

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. 10%

- (a) Please describe the design idea of the loadable kernel modules.
- (b) What are the advantages of using loadable kernel modules?

2. 10%

If a system does not employ either a deadlock-prevention or a deadlock-avoidance algorithm, then a deadlock situation may occur. Please describe the algorithm used to examine the state of the system to determine whether a deadlock has occurred.

3. 15%

Paging is a memory management scheme that is used in most operating systems.

- (a) Please describe the basic method to implement paging.
- (b) Please describe the paging hardware with translation look-aside buffer (TLB).

4. 15%

Figure 1 shows the procedure of the traditional network stack. Please describe the packet receive mechanism.

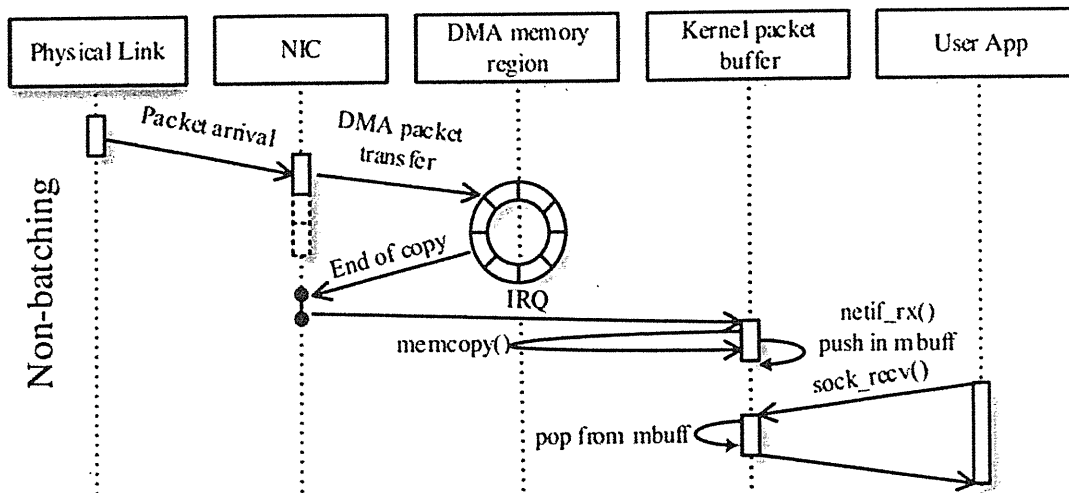


Figure 1. Working mechanism of traditional network stack

5. Show the example of an instruction that performs an “indirect jump,” what is indirect jump? 10%
6. Show the memory system signal and bus connection that uses 32K x 8 SRAM modules for the following system: 32-bit address, 32-bit data, total 1MB in memory size. The entire memory is allocated at the highest 1MB segment of the memory space. 15%.
7. Briefly explain the MESI protocol. 10%
8. Explain the following terminology. 15%, Each 5%.
 - (a) Out-of-Order (OOO) execution
 - (b) SIMT GPU
 - (c) MIMD multi-core