G5-17

Sr. No. 3141

Exam. Code: 107406
Subject Code : 2270

B.Sc. Bio-technology - 6th Sem.

(2517)

Paper-BT-I: rDNA Technology-B

Time Allowed: 3 hrs. **Max. Marks: 40**

Section A: Attempt All Questions. 1 marks each.

i. Explain features of Ti Plasmid.
ii. What do you mean by Shuttle vectors?
iii. When you can use adapters for cloning?
iv. What is inverse PCR.
v. What kind of probe is used for cDNA microarray?
vi. Error prone PCR.
vii. Role of Mg^{2+} ions in *Taq* activity?
viii. Single primer method?

Section B: Attempt five questions by selecting one from each unit. 4 marks each

Unit I

Q1. Explain various promoters used vector construction for constitutive and regulated gene expression?
Q2. Explain features of pGEX vector? What are its applications?

Unit II

Q3. Describe the process of making genomics library?
Q4. Where you will use linkers and adapters while gene cloning?

Unit III

Q5. Explain different forms of PCR, used for full length cDNA cloning?
Q6. What are microarrays? How they are helpful in analyzing global gene expression and what are its limitations?

Unit IV

Q7. Explain Sanger Coulson method of Sequencing?
Q8. Explain PCR based methods of site directed mutagenesis?

Section C: Do any two questions. 6 marks each

Q9. Explain various component of BAC and Ti vectors. What size fragment would you insert into each?
Q10. What are lambda vectors? What makes them suitable for cloning of large fragments? How can you screen a cDNA lambda library?
Q11. What is PCR? Explain various steps of PCR and important components of a PCR reaction?
Q12. Explain Phage display and its applications?

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Exam. Code : 107406
Subject Code : 2271

B.Sc. Bio-Technology Semester—VI

APPLICATIONS OF PLANT TISSUE CULTURE

Paper–BT-2

Time Allowed—3 Hours] [Maximum Marks—40

SECTION—A

Note : Attempt **ALL** parts. Answer to any part should not exceed 1/3 of a page.

1. Define :
   (a) Acclimatization
   (b) Bioreactor
   (c) Cybrid
   (d) Somaclonal variations
   (e) Protoplast isolation
   (f) Embryo culture
   (g) Secondary metabolites
   (h) De-differentiation. 8×1=8

SECTION—B

Note : Attempt any **FIVE** questions. Answer to any question should not exceed **two** pages.

2. Explain the process of acclimatization of tissue culture raised plants.

3. Write a short note on applications of somatic embryogenesis.
4. Write a short note on haploid culture.
5. What do you mean by rescuing of hybrid embryos ?
6. How is selection of somatic cybrids done ?
7. Describe the process of protoplast fusion.
8. Describe the use of bioreactors in secondary metabolite production.
9. Explain the cell suspension culture. 5×4=20

SECTION—C

Note : Attempt any **TWO** the questions. Answer to any question should not exceed **five** pages.

10. Describe in detail the application of somatic embryogenesis.
11. Describe in detail haploid and triploid plant production through tissue culture.
12. Describe :
    (a) Protoplast isolation
    (b) Viability of protoplasts.
13. Explain the production of secondary metabolites by plant tissue culture. 2×6=12

Exam. Code : 107406
Subject Code : 2272

B.Sc. Bio-Technology Semester—VI

ANIMAL BIOTECHNOLOGY

Paper–BT-3

Time Allowed—3 Hours] [Maximum Marks—40

Note : Section A is compulsory. Section B attempt any 5 questions. The answer should not exceed **two** pages. Section C attempt any 2 questions. The answer should not exceed **Five** pages.

SECTION—A (Compulsory)

Write a brief account of the following.

1. Give the origin and characteristic features of WI-38, MRC-5
2. HeLa cell line application
3. Vector
4. Transgeneic animals
5. Microcarriers and their materials
6. Bioreactor
7. Superovulation
8. Any transgenic mice. 1×8=8

SECTION—B

1. Define cell line and continuous cell line and explain with the example of CHO KI and B 16 cell line.

2. How organ culture differs from cell culture. How to do organ culture ?
3. Describe the need of expression of proteins in the animal cells.
4. What are promoters ?
5. Write an account of cell fusion methods for the production of monoclonal antibodies and also the method to validate the fused desired product.
6. Which methods are adopted for scaling up of anchorage dependent cells ?
7. Write a note on production of a genetically engineered blood product in animal cell culture.
8. Give the methodology of animal cloning and its application. 5×4=20

SECTION—C

1. While describing the terms differentiation, dedifferentiation and redifferentiation with example give the methods of inducing differentiation.
2. Enlist various methods of transfection and describe any two in detail.
3. Give the characteristic features of stem cells and their application in therapy.
4. Write notes on any **two** :

   (1) Production of hormones by genetic engineering, (2) Embryo transfer technology, (3) Role of transgenic animal production in improvement of cattle breed. 6×2=12

Exam. Code : 107406

Subject Code : 2273

B.Sc. Bio-Technology Semester—VI

INTELLECTUAL PROPERTY RIGHTS AND ENTREPRENEURSHIP

Paper : BT—4

Time Allowed—3 Hours] [Maximum Marks—40

Note :— Section A is compulsory. The candidates are required to attempt **Five** questions from Section B and **Two** questions from Section C.

SECTION—A

1. Write notes on the following : 1×8

   (a) Plant breeder rights

   (b) Non-patentable inventions in India

   (c) Role of IPRs in promotion of new research

   (d) Benefits of MFN

   (e) IDAs

   (f) TRIMs

   (g) Product line

   (h) Arrangement of finance for industry.

SECTION—B

2. Write a note on benefits of geographical indications registration to artisans and customers. 4

3. What are non-patentable inventions in India ? 4

4. Describe the structure and functions of WTO in brief. 4

5. Discuss the scope of Intellectual Property Protection in research and development. 4

6. Write a note on diverse functions of WIPO. 4

7. Describe the role of TRIPs agreement for international harmonization of IP laws. 4

8. Discuss the significance of different types of plant layout and designs for biotechnology startups. 4

9. Discuss different options available for financing a new enterprise. 4

SECTION—C

10. Write a detailed note on different forms of Intellectual property with examples. 6

11. Describe the principles and objectives of GATT in detail. 6

12. Write notes on the following :

    (a) Berne convention

    (b) Budapest treaty. 3×2

13. Define 'Entrepreneur' and describe the important characteristics of an entrepreneur. 6

Exam. Code : 107406
Subject Code : 2274

B.Sc. (Bio-Technology) 6th Semester

BIOPROCESS ENGINEERING—B

Paper—BT-5

Time Allowed—Three Hours] [Maximum Marks—40

SECTION—A

Note :— Attempt ***all*** the questions. 1×8=8

1. Write short notes in about **50** words each :
   (i) Geometrical ratio of fermenter
   (ii) Containment levels
   (iii) Biosafety levels
   (iv) Sensors
   (v) D.O. Probe
   (vi) Sedimentation
   (vii) BOD
   (viii) COD.

SECTION—B

Note :— Attempt any ***five*** questions. 4×5=20

2. Discuss the temperature control of bioreactors.
3. Discuss the aeration of bioreactors.
4. Discuss the online sensors.

5. Discuss the safety valves used in bioreactors.
6. Discuss the precipitation methods of bioproducts in bioprocesses.
7. Discuss the industrial centrifugations.
8. Discuss the oxygen sag curves in downstream processing.
9. Discuss the disposal of effluents.

SECTION—C

Note :— Attempt any *two* questions. 2×6=12

10. Discuss the stirrer glands and bearings used in bioreactors designing.
11. Discuss the different types of sensors used in bioreactors.
12. Discuss the tangential filtration.
13. Discuss the different factors involved in effluent treatments.