QP Code: SN23BTECH197 Reg. No | | | | | | | | | | | AY 23

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)

B. Tech (Fifth Semester - Regular) Examinations, November 2025

23BBTPC35001 –Genetic Engineering

(Biotechnology)

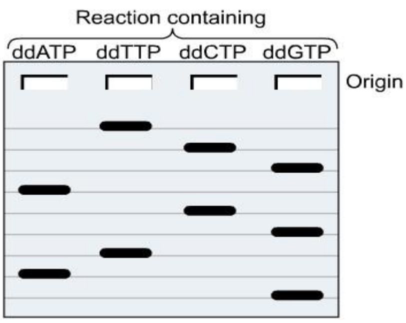
Time: 3 hrs Maximum: 60 Marks

Answer ALL questions

(The figures in the right-hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions		CO #	Blooms Level
a.	Two restriction endonuclease A and B recognizes 4bp and 6bp sequences, respectively. Calculate the average size of DNA fragment they will generate after digestion.	CO1	K3
b.	Define Competent cells. How can you develop the cell competency?	CO2	K1
c.	A researcher after sequencing a DNA has obtained the banding pattern given below. From the below image find out the template strand of DNA from 5' to 3' direction?	CO3	K3



		CO #	Blooms Level
d.	Draw the sketch labelled diagram of YAC.	CO4	K3
e.	A microbiologist isolated an unknown variety of bacteria. Which molecular tool he can use to identify the bacteria?	CO5	K2

PART – B **(10 x 5 = 50 Marks)**

<u>Answer ***ALL*** the questions</u>		Marks	CO #	Blooms Level
2. a.	Explain the basic steps of DNA isolation and purification.	5	CO1	K2
b.	Diagrammatically explain about the reaction mechanism of ligase and terminal transferase in r-DNA Technology.	5	CO1	K3
	(OR)			
c.	How can we clone a DNA using lambda bacteriophage DNA? Explain with suitable diagram.	5	CO1	K2
d.	Discuss the general properties of cloning vector with suitable diagram.	5	CO1	K2
3.a.	How to construct the genomic DNA library? Explain with diagram.	5	CO2	K3
b.	Why Inverse PCR is important? Explain the techniques of Inverse PCR with diagram?	5	CO2	K2
	(OR)			
c.	Discuss the principle of DNA microarray technology with diagram?	5	CO2	K3
d.	Illustrate any two methods of screening of recombinant DNA with diagram?	5	CO3	K1
4.a.	Give the detail principle and steps of Maxam-Gilbert's method of DNA sequencing?	5	CO3	K1

b.	Explain in detail the DNA footprinting technique used to study Protein–DNA interactions.	5	CO3	K2
	(OR)			
c.	How to express a heterologous protein in insect cells? Explain with proper diagram.	5	CO4	K2
d.	Discuss the process for generation and action mi-RNA with its applications?	5	CO4	K2
5.a.	Write notes on Random mutagenesis.	5	CO4	K1
b.	Explain the different diversity of ribozymes used in gene silencing.	5	CO5	K2
	(OR)			
c.	Describe the principle, methodology, and applications of RFLP and RAPD markers in genetic analysis.	10	CO5	K2
6.a.	Discuss the different types of gene therapy and its applications.	5	CO6	K2
b.	Enlist and discuss the different techniques used in Human genome project.	5	CO6	K3
	(OR)			
c.	Write notes on DNA vaccine.	5	CO6	K1
d.	Explain the techniques and applications of 16S rRNA sequencing.	5	CO5	K2

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