

Master of Philosophy (M.Phil)  
Molecular Cell Biology and Medical Genetics  
Semester - II Examination August-2014

Time: 3 Hrs.

Max. Marks: 100]

Paper – I  
Cytogenetics  
Q.P Code: 6112

*Your answers should be specific to the questions asked.  
Draw neat labelled diagrams wherever necessary.*

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Section – A Cytology (50 Marks)  
(Use Separate Answer booklet for Section "A" and Section "B")

LONG ESSAY

2 X 10 = 20 Marks

1. Discuss the genomic basis mechanism in disease.
2. Discuss the role of Immunohistochemistry in soft tissue tumours.

SHORT ESSAY

3X 5 = 15 Marks

3. Nested polymerase chain reaction.
4. Sex chromosome and their disorders.
5. Comparative genomic hybridization.

SHORT ANSWERS

5 X 3 = 15 Marks

6. Southern blot hybridization.
7. Telomerase as oncogenes.
8. Protein Kinase and chromosomal stability.
9. Oxidative damage to DNA.
10. Abnormalities in chromosomal number and conditions associated with it.

Section – B Genetics (50 Marks)  
(Use separate Answer booklet for Section-B)

LONG ESSAY

2 X 10 = 20 Marks

1. Enumerate Mendelian laws of inheritance. Explain briefly the law of segregation with suitable examples.
2. Define population genetics. Explain Hardy Weinberg's law with suitable examples.

SHORT ESSAY

3X 5 = 15 Marks

3. Multifactorial inheritance.
4. HLA-system
5. Immune system disorders

SHORT ANSWERS

5 X 3 = 15 Marks

6. Inactivation of X-chromosome.
7. Unusual blood groups.
8. Symbols used in pedigree charts.
9. Eugenics.
10. Zinc finger genes.

Time: 3 Hrs.

Max. Marks: 100]

Paper – II

(Molecular cell Biology)

Q.P Code: 6222

*Your answers should be specific to the questions asked.*

*Draw neat labelled diagrams wherever necessary.*

LONG ESSAY

2 X 10 = 20 Marks

1. Write down the principles and methodology of genomic DNA library construction and its applications.
2. Write down the principle behind “whole genome sequencing”. Explain briefly about “Human genome project”.

SHORT ESSAY

10 X 5 = 50 Marks

- 3 Write about DNA modifying enzymes.
- 4 What are gene knockouts? Write down the methods of generating gene knockouts.
- 5 Describe western blotting techniques.
- 6 Positive regulation of lac operon.
- 7 Attenuation in tryptophan.
- 8 Explain the principles and steps involved in microarray analysis.
- 9 What is DNA finger printing? Explain its application.
- 10 Write a note on gene therapy.
- 11 Explain TGF-B pathway in cancer.
- 12 Applications of biological databases.

SHORT ANSWERS

10 X 3 = 30 Marks

- 13 What is “Yeast artificial chromosome”?
- 14 Lipofection.
- 15 Write a note on DNA vaccines.
- 16 Applications of RFLP.
- 17 Tumor markers.
- 18 Oncogenes.
- 19 What are the disadvantages of cancer chemotherapy?
- 20 Explain various biological databases in bio informatics.
- 21 Anticancerous compounds.
- 22 Ethics involved in human genome project.