



5th Semester End Term Examination: Dec - 2022.

Subject : Bioprocess Technology

Course : B. Sc – Biotechnology

Full Marks : 60

Roll No:

Time : 3 Hours.

Instructions to the Candidates:

- Read the question paper very carefully.
- Start writing from 2nd page onwards; **Don't Write On The 1st Page Backside.**
- Question Paper is divided into Three Parts -A, B & C.
- Part-A is containing 10 multiple choice questions & 5 very short Question Answer.
- Part- B containing SIX questions out of which FOUR questions are to be answered.
- Part C containing FOUR questions out of which TWO questions are to be answered.
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PART - A

Multiple Choice Questions

[10x1=10]

- i) Identify the correct sequence during the industrial production of substances
a) inoculation, screening, fermentation, downstream processing, removal of waste
b) Screening, Inoculation, fermentation, downstream processing, removal of waste
c) Fermentation, screening, inoculation, removal of waste, downstream processing
d) Fermentation, inoculation, removal of waste, downstream processing
ii) In which of the following fermenters the impellers are replaced by the constant flow of gas?
a) Airlift fermenter
b) Tower fermenter
c) CSTR
d) Perfusion bioreactor
iii) The culture medium should not _____
a) Be sterilized
b) Be cheap and readily available
c) Contain desired products
d) Allow high yield of undesired products

- iv) Carbon sources used in media formulation are following except
 a) Carbohydrates
 b) Oils and fats
 c) Hydrocarbons
 d) Peptones
- v) Ammonia, ammonium salts, and urea are the most commonly used Sources in the fermentation process.
 a) Carbon
 b) Enzyme
 c) Nitrogen
 d) Minerals
- vi) Which of the following is not used in the construction of a fermentation vessel?
 a) Iron
 b) Steel
 c) Potassium
 d) Stainless steel
- vii) What is the basic function of the fermenter?
 a) To sterilize the medium
 b) To recover the product
 c) To provide optimum growth conditions to organisms and obtain the desired product
 d) To purify the product
- viii) While constructing the fermenter, which of the following is not required?
 a) High-speed Agitation and Aeration system
 b) Temperature control system
 c) Ph control system
 d) Sample facilities
- ix) The method of screening is used
 a) To improve the microbial strain
 b) To improve the growth of an enzyme
 c) To choose appropriate microorganisms for the conditions for growth of microbes
 d) To determine the optimum conditions for growth of microbes
- x) The bioreactor can not _____
 a) Produce aseptic condition
 b) Meet containment regulations
 c) Control pH
 d) Produce electricity

Very Short Question Answer

2. a) Sterilization
 b) Thermal death point
 c) Zvalue
 d) Inoculum development
 e) Online sensor

[5x2=10]

PART - B

Answer any FOUR out of SIX

3. Draw airlift bioreactor and explain it.
 4. What are different components of Computer aided fermentation
 5. What are ideal characteristics of bioreactor?
 6. What are different sterilisation methods used in bioprocess industry?
 7. Why process control is required in bioprocess industry?
 8. Discuss SCP

[4x5=20]

PART - C

Answer any TWO out of FOUR

9. Discuss physical, chemical and Biological parameters in bioprocess industry and discuss instrumentation related to these parameters
 10. Discuss downstream processing and discuss 4 processes under downstream process.
 15. Differentiate between Packed bed and fluidised bed bioreactor.
 16. Discuss continuous fermentation process and Batch process

[2x10=20]



5th Semester End Term Examination: Dec - 2022.

Subject : Bioinformatics
Course : B. Sc. – Biotechnology
Full Marks : 60

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PART - A

Multiple Choice Questions

[10x1=10]

1. i) GenBank and Swiss-Prot are examples of
a) Primary Database b) Composite Database
c) Secondary Database d) None of these
ii) Phylogenetic relationship can be shown by
a) Dendrogram b) Gene bank
c) Data Retrieving Tool d) Data Search Tool
iii) Submission to Genbank are made using
a) BankIt b) Sequin
c) Both a and b d) Entrez
iv) Which of the following is an E.coli model organism database?
a) Ecogene b) Ecobase
c) Ecoseq d) Colgene
v) Which of the following is not a variant of BLAST?
a) BLASTN b) BLASTP
c) BLASTX d) TBLASTNX

- vi) Which of the following is the Multiple Sequence Alignment Tool?
 a) Clustal W
 b) Chime
 c) PDB
 d) Rasmol
- vii) Which of the following is the application of bioinformatics?
 a) Drug designing
 b) Data storage and management
 c) Relationships between organisms
 d) All of the above
- viii) The laboratory work using computers and associated with web-based analysis generally online is referred to as
 a) In silico
 b) Dry lab
 c) Wet lab
 d) All of the above
- ix) Which of these is not a protein sequence database?
 a) PIR
 b) GenBank
 c) PDB
 d) COGs
- x) The initiation of FASTA format has _____ symbol.
 a) *
 b) /
 c) >
 d) <

Very Short Question Answer

[5x2=10]

2. a) Gene Bank
 b) ORF
 c) Primer
 d) Phylogenetic tree
 e) Pairwise Alignments

PART - B

Answer any FOUR out of SIX

[4x5=20]

3. Write short notes on
 a) PDB
 b) EMBL
4. Discuss the difference between local and global alignment with suitable examples.
5. What are the sequence submission tools?
6. Name two tools used in phylogenetic analysis.
7. Write a note on Microarray?
8. What is meant by structural database?

PART - C

Answer any TWO out of FOUR

[2x10=20]

9. What is database? Describe different biological database with example.
10. What is Bioinformatics? State its applications.
11. Write down the significance of multiple sequence alignment in biological data analysis.
12. What is BLAST? Describe the different types of BLAST.



5th Semester End Term Examination: Dec -2022.

Subject : Recombinant DNA technology

Course : B. Sc – Biotechnology

Full Marks : 60

Roll No:

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PART - A

Multiple Choice Questions

[10x1=10]

- 1 i) Electroporation and microinjections are methods of _____
- | | |
|--------------------|----------------------|
| a) Gene transfer | b) Host modification |
| c) PCR preparation | d) None of these |
- ii)is a forensic technique used to identify individuals by characteristics of their DNA
- | | |
|------------------------|------------------|
| a) Fingerprinting | b) cDNA library |
| c) DNA finger printing | d) None of these |
- iii) Laboratory method used to detect specific DNA molecules from among many other DNA molecules
- | | |
|------------------|------------------|
| a) Southern blot | b) Northern blot |
| c) Western blot | d) All of these |
- iv) Host controlled restriction is a phenomenon related to _____
- | | |
|-------------|---------------------|
| a) Bacteria | b) Virus |
| c) Plasmid | d) Gene of interest |
- v) GAL system belongs to _____
- | | |
|----------------------------------|---------------------------------|
| a) Prokaryotic expression system | b) Eukaryotic expression system |
| c) Both of these | d) none of these |

- vi) Fusion proteins
 a) Aids in purification b) Created through joining of two or more proteins
 c) Aids in screening d) All of the above
- vii) Expression vector differs from cloning vector in having
 a) Origin of replication b) Unique restriction site
 c) Suitable marker d) Regulatory elements
- viii) Detailed schematic description of structural and functional organisation of complete genome of an organism
 a) Gene b) Genome
 c) Genome map d) Genome analysis
- ix) It should bind to template with good specificity and strength
 a) Mg²⁺ b) DNA
 c) Primer d) Buffer
- x) If PCR is used to introduce random mutations rather than specific mutations, it is called as
 a) Mutagenic PCR b) Error-prone PCR
 c) Random PCR d) General PCR

Very Short Question Answer

[5x2=10]

- a) Ligase.
 b) Site directed Mutagenesis.
 c) Alkaline Phosphatase.
 d) DNA shuffling.
 e) TMV.

PART - B

Answer any FOUR out of SIX

[4x5=20]

2. Discuss restriction enzymes and their types.
3. Discuss steps of cloning.
4. Discuss the properties of primer.
5. What are fusion proteins, Discuss their features.
6. Write the features of cosmid vector.
7. Define screening of recombinant, explain with example.

PART - C

Answer any TWO out of FOUR

[2x10=20]

8. Discuss different steps and types of PCR.
9. Discuss Ti plasmid.
10. Differentiate between cloning and expression vector in detail.
11. List any 4 bio products created using animal biotechnology, discuss about interferons mechanism and production of interferon.