

ELECTROMAGNETIC WAVE

1 MARK QUESTIONS

1. What are the direction of electric and magnetic field vectors relative to each other and relative to the direction of propagation of electromagnetic waves?(**All India 2012**)
2. Welders wear special goggles or face masks with glass windows to protect their eyes from electromagnetic radiation.name the radiation and write the range of their frequency. (**All India 2012**)
3. To which part of the electromagnetic spectrum does a wave of frequency 5^{10} hz belong? (**All India 2014**)
4. To which part of the electromagnetic spectrum does a wave of frequency 3^{10} Hz belong? (**All India 2014**)
5. Write the condition under which an electron will move undeflected in the presence of crossed electric and magnetic fields. (**Delhi 2014**)

2 MARK QUESTIONS

1. Draw a sketch of a plane electromagnetic wave propagating along the z-direction. Depict clearly the direction of electric and magnetic fields varying sinusoidally with z. (**All India 2011**)
2. A capacitor of capacitance 'c' is being charged by connecting it across a dc source along with an ammeter. Will the ammeter show a momentary deflection during the process of charging? if so, how would you explain this momentary deflection and the resulting continuity of current in the circuit? Write the expression for current inside the capacitor. (**All India 2013**)

3 MARK QUESTIONS

1. How are em waves produced by oscillating charges?
Draw a sketch of linearly polarized em waves propagating in the Z-direction.
Indicate the directions of the oscillating electric and magnetic fields.

OR

Write Maxwell's generalization of Ampere's Circuital Law. Show that in the process of charging a capacitor, the current produced within the plates of the capacitor is

$$i = \epsilon_0 \frac{d\phi}{dt}$$

Where ϕ_E is the electric flux produced during charging of the capacitor plates. **(Delhi 2016)**

2. (i) Which segment of electromagnetic waves has highest frequency ? How are these waves produced? Give one use of these waves.
(ii) Which em waves lie near the high frequency end of visible part of em spectrum? Give its one use. In what way this component of light has harmful effects on humans?

(Foreign 2016)

3. (a) Describe briefly how electromagnetic wave are produced by oscillating charges?
(b) Give one use of each of the following.
(i) Microwaves
(ii) Ultraviolet Rays
(iii) Infrared Rays
(iv) Gamma Rays

(All India 2011)

4. Name the parts of the electromagnetic spectrum which is
(a) Suitable for 'radar' systems in aircraft navigations.
(b) Used to treat muscular strain.
(c) Used as a diagnostic tool in medicine.

Write in brief, how these waves can be produced.

(All India 2012)