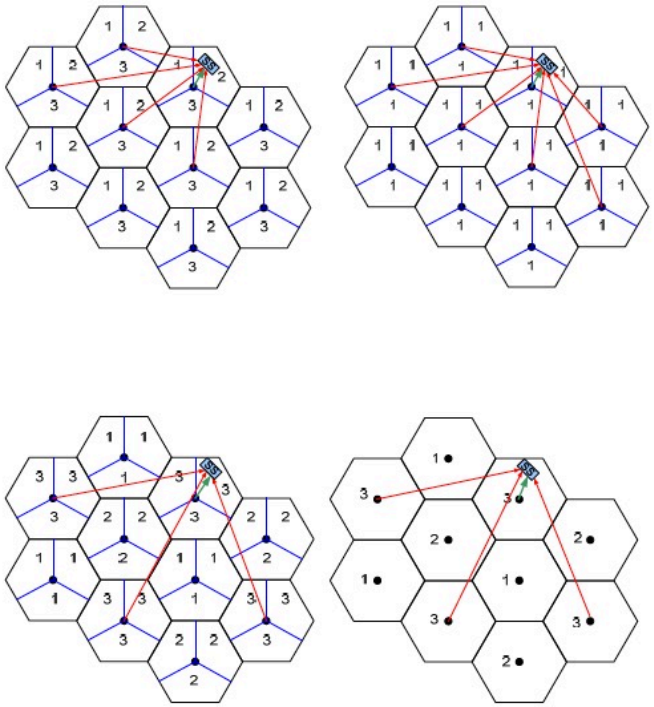
Wk09a: Individual Assignment -Due 13-03-2022

(a) The distance between cell centers with the same frequency band is required to be more than 6 km. What is the cell radius for the cluster size of 12.

(b) Label the frequency reuse patterns below



Wk09b: **Individual Assignment** -Due 13-03-2022 (cont.)

(c) A particular cellular system has the following characteristics: cluster size =9, uniform cell size, user density=100 users/sq km, allocated frequency spectrum = 900-945 MHz, bit rate required per user = 10 kbps uplink and 10 kbps downlink, and modulation code rate = 2 bps/Hz.

(d) A. Using FDMA/FDD:

- 1. How much bandwidth is available per cell using FDD?
- 2. How many users per cell can be supported using FDMA?
- 3. What is the cell area
- 4. What is the cell radius assuming circular cells?

(e) If the available spectrum is divided in to 100 channels and TDMA is employed within each channel:

1. What is the bandwidth and data rate per channel?
2. How many time slots are needed in a TDMA frame to support the required number of users?
3. If the TDMA frame is 10ms, how long is each user slot in the frame?
4. How many bits are transmitted in each time slot?