Revision Questions for Section 2.1 - Computer Organization

Computer architecture

2.1.1 CPU / ALU / CU

a. Draw a diagram showing the architecture of the **CPU** and input/output and storage units.
b. Describe the basic functions of the **ALU**
c. Describe the basic function of the **CU**.
d. Describe what is stored in the **MAR** and the **MDR** registers.

2.1.2-3 Primary memory / cache memory

a. Distinguish between **primary** and **secondary** memory in a computer.
b. Outline three main differences between **RAM** and **ROM** memory.
c. Explain how the use of **cache** memory can speed up processing.

2.1.4 Machine instruction cycle

a. Outline the main steps of the **fetch-execute** cycle.
b. Name three types of **bus** in the CPU and outline their function.

Secondary memory

2.1.5 Need for persistent storage

a. Identify the main types of **persistent storage** in a computer.
b. Distinguish between **magnetic**, **optical** and **solid-state** storage devices.
c. Explain why **primary** memory alone is not sufficient in a computer.

Operating systems and application systems

2.1.6 Functions of an operating system

a. Identify the main computer **resources** that are allocated by the operating system
b. State three other **functions** of the OS, apart from resource allocation.
c. Explain the ways in which the OS provides **security** to the user.
d. Outline the concept of **multi-tasking** in an OS.

2.1.7-8 Application software

a. Identify the main **types** of application software and give an **example** of each type.
b. Identify common **features** of the GUI of modern application software
c. Identify some features of an application program that are provided by the **OS**.

Binary representation

2.1.9 Terms

a. State the **relationship** between the storage units: bit, byte, Kilobyte, Megabyte, Gigabyte
b. State the **base** and **digits** of the number systems: binary, denary, hexadecimal

2.1.10 Data representation

a. State the primitive data types in Java.
b. Compare the ASCII and Unicode methods of storing characters.
c. Explain the relationship between the storage space used and range of integers that can be stored in a variable.
d. State the relationship between storage space and number of colours that can be represented.

Simple logic gates

2.1.11 Boolean operators

a. Write down the Boolean **expression** for the gates: AND, OR, NOT, NAND, NOR, XOR
b. Draw the logic diagram **symbol** for each gate.
c. Show the **truth table** for each gate.

2.1.12 Truth tables

a. Show the truth table for: A or (B and not C)
b. Show the truth table for: (A and B) or (B nand C)

2.1.13 Logic diagrams

a. Draw the logic diagram for: (A or B) and (B or C)
b. Draw the logic diagram for: not A xor (B nand C)