Virtual University of Pakistan

(Bt301)

Introduction to biotechnology

Final past papers

BT301 final term past papers:

BT301

Define pseudo genes? 2

What are the major properties of p1248 in the expression of staphylococcus plasmids? 2

Genomic libraries in high capacity vectors? 2

Write down the working of taq DNA polymerase in PCR? 3

Expression cloning in prokaryotes and yeast? 3

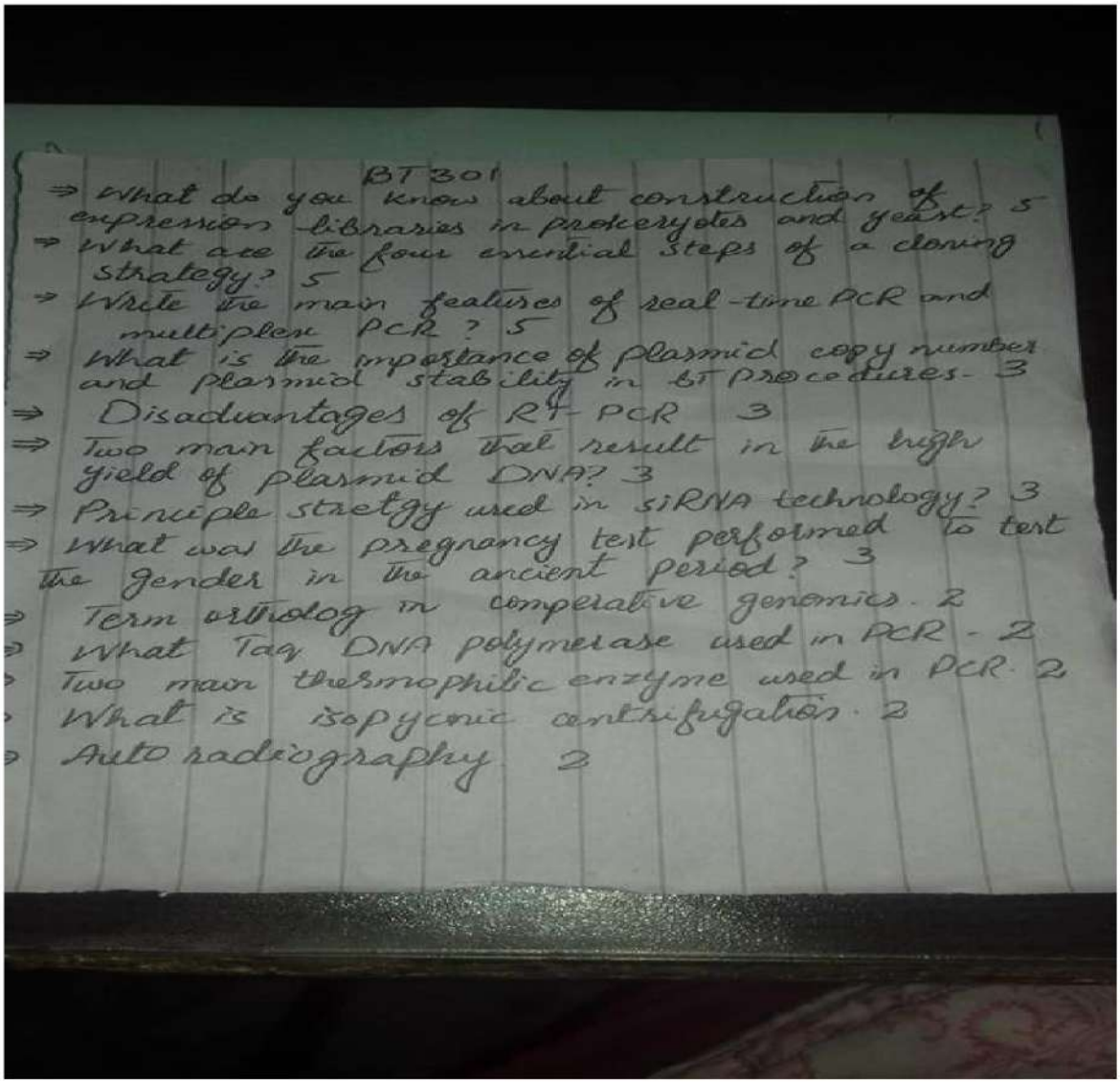
Write down the work of spotted DNA arrays In expression analysis? 3

Write down the main features of Real-time PCR and multiplex PCR? 5

SNPs as physical markers? 5

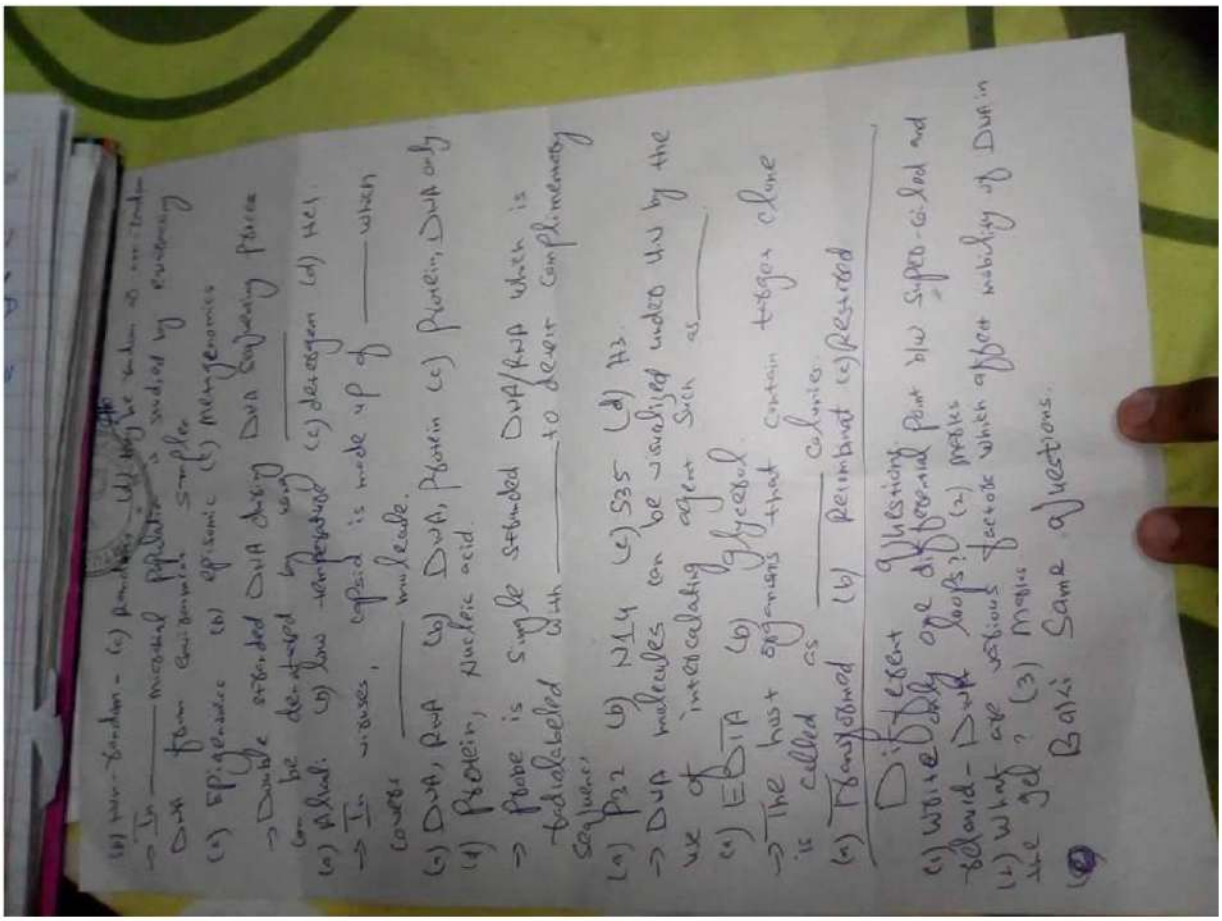
Write a brief note on proteins primary, secondary, tertiary and quaternary structure? 5

Write a note on mutagenesis. Describe its types with detail? 10



BT 301

⇒ What do you know about construction of expression libraries in prokaryotes and yeast? 5
⇒ What are the four essential steps of a cloning strategy? 5
⇒ Write the main features of real-time PCR and multiplex PCR? 5
⇒ What is the importance of plasmid copy number and plasmid stability in BT procedures. 3
⇒ Disadvantages of RT-PCR 3
⇒ Two main factors that result in the high yield of plasmid DNA? 3
⇒ Principle strategy used in siRNA technology? 3
⇒ What was the pregnancy test performed to test the gender in the ancient period? 3
⇒ Term ortholog in comperative genomics. 2
⇒ What Taq DNA polymerase used in PCR - 2
⇒ Two main thermophilic enzyme used in PCR 2
⇒ What is isopycnic centrifugation. 2
⇒ Auto radiography 2



BT301 My Paper

1. Mention the bonding of three parts which make a complete nucleotide.
2. What is epitope?
3. D/f b/w Promoter, Oligomer and multimer?
4. Side effect of ethidium bromide if contact with body?
5. How functional Complementation restores the lost function in higher organisms like animals? Give one example

Q1: what is DNA sequence; their type, benefits and applications?
Q2: PCR & RT-QPCR and features?
Q3: RT-QPCR Disadvantages?
Q4: what is orthologous?
Q5: what is multiplex PCR?
Q6: What are plasmids, type, applications, and natural presence?
Q7: siRNA strategy?
Q8: yeast and eukaryotic library? Exact q yaadni ye wala

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 twolambda 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

Bt301 paper: 18/2/18 10:30 am
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BT 301 today 8 bje dated 12-08-2017
1-Mutagenesis and its types. .. 10 marks
2-DNA
sequencing, Types, Benefits, application , data base ....10 marks
3-steps of cloning strategy. .. 5
marks
4-Real time pcr& multiplex pcr...5 marks
5 - plasmid no. & stability of plasmid
6 -disadvantage of Rt-pcr 7 - taq polymerase DNa
8- What is mean by Orthology
9-use of microaray in human health

BT301 at 8 AM)
mutagenesis and its types (10 marks)
DNA sequencing, its benefits, applications and databases (10 marks) real time pcr and multiplex pcr (5 marks)
type of Resistance observed in p1258 plasmid of staphylococcus (2)
what is taq. DNapolymeraz used for? (2) importance of plasmid copy number and stability
(idontremmebrothrs, mcqs were confusing)

BT301 cDNA library 2
marks Ortholog 2
marks
Taq polymerase 2 marks
Application of PCR 3 marks Spotted DNA Arrays 3 marks 5 steps of clonning..5 marks DNA sequencing 5 marks QPCR and multiplex PCR. 3 marks PCR its types and its applications .. 10 marks

BT301
One difference b/w super coiled or relaxed loop (2)
Define orthologs (2)
What is cDNA library(2)
Why we use taq polymerase in PCR(3) Principle strategy used in siRNA technology(3) Benefits of cDNA library(3) Applications of PCR(3) Features of Real time PCR and multiplex PCR(5) Construction of expression libraries in prokaryotes and yeast(5) DNA sequencing and benefits(5) PCR its types and applications(10)

(Final term papers before 2017)

BT301
Disadvantage of RT –PCR
Principle of si-RNa
Lenght of major n minor grooves
Function of nucleic acid
Two thermophilic enzyme used in PCR