

SHREE H.N. SHUKLA COLLEGE OF SCIENCE  
DEPARTMENT OF MICROBIOLOGY

**Question Bank MB-602 Analytical Techniques  
and Bioinformatics**

**Unit-1**

**1 Marks**

- Write the principle of colorimeter.
- Write the principle of spectrophotometer.
- Write the sections of IR.
- What is the use of nebulizer in atomic spectroscopy?
- In which state of matter is mass spectroscopy performed?
- Define a radio-isotope.

**2 Marks**

- Explain Beer-Lambert's law.
- Write applications of IR spectroscopy.
- Write applications of mass spectroscopy.
- What is the application of radioactive substances in molecular biology?

**3 Marks**

- Explain about the light source in spectrophotometer.
- Explain instrumentation of IR spectrophotometer.
- Explain double beam spectrophotometer with figure.

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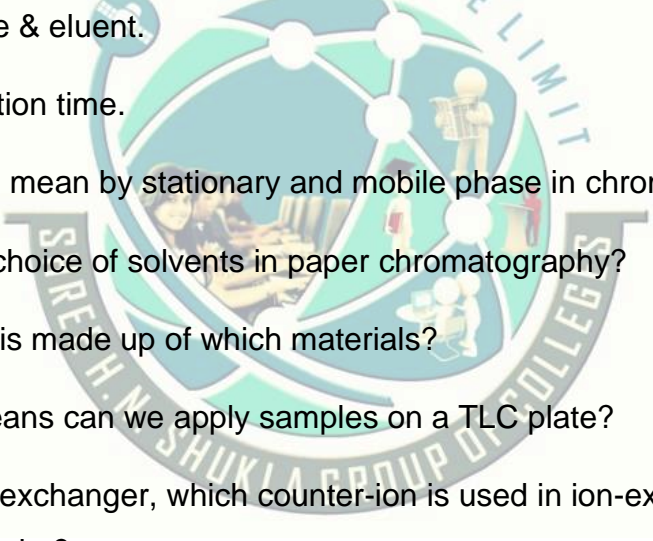
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### 5 Marks

- How many types of wave length selectors are there in a spectrophotometer? Explain each.
- Explain about detection devices in spectrophotometers.
- Explain mass spectroscopy.

### Unit-2

### 1 Marks

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- Define eluate & eluent.
  - Define retention time.
  - What do you mean by stationary and mobile phase in chromatography?
  - What is the choice of solvents in paper chromatography?
  - A TLC plate is made up of which materials?
  - By which means can we apply samples on a TLC plate?
  - For a cation exchanger, which counter-ion is used in ion-exchange chromatography?
  - For m-RNA, which immobilized ligand is used?

### 2 Marks

- Explain column chromatography.
- What are the choices of solvents for TLC?
- Explain about inert materials in ion-exchange chromatography.

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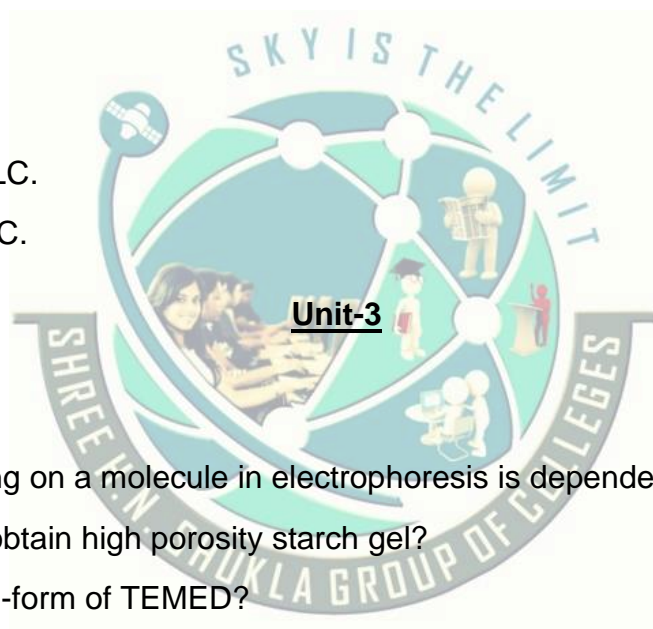
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### 3 Marks

- Explain the types of paper chromatography.
- Explain the apparatus and paper development in thin layer chromatography.
- Explain ion-exchange chromatography.
- Explain materials used in gel-permeation chromatography.

### 5 Marks

- Explain HPLC.
- Explain GLC.



### 1 Marks

- The force acting on a molecule in electrophoresis is dependent on \_\_\_\_\_?
- How can you obtain high porosity starch gel?
- What is the full-form of TEMED?
- What are the components of poly-acrylamide gel?
- What is the full-form of RFLP?
- When a sample contains 5000 proteins, which electrophoresis is used?
- Define flow cytometry.

### 2 Marks

- Explain starch gel electrophoresis.
- When is SDS-PAGE used?
- Write an overview of bio-sensor technology.
- Write applications of gel electrophoresis.

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### 3 Marks

- Explain the principle of electrophoresis.
- What are the factors affecting electrophoretic mobility?
- Explain agarose gel electrophoresis with figure.
- Explain iso-electric focusing.
- Explain native gel electrophoresis.

### 5 Marks

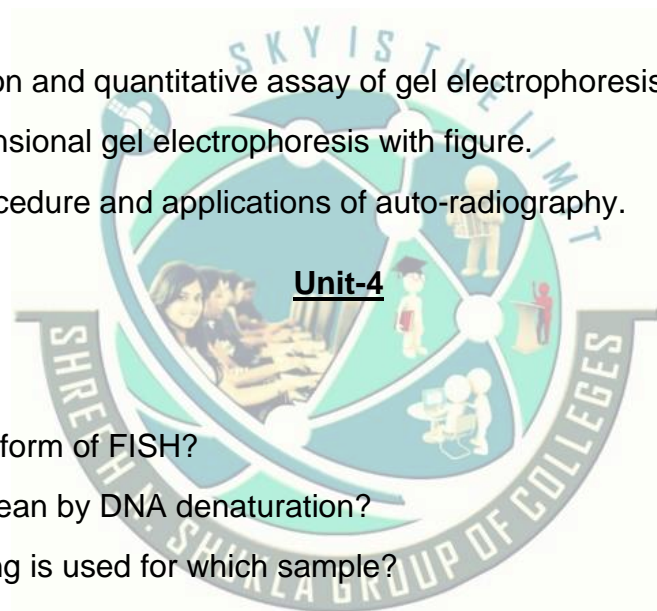
- Explain detection and quantitative assay of gel electrophoresis.
- Explain 2-dimensional gel electrophoresis with figure.
- Explain the procedure and applications of auto-radiography.

### 1 Marks

- What is the full-form of FISH?
- What do you mean by DNA denaturation?
- Southern blotting is used for which sample?
- Define blotting.
- At which temperature can we anneal DNA?
- Write the full form of STR & SSR.

### 2 Marks

- Explain Sanger DNA-sequencing method.
- Write the difference between denaturation and hybridization of DNA.
- Write types of micro-satellites with examples.
- Explain primer orientation in STR.



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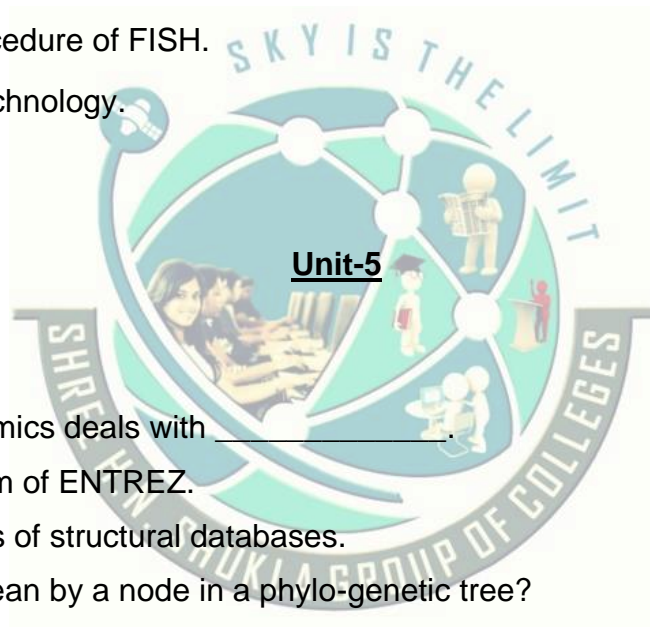
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### 3 Marks

- Explain Maxam-Gilbert sequencing method.
- Write applications of DNA sequencing.
- Explain western blotting.
- Explain VNTR technique.
- How can you synthesize DNA chemically?

### 5 Marks

- Explain the procedure of FISH.
- Explain PCR technology.



### 1 Marks

- Structural genomics deals with \_\_\_\_\_.
- Give the full form of ENTREZ.
- Write the names of structural databases.
- What do you mean by a node in a phylo-genetic tree?
- What is global alignment and local alignment?
- What do you mean by a database?

### 2 Marks

- Give the difference between a primary and a secondary database.
- What are the main types of BLAST?
- Write the brief working of FASTA.

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### 3 Marks

- What is bioinformatics? Write its applications.
- Give basic information about BLAST.

### 5 Marks

- How can you construct a phylo-genetic tree using a computer?
- How can you retrieve information from a biological database?

