

Time: 3 Hrs.

Max. Marks: 100]

Paper – I
Cytogenetics

Q.P Code :5111

Your answers should be specific to the questions asked.

Draw neat labelled diagrams wherever necessary.

C10

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 modality of specimen collection and processions for molecular pathology.
2. Discuss the structure and functions of nucleus.

SHORT ESSAY

3X 5 = 15 Marks

- 3 Brief notes on Karyotyping.
- 4 Golgi complex –structure and function.
- 5 Types of membrane receptors.

SHORT ANSWERS

5 X 3 = 15 Marks

- 6 Translocation.
- 7 Heterophagy.
- 8 Cellular inclusions.
- 9 Cell junctions
- 10 Lysosomal storage disease.

Section – B Genetics (50 Marks)

(Use Separate Answer booklet for Section-B)

LONG ESSAY

2 X 10 = 20 Marks

1. Define inheritance. Describe the characteristics of X and Y chromosomal inheritance.
2. Define Meiosis. Explain the steps in meiosis I and II in detail.

SHORT ESSAY

3X 5 = 15 Marks

- 3 Procedure of karyotyping.
- 4 Down syndrome.
- 5 Autosomal recessive inheritance.

SHORT ANSWERS

5 X 3 = 15 Marks

- 6 Mention the laws of inheritance.
- 7 De-oxy Ribo Nucleic Acid (DNA)
- 8 Golgi complex.
- 9 Complementary genes.
- 10 Epistasis.

Time: 3 Hrs.

Max. Marks: 100]

Paper – II
Molecular Cell Biology

Q.P Code: 5121

Your answers should be specific to the questions asked.

Draw neat labelled diagrams wherever necessary.

LONG ESSAY

2 X 10 = 20 Marks

1. Explain post translational modification of proteins with their functional significance.
2. Discuss the process of DNA replication in prokaryotes.

SHORT ESSAY

10 X 5 = 50 Marks

- 3 Explain transcriptional initiation in E. Coli.
- 4 High light the works of H. Khorana that helped in deciphering genetic code.
- 5 Discuss various types of mutations and their agents.
- 6 How are restriction enzymes useful in cloning and molecular genetics? Explain.
- 7 Outline the steps involved in production of recombinant insulin.
- 8 Outline the biosynthesis of pyrimidines.
- 9 Compare and contrast plasmids and phages.
- 10 Explain how a mature mRNA is produced from a primary transcript.
- 11 Discuss the utility of synthetic analogues as pharmaceutical agents.
- 12 Discuss the DNA repair by SOS mechanism

SHORT ANSWERS

10 X 3 = 30 Marks

- 13 What is a Klenow fragment? Give its uses.
- 14 Distinguish between pseudogenes and introns.
- 15 Define promoter. Give its applications.
- 16 Outline central dogma of molecular biology.
- 17 How does rho helps in transcription termination.
- 18 What makes RNase-P on enzyme?
- 19 How does amino acyl tRNA synthetase help in screening tRNAs.
- 20 Give the function and applications of reverse transcriptase.
- 21 How does B-DNA differ from Z-DNA?
- 22 What are suppressor mutations? Give example.