# Homework 6 Secondary storage devices Answers

# A list of storage devices is given below.

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|  |  |  |  |
| --- | --- | --- | --- |
| **CD-ROM** | **DVD** | **Hard Disk** | **USB Flash Memory stick** |

a) Using the table below, state the typical capacity of each of the above devices. [4]

|  |  |
| --- | --- |
| **Typical capacity** | **Storage medium** |
| 512 Megabytes – 128 Gigabytes | USB Flash Memory stick |
| 512 Gigabytes – 4 Terabytes | Hard Disk |
| 600 Megabytes – 700 Megabytes | CD-ROM |
| 2.8 Gigabytes – 4.7 Gigabytes | DVD |

b) Describe how data is written to and read from an optical disk. [3]

A high powered laser is used to write data to the disk // by burning a pit;

To read data, a low-powered laser is used;

Data is stored as pits and lands; on a single spiral track;

Difference between reflective and non-reflective parts are read as 1s and 0s (or vice-versa) // the start and end of a pit deflects light // the middle of a pit or a land reflects light

c) Explain how a DVD and a CD-ROM differ in storage capacity despite being the same physical size. [2]

A laser using a shorter wavelength is used to write data to a DVD; which burns smaller pits;

Smaller pits mean the spiral track can be tighter // longer;

d) Why might an individual prefer to keep an archive of their files on a local storage medium rather than using online cloud storage? [2]

Internet connection may be too slow // unavailable;

Downloads can be interrupted;

Concerns over security // interception of data;

Peace of mind over having their own physical copy // not reliant on anyone else;

# Hard drive technology has meant that more data has been able to fit onto the same sized physical disk.

#

a) Describe the principles of operation of a hard disk drive. [4]

Magnetic disk;

Binary data (0s and 1s) are represented by magnetising spots on the disk;

A change from a positive magnetic field to a negative field represents a 1, otherwise a 0 (or vice-versa);

Disk has multiple platters; each with own drive head;

Drive head parked when not in use;

Drive head moves radially in and out;

Disk continually spinning;

Tracks are in concentric circles;

Data is transferred in blocks // sectors;

Data is read/written as disk moves under read/write head;

b) Suggest two disadvantages of using a hard disk for data storage over optical disks or flash media. [2]

Not portable;

Contain moving parts // susceptible to damage;

Not as fast access as Flash memory;

c) State one technological change that has allowed hard disk capacity to increase without increasing the physical size of the disk. [1]

Changing from longitudinal magnetic particles to perpendicular; // greater density of magnetic particles;

More tracks on a disk;

Smaller read / write heads;

[Total 18 Marks]