End of Unit Quiz – Unit 1.2 Memory

1. Random access memory (RAM) and read only memory (ROM) are different types of memory found in computers.

   a. Give two items that are stored in RAM.

   b. What are the main difference is between RAM and ROM?

   c. Place a tick (✓) to indicate whether each statement refers to RAM or ROM.

	RAM	**ROM**
Data is not permanently written to this type of memory		
Holds the instructions for booting-up the computer		
The computer needs to be on to retain data		
It is a type of volatile memory		
Data is pre-written and comes with the computer		
Data is permanently written		

2. A ROM stores instructions that are needed to start/boot up a computer.

   a. What is the role of the Power On Self-Test (POST) in the boot sequence?

   b. ROM is present in automatic washing machines. What are some specific instructions that would be in such a ROM?

   c. What are the reasons that ROM is considered permanent and secure?

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3. Virtual memory doesn't physically exist on a memory chip but is an optimisation technique that is implemented by the operating system.

a. What is virtual memory?

b. Why is virtual memory needed?

c. How is virtual memory implemented?

4. Flash memory is sold state media.

a. What does solid state media mean?

b. What are 3 uses for flash memory?

c. What are the advantages and problems associated with the use of flash memory?

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Answers

1. Random access memory (RAM) and read only memory (ROM) are different types of memory found in computers.

   a. Give two items that are stored in RAM.

   Programs currently in use.
   Data currently in use.

   b. What are the main difference is between RAM and ROM?

   ROM is non-volatile and RAM is Volatile / RAM loses memory when computer switched off, RAM doesn't.

   c. Place a tick (✓) to indicate whether each statement refers to RAM or ROM.

	RAM	**ROM**
Data is not permanently written to this type of memory	✓	
Holds the instructions for booting-up the computer		✓
The computer needs to be on to retain data	✓	
It is a type of volatile memory	✓	
Data is pre-written and comes with the computer		✓
Data is permanently written		✓

2. A ROM stores instructions that are needed to start/boot up a computer.

   a. What is the role of the Power On Self-Test (POST) in the boot sequence?

   When computer is switched on, BIOS chip performs checks.
   These checks are called POST (Power On Self-Test).
   To make sure components are present and functioning correctly / Checks peripheral devices, other hardware, storage devices, memory and system clock.
   When checks completed CPU starts operating system.
   If a test fails, an error message is shown.

   b. ROM is present in automatic washing machines. What are some specific instructions that would be in such a ROM?

   Values stored in ROM remain whether power on or not.
   ROM can be removed from a computer and when replaced, values are still there.
   Virus attack unlikely.
   Values stored cannot be accidentally changed.

   c. What are the reasons that ROM is considered permanent and secure?

   Security against accidental/malicious damage as difficult to change
   Virus attack unlikely
   Manufactured with data required permanently stored in it so cannot be modified easily.

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3. Virtual memory doesn't physically exist on a memory chip but is an optimisation technique that is implemented by the operating system.

a. What is virtual memory?

It is simulated memory that is written to a file on the hard drive / memory that appears to exist as RAM but is in secondary storage.

b. Why is virtual memory needed?

When you need to run applications on the computer than its physical memory (RAM) can support.
It lets more memory to be used than there is in the system.

c. How is virtual memory implemented?

Operating system will set up virtual memory using the virtual memory manager (VMM).
VMM creates a file on the hard disk large enough for the extra memory needed.
OS can then address memory as if it were real memory stored in RAM.
Maps memory addresses used by a program into physical addresses in computer memory.
Swapping or paging is a process used by the operating system to move data between RAM and virtual memory.
Operating system moves data when some processes are not needed immediately out of the RAM to store them in virtual memory (on the hard disk).
Copies the data back into RAM when the process is needed again.
Transfer between the two being made automatically as required.

4. Flash memory is sold state media.

a. What does solid state media mean?

Storage media with no moving parts
Refers to removable storage with no moving parts
Device that uses flash memory

b. What are 3 uses for flash memory?

USB drives
Memory cards (such as in a camera)
Solid-state drives
Any reasonable example

c. What are the advantages and problems associated with the use of flash memory?

Advantages

- Flash is durable will not break if dropped or exposed to heat.
- Very reliable as no moving parts.
- Very compact but can store lot of data in a small space.
- Very fast access time compared to a hard disk or a DVD.
- Low cost and reliable.

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- Light weight so easily portable.

Problems

- Can get lost easily.
- Can wear out over a long time period.
- More expensive than CD or DVD.
- The metal part that is inserted into the USB port can become bent or damaged.

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