

UNIT-IV

(Biotechnology : Principles and Processes)

MCQ

1. Which is the following is a genetic vector 1
(a) plasmid (b) phage (c) cosmid (d) all of these
2. The chemical knives of DNA are 1
(a) ligases (b) polymerase (c) endo nuclease (d) transcriptase
3. Genetic engineering is used in 1
(a) gene therapy (b) vaccine production (c) obtaining transgenic plants (d) all of these
4. The first hormone artificially produced by culturing bacteria is 1
(a) insulin (b) thyroxine (c) aldrekin (d) testosterone
5. Who among the following discovered the enzyme restriction endo nuclease 1
(a) H.O. Smith (b) F. Jacob (c) A.L. Wolf (d) G. Hounfield
6. Transgenic animals are those which have 1
(a) foreign DNA in some of its cell (b) foreign DNA in all its cell (c) foreign RNA in all its cell (d) both (a) & (c)
7. Which of following scientist developed the process of DNA fingerprinting 1
(a) Kary B. Mullis (b) Alec Jeffreys (c) T.H. Morgan (d) H.O. Smith
8. Human genome contains about 1
(a) 6 billion genes (b) 10 thousand genes (c) 10 thousand nucleotides (d) 6 billions nucleotides
9. Reverse transcriptase is also called 1
(a) RNA dependent DNA polymerase (b) DNA dependent RNA polymerase (c) DNA dependent DNA polymerase (d) RNA dependent RNA polymerase
10. Natural genetic engineer is 1
(a) agrobacterium Sp (b) rhizobium Sp (c) bacillus Sp (d) bacteriophage Sp

Fill in the blanks

1. DNA typing or DNA profiling is also called..... 1
2. Replacement and alteration of a defective gene in human is called 1
3. DNA ligase is also known as 1
4. Genetically modified organism (GMO) carrying foreign genes is called..... 1
5. Introduction of foreign DNA into animal or plant cell by injecting DNA directly is called 1

6. DNA produced by joining together genes from different sources is called 1

Very short answer- question (1 marks each)

1. What is transgenic? 1
2. What is electroporation? 1
3. What is gene therapy? 1
4. Define genomic DNA library? 1
5. Give in famous example of cloned sheep? 1
6. What is genetic engineering? 1
7. What is genome? 1
8. Define biotechnology? 1
9. What is calms? 1
10. What is bacteria phase? 1
11. Expand VNTR? 1
12. Expand GMO? 1

Short answer-question (2 marks each)

1. List two application of fingerprinting. 1+1
2. Gene therapy can cure the important genetic disorders in human comment. 2
3. Explain the principles involved in DNA fingerprinting. 2
4. What is meant by genetic engineering? List the various steps involved in this technology. 2
5. What are the proposed benefits of genetic engineering in crop improvement? 2
6. What is a cloned animal? Give one example. 2

Group - 4

1. Which of the following process is related with the application of biotechnology 1
(a) fermentation (b) germination (c) evolution (d) photosynthesis
2. Biotechnology id generally being used for which of the following process 1
(a) production of monoclonal antibodies (b) rain water harvesting (c) production of GM crops
(d) both a & c
3. GM crops means 1
(a) grand matter crops (b) green metallic crops (c) genetically modified crops
(d) growing & moving crops
4. If nif gene has been incorporated in E.wli, what changes can be expected 1
(a) it will grow faster (b) it will produce growth hormone (c) it will involve in nitrogen fixation (d) no change

5. Cry gene helps cotton plants against 1
(i) silk worm (ii) glow worm (iii) boll worm (iv) flat worm
6. Monoclonal antibodies is produced by one of these technology 1
(i) synthesis technology (ii) hybridoma technology (iii) cultivation technology
(iv) selection technology

Biotechnology

MCQ

1. DNA fragments can be separated by 1
(a) centrifugation (b) gel electrophoresis (c) boiling (d) magnetic separation
2. PCR stands for 1
(a) pure chemical reaction (b) part create reaction (c) polymerase chain reaction
(d) partial cytoplasm rate
3. The sequence from where replication start 1
(a) origin of replication (b) cloning site (c) selectable marker (d) recognition site
4. Which bacteria is responsible to produce Bt toxin 1
(a) bacillus tumines (b) basillus thuringiensi (c) bacillus tuberculosis (d) lacto bacillus
5. RNA interference works on principle 1
(a) RNA interfere (b) silencing of a specific m RNA (c) prevents translation of
(d) RNA desttuction
6. Which is first transgenic cow 1
(a) Dolly (b) Eve (c) Rosie (d) Goldy
7. Which is not the way to introduce alien DNA into host cells 1
(a) thermal shock (b) micro injection (c) gene gun (d) RNA
8. Which is the tool of recombinant DNA technology 1
(a) restriction endo nuclease (b) ribosome (c) gel-elec prophoresis (d) vectors

2 Marks each

1. What is GMO? 2
2. In which way GM plants are useful? 2
3. What is cause of green revolution? 2
4. What is limitation green revolution? 2
5. What is RNA interference? 2
6. What is C principle? 2
7. What is gene therapy? 2
8. What is advantage of recombinant therapeutics? 2

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|---|---|
| 9. what is molecular diagnosis? | 2 |
| 10. What is transgenic animals? | 2 |
| 11. What is bioreactor? | 2 |
| 12. What is recombinant protein? | 2 |
| 13. How we transformed competent host with recombinant DNA? | 2 |
| 14. What is downstream processing? | 2 |

5 Marks each

- | | |
|--|-----|
| 1. What is bioethics? Briefly explain it? | 2+3 |
| 2. How are we benefited with transgenic animal? Give some common reason. | 3+2 |

Very short answer question 1 marks

- | | |
|--|---|
| 1. Which of the following steps in not involved in PLR technology
(a) denaturation (b) annealing (c) extension (d) conservation | 1 |
| 2. Which enzyme is used in isolation of DNA from bacteria
(a) cellulose (b) chitinase (c) lysozyme (d) lipase | 1 |
| 3. Which of the following enzyme is used in joining fragments of DNA
(a) DNA ligase (b) DNA polymerase (c) gyrase (d) helicase | 1 |
| 4. Which of the following technique in not used in molecular diagnosis
(a) PCR (b) ELISA (c) recombination DNA technology (d) transcription | 1 |

Short answer question 3 Marks

- | | |
|---|-----|
| 1. What is human genome project? | 3 |
| 2. Give an outline on the steps involved in DNA fingerprinting? | 3 |
| 3. Name the various cloning vectors and explain how a plasmid can be used? | 3 |
| 4. Write short notes on
(i) application of recombinant DNA technology
(ii) diagnosis of human disease by recombinant DNA technology | 1+2 |
| 5. Write comprehensive account of gene therapy, citing, examples of severe combined immunodeficiency (SCID) | 3 |
| 6. Write comprehensive account of tools and techniques of genetic engineering. | 3 |

Long answer question 5 Marks

- | | |
|---|-----|
| 1. What is the human genome project? What has been revealed about our genome so far? | 2+3 |
| 2. What is genetic engineering? Explain briefly the distinct steps common to all genetic engineering technology. | 1+4 |
| 3. Differentiate between
(a) cell cloning and organism cloning (b) direct gene transfer and indirect gene transfer | 2+3 |

4. How seep “Dolly” was cloned? Give the process of cloning step wise 5

Biotechnology and its Application

Very short answer question 1 marks

1. Define surface sterilization. 1
2. What is somatic embryo? 1
3. Define protoplast? 1
4. What is somatic hybrid? 1
5. Define biotechnology? 1
6. What is transgene? 1
7. What do you mean by transgenic organism? 1
8. Define sterisation? 1
9. What is calms culture? 1
10. What is totipotency? 1
11. What is GM food? 1
12. What are bio pesticides? 1
13. Define regeneration? 1
14. Define plant tissue culture? 1

short answer question 2 marks

1. What is old biotechnology? Write a note. 2
2. What are biowar agents? 2
3. Explain the term biowar? 2
4. What are uses of somatic hubrids? 2
5. What are bioweapens? Explain. 2
6. What is anther culture? Explain. 2
7. What is genetically modified food? Explain. 2
8. Write a short note on suspension cultures. 2

short answer question 3 marks

1. Describe the importance of mycorrhiza, cyano bacteria and bacteria in biofertilizers. 1+1+1
2. Why are biofertilizers preferred over chemical fertilizers? 3
3. What are advantages and disadvantages of biofertilizers? 3
4. Explain the terms “calms” and “suspension cultures”. 3
5. Write a note on “embryo culture”.? 3
6. What are biofertilizers? How do mycorrhiza act as an entity? 3
7. What are green manures? What are their uses? 3

Long answer question 5 marks

1. Give a schematic representation of micro propagation. 5
2. Discuss the biological methods for the control of insect pests. 5
3. Give a schematic representation of initiation of calms and suspension cultures? 5
4. How does GM food differ from conventional food? What harm is expected from it? 5
5. What can a transgene do on entering the genome of another organization? 5
6. Explain salient feature through which biotechnology and had to higher food production? 5

GROUP- D 5 Marks

1. What is recombinant DNA technology? Discuss its different steps. 2+3
2. Answer the following question 1½+2+1½
(a) define GMO (b) list four advantages of GMO over their wild varieties (d) in case of Bt cotton how does toxic protein produced by bacterium to kill the insects only
3. (a) What is PCR? 2+3
(b) What do you meant by Amplification? Explain its different steps with suitable diagram.
4. (a) What is genetically engineered insulin. (GM insulin) 1½+2+1½
(b) Roll of C-Peptide in formation of insulin.
(c) Discuss humulin.
5. (a) State the principle on which ELRSA test is based. How does it help in early detection in disease. 3+2
(b) How is the action of enzyme ligase different from ie of restrictions enzymes.
8. (a) Explain gel electrophoresis. 1+2
(b) explain the step of elution in gel electrophoresis.
9. (a) What do you meant by competent host for transformation? 1½+1½
(b)What is gene gun?
10. (a) What are restriction enzyme? 1+1+1
(b) What do you understand by sticky end?
(c) Give one restriction enzyme and one enzymes used for joining clien DNA.

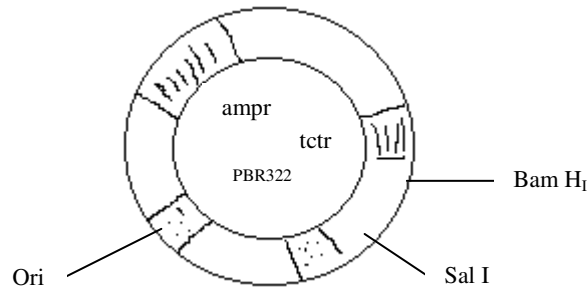
GROUP- C 3 Marks

1. (a) What are cry Proteins? 1+1+1
(b) Name the organism that proceed it.
(c) How has man exploited this protein to benefit
2. With an example explain how biotechnology logy has been applied in each of the following:- 1½+1½

- (a) In curing clarets mellitus
- (b) In nursing pest resistance plant

3.

1+1+1



- (a) Identify the diagram given above.
 - (b) What is a recognition site? Name the restriction sites shown in the diagram.
 - (c) explain the importance of (a) Ori (b) amp^R
4. (a) What is the role of primers and DNA polymerase in PCR. 1+1+1
- (b) Give the characteristics feature & source organisms of the DNA polymerase used in PCR.
- (c) Name any two vectors that are used in experiments with E.coli.
5. (a) Define Palindromic sequence? 1+1+1
- (b) Write the specific palindromic sequence in DNA that is recognized by ECoRI.
- (c) What does ECoRI stand for?
6. (a) What are bioreactors? 1+1+1
- (b) How are they more useful over the traditional culture method?
- (c) What do you ment by Downstream processing?
7. (a) Define Biopiracy. 1+1+1
- (b) Define Biopatent.
- (c) Define Plasmid.