Assignment 3

Due on 2019-02-20, 23:59 IST.

As per our records you have not submitted this assignment.

1) The region in the electromagnetic spectrum which has the maximum wavelength is:
   - a. X-ray region
   - b. Gamma ray region
   - c. Ultraviolet region
   - d. Radio wave region

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   d.

2) Energy of a radiation varies proportionally with its
   - a. wavelength
   - b. frequency
   - c. position
   - d. Both wavelength and frequency

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   b.

3) The type of radiation generally used for electronic excitation

   Score: 0
   Accepted Answers:
4) Which of the following wavelength ranges is associated with UV spectroscopy?  1 point

   a. 0.01-10 nm  
   b. 200-400 nm  
   c. 380-700 nm  
   d. 700-1000 nm

   No, the answer is incorrect.  
   Score: 0  
   Accepted Answers:  
   a.  
   c.  

5) An electron is excited from non-bonding orbital to pi orbital (anti-bonding). The correct notation will be?  1 point

   a. \( \pi \rightarrow \sigma^* \)  
   b. \( n \rightarrow \sigma^* \)  
   c. \( n \rightarrow \pi^* \)  
   d. \( n \sim \pi^* \)

   No, the answer is incorrect.  
   Score: 0  
   Accepted Answers:  
   c.  

6) The UV absorbance around 278 nm in RNase A protein is solely due to the Tyr residues present in the protein. During an experiment the absorbance of X (M) protein comes to 0.4 at 278 when measured using a cell of path length 10 mm. The concentration of the protein present in the cuvette is around: [Given: \( E_{278} (\text{RNase A}) = 9800 \text{ M}^{-1} \text{ cm}^{-1} \)]

   a. 400 \( \mu \)M  
   b. 40 \( \mu \)M  
   c. 312 \( \mu \)M  
   d. 31 \( \mu \)M

   a.
7) The double beam spectrophotometer differs from the single beam spectrophotometer in the former:
   a. Both sample and reference cuvette can be measured simultaneously
   b. Reference cell lamp has a different wavelength from sample cell lamp
   c. Chopper splits the light into two parts which passes through the reference and sample cuvette
   d. Reference absorption is first recorded followed by sample absorption

No, the answer is incorrect.
Score: 0
Accepted Answers:
   d.

8) A graduate student is going to measure the concentration of BSA protein in phosphate buffer (pH 7.4) for which he has to take two different solutions in two cuvettes C1 and C2. The solutions he should take during baseline corrections are:
   a. C1 = BSA and C2 phosphate buffer (pH 7.4)
   b. C1= C2 = BSA
   c. C1: phosphate buffer (pH 7.4) and C2 = BSA respectively
   d. C1= C2 = phosphate buffer (pH 7.4)

No, the answer is incorrect.
Score: 0
Accepted Answers:
   d.

9) For accurate measurements of fluorescence emission the cuvette should be
   a. Made of glass and all four sides frost
   b. Made of quartz with two side frost and other two sides transparent
   c. Made of plastic with all four sides transparent
   d. Made of quartz with all four sides transparent

No, the answer is incorrect.
Score: 0
Accepted Answers:
   a.
10) UV spectrophotometer uses two light sources from deuterium lamp and tungsten lamp. If tungsten lamp stops working, then in which way the measurements will be affected if the range is set from 200-800 nm?

- a. Light will pass through sample cell only but not through reference cell
- b. Light will pass through both the cells but up to a specific wavelength
- c. Excess light will pass through the reference cell as compared to the sample
- d. Lower wavelength light will not pass through both the sample and reference cells

No, the answer is incorrect.
Score: 0
Accepted Answers:
- d.

11) Trp, Tyr and Phe absorbs in the UV region (~280 nm) mainly due to their:

- a. Backbone structure
- b. Chromophoric moiety
- c. Peptide bond
- d. Both peptide bond and chromophoric moiety

No, the answer is incorrect.
Score: 0
Accepted Answers:
- b.

12) The role of the entrance monochromator in a fluorescence spectrophotometer is to:

- a. Pass polarized light
- b. Select light of a range of wavelength at the same time
- c. Select light of specific wavelength
- d. Prevent scattering of the light from the sample

No, the answer is incorrect.
Score: 0
Accepted Answers:
- b.
13) The maximum absorption intensity for a protein sample is found to be at 278 nm during UV measurement. The preferable emission wavelength should start at:

- a. 255 nm
- b. 276 nm
- c. 295 nm
- d. 325 nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
- c.

14) While taking the fluorescence emission of lysozyme protein having Phe, Trp and Tyr residue one should select the excitation wavelength for:

- a. Trp residue since Tyr and Phe is non-fluorescent in lysozyme protein
- b. Tyr since Trp and Phe is non-fluorescent in lysozyme protein
- c. Trp residue since Tyr and Phe have much lower quantum yield as compared Trp
- d. Either Trp or Tyr since Phe is non-fluorescent in lysozyme protein

No, the answer is incorrect.
Score: 0
Accepted Answers:
- c.

15) The concentration of the protein should be kept very low during fluorescence experiment order to

- a. Have proper exposure of the amino acids towards the solvent
- b. Prevent aggregation of the protein
- c. Avoid change in pH of the medium
- d. Avoid inner filter effect

No, the answer is incorrect.
Score: 0
Accepted Answers:

d.