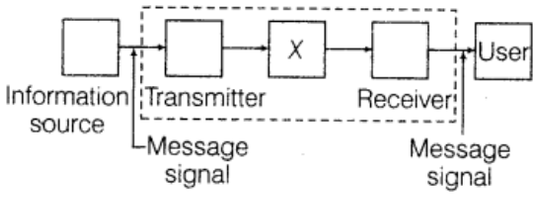
# Communication

## 1 Mark Questions

**1.The figure given below shows the block diagram of a generalised communication system. Identify the element labelled X and write its function. [Delhi 2014 C]**




**Ans.** Labelled element X represents the channel. Its function is to transmit information from one place to another.

**2.What is the meaning of the term attenuation used in communication system? [All India 2014C]**

**Ans.**It refers to the loss of strength of a signal during its propagation through the communication channel output.

**3.Give the one example of point-to-point communication mode. [All India 2014C]**

**Ans.** Telephone is the example of point-to-point communication mode.

**4.What is the function of a transducer used in a communication system? [Delhi 2012]**

**Ans.** Transducer used as a sensor or detector in communication system. It converts the physical signal into electrical signal.

**5.What does the term attenuation used in communication system mean? [Delhi 2012, 2008C]**

**Ans**. It refers to the loss of strength of a signal during its propagation through the communication channel output.

**6.What is the function of a repeater in a communication system? [Foreign 2011; Delhi 2010]**

**Ans. Repeater** It picks up the signals from the transmitter, amplifies it and transmit it to the receiver. Thus, repeater comprises up of receiver, transmitter and amplifier. Its function is to extend the range of communication

**7.What is the function of a transmitter in a communication system? [Foreign 2011]**

**Ans. Transmitter** It comprises of message signal source, modulator and transmitting antenna. Transmitter make signals compatible for communication channel via modulator and antenna**.**

**8.How are microwaves produced? [Foreign 2011]**

**Ans.** A type of electromagnetic wave is microwave whose wavelength ranging from as long as meter to as short as millimeter and having the frequency range 3000 MHz to 300 GHz. This also includes UHF, EHF and various sources with different boundaries.

**9.What is the sky wave propagation? [Delhi 2009]**

**Ans**. Sky wave propagation When radio wave propagates from one place of earth to other after reflection by ionosphere, the range of frequencies from few MHz to 30 MHz gets reflected back by ionosphere. This range also reflected as short wave band. This mode of propagation is used by short wave broadcast service.

**10.What is ground wave propagation? [Delhi 2009]**

**Ans**.Ground wave propagation The radio waves whose frequencies ranged up to 1500 kHz, propagates from one place of earth to other following its transmission along the surface of earth. These waves get attenuated and hence cannot travel over long distances. This range of frequencies also referred as amplitude modulated band (AM band).

**11.What is space wave propagation? [Delhi 2009]**

**Ans**. Space wave propagation It is also known as Line of Sight propagation (LOS). The radio wave transmitted by antenna directly reaches the receiving antenna travelling along a straight

line.

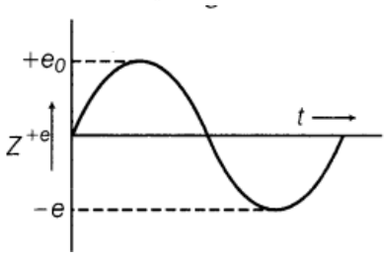
TV waves (80 MHz-200 MHz) propagate through space wave propagation

**12.What does the term transducer mean in an electronic communication system? [Delhi 2009c]**

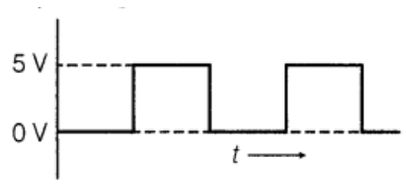
**Ans.** Transducer Any device which converts one form of energy into other, e.g. electric transducer converts pressure, temperature, etc., into varying electrical signals, i.e. transducer converts physical signals into electrical signals.

**13.Distinguish between sinusoidal and pulse shaped signals. [All India 2009C]**

**Ans.** A signal in which current or voltage change continuously with time sinusoidally is known as sinusoidal signal.




A signal in which current or voltage can take only two discrete values for it is called pulse shaped signals.




**14.What are the three basic units of a communication system? [Delhi 2008C]**

**Ans.** Three basic units of communication system are given below:

(i) Transmitter (ii) Communication channel (iii) Receiver

Basically, the transmitter is located at one place, the receiver is located at some other place (near or far) and the channel is the physical medium that connects the transmitter and receiver.

**15.Name the mode of propagation of radio waves which travels in a straight line, from the transmitting antenna to the receiving antenna. [All India 2008C]**

**Ans.** Space wave propagation is that mode of wave propagationjn which the radio waves emitted from the transmitter antenna reaches the receiving antenna through the space.

## 2 Marks Questions

**16. Write the function of the following in communication systems. [All India 2014]**

**(i) Transducer (ii) Repeater**

**Ans.** (i)Transducer – Refer to ans. 12.

(ii) Repeater – Refer to ans. 6.

**17.Write the function of the following in communication systems. [All India 2014]**

**(i) Transmitter (ii) Modulator**

**Ans**. (i) Transmitter – Refer to ans.7

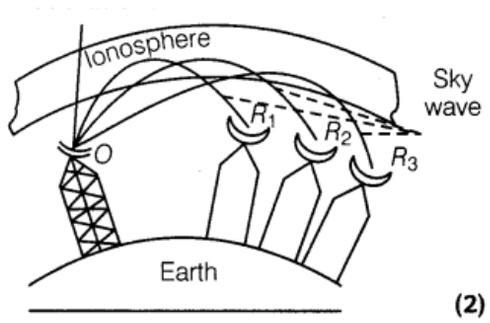
(ii) Modulator – A modulator is a device that performs modulation.

**18. Write the function of the following in communication system [All India 2014]**

**(i) Receiver (ii) Demodulator**

**Ans. (i)** Receiver – A receiver extracts the desired message signal from the received signals at the channel output.

**(ii) Demodulator –** A demodulator is a device that performs demodulation, i.e. inverse of modulation.




**(2)**

As, signals of these frequency ranges are reflected back by ionosphere up to receiver end after travel ling a large distance.

**19.Which mode of wave propagation is suitable for television broadcast and satellite communication and why? Draw a suitable diagram depicting this mode of propagation Of wave. [Foreign 2012]**

**Ans.** Sky wave

Television —> 1710 kHz to 40 MHz

**20.Distinguish between Analog and Digital signals. [Delhi 2012]**

**Ans.** Continuously with time At any time, the value of signal is represented by its amplitude.

Digital signal In digital signal, the amplitudes are not continuous with time. Amplitude of a signal has only its two levels (i.e. low or high).

**21.Mention the function of any two of the following used in communication system. (i) Transducer (ii) Repeater (iii) Transmitter (iv) Bandpass filter [Delhi 2012]**

**Ans.** (i) Transducer Refer to ans. 12.

(ii) Repeater Refer to ans. 6.

(iii) Transmitter Refer to ans. 7.

(iv) Bandpass filter A device which passes the signals with certain frequency range only.

**22.What is sky wave communication? Why is this mode of propagation restricted to the frequencies only up to few MHz? [All India 2011]**

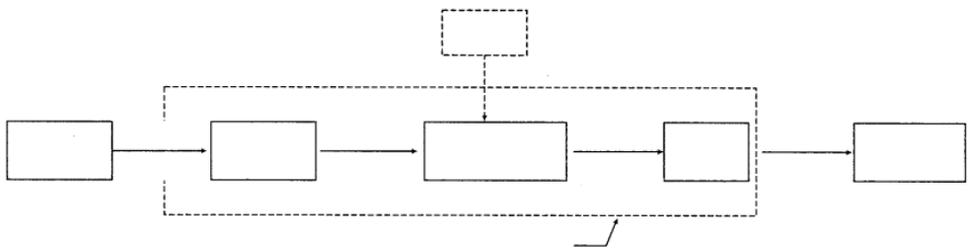
**Ans.** Sky wave propagation Refer to ans. 9. Reason behind restriction up to Few MHz. The radio wave of frequencies up to 30 MHz cannot penetrate the ionosphere and they get reflected back to earth whereas higher frequencies (> 40 MHz) bends slightly but not reflected back to the earth. Because, frequencies up to few MHz (< 30 MHz) gets reflected back to earth. Hence, this frequency range is used for sky wave communication

**23.What is space wave communication? Write the range of frequencies suitable for space wave communication. [All India 2011]**

**Ans.** Space wave propagation Refer to ans. 11.

**24.Draw a block diagram showing the important component in a communication system. What is the function of a transducer? [Foreign 2011]**

**Ans.** Range of frequency suitable for space wave propagation is 100 MHz to 220 MHz.



**25.What is the range of frequencies used for TV transmission? What is common between these waves and light waves? [Delhi 2010]**

**Ans.** The range of frequencies used for TV transmission is 100 MHz to 220 MHz

| Characteristic | Light wave | Radio wave (100 -200 MHz) TV waves |
|---|---|---|
| Speed | Travel with speed c = 3 x $10^8$ m/s | Also travel with speed c = 3 x $10^8$ m/s |
| Reflection | Occurs and get affected by ground terrain, atmosphere and other objects. | It occurs and also get affected by ground terrain, atmosphere and other objects. |

**26.What is the range of frequencies used in satellite communication? What is common between these waves and light waves? [Delhi 2010]**

**Ans**. The range of frequencies used in satellite communication is 3.7 GHz to 6.4 GHz.

Common between these waves and light waves refer to frequency range for light wave which is of GHz order.

**27.In standard AM broadcast, what mode of propagation is used for transmitting a signal? Why is this mode of propagation limited to frequencies up to a few MHz? [Foreign 2010]**

**Ans.** In standard AM broadcast, surface wave propagation is used for transmitting the signals.

Attenuation of surface wave increases very ripidly with increase in frequency that is why it is limited to frequencies up to a few MHz. In AM broadcast, range of frequencies are limited to 30 MHz

**28.Name any two types of transmission media that are commonly used for transmission of signals. Write the range of frequencies of signals for which these transmission media are used. [All India 2010c]**

**Ans.** For the transmission of signals, following two types of transmission media are used.

(i) Sky wave propagation or short wave propagation.

(ii) Space wave communication or line of sight communication.

**Range of frequencies**

(i) Sky wave propagation 30 MHz > f > 1500 kHz

(ii) Space wave communication 1 MHz > f > 100 MHz

**29.(i) What is line of sight communication?**

**(ii) Why is it not possible to use sky wave propagation for transmission of TV signals? [Foreign 2009]**

**Ans.** (i) **For line of sight communication**

Refer to Ans. 11.

(ii) The frequency of waves used for transmission of TV signals are of range 100 MHz-220 MHz. But ionosphere may be able to reflect waves back on earth of frequency upto 30 MHz. Therefore, ionosphere is unable to reflect TV waves (space waves) back on the earth

**30.A communication satellite is essentially a repeater station in space. Justify this statement by analyzing the function of a repeater. [All India 2009C]**

**Ans.** A communication satellite

(i) pick up the signal transmitted by transmitter

(ii) amplifies it

(iii) retransmit it towards information users. These all are also a function of repeater to receive, amplify and retransmission of signal.

**31.Write the function of**

- **transducer and**
- **repeater in the context of communication system. [All India 2009]**

**Ans. Transducer** Any device which converts one form of energy into other, e.g. electric transducer converts pressure, temperature, etc., into varying electrical signals, i.e. transducer converts physical signals into electrical signals.

**Repeater** It picks up the signals from the transmitter, amplifies it and transmit it to the receiver. Thus, repeater comprises up of receiver, transmitter and amplifier. Its function is to extend the range of communication