Lecture 3 Memory Addressing and Partition

1. Deduce the size of the address bus if the total size of the memory is 4 MB
2. Determine the total memory size if the address bus size is 21 bits.
3. Explain the difference between logical and physical addresses.
4. What are segment registers, and what role do they play in memory addressing?
5. Define overlapping and non-overlapping segments with examples.
6. What are the advantages of memory segmentation in 8086?
7. Describe the purpose and operation of the segment registers in the 8086 architecture. How are they different from general-purpose registers?
8. A system using the 8086 microprocessor has a program loaded into memory at segment address A4FB. If an instruction references an offset 4872H, what is the physical address?
9. If a segment starts at address 20000H and another starts at 20100H, are they overlapping? Justify your answer.
10. Given Segment number = 1111H and Offset = 1332H, calculate the physical address.
11. If the physical address is 33330H and the offset is 0020H, determine the segment number.
12. Convert the following physical addresses to their equivalent logical address (segment:offset) representation:
A9822H
38A41H
13. How many segments of 64KB can be allocated in the 1MB memory space of the 8086?
14. If the instruction pointer (IP) is 1234H and the code segment (CS) is 4321H, what is the resulting physical address?
15. Deduce the 5th largest and the 5th smallest possible segment numbers and logical addresses (segment: offset pair) for the given physical address: 32556h.
16. Deduce two different logical addresses (segment: offset pair) for 78F97h.