



## Class 12 Physics | Electromagnetic Waves

MCQ WORKSHEET • 15 questions • Choose one correct option • Suggested time: 25 minutes

### 1. Electromagnetic waves in vacuum are:

- A. Transverse
- B. Longitudinal
- C. Stationary only
- D. Mechanical

### 2. In a plane electromagnetic wave, $E$ and $B$ are:

- A. Perpendicular and in phase
- B. Parallel and  $90^\circ$  out of phase
- C. Perpendicular and opposite in phase
- D. Parallel and in phase

### 3. The relation between field amplitudes in vacuum is:

- A.  $E_0 = B_0$
- B.  $E_0 = c^2 B_0$
- C.  $B_0 = c E_0$
- D.  $E_0 = c B_0$

### 4. An EM wave has $B_0 = 10^{-8}$ T. With $c = 3 \times 10^8$ m/s, $E_0$ is:

- A. 3 V/m
- B. 30 V/m
- C.  $3 \times 10^{-16}$  V/m
- D. 0.3 V/m

### 5. An EM wave of frequency $10^8$ Hz in vacuum has wavelength:

- A. 0.3 m
- B. 3 m
- C. 300 m
- D. 30 m

### 6. Which needs no material medium to travel?

- A. Sound in air
- B. Visible light
- C. A stretched-string wave
- D. A water-surface wave

### 7. Which has the highest frequency?

- A. Radio waves
- B. Microwaves
- C. Gamma rays
- D. Infrared

### 8. Which has the longest wavelength?

- A. Visible light
- B. Ultraviolet
- C. X-rays
- D. Radio waves

### 9. Correct order of increasing frequency is:

- A. Microwave, radio, visible, infrared
- B. Radio, infrared, microwave, visible
- C. Visible, infrared, microwave, radio
- D. Radio, microwave, infrared, visible

### 10. Infrared radiation is commonly used in:

- A. Nuclear gamma spectroscopy only
- B. TV remote controls
- C. Radio broadcasting at metre wavelengths
- D. Imaging bones through the body

### 11. X-rays are used in medical imaging mainly because they:

- A. Are audible
- B. Cannot travel in vacuum
- C. Have the longest wavelengths
- D. Penetrate tissues with differing absorption

### 12. Ultraviolet radiation is commonly used for:

- A. Heating only by conduction
- B. Germicidal disinfection
- C. AM radio transmission
- D. Underwater sound detection

### 13. Microwaves are commonly used in:

- A. Mechanical balances
- B. Ordinary optical microscopes as visible light
- C. Radar systems
- D. Stethoscopes

### 14. Displacement current is associated with:

- A. Constant magnetic flux
- B. A stationary charge with constant field
- C. Only moving positive ions
- D. Changing electric flux

### 15. For a charging capacitor, displacement current between plates equals:

- A. Conduction current in the leads
- B. Half the lead current
- C. Twice the lead current
- D. Zero always

## ANSWER KEY — check after completing all 15 questions

1.A 2.A 3.D 4.A 5.B 6.B 7.C 8.D 9.D 10.B 11.D 12.B 13.C 14.D 15.A