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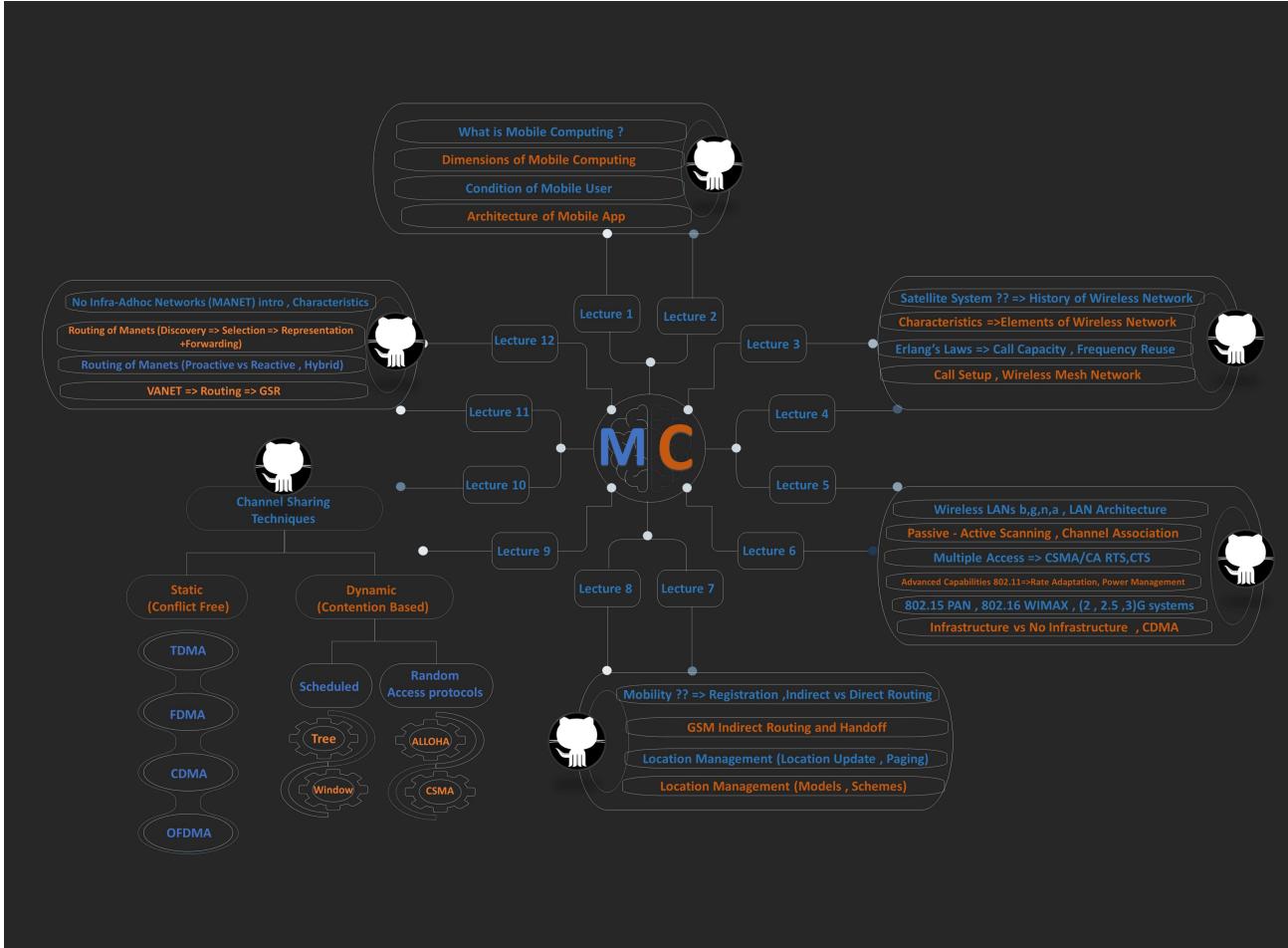
 AhmedKhalil777	Merge branch 'master' of github.com:mansoura-cis/4th_Grade_IS-Master-	Latest commit 4780940 10 minutes ago
..		
 PICS	20200109 {The Final of MC _4}	2 days ago
 CH 5-6.pdf	20200105 {The MC Final Exam }	6 days ago
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 README.md	
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In The Name of Allah

The Final Exam In Shaa AllAH Contents of Mobile Computing

Map Of the Course



In The Name of Allah

Rules of MC

Erlang A (Traffic Load or Traffic Intensity)

$$\alpha = \lambda T$$

λ is the Average number of MSs requesting the service
 T Average length of time the MSs requiring the Service
(average holding time)

A servicing channel that is kept busy for an hour is Quantitatively defined as one Erlang

Examples

If 30 requests are generated by users per hour and $T = 360$ sec

$$\alpha = \frac{30}{60 * 60} * 360 = 3 \text{ Erlang}$$

For Cell of 2 Channels, if 90 requests are generated by users per half hour and the average holding time is 100 sec , then the average call arrival rate is ?? And what is the Traffic intensity ??

$$\lambda = \frac{90}{30 * 60} = 0.05 \quad \alpha = 0.05 * 100 = 5 \text{ Erlang}$$

Erlang B => B_C (The Blocking Probability)

The Probability of Loss

The Probability of rejection for an arriving call

$$B_C = ERL(n, a) = \sum_{i=0}^n \frac{a^i}{i!} \quad n \Rightarrow \text{Number of Channels}$$

a => The traffic intensity

$$QoS = 1 - B_C \quad QoS \Rightarrow \text{Quality of service}$$

A Call is blocked if all n channels are occupied when the call arrives

Erlang C => is the probability of an arriving call being Delayed

Cell Capacity (n) => is the number of channels required for the cell based on its traffic load and a given blocking probability

$$n(\alpha) = \min \{ i=1,2 | ERL(i, \alpha) < B_C \text{ max} \}$$

Examples

Assume that the offered traffic is $\alpha = 2.0$ Erlang , and the blocking probability is 1%

$$n(2.0) = \min \{ i=1,2 | ERL(i, 2.0) < 0.01 \}$$

هتفضل تجرب بعدد ال

Channels

لنيك ما يقتنى من الـ

Blocking probability

$$B_C = ERL(4,2) = \frac{\frac{2^4}{4!}}{1 + 2 + \frac{2^2}{2!} + \frac{2^3}{3!} + \frac{2^4}{4!}} = \frac{\frac{16}{24}}{1 + 2 + \frac{4}{2} + \frac{8}{6} + \frac{16}{24}} = \frac{2}{21} \approx 9.5\%$$

$$B_C = ERL(6,2) = \frac{\frac{2^6}{6!}}{1 + 2 + \frac{2^2}{2!} + \frac{2^3}{3!} + \frac{2^4}{4!} + \frac{2^5}{5!} + \frac{2^6}{6!}} = \frac{1}{21} \approx 1.2\%$$

اللهم ارزقني قوة الحفظ وسرعة الفهم وصفاء الذهن اللهم اهمني الصواب في الجواب
وبلغني أعلى المراتب في الدين والدنيا والآخرة وأحفظني وأصلحني واصلح بي الأمة

Reuse Distance => is the closest distance between the centers of tow cell using the same frequency

Determined by Cluster size (a group of cells using different frequency bands)

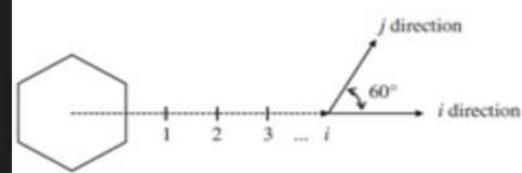
$$D = \sqrt{3N} * R$$

N => number of cells in a cluster
R => Cell Radius

Clustersize (N)=> is Usually set to 1,3,4,7,9

$$N = i^2 + ij + j$$

i => is number of cell along the direction x
j => is number of cell along direction 60 deg to direction of i

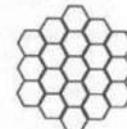


Examples

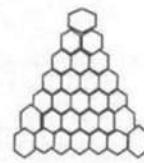
1. A new wireless service provider decided to employ a cluster of 19 cells as the basic module for frequency reuse.
 - (1) Can you identify such a cluster structure?
 - (2) Repeat (1) for reuse factor of 28.

[Solution]

(a) 19-cell cluster $i = 3, j = 2 \implies N = 4 + 9 + 6 = 19$



(b) 28-cell cluster, $i = 4, j = 2 \implies N = 16 + 4 + 8 = 28$



2. For the following cell pattern,



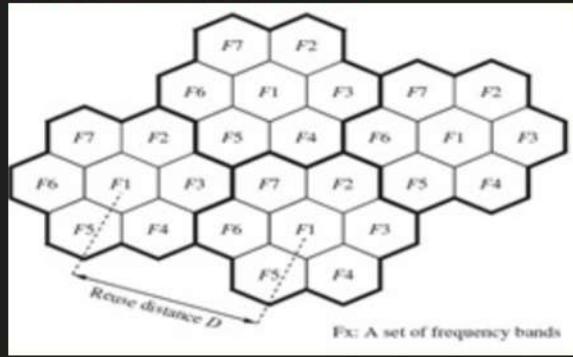
- (1) Find the reuse distance if the radius of each cell is 2 km.

So the number of channels are **6 channels** to avoid the blocking or the loss

مشكلة الشبكات هو في ان كان ترددان مثل بعض قربين من بعض هيجصل تداخل في الحقيقة فوة الترددات يقل كل ما المسافة بينه الى ان تنتهي لذلك يمكن ان يستخدم الترددات مرة اخري ولكن على بعد مبني هذا الجد يسمى

Reuse Distance

Frequency Reuse (Channel Reuse): A frequency band or a channel can be **reused** in another cell if those cells are apart and there would be no interference



Path loss => A model that describes signal attenuation between Transmitter Tx and Receiver Rx as a function of propagation distance

$$L(dB) = 10 n \log_{10}(d) + C$$

n => path loss exponent can be 2 to 4 for free space and 4 to 6 in indoor environment
d => distance between Tx and Rx
C => constant for the system loss

- (2) If each channel is multiplexed among 8 users, how many calls can be simultaneously processed by each cell if only 10 channels per cell are reserved for control, assuming a total bandwidth of 30 MHz available and each simplex channel of 25 kHz?

Ans:

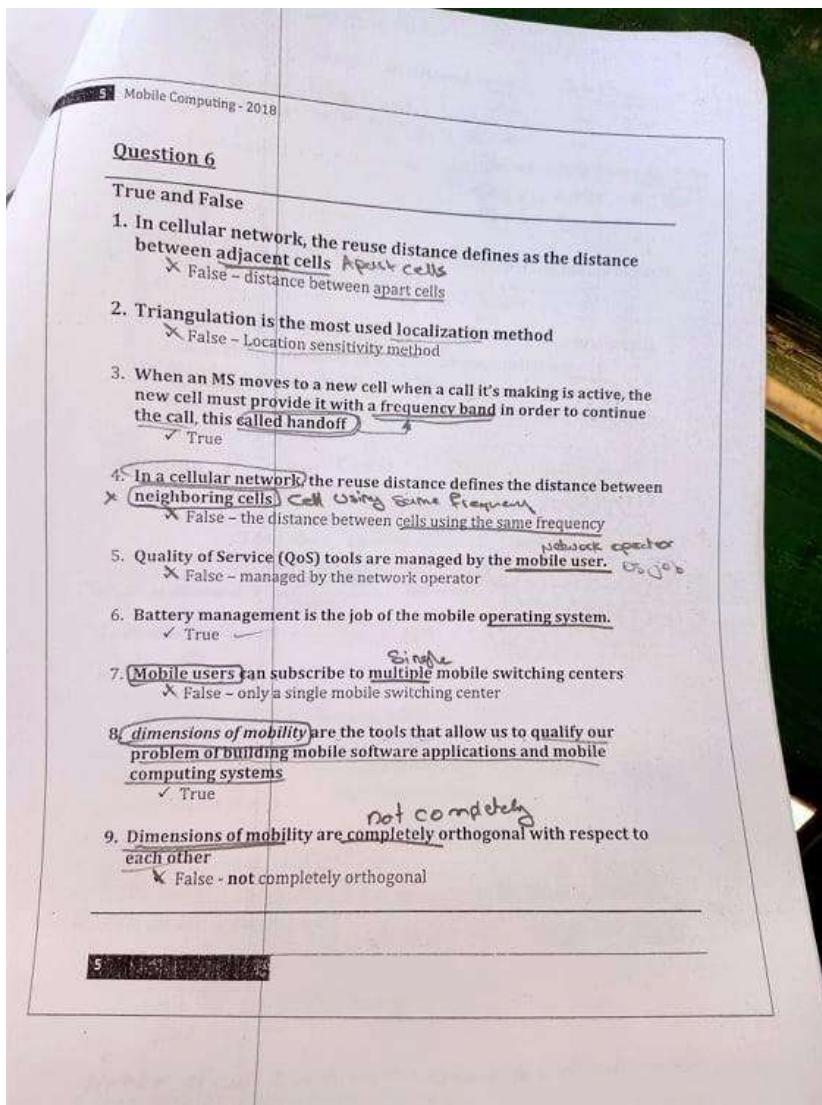
- (a) $D = \sqrt{3N}R \Rightarrow D = 2 * (3 * 12)^{0.5}$
The reuse distance = 12 kms
(b) One duplex channel = 2 (BW of one simplex channel) = $2 * 25 = 50$ kHz
Number of channels = $(\frac{30 \times 10^6}{50}) - 10 * 12 = 600 - 120 = 480$ channels
Number of channels per cell = $\frac{480}{12} = 40$ /cell
Total number of calls per cell = $8 * 40 = 320$ calls/cell

اللهم اني استودعك ما قرأت و ما حفظت و ما تعلمت
فرده عند حاجتي اليه انك على كل شيء قادر

سيد الاستغفار

اللهم أنت ربِّي لا إله إلا أنت خلقتني وأنا
عبدك وأنا على عهْدك ووَعْدك ما استطعت
أعوذ بك من شر ما صنعت أبوء لك بنعمتك
علي وأبوء بذنبي فاغفر لي فإنه لا يغفر
الذنوب إلا أنت

All of these questions not from me , From the Past exams or The Courses Materials



The first image

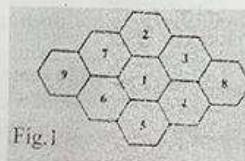
- 1=> False Apart Cells
- 2 => False (Location Sensitivity method)
- 3=> True
- 4 => False (the distance between cells have the same frequency => Clustering)
- 5 => False (managed by the network operator)
- 6=> true
- 7=> False (Single MSC)
- 8=> True
- 9=> False (Not Completely orthogonal)

MCQ

Consider a cell of 4 channels, if 18 requests are generated by users per half an hour, and the average holding time is 200 sec then:

1. Average call arrival rate λ is Erlang			
a) 36	b) 2	c) 100	d) 800
2. The blocking probability B_c is %			
a) 4	b) 9.5	c) 1.2	d) 12
3. The QoS is %			
a) 96	b) 98.8	c) 90.5	d) 100

A user multiplexed-based system, shown in figure 1, has total bandwidth of 30MHz and contains 20 control channels per cell with equal channel spacing of 30KHz. The area of each cell is equal to 8Km² and total area 3600km²



4. Total number of required cluster cells			
a) 20	b) 9	c) 50	d) 10
5. The cell radius km			
a) 1.6	b) 33.8	c) 12	d) 8
6. The reuse distance km			
a) 62.3	b) 8.3	c) 175.6	d) 36
7. Total number of traffic channels/cell			
a) 820	b) 91	c) 1000	d) 100
8. If each channel is multiplexed among 5 users, then the total number of calls by each cell is			
a) 455	b) 164	c) 2000	d) 500
e)			

The Second Pic

السؤال الأول فيه غلطة مفروض يسأل عن ال

Traffic intensity

مش

average arrival call

١٦) مقدار الاتصال في كل جهاز

$$\textcircled{1} \quad \lambda = \frac{18}{30 \times 60} = 0.01 \quad \alpha = \lambda T = 0.01 \times 200 = 2 \text{ ERlangs}$$

$$\textcircled{2} \quad B_C = \frac{\frac{2^4}{4!}}{1 + 2 + \frac{2^2}{2!} + \frac{2^3}{3!} + \frac{2^4}{4!}} \rightarrow 100 = 1.9.5$$

$$\textcircled{3} \quad QoS = 1 - B_C = 1 - 0.5 = 0.5$$

- 4 => Total number of required clusters = 9 cells/Cluster
- 5 => (The Area of Circle PI * R^2) => Cell Radius = (Area / PI)^1/2 = (8 / 3.14)^1/2 = 1.596 => 1.6 kM
- 6 => D = (3*N)^1/2 * R = (3 * 9)^0.5 * 1.6 = 8.3 KMs
- 7 => Total traffic Channels/Cell = 30000/30 - 20 * 9 = 820 channels
 - Traffic channels/cell = 820/9 = 91 channels/Cell
- 8 => # of Maximum calls per cell = 91 * 5 = 455 calls

9 | Mobile Computing - 2019

9. Which of the following is a universally adopted shape of cell?			
a) circle	b) hexagon	c) triangle	d) square
10. What is the condition for handoff?			
a) Move to different cell with idle	b) remain in same cell with call	c) Move to different cell with call	d) remain in same cell with call
11. Hexagon shape is used for radio coverage for a cell because			
a) Maximum coverage area	b) Fewer number of cells required	c) No intersections	d) All
12. Set of properties that distinguish between mobile computing and station system			
a) Dimension of mobility	b) Mobility condition	c) all spectrum	d) none
13. is the ability of mobile software to obtain location information			
a) Location awareness	b) localization	c) Location sensitivity	d) none
14. mobility includes moving between different			
a) networks	b) application	c) geographic area	d) All
15. QoS provide information about			
a) Bandwidth	b) probability of connectivity loss	c) traffic measurements	d) All
16. Battery management is the job of			
a) network	b) base station	c) OS	d) none
17. mobile computing differs from station devices in all the following except			
a) functional requirement	b) non-functional	c) design	d) tasks
18. affects memory and CPU capacities			
a) Mobility	b) Size of device	c) Platform proliferation	d) none
19. VLR and HLR in wireless mobile communications are			
a) gateway	b) database	c) routers	d) none

9

The third image

- 9 => Hexagon
- 10 => C -Move to different cell with call
- 11 => All
- 12 => Dimension of Mobility => Comparison between systems
- 13 => Location Sensitivity
- 14 => all
- 15 => all
- 16 => OS
- 17 => non-functional
- 18 => Size of the device

- 19 => database
-

2 Mobile Computing - 2019

Question 1

There are 1000 users subscribed to a cellular network. The call request rate for each user is 2 call requests per week. For each cell, the average call duration is 10 min.

$$A = \lambda T$$

$$\lambda = \frac{2 * 1000}{7 * 24 * 60} = \frac{2000}{10080}$$

$$T = 10$$

$$A = \lambda T = \frac{2000}{10080} * 10 = 1.98 \text{ Erlang}$$

Question 2

During a busy hour, the number of calls per hour for each of the 12 cells of a cellular cluster is 2220, 1900, 4000, 1100, 1000, 1200, 1800, 2100, 2000, 1580, 1800 and 900.

Assuming the average hold time of 60 seconds, what is the total Erlang value of the system?

Total number of calls in the system =
 $(2220+1900+4000+1100+1000+1200+1800+2100+2000+1580+1800+900) = 21600 \text{ calls}$

Avg. call holding time $T = 60 \text{ seconds}$

Call arrival rate per hour $\lambda = 21600$

Traffic load $A = \lambda * T = \frac{21600}{3600} * 60 = 360 \text{ Erlangs}$

2

10 Mobile Computing - 2019

20. Traffic intensity is expressed in			
a) Erlang	b) Erlang b	c) Erlang c	d) none
21. Which standard uses DSSS process			
a) IEEE 802.11 a	b) IEEE 802.11 b	c) IEEE 802.11 g	d) IEEE 802.15
22. The cluster cell structure identified by i=4 and j=2 contains cells			
a) 20	b) 28	c) 14	d) none
23. in CSMA/CA, sender first transmit small Packets to BS			
a) RTS	b) CTS	c) ACK	d) none
24. scanning frame are sent from Aps to hosts			
a) passive	b) active	c) handoff	d) none
25. is responsible for authentication information of MS SIM card			
a) HLR	b) VLR	c) AuC	d) none
26. unlike 802.11, network has more range and data rates			
a) Bluetooth	b) Wifi	c) WiMAX	d) GSM
27. is important to measure QoS			
a) Type of device	b) Type of OS	c) Type of Network	d) none
28. Who maintain handoff			
a) BS	b) MSC	c) PSTN	d) none
29. IEEE 802.11 standard, ACK is considered a message			
a) Broadcast	b) unicast	c) multicast	d) none
30. IEEE 802.11 standard, RTS is considered a message			
a) Broadcast	b) unicast	c) multicast	d) none
31. CSMA/CD used in			
a) LAN	b) WLAN	c) WAN	d) none
32. is the responsibility of MSC			
a) Connect MS,BS	b) Connect MS,PSTN	c) Connect BS, PSTN	d) All
33. If the size of the cell is kept small in cellular network then			
a) the capacity increased	b) slow handoff process	c) decrease user density	d) none

10

The Fifth image

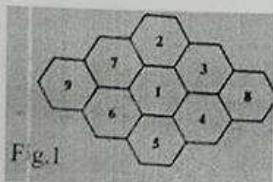
- 20 => Erlang
- 21 => IEEE 802.11 b
- 22 => $N = 16 + 8 + 4 = 28$ cell
- 23 => RTS
- 24 => Passive
- 25 => AuC
- 26 => WIMAX
- 27 => Type of Network
- 28 => MSC
- 29 => Broadcast

- 30 => unicast => Infrastructure Model
- 31 => LAN
- 32 => Connect BS , PSTN
- 33 => The Capacity increased => The size of the cells in cellular network is kept small because of the need of high capacity in areas with high user density and reduced size and cost of base station electronics.

9 Mobile Computing - 2019

Question

A user multiplexed-based system, shown in figure 1, has total bandwidth of 30MHz and contains 20 control channels per cell with equal channel spacing of 30KHz. The area of each cell is equal to 8Km² and total area 3600km²



1. Total number of clusters			
a) 20	b) 9	c) 50	d) 10
2. The cell radius km			
a) 1.6	b) 33.8	c) 12	d) 8
3. The reuse distance km			
a) 62.3	b) 8.3	c) 175.6	d) 36
4. Total number of traffic channels/cell			
a) 820	b) 91	c) 1000	d) 100
5. If each channel multiplexed among 5 users, then total number of cells by each cell is			
a) 455	b) 164	c) 2000	d) 500

9

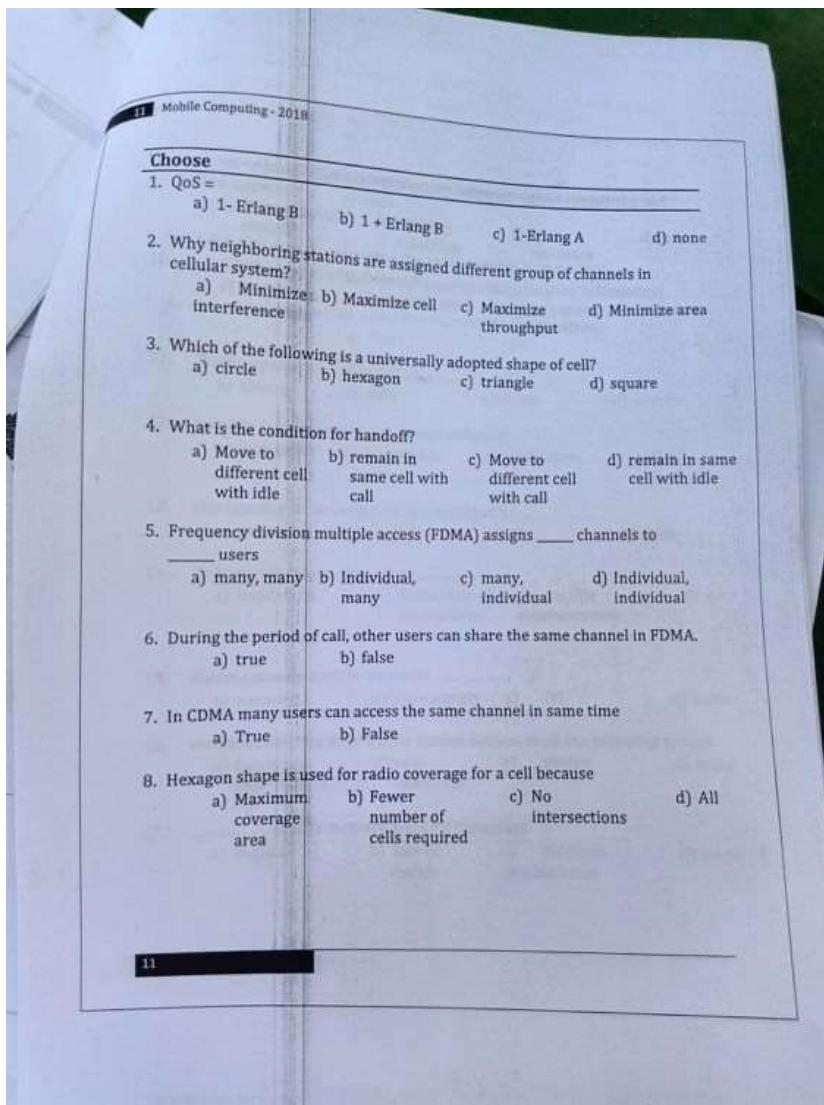
تم حلها فوق

2 | Mobile Computing - 2019

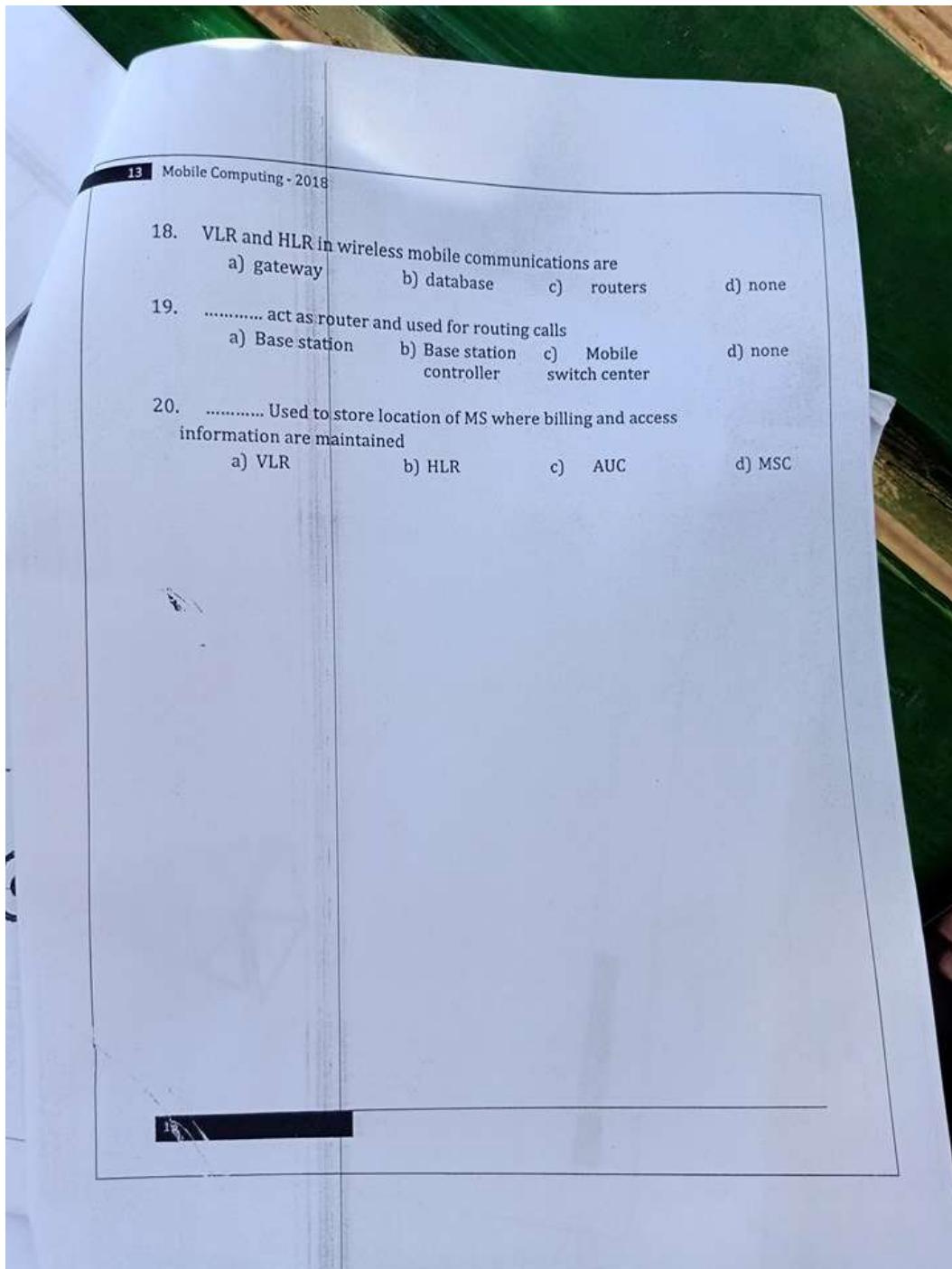
Questions (True - False)

1. Home network give MS a care of address in case of mobility with indirect routing
2. The correspondent gets foreign address of mobile and sends directly to mobile in direct routing.
3. Anchor foreign agent is the first visited network
4. GSM is an example of direct mobility routing
5. Reporting cell is used to detect MS that entered a new cell based on paging scheme
6. Cost of paging is more than cost of location update
7. Network where mobile user is currently residing is known as home network
8. Static location update means that subscriber chooses when and where to update location

- 1 => False => Foreign Network
- 2 => True
- 3 => True
- 4 => False => indirect routing to mobile
- 5=> True
- 6 => False => عارف الصح سؤال غريب
- 7=> False => Visited Network
- 8 => False Local Update



- 1 => 1 - Erlang B
- 2 => Minimize interference
- 3 => hexagon
- 4=> Move to different cell with a call
- 5 => Individual to Individual =>The Frequency band is divided into many channels Each channel is assigned to only a user
- 6 => False not functioned in the FDMA model
- 7 => True
- 8 => All



- 18 => Database\
- 19 => Mobile switching center
- 20 => HLR

Mobile Computing - 2018

MCQ

In the following timeline, assume we have the packets $\{p_1, p_2, p_3\}$, each supposed to start at the following transmission times in milliseconds $\{1, 3, 9\}$ and random delays in milliseconds $\{2, 4, 2\}$. Each packet's length is 3 milliseconds.

<i>Delay</i>	<i>p₁</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	...
--------------	----------------------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	-----

1. At time 3 in pure ALOHA, if there is a collision will occur between
 a) P1 and P2 b) P2 and P3 c) P1 and P3 d) No collision

2. At time 9 in pure ALOHA, if there is a collision will occur between
 a) P1 and P3 b) P2 and P3 c) P1 and P3 d) No collision

3. At time 3 in pure ALOHA, if there is a collision will occur between
 a) P1 and P2 b) P2 and P3 c) P1 and P3 d) No collision

4. Active Transactions can be
 a) Synchronous b) Asynchronous c) a and b d) none

5. location sensing technology
 a) Proximity b) scene Analysis c) Triangulation d) ALL

6. Every manufacturer has his own platform like android, ios. This challenge related to
 a) Limited device b) Location awareness c) Varying UI d) Platform proliferation

7. how to choose the best UI for the context. This challenge related to
 a) Limited device b) Location awareness c) Varying UI d) Platform proliferation

8. Stationary application users have more efficient UI than mobile application
 a) True b) False

9. 802.11 base station is
 a) MSC b) Cell Towers c) Access Point d) None

10. Contain information about visiting MSs
 a) VLR b) HLR c) AuC d) Base Station

10

- 1 => P1 , P2
- 2 => P2 ,P3
- 4 => C
- 5 => All
- 6 => Platform Proliferation
- 7 => Varying UI
- 8 => True
- 9 => Access Point
- VLR

Mobile Computing - 2018			
23. triangle routing equal			
a) indirect	b) direct	c) anchor	d) none
24. non-transparent to correspondent in routing			
a) indirect	b) direct	c) anchor	d) none
25. means route call via new BS without interruption			
a) direct	b) indirect	c) handoff	d) none
26. reasons of handoff			
a) strong signal to/from new BS	b) load balance	c) noise	(d) ALL
27. Considered as channel partitioning except			
a) TDMA	b) FDMA	c) CDMA	d) CSMA
28. Considered as random access except			
a) CSMA	b) Slotted ALOHA	c) Pure ALOHA	d) Taking turns
29. Pure ALOHA efficiency is			
a) better than Slotted ALOHA	b) 18%	c) High	d) ALL
30. One of the following is not characteristics of CSMA			
a) higher than slotted ALOHA	b) Efficiency 37%	c) Increase throughput of ALOHA	d) Listen before transmit
31. MS are out of each other's radio transmission range			
a) Hidden terminal problem	b) Exposed terminal problem	c) Interrupt problem	d) None
32. Routing metrics can be			
a) delay	b) number of hops	c) distance	(d) all
33. dynamic topologies are one of the characteristics of			
a) MANET	b) VANET	c) WiFi	(d) a and b
34. routing processes are			
a) route discovery	b) route selection	c) data forwarding	(d) all
35. In MANET, route computation must be distributed			
a) true	b) false		✓ true

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Mobile Computing - 2018

Question 7

During a busy hour, the number of calls per hour for each of the 12 cells of a cellular cluster is 2220, 1900, 4000, 1100, 1000, 1200, 1800, 2100, 2000, 1580, 1800 and 900. *Sum = 21600*

Assuming the average hold time of 60 seconds, what is the total Erlang value of the system?

Total number of calls in the system =
 $(2220+1900+4000+1100+1000+1200+1800+2100+2000+1580+1800+900) = 21600$ calls

Avg. call holding time $T = 60$ seconds

Call arrival rate per hour $\lambda = 21600$

Traffic load $A = \lambda \cdot T = \frac{21600}{3600} \cdot 60 = 360$ Erlangs

Complete

1. QoS information provided while designing mobile applications are
2. Types of signals between BS and MS are and
3. Type of active transactions are and
4. is acquiring position information requires connectivity to some network-based infrastructure
5. NFC network has bandwidth and Range distance
6. basically represents the area that can be covered by a transmitting base station
7. MSC contains three main components
8. means find the cell where the receiver is currently located

7

Mobile Computing - 2018			
11. Model that describes signal attenuation between transmitter and receiver			
a) Frequency reuse	b) Link Budget	c) Routing Path	d) Path Loss
12. Closest distance between the center of two cells using same frequency			
a) Reuse Distance	b) Reuse Frequency	c) Loss Distance	d) Cluster size
13. Multiple Access Techniques can be handled using			
a) Control channel	b) Traffic Channel	c) Data Channel	d) User Channel
14. In ad hoc mode, the connections between			
a) Host and BS	b) AP and Hosts	c) AP only	d) Hosts only
15. CSMA means			
a) Transmit before sense	b) Sense before receive	c) Sense after transmit	d) Sense before transmit
16. At 802.11 receiver, return ack after			
a) SIFS	b) SFIS	c) DIFS	d) FIFS
17. In network mode, nodes organize themselves and route among themselves			
a) WiFi	b) 802.11	c) Cellular	d) Ad hoc
18. When wireless user uses the same access point, then mobility becomes			
a) High	b) Low	c) Medium	d) none
19. When wireless user uses the multiple access point, then mobility becomes			
a) High	b) Low	c) Medium	d) none
20. Correspondent gets foreign address of mobile and sends directly to mobile			
a) direct	b) indirect	c) semi direct	d) none
21. address used by home agent to forward datagrams to mobile			
a) permanent	b) care off	c) a and b	d) none
22. address used by correspondent to forward datagrams to mobile			
a) permanent	b) care off	c) a and b	d) none

- 11 => Path loss
- 12 => Reuse Distance
- 13 => Control Channel
- 14 => Hosts Only
- 15 => Sense Before Transmit
- 16 => SIFS
- 17 => Adhoc
- 18 => Low
- 19 => High
- 20 => direct
- 21 => Care off

- 22 => Permanent

5. Mobile Computing - 2019

32. Network to which mobile user's permanent phone number belongs, is known as

- | | | | |
|------------|---------------|--------------|---------|
| a) home N. | b) visited N. | c) anchor N. | d) none |
|------------|---------------|--------------|---------|

33. Location update means that subscriber chooses when and where to update location

- | | | | |
|-----------|----------|-----------|------------|
| a) global | b) local | c) static | d) dynamic |
|-----------|----------|-----------|------------|

34. Typical cluster cell size whose structure is identified by $i=4$ and $j=2$ is

- | | | | |
|------|-------|-------|-------|
| a) 6 | b) 19 | c) 28 | d) 30 |
|------|-------|-------|-------|

35. For cell of 2 channels, if 90 requests are generated by users per half hour and the average holding time is 100 sec, then the average call arrival rate is

- | | | | |
|--------|----------|----------|---------|
| a) 0.8 | b) 0.008 | c) 0.025 | d) 0.05 |
|--------|----------|----------|---------|

36. If average call arrival rate is 0.05 , then The blocking probability will be

- | | | | |
|---------|---------|---------|---------|
| a) 0.90 | b) 0.68 | c) 0.75 | d) 0.85 |
|---------|---------|---------|---------|

37. If The blocking probability is 0.78 ,then the QoS will be

- | | | | |
|--------|----------|---------|---------|
| a) 0.6 | b) 0.012 | c) 0.32 | d) 0.22 |
|--------|----------|---------|---------|

38. The set of tools that allow us to qualify the problem of building mobile SW application is known as

- | | | | |
|---------------------------|--------------------------|-----------------------------|---------|
| a) Dimensions of mobility | b) Condition of mobility | c) Architecture of mobility | d) none |
|---------------------------|--------------------------|-----------------------------|---------|

39. MANETs are less secure than other wireless networks

- | | |
|---------|----------|
| a) true | b) false |
|---------|----------|

Route Selection

40. Route discovery is to pick the optimal path from a set of routes

- | | |
|---------|----------|
| a) true | b) false |
|---------|----------|

41. The type of network can affect the QoS

- | | |
|---------|----------|
| a) true | b) false |
|---------|----------|

dsdv *dsdv p/a ACTIVE*

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12. routing occurs when the route determination procedure is invoked on demand *invoked on demand*

- | | | | |
|-----------|--------------|---|-----------|
| a) hybrid | b) proactive | <input checked="" type="checkbox"/> c) reactive | d) direct |
|-----------|--------------|---|-----------|

13. system support voice and data channel using GPRS and evolve EDGE

- | | | | |
|-------|---|-------|-------|
| a) 2G | <input checked="" type="checkbox"/> b) 2.5G | c) 3G | d) 4G |
|-------|---|-------|-------|

14. Closest distance between the center of two cells using same frequency

- | | | | |
|---|--------------------|-----------------|---------|
| <input checked="" type="checkbox"/> a) Reuse Distance | b) Reuse Frequency | c) Cluster size | d) none |
|---|--------------------|-----------------|---------|

15. Model that describes signal attenuation between transmitter and receiver *attenuation J300*

- | | | | |
|--------------------|----------------|-----------------|--|
| a) Frequency reuse | b) Link Budget | c) Routing Path | <input checked="" type="checkbox"/> d) Path Loss |
|--------------------|----------------|-----------------|--|

16. channel is used to organize the use of data channels among multiple users

- | | | | |
|---------|--|--------------------|-----------|
| a) Data | <input checked="" type="checkbox"/> b) Control | c) Multiple access | d) random |
|---------|--|--------------------|-----------|

17. Frequency division duplexing is a mode of

- | | | | |
|---|---|---------|---------|
| <input checked="" type="checkbox"/> a) TDMA | <input checked="" type="checkbox"/> b) FDMA | c) CDMA | d) CSMA |
|---|---|---------|---------|

18. is an example of random-access dynamic channel sharing techniques

- | | | | |
|---------|---------|--|---------|
| a) Tree | b) TDMA | <input checked="" type="checkbox"/> c) ALOHA | d) FDMA |
|---------|---------|--|---------|

19. Every manufacture has his own platform like android, ios. This challenge related to

- | | | | |
|-------------------|-----------------------|---------------|---|
| a) Limited device | b) Location awareness | c) Varying UI | <input checked="" type="checkbox"/> d) Platform proliferation |
|-------------------|-----------------------|---------------|---|

20. Active Transactions can be

- | | | | |
|----------------|-----------------|--|---------|
| a) Synchronous | b) Asynchronous | <input checked="" type="checkbox"/> c) a and b | d) none |
|----------------|-----------------|--|---------|

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wireless *means mobile is*
> جعل الموبايل

53. Wireless always means mobility

a) true b) false

54. Mobility includes moving between different applications

a) true b) false

55. QoS is provided by the network operators

a) true b) false

56. Operating systems and platforms aren't responsible for handling the power consumption issues

a) true b) false

57. VANET is used mainly to find some relevant local information

a) true b) false

58. Boundary crossing can be detected by comparing BS IDs in time based ^{area} location management scheme

a) true b) false

area cell cell change in coverage

42. Validating the information of subscriber originating the call is done by HLR

- a) true b) false

^{PASSIVE}
43. In Active scanning, beacon frames are sent from Aps to hosts

- a) true b) false

44. RTS and CTS are signals mainly used in CSMA/CD protocols

- a) true b) false

^{Localization Sensitivity}
45. Localization is the ability of the device and SW application to obtain location information while moving

- a) true b) false

46. The network doesn't know the location of MS until the call is made in never update area management scheme

- a) true b) false

47. Home network give MS a care of address in case of mobility with indirect routing

- a) true b) false

48. Direct routing, correspondent gets foreign address of mobile and sends packets directly to mobile

- a) true b) false

^{WA}
49. Anchor foreign agent is located in the first visited network

- a) true b) false

^{INDIRECT}
50. GSM is an example of direct mobility routing

- a) true b) false

51. Authentication information of MS is stored in SIM card

- a) true b) false

52. Base stations are typically connected via wired links

- a) true b) false

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802.12 Bluetooth

802.16 WiMAX

Cellular

base station cell tower

21. 802.11 base station is
 a) MSC b) cell tower c) AP Access Point d) none

22. Maximum efficiency of slotted ALOHA is
 a) 90% b) 37% c) 0.37% d) 18%

23. Channel allocation and assignment is done in a predefined way and doesn't change is known as
 a) Scheduled b) dynamic c) contention based d) conflict free

24. Collision detection is easier to implement in
 a) WiFi b) WLAN c) wired LAN d) ALL

25. Polling MAC protocols are commonly used in Topology
 a) Bus b) Star c) Ring d) mesh

26. means route call via new BS without interruption
 a) direct b) indirect c) handoff d) anchor

27. All the following is considered as random access except
 a) ALOHA b) slotted ALOHA c) CSMA d) CDMA

28. there is a negligible delay in protocol
 a) DSR ^{per reactive} b) DSDV c) reactive d) ALL

29. When MSs are out of each other radio transmission range, this can cause
 a) Collision b) Hidden Terminal c) Exposed Terminal d) A and B

ABC

30. Sending via Bluetooth is done using Multiple access channel sharing scheme
 a) static b) dynamic c) taking turn d) ALL

31. Network where mobile user is currently residing, is known as
 a) home N. b) visited N. c) foreign Agent d) none

visited network (cell)

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2 Mobile Computing - 2019

MCQ

1. Which standard uses DSSS process
 a) IEEE 802.11 a b) IEEE 802.11 b c) IEEE 802.11 g d) IEEE 802.15

2. IEEE 802.11 standard, ACK is considered a
 a) Broadcast b) Multicast c) Unicast d) ALL

3. The MANET topology is best described as topology
 a) mesh b) hierachal c) dynamic d) tree

4. IEEE 802.11 standard, RTS is considered a
 a) Broadcast b) Multicast c) Unicast d) ALL

5. SIFS time delay used in CSMA CA before sending
 a) ACK ~~Acknowledge~~ b) Data c) A and B d) none

6. mobile computing differs from station devices in all the following except
 a) functional b) non-functional c) design d) tasks
 requirement

7. is an example of table-driven MANET routing protocols
 a) DSDV b) DSR ^{"use active"} c) AODV ^{"use old"} d) ZRP ^{"use old"}

8. VLR and HLR in wireless mobile communications are
 a) gateway b) Databases c) routers d) none

9. Used to store location of MS where billing and access information are maintained
 a) VLR b) HLR c) AUC d) none

10. CSMA/CD used in
 a) Wifi b) WLAN ^{used in} c) LAN ^{CSMA/CD or wifi} d) ALL

11. All use TDMA except
 a) IS-136 b) IS-95 ^{CDMA} ^{TDMA} c) GSM d) none

Choose

1. QoS =
 a) 1-Erlang B b) 1 + Erlang B c) 1-Erlang A d) none

2. Why neighboring stations are assigned different group of channels in cellular system?
 a) Minimize b) Maximize cell c) Maximize d) Minimize area interference throughput

3. Which of the following is a universally adopted shape of cell?
 a) circle b) hexagon c) triangle d) square

4. What is the condition for handoff?
 a) Move to b) remain in c) Move to d) remain in same
 different cell same cell with different cell cell with idle
 with idle call with call

5. Frequency division multiple access (FDMA) assigns _____ channels to _____ users
 a) many, many b) Individual, c) many, d) Individual,
 many individual individual

6. During the period of call, other users can share the same channel in FDMA.
 a) True b) false

7. In CDMA many users can access the same channel in same time
 a) True b) False

8. Hexagon shape is used for radio coverage for a cell because
 a) Maximum b) Fewer c) No d) All
 coverage number of intersections
 area cells required

9. Set of properties that distinguish between mobile computing and station system
a) Dimension of mobility b) Mobility condition c) all spectrum d) none
10. is the ability of mobile software to obtain location information
a) Location awareness b) localization c) Location sensitivity d) none
11. Traffic intensity is expressed in
a) Erlang b) MHz c) λ/sec d) a and c
12. mobility includes moving between different
a) networks b) geographic c) application area d) All
13. QoS (Quality of Service) tools are managed by
a) network b) mobile c) OS d) none
14. QoS provide information about
a) Available bandwidth b) probability of connectivity c) statistical measurements d) All loss
15. Battery management is the job of
a) network b) base station c) OS d) none
16. mobile computing differs from station devices in all the following except
a) functional requirement b) non-functional c) design d) tasks
17. affects memory and CPU capacities
a) Mobility b) Size of device c) Platform proliferation d) none

18. VLR and HLR in wireless mobile communications are
a) Gateway b) **database** c) routers d) none
19. act as router and used for routing calls
a) Base station b) Base station c) **Mobile controller** d) none
20. Used to store location of MS where billing and access information are maintained
a) VLR b) **HLR** c) AUC d) MSC
21. The set of properties that distinguishes the mobile user from the typical user of stationary computing system
a) **Mobile condition** b) Dimension of mobility c) A and B d) None
22. The connectivity to the network is not a prerequisite for being a mobile computing
a) True b) False
23. Mobile computing devices don't need to be a wireless
a) True b) False
24. Wireless communication systems are mobile computing systems
a) True b) **False**
25. Mobile computing system can be considered a stationary computing system if we stop moving it
a) True b) False
26. can obtain latitude and longitude with accuracy 1-5 meter
a) Scene analysis b) Triangulation method c) Proximity based method d) **GPS**

27. Storage and processing issues are largely addressed by
a) Operating system b) Network Operator c) Dimension of mobility d) None
28. Power consumption issues are largely addressed by
a) Operating system b) Network Operator c) Dimension of mobility d) None
29. Stationary application users have more efficient user interface than mobile computing system
a) True b) False
30. In Active Transaction, all transactions are initiated by the user
a) True **b) False**
31. The high-level plan of what the application will be like is called
a) Architecture of mobile software app. b) Architecture Pattern c) Architecture style d) None
32. are considered as the closer shapes to a circular area
a) Square b) Triangle **c) Octagons** d) Rectangle
33. Each MS subscribes only MSC
a) True b) False
34. There are 1000 users subscribed to a cellular network. The call request rate for each user is 2 call requests per week. For each cell, the average call duration is 10 min. Then the average call arrival rate is
a) 0.198 b) 1.98 c) 19.8 d) none

The Main Process of Call Setup

authentication => Location Management => allocate uplink and the downlink => admission control (Handoff) The Maintenance of a call

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