**The logical address space in a computer system consists of 128 segments. Each segment can have up to 32 pages of 4K words in each. Physical memory consists of 4K blocks of 4K words in each. Formulate the logical and physical address formats**

ANSWER:

Logical address space has 128 segments x 32 pages x 4K words:  
128 x 32 x 4 x 2^10 = 2^7 x 2^5 x 2^2 x 2^10 = 2^24  
so we need 24 bits.  
  
Physical memory has address space of 4K blocks x 4K words:  
4 x 2^10 x 4 x 2^10 = 2^2 x 2^10 x 2^2 x 2^10 = 2^24  
so we need 24 bits.  
  
Size of the two address spaces is the same.  
  
Address format for logical address space would be:  
segment addressing: 7 bits  
page addressing: 5 bits  
word addressing: 12 bits  
  
segment - page - word  
23...17 - 16...12 - 11...0  
  
Address format for physical address space would be:  
block addressing: 12 bits  
word addressing: 12 bits  
  
block - word  
23...12 - 11...0

page size = 1 KB = 1024 B

Page number 🡨--🡪Offset

3085/1024 = 33085 mod 1024 = 1342095/1024 = 4142095 mod 1024 = 111215201/1024 = 210215201 mod 1024 =161650000/1024 =634650000 mod 1024 =7842000001/1024 = 19532000001 mod 1024 = 129