

NEW STANDARD ACADEMY

Marks: 90

Date : 05-08-24

CLASS : 12TH NEET

Time: 3 HRS

PHYSICS

- In a plane electromagnetic wave, the electric field oscillates sinusoidally at a frequency of 2×10^{10} Hz. What is the wavelength of the wave?
(1) 1.0 cm (2) 1.5 cm
(3) 2.0 cm (4) 3.0 cm
- Which of the following pairs of space and time varying electric field $E = \hat{i}E_x + \hat{j}E_y + \hat{k}E_z$ and magnetic field $B = \hat{i}B_x + \hat{j}B_y + \hat{k}B_z$ would generate a plane electromagnetic wave travelling in the z-direction?
(1) E_x, B_z (2) E_y, B_z
(3) E_z, B_x (4) E_x, B_y
- The magnetic field between the plates of radius 12 cm, separated by a distance of 4 mm of a parallel plate capacitor of capacitance 100 pF along the axis of plates having conduction current of 0.15A, is
(1) zero (2) 1.5 T
(3) 15 T (4) 0.15 T
- The rate of change of voltage of a parallel plate capacitor if the instantaneous displacement current of 1 A is established between the two plates of a $1 \mu\text{F}$ parallel plate capacitor
(1) 10^6 V/s (2) 10 V/s
(3) 10^8 V/s (4) 10^{-6} V/s
- The relation between electric field E and magnetic field induction B in an electromagnetic waves
(1) $E=H$ (2) $E = \frac{\mu_0}{\epsilon_0} H$
(3) $E = \sqrt{\frac{\mu_0}{\epsilon_0}} H$ (4) $E = \sqrt{\frac{\epsilon_0}{\mu_0}} H$
- In a plane electromagnetic wave, the electric field oscillates sinusoidally at a frequency of 2.5×10^{10} Hz and amplitude 480 V/m. The amplitude of oscillating magnetic field will be
(1) $1.52 \times 10^{-8} \text{ Wb/m}^2$
(2) $1.52 \times 10^{-7} \text{ Wb/m}^2$
(3) $1.6 \times 10^{-6} \text{ Wb/m}^2$
(4) $1.6 \times 10^{-7} \text{ Wb/m}^2$
- A flood light is covered with a filter that transmits red light. The electric field of the emerging beam is represented by a sinusoidal plane wave
 $E_z = 36 \sin(1.2 \times 10^7 z - 3.6 \times 10^{15} t) \text{ V/m}$
The average intensity of the beam will be
(1) 0.86 W/m^2 (2) 1.72 W/m^2
(3) 3.44 W/m^2 (4) 6.88 W/m^2
- The radiation pressure exerted by an EM wave of intensity I on a surface kept in vacuum is (Here c is speed of light.)
(1) I/c (2) $2I/c$
(3) $I/2c$ (4) I^2/c
- Consider an electric charge oscillating with a frequency of 10 MHz The radiation emitted will have a wavelength equal to
(1) 20 m (2) 30 m
(3) 40 m (4) 10 m
- Which of the following electromagnetic waves has minimum frequency?
(1) radiowave (2) ultrasonic wave
(3) microwave (4) audible wave
- Which statement is incorrect?
(1) Speed of light in free space = $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$
(2) Speed of light in medium = $\frac{1}{\sqrt{\mu \epsilon}}$
(3) $\frac{E_0}{B_0} = c$
(4) $\frac{B_0}{E_0} = c$
- The electric field strength in an electromagnetic wave is 10^4 V/m . The magnitude of magnetic field strength (in tesla) will be
(1) 10^4
(2) 3×10^{12}
(3) 3.3×10^{-4}
(4) 3.3×10^{-5}
- Consider an electromagnetic wave that propagates in the + z direction with an electric field strength of 1 V/m pointing in the + y direction. Then the direction and

magnitude of the magnetic field pulse that travels along with the electric field is

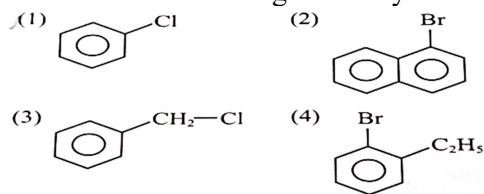
- (1) 3.33×10^{-9} T - y direction
 - (2) 3.33×10^{-9} T in - x direction
 - (3) 3.33×10^{-9} T in + x direction
 - (4) 9.99×10^7 T in - x direction
14. The wave function (in SI units) for an electromagnetic wave is given as $\Psi(x, t) = 10^3 \sin \pi (3 \times 10^6 x - 9 \times 10^{14} t)$
The speed of the Wave is
- (1) 9×10^{14} m / s
 - (2) 3×10^5 m / s
 - (3) 3×10^6 m / s
 - (4) 3×10^7 m / s
15. Poynting vector (which gives the direction of electromagnetic waves) is defined as
- (1) $\vec{j} = \vec{E} \times \vec{B}$
 - (2) $\vec{j} = \vec{E} \cdot \vec{B}$
 - (3) $\vec{j} = \frac{\vec{E} \times \vec{B}}{2}$
 - (4) $\vec{j} = \vec{E} \times \vec{B} + \vec{E} \cdot \vec{B}$


CHEMISTRY

1. The reaction $C_3H_8 + Cl_2 \xrightarrow{\text{light}} C_3H_7Cl + HCl$ is an example of
 - a) Electrophilic Addition reaction
 - b) Free radical substitution reaction
 - c) Oxidation reaction
 - d) Addition of halogen reaction
2. The product formed in the reaction of HX with $(CH_3)_2C=CH_2$ is
 - a) $(CH_3)_2CXCH_3$
 - b) $(CH_3)_2CH.CH_2X$
 - c) $(CH_3)_2CH=CH_2$
 - d) $(CH_3)_2CXCH_2X$
3. The typical reaction of alkyl halides is
 - a) Electrophilic substitution
 - b) Nucleophilic substitution
 - c) Electrophilic addition
 - d) All of the above
4. The reaction $CH_2=CH-CH_3 + HBr \rightarrow CH_3CHBrCH_3$ is an example of
 - a) Nucleophilic addition
 - b) Electrophilic addition
 - c) Electrophilic rearrangement
 - d) Free radical addition
5. 1, 4-pentadiene reacts with NBS to form mainly
 - a) $CH_2=CH-CH=CH-CH_2-Br$
 - b) $CH_2=CH-\underset{\text{Br}}{\text{CH}}=CH=CH_2$
 - c) $CH_2=CH-\underset{\text{Br}}{\text{CH}_2}-CH=CH-Br$

d) None of the above

6. Which of the following is not aryl halide?

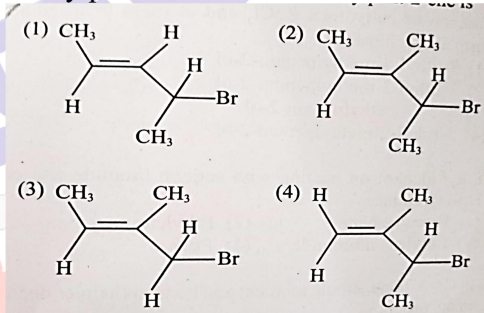


7. In benzyl chloride, halogen bearing carbon is linked to ___ hybridized carbon.
- a) sp^3
 - b) sp^2
 - c) sp
 - d) sp^3d
8. How many secondary alkyl chloride are possible form n-pentane?
- a) 1
 - b) 2
 - c) 3
 - d) 4
9. IUPAC nomenclature of  is
- (a) 1-Chloro-3-phenyl prop-2-ene
 - (b) Cinnamyl chloride
 - (c) Benzylic chloride
 - (d) Phenyl allyl chloride

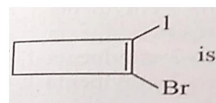
10. IUPAC nomenclature of



- (a) 4-Chloro-3-ethylpenta-1, 4-diene
 - (b) 2-Chloro-3-ethylpenta-1, 4-diene
 - (c) 2-Chloro-3-ethylpenta-1, 4-diene
 - (d) 4-Chloro-3-ethylpenta-1, 4-diene
11. Correct structure of 4-Bromo-3-methylpent-2-ene is



12. Correct IUPAC name of



- (a) 1-Brom-2-iodocyclobut-1-ene
- (b) 1-Iodo-2-bromocyclobut-1-ene

- (c) 1-Bromo-4-iodocyclobut-1-ene
- (d) 1-Bromo-2-iodocyclobut-2-ene
13. In C-X bond, dipole moment and bond enthalpies decrease in the order
- (a) $C - I > C - Br > C - Cl > C - F$
- (b) $C - F > C - Cl > C - Br > C - I$
- (c) $C - Cl > C - F > C - Br > C - I$
- (d) $C - F > C - Br > C - I > C - Cl$
14. Which of the following is not formed during the chlorination of ethane?
- (a) Ethylene chloride
- (b) Chloro ethane
- (c) Ethyl chloride
- (d) Ethylidene dichloride
15. Which of the following leads to the formation of an alkyl halide?
- (a) $C_2H_5OH \xrightarrow{Red P + Br_2}$
- (b) $C_2H_5OH \xrightarrow{SOCl_2}$
- (c) $C_2H_5OH \xrightarrow{KBr + Conc. H_2SO_4}$
- (d) All of the above

BIOLOGY

1. Biopiracy is:
- a) The use of biological patent.
- b) Thefts of plants and animals,
- c) The use of bioresources of a country without proper authorization.
- d) Stealing of biological resources.
2. Biopatent means
- a) Right to use an invention
- b) Right to use biological resources
- c) Right to use applications.
- d) Right to use processes
3. Transgenic _____ are being used to test the safety of the polio vaccine.
- a) cow b) mice
- c) sheep d) goat
4. Which GMO is now being developed in order to be used in testing the safety of Polio vaccines before they are used in humans?
- a) Transgenic sheep
- b) Transgenic cow
- c) Transgenic mice
- d) Transgenic viruses
5. Rosie a transgenic cow is known to produce a type of milk which has all the following characteristics, except
- a) protein content of 2.4 g/l
- b) has human α -lactalbumin

- c) more balanced diet than normal cow milk for babies
- d) was produced for the first time in year 2001
6. Mark the statement that is incorrect with respect to application of biotechnology:
- a) In 1997, the first transgenic cow, Rosie was introduced with α -1 antitrypsin gene
- b) Today transgenic models exist for cancer, cystic fibrosis rheumatoid arthritis and Alzheimer's disease
- c) Transgenic mice are being used to test the safety of the polio vaccine
- d) GEAC is an organization that makes decisions regarding the validity of GM research and safety of introducing GM-organisms for public services
7. Transgenic animals are generally produced for all of the following needs except:
- a) Testing of chemical safety.
- b) Testing of vaccine safety.
- c) Stimulation of pathogenicity.
- d) Production of pharmacologically important proteins.
8. More than 95% of transgenic animals are:
- a) Rabbits. b) Mice.
- c) Fish. d) Cows.
9. Use of bioresources by multinational companies and organizations without authorization from the concerned country and its people is called:
- a) Biodegradation b) Biopiracy
- c) Bioinfringement d) Bioexploitation
10. In India, the organization responsible for assessing the safety of introducing genetically modified organisms for public use is:
- a) Research Committee on Genetic Manipulation (RCGM)
- b) Council for Scientific and Industrial Research (CSIR)
- c) Indian Council of Medical Research (ICMR)
- d) Genetic Engineering Approval Committee (GEAC)
11. The substance produced by a cell in viral infection that can protect other cells from further infection is:

- (a) interferon (b) histamine
(c) serotonin (d) colostrum

12. B-lymphocytes are:

- (1) formed in bone marrow
(2) preprocessed in bone marrow
(3) preprocessed in liver
(4) formed in thymus

Codes:

- (a) 1, 2 and 3 are correct
(c) 2 and 4 are correct
(b) 1 and 2 are correct
(d) 1 and 3 are correct

13. Cirrhosis of liver is caused by the chronic intake of:

- (a) opium (b) alcohol
(c) cocain (d) tobacco
(chewing)

14. Which of the following is correct regarding AIDS causative agent HIV?

- (a) HIV is unenveloped retrovirus.
(b) HIV does not escape but attacks the acquired immune response.
(c) HIV is enveloped virus containing one molecule of single-stranded RNA and one molecule of reverse transcriptase.
(d) HIV is enveloped virus that contains two identical molecules of single-stranded RNA and two molecules of reverse transcriptase

15. Match List-I with List-II

List-I	List-II
A Filariasis	1 <i>Haemophilus influenzae</i>
B Amoebiasis	2 <i>Trichophyton</i>
C Pneumonia	3 <i>Wuchereria bancrofti</i>
D Ringworm	4 <i>Entamoeba histolytica</i>

- (a) A = 4 B = 1 , C = 3 , D = 2
(b) A = 3 , B = 4 , C = 1 , D = 2
(c) A = 1 , B = 2 , C = 4 D = 3
(d) A = 2 B = 3 , C = 1 , D = 4