Reg. No.: | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

PG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.
(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: M.Sc., BOTANY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
III	PART III	CORE - 10	P23BO310	RECOMBINANT DNA TECHNOLOGY AND INDUSTRIAL APPLICATION

Date & Session: 23.04.2025/FN **Time: 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	Which of the following is NOT a vector used in recombinant DNA technology? a) Plasmids b) Phages c) Ribosomes d) Cosmids
CO1	K2	2.	Which of the following gene transfer methods uses a high-voltage electrical field to introduce DNA into cells? a) Biolistics b) Electroporation c) Liposome-mediated delivery d) Ti plasmid transfer
CO2	K1	3.	Which fermentation condition is crucial for large-scale production of Vitamin C using Saccharomyces cerevisiae? a) Aerobic conditions b) Anaerobic conditions c) High-temperature fermentation d) High-salt concentration
CO2	K2	4.	Which organism is commonly used for the industrial production of Vitamin B12 via recombinant DNA technology? a) Escherichia coli b) Saccharomyces cerevisiae c) Propionibacterium shermanii d) Zygosaccharomyces bailii
CO3	K1	5.	Which microorganism is commonly used for the production of Penicillin? a) Streptomyces b) Bacillus subtilis c) Penicillium chrysogenum d) Escherichia coli
CO3	K2	6.	Which of the following antibiotics is a product of Streptomyces species? a) Penicillin b) Tetracycline c) Erythromycin d) Streptomycin
CO4	K1	7.	Which recombinant hormone is used to treat anemia by stimulating Red Blood Cell production? a) Insulin b) Erythropoietin c) Interferon d) Human growth hormone
CO4	K2	8.	What is the primary medical application of recombinant interferons? a) Treatment of diabetes b) Treatment of infections c) Treatment of cancer d) Treatment of heart disease
CO5	K1	9.	Which of the following is an application of rDNA technology in Agriculture? a) Bioremediation b) Edible vaccines c) Monoclonal antibody production d) Recombinant hormones
CO5	K2	10.	Which enzyme is commonly produced using recombinant DNA technology for industrial applications like detergent manufacturing? a) Amylase b) Lipase c) Protease d) All of the above

Course Outcome	Bloom's K-level	Q. No.	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K2	11a.	Describe the structure and function of plasmids as vectors in recombinant DNA technology. **(OR)**
CO1	K2	11b.	Explain the role of restriction enzymes in gene cloning.
CO2	K2	12a.	How is Vitamin B12 produced using recombinant DNA technology? **(OR)**
CO2	K2	12b.	Describe the fermentation process involved in the industrial production of Vitamin C by genetically modified Saccharomyces cerevisiae.
CO3	K3	13a.	How does recombinant DNA technology contribute to the production of antibiotics like Penicillin? **(OR)**
CO3	K3	13b.	What is the significance of recombinant enzymes such as Human Deoxyribonuclease I in medical treatments?
CO4	K3	14a.	Explain the use of recombinant Erythropoietin in the treatment of Anemia. **(OR)**
CO4	K3	14b.	Describe the role of recombinant interferons in treating diseases like multiple Sclerosis.
CO5	K4	15a.	What are monoclonal antibodies, and how are they produced using recombinant DNA technology? **(OR)**
CO5	K4	15b.	Explain the concept of edible vaccines and their potential applications.

Course Outcome	Bloom's K-level	Q. No	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K4	16a.	Discuss the different types of vectors used in recombinant DNA technology, including Plasmids, Phages, and Cosmids. **(OR)**
CO1	K4	16b.	Explain the process of constructing a genomic library. How is it different from a cDNA library?
CO2	K5	17a.	Explain the steps involved in the industrial production of Vitamin B12 using recombinant bacteria like Paracoccus denitrificans. **(OR)**
CO2	K5	17b.	Discuss the process of recombinant Vitamin C production and the fermentation conditions required for large-scale production.
CO3	K5	18a.	Discuss the industrial production of Penicillin using recombinant DNA technology. **(OR)**
CO3	K5	18b.	Explain how recombinant DNA technology is used in the production of therapeutic proteins such as L-Asparaginase.
CO4	K5	19a.	Explain the production of recombinant insulin using recombinant DNA technology. **(OR)**
CO4	K5	19b.	Discuss the process and medical applications of recombinant Erythropoietin, particularly for the treatment of Anemia.
CO5	K6	20a.	Describe the applications of recombinant DNA technology in the production of monoclonal antibodies and their role in medical diagnostics. **(OR)**
CO5	K6	20b.	Explain the process of Bioremediation and the role of recombinant DNA technology in cleaning up environmental pollutants.