



## Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)

Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC

Coimbatore - 641 043, Tamil Nadu, India

### Master's Degree Examination – May 2025

#### II Semester

Class : I P.G.  
Major : Biotechnology

Time: 3 Hours  
Max. Marks: 100

#### 23MBTC10 Recombinant DNA Technology

##### Course Outcomes:

- CO1: demonstrate the application of various techniques in developing a recombinant molecule
- CO2: explain the process of gene cloning
- CO3: relate the importance of genetically modified organisms for human welfare
- CO4: justify the importance of genome projects and the potential application of recombinant techniques
- CO5: critically analyze the various issue related to gene manipulation
- CO6: choose a problem and design a solution and also the methodology to protect their work

#### Part A

10 x 1 = 10

#### Choose the Correct Answer

1. Which enzyme is used to join together two different types of DNA molecules? CO1K1  
a. Nuclease      b. NO1      c. ligase      d. R43
2. Recombinant plasmids are added to a bacterial culture that has been pretreated with \_\_\_\_ ions. CO1K2  
a. Iron      b. calcium      c. Zinc      d. Gold
3. Polymerase chain reaction (PCR) was invented by CO2K2  
a. Mullis      b. Tweez      c. Jimmer      d. Kartz
4. DNA libraries are collection of CO2K1  
a. Cloned DNA      b. RNA      c. Virus      d. bacteria
5. cDNA libraries are produced from CO2K2  
a. RNA      b. mRNA      c. vector      d. plasmid
6. Bacterial artificial chromosomes are the \_\_\_\_\_ factor of bacterial cells. CO2K2  
a. C      b. A      c. F      d. Z
7. Viral-mediated gene transfer is called CO2K3  
a. Transduction      b. Infection      c. PCR      d. SEq
8. Shine-Dalgarno sequence is present in the CO3K3  
a. mRNA      b. tRNA      c. sRNA      d. kRNA
9. Initiation factors are \_\_\_\_\_ proteins CO3K2  
a. Heavy      b. soluble      c. light      d. Zero
10. \_\_\_\_\_ is the initiation codon CO2K2  
a. AAA      b. GAG      c. AUG      d. GCC

**Part B**

**5 x 6 = 30**

**Answer ALL questions**

**Each answer should not exceed 400 words or two pages**

- 11.a. What are the enzymes involved in cutting and ligating DNA. CO1K2  
(or)
- 11.b. Give a brief account on expression vectors. CO1K2
- 12.a. Write down the steps involved in PCR. CO2K3  
(or)
- 12.b. Highlight the steps in construction of cDNA library. CO3K3
- 13.a. Give a note on Zinc Finger Nucleases. CO3K3  
(or)
- 13.b. Enumerate the steps in Sanger sequencing of DNA CO2K3
- 14.a. Explain on gene therapy. CO3K4  
(or)
- 14.b. What are DNA vaccines? Elaborate. CO3K4
- 15.a. Discuss the production of Flavr savor tomatoes. CO4K4  
(or)
- 15.b. How will you perform Northern blotting? CO4K4

**Part C**

**5 x 12 = 60**

**Answer ALL questions**

**Each answer should not exceed 800 words or four pages**

- 16.a. Highlight about plant transformation vectors. CO1K1  
(or)
- 16.b. Discuss the different methods of gene transfer with illustration. CO1K2
- 17.a. Discuss the steps involved in PCR. CO2K2  
(or)
- 17.b. Elaborate on DNA finger printing. CO3K3
- 18.a. Write a note Human Genome Project. CO3K3  
(or)
- 18.b. What are genome editing tools? Explain its significance. CO4K4
- 19.a. Describe transformation along with selection and screening. CO3K3  
(or)
- 19.b. Discuss on any one vector with diagram for inserting large DNA fragments. CO4K4
- 20.a. Elaborate on Enumerate the biosafety regulations. CO3K3  
(or)
- 20.b. Discuss on IPR and types of patent. CO4K4

\*\*\*\*\*