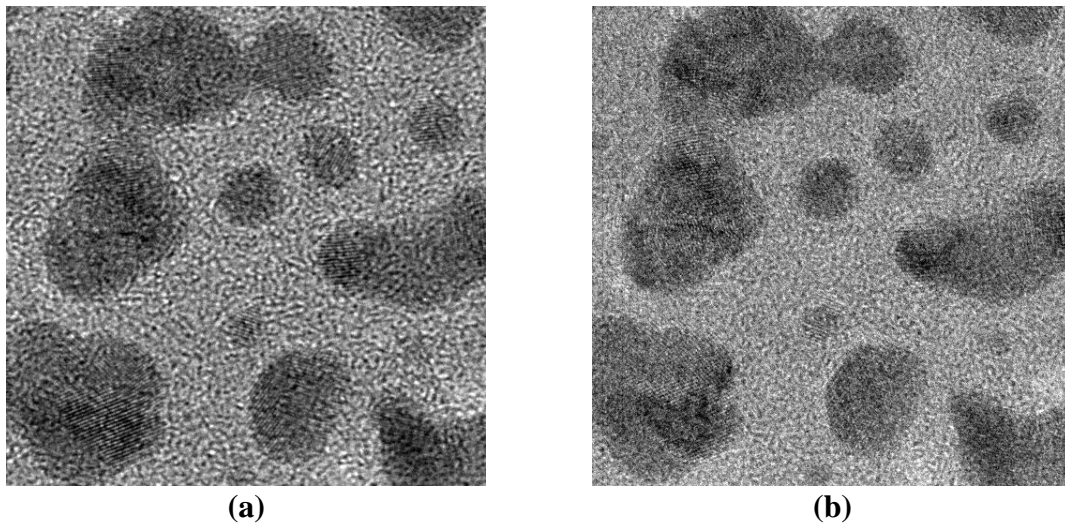


## MISCADA Image Analysis questions (II)

*Please submit answers on DUO*

(1) TIFF files for the two images shown below are provided on DUO. They are images of gold nanoparticles (dark features) on a carbon support film. The first (figure 1a) was acquired with an optimum exposure, such that individual features are easily discernible. The second (figure 1b) image was deliberately acquired with a short exposure time, in order to introduce noise.



**Figure 1:** Images of gold nanoparticles on a carbon support film. Image (a) is acquired with an optimum exposure time, while (b) is underexposed.

i) For the short exposure time image write a programme to generate the 3x3 and 5x5 median filtered images.

[8 marks]

ii) Generate the Fourier transform of the filtered images as well as the optimum exposure time image. You may use a Fast Fourier Transform command in your programming language.

[8 marks]

iii) Taking the optimum exposure time image as the true 'object' discuss the effect median filtering has on the underexposed image and its Fourier transform.

[4 marks]