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CC-303: Data communication and Network.

ch:1: Introduction to Data communication and Network.

Assignment: 1

Q.1 Define data communication and explain its characterstics.

Ans: Data communication means, it involves exchange of data between two computers.
- Computers work with the binary language of zeros and ones.
- The connection can be either a simple wire, or it can be through wireless medica as well.

* Characteristics:

1. Correct delivery:-

When a sender transmits data for an intended recipient, the data must reach only the intended recipient and not someone else.

2. Accurate delivery:-

Data sent by the sender must be received by the receiver in the same form as the one in which it was sent.

3. Timely delivery:-

Data must travel from the sender to the receiver in a finite amount of time.

Q.2 Discuss Protocols and Standards.

Ans: Protocols :-

A protocole is a set of rules and conventions that govern data communication

- A protocol defines the following:

1. Syntax:

Syntax defines the structure or format the data. This means that the order in which it is to be sent is decided. For instance, a protocol could define that ~~must~~ the first 16 bits of any data transmission must always contain the receiver's address.

2. Semantics:

Semantics define the interpretation of the data is being sent.

3. Timing:
This refers to an agreement between the sender and receiver about data transmission rate and duration.

★ STANDARDS:

Data communication standards can be classified into the following two categories:

i) de facto:
de facto standards can be further devided into proprietary and non-proprietary standards.
- Proprietary standards are invented and owned by organization
- Non-proprietary are those that are developed by an organization/commitee/group.

ii) de jure:
- This standards are the standards that have been legislated by an official body
- These are usually led by governments or goverment appointed agencies.

Q.3. Discuss Amplitude, frequency, Phase & Time.

~~1. Amplitude~~

1. Amplitude:

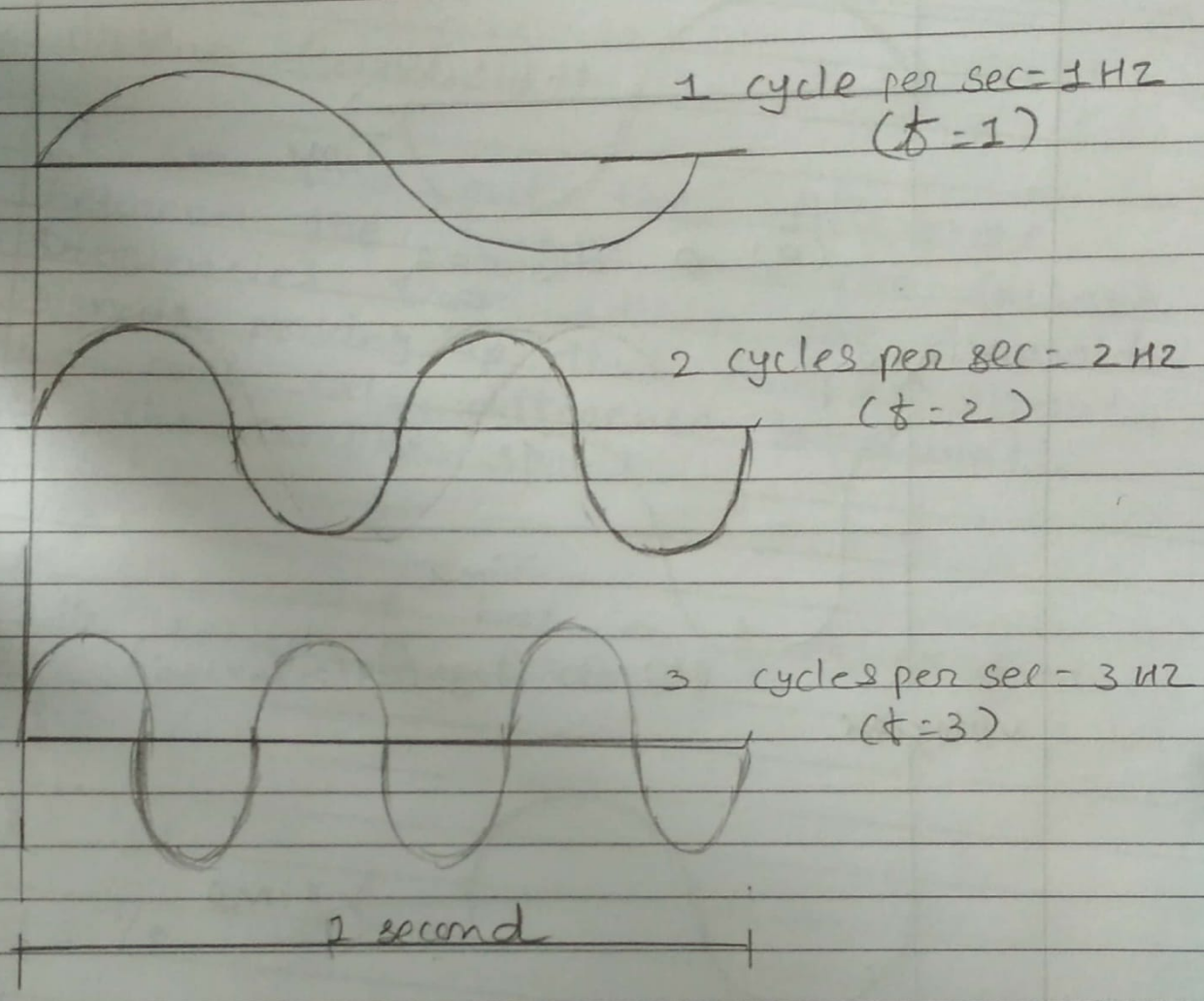
At any point, the strength of the signal or amplitude is given by the x-axis.
- Amplitude is measured in volts, amperes or watts.

2. Period:

We see the signal repeats itself, i.e., completes one cycle after time: T. That is the signal reaches the peak and comes back to its original starting position in time T.
This time taken for the completion of one cycle is called period.

3) Frequency:

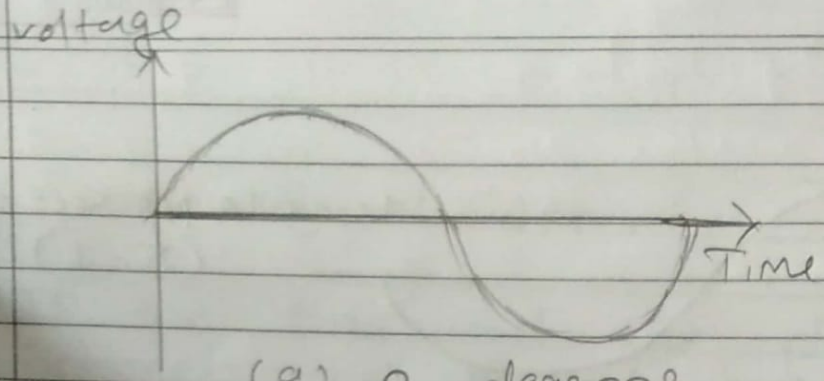
The frequency is nothing but the number of cycles or perids a signal completes in one second.
- It can easily shown that $f = 1/T$.
- Frequency is measured in Hertz (Hz).



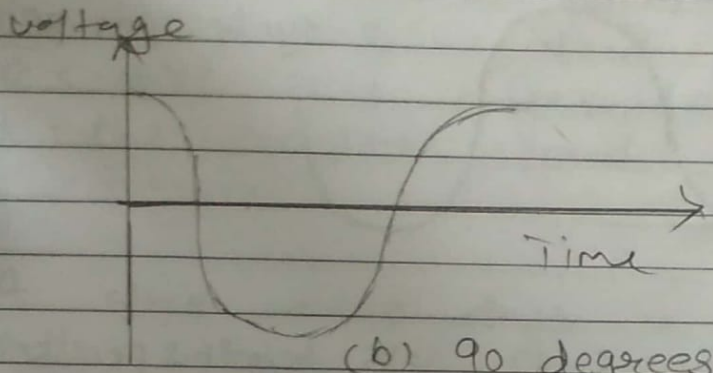
(4) Phase:

It is used to describe a sinusoidal signal.

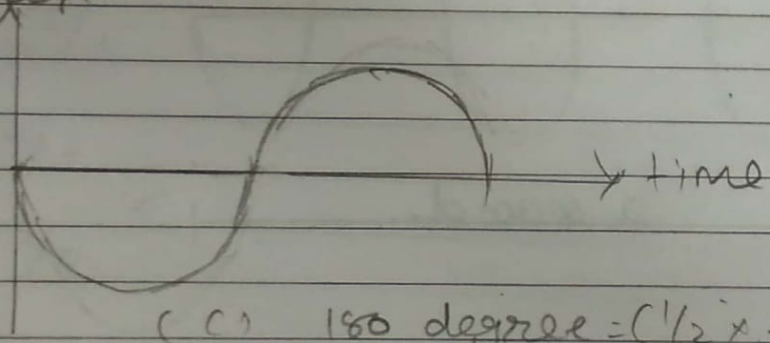
- Phase is measured in degree and radians.
- In figure 1.2 shows for sinusoidal waves with phase ~~defences~~ differences of 90° from the previous one in section (a), (b), (c) and (d).



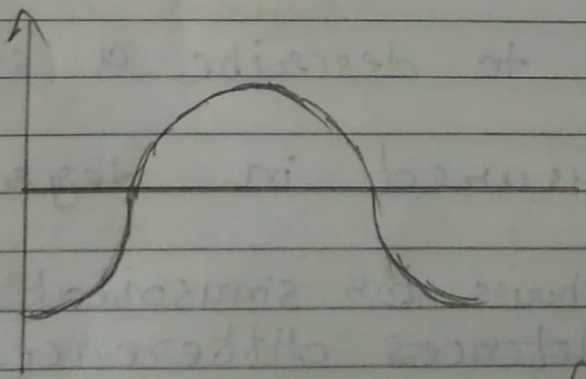
(a) 0 degrees



(b) 90 degrees (= 1/4 × 360°)



(c) 180 degree = (1/2 × 360°)



(d) 270 degree = (3/4 × 360°)

Q.4. Define Bandwidth.

It we find out the difference between the highest and the lowest frequencies from within the sinusoidal signals making up that complex signal, we call this difference bandwidth of the complex signal.

Q.5. A sine wave has a frequency of 8 Hz What is Period?

$\therefore f = 1/t$.

$\therefore 8 = 1/t$

$\therefore t = 1/8$.

Q.6. A sine wave has a frequency of 5 Hz. What is period?

$\therefore f = 1/t$.

$\therefore 5 = 1/t$

$\therefore t = 1/5$.

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Q7. A sine wave completes one cycle in 3 seconds. What is the frequency?

$\therefore f = 1/t$

$\therefore f = 1/3$

Q8. A sine wave completes one cycle in 15 Ms. What is frequency?

$f = 1/t$

$\therefore f = 1/3$

$\therefore f = \frac{1}{(15 \times 10^{-6})}$

$\therefore f = 66,666.66 \text{ Hz}$

$\therefore f = 66 \times 10^{3} \text{ Hz}$

$\therefore f = 66 \text{ KHz}$