

M.Sc. MOLECULAR VIROLOGY DEGREE EXAMINATION**FIRST YEAR****(For candidates admitted from 2009-2010 onwards)****PAPER III – BASIC AND APPLIED VIRAL GENETICS****Q.P. Code: 289127****Time : Three Hours****Maximum : 100 marks****Answer ALL questions in the same order.****I. Elaborate on:**

	Pages (Max.)	Time (Max.)	Marks (Max.)
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- | | | | |
|---|----|---------|----|
| 1. Explain in detail the mechanism of DNA replication in prokaryotes. | 17 | 40 min. | 20 |
| 2. Write in detail the replication and propagation of retroviruses. | 17 | 40 min. | 20 |

II. Write notes on :

- | | | | |
|--|---|---------|---|
| 1. Describe the mechanism of DNA condensation in eukaryotes. | 4 | 10 min. | 6 |
| 2. Explain the features of genetic code. | 4 | 10 min. | 6 |
| 3. Write short notes on prions and their diseases. | 4 | 10 min. | 6 |
| 4. Define the role of introns and exons. | 4 | 10 min. | 6 |
| 5. Describe the event of polyadenylation of ribonucleic acids. | 4 | 10 min. | 6 |
| 6. Distinguish the process of transcription in pro and eukaryotes. | 4 | 10 min. | 6 |
| 7. Differentiate the replication of single strand and double strand DNA viruses. | 4 | 10 min. | 6 |
| 8. What are antisense RNA molecules? State their significance. | 4 | 10 min. | 6 |
| 9. How are viral nucleic acids processed after infecting the host? Explain the strategies. | 4 | 10 min. | 6 |
| 10. Write short notes on types and properties of histones. | 4 | 10 min. | 6 |

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	Pages (Max.)	Time (Max.)	Marks (Max.)
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- | | | | |
|---|----|---------|----|
| 1. Write in detail the post transcriptional modifications of a typical eukaryotic cell. | 17 | 40 min. | 20 |
| 2. What are prions? How are they converted into infecting particles?
Explain the physical and chemical properties of prions. | 17 | 40 min. | 20 |

II. Write notes on :

- | | | | |
|--|---|---------|---|
| 1. Write an account on histones and their roles. | 4 | 10 min. | 6 |
| 2. Explain the nucleic acid replication of Human Immunodeficiency Virus. | 4 | 10 min. | 6 |
| 3. Explain the replication mechanism of Influenza viruses. | 4 | 10 min. | 6 |
| 4. Discuss the role of Okazaki fragments in DNA replication. | 4 | 10 min. | 6 |
| 5. Explain the regulation of gene expression in prokaryotes using a suitable model. | 4 | 10 min. | 6 |
| 6. Distinguish antigenic drifts and antigenic shifts.
Add a short note on their significance. | 4 | 10 min. | 6 |
| 7. Compare and differentiate the features of DNA polymerases. | 4 | 10 min. | 6 |
| 8. Explain degeneracy of the genetic code. | 4 | 10 min. | 6 |
| 9. Write short notes on post translational modifications. | 4 | 10 min. | 6 |
| 10. Describe the event of transcription initiation in prokaryotes. | 4 | 10 min. | 6 |

[LD 1013]

OCTOBER 2013

Sub. Code: 9127

M.Sc. MOLECULAR VIROLOGY DEGREE EXAMINATION

FIRST YEAR

(For candidates admitted from 2009-2010 onwards)

PAPER III – BASIC AND APPLIED VIRAL GENETICS

Q.P. Code: 289127

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(2 x 20 = 40)

1. Describe Viral oncogenes. Discuss mechanisms of viral oncogenesis.
2. What are prions? Explain their structure and significance.

II. Write notes on:

(10 x 6 = 60)

1. Catabolic repression.
2. Evolutionary significance of histoproteins.
3. Write a short notes on:
 - a) Spliceosomes.
 - b) Polyadenylation.
4. Nucleic acid based classification of viruses.
5. Elaborate features of DNA polymerase.
6. Explain transcription initiation in prokaryotes.
7. Describe constituents of nucleosome and chromatin structures.
8. Explain the replication of Polio and influenza viruses.
9. Procession of primary transcripts in to mature mRNA.
10. Replication mechanism of S V 40 virus.

[LF 1014]

OCTOBER 2014

Sub. Code: 9127

M.Sc. MOLECULAR VIROLOGY DEGREE EXAMINATION

FIRST YEAR

(For candidates admitted from 2009-2010 onwards)

PAPER III – BASIC AND APPLIED VIRAL GENETICS

Q.P. Code: 289127

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(2 x 20 = 40)

1. Draw the cell cycle. Describe in detail the checkpoints in cell cycle.
2. Explain with illustration the replicative lifecycle of retrovirus in human beings.

II. Write notes on:

(10 x 6 = 60)

1. Mechanism of SV40 DNA synthesis.
2. Catalytic RNA.
3. Nucleosomes.
4. DNA recombination.
5. Gene Therapy
6. Classify animal viruses based on their nucleic acid.
7. Write short notes on types and properties of histones.
8. Explain Antigenic shift and Antigenic drift with diagram.
9. Ambisense RNA Viruses.
10. Explain Intragenic and Intergenic mutation.

[LH 0415]

OCTOBER 2015

Sub. Code: 9127

M.Sc., MOLECULAR VIROLOGY
(for Candidates admitted from 2009-2010 Batch onwards)
FIRST YEAR
PAPER III – BASIC AND APPLIED VIRAL GENETICS

Q.P. Code : 289127

Time : Three hours

Maximum : 100 marks

I. Elaborate on :

(2 x 20 = 40)

1. Describe Viral Oncogenes and explain the mechanism of viral Oncogenesis.
2. Elaborate on replicative life cycle of poliovirus. Add a note on its lab diagnosis.

II. Write notes on :

(10 x 6 = 60)

1. Introns and Exons.
2. Prions.
3. Restriction endo-nucleases.
4. Okayaki fragments.
5. Antiviral agents.
6. Real Time PCR.
7. Replication of Pox virus.
8. Catalytic RNA.
9. Degeneracy of genetic code.
10. Post translational modification.

[LJ 1016]

OCTOBER 2016

Sub. Code: 9127

**M.Sc. MOLECULAR VIROLOGY EXAMS
FIRST YEAR
PAPER III – BASIC AND APPLIED VIRAL GENETICS**

Q.P. Code : 289127

Time: Three hours

Maximum : 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Describe mechanisms underlying mutation with special emphasis on phenotypic variation. Write a note on mutation rates and their outcomes.
2. Write in detail an protein synthesis in prokaryotes.

II. Write notes on: **(10 x 6 = 60)**

1. M phase.
2. E coli K₁₂ strain.
3. Restriction endo-nuclease.
4. Types of PCR.
5. Methyl transferases.
6. Lac operon.
7. Shuttle vector.
8. Virus assembly and release.
9. Receptor mediated endocytosis.
10. Tiling array.

[LK 0517]

MAY 2017

Sub. Code: 9127

**M.Sc. MOLECULAR VIROLOGY EXAMS
FIRST YEAR
PAPER III – BASIC AND APPLIED VIRAL GENETICS**

Q.P. Code : 289127

Time: Three hours

Maximum : 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Outline differences between RNA and DNA viruses? Discuss in detail about RNA virus multiplication.
2. PCR, its principle, applications and difference between conventional and real time PCR.

II. Write notes on: **(10 x 6 = 60)**

1. Kozak consensus sequence.
2. Translation of Eukaryotic mRNA.
3. Catalytic RNA.
4. Okazaki fragments and their role in DNA replication.
5. Restriction endonuclease and its natural function.
6. What is "viral interference"? Write a note about the mechanism.
7. Antisense RNA technology and their significance.
8. Compare and contrast the levels of gene regulation found in prokaryotes and eukaryotes.
9. Applications of recombinant DNA technology.
10. The role of introns and exons.

[LL 1017]

OCTOBER 2017

Sub. Code: 9127

**M.Sc. MOLECULAR VIROLOGY EXAMS
FIRST YEAR
PAPER III – BASIC AND APPLIED VIRAL GENETICS**

Q.P. Code : 289127

Time: Three hours

Maximum : 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Describe the mechanism of transcription in prokaryotes. What are the major differences from the mechanism in eukaryotes?
2. Give a detailed account of prion proteins and their role in causing infections.

II. Write notes on: **(10 x 6 = 60)**

1. Satellite DNA
2. Role of helicase enzyme.
3. Reverse transcriptase.
4. Ribosomal RNA.
5. Ribozyme.
6. Virus adsorption into host cell-mechanism involved.
7. Define mutation and explain any four types of mutation.
8. ECoR.
9. Splicing.
10. Insertion elements.

[LN 1018]

OCTOBER 2018

Sub. Code: 9127

**M.Sc. MOLECULAR VIROLOGY EXAMS
FIRST YEAR
PAPER III – BASIC AND APPLIED VIRAL GENETICS**

Q.P. Code : 289127

Time: Three hours

Maximum : 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Enumerate the differences between RNA and DNA viruses. Discuss in detail RNA viral multiplication.
2. What are prions? Write in detail about the Pathogenic mechanism and diseases caused by them.

II. Write notes on: **(10 x 6 = 60)**

1. Karyotyping.
2. Reverse transcriptase PCR.
3. Difference between hyperplasia and hypertrophy.
4. Splicosome.
5. Catalytic RNA.
6. Viral interference.
7. Genetic code.
8. Plasmid vector.
9. Immunochemistry.
10. Different types of Mutations.

[LP 1019]

OCTOBER 2019

Sub. Code: 9127

**M.Sc. MOLECULAR VIROLOGY EXAMS
FIRST YEAR
PAPER III – BASIC AND APPLIED VIRAL GENETICS**

Q.P. Code : 289127

Time: Three hours

Maximum : 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Describe in detail different cellular sites of viral RNA replication, each with example.
2. Write in detail the post transcriptional modifications of a typical eukaryotic cell.

II. Write notes on: **(10 x 6 = 60)**

1. Write an account on histones and their roles.
2. Human Genome project.
3. Ribosomal RNA.
4. Viral vectors in Gene therapy.
5. Explain Intragenic and Intergenic mutation.
6. Polyadenylation.
7. Reverse transcriptase.
8. Tiling array.
9. Flow cytometry.
10. Okazaki fragments and their role in DNA replication.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0321]

MARCH 2021

Sub. Code: 9127

(OCTOBER 2020 EXAM SESSION)

M.Sc. MOLECULAR VIROLOGY

FIRST YEAR (From 2009-2010 onwards)

PAPER III – BASIC AND APPLIED VIRAL GENETICS

Q.P. Code : 289127

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Give a detailed account of viral replication in retroviruses.
2. Explain post transcriptional RNA processing in eukaryotes.

II. Write Short Notes on:

(10x6 = 60)

1. Steps involved in transcription initiation.
2. Structure of Chromatin.
3. Lagging Strand.
4. Types of Plasmids.
5. DNA Polymerase enzyme.
6. Role of Nucleases.
7. Define mutation and explain various types of mutation.
8. Scrapie.
9. Catalytic RNA.
10. Introns and exons.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0222]

**FEBRUARY 2022
(OCTOBER 2021 EXAM SESSION)**

Sub. Code: 9127

**M.Sc. MOLECULAR VIROLOGY
FIRST YEAR (Candidates admitted from 2020-2021 onwards)
PAPER III – BASIC AND APPLIED VIRAL GENETICS AND ENTOMOLOGY
Q.P. Code : 289127**

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on: (2 x 20 = 40)

1. Enumerate the differences between RNA and DNA viruses. Describe in detail about RNA viral multiplication.
2. What are prions? Describe the pathogenic mechanisms and diseases caused by them.

II. Write Short Notes on: (10x6 = 60)

1. tRNA.
2. Introns and exons.
3. Lac Operon.
4. Post translational modification.
5. Mutations.
6. E coli K12 strain.
7. Application of recombination DNA technology.
8. Public health importance of ticks and mites.
9. Differences between the species of mosquitos.
10. Life cycle of culex mosquito and the diseases caused by them.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0222]

**FEBRUARY 2022
(OCTOBER 2021 EXAM SESSION)**

Sub. Code: 9127

**M.Sc. MOLECULAR VIROLOGY
FIRST YEAR (Candidates admitted from 2020-2021 onwards)
PAPER III – BASIC AND APPLIED VIRAL GENETICS AND ENTOMOLOGY
Q.P. Code : 289127**

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on: (2 x 20 = 40)

1. Enumerate the differences between RNA and DNA viruses. Describe in detail about RNA viral multiplication.
2. What are prions? Describe the pathogenic mechanisms and diseases caused by them.

II. Write Short Notes on: (10x6 = 60)

1. tRNA.
2. Introns and exons.
3. Lac Operon.
4. Post translational modification.
5. Mutations.
6. E coli K12 strain.
7. Application of recombination DNA technology.
8. Public health importance of ticks and mites.
9. Differences between the species of mosquitos.
10. Life cycle of culex mosquito and the diseases caused by them.
