Exam: May 17th , 2011

NOTES:
- Correctness in English is NOT taken into account in the evaluation of the exam.
- *Hint 1: "brief" and "short" indicate that 3~5 lines of answer are sufficient. The capability of understanding well the question and summarizing efficiently the important technical aspects is a "plus".*
- *Hint 2: Please be focused in your answer. If I ask "what is a motion vector" do not write a three-page description of a video codec.*

1. What is the difference between *size* and *resolution* of an image or a video frame?

2. Explain the use of the three different picture types (I, P, and B-pictures) in the MPEG video compression algorithms (consider issues such as how motion estimation and compensation is done, compression efficiency, temporal scalability, random access, etc.)

3. Provide a short explanation of the following terms:

    (a) JPEG quality factor
    (b) MacroBlock.
    (c) Blocking Artifact
    (d) Picture Start Code (in e.g. H.261)
    (e) Payload format

4. Draw a block diagram of a basic video **encoder** (such as the H.261 encoder) which is based on motion compensated prediction and DCT coding of the prediction error. The input to the encoder is a sequence of video frames, the output is the compressed video bit stream. Make visible (different color, or thicker line) the decoding loop. Why is the decoding loop included in the encoder?

5. What is a *file format* in multimedia? Name at least one functionality that is enabled by the file format.