

Electromagnetic Waves

NEET previous year questions · Physics

5 questions from the official papers: NEET 2026 (1), Re-NEET 2026 (2), NEET 2020 (2). Each is followed by its answer and a worked solution written by BrainIt. Generated on 23 October 2026.



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1. NEET 2026 · Q45

Match List-I (Electromagnetic wave) with List-II (Production) and choose the correct answer from the options given below.

List I	List II
P) Microwave	I) Electrons in atoms emit light when they move from a higher energy level to a lower energy level
Q) Visible light	II) Radioactive decay of nucleus
R) Gamma rays	III) Vibration of atoms and molecules
S) Infra-red rays	IV) Klystron valve or magnetron valve

- (1) P-III, Q-I, R-II, S-IV (2) P-III, Q-IV, R-I, S-II
(3) P-IV, Q-I, R-II, S-III (4) P-IV, Q-III, R-II, S-I

Answer (3)

Sol. Microwaves are generated by klystron or magnetron valves (P-IV). Visible light is emitted when atomic electrons drop from higher to lower energy levels (Q-I). Gamma rays are produced in radioactive decay of the nucleus (R-II). Infra-red radiation arises from the vibration of atoms and molecules (S-III). This matches option (3).

2. Re-NEET 2026 · Q38

An electromagnetic wave travelling in a lossless dielectric medium having a dielectric constant, $\epsilon_r = 9$, has the electric field, $E_x = E_0 \sin(kz - 2\pi \times 10^6 t) \text{ V m}^{-1}$ where E_0 is the amplitude and k is the wave vector. Among the following options, the incorrect choice is

- (1) The speed of the electromagnetic wave inside the medium is 10^8 ms^{-1}
(2) The wavelength of the electromagnetic wave inside the medium is 300 m
(3) The magnetic field is given by the relation $B_y = \frac{E_0}{v} \sin(kz - 2\pi \times 10^6 t)$ where v is the speed of the electromagnetic wave inside the medium
(4) The direction of propagation of the electromagnetic wave is along $+z$

Answer (2) or (3) (NTA accepted more than one option)

Sol. NTA accepted both option (2) and option (3) as answers. The refractive index is $n = \sqrt{\epsilon_r} = 3$, so $v = \frac{c}{n} = 10^8 \text{ m s}^{-1}$, making option (1) correct. From $\omega = 2\pi \times 10^6$, the frequency is 10^6 Hz , hence $\lambda = \frac{v}{f} = 100 \text{ m}$, not 300 m; therefore option (2) is incorrect. Option (3) is also incorrect as printed: the magnetic field should be $B_y = \frac{E_0}{v} \sin(kz - \omega t)$, whereas the option uses B_0/v . Option (4) is correct because $kz - \omega t$ represents propagation along $+z$.
NCERT Class 12, Electromagnetic Waves.

3. Re-NEET 2026 · Q43

The following table presents the part of the electromagnetic spectrum and their corresponding major applications. The correct option is:

List I	List II
P) Microwave	I) For purifying the water
Q) UV rays	II) For warming the food
R) Gamma rays	III) For AM and FM communication systems
S) Radio wave	IV) For treating the Cancer cells

- (1) P-I, Q-II, R-III, S-IV (2) P-I, Q-IV, R-II, S-III
 (3) P-II, Q-I, R-IV, S-III (4) P-II, Q-IV, R-III, S-I

Answer (3)

Sol. Microwaves are absorbed by water molecules in food and heat it, so P-II. Ultraviolet radiation is germicidal and is used in water sterilisation, so Q-I. Gamma rays carry enough energy to destroy malignant tissue and are used in radiotherapy, so R-IV. Radio waves are the carriers in amplitude modulated (AM) and frequency modulated (FM) broadcasting, so S-III. NCERT Class 12, Electromagnetic Waves (electromagnetic spectrum).

4. NEET 2020 · Q142

Light with an average flux of 20 W cm^{-2} falls on a non-reflecting surface at normal incidence having surface area 20 cm^2 . The energy received by the surface during a time span of 1 minute is

- (1) $12 \times 10^3 \text{ J}$ (2) $24 \times 10^3 \text{ J}$
 (3) $48 \times 10^3 \text{ J}$ (4) $10 \times 10^3 \text{ J}$

Answer (2)

Sol. The energy received is given by $E = \text{flux} \times \text{area} \times \text{time}$. Substituting, $E = 20 \text{ W/cm}^2 \times 20 \text{ cm}^2 \times 60 \text{ s} = 24 \times 10^3 \text{ J}$. Chapter: Electromagnetic Waves.

5. NEET 2020 · Q168

The ratio of contributions made by the electric field and magnetic field components to the intensity of an electromagnetic wave is (c = speed of electromagnetic waves)

- (1) $1 : 1$ (2) $1 : c$
 (3) $1 : c^2$ (4) $c : 1$

Answer (1)

Sol. In an electromagnetic wave the electric and magnetic energy densities are equal because $E = cB$ and $c^2 = 1/(\mu_0 \epsilon_0)$. Their contributions to intensity are therefore in the ratio 1:1. Chapter: Electromagnetic Waves.

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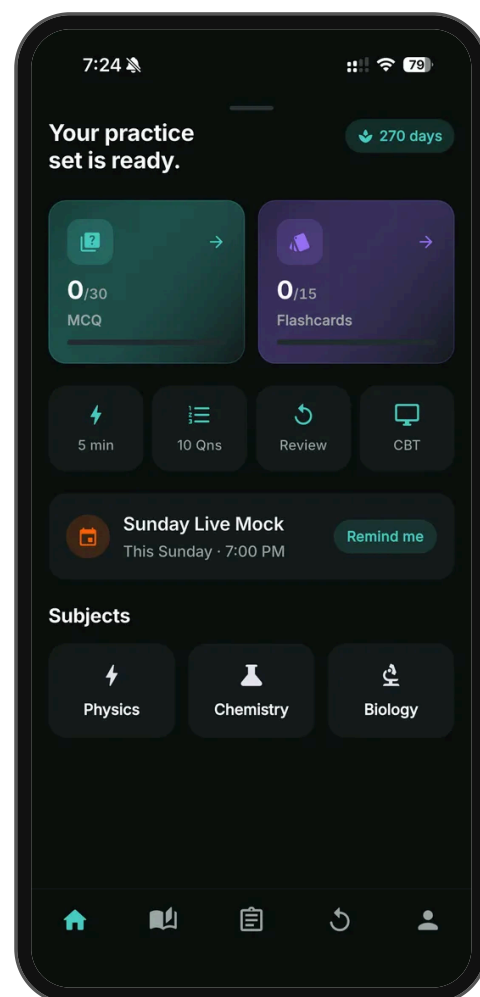
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