

Master of Science (M.Sc.) Semester-I (CBCS) (Microbiology) Examination
ADVANCED TECHNIQUES IN MICROBIOLOGY (ATM)

Paper-3
Paper-III

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw diagrams wherever necessary.

1. ✓ Describe the method for determining the molecular weight of macro molecules by using centrifugation technique. 16

OR

Describe the concept and applications of light scattering in detail. 16

2. Explain two-dimensional gel electrophoresis in detail. 16

OR

✓ Explain the principle and applications of capillary electrophoresis with their limitations. 16

3. ✓ Describe the methodology of FISH. What do you mean by fiber FISH ? 16

OR

(a) Write an explanatory note on Laser Scanning. 8

(b) Explain the sample preparation and staining procedure used in Electron Microscopy. 8

4. Explain the phenomenon of NMR and its biological importance. 16

OR

✓(a) Explain the principle of Radioimmunoassay. 8

✓(b) Write note on site-directed mutagenesis. 8

5. Write short notes on : 4

✓(a) Sedimentation. 4

✓(b) Immuno-electrophoresis 4

✓(c) Cryoelectron microscopy 4

✓(d) Western blotting technique. 4

Master of Science (M.Sc.) Semester-I (CBCS) (Microbiology) Examination**ADVANCE TECHNIQUES IN MICROBIOLOGY (ATM)****Paper-3****Paper-III**

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw well labelled diagram wherever necessary.

1. Explain how molecular weight and size of macromolecule is determined using light-scattering technique. 16

OR

Write notes on :

- (a) Viscosity. 8
 (b) Diffusion sedimentation. 8
2. Describe principle, procedure and applications of immunoelectrophoresis. 16

OR

Explain principle, instrumentation and applications of SDS-PAGE. 16

3. Describe principle, mechanism and applications of confocal microscopy. 16

OR

(a) Differentiate between SEM and TEM. 8

(b) Explain scanning tunneling microscopy. 8

4. Describe principle, mechanism and application of NMR. 16

OR

Explain in detail Southern Blotting technique. 16

5. Write short notes on :

- (a) CD/ORD. 4
 (b) Capillary electrophoresis. 4
 (c) FISH. 4
 (d) Site directed mutagenesis. 4

AHK/KW/19/1619

Master of Science (M.Sc.) Semester-I (CBCS) (Microbiology) Examination
ADVANCE TECHNIQUES IN MICROBIOLOGY (ATM)

Paper-3

Paper-III

Time: Three Hours]

[Maximum Marks : 80

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw well labelled diagrams wherever necessary.

1. Describe the method for determining the molecular weight of macro molecules by using centrifugation techniques 16

OR

(a) How is viscosity used in macromolecular characterization? 8

(b) Explain molecular size determination by diffusion technique. 8

2. Explain principle, working and applications of SDS-PAGE. 16

OR

Explain immune-electrophoresis and add a note on its applications. 16

3. Explain the principle and working of TEM with well labelled diagram. 16

OR

Describe principle and applications of Atomic force microscopy. 16

4. Explain principle, procedure and application of Northern Blotting 16

OR

(a) Explain the principle of transcriptional start point mapping. 8

(b) Write note on Southern Blotting. 8

5. Write notes on :

(a) CD/ORD. 4

(b) Capillary electrophoresis. 4

(c) Applications of cryoelectron microscopy. 4

(d) Principle of NMR. 4

S.S.E.S. Amt's Science College, Congress Nagar, Nagpur
Terminal Examination
M.Sc.I. (Microbiology)
Semester I (Winter 2019)
Paper III- Advance Techniques in Microbiology (ATM)

Time: 3hrs

Marks: 100

Note: All the questions are compulsory and carry equal marks.
Draw diagrams wherever necessary.

Q.1. Explain how molecular weight and size of macromolecules is determine using light scattering technique.

OR

16

a) Viscosity.

8

b) Diffusion Sedimentation.

8

Q.2) Describe principle, instrumentation and applications of SDS-PAGE.

OR

16

Write short notes on:

a) Immuno Electrophoresis

8

b) Agarose Gel electrophoresis

8

Q.3) Describe principle, sample preparation and working of Fluorescent Microscopy with well labeled ray diagram.

OR

16

A) Differentiate between SEM and TEM.

8

B) Explain Scanning Tunneling Microscopy

8

Q.4) Describe principle, mechanism, and application of NMR .

16

OR

Write notes on:

A) Southern blotting technique

8

B) Western blotting technique.

8

Q.5) Write notes on:

1. CD/ORD

4

2. Capillary Electrophoresis

4

3. FISH

4

4. Site Directed Mutagenesis

4

NRT/KS/19/2891

Master of Science (M.Sc.) Semester-I (CBCS) (Microbiology) Examination

ADVANCED TECHNIQUES IN MICROBIOLOGY (ATM)

Paper—3

Paper—III

Time : Three Hours]

[Maximum Marks : 80

N.B. :— All questions are compulsory and carry equal marks.

1. Discuss the mechanism of diffusion sedimentation to determine size, shape and molecular weight of macromolecule. 16

OR

Write notes on :

- (a) Ultracentrifugation 8
(b) Viscosity. 8
2. Describe principle, mechanism and applications of agarose gel electrophoresis. 16

OR

Write notes on :

- (a) Immunoelectrophoresis 8
(b) Two dimensional gel electrophoresis. 8
3. Explain the principle and working of SEM and give its applications. 16

OR

Write notes on :

- (a) Laser scanning microscopy 8
(b) Scanning tunneling microscopy. 8
4. Discuss the principle, procedure and applications of Radioimmunoassay. 16

OR

Write notes on :

- (a) Southern blotting 8
(b) Transcriptional start point mapping. 8
5. Write short notes on :
- (a) CD/ORD 4
(b) Capillary electrophoresis 4
(c) Staining procedure of fluorescent microscopy 4
(d) Biological Applications of NMR. 4

**Master of Science (M.Sc.) First Semester (CBCS) (Microbiology) Examination
ADVANCE TECHNIQUES IN MICROBIOLOGY (ATM)**

Paper-3

Paper-III

Time : Three Hours]

[Maximum Marks : 80

- N.B. :** (1) All questions are compulsory and carry equal marks.
(2) Draw well labelled diagram wherever necessary.

1. Describe how size, shape and molecular weight of macromolecules are determined by light scattering technique. 16

OR

Write notes on :

- (a) Analytical Centrifugation 8
(b) ORD. 8
2. Explain principle, procedure and application of SDS-PAGE. 16

Write notes on :

- (a) Agarose gel electrophoresis 8
(b) Two-dimensional gel electrophoresis. 8
3. Describe principle, mechanism and application of confocal microscopy. 16

OR

Write notes on :

- (a) TEM 8
(b) Fluorescent microscopy. 8
4. Discuss principle, instrumentation and biological importance of NMR. 16

OR

Write notes on :

- (a) Transcriptional start point mapping 8
(b) Site-directed mutagenesis. 8
5. Write short notes on :
- (a) Differential centrifugation 4
(b) Capillary electrophoresis 4
(c) FISH 4
(d) Radioimmunoassay. 4

S.S.E'S Amravati's Science College, Nagpur

PRELIMINARY EXAMINATION

Winter 2023

M Sc Semester - I

MICROBIOLOGY

PaperIII- Advance Techniques in Microbiology

Time: 3 Hours

Max Marks: 80

Note: a) All the questions are compulsory and carry marks as indicated.
b) Draw neat and well labelled diagrams wherever necessary.

- Q.1 Describe the method for determining the molecular weight of macro molecules by using centrifugation technique. 16
- OR
- Describe the concept and applications of light scattering in detail. 16
- Q.2 Explain principle, instrumentation, and working of agarose gel electrophoresis in detail with its applications. 16
- OR
- a) Explain the pulse field gel electrophoresis. 08
- b) Write instrumentation, working of HPLC. 08
- Q.3 Discuss principle, procedure and application of Western blotting technique. 16
- OR
- a) Explain in detail about autoradiography. 08
- b) Explain FTIR Spectroscopy in detail. 08
- Q.4 Describe preparation of sample, principle, working and application of TEM in detail with its ray diagram. 16
- OR
- a) Explain florescent microscopy with its ray diagram. 08
- b) Describe FISH in detail. 08
- Q.5 Write a note on: 4×4=16
- a) X-ray crystallography
- b) Two dimensional electrophoresis
- c) NMR
- d) Cryoelectron microscopy

M.Sc. (Microbiology) Semester-I (CBCS) (New Education Policy) Examination
MMHT02 : ENZYMOLOGY AND TECHNIQUES
Paper—II

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) All questions are compulsory and carry equal marks.
(2) Draw diagram wherever necessary.

1. Give the concept of isoenzyme and write in detail about lactase dehydrogenases as marker enzymes. 16

OR

Write a detailed account of multienzyme complexes. 16

2. Discuss the kinetics of enzyme inhibition. 16

OR

(a) Give the significance of MM Equation and discuss its transformations. 8

(b) Write note on feed back inhibition with suitable example. 8

3. Discuss MWC and sequential model for co-operative ligand bindings. 16

OR

Write general concept of enzyme biosensor. Add a note on glucose biosensor. 16

4. Give detailed account of membrane entrapment and lattice entrapment techniques of immobilization. 16

OR

Discuss the kinetics of immobilized enzyme. 16

5. Write notes on :

(a) Metal ion catalysis 4

(b) Allosteric enzymes 4

(c) Applications of protein engineering 4

(d) Affinity binding for enzyme immobilization. 4

M.Sc. (Microbiology) Semester-I (CBCS) (New Education Policy) (Examination
MMIT03 : ADVANCE TECHNIQUES IN MICROBIOLOGY

Paper—III
(Elective-1)

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw diagram wherever necessary.

1. Discuss the mechanism of diffusion sedimentation in determination of size, shape and molecular weight of macromolecule. 16

OR

Write notes on :

- (a) Mechanism of light scattering for the determination of size. 8
(b) Principle of X-Ray crystallography. 8
2. Describe principle, mechanism and applications of agarose gel electrophoresis. 16

OR

Write notes on :

- (a) Two dimensional gel electrophoresis 8
(b) Immunoelectrophoresis 8
3. Discuss the principle, procedure and applications of Radioimmunoassay. 16

OR

Write notes on :

- (a) NMR and its biological importance 8
(b) Southern blotting 8
4. Explain the principle and working of TEM and give its applications. 16

OR

Write notes on :

- (a) FISH 8
(b) Laser scanning microscopy 8
5. Write short notes on :
- (a) CD/ORD 4
(b) Capillary electrophoresis 4
(c) Autoradiography 4
(d) Staining procedure of fluorescent microscopy. 4