

Exam Code: 107406 **Paper Code: 6162**
(30)

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

Course Title: rDNA Technology-II

Course Code: BBTM-6061

Time Allowed: 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. Each question carries 6 marks.

Section-A

1. Explain the following:
 - (i) Linkers and adapters 3
 - (ii) Ti and Ri Plasmid 3
2. What is cDNA cloning? How it is different from genomic cloning? Explain self-priming and adapter/linker methods of cDNA cloning. 6

Section-B

3. How the host is selected with respect to promoters? 6

4. What are promoters? Explain expression vectors in concern to T5 and T7 promoters. 6

Section-C

5. What is PCR? How primers are designed? Discuss applications of PCR. 6
6. Write a note on following:
- (i) Melting temperature and annealing temperature 2
 - (ii) Random mutagenesis 2
 - (iii) Gene cloning 2

Section-D

7. Discuss phage display for selection of mutant peptides and yeast two hybrid system. 6
8. Write a note on following:
- (i) Sanger-Coulson Method 3
 - (ii) Illumina Solexa 3

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Bachelor of Sciences (Bio-Technology) Semester: VI

Course Title: Animal Biotechnology-II

Course Code: BBTM-6062

Time: 3 Hours

Marks: 30

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

Section-A

1. Write a detailed note on following:

- | | |
|-------------------------|---|
| (i) HEK-293 | 2 |
| (ii) HeLa | 2 |
| (iii) A 549 cell lines. | 2 |

2. Explain in detail about methods, advantages, and applications of histotypic cultures. 6

Section-B

3. What are expression vectors? Why it is necessary to express proteins in animal cells? 6

4. What is transfection? Describe calcium phosphate method and DEAE-Dextran Method in detail. 6

Section-C

5. Describe different types of bioreactors that are used for large scale culture of cells. 6

6. What are monoclonal antibodies? Discuss the methodology of production along with the applications. 6

Section-D

7. Explain in detail about the production of regulatory proteins. 6

8. What is animal cloning? Discuss "Embryo transfer technique" in detail. 6

Exam Code: 107406 **Paper Code: 6164**
(30)

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
A) Somatic embryogenesis?
B) Acclimatization of tissue culture raised plants
(3+3 marks)
2. What is Micropropagation? Discuss different stages and applications of micropropagation (6 marks)

Section-II

3. What is somaclonal variation? Write down the factors that affect the production of somaclonal variants and its applications? (6 marks)

4. A) What do you mean by Embryo culture?
B) Write a note on haploid plants produced through tissue culture? (3+3 marks)

Section-III

5. A) Explain the process of protoplast fusion?
B) Discuss the factors affecting protoplast isolation? (3 +3 marks)
6. A) Discuss the applications of somatic cell hybridization?
B) Somatic hybrids vs cybrids? (3+3 marks)

Section-IV

7. Explain the role of bioreactors in secondary metabolite production? (6 marks)
8. A) Explain Immobilized plant cell culture?
B) Briefly discuss the transgenic approaches in secondary metabolite production? (2+4 marks)

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(30)

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. Write a note on design of bioreactor? Give the structure, functioning and kinetics of Air loop bioreactor? 6 marks
2. Name and explain the construction, design and working of various types of bioreactors used for microbial cell culture in bioprocesses? 6 marks

Section - B

3. Write the name and types of various pH probes used in measurement of acidity/basicity of fermentation broth? Also design and working principles of these probes?
6 marks
4. Explain the various types of agitators used in a 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 is the process of centrifugation? Explain the structure and functioning of various types of centrifuges used in industrial bioprocesses?
6 marks
6. A. Write a comprehensive and detailed note on aqueous two phase extraction system of downstream processing?
4 marks
- B. Why do we need cell disruption for isolating or extracting metabolites from microbial cells. Name any two methods used for cell disruption in industrial bioprocesses?
2 marks

Section - D

7. What do you know about fermentation economics? What are the various factors and parameters which decide the economy of a bioprocess, explain these factors with suitable examples related to industrial bioprocesses studied by you?
6 marks
8. What do you know about the aerobic and anaerobic treatment processes for industrial effluent treatment? Explain the process of Anaerobic sludge digestion for the treatment of industrial wastewaters while giving details of acidogenic and methanogenic microorganisms involved in this process?
6 marks

C.O.E office 24/5/24 (M)

K.M.U - II

Exam Code: 107406
(30)

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) Derive the expression for entropy change of ideal gas with change in pressure, volume and Temperature. (4)
(b) Explain the difference between isothermal and adiabatic process. (2)
2. (a) Derive thermodynamically Kirchoff's equation. (4)
(b) Explain the concept of activity and activity coefficient. (2)

Section -B

3. (a) Define Osmotic Pressure How it is determined by Berkeley and Hartley 's method? (4)
(b) Calculate the boiling point of a solution containing 0.4650g of camphor (mol.wt = 152) dissolved in 31.4 g of acetone (b.pt.= 56.30°C) if the molecular elevation per 100g of acetone is 17.2°C. (2)
4. (a) Derive the relation between elevation in boiling point and molecular weight of non volatile solute. (4)
(b) State and Explain the Law of Chemical Equilibrium. (2)

Section - C

5. (a) Discuss the kinetics of general acid catalysed reaction. (4)
(b) What is rate law? How does it differ from law of mass action? (2)
6. (a) Derive the expression for the rate constant for the second order reaction when both the reactants are different. (3)
(b) Explain the different methods for determining the order of the reaction. (3)

Section — D

7. (a) Explain how the conductometric titrations can be used for the titration of a salt of weak acid and a strong acid. (4)
(b) What do you mean transport number? How it is related to the velocity of ions? (2)
8. (a) What do you mean by hydrolysis of salts? Explain how different salts are classified according to their hydrolytic behavior. (4)
(b) What are buffer solutions? Explain buffer action in acidic buffer and basic buffer solution. (2)