

AOS Quiz#1

All questions carry equal marks. Total marks -15

Q#1-Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames.

- a. How many bits are there in the logical address?
- b. How many bits are there in the physical address?

Answer:

- a. Logical address: 13 bits
- b. Physical address: 15 bits

Q#2-What is the effect of allowing two entries in a page table to point to the same page frame in memory? Explain how this effect could be used to decrease the amount of time needed to copy a large amount of memory from one place to another. What effect would updating some byte on the one page have on the other page?

Answer: By allowing two entries in a page table to point to the same page frame in memory, users can share code and data. If the code is reentrant, much memory space can be saved through the shared use of large programs such as text editors, compilers, and database systems. "Copying" large amounts of memory could be effected by having different page tables point to the same memory location. However, sharing of non-reentrant code or data means that any user having access to the code can modify it and these modifications would be reflected in the other user's "copy."

Q#3-Consider a system in which a program can be separated into two parts: code and data. The CPU knows whether it wants an instruction (instruction fetch) or data (data fetch or store). Therefore, two base–limit register pairs are provided: one for instructions and one for data. The instruction base–limit register pair is automatically read-only, so programs can be shared among different users. Discuss the advantages and disadvantages of this scheme.

Answer: The major advantage of this scheme is that it is an effective mechanism for code and data sharing. For example, only one copy of an editor or a compiler needs to be kept in memory, and this code can be shared by all processes needing access to the editor or compiler code. Another advantage is protection of code against erroneous modification. The only disadvantage is that the code and data must be separated, which is usually adhered to in a compiler-generated code.