



(viii) What does light emit as a side scatter (SSC) measure?

- a) Cell size
- b) Cell granularity / complexity
- c) Cell surface marker fluorescence
- d) Optics

(ix) Identify the type of data that MALDI-TOF mass spectrometry provides:

- a) Structural information
- b) Nucleotide sequences
- c) Cell morphology
- d) Cellular functions

(x) Identify the correct statement about MALDI-TOF mass spectrometry:

- a) It is used to measure the charge of ions.
- b) It is primarily used in DNA sequencing.
- c) It ionizes and analyzes large biomolecules, such as proteins.
- d) It operates by passing ions through a magnetic field.

(xi) Select the technique used in metabolomics to separate and identify metabolites based on their mass and charge:

- a) Gas chromatography-mass spectrometry (GC-MS)
- b) Polymerase chain reaction (PCR)
- c) X-ray crystallography
- d) Nuclear magnetic resonance (NMR)

(xii) In metabolomics, what is a metabolite?

- a) A small molecule involved in metabolism
- b) A large protein structure
- c) A type of lipid
- d) A genetic sequence

(xiii) Homozygosity and heterozygosity of an individual can be determined by

- a) Back cross
- b) Self-fertilization
- c) Test cross
- d) All of the above

(xiv) Select the term that best describes the electron beam's interaction with the sample in SEM:

- a) Transmission
- b) Reflection
- c) Absorption
- d) Scattered electron

(xv) Home pregnancy test kit is an example of:

- a) Sandwich ELISA
- b) Indirect ELISA
- c) Competitive ELISA
- d) Direct ELISA

### Group-B

(Short Answer Type Questions)

3 x 5=15

2. Write a short note on Xeroderma pigmentosum

(3)

3. What is Codon and Anticodon

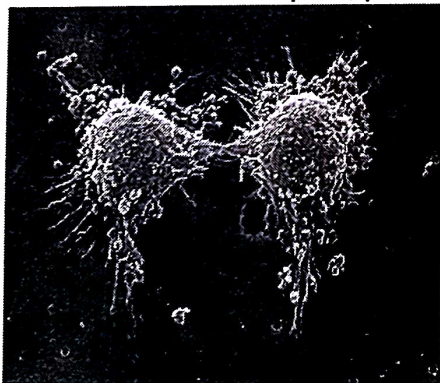
(3)

4. Summarize the basic principle behind FISH technology?

(3)

5.

(3)



Infer the possible characteristics features from SEM micrographs.



6. Differentiate between Telomers and Telomerase

(3)

OR

Correlate Point-mutation with molecular biology diagnosis

(3)

**Group-C**

(Long Answer Type Questions)

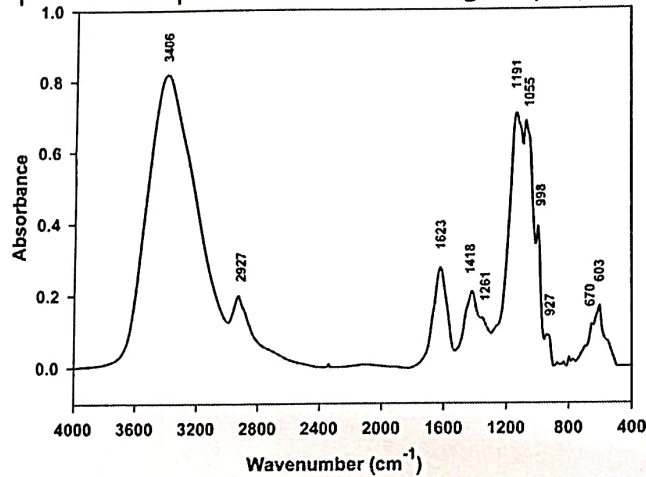
5 x 6=30

7. Explain the sample preparation of SEM before imaging

(5)

8. FTIR spectrum of a compound. Interpret the spectrum, identifying the major peaks and possible functional groups present.

(5)



9. Provide examples of applications of ELISA in research, clinical diagnostics, and industry.

(5)

10. What are the genetic implications of Thalassemia?

(5)

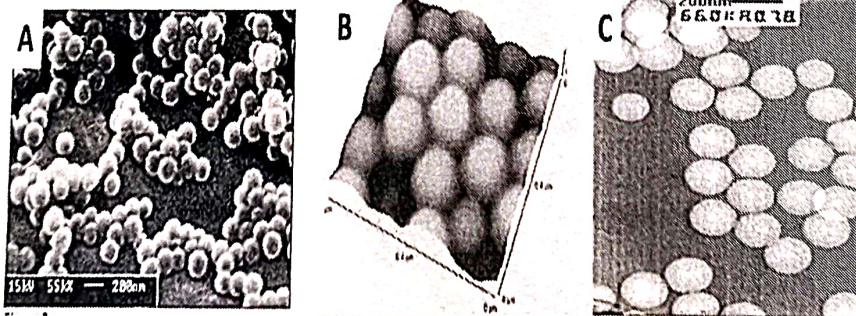
11. In a population of cats, the allele for black fur (B) is dominant over the allele for white fur (b).

(5)

If 64% of the cats in the population have black fur, what percentage of the population is heterozygous for fur color?

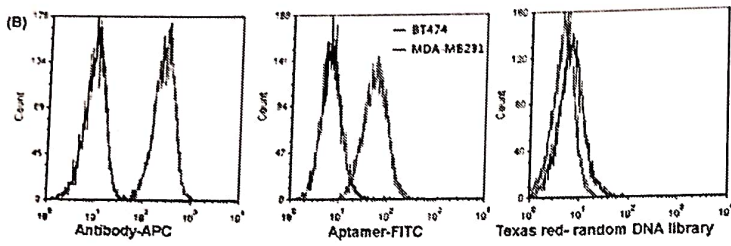
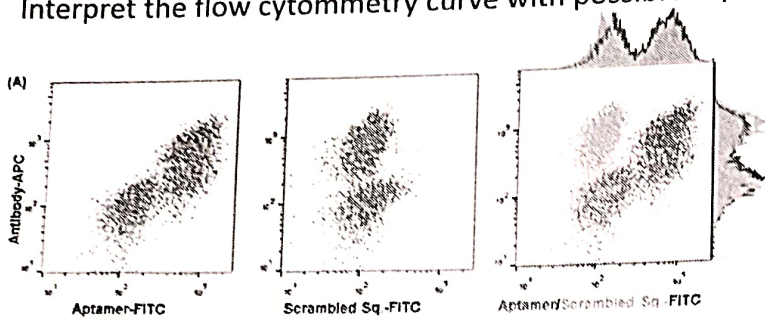
12. Identify the microscopic image from the following and interpret its one characteristic feature.

(5)



OR

Interpret the flow cytometry curve with possible explanation.



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