OUTPUT DEVICES

State the types and functions of output devices
What is an output device?

- An output device is a peripheral or hardware component that conveys information to the user.
- It accepts data from the CPU and converts them into a form the user can understand.
- It may be text, graphics, audio or video.
Hard copy and Soft copy

- Hard copy is a permanent printout.
- Soft copy is an electronic temporary display on a screen.
Examples of Output Devices

- Monitors, printers, speakers and handsets, plotters, microfilm, data projectors and fax machines.
MONITORS

Also known as:

• Visual Display Units (VDU)
• Cathode Ray Tube (CRT)
• Visual display terminal (VDT)
• Liquid Crystal Display (LCD) – flat screens on laptops
• Light-emitting diode (LED) - palmtops
Monitors

Features

- Ideal for showing the results from an inquiry where no printout is needed.
- Contains a matrix or array of luminescent dots of red, green and blue (known as RGB).
- They come in various sizes and resolutions.
- The resolution is determined by the number of dots of light (pixels) displayed on the screen.
  - Pixel stand for picture element
Monitors

Features cont’d

• Colour: number of colours displayed can vary from 16 to 256 to 64 thousand to 16.7 million.
Advantages of LCD over CRT monitors

- LCDs use less space
- LCDs consume less than one-third the electricity
- LCDs generate less heat
- LCDs are lighter and more portable.
- LCDs produce better quality images.
PRINTERS

These are used to produce permanent hard copies of output on a physical medium such as paper or transparency film.

They may be impact or non-impact.
Impact printers

• These printers make an impression on paper by striking a mechanism against an ink ribbon.
• They are noisy and do not usually print acceptable graphics.
• Useful for printing multiple copies using carbon paper.
Advantages of Impact Printers

• Usually cheaper than non-impact printers
• Ideal for printing multipart forms – they can print through many layers of paper. E.g. for payment receipts
• Fairly durable and resistant to dust and temperature extremes
Disadvantages

• They are noisy
• They print quality is slightly lower than letter quality
• Slower than non-impact printers
Dot-matrix

- Able to print through layers of paper
- Able to print multipart stationery
- Cheap
- Not suitable for wordprocessing or desktop publishing
- Uses pins to print a pattern of dots on paper
- Relatively poor quality of printing which can be read but cannot be used for reproduction or for business letters
Train Printer

• Also known as chain printer
• Characters are located on a continuous belt
• Character move horizontally across the page.
  – As the required character moves into position, it is hammered onto the paper through a carbon ribbon.
Daisy-wheel

• Produces a good letter-quality print but is much slower than the dot-matrix.
• It prints about 30-40 characters per second (cps).
• It does not print graphics.
• It is no longer very popular.
• The print head is like a bicycle wheel with each character raised. It can either be metal or plastic.
Line Printer

• These print an entire line at a time.
• Might be enclosed to reduce the noise when printing – today’s machines are quiet.
• High-speed line printers print about 1500 lines per minute.
• Use to print large amounts of:
  – Address labels
  – Payroll cheques
  – Statements or bills
Non-Impact Printers

- These printers do not involve the actual striking of the paper.
- Ink or toner powder is sprayed onto the paper e.g. by heating.
- The printing element is simple and has no moving parts.
- They are inexpensive to manufacture.
- They print quickly and silently.
Ink-jet Printer

- They operate by projecting small ink droplets and deflecting them electrostatically.
- They can print up to 4 – 6 pages per minute.
- The quality of printouts can be as good as a laser printer.
- They are slower depending on what is being printed.
- Their ink-filled print heads must be cleaned and cartridges replaced more frequently than toners in the laser printers.
Ink-jets cont’d

• Use at home, small-quantity outputs photographs and school work.
• Ordinary paper can be used.
Laser Printer

• Produce attractive documents at a high resolution.
• Much faster than ink-jets.
• Used in workplaces, because they are quiet, prints quickly, can be stocked with a large number of sheets of paper and produce very high-quality documents.
• Printouts range from 300 to 1200 dots printed per inch (dpi)
Laser cont’d

• Paper is charged electrostatically and attracts dry ink powder.
• The pattern is then baked onto the paper.
• Speeds of 8 to 12 pages per minute.
• Color lasers also available.
• Far more costly than color-inkjet.
• Produce a higher quality image and is cheaper to run.
• Some also perform the function of scanning, photocopying and faxing.
Thermal Printer

• These use heat on chemically treated paper to form characters.
• They can be found in automatic banking machines, debit or credit card machines or ultrasound scanning machines.
• They are quiet, and in recent time they print quickly.
• Paper is expensive and eventually fades if exposed to light and heat.
Plotter

- A machine which uses coloured pens or toner to draw an image on paper.
- Used by car designers, architects and engineers who wish to print accurate charts, diagrams and 3D diagrams.
- Paper is handled differently depending on the type of plotter.
- Flatbed ones hold the paper still while the pens move.
- Drum plotters roll the paper over a cylinder.
Plotter cont’d

• Pinch-rollers are a mixture of the two.
  – Advantage
    • Drum plotter – it can produce very large drawings.
Microfilm

- Alternative to the printer.
- Output is printed on a roll of film or a sheet of film.
- It is faster.
- It condenses large stacks of paper into small amounts of microfilm or microfiche with no special programming.
- Dis: Computer Output Microfilm takes a special device to print the microfilm and a special viewer to read it.
Sound

- Allows the recording of sound (input) via microphones and the playback of sound (output) via speakers.
- Can be from MIDI file or from a CD.
- Can be good for young children and visually impaired.
Modems

- Input and output devices.
- Enables a computer to send data to and receive data from another computer, over a telephone line.
- It converts the digital data to analog signals by varying (modulating) the frequency of a carrier wave.
- Allows the computer to send and receive e-mail and to access the Internet.
- The speed at which a modem transfers data is measured in kilobits per second.
Human Readable/Machine readable

• This means that the output is in a form that only a computer can process.
Books used

• Information Technology for CSEC – Glenda Gay and Ronald Blades

• CXC Information Technology – Kelvin Skeete