**BIO 331**

Quiz 1

**Rollno : Date: 4th October 2024**

**Question 1:** Select the best answer **(8 point)**

1. Which would be deflected by the greatest degree in mass spectrometer.
2. 12C+ c. 13C+
3. 13C2+  d. 14C+

Answer: B, Lect#1 Slide #12 (depends on the mass-to-charge ratio (m/z). The ion with the highest charge and lowest mass is deflected the most)

1. What do height of peak represent in Mass spectrometer.
2. Number of isotopes
3. Average atomic mass
4. Mass to charge ratio
5. Relative abundance

Answer: D, Lect#1 Slide #11

1. In ionization step, the protein is ionized by \_\_\_\_\_\_\_\_\_\_\_\_.
2. Electrons
3. Protons
4. Both
5. None of these

Answer: B, Lect#1 Slide #13

1. Br has 2 isotopes (Br-81, Br-79) both have almost same abundance i.e., 50%. How many peaks will be present in the mass spectrum of Br2. And what will be the length of these peaks.

a. 3, 1:1:1

b. 4, 1:1:1:1

c. 2, 1:1

d. 3, 1:2:1

e. 4, 1:2:2:1

Answer: C, ( Due to the near-equal abundance of the isotopes, the peak ratio will be 1:2:1)

1. The time needed to pass through a drift tube is directly proportional to
2. Velocity
3. Mass
4. Magnetic field
5. Quantity of sample

Answer: A, Lect#1 Slide #21

1. Name the bonds present in psi: \_\_ Peptide bonds\_\_ .

<https://proteopedia.org/wiki/index.php/Phi_and_Psi_Angles>

1. m/z of C+++ = 201, the molecular weight of C will be \_\_\_ 402\_\_\_.

(Since the charge is +2 (C²⁺), the molecular weight (MW) will be twice the m/z value.)

1. \_\_\_\_\_\_\_\_\_ controls Cα - Cα distance.

Not sure

**Question 2:** Answer the following questions **(5 x 2 point)**

1. Describe the components of Mass Spectrometer?

Answer: Lect#1 Slide #13

1. What is the role of organic matrix in ionization process?

Answer: In MALDI, the organic matrix absorbs laser energy and assists in the ionization of the sample by transferring the energy to the analyte molecules without causing fragmentation.

(Lect#1, Slide 23, Soft Ionization)

1. Why MALDI is not used for MS/MS analysis?

Answer: produces ions with too much internal energy, leading to extensive fragmentation

1. Why is a window of 1Da selected for tuning MS1?

Answer: precise isolation of ions with minimal contamination from neighboring isotopes

1. How Massdiff is used to shortlist proteins?

Answer: match the experimental mass spectrometry data against a database of known protein masses, to shortlist and identify proteins based on their unique mass

(Lect#1, Slide 15)