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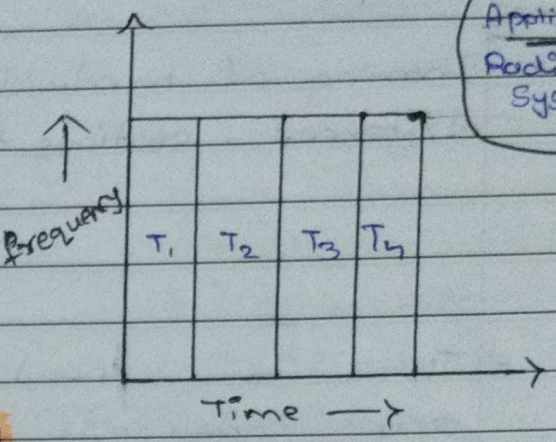
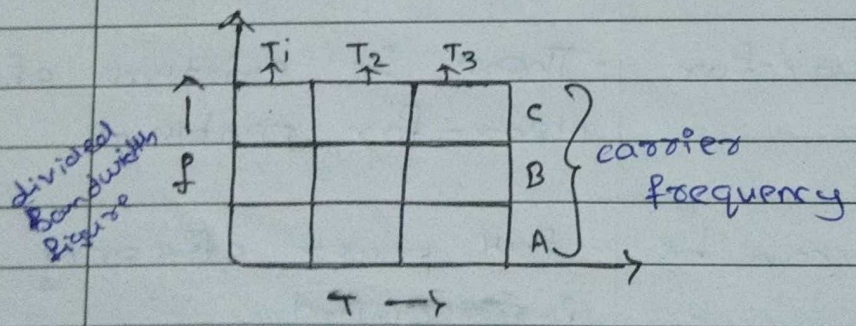
Assignment-4

Date:

1) Explain TDMA in detail.

- TDMA : Time Devision Multiple Access
- TDMA is the channelization process in which the bandwidth of channel is divided into various stations on the time basis.
- There is a time slot given to each station, the station can transmit data during that time slot only.
- Each station must have aware of its beginning of time slot and the location of the time slot.
- TDMA requires synchronization between different stations.
- It is the type of access method in the data link layer.
- At each station data link layer tells the station to use the allocated time slot.





Points

- No guardband required
- Full length frequency

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2) Write down difference between CDMA and FDMA.

FDMA	CDMA
- FDMA : Frequency Division Multiple Access	- CDMA : Code Division Multiple Access
- Sharing of bandwidth among different stations takes place	- Sharing of both :- bandwidth and time among different stations takes place.
- There is no need of any codeword	- codeword is necessary
- There is only need of gaurdband between adjacent channels are necessary	- both gaurd bands and gaurd time are necessary
- Variable transmission rate is difficult	- variable transmission rate is easy.
- There is no Near-far problem	- There is existance of Near-far problem.
- Power efficiency can be reduced	- Full power efficency is required.
- Capacity of system is low	- capacity of system is large.

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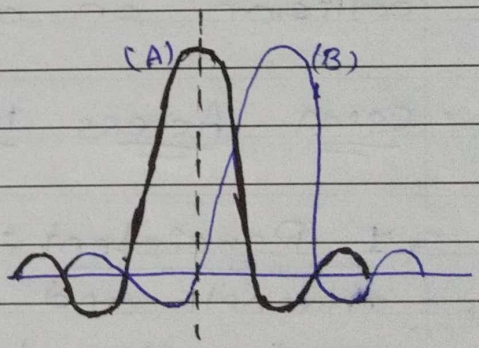
Date: 3

FDMA	CDMA
- It is costly	- Only installation is costly and operating cost is low.
- It is less flexible	- It is more flexible.

3) Explain OFDM in detail.

- Orthogonal Frequency Division Multiplexing (OFDM) is a digital multi-carrier modulation scheme that extends the concept of single subcarrier modulation by using multiple subcarriers within the same single channel ... OFDM is based on the well-known technique of Frequency division Multiplexing (FDM)

- First Subcarrier (A)
- Second Subcarrier (B)



NOTE: when A is at peak then B is at 0 and vice versa

- It is a form of signal modulation that divides a high data rate modulating stream placing them onto many slowly modulated narrowband close-spaced subcarriers, are in this way is less sensitive to frequency selective fading.

- Application of OFDM

- 3G LTE, WiMAX, LANs, digital audio radio, underwater communications, optical light modulation

4) Explain CSMA in detail.

- CSMA : Carrier Sense Multiple Access.
- It is based on media access protocol to sense the traffic on a channel (idle or busy) before transmitting the data.
- It means, if the channel is idle, the station can send data to the channel.
- Otherwise, it must wait until the channel becomes idle.
- Hence, it reduces the chances of a collision on a transmission medium.

- CSMA Access Modes

- 1-Persistent : It first sense the shared channel and if it is idle, it immediately sends the data.
  Else it must wait and keep track of the status of the channel.

- Non-Persistent : Here, each node must sense the channel, and if the channel is inactive, it immediately sends the data. otherwise, the station must wait for a random time.

- P- Persistent: It is the combination of 1-persistent and non-persistent modes.
Here, it defines that each node senses the channel, and if the channel is inactive, it sends a frame with P probability.
If the data is not transmitted, it waits for a (q = 1-p prob.) random time and resumes the frame with the next time slot.

- O-Persistent: It defines the superiority of the station before the transmission of the frame on the shared channel.
If channel is inactive, each stations waits for its turn to retransmit the data.