



BIOLOGY

BOOKS - MBD BIOLOGY (ODIA ENGLISH)

PRINCIPLES AND PROCESS OF BIOTECHNOLOGY

Question Bank

1. Restriction endonuclease are used as:

- A. molecular build up at nucleotides
- B. molecular degradation to DNA breakup
- C. molecular knives for cutting DNA at specific sites
- D. molecular cement to combine DNA sites.

Answer: C



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2. A somatic plant cell has potential to develop into a full plant. This is called:

- A. totipotency
- B. gene cloning
- C. tissue culture
- D. regeneration

Answer: A



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3. Enzymes breaking nucleic acids into nucleotides are called:

A. hydrolases

B. amylases

C. nucleic acidases

D. nucleases

Answer: D



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4. Recombinant DNA technology is related with:

A. Stanley Cohen and Herberf Boyer

B. Bateson and Punnet

C. Huxley and Harvey

D. Schleiden and Schwann

Answer: A



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5. Cosmid is:

A. extragenetic material in Mycoplasma

B. Circular DNA in bacteria

C. extra DNA in bacteria

D. fragment of DNA inserted in bacteria for
forming copies

Answer: D



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6. Match the correct one:

A. RNA Polymerase -RNA primer

B. respiration-Lysosome

C. restriction enzyme-genetic engineering

D. central dogma-DNA structure

Answer: C



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7. Plasmid is used as carrier because:

- A. It has both ends with replicating points
- B. It has no free ends
- C. It is circular DNA with a capacity of binding with eukaryotic DNA
- D. All of the above

Answer: C



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8. The Ti plasmid used in genetic engineering is obtained from:

- A. *Bacillus thuringiensis*
- B. *Agrobacterium rhizogenes*
- C. *Agrobacterium tumefaciens*
- D. *Escherichia coli*

Answer: C



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9. The function of polymerase chain reaction (PCR) is:

- A. translation
- B. transduction
- C. DNA amplification
- D. None of these

Answer: C



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10. Genetically engineered bacterium used in production of :

A. thyroxine

B. human insulin

C. epinephrine

D. cortisol

Answer: B



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11. Abnormal gene is replaced by normal gene through:

A. gene therapy

B. medicines

C. cloning

D. radiation

Answer: A



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12. In genetic engineering, the terms vector is applied for :

- A. plasmid
- B. sources of DNA
- C. cell which receives
- D. virus

Answer: A



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13. Gene therapy involves:

A. introducing normal genes in cell

B. eliminating defective and useless genes

C. treating of defective genes with radiations

D. replacement of defective genes by normal ones

Answer: D



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14. Which of the following enzyme is used in genetic engineering?

A. Translocase

B. Topoisomerase

C. DNase

D. Restriction endonuclease

Answer: D



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15. The transgenic animals are those which have :

- A. foreign RNA in all its cell
- B. foreign DNA in all its cells
- C. foreign DNA in some of its cells
- D. Both (a) and ©

Answer: B



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16. Known sequence of DNA that is used to find complementary DNA strand is:

A. vector

B. plasmid

C. DNA probe

D. recombinant DNA

Answer: C



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17. Totipotency in cell is:

A. flower in a culture medium

B. development of fruit from a flower in a culture medium

C. development of an organism from a cell in culture medium

D. development of and tissues of all kinds from a cell in a culture medium

Answer: C



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18. The nuclease enzyme, which begins its attack from free end of a polynucleotide, is:

A. Exonuclease

B. Kinase

C. Polymerase

D. Endonuclease

Answer: A



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19. DNA fingerprinting method is very useful for

- A. DNA tests for identity and relationships
- B. Forensic studies
- C. Polymorphism
- D. All of the above

Answer: D



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20. Reverse transcriptase:

- A. disintegrates host DNA
- B. translates host DNA
- C. transcribes viral RNA to DNA
- D. polymerises host DNA

Answer: C



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21. Bovine spongiform encephalopathy disease is equal to :

A. Kala Azar

B. Parkinson's disease

C. Creutzfeldt-Jacob disease

D. None of the above

Answer: C



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22. A clone of sheep Dolly has been made by :

- A. Gene transfer
- B. Somatic cell cloning
- C. Nucleus transfer
- D. Germinal cell cloning

Answer: C



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23. Which one of the following bacteria has found extensive use in genetic engineering work in plants?

A. *Agrobacterium tumefaciens*

B. *Clostridium septicum*

C. *Xanthomonas citri*

D. *Bacillus coagulans*

Answer: A



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24. Improvement fo genotype of an organism by addition of some foreign genes is :

- A. Genetic diversity
- B. Gene handling
- C. tissue culture
- D. Genetic engineering

Answer: A



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25. Variable number of tandem repeats (VTNRs) in the DNA molecule are highly useful in :

A. Monoclonal antibody production

B. DNA fingerprinting

C. Recombinant DNA technology

D. Stem cell culture

Answer: B



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26. The first clone animal of the world is :

A. Molly sheep

B. Polly sheep

C. Dolly sheep

D. Molly goat

Answer: A



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27. In transgenics, the expression of transgene in the target tissue is known by:

- A. Enhancer
- B. Transgene
- C. Promoter
- D. Reporter

Answer: D



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28. DNA fingerprinting is related to :

A. Molecular analysis of profiles of DNA samples

B. Analysis of DNA samples using imprinting devices

C. Techniques used for molecular analysis of different specimens of DNA

D. Techniques used in identification of fingerprints of different persons

Answer: A



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29. Which of the following is specifically used in genetic engineering ?

A. Ligase

B. Gyrase

C. DNA polymerase

D. Restriction endonuclease

Answer: D



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30. Molecular scissors, which cut DNA at specific site :

A. ligase

B. cellulase

C. endonucleases

D. polymerase

Answer: C



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31. Plasmids are extrachromosomal circular DNA molecules:

A. which have their own point of replication and can replicate independently

B. which have their own point of replication but cannot replicate dependently

C. which do not have their own point of replication and cannot replicate independent of bacterial chromosomal DNA

D. None of the above

Answer: A



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32. Identify the plasmid

A. Alu I

B. Hind III

C. Eco RI

D. Pbr322

Answer: D



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33. Natural genetic engineer is :

A. *Bacillus subtilis*

B. *Pseudomonas* spp.

C. *Escherichia coli*

D. *Agrobacterium tumefaciens*

Answer: D



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34. The most thoroughly studies of the known bacteria-plant interaction is the:

- A. Plant growth simulation by phosphate-solubilising bacteria
- B. Cyanobacterial symbiosis with some aquatic ferns
- C. Gall formation on certain angiosperms by *Agrobacterium*

D. Nodulation of Sesbania stems be
nitrogen fixing bacteria

Answer: C



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35. What does Bt stand for the popular crop Bt
cotton ?

A. Best

B. Best type

C. Biotechnology

D. *Bacillus thuringiensis*

Answer:



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36. DNA fingerprinting technique was first developed by :

A. Jeffreys, Wilson and Their

B. Schleiden and Schwann

C. Edward and Steptoe

D. Boysen and Jensen

Answer: A



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37. What is the first step in Southern Blotting technique ?

A. Isolation of DNA from a nucleated cell
such as the one from the scene of crime

B. Denaturation of DNA on the gel for hybridization with specific probe

C. Production of group of genetically identical cells

D. Digestion of DNA by restriction enzyme

Answer: D



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38. An example of gene therapy is :

A. production of injectable Hepatitis B vaccine

B. production of vaccines in food crops like potatoes which can be eaten

C. production of testtube babies by artificial insemination and implantion of fertilized eggs

D. introduction of gene for adenosine deaminase in persons suffering from

Severe Combined Immuno Deficiency
(SCID).

Answer: D



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39. The total number of nitrogenous bases in human genome is estimated to be about :

A. 35 million

B. 3.1 billion

C. 3.5 million

D. 35 thousand

Answer: B



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40. Name of the drug used in cancer treatment produced by using biotechnology is:

A. HGH

B. TSH

C. Insulin

D. Interferon

Answer: D



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41. Which of the following pairs is correctly matched ?

A. Central dogma-Codon

B. Okazaki fragments-Splicing

C. RNA polymerase-RNA primer

D. Restriction enzymes-Genetic engineering

Answer: B



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42. T1 plasmid is used for making transgenic plants. It is obtained from:

A. Azotobacter

B. Agrobacterium

C. Rhizobium in leguminous root

D. Yeast

Answer: B



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43. Somaclonal variation can be obtained by:

A. Hybridisation

B. Tissue culture

C. Application of colchicine

D. Irradiation with gamma rays

Answer: B



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44. The enzyme used for cutting DNA segment in genetic engineering is :

A. ATPase

B. Ligase

C. DNA polymerase

D. Restriction endonuclease

Answer: B



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45. Widely used tool in genetic engineering of crop plants is :

A. Protoplast fusion

B. Transposon

C. Microinjection

D. Agrobacterium mediation

Answer: D



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46. Which one of the following hydrolyses internal phosphodiester bonds in a polynucleotide chain ?

A. Lipase

B. Protease

C. Exonuclease

D. Endonuclease

Answer: D



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47. There is a restriction endonuclease called EcoRI. What does "co" part in it stand for ?

A. Coli

B. Coelom

C. Coenzyme

D. Colon

Answer: A



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48. Agarose extracted from sea weeds finds

use in :

A. Spectrophotometry

B. Tissue culture

C. Gel electrophoresis

D. PCR

Answer: C



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49. Given below is a sample of a portion of DNA strand giving the base sequence on the opposite strands. What is so special shown in it ?

5'-----GAATTC-----5'

3'-----CTTAAG-----5'

- A. Replication completed
- B. Deletion mutation
- C. Start codon at the 5' end
- D. Palindromic sequence of base pairs

Answer: D



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50. In DNA fingerprinting which of the following is true ?

A. VNTR is used as probes

B. Specific metabolic genes are used as probes

C. House keeping or luxury genes are used as probes

D. All of the above

Answer: A



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51. Matching sequence of DNA between two evidences, one of the criminal with the suspect is known as :

- A. DNA fingerprinting
- B. DNA amplification
- C. Gene mapping
- D. DNA resolution

Answer: A



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52. A technology which has found immense use in solving cases of disputed parentage is :

- A. DNA fingerprinting
- B. Polymerase chain reaction
- C. Recombinant DNA technology
- D. Monoclonal antibody production

Answer: A



53. First hormone prepared by genetic engineering is :

- A. insulin
- B. oxytocin
- C. adrenaline
- D. somatotropin

Answer: A



54. First biochemical to be produced commercially by microbial cloning and genetic engineering is :

- A. interferon
- B. penicillin
- C. human insulin
- D. fertility factors

Answer: C



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55. Which of the following statement is true ?

A. In the historic cloning experiment of Dr. Wilmut, the transplanted nucleus was taken from an udder, cell.

B. Mammalian characters appeared first in dinosaurs.

C. Heart of mammals is incapable of being
in vitro.

D. Pyramid of biomass is upright in pond
ecosystem.

Answer: A



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56. Protoplasts of two different species are
fused in :

A. clona propagation

B. organography

C. micropropagation

D. somatic hybridization

Answer: D



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57. c - DNA probes are copied from the messenger RNA molecules with the help of :

A. Restriction enzymes

B. Reverse transcriptase

C. DNA polymerase

D. Adenosine deaminase

Answer: D



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58. Electroporation procedure involves :

- A. Fast passage of food through sieve pores in phloem elements with the help of electric stimulation
- B. opening of stomatal pores during night by artificial light
- C. making transient pores in the cell membrane to introduce gene constructs
- D. purification of saline water with the help of a membrane system

Answer: C



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59. Which one of the following is a correct statement ?

A. "Bt" in "Bt-cotton" indicates that it is a genetically modified organism produced through biotechnology

B. Somatic hybridization involves fusion of two complete plant cells carrying desired genes

C. The anticoagulation hirudin is being produced from transgenic Brassica napus seeds

D. "Flaver Savr" variety of tomato has enhanced the production of ethylene which improves its taste

Answer: C



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60. A tumour inducing plasmid widely used in the production of transgenic plants in that of :

- A. Escherichia coli
- B. Bacillus thuringiensis
- C. Staphylococcus aureus
- D. Agrobacterium tumefaciens

Answer: D



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61. Common bacterium used in genetic engineering is :

A. E.coli

B. Diplococcus

C. Rhizobium

D. Spirillum

Answer: A



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62. Choose the correct statement with reference to 'Dolly'.

A. She was created by taking nucleus from unfertilized eggs and cytoplasm from unfertilized eggs.

B. She was created by taking nucleus from udder cells and cytoplasm from unfertilized eggs

C. She was created by taking cytoplasm from udder cell and nucleus from unfertilized eggs.

D. She was created by taking cytoplasm from udder cell and nucleus from fertilized eggs.

Answer: B



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63. Production of a human protein in bacteria by genetic engineering is possible because:

- A. bacterial cell can carry out the RNA splicing reactions
- B. the human chromosome can replicate in bacterial cell
- C. the mechanism of gene regulation is identical in humans and bacteria
- D. the genetic code is universal

Answer: D



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64. Two microbes found to be very useful in genetic engineering are:

A. *Diplococcus* sp. and *Pseudomonas* sp.

B. Crown gall bacterium and *Caenorhabditis elegans*

C. *Escherichia coli* and *Agrobacterium tumefaciens*

D. *Vibrio cholerae* and a tailed bacteriophage

Answer: C



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65. What is the function of Restriction endonuclease?

- A. Restricts the synthesis of DNA inside the nucleus
- B. Synthesizes DNA
- C. Cuts the DNA molecule randomly
- D. Cuts the DNA molecule at specific sites

Answer: D



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66. A genetically engineered micro-organism used successfully in bioremediation of oil spills is a species of :

- A. Trichoderma
- B. Xanthomonas
- C. Bacillus
- D. Pseudomonas

Answer: D



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67. The construction of the first recombinant DNA was done by using the native plasmid of :

A. E.coli

B. Salmonella typhimurium

C. B.thuringiensis

D. Yeast

Answer: B



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68. The basis of DNA fingerprinting is :

- A. the double helix
- B. errors in base sequence
- C. polymorphism in sequence
- D. DNA replication

Answer: C



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69. The linking of antibiotic resistance gene with the plasmid vector became possible with :

- A. DNA ligase
- B. Exonucleases
- C. Endonucleases
- D. DNA polymerase

Answer: A



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70. Gel electrophoresis is used for :

A. isolation of DNA molecule

B. cutting of DNA into fragments

C. separation of DNA fragments according
to their size

D. construction of recombinant DNA by
joining with cloning vectors

Answer: C



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71. Which one of the following palindromic base sequences in DNA can be easily cut at about the middle by some particular restriction enzyme ?

A. 5' ----- GATATG ----- 3' 3' ----- CTAATA
----- 5'

B. 5' ----- GAATTC ----- 3' 3' -----
CTTAAG ----- 5'

C. 5' ----- GACGTA ----- 3' 3' -----
CTCAGT ----- 5'

D. 5' ----- GGTTTCG ----- 3' 3' -----

ATGGTA ----- 5'

Answer: B



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72. An improved variety of transgenic basmati

rice :

A. gives high yield and is rich in Vitamin A

- B. is completely resistant to all insect pests and diseases of paddy
- C. gives high yield but has no characteristic aroma
- D. does not require chemical fertilizers and growth horma

Answer: A



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73. Generic engineering has been successfully used for producing:

A. transgenic models for studying new treatment for certain cardiac diseases

B. transgenic Cow-Rosie which produces high fat milk for making ghee

C. animals like bulls for farm work as they have super power

D. transgenic mice for testing safety of polio vaccine before use in humans

Answer: D



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74. The genetically-modified (GM) brinjal in India has been developed for:

A. Enhancing shelf life

B. Enhancing mineral content

C. Drought-resistance

D. Insect-resistance

Answer: D



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75. PCR and 'Restriction Fragment Length

Polymorphism are the methods for :

A. Genetic transformation

B. DNA sequencing

C. Genetic fingerprinting

D. Study of enzymes

Answer: D



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76. For transformation, microparticles coated with DNA are to be bombarded with gene gun are made up of :

A. Platinum of Zinc

B. Silicon or Platinum

C. Gold or Tungsten

D. Silver or Platinum

Answer: C



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77. Which vector can clone only a small fragment of DNA ?

A. Bacterial artificial chromosome

B. Yeast artificial chromosome

C. Plasmid

D. Cosmid

Answer: C



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78. In vitro clonal propagation in plants is characterized by:

A. PCR and RAPD

B. Northern blotting

C. Electrophoresis and HPLC

D. Microscopy

Answer: A



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79. DNA fragments are :

A. Negatively charged

B. Nertral

C. Positively charged

D. Positively or negatively charged

Answer: A



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80. What term is used for an extrachromosomal circular DNA in a bacterial cell ?



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81. What are the molecular scissors ?



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82. What term is used for the DNA sequence from same words when read both forward and backward.



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83. Name the enzyme that joins two strands of DNA.



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84. What type of technique is used for amplification of DNA ?



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85. Name the protein that produced in a heterozygous host .



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86. What is the first restriction endonuclease ?



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87. Which acts as a vector to transfer a piece of DNA ?



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88. Enzymes that cut the DNA at specific sites are called _____.



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89. The enzyme required for making genes from the mRNA is called _____.



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90. The plasmid of *A. tumefaciens* is called _____.



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91. Plants possessing genes of other organisms are called _____ plants.



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92. _____ are most widely used cloning vectors in genetic engineering.



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93. Short DNA molecules with known base sequences used for recognition of restriction fragments are called _____.



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94. As transgenic plants and animals produce various useful substances, they are called living _____



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95. Bt gene is transferred to plants from the bacterium _____



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96. Seeds which cannot tolerate drying and freezing temperature are called _____ seeds.



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97. _____ enzymes join the cut ends of DNA.



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98. Institutions for collection and maintenance of germplasm are called _____



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99. The enzyme reverse transcriptase is used to obtain recombinant DNA.



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100. *Bacillus subtilis* is a natural genetic engineer.



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101. In the crop Bt cotton, Bt stands for Biotechnology.



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102. pBR322 is a/an endonuclease.



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103. The enzyme that used for cutting DNA IS DNA polymerase.



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104. Eco RI is a coenzyme.



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105. Oxytocin is the first hormone prepared by genetic engineering.



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106. Explain diagrammatically the action of restriction enzyme on DNA.



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107. From what you have learnt, can you tell whether enzymes are bigger or DNA is bigger in molecular size ? How did you know ?



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108. What would be the molar concentration of human DNA In a human cell ?



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109. Do eukaryotic cells have restriction endonucleases ?



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110. Besides better aeration and mixing properties, what other advantages do stirred tank bioreactors have over shake flasks?



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111. Collect five examples of palindromic DNA sequences by consulting your teacher. Better try to create a palindromic sequence by following base-pair rules.



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112. Can you recall meiosis and indicate at what stage a recombinant DNA is made ?



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113. Can you think and answer how a reporter enzyme can be used to monitor transformation of host cells by foreign DNA in addition to a selectable marker ?



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114. Describe briefly the following Origin of replication



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115. Describe briefly the following Bioreactors



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116. Describe briefly the following Downstream processing



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117. Explain briefly PCR



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118. Explain briefly Restriction enzymes and DNA



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119. Explain briefly Chitinase



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120. Discuss with your teacher and find out how to distinguish between Plasmid DNA and

chromosomal DNA



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121. Distinguish between: DNA and RNA



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122. Discuss with your teacher and find out how to distinguish between Exonuclease and endonuclease



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123. What does 'H', 'd' and 'III' refer to in the enzyme Hind III?



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124. What modification is done on the Ti plasmid of *Agrobacterium tumefaciens* to convert it into a cloning vector ?



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125. Write Short notes on Recombinant DNA technology



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126. Write Short notes on Genetic engineering



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