This question paper contains **2** printed pages]

# PB—27—2024

## FACULTY OF SCIENCE AND TECHNOLOGY

## B.Sc. (Third Year) (Fifth Semester) EXAMINATION

## APRIL/MAY, 2024

## (New Course)

BIOTECHNOLOGY

Paper–DSEBT-4E-I

(Advanced Bioinformatics)

**(Saturday, 13-4-2024)** **Time : 10.00 a.m. to 1.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

*N.B.* :— (*i*) Attempt *all* questions.

(*ii*) Figures to the right indicate full marks.

(*iii*) Illustrate your answers with suitable diagram scheme etc.

1. What is bioinformatics ? Give a detailed account of advanced fields of bioinformatics. 15

*Or*

Write on :

(*a*) HTML 8

(*b*) WWW. 7

P.T.O.

2. Describe in detail multiple sequence alignment. 15

*Or*

Write notes on :

(*a*) Rasmol 8

(*b*) Cn3D. 7

3. Describe in brief Protein sequence database. 15

*Or*

Write notes on :

(*a*) GenBank 8

(*b*) DDBJ. 7

4. Describe secondary structure classification of protein. 15

*Or*

Write notes on :

(*a*) Motif 8

(*b*) Domain. 7

5. Write short notes on (any *three*) : 15

(*i*) WWW

(*ii*) PyMol

(*iii*) Pubmed

(*iv*) Homology modelling.

This question paper contains **2** printed pages]

# PB—24—2024

## FACULTY OF SCIENCE

## B.Sc. (Third Year) (Fifth Semester) EXAMINATION

## APRIL/MAY, 2024

## (New Pattern)

BIOTECHNOLOGY

(Paper–CCBT-3E)

(Bioprocess Technology)

**(Friday, 12-4-2024)** **Time : 10.00 a.m. to 1.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

*N.B.* :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw a well labelled diagrams wherever necessary.

1. Define Bioreactor. Explain in detail construction, design and operation of Bioreactor. 15

*Or*

(*a*) Explain welding, surface treatment components and specification of the fermenters. 8

(*b*) Explain in detail materials of construction of fermenter. 7

P.T.O.

2. Define sterilization. Explain in detail media sterilization with principle and mechanism. 15

*Or*

(*a*) Define media. Explain in detail constituents of design of media. 8

(*b*) Describe design of sterilization cycle using kinetics of thermal death of microbes. 7

3. Define Growth. Explain in detail batch and continuous culture kinetics. 15

*Or*

(*a*) Explain in detail effect of temperature on cell growth. 8

(*b*) Give an account on strategies of fermentation control. 7

4. Explain in detail quality control and quality assurance. 15

*Or*

(*a*) Describe scale up in Bioprocesses fermentation. 8

(*b*) Give an account on foam and its control. 7

5. Write short notes on (any *three*) : 3×5=15

(*a*) Fermenter

(*b*) Decimal reduction

(*c*) Fed batch culture

(*d*) SOP

(*e*) Costing of media.

This question paper contains **2** printed pages]

# PB—16—2024

## FACULTY OF SCIENCE AND TECHNOLOGY

## B.Sc. (Third Year) (Fifth Semester) EXAMINATION

## APRIL/MAY, 2024

## (New Course)

BIOTECHNOLOGY

(Developmental Biology)

**(Monday, 08-04-2024)** **Time : 10.00 a.m. to 1.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

***Note*** *:—* (*i*) *All* the questions are compulsory.

(*ii*) Each question carries equal marks.

1. Describe in detail competence, determination and commitment. Explain each with an example. 15

*Or*

(*a*) Explain in brief about fertilization. 8

(*b*) Describe in detail organogenesis in frog. 7

2. Describe in detail developmental stages of Drosophila. 15

*Or*

(*a*) What is stem cell ? Describe in detail different types of stem cells. 8

(*b*) What is progenitor cells ? Explain in detail cell lineages in animal.

P.T.O.

7

3. What is seedling development ? Explain floral patterning in Arabidopsis. 15

*Or*

(*a*) Write a note on meristem structure. 8

(*b*) Describe in detail photomorphogenesis. 7

4. What is transgenic technology ? Explain its application in plant and animal. 15

*Or*

(*a*) Write a note on concept of test tube baby. 8

(*b*) Write a note on citrus. 7

5. Write short notes on (any *three*) : 15

(*i*) Types of Cleavage

(*ii*) Apoptosis

(*iii*) Hybrid

(*iv*) Embryoculture

(*v*) Patterns of Cleavage.

This question paper contains **2** printed pages]

# PB—28—2024

## FACULTY OF SCIENCE

## B.Sc. (Third Year) (Fifth Semester) EXAMINATION

## APRIL/MAY, 2024

## (New Pattern)

BIOTECHNOLOGY

(Medical Biotechnology)

**(Saturday, 13-4-2024)** **Time : 10.00 a.m. to 1.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

*N.B.* :— (*i*) *All* questions are compulsory.

(*ii*) Draw neat and well labelled diagrams wherever necessary.

1. What is stem cell ? Describe in detail stem cell therapy with examples. 15

*Or*

(*a*) Write principle and applications of live, killed and attenuated vaccines. 8

(*b*) Write principle and applications of recombinant DNA and protein based vaccines. 7

2. How to diagnose bacterial, viral and parasitic diseases by using ELISA and Western blot ? 15

*Or*

(*a*) Write about production of monoclonal antibodies. 8

(*b*) Write applications of monoclonal artibodies in diagnostic reagents. 7

P.T.O.

3. Describe in detail role of adult and embryonic stem cells and a note on its clinical applications. 15

*Or*

(*a*) Write about properties and potency of stem cells. 8

(*b*) Explain the concept of tissue engineering. 7

4. Describe in detail role of oncogenes and give examples. 15

*Or*

(*a*) What are tumor suppressor genes and how do they work ? 8

(*b*) Write about symptoms and treatment of SCID. 7

5. Write short notes on (any *three*) : 15

(*i*) Secondary immunodeficiency

(*ii*) Apoptosis

(*iii*) Plant based vaccines

(*iv*) Passive immunization

(*v*) Therapeutic interventions of uncontrolled cell growth.

This question paper contains **2** printed pages]

# PB—10—2024

## FACULTY OF SCIENCE

## B.Sc. (Third Year) (Fifth Semester) EXAMINATION

## APRIL/MAY, 2024

## (New Pattern)

BIOTECHNOLOGY

(*r*-DNA Technology)

**(Friday, 05-04-2024)** **Time : 10.00 a.m. to 1.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

***Note*** *:—* (*i*) *All* questions are compulsory.

(*ii*) Each question carries equal marks.

1. What are reporter genes in gene cloning ? Explain in detail types of reporter genes and add a note on their assays in gene cloning. 15

*Or*

(*a*) Explain various vectorless gene transfer methods. 8

(*b*) Explain pBR 322 as a vector. 7

2. Describe in detail principle and mechanism of PCR and write a note on its types and applications. 15

*Or*

(*a*) Explain in detail southern hybridization. 8

(*b*) Describe in detail DNA Microarray. 7

3. What are probes ? Explain their types and explain screening of library using probe based direct and indirect methods. 15

*Or*

(*a*) Explain construction of DNA library. 8

(*b*) Explain the technique of Autoradiography of DNA. 7

4. What is protein engineering ? Explain various strategies to improve properties of proteins and enzymes. 15

*Or*

(*a*) Explain in detail production technology of recombinant insulin. 8

(*b*) Explain the concept of gene therapy. 7

5. Write short notes on any *three* of the following : 3×5=15

(*a*) Restriction endonucleases

(*b*) Sanger's method of DNA sequencing

(*c*) Chemical synthesis of DNA

(*d*) BT cotton.