1. Which statements cause mobile controlled handoff? *Select all that apply.*   `1 point`

   - ☑ Quality of communication
   - ☑ Mobility of the mobile host
   - ☐ Base station overload

2. Suppose that a mobile phone is moving in a region that consists of a group of seven cells. The cells are numbered 1 through 7. The region uses cell group location storage to store the mobile phone location information.   `1 point`

   If the mobility pattern of the phone is Cell1, Cell5, Cell7, Cell6, Cell1, how many handoffs are required?

   - ○ 4
   - ○ 5
   - ○ 1
   - ◉ 0

3. Suppose that one cell tower is placed on a 10-mile long road. The maximum speed of the highway is 60 MPH. The range and TTL of the cell tower are 4 miles and 5 minutes, respectively, and the maximum traffic on the road is 15 cars per mile per minute.   `1 point`

   What should the capacity of the cell tower be so that it can handle the traffic? *Note: Round the answer to the nearest integer.*

   - ○ 375
   - ○ 225
   - ◉ 240
   - ○ 350

4.   `1 point`

Time of Day	Cars Per Min
Midnight	0.5
1 am	0.4
2 am	0.3
3 am	0.2
4 am	0.1
5 am	0.6
6 am	1.5
7 am	2
8 am	7
9 am	15
10 am	20
11 am	22
Noon	25
1 pm	24
2 pm	25
3 pm	24
4 pm	35
5 pm	35
6 pm	37
7 pm	30
8 pm	20
9 pm	15
10 pm	8
11 pm	4

Table: Traffic crossing a 1-mile stretch of highway

Suppose that cell towers are being installed on a **15-mile** stretch of highway. Assume that the maximum speed on this highway is **65 mph**. The traffic at different times of the day is given in the table.

Each cell tower that is installed has the capacity to store the location information of **200** mobile phones. Each cell tower has a range of **5 miles**.

Now assume that the Time to Live (TTL) is **6 minutes**. Suppose that the capacity of the cell towers has decreased to **150**. Given the range of each cell tower, how many towers are needed to cover the 15-mile stretch of highway?

- ○ 3
- ○ < 3
- ● > 3
- ○ Cannot be determined

5. What is the advantage of registration area based location information as opposed to cell based location information? `1 point`

- ○ Lower search cost
- ○ Lower registration cost
- ● Lower update cost
- ○ Lower handoff cost

6. In a tree based replication with n location registrars, what is the worst case search cost? `1 point`

- ○ 2 log(n)
- ● n/2
- ○ Log(n)
- ○ n^2

7. Why does IPv4 fail for mobile internet? `1 point`

- ○ DNS servers are not configured for messages from mobile phones.
- ● Too many DNS updates will overload the system.
- ○ There are not enough IP addresses.
- ○ Mobile phones are not equipped to support IPv4.

8. Why can ingress filtering cause problems for mobile IP? `1 point`

- ○ It causes message integrity problems.
- ○ It introduces inefficiencies and causes delays in communication.
- ○ It causes man-in-the-middle problems.
- ● It can potentially prevent legitimate communication.

9. When does mobile IP protocol introduce inefficiencies? `1 point`

- ○ When ingress filtering is not applied.
- ○ When the mobile host goes to a remote foreign agent.
- ● When the correspondent host and the mobile host are in the same network.
- ○ When the mobile host does not move.

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