**Lesson Summary and Revision Notes: Week 9**

Explain Why a Computer System Requires an Operating System.

* Provides both the environment in which applications can be run.
* Provides a useable interface between humans and computer.
* It also disguises the complexity.

Explain the key management tasks carried out by the Operating System

1) **Memory Management**: the management of a computer’s main memory.

It consist of three parts:

* memory optimisation: determine how computer memory is allocated and deallocated when applications are running simultaneously.
* memory organisation: determines how much memory is allocated to an application, and how the memory can be split up in the most appropriate or efficient manner.
* memory protection: ensures that two competing applications cannot use the same memory locations at the same time. If this was not done, data could be lost, applications could produce incorrect results.

2) **Security Management**: function is to ensure the integrity, confidentiality and availability of data.

This can be achieved through:

* carrying out OS updates when they are available
* ensuring antivirus software are up to date
* commuicate with firewall to check for network traffic access
* maintaining access rights for all users
* offering abiity for recovery of data that has been lost or corrupted
* prevent illegal intrusion to the computer system.

3) **Process Management**: involves the allocation of resources and permits the sharing and exchange of data, thus allowing all processes to be fully synchronised (eg: resources scheduling and process scheduling queues).

4) **Hardware Management**: involves all input and output peripheral devices.

This includes:

* communicating with all input and output devices using device drivers
* translating data from a file into a format that the I/O device can understand using device drivers
* ensuring each hardware resource has a priority so that it can be used and released as required.

5) **File Management**: The main tasks of file management include:

* defining the file naming conventions which can be used
* performing specific tasks, such as create, open, close, delete, rename etc
* maintaining the directory structures
* ensuring access control mechanisms are maintained

Utility software that are offered by most operating system includes:

* » hard disk formatter
* » virus checker
* » defragmentation software
* » disk contents analysis/repair software
* » file compression
* » back-up software

Define what is a program library and explain the purpose of using a program library

**Program Libraries**: a collection of programs and software packages that are made available for common use within some environment.

Program libraries are used:

* when software is under development and the programmer can utilise pre-written subroutines in their own programs, thus saving development time.
* to help a software developer who wishes to use dynamic link library (DLL) subroutines in their own program.

What are the two types of program library ?

Program Libraries: can be classified as static or dynamic.

* **Static libraries**: the library routines is embedded directly into the new executable program code at the time of compilation.
* **Dynamic-Linked libraries (DLL Files)**: software being developed is not linked to the library routines until actual run time. These library routines are stand-alone files only being accessed as required by the new program.

Pros and Cons of using DLL (Dynamic Linked Libraries) Files

