

Question Bank 503 (Molecular Biology & Genetics)

UNIT: 1

1 Mark:

1. Define Cistron.
2. What is Replisome?
3. Enlist only DNA replication method.
4. Define Dispersive mode of DNA replication.
5. DNA replication occurs in which phase of cell cycle?
6. Write down four characteristics of DNA.
7. Define Dominance
8. Define Recessive.
9. Give contribution of Gregor Mendel.
10. Define gene.

2 & 3 Marks:

1. Write down difference between prokaryotic and eukaryotic gene.
2. Write short note on "cistron".
3. Write short note on gene structure.
4. What is gene architecture? Write short note on it.
5. Short note on Meselson and Stahl experiments?
6. Short note on prokaryotic gene.

5 Mark:

1. Describe semi-conservative mode of replication in details
2. Explain "DNA as a universal genetic material".
3. Short note on gene structure and architecture.
4. Mendelian Laws of inheritance

UNIT: 2

1 Mark:

1. Enlist steps involved in post transcriptional modification.
2. Define transcription?
3. Define genetic code.
4. What is translation?
5. Write down the procedure of central dogma of life.
6. What is translocation?
7. What is operon?
8. Define reverse transcription.
9. What is cDNA?
10. Define the term Operator, Promoter?

2 & 3 Marks

1. Short note on post transcriptional modification.
2. Short note on genetic code in details.
3. Structure of ribosome and its function.
4. Describe in details post translational modification process.
5. Short note on arabinose operon.
6. Enlist gene expression gene involved in “trp operon” and its function.
7. Principle of gene regulation.
8. Post transcriptional control in detail.
9. Describe translocation in details.
10. What are splicing and its types?

5 Mark:

1. Process of transcription in details.
2. Conversion of mRNA to protein, name of this process and describe in details.
3. Short note on “lac operon”.
4. Short note on “trp operon”.
5. Types of RNA polymerase and describe its structure in details.

UNIT: 3

1 Mark:

1. What is recombination?
2. Define homologous recombination.
3. Define competence.
4. Define electroporation.
5. What is jumping gene?
6. Define transformation.
7. Define Hfr conjugation.
8. Enlist the artificial competence.
9. Illegitimate recombination: define.
10. Define conjugation.

2 & 3 Marks:

1. Short note on homologous recombination.
2. Short note on Griffith experiment.
3. Specialized transduction in detail.
4. Conjugation in Gram -ve bacteria.
5. F⁺ conjugation in detail.
6. Hfr conjugation in detail.

5 Mark:

1. Short note on recombination.
2. Short note on transformation.
3. Short note on generalized transduction.

4. Short note on conjugation and its types.
5. Short note on transposable elements.

UNIT: 4

1 Mark:

1. Define mutation.
2. Define mutagen.
3. Define inducible mutation.
4. Define the term
 - a. Physical mutagen
 - b. Biological mutagen
 - c. Chemical mutagen
5. Ames test?
6. Enlist the DNA repair mechanism.

2 & 3 Marks:

1. Describe the types of mutation.
2. Phenotypic effect of mutation: short note
3. Short note on biochemical basis of mutation.
4. Describe mismatch repair mechanism.

5 Mark:

1. Difference between spontaneous and induced mutation.
2. Short note on physical mutagenesis.
3. Short note on photo reactive and excision repair mechanism.

UNIT 5

1 Mark:

1. What is a vector?
2. What is meant by transformation?
3. Name some common vectors used in rDNA technology.
4. Define cDNA.
5. Define gene cloning.
6. Name the bacteria used for carrying out transformation in plants.
7. Define host.
8. Give the full form of YAC.
9. Define probe.
10. What are restriction endonucleases?

2 & 3 Marks:

1. Explain the difference between cloning vectors and expression vectors.
2. Give the difference between stringent and relaxed replication control of plasmids.
3. What is meant by site directed mutagenesis?
4. What should be the properties of a good host?
5. Describe the types of restriction endonucleases.
6. What should be the properties of a good vector?
7. Name and describe the tools used for gene cloning.
8. Write the applications of genetic engineering.
9. Write a short note on pBR322 vectors.
10. Describe in short pUC vectors.

5 Mark:

1. Describe the different kinds of vectors available for yeast and discuss their advantages and limitations.
2. Write a short note on molecular chaperons.
3. Write a note on colony hybridization.
4. Describe the method for insertion of recombinant DNA into the suitable host.
5. Describe the method of integration of DNA insert into the vector.