A

I. Study this extract from a virus information database. Then make a flowchart to show each step in the method of infection for this virus. Step 1 and 2 are done for you.

Step 1	An infected .EXE file arrives as an email attachment.
Step 2	The infected .EXE file is opened.

Virus name	W32/Magistr.@MM
Risk assessment	Medium
Date discovered	17/12/19
Origin	Sweden
Length	Varies, adds at least 24KB
Type virus	Sub-type worm

Method of infection

This is a combination of a files infector virus and an email worm.

The virus arrives as an .EXE file with varying filenames. When you execute the attachment, your machine is infected and in turn is used to spread the virus.

When first run, the virus may copy one .EXE file in the Windows or Windows System directory using the same name but with the final character of the filename decreased by a factor of 1. For example, EHGEDI57.EXE will become EHGEDI56.EXE, TCONTRACT.EXE will become TCONTRACS.EXE.

This copy is then infected and a WIN.INI entry, or registry run key value may be created, to execute the infected file when the system starts up.

This copied executable infects other 32 bit .EXE files in the Windows directory and subdirectories, when run.

Five minutes after the file is opened, the email worm attempts a mailing routine. It creates a .DAT file hidden somewhere on the hard disk. This contains strings of the files used to grab email addresses from address books and mailboxes. The .DAT file name will be named after the machine name in a coded fashion. For example, y becomes a, x becomes b. Numbers are not changed. The worm uses mass mailing techniques to send itself to these addresses. The subject headings, text and attachments will vary. The text is taken from other files on the victim's computer.

This worm may also alter the REPLY-TO email address when mailing itself to others. One letter of the address will be changed. This makes it difficult to warn the victim that their machine is infecting others as the message will be returned to sender.

B

THE ANATOMY OF A VIRUS

A biological virus is a very small, simple organism that infects living cells, known as the host, by attaching itself to them and using them to reproduce itself. This often causes harm to the host cells.

Similarly, a computer virus is a very small program routine that infects a computer system and uses its resources to reproduce itself. It often does this by patching the operating system to enable it to detect program files, such as COM or EXE files. It then copies itself into those files. This sometimes causes harm to the host computer system.

When the user runs an infected program, it is loaded into memory carrying the virus. The virus uses a common programming technique to stay resident in memory. It can then use a reproduction routine to infect other programs. This process continues until the computer is switched off.

The virus may also contain a payload that remains dormant until a trigger event activates it, such as the user pressing a particular key. The payload can have a variety of forms. It might do something relatively harmless such as displaying a message on the monitor screen or it might do something more destructive such as deleting files on the hard disk.

When it infects a file, the virus replaces the first instruction in the host program with a command that changes the normal execution sequence. This type of command is known as a JUMP command and causes the virus instructions to be executed before the host program. The virus then returns control to the host program which then continues with its normal sequence of instructions and is executed in the normal way.

To be a virus, a program only needs to have a reproduction routine that enables it to infect other programs. Viruses can, however, have four main parts. A misdirection routine that enables it to hide itself; a reproduction routine that allows it to copy itself to other programs; a trigger that causes the payload to be activated at a particular time or when a particular event takes place; and a payload that may be a fairly harmless joke or may be very destructive. A program that has a payload but does not have a reproduction routine is known as a Trojan.

I. Read the text to find answers to these questions.

1. How are computer viruses like biological viruses?
2. What is the effect of a virus patching the operating system?
3. Why are some viruses designed to be loaded into memory
4. What examples of payload does the writer provide?
5. What kind of programs do viruses often attach to?
6. Describe function of each virus routine.
    a) misdirection
    b) reproduction
    c) trigger
    d) payload