HL Unit 6 – Resource Management

Quiz 1

Question 1			
Objectives:	6.1.7	Exam Reference:	May-14 9

Outline the role of paging in the management of primary memory. [2]

*Award up to **[2 marks max]**.*
It is used in the formation of virtual memory / use of secondary memory;
To increase the amount of primary memory;
Memory divided into (tagged) "pages";
Which are then transferred in and out as required;

Question 2			
Objectives:	6.1.7	Exam Reference:	May-16 9

Explain **two** functions that an operating system needs to perform in relation to multitasking. [4]

*Award **[2]** for each of the two functions, up to **[4 max]**.*

Memory management;
OS allows more than one program/process to share the memory;
By allocating separate memory to each program;
Provides memory isolation for each of processes;
The system may begin to run out of shared storage (as many programs are running) so OS moves pages to disk/paging;
etc.

Processor Management;
To allow (the appearance of) more than one program running at the same time;
By the allocation of time slices;
Decides which process runs at a certain point in time;
Arrange the execution of applications so that you believe that there are several things happening at once (scheduler);
Prioritizes tasks by importance (interrupts);
etc.

Question 3			
Objectives:	6.1.5	Exam Reference:	Nov-14 5

State **one** function of the *operating system* in managing memory. [1]

*Award **[1 mark]** for a function stated.*
Allocating storage for data and instructions;
Keeping track of free and occupied parts of memory;

Question 4			
Objectives:	6.1.5	Exam Reference:	Nov-14 5

Describe one way that the operating system of a networked workstation hides the complexity of the network from the user. [3]

*Award **[1 mark]** for an appropriate use for the user, **[2 marks]** for an elaboration.*
For example:
Icon showing images on the user's desktop;
Connects to (part of) the server/printer;
Operating system runs this access in the background (device drivers);

Question 5			
Objectives:	6.1.1.- 6.1.6	Exam Reference:	Nov-14 14

The operating system in the latest mobile phones allows the user to open more than one application at the same time.

(a) State **three** possible applications that might be open at the same time. [1]

*Award **[1 mark]** for three or more acceptable possible applications stated.*
Internet browser
Phone application (making a call)
Camera application (taking a picture)
MP3 player
E-mail reader

(b) Explain the role of the operating system in the management of these applications. [4]

*Award marks as follows up to **[4 marks max]**.*
*Award **[2 marks]** for a basic description of the operating system in the management of applications.*
*Award **[1 mark]** for elaborating on the description.*
*Award **[1 mark]** for an explanation that is clear, detailed and balanced.*
Answers may include:

Memory management: The OS allocates a certain portion of the memory for each application. The amount of memory needed by each application may change so the OS will need to be able to allocate more memory to an application as needed and to recover memory when the application no longer needs it.

Allocation of processing time for each application: This could involve time-slicing in which each application is given a certain amount of processor time before control is switched to the next application. Alternatively, the OS could use an event-driven model in which control of the processor is passed to the appropriate application as events such as an incoming call, a button press, or an interrupt occur.

Coordination of interfaces: The OS determines which application should be notified if a button is pressed and updates the display based on requests received from each of the applications.

With reference to two specific resources, outline how the design of these resources for a mobile phone would differ from those of a standard PC. [4]

*Award **[1 mark each]** for identifying each valid system resource up to a maximum of **[2 marks]**.*
*Award an additional **[1 mark each]** for describing how the design of each of the identified resources differ between the mobile phone and PC platforms up to a maximum of **[2 marks]**.*
Answers may include:

Memory: The small size of the mobile phone restricts the amount of memory that can be included to less than what can be included in a PC. More importantly, the mobile must use much less power than a PC and this further restricts the amount of memory that can be included and also makes some designers choose slower memory that consumes less power.

Display Screen: The small size of the mobile restricts the size of the screen to something much less than a PC. To compensate, the screen may need to have a much higher resolution. Also, the mobile screen must be readable in direct sunlight, which most PC displays are not.

Input devices: The PC usually uses a full-size keyboard. The mobile must generally use a much smaller keyboard which results either in a greatly reduced number of keys or in very tiny keys such as on a Blackberry. The PC also usually has a pointing device like a mouse which itself is already larger than

A mobile phone manufacturer is considering adding a graphics card to one of its models.

(c) Discuss the possible consequences of going ahead with this modification. [6]

*Award marks as follows up to **[6 marks max]**.*
*Award **[1 mark]** for each consequence identified, up to **[2 marks max]**.*
*Award **[2 marks]** for a deeper description of the consequences, demonstrating some knowledge and understanding.*
*Award **[2 marks]** for a clear discussion of the consequences in terms of size, weight, power, usability, and user appeal, showing detailed knowledge and understanding.*
Answers may include:

Will speed the display of complex graphics, will make animations and movies look great.
Video card uses a lot of power, will reduce battery life and increase heat.
Video card occupies space, will make phone larger and heavier.