

Topic 17 Hardware: Processors – Worksheet

1. Answer the questions using complete English sentences.

- a) Define the term *software*. (1)

Software is the set of programs run by a computer system.

- b) Why is it prudent to make a backup of user data prior to upgrading an operating system? (2)

The upgrade process carries a risk of data loss due to potential errors, corruption, or the necessity to format the hard drive, and a backup ensures your files are safe and can be restored.

- c) What is meant by "booting up" a computer? (2)

"Booting up" refers to the initial sequence of operations a computer performs from the moment it is powered on until the operating system is fully loaded and ready for use.

- d) State the primary purpose of an API. (2)

The primary purpose of an API is to provide a defined set of rules and protocols that allows different software applications to communicate and interact with each other (1), enabling them to share data and functionality (1).

- e) List at least three tasks an operating system API allows. (3)

File access (reading, writing, etc.)

Spawning new tasks (running programs or sub-programs)

Memory management (requesting memory to store data)

Device management (printer, mouse, keyboard)

Inter-process communications

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- f) Not only operating systems have APIs. You can also think of APIs as abstraction layers that hide complexity. List an API that you used while writing Java programs. **(1)**

Math class API – PI, abs(), random(), ...

String class methods – indexOf(), ...

- g) What are the key benefits for a programmer using an existing API, rather than writing their own code to perform a complex task? **(3)**

Typically an API has been written, optimized, and debugged, and is hopefully free of security issues, so you get to simplify your code development.

For operating systems, requiring programs use an API to access hardware prevents errored or malicious code from making the operating system unstable.

- h) What does an operating system do when it is "loading and running applications"? **(3)**

When loading and running an application, the operating system locates the application's program file on storage, allocates necessary memory (RAM) and other resources for it, loads its instructions into memory, and schedules its processes for execution by the CPU.

- i) Research and describe drive partitioning, including the legacy MBR (Master Boot Record) standard to the modern GPT (GUID Partition Table) format. **(6)**