

Mobile Computing - Lecture 3

- 1) Each wireless service provider is allocated a limited amount of bandwidth (frequencies). (**True**/False)
- 2) Efficient use dictates multiplexing technique. (**True**/False)
- 3) There are multiplexing techniques.
 - a. 2.
 - b. 3.
 - c. **4.**
 - d. None.
- 4) Allocated frequency band is divided into sub-bands (channels), and each user is assigned a channel.
 - a. **Frequency Division Multiple Access (FDMA).**
 - b. Time Division Multiple Access (TDMA).
 - c. Code Division Multiple Access (CDMA).
 - d. Orthogonal Frequency Division Multiplexing (OFDM).
- 5) One channel is used by many users. BS assigns time slots for users in a round-robin fashion.
 - a. Frequency Division Multiple Access (FDMA).
 - b. **Time Division Multiple Access (TDMA).**
 - c. Code Division Multiple Access (CDMA).
 - d. Orthogonal Frequency Division Multiplexing (OFDM).
- 6) AKA spread-spectrum. Each user is assigned a unique code. Code is mixed with each bit before transmission
 - a. Frequency Division Multiple Access (FDMA).
 - b. Time Division Multiple Access (TDMA).
 - c. **Code Division Multiple Access (CDMA).**
 - d. Orthogonal Frequency Division Multiplexing (OFDM).

- 7) One signal is composed of a number of closely-spaced modulated orthogonal carriers.
- Frequency Division Multiple Access (FDMA).
 - Time Division Multiple Access (TDMA).
 - Code Division Multiple Access (CDMA).
 - Orthogonal Frequency Division Multiplexing (OFDM).
- 8) Validate information of subscriber originating the call.
- Authentication.
 - Location management.
 - Resource management.
 - Handoff/admission control.
- 9) Find the cell where the receiver is currently located.
- Authentication.
 - Location management.
 - Resource management.
 - Handoff/admission control.
- 10) Allocate downlink and uplink channels.
- Authentication.
 - Location management.
 - Resource management.
 - Handoff/admission control.
- 11) Maintain the call if receiver moves while call is active
- Authentication.
 - Location management.
 - Resource management.
 - Handoff/admission control.
- 12) Channels used are either control or data, and either uplink (BS -> MS) or downlink (MS -> BS). (True/False)

- 13) Signal strength of BS is measured in
- Bp.
 - dBm.**
 - Else.
- 14) Signal strength is affected by
- Contour of the terrain.
 - Height of the transmitting antenna.
 - Presence of hills, valleys, and tall buildings.
 - Atmospheric conditions.
 - All.**
- 15) MS measures signal strength of BS of the cell where MS is currently located.
- Periodically.**
 - Inconstantly.
 - Else.
- 16) If signal strength drops below a threshold, the MS will handoff to another adjacent call (BS). (**True/False**)
- 17) Type of handoff
- Hard.
 - Soft.
 - Both.**
- 18) When a user (MS) makes a call, the BS reserves 2 channels for transmission and reception. (**True/False**)
- 19) There are also 2 other channels for uplink and downlink control information between BS and MS. (**True/False**)

- 20) When the user is moving away from the cell while the call is active, the new adjacent cell needs to reserve channels for the user.
- 2
 - 4
- 21) In admission control, each cell has requests for “new call” channels as well as “handoff call” channels. (**True/False**)
- 22) designing good channel assignment schemas.
- Recourse management.**
 - Handoff.
- 23) treats all channel requests **equally**.
- Fully-Shared Schema (FSS).**
 - Handoff Queuing scheme (HQS).
 - Guard Channel Scheme (GCS).
- 24) is simple.
- Fully-Shared Schema (FSS).**
 - Handoff Queuing scheme (HQS).
 - Guard Channel Scheme (GCS).
- 25) maximum utilization of channels and high drop rate of handoff calls.
- Fully-Shared Schema (FSS).**
 - Handoff Queuing scheme (HQS).
 - Guard Channel Scheme (GCS).
- 26) when signal strength drops below threshold, MS requests channels from new cell.
- Fully-Shared Schema (FSS).
 - Handoff Queuing scheme (HQS).**

- c. Guard Channel Scheme (GCS).
- 27) In HQS, if new cell has available channels, reserve 2 channels for MS.
(True/False)
- 28) If not, add MS to handoff queue. (True/False)
- 29) In HQS, when channels become available, assign on a FSFC.
(True/False)
- 30) MS has a window of time before actual admission.
- a. Fully-Shared Schema (FSS).
 - b. Handoff Queuing scheme (HQS).
 - c. Guard Channel Scheme (GCS).
- 31) New call requests are blocked until queue is empty.
- a. Fully-Shared Schema (FSS).
 - b. Handoff Queuing scheme (HQS).
 - c. Guard Channel Scheme (GCS).
- 32) reserve subset of channels for handoffs.
- a. Fully-Shared Schema (FSS).
 - b. Handoff Queuing scheme (HQS).
 - c. Guard Channel Scheme (GCS).
- 33) remaining channels are shared between new calls and handoff calls.
- a. Fully-Shared Schema (FSS).
 - b. Handoff Queuing scheme (HQS).
 - c. Guard Channel Scheme (GCS).

- 34) Never Update Schema:
- a. MS never tells its home MSC where it is.
 - b. When network needs to forward new call to MS, it pages all service area.
 - c. Very expensive for network in terms of bandwidth use.
 - d. **All.**
- 35) Always Update Schema
- a. Whenever MS detects that it entered a new cell, it sends a location update to MSC.
 - b. Network always knows where the MS is.
 - c. Expensive to MS.
 - d. **All.**
- 36) Location Area Scheme
- a. Tradeoff between network paging and MS updates.
 - b. Divide service area into location areas (LAs).
 - c. Each LA consists of a number of adjacent cells.
 - d. Each LA has a unique ID.
 - e. Each BS broadcasts the ID of the LA to which it belongs.
 - f. When an MS enters a new LA, it updates its location with MSC (usually the manager of the LA).
 - g. When the network needs to find an MS, it pages its current LA
 - h. **All.**
- 37) Reporting Cell
- a. Tradeoff between network paging and MS updates.
 - b. Divide service area into cells and some cells are reporting cell.
 - c. If MS enters reporting cell must send the location update.
 - d. When the network needs to find an MS, it pages the last reporting cell and its neighbor.
 - e. **All.**

- 38) Distance based location update
- Tradeoff between network paging and MS updates.
 - Set D = 0.
 - If MS enters new cell then D increases by 1.
 - After threshold D the MS must send location update and set D to zero.
 - When the network needs to find an MS, it pages the last location update and all cells around it within D.
 - All.
- 39) The offered traffic load or traffic intensity (a) of a cell is characterized by
- Average number of MSs requesting the service (average call arrival rate λ).
 - Average length of time the MSs requiring the service (average holding time T).
 - Both.
- 40) $a =$
- λ/T
 - λT
- 41) A servicing channel that is kept busy for an hour is quantitatively defined as two Erlang. (True/**False**)
- 42) is the blocking probability, probability of loss, or probability of rejection for an arriving call.
- Erlang.
 - Erlang B(Bc).**
 - Erlang C.

43) In Erlang B, A call is blocked if all n channels are occupied when the call arrives. (True/False)

44) is the probability of an arriving call being delayed.

- a. Erlang.
- b. Erlang B(B_c).
- c. **Erlang C.**

45) A frequency band or channel in a cell can be **reused** in another cell if those cells are apart and there would be no interference. (True/False)

46) is the closest distance between the centers of two cells using the same frequency Determined by cluster size.

- a. Frequency reuse.
- b. **Reuse distance.**
- c. None.

47) Cluster size is a group of cells using different frequency bands. (True/False)

48) Reuse distance =

- a. $D = (3N)^{0.5}R$
- b. **$D = (2N)^{0.5}R$**
- c. Else.

49) $N =$

- a. **$i^2 + ij + j^2$**
- b. $i^4 + ij + j^4$