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COMPUTER MAINTENANCE AND REPAIR GCS 1210

Mr. Jones, a Doctor at Mulago Hospital, has a gradual decline in the performance of his personal computer, a tower model with an ATX motherboard with a P4 processor, 2GB of RAM, an old CRT screen, and a wired Keyboard, Mouse, and a USB printer. Because of the nature of his work, he could not afford to have his computer away from him since he was always busy dealing with patient records on the PC. The climax was his computer, this time suddenly strange and unpredictable behavior from programs, the computer would reboot without a clear cause, the computer would show constant activity occurring, and email files or other files would disappear. He asked whether he had ever backed up his data, to which he answered YES. He had backed up data on the internal hard disk itself. The only storage device he had was the hard disk. There was no record of regular maintenance.

1.

a) Before the technician can embark on the computer repair alone, explain the steps he would take to prepare himself to repair the computer. (5 marks)

b) Suggest any five possible causes of the computer becoming abnormally slow

(5 marks)

c) After hearing how Jones used his computer before it failed, what are the symptoms you think caused the it to fail before you begin actual repair (5 marks)

d) What processes would you advise Jones to follow to avoid such failures in the future? (5 marks)

2.

a) Looking at the type of hardware used by Jones, please describe the various I/O devices connections that would have to disconnect and reconnect before and after repairs were done (5 marks)

b) What safety precautions would you need to take to protect hardware devices, software resources, and data? (6 marks)

c) If you were to recommend an upgrade, especially where possible, would this upgrade be performed and why? (4 marks)

d) What tools should you have at hand to begin (5 marks)

a) Gather data from Mr. Jones with detailed questions about the symptoms, timeline and usage habits

Backup data. Attempt to backup data externally if the hard drive is still accessible even though it was only backed up on the internal disk

Documentation. Record the system specifications and current condition before making any changes

Power down and unplug. Ensure the PC is completely shut down and unplugged to avoid electric shock

Gather tools and resources. Prepare appropriate diagnostic tools, software utilities and repair equipment

b) Insufficient RAM whereby his computer has 2 GB of RAM which is very low for modern tasks and multitasking

Malicious software that can slow down performance by occupying a significant amount of memory

Failing Hard drive. Over time, mechanical hard drives degrade thereby leading to poor performance in computers

Dust accumulation and overheating. Dust blocks ventilation causing heating and slow downs

Too many background processes for example start up applications running in the background leading to slow downs

c) Black screen and Boot failure caused likely by failing power supply

Unpredictable Reboots caused by overheating, or RAM failures

Screen blackouts and program behavior points to possible GPU or RAM problems

Files disappearing suggests malware infection or hard disk corruption

Constant disk activity could indicate a failing hard drive or a malware issue

d) Regular maintenance by cleaning dust, check hardware and update software regularly

Proper backups by backing up data to an external device or cloud storage

Install Antivirus and firewall to protect the system against malware

Hardware upgrades by increasing the RAM capacity, hard disk storage and outdated peripherals

Power protection by using Uninterruptible Power Supply to avoid sudden shutdowns

Question 2

a) CRT Monitor: VGA cable and power cord

Wired Keyboard and Mouse: PS/2 or USB ports

USB Printer: USB cable and power plug

Power cable: Main cord from PSU

Speakers: 5mm audio jack

b) Use an Anti-Static Wrist Strap to prevent static discharge that can damage components

Always work with the computer Unplugged

Avoid touching components directly, hold them by their edges

Work on a Non-conductive surface. Avoid metallic or wet surfaces

Proper ventilation to keep the workspace from overheating

Label connections to avoid incorrect reassembly by labelling cables and screws

c) RAM upgrade: Upgrade from 2 GB to at least 4 – 8 GB for better performance

Replace hard disk drive with SSD for faster boot times and better reliability

Upgrade CPU to a more modern one for speed

Replace CRT Monitor with an energy-efficient LED screen

Reason being these upgrades will significantly boost speed, and compatibility with modern applications

d) Screwdrivers (Phillips and Flat): For opening the case and handling screws.

Anti-static Wrist Strap to avoid electrostatic damage

Multimeter for checking power supply and electrical issues

Flashlight to see clearly inside the tower

Bootable USB/CD with Diagnostic Tools for testing memory, disk, and operating system health