## Homework Assignment #3 (100 points)

1. When files are deleted in an operating system the space is typically returned to the free list but

the blocks are not erased. Describe how a system can be designed so that the data is not

recoverable. (15 points)

A. The operating system(s) can implement a wrapper around the whole deleting process wherein, when the user deletes a file from the system, they are marked for deletion by operating system in an async manner. The user will be displayed that the file was deleted (which is the usual way), but behind the scenes, the async operation will make sure that some random garbage data (or logical operation values) is written on the marked space. This could take a little performance hit but it will grant the ability of unrecoverable blocks of memory from the disk.

2. What is the difference between a virus and a worm? How does each reproduce? (25 points)

A.

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| --- | --- |
| Virus | Worm |
| It is a malicious program that usually attaches itself with another legitimate program to perform its tasks. | A malicious program that can replicate itself over a network. |
| They are usually designed to modify or report information to the person who wrote the program. | They are designed to waste the system resources. |
| They can’t be controlled remotely | They are controlled remotely |
|  |  |
|  |  |

3. Name three different protection mechanisms we discussed (5 points). For each of the following

protection problems tell which of these mechanisms can be used (5 points each)

a. Michael and John want to share some secret files

b. Susan wants some of her files to be public

c. Dennis wants his files readable by everyone except his roommate

A.

4. List 5 different pathnames to the file /etc/shadow (5 points)

A.

5. The Windows file system provides a command called REN (rename). What is the difference

between this and copying the file with a new name and then deleting the old one? (15 points)

A.

6. Describe two differences between file access control lists and file permissions. (5 points) Which

are more flexible? (5 points)

A.

7. List three attacks against systems protected using full-volume encryption (10 points)

A.