

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.
- a. Frequency Division Multiple Access (FDMA).
 - b. Time Division Multiple Access (TDMA).
 - c. Code Division Multiple Access (CDMA).
 - d. **Orthogonal Frequency Division Multiplexing (OFDM).**
- 8) Validate information of subscriber originating the call.
- a. **Authentication.**
 - b. Location management.
 - c. Resource management.
 - d. Handoff/admission control.
- 9) Find the cell where the receiver is currently located.
- a. Authentication.
 - b. **Location management.**
 - c. Resource management.
 - d. Handoff/admission control.
- 10) Allocate downlink and uplink channels.
- a. Authentication.
 - b. Location management.
 - c. **Resource management.**
 - d. Handoff/admission control.
- 11) Maintain the call if receiver moves while call is active
- a. Authentication.
 - b. Location management.
 - c. Resource management.
 - d. **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
- a. Bp.
 - b. dBm.
 - c. Else.
- 14) Signal strength is affected by
- a. Contour of the terrain.
 - b. Height of the transmitting antenna.
 - c. Presence of hills, valleys, and tall buildings.
 - d. Atmospheric conditions.
 - e. All.
- 15) MS measures signal strength of BS of the cell where MS is currently located.
- a. Periodically.
 - b. Inconstantly.
 - c. Else.
- 16) If signal strength drops below a threshold, the MS will handoff to another adjacent cell (BS). (True/False)
- 17) Type of handoff
- a. Hard.
 - b. Soft.
 - c. 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.
- a. 2
 - b. 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.
- a. Recourse management.
 - b. Handoff.
- 23) treats all channel requests **equally**.
- a. Fully-Shared Schema (FSS).
 - b. Handoff Queuing scheme (HQS).
 - c. Guard Channel Scheme (GCS).
- 24) is simple.
- a. Fully-Shared Schema (FSS).
 - b. Handoff Queuing scheme (HQS).
 - c. Guard Channel Scheme (GCS).
- 25) maximum utilization of channels and high drop rate of handoff calls.
- a. Fully-Shared Schema (FSS).
 - b. Handoff Queuing scheme (HQS).
 - c. Guard Channel Scheme (GCS).
- 26) when signal strength drops below threshold, MS requests channels from new cell.
- a. Fully-Shared Schema (FSS).
 - b. 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
- a. Tradeoff between network paging and MS updates.
 - b. Set $D = 0$.
 - c. If MS enters new cell then D increases by 1.
 - d. After threshold D the MS must send location update and set D to zero.
 - e. When the network needs to find an MS, it pages the last location update and all cells around it within D .
 - f. **All.**
- 39) The offered traffic load or traffic intensity (a) of a cell is characterized by
- a. Average number of MSs requesting the service (average call arrival rate λ).
 - b. Average length of time the MSs requiring the service (average holding time T).
 - c. **Both.**
- 40) $a =$
- a. λ/T
 - b. **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.
- a. Erlang.
 - b. **Erlang B(B_c).**
 - c. 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.
- Erlang.
 - Erlang B(B_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.
- Frequency reuse.
 - Reuse distance.
 - None.
- 47) Cluster size is a group of cells using different frequency bands. (True/False)
- 48) Reuse distance =
- $D = (3N)^{0.5} R$
 - $D = (2N)^{0.5} R$
 - Else.
- 49) $N =$
- $i^2 + ij + j^2$
 - $i^4 + ij + j^4$