Question 1:

Please describe the following two algorithms about splitting.

1. Watershed algorithm.
2. Divisive clustering algorithm.

Answer 1:

1. It is an efficient way to split regions. Start flooding the landscape at all of the local minima and label ridges wherever differently evolving components meet. It is often used with the user manual marks corresponding to the centers of different desired components.
2. Computes a histogram for the whole image. Then finds a threshold that best separates the large peaks in the histogram. Repeat finding threshold until regions are either fairly uniform or below a certain size.

Question 2:

Please describe how the mean shift segmentation works.

Answer 2:

Step 1: Use kernel density estimation to estimate the density function given a sparse set of samples.

Step 2: Starting at some guess for a local maximum *yk*, mean shift computes the gradient of the density estimate *f*(*x*) at *yk* and takes an uphill step in that direction. Repeat this step until completely converge or after a finite steps.

Step 3: Because all points will converge to their own peak points, the remaining points can then be classified based on the nearest evolution path.