

## **UNIT V: ELECTROMAGNETIC WAVES**

1. Name the electromagnetic radiations used for viewing objects through haze and fog.
2. Write the frequency limit of visible range of electromagnetic spectrum in kHz.
3. Write the following radiations in an ascending order in respect of their frequencies: X-rays, microwaves, ultraviolet rays and radio waves.
4. Name the electromagnetic radiations used for studying crystal structure of solids.
5. Why are microwaves used in RADAR?
6. Which part of electromagnetic spectrum has largest penetrating power?
7. Which part of electromagnetic spectrum has highest frequency?
8. Give a reason to show that microwaves are better carriers of signals for long range transmission than radio waves.
9. What is the ratio of speed of infra-red rays and ultra-violet rays in vacuum?
10. What is the ratio of speed of gamma rays and radio waves in vacuum?
11. Arrange the given electromagnetic radiations in the descending order of their frequencies: Infra-red, X-rays, Ultraviolet and Gamma rays.
12. When can a charge act as a source of electromagnetic waves?
13. A radio can tune in to any station in the 7.5 MHz to 12 MHz band. What is the corresponding wavelength band?
14. A charged particle oscillates about its mean equilibrium position with a frequency of  $10^9$  Hz. What is the frequency of the electromagnetic waves produced by the oscillator?
15. Which part of electromagnetic spectrum does the wavelength  $10^{-10}$  m corresponds to?
16. What do electromagnetic waves consist of? Explain on what factor does its velocity in vacuum depend.
17. What is the phase difference between electric and magnetic field vectors?
18. Give a reason to show that micro waves are better carrier of signal for long range transmission than radio waves.
19. Find the wave length of electromagnetic waves of frequency  $5 \times 10^{19}$  Hz in free space. Give its two applications.
20. A plane electromagnetic wave travels in vacuum along z-direction. What can you say about the directions of its electric and magnetic field vectors? If the frequency of the wave is 30 MHz, what is its wavelength?
21. .What are the direction of electric and magnetic field vectors, in an electro magnetic waves , related to each other and to the direction of propagation of the waves?
22. The small ozone layer on top of the stratosphere is crucial for human survival. Why?
23. If the earth did not have an atmosphere, would its average surface temperature be higher or lower than what it is now?
24. which constituent radiation of electromagnetic spectrum is used:
  1. in radar
  2. to photograph internal human body parts.
  3. for taking photograph of the sky during light and foggy condition? Give one reason for your answer in each case.
25. Write the properties, wavelength, frequency of all electromagnetic waves along with their uses.

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