

## **QUESTIONS PREPARED BY DR. SUPRIYO SAHA**

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1. In Mass Spectroscopy  $m/z$  means:
  - a. mass: change ratio
  - b. mass: charge ratio
  - c. molecular weight: charge ratio
2. Which of the following statement is false for mass spectroscopy?
  - a. Mass spectroscopy is used to identify unknown compounds within a sample, and to elucidate the structure and chemical properties of different molecules
  - b. Particle are characterized by their mass to charge ratios ( $m/z$ ) and relative abundances
  - c. This technique basically studies the effect of ionizing energy on molecules
  - d. This technique can be used on all state of matter
3. Which of the following main component of mass spectroscopy deal with resolving the ions into their characteristics mass components according to their mass-to-charge ratio?
  - a. Ion Source
  - b. Analyzer
  - c. Detector System
4. What are the main criteria on which mass spectrometer used for?
  - a. Composition in sample
  - b. Relative mass of atoms
  - c. Concentration of elements in the sample
  - d. Properties of sample
5. Which species of the following is used to bombard with the sample for which mass spectroscopy has been performed?
  - a. Alpha particles
  - b. Neutrons
  - c. Electrons
  - d. Protons
6. Separation of ions in mass spectrometer take place on the basis of which of the following?
  - a. Mass
  - b. Charge

c. Molecular weight

d. Mass to charge ratio

7. Which of the following ions pass through the slit and reach the collecting plate?

a. Negative ions of all masses

b. Positive ions of all masses

c. Negative ions of specific mass

d. Positive ions of specific mass

8. In mass spectrometer, the ion currents are measured using which of the following?

a. Scintillation counter

b. Ion counter

c. Electrometer tube

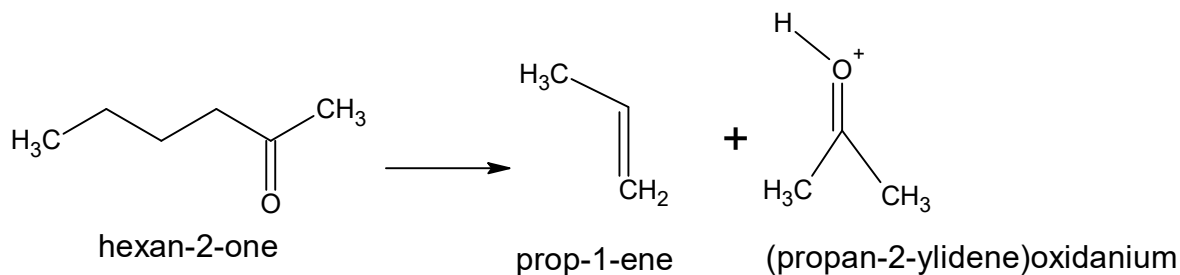
d. Electric fields

9. In mass spectrometer, the sample gas is introduced into the highly evacuated spectrometer tube and it is ionised by electron beam.

a. True

b. False

10. In the structure of 2-hexanone, it splits into two portions such as prop-1-ene (neutral molecule) and the other oxonium ion ( $m/z = 58$ ). Mention the rule behind this splitting?



Ans:

11. Wavenumber is the reciprocal of wavelength:

a. True b. False

12. Fingerprint region in IR spectroscopy:

a.  $(1500-600) \text{ cm}^{-1}$  b.  $(900-400) \text{ cm}^{-1}$  c.  $(2000-800) \text{ cm}^{-1}$

13. When vibrations occurred with changeable bond length but fixed bond angle:

a. Stretching b. Bending

14. Identify the bending vibration where two atoms are moved in the opposite direction along with the plane of symmetry:

a. Twisting b. Rocking c. Scissoring d. Wagging

15. In FTIR spectrometer additional horizontally movable mirror is present:

a. True b. False

16. In Nujol Mull process of sample preparation in IR, Nujol means:

a. Polymer

b. Crude oil

c. Mineral oil

d. Volatile oil

17. Which material are used to prepare rod of globar source ?

a. Silicon dioxide

b. Silicon carbide

c. Silicon oxide

d. All of the above

18. Which compound are used as diluent in IR sampling?

a. alkali halide

b. keton

c. Aldehyde

d. Acetone

19. Monochromator filter are made up of \_?

a. Hydrogen peroxide

b. Silicon

c. Lithium flouride

d. All of the above

20. Nernst glower consists of

a. Zirconium

b. Yttrium

c. Chromium

d. All of the above

21. Which of the following compounds is consistent with an infrared spectrum showing: a broad absorption band at 3000  $\text{cm}^{-1}$  with some sharper bands appearing on its shoulder at about 2930  $\text{cm}^{-1}$ ; a strong absorption at about 1700  $\text{cm}^{-1}$ ; a sharp band at 1500  $\text{cm}^{-1}$ ; a series of sharp bands between 650 and 800  $\text{cm}^{-1}$ ?

a.  $\text{CH}_3\text{COOH}$  b.  $\text{C}_6\text{H}_5\text{COOH}$  c.  $\text{CH}_3\text{CH}_2\text{OH}$  d.  $\text{C}_6\text{H}_5\text{OH}$

