

Bt301:-

Introduction to Biotechnology:-

Solved Final Papers:-

Questions:-

1: What is insertional inactivation?

Ans.1:- Insertional inactivation is the inactivation of a gene upon insertion of another gene inside in its place or within its coding sequence. This video also explains the selection of recombinant colonies in selective antibiotic medium by insertional inactivation

2: what is DNA sequence; benefits and applications?

Ans.2:- DNA sequencing is the process of determining the precise order of nucleotides within a **DNA** molecule. It includes any method or technology that is used to determine the order of the four bases—adenine, guanine, cytosine, and thymine—in a strand of **DNA**.

DNA sequencing: Benefits and Applications:-

DNA sequence information is a prerequisite for planning any substantial manipulation of the DNA. Information is useful to various fields' i.e. molecular and evolutionary biology, metagenomics, medicine, forensics etc.

3: PCR & RT-QPCR and features?

Ans.3:- PCR:

PCR is a technology in molecular biology used to amplify a single or a few copies of a target DNA across several orders of magnitude, generating millions of copies of a Particular DNA sequence.

Real-time quantitative PCR (qPCR):-

RT-QPCR is used to measure the quantity of a target sequence. It is used to measure starting amounts of DNA, cDNA, or RNA

4: what is multiplex PCR?

Ans.4:- Multiplex PCR

Multiplex PCR is used to amplify several different DNA sequences Simultaneously

5: siRNA strategy?

Ans.2:- Small interfering RNA (siRNA) is the most commonly used RNA interference (RNAi) tool for inducing short-term silencing of protein coding genes. siRNA is a synthetic RNA duplex designed to specifically target a particular mRNA for degradation.

6: What is mean by Orthology?

Ans.6:- Orthologs are homologous genes in different organisms that encode proteins with the Same function and which have evolved by direct vertical descent.

7: What are relaxed plasmids?

Ans.7: These plasmids contain DNA regions called par-locuses (from partition) that control the correct division of the plasmids in the two daughter cells. Plasmids with high copy number are under relaxed control of replication. These plasmids are replicated independently of the replication of the bacterial chromosome

8: Applications of PCR?**Ans.8:- Applications of PCR**

PCR has widespread applications in various fields of life sciences including genetic engineering, medical, forensic, agriculture, environment etc. PCR-Gene cloning and expression. PCR has been used in

Gene cloning and screening of genomic libraries

PCR-Medicine

PCR has major impact on medicine especially in the field of clinical microbiology or diagnosis. Molecular tools have also allowed to perform prenatal genetic diagnosis

PCR-Forensic sciences

Forensic science is the application of scientific procedures to solve criminal and legal matters

Molecular methods are used to established the filiations of a person or to obtain evidence from minimal samples of saliva, semen or other tissues

PCR-DNA profiling

DNA profiling or DNA fingerprinting is a forensic technique used to identify individuals by characteristics of their DNA

PCR-Agricultural sciences and environment

PCR has also facilitated research in detection of pathogens in plants, animals and environment

PCR-Molecular Paleontology

Molecular paleontology refers to the recovery and analysis of DNA and protein from ancient human, animal and plant remains

9: Write a note on plasmids and natural plasmids?**Ans.2:- Plasmids:-**

Plasmids are mostly circular DNA molecules that replicate separately from the host chromosome. Naturally occurring bacterial plasmids range in size from 5,000 to 400,000 bp.

Natural Plasmids:-**Natural plasmids as cloning vehicles**

Plasmids which were not constructed in vitro for the sole purpose of cloning are called natural plasmids. Col E1 is a natural occurring plasmid. RSF2124 is a derivative of Col E1

10: 4 steps of cloning?

Ans.10:- Steps of cloning:-

Cloning with lambda replacement vectors involves the following steps:

- (i). Isolation and cutting vector DNA with appropriate restriction enzymes
- (ii). Connecting the two lambda fragments to foreign DNA by using DNA ligase
- (iii). In vitro packaging of recombinant DNA
- (iv). Infection of E. coli cells and isolation of phage clones by picking plaques on a host strain
- (v). Checking recombinant phage for the presence of foreign DNA