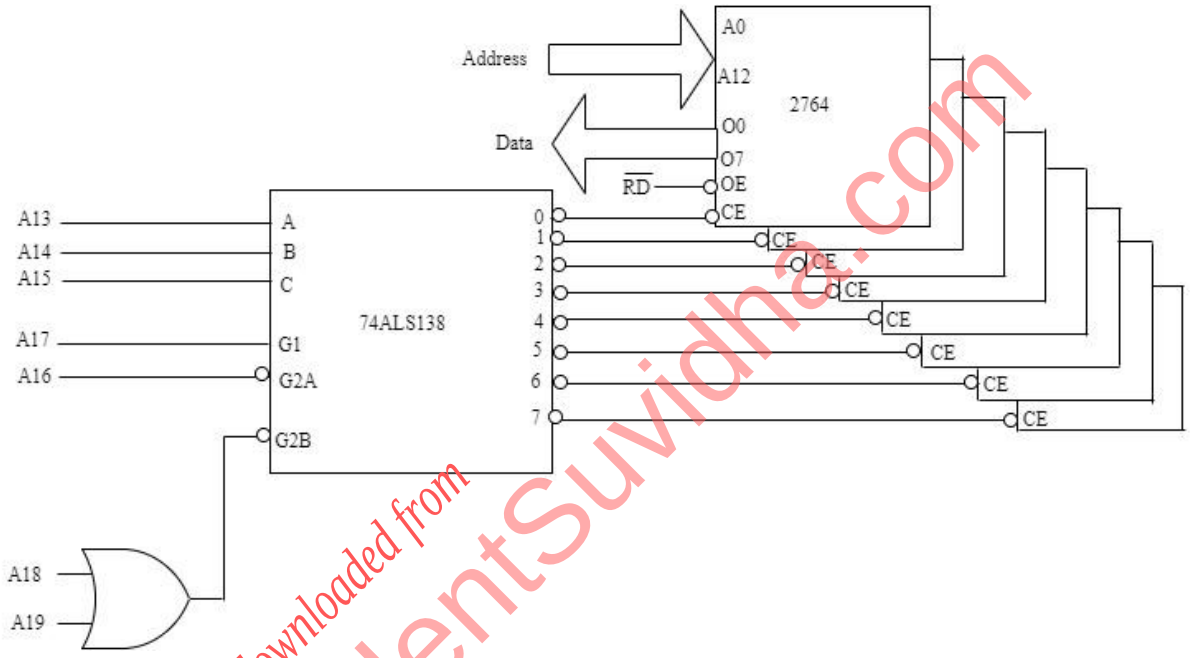
- DAA
- AAM
- AAD
- TEST
- NEG

Q4. Which flag conditions are tested for the following conditional JMP instructions?

- JG
- JA
- JBE
- JLE
- JAE

Give an example of implementation of loop using JCXZ instruction? Differentiate LOOP, LOOPE and LOOPNE instructions. Why is memory address decoding required?

Given the following circuit that uses eight 2764 EPROMS for a 64k*8 section of memory in an 8088-microprocessor based system. Calculate the address range of whole decoder and the address range of output 0 and 4 of decoder.



Q5. List the differences between 8086 and 8088 microprocessors. What mode operation of 8086/8088 is selected when pin MN/$\overline{MX}$ is grounded? Which pins of 8086/8088 are used for DMA request and acknowledge. What happens in 8086/8088 when $\overline{TEST}$ input is at logic 1? Draw and explain the read-write bus cycle for 8086/8088 microprocessor. Explain the mode 1 operation of 82C55 Programmable Peripheral Interface.

Q6. Explain the command registers of 8237 DMA Controller. What is the role of base address and base word count registers of DMA controller? What are three software commands in DMA controller? How DMA controller can be used to copy a memory block to another memory block? Write the main features of Pentium Pro architecture.