**System Protection**

1. In a ring-protection system, level 0 has the greatest access to objects, and level n (where n > 0) has fewer access rights. The access rights of a program at a particular level in the ring structure are considered a set of capabilities. What is the relationship between the capabilities ofa domain at level j and a domain at level i to an object (for j >i)?
2. What protection problems may arise if a shared stack is used forparameter passing?
3. If all the access rights to an object are deleted, the object can no longerbe accessed. At this point, the object should also be deleted, and thespace it occupies should be returned to the system. Suggest an efficientimplementation of this scheme.
4. Why is it difficult to protect a system in which users are allowed to dotheir own I/O?
5. Consider a computing environment where a process is given the privilege of accessing an object only n times. Suggest a scheme for implementing this policy.
6. Discuss the strengths and weaknesses of implementing an access matrix using access lists that are associated with objects.
7. Discuss the strengths and weaknesses of implementing an access matrix using capabilities that are associated with domains.
8. Explain the **need-to-know** principle in the context of system protection requirement. How does it differ from principle of least privilege?

**System Security**

1. What are the four levels where security measures must be taken?
2. What is the most common technique for security attacks?
3. Provide examples of at least three program threats.
4. Provide examples of at least two system and network threats.
5. Buffer-overflow attacks can be avoided by adopting a better programmingmethodology or by using special hardware support. Discuss thesesolutions.
6. Make a list of six security concerns for a bank’s computer system. Foreach item on your list, state whether this concern relates to physical,human, or operating-system security.
7. What is a distributed denial-of-service attack and how does it work?

**Case Study on Windows**

1. List the design goals ofWindows. Describe two in detail.
2. How doesWindows allocate user memory?
3. Describe the management scheme of the virtual memorymanager.Howdoes the VM manager improve performance?
4. Describe the three main architectural layers of theWindows kernel.