BIOLOGY

BOOKS - ARIHANT PRAKASHAN

PRINCIPLES AND PROCESSES OF BIOTECHNOLOGY

Topic 1 Practice Questions 1 Mark Questions

1. Which enzyme helps in joining DNA fragments?

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2. Enzymes that cut the DNA at specific sites are called_____.

A. ligase

B. exonuclease

C. restriction endonuclease

D. primase

Answer: C

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3. Exonuclease is an enzyme that

A. makes internal cuts in polynucleotide

B. polymerises nucleotides

C. joins two polynucleotide fragments

D. removes nucleotides from the termini one after another

Answer: d

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4. DNA ligase is commonly known as

A. molecular scissors

B. molecular marker

C. molecular glue

D. molecular probe

Answer: c

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5. During electrophoresis, DNA fragments move from

A. anode to cathode

B. remain static

C. move randomly

D. cathode to anode

Answer: d

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6. The blotting of protein molecules to a nylon membrane is known as

A. Southern blotting

B. Western blotting

C. Northern blotting

D. Eastern blotting

Answer: b

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7. Detection of a desired DNA fragment by using radioactive emission is known as

A. hybridisation

B. denaturation

C. autoradiography

D. electrophoresis

Answer: c

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8. Which of the following is not required in the preparation of a recombinant DNA molecule ?

A. Restriction endonucleases

B. DNA ligase

C. DNA fragments

D. E.coli

Answer: d

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9. Only type III restriction endonucleases are used in RDT.

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10. Class II restriction endonucleases (enzymes) recognise specific nucleotide sequence in DNA called .....

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11. Cohesive ends in the DNA fragments are generated by ..... cutting.

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12. The anionic detergent, used in polyacrylamide gel electrophoresis is known as ..... .

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13. Fill in the blanks : The technique of separation of components of a mixture in the solution based on their differential adsorption is called .....

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14. The restriction endonuclease isolated from Escherichia coli .

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15. The enzyme that catalyses the synthesis of RNA on a DNA template.

16. The enzyme that catalyses the replication of DNA.

17. The enzyme that catalyses the synthesis of a complementary DNA strand on an RNA template.

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18. The fluorescent dye used in agarose gel electrophoresis.

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19. Transfer of DNA fragments from the agarose gel to a nylon membrane.

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Topic 1 Practice Questions 2 Mark Questions

1. What are restriction enzymes ? Mention their functions in recombinant DNA technology.

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2. Write Short notes on Genetic engineering

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3. What is a restriction endonuclease (restriction enzyme)? Why is the word restriction used to designate these?

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4. Describe two types of cutting of DNA, executed by restriction endonucleases.

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5. What is a palindrome? Give an exmaple .

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6. What is a DNA polymerase ? How many types of DNA polymerases you have studied ?

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7. Why is DNA ligase called molecular glue?

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8. Enumerate the features of a suitable cloning plasmid.

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9. What is a recombinant DNA?

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10. What is microinjection?

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11. Describe briefly electroporation?

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12. What is polymerase chain reaction

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Topic 1 Practice Questions 3 Mark Questions

1. Differentiate between: Exonuclease and Endonuclease.

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2. Write brief notes on the DNA ligases .

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3. Write brief notes on the DNA polymerase .

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4. What is Southern blotting?

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5. Why is SDS used in polyacrylamide gel electrophoresis?

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6. What is autoradiography?

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7. Write brief notes on the Cloning plasmid .

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8. Cosmid is:

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9. Differentiate between the Electroporation and Microinjection.

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10. How bacterial cells are made competent to take up DNA?

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11. Describe the role of $CaCl_2$ in the prepration of competent cell.

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12. PCR is a useful tool for early diagnosis of an infectious disease. Comment.

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13. Explain, how to find whether an Ecoli bacterium has transformed or not, when a recombinant DNA bearing ampicillin-resistance gene is transferred into it.

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Topic 1 Practice Questions 7 Mark Questions

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

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2. Describe briefly recombinant DNA technology.

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Topic Test 1

1. The blotting of RNA is called

A. Northern blot

B. Southern blot

C. Western blot

D. Eastern blot

Answer: A

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2. Agarose extracted from sea weeds is used in

A. PCR

B. tissue culture

C. gel electrophoresis

D. plant breeding

Answer: C

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3. Exonucleases make cuts at specific position within DNA.

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4. First letter of restriction enzymes represents..... .

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5. Molecular scissors used in recombinant technology are known as

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6. How does a restriction nuclease function ? Explain.

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7. Explain with the help of a suitable example the naming of a restriction endonuclease.

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8. Explain palindromic nucleotide sequence with the help of a suitable example.

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9. State the role of UV light and ethidium bromide during gel electrophoresis of DNA fragments.

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10. A recombinant DNA is formed when sticky ends of the vector DNA and the foreign DNA join. Explain, how sticky ends are formed and get joined?

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Topic 2 Practice Questions 1 Mark Questions

1. Which procedure is followed for amplification of DNA?

A. Electrophoresis

B. Autoradiography

C. Polymerase chain reaction

D. Southern blotting

Answer: C

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2. In recombinant DNA technique, the term vector refers to

A. plasmids that can transfer foreign DNA into a living cell

B. cosmids that can cut DNA at specific base sequence

C. plasmids that can join different DNA fragments

D. cosmids that can degrade harmful proteins

Answer: A

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3. The rDNA molecule is introduced into the cell of bacterium with the help of

A. Restriction endonucleases

B. DNA ligase

C. electroporation

D. None of the above

Answer: C

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4. Choose the incorrect statement.

A. A plasmid is small, double-stranded circular DNA

B. A plasmid contains an origin of replication

C. A plasmid has several restriction sites

D. A plasmid has telomeres

Answer: D

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5. A cosmid is a

A. plasmid phage hybrid vector

B. DNA bacteriophage vector

C. expression vector

D. viral vector

Answer: A

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6. The example of a plant cell compatible vector is

A. fertility plasmid

B. colicinogenic plasmid

C. tumour inducing plasmid

D. resistance plasmid

Answer: C

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7. Amplification of DNA by PCR uses a DNA polymerase called

A. Taq DNA polymerase

B. RNA polymerase

C. DNA polymerase-III

D. Reverse transcriptase

Answer: A

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8. The conjoint structure formed by the joining of the vector DNA and the target DNA fragment is known as ..... .

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9. The uptake of the recombinant DNA by the bacterial host cell is known as ..... .

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10. The delivery of a foreign DNA fragment into the fertilised egg with a micropipette is known as ..... .

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11. A hybrid of plasmid and phage is $\underline{\mathrm{YAC}}$.

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12. Cosmids are autonomously replicating circular extrachromosomal DNA.

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13. A plant cell, whose cellulose cell wall is digested.

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14. The instrument used in PCR amplification.

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Topic Test 2

1. Biolistic (gene gun) technique is used in _____.

A. DNA fingerprinting

B. disarming pathogen vectors

C. constructing recombinant DNA by joining with vectors

D. transformation of plant cells

Answer: D

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2. Which of the following serves as vectors in genetic engineering ?

A. Plasmid

B. Phage

C. Cosmid

D. All of these

Answer: D

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3. Genetic engineering would not have been possible if which of the following were not known ?

A. DNA polymerase

B. DNA ligase

C. Reverse transcriptase

D. all of these

Answer: C

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4. For E. coli vector pBR322, which one of the given options correctly identifies its certain component(s)?

A. rop-reduced osmotic pressure

B. Hind, III-EcoRI - selectable markers

C. $amp^R - tet^R$, antibiotic resistance genes

D. ori-original restriction enzyme

Answer: C

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5. In genetic engineering, antibiotics are used as initiation sequences.

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6. .....and.....are commonly used vectors for human genome sequencing.

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7. Write a short note on competent cell.

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8. Differentiate between cosmid and plasmid.

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9. Klenow fragment and Taq polymerase.

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10. What is the role of Thermus aquaticus in PCR ?

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Chapter Test 1 Mark Question

1. Which one is a true statement regarding Taq DNA polymerase used in PCR ?

A. It is used to ligate introduced DNA in recipient cell

B. It serves as a selectable marker

C. It is isolated from a virus

D. It remains active at high temperature

Answer: D

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2. Plasmid is a/an

A. extrachromosomal double-stranded circular DNA

B. single-stranded DNA

C. extrachromosomal linear DNA

D. None of these

Answer: A

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3. Restriction enzymes recognise short sequences called palindromes.

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4. PCR was invented by Hershey and Chase.

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

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6. The main function of gel electrophoresis is to separate.....

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7. .....remove nucleotides from ends of the DNA .

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8. The vector for t-DNA is.....

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9. Cosmids can take up inserts up to.....

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10. Type-II Restriction enzymes cleave DNA fragments at which site

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Chapter Test 2 Mark Question

1. Any recombinant DNA with a desired gene is required in billion copies for commercial use. How is the amplification of clone occurs ?

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2. Briefly explain electroblotting.

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3. Write brief notes on the Agarose gel electrophoresis.

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4. Write a short note on microinjection.

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Chapter Test 3 Mark Question

1. Differentiate between Transformation and screening.

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2. Differentiate between restriction endonuclease and DNA polymerase.

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3. Why are cloning vectors bacteriophages sometimes preferred over bacterial plasmids ?

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4. Give the name of the organism from where the thermostable DNA polymerase is isolated. State its role in genetic engineering.

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5. Describe the features of pBR322.

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Chapter Test 7 Mark Question

1. Describe briefly recombinant DNA technology.

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