1. The \_\_\_\_\_\_\_ is that part of main memory available for storage of copies of disk blocks.  
a) Buffer  
b) Catalog  
c) Storage  
d) Secondary storage

Answer: a  
Explanation: There is always a copy kept on disk of every block, but the copy on disk may be a version of the block older than the version in the buffer.

2. A major goal of the database system is to minimize the number of block transfers between the disk and memory. This is achieved by  
a) Buffer  
b) Catalog  
c) Storage  
d) Secondary storage

Answer: a  
Explanation: There is always a copy kept on disk of every block, but the copy on disk may be a version of the block older than the version in the buffer.

3. The subsystem responsible for the allocation of buffer space is called the \_\_\_\_\_\_\_\_\_\_\_  
a) Buffer  
b) Buffer manager  
c) Storage  
d) Secondary storage

Answer: b  
Explanation: Programs in a database system make requests (that is, calls) on the buffer manager when they need a block from disk.

4. In the buffer where there is no space for another block, the block can be inserted using  
a) Pinned block strategy  
b) Forced output block  
c) Buffer replacement strategy  
d) All of the mentioned

Answer: c  
Explanation: Most operating systems use a least recently used (LRU) scheme, in which the block that was referenced least recently is written back to disk and is removed from the buffer.

5. A block that is not allowed to be written back to disk is said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_  
a) Pinned  
b) Forced  
c) Buffer  
d) All of the mentioned

Answer: a  
Explanation: Although many operating systems do not support pinned blocks, such a feature is essential for a database system that is resilient to crashes.

6. There are situations in which it is necessary to write back the block to disk, even though the buffer space that it occupies is not needed. This write is called the  
a) Pinned block strategy  
b) Forced output block  
c) Buffer replacement strategy  
d) All of the mentioned

Answer: b  
Explanation: The main-memory contents and thus buffer contents are lost in a crash, whereas data on disk usually survive a crash.

7. The frequently used buffer replacement strategy is  
a) Most recently used  
b) Least recently used  
c) Longest block  
d) All of the mentioned

Answer: b  
Explanation: If a block must be replaced, the least recently referenced block is replaced.

8. In case the buffer manager do not write the blocks properly then the buffer manager uses  
a) Replacement strategy  
b) Forced strategy  
c) Crash recovery system  
d) Both Replacement and Forced strategy

Answer: c  
Explanation: The crash-recovery subsystem imposes stringent constraints on block replacement.

9. The technique where the blocks which have been used are replaced is called  
a) Replacement strategy  
b) Forced strategy  
c) Crash recovery system  
d) Most recently used

Answer: d  
Explanation: The optimal strategy for block replacement is the most recently used (MRU) strategy.

10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ frees the space occupied by a block as soon as the final tuple of that block has been processed.  
a) Replacement strategy  
b) Forced strategy  
c) Toss immediate strategy  
d) Most recently used

Answer: c  
Explanation: The optimal strategy for block replacement is the most recently used (MRU) strategy.