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Code – CSE-323.

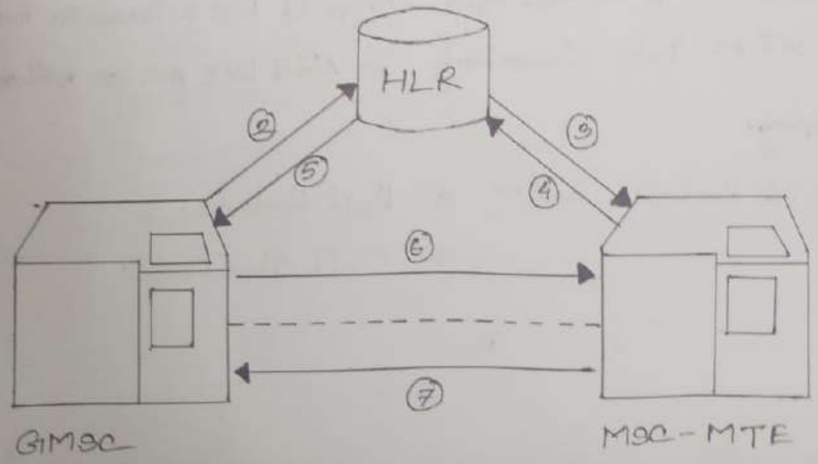
Answer to the Question No-2 (a)

(a) Ans: Originating Call: Call Origination in a telecommunication term And generally refers to an inbound call or to the party making call (the call originator). Call Origination is the opposite side of call termination And includes the Activities related to the call set-up, switching and Connection. It is Important for a call center to Understand the meaning of the call ~~set-up~~, ~~Origini~~ Origination as telecom carrier rate sheets Often are priced Based on call origination and termination.

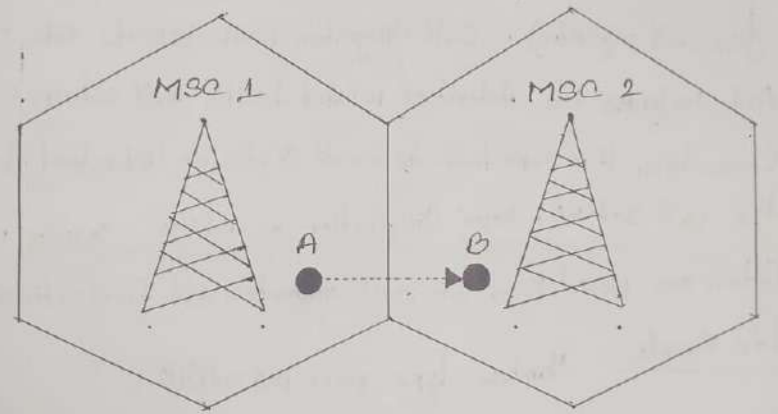
⇒ For Example: Number Type price per minute.

Local $ 0.0034

Totall Free $ 0.00130.



Handover call: In cellular telecommunication, the terms handover or Hand off refers to the process of transferring ongoing Call or Data Connectivity from on Base Station to the base station. When a mobile Moves in to the different cell while the Conversation is in progress. then the MSC (Mobile switching Center) transfer the call to a new chanel belonging to the New base Station



When a mobile user A moves from One cell to Another cell then BSC1 signal strength loses for the Mobile User A And the signal strength of BSC 2 increases And thus Ongoing call or Data Connectivity for Mobil user goes on without Interrupting.

Type of Handover call →
(I) Hard Handover.
(II) Soft-Hand over.

(b) Q. Ans: Measure Network performance way: As mentioned above, to monitor the performance from a user point-of-view, we need to perform Network performance tests from that same perspective. Ideally to do so, you want to monitor Network performance from the end-user's location without having to install a Network measurement tool on each user workstation.

Moreover, you don't want to capture every data packet for analysis. Which will require a lot of Extra hardware and can intrude into your user privacy.

⇒ The most essential Network metrics —

→ Latency. In a Network, latency refers to the measure of time it takes for Data to reach its destination Across a Network. .....

→ Jitter ....

→ paket Loss ---

→ Throughput ----

→ paket Duplication ----

→ paket Reordering ----

→ User quality of Experience ----

→ Most Score ---

Classification of Routing algorithm.

The Routing Algorith is Divided two categories.

(I) Adaptive Routing Algorithm

(II) Non- Adaptive Routing Algorithm.

⇒ **Adaptive Routing**: → In Adaptive routing algorithm is also known as Dynamic routing Algorithm.

→ This Algorithm maks the routing Decision based on the topology and Network traffic.

→ The main perameters related to this Algorithm are Hop Count, distance And estimated transit time.

*** Adaptive Routing Algorithm can be three part classified**

(I) centralized Algorithm.

(II) Isolation "

(III) Distributed "

Non- Adaptive Routing Algorithm: → Non Adaptive routing Algorithm is also known a static routing Algorithm.

→ when booting up the network, the routing information stores the routers.

→ Non Adaptive routing Algorithms do not take the routing dession based on the Network tropology or Network traffic.

** The Noon- Adaptive Routing Algorithms is of two type:

(I) Flooding type

(II) Random walks.

Answer to the question No - 4 (a)

(a) Ans: Traffic intensity / user = $\lambda \cdot t_R$

$= 1 \times (1/60) \times 2.5$

$= 0.041$ Erl / user

for each cell, $n = 20$, $B = 10\%$.

From Erlang's table, The offered traffic, $A = 17.61$ Erls.

Number of user / cell $= 17.61 / 0.041 = 429$

Total Number of users $= 700 \times 429 = 300300$

penetration rate = (Number of user / Total population) $\times 100$

$= (300300 / 4 \times 10^6) 100$

$= 7.50\%$ (Answer)

Answer to the Question No - 4 -

(b) Frequency Reuse: Frequency Reuse is the scheme in which allocation and reuse of channels throughout a Coverage region is done. Each cellular base Station is allocated a group of radio channels o frequency Sub-bands to be used within a small geographic area known as a cell. The shape of the cell is Hexagonal. The process of Selecting and allocating the frequency sub-band for All the Cellular base station within system is called frequency planning

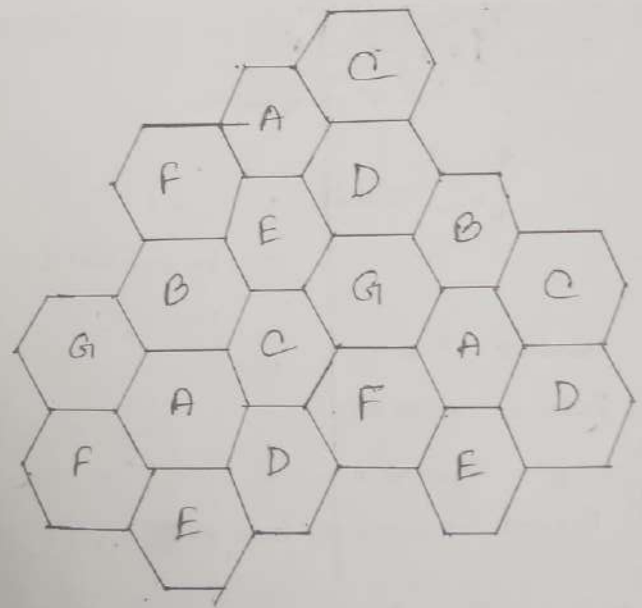
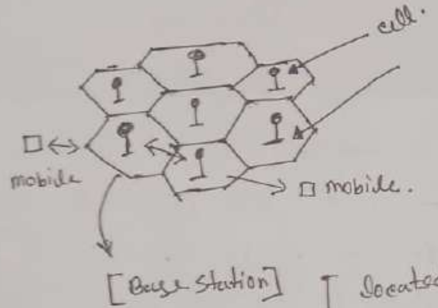


Fig: Frequency Reuse.

Cellular Network:

A Cellular Network is a radio Network Distributed over land through cells where each cell includes a Fixed location transceiver known as base station. The cells together provide radio coverage over larger geographical areas. User equipment (UE), such as mobile phones, is therefore able to Communicate even if the Equipment is moving through cells During transmission.



[located at center of cell.
adjacent cells operate at diff Frequency.

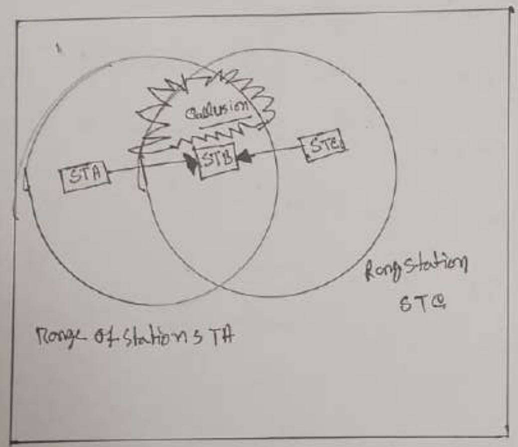
Advantages:

1. Increased Capacity.
2. Reduced power use.
3. Larger Coverage Area
4. Reduced interference from other signal.

[Factor for determining cell size]
→ No. of user
→ Multiplexing And transmission tech. used.

Answer to the Question No - 5.

(a) Answer: Hidden terminal problem:- In wireless LANs (wireless Local area Networks) the hidden terminal problem is a transmission problem that arises when two or More station who are Out of range of each others transmit Simultaneously to a common recipient. This is prevalent in ~~dece~~ Decentralised System where there arent Any Entity for Controling transmission. This occurs when a station is visible from a wireless access point (AP), but is Hidden from Others Station that Communicate with the AP.



⇒ Suppose that there are three station labelled STA, STB, And STC, are ~~transm~~ transmiting while STB is receiving. The station are in a configuration such that the two transmitters STA And STC are not in the radio range of each other. ~~This is shown~~.

The Above Diagram shows that station STA Starts transmiting to Station STB. ~~Since Station STC~~ The frames recived by STC are garbled and Collision occurs. The situation is known as the Hidden terminal problem.

Solution: The Exposed terminal problem is solved by MAC (Medium Access Control) layer protocole IEEE 802.11 RTS/CTS, with the Condition that the Station are synchronized And Frams Size And data speed are the Same. RTS stands for Request to send and CTS stands for clear to send.

A transmitting station sends a RTS fram to the receiving station. The receiving station replies by sending a CTS fram. on receipt of CTS fram, the transmitting station begins transmission.

Any station Hearing the RTS is close to the transmitting station And remains silent long Enough for the CTS. Any Station Hearing the CTS is close to the receiving station and Remains transmission. in the above Example, station STC Hear RTS from station STA. but Hears CTS frame from station STB. So it Understands that STB is busy Defers its transmission thus avoiding collision.

(5) (b) Answer: cell cluster: cells in a cellular Network are generally "grouped" together into cell clusters. cellular Networks are generally Designed as repeated cluster pattern. The Number of cells in a cluster (typically 4, 7, 12 or 21) is a trade-off between the traffic capacity in the cluster and its capacity in the cluster and its interference with the Adjacent cluster of cells (where the same frequencies will be re-used)

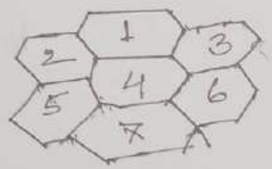


Fig: cluster.

Answer to the Qustion No — (1) (a)

(1)
(a) Ans: $A_1 = 3$ kbps, $A_1 = 1$ Erls, $A_2 = 4$ kbps.

possible probability state

3	$A_3^3/3!$	{0,3}	
2	$A_3^2/2!$	{0,2}	
1	A_1	{0,1}	{1,1
0		{0,0}	(1,0}
A_1-1		1	A2
$A_2=2$		0	1

~~pro~~ possible probabillity state

3	$A_3^3/3!$	$A_2 A_3^2/3!$	
2	$A_1^2/2!$	$A_2 A_3^2/2!$	
1	A_1	$A_2 A_1$	$A_1 A_2^2/2!$
0	1	A_2	$A_2^2/2!$
		1	A_2
		0	1

~~pro~~ possible probabillity state before Normallization

3	0.167	0 334	
2	0, 5	1	
1	1	2	2
0	1	2	2
		1	2
		0	1

~~*~~ Qos each traffic is = 12 ! 001 .