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**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech. (Food Technology) 2022 Admission**  
**IV Semester Final Examination – July 2024**

Pafe.2221

**Food Biotechnology (2+1)**

**Marks: 50**  
**Time: 2 hours**

**I Fill in the blanks**

**(10x1=10)**

1. The double-helix structure of DNA was discovered by Watson and Crick in the year .....
2. During synthesis of DNA, while the leading strand gets synthesized as a single polynucleotide chain, the lagging strand is synthesized in pieces. Therefore, DNA synthesis is said to be .....
3. The number of chromosomes in *E. coli* is .....
4. The three stop codons are .....
5. Polysomes/polyribosomes are only found in .....
6. The enzyme used to produce a complementary DNA from a RNA is .....
7. Synthesis of all poly-peptides starts with this amino acid .....
8. The enzyme associated with adding two double-stranded DNA together end to end is .....
9. The cofactor associated with *Taq* DNA polymerase in PCR is .....
10. The short stretches of single stranded DNA, incorporated with some radioactive dNTP, for ease of detection in photosensitive plates during nucleic acid hybridization assays is called the .....

**II Write short notes on ANY FIVE of the following**

**(5x2=10)**

1. Restriction enzymes
2. Biosensors
3. Enzyme immobilization
4. Ethical issues concerning GM foods
5. Transposable elements
6. Codon usage bias
7. Public perception of GM foods

**III Answer ANY FIVE of the following**

**(5x4=20)**

1. What do you know about mutation and DNA repair? Write about the mechanisms of repair of damaged DNA.
2. What is gene cloning? Why do we need to clone a gene? Mention the various steps of cloning a useful gene.
3. What are plasmids and what are their roles? How can we use plasmids in gene cloning? Cite some examples of plasmids used in gene cloning.
4. What do you know about genetic recombination in bacteria? In which different ways does genetic recombination may occur in bacteria? Explain briefly.
5. Write a brief note on RNA synthesis, with necessary diagrams. What are the various types of RNA?
6. What are the basic differences in organization of the genetic material among bacteria, eukaryotes and viruses? Use diagrams, if needed.
7. What is need of DNA replication? How does the process of DNA replication proceeds? Explain the involvement of various enzymes in the process.

**IV Write an essay on ANY ONE of the following**

**(1x10=10)**

1. Recombinant DNA (rDNA) technology, the tools used in rDNA technology, and the applications and promises of the rDNA technology.
2. Application of biotechnology in food and food technology.

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