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Daily Practice Problems

NEET PHYSICS

Topic: Electromagnetic waves

Q.1 If $\vec{E}$ and $\vec{B}$ are the electric and magnetic field vectors of electromagnetic waves then the direction of propagation of electromagnetic wave is along the direction of-

(1) $\vec{E}$ (2) $\vec{B}$

(3) $\vec{E}\times\vec{B}$ (4) none of these

Q.2 The electromagnetic waves do not transport-

(1) energy

(2) charge

(3) momentum

(4) information

Q.3 The wave function (in S.I. units) for an electromagnetic wave is given as-

$\Psi(x,t) = 10^3 \sin\pi(3 \times 10^6 x - 9 \times 10^{14} t)$. The speed of the wave is-

(1) 9×10^{14} m/s

(2) 3×10^8 m/s

(3) 3×10^6 m/s

(4) 3×10^7 m/s

Q.4 In the above problem, wavelength of the wave is-

(1) 666 nm (2) 666 Å

(3) 666 μm (4) 6.66 nm

Q.5 In an electromagnetic wave the average energy density is associated with-

(1) electric field only

(2) magnetic field only

(3) equally with electric and magnetic fields

(4) average energy density is zero

Q.6 In an electromagnetic wave the average energy density associated with magnetic field will be-

(1) $\frac{1}{2}LI^2$

(2) $\frac{B^2}{2\mu_0}$

(3) $\frac{1}{2}\mu_0 B^2$

(4) $\frac{1}{2}\frac{\mu_0}{B^2}$

Q.7 In the above problem, the energy density associated with the electric field will be-

(1) $\frac{1}{2}CV^2$

(2) $\frac{1}{2}\frac{q^2}{C}$

(3) $\frac{1}{2}\frac{\varepsilon^2}{E}$

(4) $\frac{1}{2}\varepsilon_0 E^2$

Q.8 In which part of earth's atmosphere is the ozone layer present ?

(1) troposphere

(2) stratosphere

(3) ionosphere

(4) mesosphere

Q.9 The ozone layer is earth's atmosphere is crucial for human survival because it-

(1) hions

(2) reflects radio signals

(3) reflects ultraviolet rays

(4) reflects infra red rays

Q.10 The frequency from 3×10^9 Hz to 3×10^{10} Hz is-

(1) high frequency band

(2) super high frequency band

(3) ultra high frequency band

(4) very high frequency band

Q.11 The frequency from 3 to 30 MHz is known as-

(1) audio band

(2) medium frequency band

(3) very high frequency band

(4) high frequency band

Q.12 The AM range of radiowaves have frequency-

(1) less than 30 MHz

(2) more than 30 MHz

(3) less than 20000 Hz

(4) more than 20000 Hz

Q.13 Select wrong statement from the following for EMW-

(1) are transverse

(2) travel with same speed in all medium

(3) travel with the speed of light

(4) are produced by accelerating charge

Q.14 The waves related to tele-communication are-

(1) infrared

(2) visible light

(3) microwaves

(4) ultraviolet rays

Q.15 The nature of electromagnetic wave is-

(1) longitudinal

(2) longitudinal stationary

(3) transverse

(4) transverse stationary

Q.16 Greenhouse effect keeps the earth surface-

(1) cold at night

(2) dusty and cold

(3) warm at night

(4) moist

Q.17 A plane electromagnetic wave of frequency 40 MHz travels in free space in the X-direction.

At some point and at some instant, the electric field $\vec{E}$ has its maximum value of 750 N/C in Y-direction.

The wavelength of the wave is-

(1) 3.5 m (2) 5.5 m

(3) 7.5 m (4) 9.5 m

Q.18 In the above problem, the period of the wave will be-

(1) 2.5 μs

(2) 0.25 μs

(3) 0.025 μs

(4) none of these

Q.19 In Q.18, the magnitude and direction of magnetic field will be-

(1) 2.5 μT in X-direction

(2) 2.5 μT in Y-direction

(3) 2.5 μT in Z-direction

(4) none of these

Q.20 In Q.17, the angular frequency of e.m wave will be-(in rad/s)

(1) $8\pi \times 10^7$

(2) $4\pi \times 10^7$

(3) $2\pi \times 10^5$

(4) $\pi \times 10^4$

Q.21 In Q.17, the propagation constant of the wave will be-

(1) 8.38 m^{-1}

(2) 0.838 m^{-1}

(3) 4.19 m^{-1}

(4) 0.419 m^{-1}

Q.22 The sun delivers 10^3 W/m^2 of electromagnetic flux to the earth's surface.

The total power that is incident on a roof of dimensions 8m × 20m, will be-

(1) 6.4×10^3 W

(2) 3.4×10^4 W

(3) 1.6×10^5 W

(4) none of these

Q.23 In the above problem, the radiation force on the roof will be-

(1) 3.33×10^{-5} N

(2) 5.33×10^{-4} N

(3) 7.33×10^{-3} N

(4) 9.33×10^{-2} N

Q.24 In Q.22, the solar energy incident on the roof in 1 hour will be-

(1) 5.76×10^8 J

(2) 5.76×10^7 J

(3) 5.76×10^6 J

(4) 5.76×10^5 J

Q.25 The sun radiates electromagnetic energy at the rate of 3.9×10^{26} W. It's radius is 6.96×10^8 m. The intensity of sun light at the solar surface will be – (in W/m^2)

(1) 1.4×10^4

(2) 2.8×10^5

(3) 4.2×10^6

(4) 5.6×10^7

Q.26 In the above problem, if the distance from the sun to the earth is 1.5×10^{11} m, then the intensity of sunlight on earth's surface will be- (in W/m^2)

(1) 1.38×10^3

(2) 2.76×10^4

(3) 5.52×10^5

(4) none of these

Q.27 The decreasing order of wavelength of infrared, microwave, ultraviolet and gamma rays is :

(1) infrared, microwave, ultraviolet, gamma rays

(2) microwave, infrared, ultraviolet, gamma rays

(3) gamma rays, ultraviolet, infrared, microwaves

(4) microwaves, gamma rays, infrared, ultraviolet

Q.28 The S.I unit of displacement current is-

(1) Henry (2) Coulomb

(3) Ampere (4) Farad

Q.29 Displacement current is same as-

(1) conduction current due to flow of free electrons

(2) conduction current due to flow of positive ions

(3) conduction current due to flow of both positive and negative free charge carriers

(4) is not a conduction current but is caused by time varying electric field

Q.30 The maxwell's equation :

$\oint \vec{B}.\vec{dl} = \mu_0\left(i+\varepsilon_0.\frac{d\phi_E}{dt}\right)$ is a statement of-

(1) Faraday's law of induction

(2) Modified Ampere's law

(3) Gauss's law of electricity

(4) Gauss's law of magnetis

ANSWER KEY

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.	3	2	2	1	3	2	4	2	3	2
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	2	1	2	3	3	3	3	3	3	1
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	2	2	2	1	4	1	2	3	4	2