Adventist Youth Honors Answer Book/Vocational/ Computer

General Conference

Skill Level 1

Year of Introduction: 1986

1. Write 200 words or give a three-minute oral report about the history of computers.

1936 The first programmable computer is the Z1 originally created by Germany's Konrad Zuse in his parent’s living room in 1936 to 1938 is considered to be the first electrical binary programmable computer. The first digital computer, the ABC started being developed by Professor John Vincent Atanasoff and graduate student Cliff Berry in 1937.

1943 Then followed the ENIAC, then the EDSAC as the first stored program electronic computer. 1954 Toshiba introduces its first computer, the TAC digital computer.

1958 NEC builds its first computer, the NEAC 1101

1960 Digital Equipment Corporation released its first of many PDP computers, the PDP-1

1966 Hewlett Packard released its first general computer, the HP - 2115

1974 XEROX ALTO is considered to be the first workstation.

1975 Ed Roberts coined the term personal computer when he introduced the Altair 8800, although the first personal computer is considered to be the Kenback-1.

1981 IBM introduced the IBM PC.

1983 Compaq released its first computer and the first 100% IBM compatible computer, the Compaq Portable

1984 IBM PCD later released the IBM portable.

1985 Dell introduced its first computer, the Turbo PC

1994 IBM introduces the IBM thinkPad 775CD, the first notebook with an integrated CD- ROM. The World Wide Web Consortium (W3C) was founded.

1995 Java is introduced.

1998 Google is founded

2001 Windows XP & Mac OS X are released. Palm, Inc. introduced the Kyocera 6035, the first smartphone in the United States.

2010 iPad is released (first commercially successful tablet computer).

2. Define the following terms

Hardware

Hardware is any physical portion of a computing device, such as memory, motherboard etc

Software

Software is a term describing a set of instructions that control the operation of a computer. Software can be easily changed and updated. Once it has been created, it can be reproduced very cheaply. This is because software is not something that can be touched or held in a person's hand. The media on which the software is written can be touched, but the media does not generally look any different after the software is written to it. Software can be stored on many types of media, and can in fact be distributed without the use of a storage medium (other than its final storage destination on a computer's hard drive).

Floppy Disk

A floppy disk is a removable storage media for computers. It consists of a plastic disk coated with a magnetic material encased in a plastic sheath. Data can be stored on them by changing the magnetic properties of very tiny areas on the disk. The data can be read back by detecting these magnetic fields. Floppy disks are no longer in widespread use, having been replaced by writable CD Roms, flash drives, and computer networks. In their heyday, they were used for distributing software, exchanging data between computers, data storage, and for data archival.

Hard Drive

A hard drive is a nonvolatile data storage device. It works by the same principals as a floppy disc, except that it is much faster, has much greater storage capacity, and is usually not removable from the computer. Most hard drives consist of several aluminum platters stacked on a spindle. The platters (or disks) are coated with a material whose magnetic properties are easily detected (for reading) and changed (for writing). The computer's operating system is usually stored on the hard drive as are most of the other programs the computer runs. Data stored on a hard drive will not be destroyed if the computer is turned off.

Mainframe

A mainframe is a large, powerful computer shared by many users. It is generally located someplace in a building separate from where its users are. The users of a mainframe connect to it through a terminal consisting of a keyboard and a monitor. A mainframe can be connected to many terminals – and therefore - many users at a time. The terminals are connected to the mainframe by a network. Some terminals are also equipped with a mouse and speakers. Full access to a mainframe is usually reserved for the system administrator who is responsible for installing software, performing maintenance, and creating user accounts. Regular mainframe users generally do not have privileges to install new software or alter files belonging to other users.

Desktop Computer

A desktop computer is a small computer system that is dedicated to a small number of users. This type of computer is often found in homes and offices and is capable of running stand-alone (that is, in the absence of another computer such as a mainframe). Desktop computers do not take up a lot of space, but they are not easy to move from one location to another (like a laptop).

Laptop Computer

A laptop computer is a small, portable computer. They are generally not as powerful as desktop computers selling for the same amount. Laptops come in a "clamshell" design, such that the video display can be folded down over the keyboard when the computer is not in use, or when it is transported. The circuitry is located beneath the keyboard. Laptops are designed to maximize battery life and minimize size and weight.

ROM

ROM is an acronym that stands for Read Only Memory. This is a form of computer memory whose contents cannot be altered except when it is manufactured. It is typically used to store a computer's boot program. The boot program is the first program to execute when a computer is turned on, and it typically loads an operating system into main (writable) memory from some other storage media (such as a harddrive, cd rom drive, or network).

RAM

Different RAM types. From top to

bottom: DIP, SIPP, SIMM 30 pin, SIMM

72 pin, DIMM (168-pin), DDR DIMM

(184-pin).

RAM is an acronym that stands for Random Access Memory. "Random access" means that the contents of the memory can be accessed in any random order. The term was originally coined to differentiate it from serial memory (such as data stored on a magnetic tape). The contents of a serial memory could only be accessed sequentially. RAM is a volatile memory, which means that when the power is turned off, the information stored there is lost. RAM can be accessed very quickly by the computer. Its contents can be both read and written. Most programs on a computer are loaded into and executed from RAM. RAM is also used as "scratch space" where the computer stores the results of calculations.

Alphanumeric

The set of all letters and numbers. An alphanumeric value is any string made up of only letters and numbers. For instance, "a12bgj", "1234", and "ABCD" are all alphanumeric, whereas "aB$4" is not (it contains the '$' symbol which is neither a letter nor a number).

CPU

CPU is an acronym that stands for "Central Processing Unit." This is the "brain" behind a computer, and is where all the arithmetic, logic, and program flow is performed.

Circuit Board

A circuit board is a stiff sheet of material upon which various components of a circuit are soldered. It supplies the connections between the components as well as a platform on which they are mounted.

Cursor

The cursor is a visual indicator on a computer display. It shows where on the display the next keyboard entry will be made. In a graphical system, the cursor may be moved around the screen with a mouse. In a text system, the cursor may be moved around using the arrow keys on the keyboard.

Port

A port is an external connection on a computer. It provides a connection to an external device such as a mouse, keyboard, printer, external modem, camera, or other device.

Program

A program is a series of computer instructions that when executed performs a predetermined task.

DOS or OS

OS stands for "Operating System" and DOS stands for "Disk Operating System." An operating system is a program that coordinates the rest of the computer. It allows other programs to run and generally provides an easy mechanism for other programs to access various hardware devices on the computer. A Disk operating system is an operating system that is loaded from a harddrive or floppy drive.

CD Rom

A CD Rom is a type of computer storage medium. "CD ROM" stands for "Compact Disc, Read Only Memory". These devices were originally developed for storing music, but were pressed into service for storing all kinds of computer data after their initial introduction. A typical CD Rom can store approximately 650 megabytes of data. The data on a CD Rom is read from the disc by a laser beam in a CD Rom drive.

3. What are the proper handling and storage techniques for disks?

Disks should be stored away from devices create magnetic fields such as speakers and video monitors. They should be kept free from dust and moisture, and should not be bent or folded. Care should be taken to not scratch compact discs.

4. Describe the function of and point out the following components of a personal computer

Keyboard

A computer keyboard is a peripheral modeled after the typewriter keyboard. Keyboards are designed for the input of text and characters, and also to control the operation of the computer. Physically, computer keyboards are an arrangement of rectangular or near- rectangular buttons, or "keys". Keyboards typically have characters engraved or printed on the keys; in most cases, each press of a key corresponds to a single written symbol. However, to produce some symbols requires pressing and holding several keys simultaneously, or in sequence; other keys do not produce any symbol, but instead affect the operation of the computer, or the keyboard itself. Roughly 50% of all keyboard keys produce letters, numbers or signs (characters). Other keys can produce actions when pressed, and other actions are available by simultaneously pressing more than one action key.

Monitor

A computer display, monitor or screen is a computer peripheral device capable of showing still or moving images generated by a computer.

System Unit or Central Processing Unit

The system unit is the part of a computer that contains the microprocessor, memory, and hard rive. It is the "main" component of a desktop computer system or a mainframe. All other devices (such as the monitor, keyboard, mouse, printer, etc.) plug into it. It is sometimes also called the "Central Processing Unit," although that term is also used to describe the microprocessor.

Printer

A computer printer is a device which records computer output to paper. Printers come in

many forms as described in a later section.

Disk Drive

A disk drive is a device which stores data onto a platter (the disc) which has been coated with a magnetically sensitive material. Data on a disk drive can be stored for long periods of time even when the device is powered off. There are two types of disk drives: hard drives and floppy drives.

5. Know the difference between and uses for the following printers:

Letter Quality

A letter-quality printer was a form of computer impact printer that was able to print with the quality typically expected from a business typewriter such as an IBM Selectric. Over time, several different technologies were used including automating ordinary typebar typewriter mechanisms (such as the Friden Flexowriter), automating IBM Selectric mechanisms (such as the IBM 2741 terminal), and, finally, the daisy wheel printer. The Selectric-based and daisy wheel printers offered the additional advantage that the typeface was readily changeable by the userto accommodate varying needs. Because of its low cost, the daisy wheel printer became the most successful of the three types. Most letter quality printers were available either as complete computer terminals with keyboards or as print-only devices. Nowadays, printers using non-impact printing (for example laser printers, inkjet printers, and other similar means) have replaced traditional letter-quality printers in most applications.

Dot Matrix

A dot matrix printer or impact matrix printer refers to a type of computer printer with a print head that runs back and forth on the page and prints by impact, striking an ink- soaked cloth ribbon against the paper, much like a typewriter. Unlike a typewriter or daisy wheel printer, letters are drawn out of a dot matrix, and thus, varied fonts and arbitrary graphics can be produced. Because the printing involves mechanical pressure, these printers can create carbon copies and carbonless copies. Each dot is produced by a tiny metal rod, also called a "wire" or "pin", which uses the power of a tiny electromagnet or solenoid to drive it forward, either directly or through small levers. In the 1970s and 1980s, dot matrix impact printers were generally considered the best combination of expense and versatility, and until the 1990s they were by far the most common form of printer used with personal computers.

Laser

A laser printer is a common type of computer printer that produces high quality printing, and is able to produce both text and graphics. An electric charge is first projected onto a revolving drum. The drum has a surface of a special plastic or garnet. Electronics drive a system that writes light onto the drum with a laser. The light causes the electrostatic charge to leak from the exposed parts of the drum. The surface of the drum passes through a bath of very fine particles of dry plastic powder, or toner. The charged parts of the drum electro statically attract the particles of powder. The drum then deposits the powder on a piece of paper. The paper passes through a fuser, which, with heat and pressure, bonds the plastic powder to the paper. Laser printers are the workhorse printer of the business world. They are capable of producing very high quality prints very cheaply. Although most laser printers only work in black and white, some models can also produce color prints. Because of their speed and economy, laser printers have largely replaced all other types of printers except ink jet and thermal printers.

Plotter

Plotters print their output by moving a pen across the surface of a piece of paper. This means that plotters are restricted to line art, rather than raster graphics as with other printers. They can draw complex line art, including text, but do so very slowly because of the mechanical movement of the pens. (Plotters are incapable of creating a solid region of color; but can hatch an area by drawing a number of close, regular lines.) Plotters are used primarily in technical drawing and CAD applications, where they have the advantage of working on very large paper sizes while maintaining high resolution. Another use has been found by replacing the pen with a cutter, and in this form plotters can be found in many garment and sign shops.

Ink Jet

Most current inkjets work by having a print cartridge with a series of tiny electrically- heated chambers. To produce an image, the printer runs a pulse of current through the heating elements. A steam explosion in the chamber forms a bubble, which propels a droplet of ink onto the paper (hence Canon's tradename for its inkjets, Bubblejet). When the bubble condenses, surplus ink is sucked back up from the printing surface. The ink's surface tension pumps another charge of ink into the chamber through a narrow channel attached to an ink reservoir. Compared to earlier consumer-oriented printers, ink jets have a number of advantages. They are quieter in operation than impact dot matrix or daisywheel printers. They can print finer, smoother details through higher print head resolution, and many ink jets with photorealistic-quality color printing are widely available. The disadvantages of inkjets include flimsy print heads (prone to clogging) and expensive ink cartridges (sometimes costing US$30 –$40 or more). This typically leads value-minded consumers to consider laser printers for medium-to-high volume printer applications.

A common business model for inkjet printers involves selling the actual printer at or even below production cost, while dramatically marking up the price of the (proprietary) ink cartridges.

Thermal

A thermal printer (or direct thermal printer) produces a printed image by selectively heating coated paper when the paper passes over the thermal print head. The coating turns black in the areas where it is heated, producing an image. Two-color direct thermal printers are capable of printing both black and an additional color (often red), by applying heat at two different temperatures. Thermal printers are often faster and quieter than dot matrix printers. They are also more economical than other types of printers since their only consumable is the paper itself. Possible applications of thermal printers include filling station pumps, information kiosks, and cash register systems. Thermal printers are useful anywhere low cost is more important than high quality.

6. Show or describe how to protect a computer system from dust, dirt, staticelectricity, power surges and outages, or other potentially dangerous factors that could hamper or hurt a computer system.

Dirt and Dust

One way to protect a computer from dust and dirt is to locate it in an area where there is little dust or no dirt at all. A computer should be elevated off the floor. It can be stored on a desk, or even on top of a block of wood - getting it even an inch or two off the floor will prevent it from accumulating much dust.

Static Electricity

Computer circuitry can be damaged by static electricity. One generally doesn't have to worry about that too much as long as the cover of the computer is on. However, when installing a new card in a PC, adding an internal hard drive, or performing any maintenance that requires one to remove the cover, care must be taken to discharge static electricity. This can best be done by wearing an anti-static wrist strap while handling components. One end of the strap is worn around the wrist, and the other is connected to the same electrical ground that the computer is connected to. However, not all computer users own an anti-static strap. In those cases, other precautions can be taken to avoid static discharge into the electronic components. One way this his can be done is by touching the metal frame of the computer before touching any of the sensitive electronic components inside.

When installing new components into a computer, the component should be left in its protective packaging until it is ready to be inserted into the computer. Touch the package first, then remove the component. If not wearing a wrist strap, touch the computer's frame next, and then install the component.

Power Surges and Outages

Computers should be protected from power surges by plugging them into a surge protector. These can be purchased at computer stores, office supply stores, or even hardware stores. A surge protector will not protect a computer from a power outage though. For that, an uninterruptible power supply (or UPS) can be used. An UPS is a device that will continue to supply electrical power to the computer for a short while after the power fails. Some UPS's can supply power for hours, while others can supply power for only a few minutes - long enough to shut the computer down to prevent loss of data. A good UPS can tell the computer when it has lost its primary source of power and instruct the computer to shut itself down when backup power is nearly spent.

Other Dangers

Be careful about eating or drinking around a computer. It is easy to drop food crumbs into a computer keyboard, and more than one computer has been destroyed by a spilled drink. Don't set a drink down next to a computer, or worse yet, on a shelf or desk above the computer. It is best to keep these things away from the computer, but if that cannot be avoided, they should be placed in a position such that a spill is unlikely to reach the computer.

Computers should be protected from other forms of liquid as well - if the roof begins to leak, unplug the computer and move it to a dry area.

Do not drop a computer. Some of the components are easily damaged by the shock, especially those components with moving parts such as disk drives. A sharp jolt to a computer may also dislodge components, bend connectors, or in severe cases, break solder joints.

Operate a computer in a cool environment. Excessive heat can damage a computer or cause it to lose stability. Programs can misbehave, and memories and other devices can fail in high temperature environments.

When transporting a computer, pack it appropriately. Laptops should be carried in special bags made for that purpose. Desktop systems should be boxed in their original packaging when possible. If transporting a monitor by car, place the screen against the back of the seat. The front of the screen is the heaviest side of the monitor, so placing it against the back of the seat will make it less likely to slide around, as well as protect the screen from other objects that might fly around (such as a keyboard!) during a sudden stop.

7. Name at least four input devices for computers

* Keyboard
* Mouse
* Digital Camera
* Scanner
* Microphone
* Network Interface Card
* Modem
* Flash Drive
* Floppy Drive
* CD Rom Drive
* Frame Grabber

8. What does it mean to backup a disk or a file? Why is it important?

Backing up a disk or a file means making another copy of it. Although computers are highly reliable machines, they are not perfect. Floppy discs can be lost or damaged. All hard drives will eventually fail. When this happens, it can be difficult, expensive, and even impossible to recover the data that was stored on them. For this reason, all important data should be backup up. This can be accomplished by copying it to another computer, burning the data onto a CD Rom, copying it to a floppy drive, a second hard drive, or a flash drive. In some cases, a file can be backed up by emailing it to oneself so that the data is stored on an email server, although in this case, care must be taken that the data really is stored on a different computer.

9. What is computer preventative maintenance? Why is it important?

Guard Against Malicious Software

There are many things a computer user can do to keep the computer running smoothly. The most important is to prevent the computer from getting infected with a virus, a worm, or spyware. Many places on the internet will entice the user to download malicious software, so computer users should be especially careful. An infected computer system can get so bogged down with junk programs that it is virtually inoperable. Sometimes the only way to "cure" it is by performing a complete reinstall of all the programs and the operating system. Anti-virus and firewall software can be an effective means to protect a computer from malicious software.

Security Updates

Software vendors often issue security updates to the software they provide. Often, a vulnerability in a program is discovered, and the software vendor fixes the problem an issues an update. These updates should be applied as soon as possible (or better - automatically) because there are other people in the world who are watching for these updates with evil intent. As soon as the security update is announced, these individuals will attempt to develop a program to exploit the vulnerability. These programs, once they have breached a computer, usually put the computer to work looking for other vulnerable computers, and thus, the infection spreads. Do not believe that because you are an anonymous person, your computer will not be affected. These programs do not care who you are - they are only concerned that your computer is vulnerable. Sometimes these programs only attempt to spread themselves around. Other times, they can install themselves invisibly, log the user's keystrokes, and forward them to the author of the malicious program. In these cases, the program is looking for sensitive information about you : bank account numbers, social security numbers, etc. Keep your computer software secured and up to date!

Defragment the Hard Drive

Another thing a computer user can do to tune the computer's performance is to defragment the hard drive. This operation puts all the data from each file sequentially on the hard drive, so it can be accessed more quickly. A computer can store data from single file in locations physically scattered all over the drive. The data is still presented to the computer as if it were stored sequentially – it just takes it a lot longer to collect all that information.

Dust Bunnies Inside

A computer should be dusted any time it is opened. Dust can be blown out using a can of compressed air. Care should be taken when this operation is performed - the dust can easily fly back into the maintainers face and get into the eyes. Be careful that all fans are operating properly after they are cleaned. Cooling fans often fail immediately after they are cleaned. One should also check under the cooling fan to make sure the fins of the heat sink are clean. If the heat sink is plugged up with dirt and grime the processor will overheat.

10. Successfully boot, load (install), and use a prepared software program for use in a computer system. (No computer games.)

There are many programs that can be used to meet this requirement. Some programs can be purchased at a store, and others can be downloaded for free (legally!) from the Internet. Some excellent programs that can be downloaded for free include Open Office (an Office suite with a word processor, spread sheet, presentation program, and drawing package), Firefox (a web browser), Thunderbird (an email program), and The Gimp (a photo/image editing program). All of these programs are of excellent quality and compare very favorably to their commercial counterparts. Best of all, they are FREE.

11. Tell several ways an individual or family could use a personal computer other than for games.

Tracking finances, staying in contact with other family members, record keeping, making documents, producing web pages, connecting to the Internet, researching a school (or work) assignment, getting directions, finding lost friends, downloading pathfinder honors requirements and answers, and many, many more!