**Information processing cycle**

1. Yes, data refers to raw, unprocessed facts. Computers take data and process it into useful information.
2. Output can be sent directly to storage. Output can be used as input for other programs and computer systems.
3. Processing can only take place when the software and data is loaded into the physical memory (RAM) of the ICT device.
4. Searching, sorting, calculating etc.
5. Passwords/Encryption and physical safe keeping/backups.

**Output: pointing devices and touch screens**

6. The keyboard is still the fastest way to enter text, especially for someone who can type quickly and accurately and is relatively easy to learn and use.
7. It is actually both! Input as it allows the user to provide input by touching the screen and output as it can display output as a normal computer screen would.
8. Disconnect and re-connect the mouse.
   If this doesn’t work, try a different port.
   As a final solution, you can reboot the computer.
9. Any situation where a lot of text needs to be input e.g. typing a history essay.
10. Cut (Ctrl+X) and Paste (Ctrl+V)
11. A left-click is just to select an object e.g. an image in a document.
   A right-click is normally used to bring up a set of options related to the current task — sometimes referred to as a context-sensitive menu.
   Double-clicking is normally done to open or run something e.g. a command button or a folder or to run a program
12. A wireless keyboard/mouse clears clutter from the desk or work surface.
   A wireless keyboard can be inconvenient as you can’t use the device if the batteries are flat and you don’t have spare batteries or if the transmitter is damaged.
13. Quicker/easier and more accurate to input information, especially with a relatively fixed selection of options.
   Saves space as it serves the function of both a mouse and keyboard.
   It is easy and intuitive to use/requires very little training.
14. Comfort/ease of use and safety aspects such as reducing the risk of RSI (Repetitive Strain Injury).
15. A touchpad is a separate hardware device built into portable computers such as a laptop or Netbook. They save ‘space’ in that the user can perform actions that would normally require a mouse without the need for a desk or extra surface area.

16. The touch pad is not as accurate or precise as a mouse. Some users find it difficult to use especially with drag and drop operations.

17. Check/replace the batteries in the keyboard. Check connections/Shut down and reboot the computer. Try another keyboard to see that is not the keyboard itself.

**Input: scanners, smartphones and digital cameras**

18. The webcam forms part of/is physically built into the laptop.

19. It can be faster and more accurate to use a scanner and OCR software than other text input methods.

Older, hardcopy document such as deeds of sales can be scanned to be preserved.

One can store documents digitally which also means that less paper and ink are used, which is beneficial to the environment.

Large documents that consist of many pages can be scanned and collated into a single digital file.

The electronic copies created are stored digitally and do not take up office space such as paper files.

Scanned copies can be shared/e-mailed directly instead of having to be faxed or posted.

20. Each digital picture is made of small ‘dots’ or pixels. The resolution of the image refers to the number of horizontal and vertical pixels in the image. Multiply the two and you get the total number of pixels in this case 10 MP or 10 mega (million) pixels.

21. E-tolling/toll roads

Access control systems, etc.

22. Colour depth – the number of bits used to represent a colour.

The sensor size – the bigger the sensor in a camera, the better the quality of the image.

The ISO rating (the camera’s sensitivity to light).

Using optical rather than digital zoom.

23. No, digital cameras use (mega) pixels to specify the resolution and scanners specify the resolution in terms of the number of dots it can scan per inch or dpi.

**Output: monitors/display devices, speakers/headphones, printers**

24. Check your headphones/speakers are plugged into correct port/jack.
Check that your speakers are plugged in and switched on.

Check that the computer’s sound settings are not low or on mute.

Try playing another CD to see if the disc is not perhaps faulty.

25. Speed measured in pages per minute (ppm)
Resolution measured in DPI (Dots per inch)
Cost per page

Wireless capability / Has an Ethernet port (network connection)

26. The **aspect ratio** is the relationship between the width and height of the display e.g. 16:9 or 16:10 ratio displays.

The **contrast ratio** — this is the relationship between the darkest black and the brightest white. Low contrast ratios produce soft, ‘muddy’ images.

The **refresh rate** refers to how often/quickly the screen display is refreshed. The higher the refresh rate, the better.

27. Laser, inkjet and dot-matrix printers


Inkjet printer for high quality photographs (if you buy a photo quality inkjet printer and use specially coated paper).

Laser printer for high-speed printing.

29. Check the monitor is switched on/plugged into the power.

Check all the connections.

30. Higher running costs than laser printers.

Slower printing speeds than laser printers.

Generally, the print quality is not as good as that of laser printers. 16

**Storage and communication devices**

31. It means that storage retains its contents even when the power is switched off, because the data is stored magnetically or optically. RAM, by contrast, is volatile, meaning that it loses its contents if it not constantly supplied with power.

32. The Scandisk utility.

33. a) Ease of use – they can just be plugged into a USB port and used.

Higher speed – faster than optical media (CD/DVD).

Much larger capacity than CD or DVD discs.

Reliability – more reliable than optical media.
b) USB, FireWire or Thunderbolt

c) External hard drives provide a portable device for carrying data and software around with you.

External hard drives are better than internal hard drives when it comes to storing backup safely, away from your computer.

You can add extra storage to your computer just by plugging it into a USB port, without having to open the case, etc.

d) 2.5" drives can get their power from the computer using the connection cable, whilst 3.5" drives need an extra power supply for themselves. 2.5" drives generally have smaller capacities than 3.5" drives.

34. Their small size, large capacity and ease of use means that they make it easy for people to pirate media, copy and steal data or install illicit software on computers that are not their own.

35. Two of: Bluetooth, 3G/4G and WiFi

36. a) You can make and receive phone calls and be connected to the Internet at the same time.

ADSL generally provides cheaper connections to the Internet than 3G.

b) Any two:

- ADSL needs specialised equipment installed at the telephone exchange.
- ADSL speed drops the further you are away from the telephone exchange.
- ADSL is designed for fast downloads and slower uploads, so it is not suitable in situations where you might want to upload large amounts of data.

37. Only programs and data that need to be processed need to be loaded into RAM. Storage must permanently store every program and all your data even when the computer is switched off.

38. Defragmentation of a hard drive can speed up disk access as it reorganises the files so that they are located more easily, and quickly loaded from disk. The process simply involves rearranging and relocating parts of files ‘scattered’ across the disk, but does not, however, free up disk space.

39. They provide much faster data access (especially via USB 3).

They are ‘industry standard’ (i.e. useable with all operating systems and most devices, provided the devices have USB ports).

USB ports are found on virtually every type of computer or device, whereas a CD or DVD needs the use of an optical (CD or DVD) drive.

They have a much larger capacity than optical media.

They are more reliable (CD and DVD discs can easily get scratched or damaged).

They are much easier to use in terms of adding and deleting files.
40. 3G/4G (LTE)

41. 3G Internet connections depend on the coverage and strength of the 3G signal.

42. Advantages:

- A SSD is faster than a traditional hard drive.
- It has the advantage of no moving parts and therefore can’t be damaged easily by being moved whilst in use.
- SSDs are also much more energy-efficient and run quieter than traditional (mechanical) hard drives.

Disadvantages:

- SSDs are much more expensive than traditional hard drives.
- SSDs generally come in smaller capacities than traditional hard drives.

43. Partly because they are very portable but mostly because they are extremely cheap, costing just a few Rand per disc.

**Mixed questions – Apply your operational knowledge**

44. Scan the hardcopies with a scanner and use OCR (Optical Character Recognition) software to convert the scanned image to editable text.

45. Increased usage of GUI types of interfaces.

They take up valuable space.

One can always make use of an on-screen keyboard.

46. You have selected the wrong printer in the print dialog box (especially in a network environment).

The printer queue may have been paused.

There is no ink/toner or paper left, etc.

47. Keyloggers are a type of software (falling under the category of spyware) that can track and record your keystrokes and even track what your mouse is doing and record a screenshot whenever you click on something.

In this way the person who installed the software can monitor what you are doing or simply obtain your passwords, etc. without your knowledge or permission.

48. RFID tags can be detected/read at a distance wirelessly.

49. In order to save space and reduce power consumption, many Netbook computers are not equipped with an optical drive.
50. While the better the resolution, the better the quality will be, it also means the larger the file will be. In addition the human eye will not necessarily notice the difference between different resolutions.

51. Barcode scanners provide quick and accurate input.

They can be linked to stock control software that keeps track of which books are in the library and which or not and keep statistics in terms of which books are most frequently read etc.

52. a) Poor quality programs/programming that don’t perform sufficient checks on the data. It is virtually impossible to eliminate human error. It is difficult to judge whether some data (e.g. an account balance as opposed to someone’s age) is feasible/accurate or not.

b) Drop-down lists and calendars (to choose a date from), spin edits, check boxes and radio buttons, etc.

c) Input masks, validation rules, default values, field types and sizes, lookup fields etc.

53. Instagram, Facebook, etc.

54. An external hard drive, as CD and DVD discs (and flash drives) have a much lower capacity.

Flash disks are easy to lose.

Flash disks are more expensive (per GB) than a hard drive.

Flash disks have a limited life span in terms of how many times data can be saved on them.

55. High-resolution images would use a lot of bandwidth/cap.

56. Microphone, webcam, headset, speakers.

57. Right-click on the drive in Windows Explorer and choose Properties to see how large the drive is and how much free space there is.

58. Backup to an external device such as a portable hard drive, or use cloud storage (on the Internet). 19