

(Metagenomics, Epigenetics and Chromatin Biology)

Maximum Marks: 70

Note:- Attempt any ten questions. Each question carries one mark.

1. An example of RNase III-like enzyme that recognizes and digests long double stranded RNAs is.....
2. An example of chromatin remodelling enzyme is.....
3. miRNA are highly conserved sequences ranging about nucleotides in length.
4. Splicing removes
5. Name any one of the imprinting disorder.....

6. Usually, methylated regions of genes are transcriptionally..... **(Active/Inactive)**
7. The structure of chromatin can be modified by:
 - a) Methylation
 - b) Acetylation
 - c) Phosphorylation
 - d) All of the above
8. The modification of histone affects:
 - a) Transcription
 - b) Gene Expression
 - c) Both a and b
 - d) None of the above
9. Which of the following is a non-coding RNA?
 - a) mRNA
 - b) rRNA
 - c) tRNA
 - d) miRNA
10. The common targets for epigenetic DNA methylation are:
 - a) CpG islands
 - b) ApT island
 - c) Telomeres
 - d) None of the above
11. Epigenetic changes are also inherited from one generation to another. **(State whether true or false)**
12. The core nucleosome is composed of two copies each of histone H2A, H2B, H3 and H4 and 147 bp of DNA. **(State whether true or false)**

(3)

Section-B

Note:- Attempt any five questions. Each question carries two marks.

Q. II. Very Short Answer Type (25-30 Words) 2x5

1. What MARs?
2. Define epigenetics.
3. What are histones?
4. What is meant by DNA-methylation?
5. What are heterochromatins?
6. Define RNA-interference.
7. What is meant by transcriptional silencing?

Section-C

Note:- Attempt any five questions. Each question carries four marks.

Q.III. Short Answer Type (250 Words) 4x5

1. Give a brief account on role of non-coding RNAs.
2. Describe the concept of "histone code".
3. Give a brief account on chromatin remodelling.
4. Discuss the concept of dose compensation in *Drosophila*.
5. Describe the genome imprinting in brief.

(4)

Section-D

Note:- Attempt any three questions. Each question carries ten marks.

Q.IV. Essay type (more than 500 Words) 3x10

1. Give a detailed account on organization and structure of eukaryotic genome.
2. Discuss in detail the role of RNA interference in regulation of gene expression.
3. Describe Position effect variegation, heterochromatin formation and gene silencing in *Drosophila*.
4. Discuss the epigenetic determinants of cancer.