

Name: _____						
Subject: Biology		Class: 12 th	Time: 80 minutes	Total Marks:	40	
Chapter No.23		MJDexpert.com			Obtained marks	

Note: Please attempt any 10 short questions from Question 2. Also, attempt both parts of Question 3. Cutting and removal of any content is strictly prohibited.

Q#1 Encircle the Correct Option (10 x 1 = 10)

1. How many copies are generated in a test tube using polymerase chain reaction (PCR)?

- A) Billions B) Millions C) Hundreds D) Thousands

2. The gene of interest is linked to the open end of a plasmid by which enzyme?

- A) DNA ligase B) DNA polymerase C) RNA polymerase D) Helicase

3. When sprayed with the substrate, adult transgenic tobacco plants emit light. The substrate is called:

- A) Luciferon B) Luciferin C) Luciferol D) Luciferase

4. The self-replicating circular DNA found in the cytoplasm of bacteria is called:

- A) Plastid B) Plasma C) Plasmid D) None

5. Insertion of genetic material into human cells for treating a disorder is known as:

- A) Gene treatment B) Gene therapy C) Gene pool D) Gene sequencing

6. The DNA polymerase enzyme was first obtained from:

- A) Bacteria B) Viruses C) Plants D) Fungi

7. How many methods are used to generate different sizes of DNA fragments?

- A) 5 B) 4 C) 3 D) 2

8. How many methods are possible for extracting a gene?

- A) 5 B) 4 C) 3 D) 2

9. Select the correct statement:

- A) Both viruses and plasmids can function as vectors B) Only gene therapy uses vectors
C) Both A and B D) None of these

10. What is the correct method to obtain a gene?

- A) From RNA B) From DNA C) From mRNA D) From tRNA

Q #2 Short Questions (2 x 10 = 20)

- List the essential materials required for producing recombinant DNA.
- How can a gene be obtained?
- Define gene cloning.
- What does PCR stand for, and what is its function?
- Differentiate between molecular vectors and molecular scissors.
- Compare in vivo and ex vivo gene therapy.
- How can gene therapy assist cancer patients?
- Why are transgenic animals that secrete products often cloned?
- What are transgenic organisms and bioreactors?
- Explain Sanger's method of gene sequencing.

Q #3 Long Questions (2 x 5 = 10)

- What is the process for creating recombinant DNA for gene cloning?
- Describe the polymerase chain reaction (PCR) in detail.