

Exam Code: 107406

Paper Code: 6162

Programme: Bachelor of Science (Bio-technology)

Semester - VI

Course Title: rDNA Technology

Course Code: BBTM-6061 ✓

Time Allowed: 3 Hours

Max Marks: 30

Note: Attempt five questions in all, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 6 marks.

Section A

1. Write a note on
 - A) BAC Vectors
 - B) Ti Plasmids(3 + 3 marks)
2. A) What are adapters and linkers? Discuss their role in cloning
B) Discuss self priming strategy for cDNA Cloning? (3+3 marks)

Section B

3. A) What are signal sequences and fusion tags? Explain their benefits with the help of examples
B) Discuss LAC promoter and its induction system? (4+2 marks)
4. What are inclusion bodies and how can we recover active proteins from them? (6 marks)

Section C

5. What is site directed mutagenesis? Discuss PCR based method for site directed mutagenesis? (6 marks)
6. A) What is the advantage of site directed mutagenesis over random mutagenesis.
B) Briefly discuss any two types of PCR and their applications. (2+4 marks)

Section D

7. Write a note on microarrays and its applications? (6 marks)
8. Write a note on
 - A) Phage display
 - B) Maxam Gilbert method of DNA Sequencing(3+3 marks)

Exam Code: 107406
(20)

Paper Code: 6163

Programme: Bachelor of Science (Bio-Technology)
Semester-VI

Course Title: Animal Biotechnology-II

Course Code: BBTM-6062 ✓

Time Allowed: 3 Hours

Max Marks: 30

Note: Candidates are required to attempt 5 questions, selecting atleast one question from each section. The fifth question may be attempted from any section. Each question carries 6 marks.

Section-A

1. Write a note on
 - (i) WI-38 2
 - (ii) MRC-5 2
 - (iii) IMR-90 cell lines. 2
2. Discuss the 3-dimensional culture in spheroids along with its applications. 6

Section-B

3. Explain lipofection, microinjection and electroporation. 6
4. What are promoters? Discuss its various types. 6

Section-C

5. What are stem cells? Explain embryonic and adult stem cells along with their applications. 6
6. Write a note on scale up methods used for propagation of anchorage dependent and suspension cell cultures. 6

Section-D

7. Discuss the methodology for transgenic animals along with their applications. 6
8. Write a note on "Transgenic animals as bioreactor". 6

Exam Code: 107406
(20)

Paper Code: 6164

Programme: Bachelor of Science (Bio-Technology)
Semester-VI

Course Title: Plant Bio-Technology-II

Course Code: BBTM-6063 ✓

Time Allowed: 3 Hours

Max Marks: 30

Attempt five Questions selecting atleast one question from each section. The fifth question may be attempted from any section. All questions carry 6 marks

Section-I

1. a) Write a note on micropropagation?
b) What is the need of acclimatization of tissue culture raised plants? List the operations carried out for in vitro for acclimatization? (3+3 marks)
2. Discuss different types of somatic embryogenesis and their applications? (6 marks)

Section-II

3. a) Discuss triploid plant production through tissue culture?
b) Explain the term rescuing of hybrid embryos? (3+3 marks)

4. Write a note on
a) Somaclonal variation
b) Ovary Culture (3 + 3 marks)

Section-III

5. What is somatic cell hybridization? Explain method of selection of heterokaryon and its applications? (6 marks)
6. Write a note on
a) Cybrids
b) factors affecting protoplast isolation (3+3 marks)

Section-IV

7. Discuss production of secondary metabolites by tissue culture and its applications? (6 marks)
8. a) Write a note on the transgenic approaches in secondary metabolite production?
b) What is Cell suspension culture? (4+2 marks)

Exam Code: 107406
(20)

Paper Code: 6165

Programme: Bachelor of Science (Bio-Technology)
Semester-VI

Course Title: Bioprocess Engineering-II with Training

Course Code: BBTM-6064

Time Allowed: 3 Hours

Max Marks: 30

Instructions for students: Candidates are required to attempt five questions, selecting at least one question from each section; A, B, C, D. The fifth question may be attempted from any of these four sections. Each question carry 6 marks.

Section — A

1. A. What are the various fermentation strategies, environmental factors, construction materials, type of bioprocess that decide the design of a bioreactor?

4 marks

- B. Name a few difference between a bioreactor and a fermenter?

2 marks

2. Name and explain the construction, design and working of various bioreactors used for microbial cell culture?

6 marks

Section — B

3. Write the name and types of various Dissolved oxygen probes used in measurement of dissolved oxygen in fermentation broth? Also explain working principles of these probes?
6 marks
4. Explain the various types of agitators used in bioreactor? Also give the agitation kinetics involved? How power number and Reynold's number is related to the agitation intensity in a bioreactor?
6 marks

Section — C

5. What are the industrial filters? Explain the types of filters used in industrial bioprocesses extraction and product purifications?
6 marks
6. A. Write a comprehensive and detailed note on super critical fluid extraction method of downstream processing?
4 marks
B. Why do we need whole broth processing in some industrial bioprocesses? Give the name of one such process also?
2 marks

Section—D

7. What are the primary, secondary and tertiary treatment processes for industrial effluent treatment? Explain the process of Anaerobic sludge digestion for the treatment of industrial wastewaters?
6 marks
8. What do you know about fermentation economics? What are the various factors and parameters that decide the economy of a bioprocess, explain these factors with suitable examples related to industrial bioprocesses studied by you?
6 marks

Exam Code: 107406

Paper Code: 6167

Programme: Bachelor of Science (Bio-Technology)

Semester-VI

Course Title: Biochemical and Biophysical Techniques-II

Course Code: BBTM-6066

Time: 3 Hours

Max. Marks: 30

Note: Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Section A

- 1 (a) Write the various applications of SDS-PAGE electrophoresis. (3)
(b) Write in brief about the types of protein gel electrophoresis. (3)
- 2 (a) Write factor which affect the process of electrophoretic mobility. (3)
(b) Write a short note on Agarose gel electrophoresis. (3)

Section B

- 3 (a) Write a short note on the principle of 2D gel electrophoresis. (3)
(b) What are the applications of 2D electrophoresis in biology? (3)
- 4 (a) Write simple steps involved in the determination of molecular wt. of protein molecule. (3)
(b) Briefly describe the demerits of capillary electrophoresis. (3)

Section C

- 5 (a) Write the various applications of Mass spectroscopy. (3)
(b) Briefly write about the ionization method used in MALDI-TOF. (3)
- 6 (a) Explain about the functioning of MALDI-TOF analyser. (3)
(b) Write the applications of fluorescence spectroscopy. (3)

Section D

- 7 (a) Write the chemical properties of radioactive isotopes. (3)
(b) Mentioned the theory of Geiger Muller (GM) counter. (3)
- 8 (a) Write applications of radioactive isotopes in biological science. (3)
(b) Write a short note on safety rule applied for radioactive materials applications. (3)

Exam Code: 107406
(20)

Paper Code: 6166

Programme: Bachelor of Science (Bio-Technology)
Semester-VI

Course Title: Chemistry-III

Course Code: BBTM-6085 ✓

Time Allowed: 3 Hours

Max Marks: 30

Note:

*** Attempt five questions in all, selecting at least one question from each section. Fifth question may be attempted from any section. Each question carries 6 marks.**

*** Use of non - scientific calculator is allowed.**

Section — A

1. (a) Describe in detail Carnot Cycle for establishing the maximum convertibility of heat into work. (4)
(b) State and explain Second law of thermodynamics. (2)
2. (a) Derive thermodynamically Kirchoffs equation. (4)
(b) Explain the concept of activity and activity coefficient (2)

Section — B

3. (a) What do you mean by *Le — Chatelier principle ? Also discuss the effect of temperature and pressure on Le — Chatelier principle (3)
- (b) Ten gram of substance dissolved in 100 g of water raised its boiling point by 0.98°C . Calculate the molecular mass of the substance . The molal elevation constant for water is 0.52°C (3)
4. (a) State and Explain the Law of Chemical Equilibrium (2)
- (b) Derive Vant's Hoff Equation, giving the effect of temperature on equilibrium constant. (4)

Section — C

5. (a) Show that the half life period of the third order reaction is inversely proportional to the square of the initial concentration. (3)
- (b) Explain different methods for determining the order of the reaction. (3)
6. (a) Discuss the kinetics of general acid catalysed reaction. (4)
- (b) Difference between Order and Molecularity of the reaction. (2)

Section — D

7. (a) Explain Debye — Huckel theory of strong electrolyte. (4)
- (b) What are buffer solutions? Explain buffer action in acidic buffer and basic buffer solution. (2)
8. (a) Explain how the conductometric titrations can be used for the titration of strong acid and strong base. (4)
- (b) What do you mean transport number. How it is related to the velocity of ions (2)