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Unit 2 - Week 1

Assessment 1

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

Submitted assignment

This quiz is based on lecture 1, 2 & 3 of week 1.

1) Electromagnetic radiation consists of oscillating electric and magnetic fields with the following property ***1 point***

- The fields oscillate in random directions with the same frequency
- The fields oscillate in perpendicular directions with different frequency
- The fields oscillate in the direction of propagation
- The fields oscillate in directions, which are both perpendicular to the direction of propagation

No, the answer is incorrect.
Score: 0

Accepted Answers:
The fields oscillate in directions, which are both perpendicular to the direction of propagation

2) The proposal that electromagnetic radiation consists of quanta was first made by Albert Einstein. In this theory, the intensity of radiation is proportional to ***1 point***

- The wavelength of the packet
- The frequency of the packet
- The number of packets per unit time per unit area
- The amplitude of the electric and magnetic fields

No, the answer is incorrect.
Score: 0

Accepted Answers:
The number of packets per unit time per unit area

3) The relation between the energy (***E***) of the electromagnetic radiation and the wavelength (λ) of the radiation is (ν is the frequency, ***c*** is the speed in vacuum) ***1 point***

- $E = h\nu/\lambda$
- $E = hc/\lambda$
- $E = hc\lambda$
- $E = h\lambda/c$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$E = hc/\lambda$

4) The wavelength of light used to excite an electron in hydrogen atom has a value 400 nm (nano meter). The frequency of the radiation is **1 point**

- $7.5 \times 10^{14}\ Hz$
- $7.5 \times 10^{15}\ Hz$
- $7.5 \times 10^{16}\ Hz$
- $7.5 \times 10^{12}\ Hz$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$7.5 \times 10^{14}\ Hz$

5) The frequency of an electromagnetic radiation used to excite molecular vibration in a molecule is about $10^{14} Hz$. The wave number corresponding to this frequency is **1 point**

- $3000\ cm^{-1}$
- $3333.3\ cm^{-1}$
- $3000\ m^{-1}$
- $300\ cm^{-1}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$3333.3\ cm^{-1}$

6) The frequency of radiation with a wave number of $1000\ m^{-1}$ is given by **1 point**

- $3\ \times\ 10^{15}\ Hz$
- $3\ \times\ 10^{13}\ Hz$
- $3\ \times\ 10^{12}\ Hz$
- $3\ \times\ 10^{11}\ Hz$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$3\ \times\ 10^{11}\ Hz$

7) The wavelength of radiation corresponding to a wave number of 3333 m^{-1} is **1 point**

- $300\ \mu m$
- $30\ \mu m$
- $100\ \mu m$
- $333\ \mu m$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$300\ \mu m$

8) The energy associated with a transition frequency of a Tera hertz per molecule is equivalent to ***1 point***

- 40 kJ/mol
- 4 kJ/mol
- 0.4 kJ/mol
- 0.04 kJ/mol

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.4 kJ/mol

9) Thermal energy at room temperature is 0.025eV (electron volt) per molecule. This corresponds to a photon of wavelength ***1 point***

- $49.6\ \mu m$
- $500\ \mu m$
- $4.96\ \mu m$
- $200\ \mu m$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$49.6\ \mu m$

10) The energy associated with a photon in an electromagnetic radiation with a wave number of 100 cm^{-1} is given by ***1 point***

- $1.0 \times 10^{-21}\ J$
- $1.99 \times 10^{-21}\ J$
- $1.99 \times 10^{-18}\ J$
- $1.99 \times 10^{-20}\ J$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1.99 \times 10^{-21}\ J$

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