X

Unit 2 - Week 1

Assessment 2

The due date for submitting this assignment has passed. **Due on 2016-03-18, 23:59 IST.**

Submitted assignment

1) Light photon with a wavelength of 100 nm falls on a metal which requires $4.4 \times 10^{-19}\ J$ for ejecting the electron from the light energy. The kinetic energy of the ejected electron is *1 point*

- $1.56 \times 10^{-18}\ J$
- $1.56 \times 10^{-19}\ J$
- $19.9 \times 10^{-19}\ J$
- $1.99 \times 10^{-19}\ J$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1.56 \times 10^{-18}\ J$

2) A laser radiation has a power of 1 mW ($10^{-3}\ J.\ s^{-1}$). If the wavelength of light emitted is 6626 Angstroms, the number of photons in the laser radiation per second is *1 point*

- 10^{14}
- 10^{15}
- 3.33×10^{15}
- 10^{16}

No, the answer is incorrect.
Score: 0

Accepted Answers:
3.33×10^{15}

3) Radiation density per unit volume per unit time, according to Planck's law depends on the frequency ν as *1 point*

- $\frac{8\pi k_B T}{c^3}\nu^2$
- $\frac{8\pi h\nu^3}{c^3(e^{h\nu/k_BT}-1)}$

- $\frac{8\pi h\nu^3}{c^3(e^{-h\nu/k_BT}-1)}$
- $\frac{8\pi k_BT}{c^3\nu^2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{8\pi h\nu^3}{c^3(e^{h\nu/k_BT}-1)}$

4) In Einstein's theory emission of radiation from excited state happens either as spontaneous or is due to stimulated by radiation. The rate of change of the concentration of excited molecules due to spontaneous emission is proportional to ***1 point***

- excited state molecular concentration only
- radiation density only
- excited state molecular concentration and radiation density
- the inverse of radiation density

No, the answer is incorrect.
Score: 0

Accepted Answers:
excited state molecular concentration only

5) The macroscopic absorption and spontaneous emission coefficients are proportional to ***1 point***

- The dipole moment matrix element between states of change
- The absolute square of the dipole moment matrix element between states of change
- Independent of molecular dipole moments
- Inversely proportional to the dipole moment matrix element between states of change

No, the answer is incorrect.
Score: 0

Accepted Answers:
The absolute square of the dipole moment matrix element between states of change

6) The unit for gyromagnetic ratio of nuclei is ***1 point***

- Hz
- Hz. Tesla
- Hz. Tesla^{-1}
- Tesla

No, the answer is incorrect.
Score: 0

Accepted Answers:
Hz. Tesla^{-1}

7) The gyromagnetic ratios for ^{13}C and ^{1}H are in the ratio 1:4. For the same given static magnetic field strength, the energy level splitting for the carbon and hydrogen are in the ratio ***1 point***

- 1 : 1
- 1 : 2
- 1 : 3
- 1 : 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
1 : 4

8) ***1 point***

H_2(hydrogen molecule) and HD (mono-deuterated hydrogen molecule) have the same bond length. Their moments of inertia are in the ratio

- 1 : 1.333 for H_2 : HD
- 1.333 : 1 for H_2 : HD
- 1 : 2 for H_2 : HD
- 2 : 1 for H_2 : HD

No, the answer is incorrect.
Score: 0

Accepted Answers:
1 : 1.333 for H_2 : HD

9) Both HCl and DCl (Deuterated hydrogen chloride) have nearly the same bond strength and therefore the same force constant. Their vibrational frequencies are in the ratio (HCl : DCl) ***1 point***

- 1 : 1 (no change)
- 2 : 1
- 1 : 4 : 1
- 1 : 1 : 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
1 : 4 : 1

10) The ratio of spontaneous emission coefficient (A) and the absorption coefficient (B), denoted by A/B has the dimension ***1 point***

- $ML^{-1}T^{-1}$
- MLT
- $ML^{2}T^{-2}$
- MLT^{-1}

No, the answer is incorrect.
Score: 0

Accepted Answers:
$ML^{-1}T^{-1}$

Previous Page End