

1. Electromagnetic radiation is characterized by
(a) Amplitude
(b) Periodicity
(c) Wavelength and wave number of frequency
(d) All
2. Radiation of wavelength 200 nm is equivalent in wave number to
(a) $5 \times 10^4 \text{ cm}^{-1}$ (b) $5 \times 10^5 \text{ cm}^{-1}$ (c) $5 \times 10^2 \text{ cm}^{-1}$ (d) $5 \times 10^{10} \text{ cm}^{-1}$
[Hint. $\nu = 1/(200 \times 10^{-9} \text{ m}) = 5 \times 10^4 \text{ cm}^{-1}$]
3. Radiation of wavelength 200 nm has the frequency
(a) $1.2 \times 10^{15} \text{ Hz}$ (b) $1.5 \times 10^{15} \text{ Hz}$ (c) $1.5 \times 10^{10} \text{ Hz}$ (d) $1.2 \times 10^{10} \text{ Hz}$
[Hint. $\nu = \frac{c}{\lambda} = \frac{3 \times 10^{10} \text{ cm/s}}{200 \times 10^{-7} \text{ cm}} = 1.5 \times 10^{15} \text{ Hz}$.]
4. The phenomenon related to frequency and intensity of radiation include
(a) Absorption (b) Raman and Rayleigh scattering
(c) Phosphorescence and fluorescence (d) All
5. Both NMR and NQR are observed in the region
(a) UV /visible (b) Radiofrequency (c) Microwave (d) X-ray
6. Wavelength corresponding to maximum energy is inversely proportional to temperature.
The law is
(a) Wein displacement law (b) Stefan's law
(c) Rayleigh Jean law (d) Boltzmann law
7. The total amount of energy per unit volume, μ obeys $\mu = \sigma T^4$. It is
(a) Planck's law (b) Jean's law (c) Stefan's law (d) None
8. The equation, $1/2 mv^2 = h(\nu - \nu_0)$ is known as
(a) Einstein's photoelectric equation (b) Maxwell equation
(c) Lummer equation (d) All
9. In the Born-Oppenheimer approximation
(a) $E_{\text{el}} > E_{\text{vib}} > E_{\text{rot}} > E_{\text{tr}}$ (b) $E_{\text{tr}} > E_{\text{rot}} > E_{\text{vib}} > E_{\text{el}}$
(c) $E_{\text{vib}} > E_{\text{el}} > E_{\text{rot}} > E_{\text{tr}}$ (d) None
10. Photon of wavelength 400 nm corresponds to
(a) $20,000 \text{ cm}^{-1}$ (b) $25,000 \text{ cm}^{-1}$ (c) $50,000 \text{ cm}^{-1}$ (d) $40,000 \text{ cm}^{-1}$