

Mr. N. Nolfi

Victim:

Mr. Solution Well done Mr. S.!!

KU	APP	TIPS	COM
11/11	13/13	8/8	14/14

A. Questions 1 to 5 are of "multiple choice" type. Circle the *best answer* for each question.

1. Binary data are stored on a CD-ROM (1 KU)

- (a) in very thin permanent ink (the 0s and 1s can be seen using a high power microscope).
- (b) optically, with the data arranged in one continuous spiral.
- (c) optically, with the data arranged in concentric tracks, each of which is subdivided into sectors.
- (d) magnetically, with the data arranged in one continuous spiral.
- (e) magnetically, with the data arranged in concentric tracks, each of which is subdivided into sectors.



"Being a computer game champion three years running is impressive. But it's not quite the computer experience we're looking for."

2. The best defence against hackers and malware is (1 KU)

- (a) the use of safe computing practices.
- (b) the use of anti-virus software.
- (c) the use of anti-spyware software.
- (d) the use of firewall software.
- (e) to install the latest updates for all software, especially for security software and the operating system.
- (f) to do all of the above.
- (g) to do none of the above.
- (h) to trust Microsoft and Bill Gates to protect your computer.



Yes, yes, keep staring at the Windows logo. It's all part of my plan to rule the world!!
MUHAHAHAHAHAHA!



3. A DVD-ROM-18 (dual layer, both sides) can store 15.9 GB of data. How many 1.44 MB floppy diskettes would you need to store the same amount of information? (Use the *binary* meaning of "kilo" for both values.) (1 KU, 4 APP)

- (a) 11306.66667
- (b) 11041.66667
- (c) 0.09057
- (d) 11041
- (e) 110306
- (f) 11042
- (g) 11307
- (h) 286.2
- (i) 11.04
- (j) 12.5
- (k) 14
- (l) 11

Show your calculations for question 3 in this space.

$$15.9 \text{ GB} = 15.9 (1024) \text{ MB} = 16281.6 \text{ MB}$$

$$\# \text{floppies} = \frac{16281.6 \text{ MB}}{1.44 \text{ MB/floppy}} \div 11306.7$$

Round up to nearest whole number because the number of floppies must be whole

4. Using a dial-up Internet connection operating at maximum speed (56.6 kbps), how long would it take to download a 0.5 GB file? (Use the *decimal* meaning of "kilo" for the transfer rate, i.e., 56.6 kbps = 56600 bps and the *binary* meaning of "kilo" for the file size.) (1 KU, 4 APP)

- (a) 28300 minutes
- (b) 28300 hours
- (c) 21 h, 4 min, 7 s
- (d) 21 h, 4 min, 43 s
- (e) 21 h, 7 min, 8 s
- (f) 75883 minutes
- (g) 75883 hours
- (h) until he __ freezes over

Show your calculations for question 4 in this space.

$$56.6 \text{ kbps} = 56600 \text{ bps} = 56600 \div 8 \text{ B/s} = 7075 \text{ B/s}$$

$$0.5 \text{ GB} = 0.5 (1024) (1024) (1024) \text{ B} = 536870912 \text{ B}$$

$$\text{time} = \frac{536870912 \text{ B}}{7075 \text{ B/s}} \div 75883 \text{ s}$$

$$75883 \div 3600 \div 21.0786 \text{ h}$$

$$0.0768 \text{ h} = 0.0768 \text{ h} (60) \text{ min} \div 4.6 \text{ min}$$

5. A computer needs to have both RAM (primary storage) and a hard drive (secondary storage) because (1 KU)
- (a) like people, computers can get forgetful as they age. Having two types of memory helps to avoid memory loss.
 - (b) RAM stores more important (primary) data while the hard drive stores less important (secondary) information.
 - (c) the hard drive is used to back up important data.
 - (d) RAM is a very fast type of memory that stores open programs and documents. It has a relatively small storage capacity and cannot store information unless the computer's power is turned on. The hard drive is a relatively slow storage device that is used for the long term storage of large amounts of data. The RAM is needed for its speed and the hard drive is needed for its ability to store large amounts of data even if the computer's power is turned off.
 - (e) the hard drive is a very fast type of storage that stores open programs and documents. It has a relatively small storage capacity and cannot store information unless the computer's power is turned on. The RAM is a relatively slow storage device that is used for the long term storage of large amounts of data. The hard drive is needed for its speed and the RAM is needed for its ability to store large amounts of data even if the computer's power is turned off.
 - (f) RAM is used for information that is difficult to remember. That is, the information needs to "rammed" into the computer to prevent it from being forgotten. On the other hand, a hard drive is used to store information that is easier to remember but hard to drive into the RAM.
 - (g) of all of the above.

B. The remaining questions require written responses.

6. What is an operating system? Why does your computer need to have one? (3 KU, 3 COM)

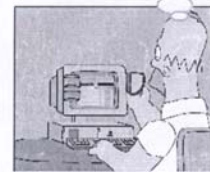
An operating system is a "master control program" that

- (a) provides an interface for a computer to communicate with the computer
- (b) manages hardware (i.e. various devices of the computer system)
- (c) manages file systems
- (d) provides support for application software.

Without an operating system, it would be virtually impossible to operate a computer.

7. At the right is a picture showing Homer wondering whether the Internet is *installed* on the computer. Explain why such a thought reveals that Homer knows very little about the Internet. (3 TIPS, 3 COM)

Gee, I wonder if the Internet is installed on this computer.



The Internet is NOT a program that can be installed on a computer.

It is a global computer network to which a computer can be connected. Homer should be wondering whether the computer has an Internet connection, not whether the Internet is installed.

8. Homer is having difficulties organizing his collection of *nine hundred and twenty-five 700 MB CD-R disks*. In a rare moment of brilliance, he decides to solve this problem by backing up all the CDs to his computer's hard drive. Unfortunately, he discovers that his hard drive is far too small so he decides to purchase a new one. Given Homer's extremely limited mathematical skills, he offers to give you a dozen doughnuts in exchange for your computer and mathematical expertise. What storage capacity would you suggest for Homer's new hard drive? (Keep in mind that the drive must store all his software, his collection of CDs and all his other documents.)

Note: Recall that for storage capacities, we should use the binary meaning of "kilo," which is 1024.
(5 APP, 2 TIPS, 5 COM)

Solution:

List the given information first.

Number of CDs 925

Storage Capacity of each CD 700 MB

Calculate the total storage capacity of all of Homer's CDs next.

$$\begin{aligned}\text{Total storage capacity} \\ &= 925(700) \text{ MB} \\ &= 647500 \text{ MB}\end{aligned}$$

Then, convert your answer to GB.

$$\begin{aligned}647500 \text{ MB} &= 647500 \div 1024 \text{ GB} \\ &\approx 632.3 \text{ GB}\end{aligned}$$

Finally, state your conclusion.

I would suggest that Homer buy a hard drive with a storage capacity of at least 1 TB. This would allow him to store all his CDs and have plenty of room left over for other purposes.

9. Why is a modem required for Internet connections such as dial-up, ADSL or cable? Would a modem still be necessary for a purely digital network? Explain. (3 TIPS, 3 COM)

ADSL, dial-up and cable connections provide access to the Internet by making use of the existing telephone and cable TV infrastructure. Since telephone and cable TV service existed long before the age of purely digital networks, they can only be used to transmit and receive data in analog form. The purpose of a modem, which stands for "modulator demodulator" is to convert between digital and analog forms to make it possible for digital information to be carried over analog lines. A purely digital network would not require a mode as there would be no need for digital-analog conversion.

10. Sketch a diagram showing (3 KU, 3 COM)

- (a) The devices that you would need for a simple home network. Assume that a single DSL or cable Internet connection is shared among all the computers connected to the network. (Label the devices!)
- (b) How the devices are interconnected.

