

**CLASS: XII**  
**PHYSICS ASSIGNMENT**

**Unit X : Communication Systems**

1. What is a communication system? Describe briefly the major constitution of a communication system.
2. What is an analog signal? Explain the terms bandwidth and baseband.
3. What is a discrete signal? Explain briefly how an analog signal can be converted into a digital signal. Enumerate some of the advantages of digital communication.
4. For a 4-bit D/A converter, work out the output voltage for each of the following input voltage combinations:
  - (i) 0001
  - (ii) 0010
  - (iii) 0100
  - (iv) 1000
  - (v) 1001
  - (vi) 1101
5. Explain the term modulation.
6. Why should transmitters broadcasting programmes use different carrier frequencies?
7. What is a carrier wave? Why high frequency carrier waves are employed for transmission.
8. A radio broadcast is transmitted using *amplitude modulation* at a *carrier frequency* of 680 kHz. Explain the meaning of each of the italicized words.
9. What is amplitude modulation? Discuss its advantages and disadvantages.
10. What is frequency modulation?
11. Why is an FM signal less susceptible to noise than an AM signal?
12. What mode of communication is employed for the transmission of TV signals? Explain why TV transmission towers are usually made very high.
13. Explain the term demodulation.
14. What are different modes of propagation of Radio waves?
15. Why ground wave propagation is not suitable for high frequencies?
16. Long distance radio broadcasts use short-wave bands. Why?
17. It is necessary to use satellites for long distance TV transmission. Why?
18. Optical and radio telescopes are built on ground but X-ray astronomy is possible only from satellites orbiting the earth. Why?
19. Explain, how an optical fibre transmits light round bends.
20. Work out the critical angle for light at the boundary between the core and the cladding of a step index fibre if the refractive index of the core is 1.48 and of the cladding is 1.45.