TUTORIAL #8	Computer Memory Types and Usage, Reliability and Redundancy	(CE/CZ1006)

8.1 Computer Memory Types and Usage

1. What memory type would you use to implement the cache in Processor Cx1006-200M16 in the case study notes? Explain your choice.

2. Name two main types of Flash memory available in the market. What are the differences between them? Which application/product areas are they used in?

3. Reference the two HDDs listed in the case study notes (HDD001 and HDD002)

    a. What is the **capacity** of each drive?

    b. For HDD001,
        i. What is its **access time**?
        ii. What is the time needed to transfer a 4Kbyte file stored in random non-consecutive sectors on different tracks? Assume that every sector is on a different track.
        iii. After defragmenting HDD001, what would be the time needed to transfer a 280Kbyte file?

    c. If you are building a Network Access Storage for your home to act as a backup storage for your home's computers, which HDD would you choose? Justify your choice.

    d. Would you use a SSD instead for Q3(c) above? Since SSD is more robust than HDD and robustness is very important for backup storage.

4. What would be the memory choices for the system and storage memory for each scenarios below? Justify your memory choice selection in terms of functionality, performance and cost.
    a. Entry level Microsoft Windows desktop computer for general office use but needs huge data storage capacity to store videos relating to the company product.
    b. Ultra-thin Android Tablet with long battery life.

8.2 Reliability

5. Reference the case study notes,
    a. What is the probability that the HDD is still functioning after 1 year? Compute for HDD001and HDD002.
    b. Would HDD001 definitely fail before HDD02?

8.3 Redundancy

6. Various RAID configurations have been described in the lecture.
    a. Which RAID configuration(s) cannot tolerate any disk failure? Explain. Under what situation do we use this RAID configuration?

    b. Which RAID configuration(s) can only tolerate one single disk failure? Explain.

    c. Which RAID configuration(s) is able to tolerate more than one disk failure? Explain.

(Not necessary to be covered during tutorial)

7. Why does the Processor Cx1006-200M16 has two different types of non-volatile memory (Flash and EEPROM) on-chip?