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Example Questions for
Introduction to Image Acquisition Methods

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1. Name the four types of interaction between electromagnetic radiation and matter, and give a short description (1-2 sentences for each type).

(2+2+2+2 p.)

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2. What does DT-MRI measure and for which applications is it useful?

(4 p.)

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3. What transform of an actual image slice is measured in the X-ray tomography process? Describe one possible way to reconstruct the image from this data.

(6 p.)

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4. Name two imaging techniques in which piezoelectric effects are used in the measurement system. Describe for one of these methods how they are used.

(4 p.)

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5. Why does electron microscopy achieve a higher resolution than optical microscopy ?

(2 p.)

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6. Check which of the following statements A–F are true, and which are false.

(2 p. for each correct "true" or "false" answer, −2 p. for each incorrect "true" or "false" answer, 0 p. for each unanswered statement. Negative total numbers of points are adjusted to 0*.)*

A: Convolution in the spatial domain becomes addition in the Fourier domain.

B: The Huygens principle exploits the wave nature of radiation.

C: Digital cameras with higher resolution suffer from lower image quality in terms of noise.

D: Colours that are identical for our human visual system always have the same spectral composition.

E: SPECT is a specific type of transmission X ray tomography.

F: Both radar and ultrasound imaging techniques can be used for velocity measurements.
