Question 1.

For a cellular system with a large number of cells, with 40.0 Erlangs offered traffic per cell: estimate the capacity demand, per cell, required on the

- RACH (in access messages per second)
- PAGCH (for both paging messages per second and assignment messages per second)
- TCH/8 (in Erlangs)

a) due to call initiation

b) due to handover

c) due to location updating

**Assume:**

- One cell per location area
- Subscribers generate traffic at 0.05 Erlang/subscriber
- Average call time is 100 sec
- TCH/8 is required for 5 sec for call setup
- 0.2 handovers per call
- Assume that traffic is 50% mobile initiated and 50% network initiated
- Handover requires one PAGCH message followed by TCH/8 for 2 sec
- Location update requires one RACH message, one PAGCH message followed by TCH/8 for 2 sec
- Location update rate consistent with handover rate

**Hint:**

First find the usage of RACH, PAGCH and TCH/8 for ONE call initiation, ONE handover, and ONE location update. Then work out the overall capacity demand.

**Question 2.**

Repeat Question 1 for the case of 7 cells per location area