Task 1 Explain the 9 rules of Codd!

Task 2 What are differences between SQL and NoSQL systems?

Task 3 Explain the difference between OLTP and OLAP! Which opportunities and challenges does HTAP provide?

Task 4 Explain the storage hierarchy! Which options do an increasing main memory and new storage technology provide?

Task 5 What is the difference between the 3 and the 5 layer architecture? In which aspects do the different layer of the 5-layer architecture differ? Which layer of the 5-level Architecture are needed to process transactions?

Task 6 Which additional developments with respect to applications and hardware exist? What does this mean for the development of a database management system?

Task 7 Which advantages and disadvantages do hard-disks and flash storage provide? Discuss the operating principles of both storage media based on the following operations:

- Sequential read
- Read of blocks (Random-Access)
- Read of bits (Random-Access)
- Sequential write
- Write of blocks (Random-Access)
- Write of bits (Random-Access)
Task 8 Raid

(a) Which RAID-Levels (Raid0-6) are suitable to ensure the following requirements of DBMSs:
- Persistence
- Access speed
- Throughput

Which disadvantages do Raid systems have?

(b) On a RAID-3 system with 5 disks the following records are stored:
1. Platte: D1 = 10100101
2. Platte: D2 = 11110000
3. Platte: D3 = 00111100
4. Platte: D4 = 10111001

Explain a procedure for the computation of the parity bit P = ????????!
Assume, that disk No. 3 is defective. How can D3 be computed from the remaining information?

Task 9 Which aspects must be considered regarding the long-term archiving?

Good Luck!