	INDIAN SCHOOL AL WADI AL KABIR	
Class: XII	**Department: SCIENCE 2023 – 24** **SUBJECT: PHYSICS**	**Date: 08/11/2023**
Worksheet No: 08 **WITH ANSWERS**	**CHAPTER / UNIT: ELECTROMAGNETIC WAVES**	**Note:** **A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC:**	**ROLL NO.**

OBJECTIVE TYPE QUESTIONS

1. What is wavelength of signal weather frequency of 300 megahertz?

(a) 2m (b) 20m

(c) 10m (d) 1m.

Ans. D $[\lambda = \frac{c}{\upsilon} = \frac{3\times10^8}{3\times10^8} = 1m]$

Application

2. If $\lambda_x, \lambda_m, \lambda_v$ represents wavelength of X-Rays, microwaves & visible rays then

(a) $\lambda_m > \lambda_x > \lambda_v$ (b) $\lambda_m > \lambda_v > \lambda_x$

(c) $\lambda_v > \lambda_x > \lambda_m$ (d) $\lambda_v > \lambda_m > \lambda_x$

Ans. B

Understanding

3. Human body radiate

(a) microwave (b) X-rays

(c) infrared rays (d) gamma rays.

Ans. C

Remembering

4. EM waves can be produced by a charge:

(a) An accelerated charged particles

(b) A charged particles moving with constant speed

(c) at rest.

(d) either at rest or moving with constant velocity.

Ans. (a)

Remembering

5. In EM spectrum minimum wavelength is of:

(a) gamma rays (b) radio waves

(c) visible rays (d) microwave.

Ans. A

Understanding

6. Properties of EM radiation are identified by using there:

(a) colour (b) their use

(c) speed (d) frequency or wavelength

Ans. D

Understanding

7. Light wave constitutes:

(a) mechanical waves (b) magnetic waves

(c) electromagnetic waves (d) longitudinal waves

Ans. C

Understanding

8. Which of the following transport by EM waves:

(a) charge & momentum (b) frequency & wavelength

(c) energy & momentum (d) wavelength & energy

Ans. C

Understanding

FILL IN THE BLANKS

1 . For an EM wave propagating alongx –axis Emax =30V/m, the maximum value of magnetic field is _____.

Ans. 10^{-7}T

Application

2. Shorter the wavelength of an electromagnetic waves ,…….. energy it carries

Ans. More [$E = \frac{hc}{\lambda}$ **]**

Understanding

3. Waves used to transmit cellular telephone message are…….

Ans. microwaves

Analysing & Evaluating

4. In EM waves transport both……and……. takes place.

Ans. Energy, momentum [E = $h\upsilon$ & $p=\frac{h}{\lambda}$]

Understanding

5. EM waves are produced by…….. charges.

Ans. Accelerated/Oscillated

Understanding

6. To study structure of crystals…….. are used.

Ans. X-rays

Application

7. Human eye can detect…….. part of electromagnetic spectrum.

Ans. visible

Remembering

8. To treat cancer and tumor in radiography…….. rays are used.

Ans. γ -rays

Remembering

QUESTIONS BASED ON BOARD PAPERS

FILL IN THE BLANKS

[1] During the propagation of an EM wave in a medium electrical energy density is ---------- magnetic energy density
Equal
Understanding
[2] The velocity of electromagnetic waves in the free space can be given by relation -----

$$c = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$$

Remembering

[3] The cross product $\vec{E}$ X$\vec{B}$, always gives the ------- of em waves
Direction
Understanding

[4] The em waves of frequency range from 5 x 10^5 Hz to 10^9 Hz are called ----
Remembering
Radio wave

[5] The em waves of frequency range from 3 x 10^{18} Hz to 10^{22} Hz are called ----
Gamma rays
Remembering

[6] The em waves which are used in the working of solar water heater and cookers are called ----
Infra red

Remembering
[7] In a plane em wave, the electric field oscillates at a frequency of 2.5 x 10^{10} Hz and amplitude of 480V/m. The amplitude of oscillating magnetic field is ----
1.6 x10^{-6} wb/m^2
Application
[8] Maxwell's equations related to study of em waves describe the fundamental laws of ---- &----
Electricity & magnetism
Understanding

<u>OBJECTIVE TYPE QUESTIONS</u>

[1] Microwaves are the emwaves with frequency, in the range of
[a] micro hertz[b] mega hertz [c] giga hertz[d] hertz
[c]
Remembering

[2] Which of the following em waves has smaller wavelength
[a] X – rays [b] radio waves [c] gamma rays [d] microwaves
C

Remembering

[3] The waves used in telecommunication are
[a] infra red[b] u.v [c] microwaves [d] cosmic rays
[c]
Remembering

Long type questions

[1] Explain the production of em waves
[2] What is displacement current ?
[3] Derive the expression for displacement current
[4] Write Amperes -Maxwell formulas.

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