Question bank

PAPER - 1

M.Sc. r-DNA TECHNOLOGY

MCQs

1.Which technique is used for detecting specific DNA sequences using a labelled probe?

a) Western blot

b) Southern blot

c) Northern blot

d) South-Western blot

Answer: b) Southern blot

2. Alpha complementation is used for selection in:

a) Yeast two-hybrid system

b) Blue-white screening

c) Colony hybridization

d) DNA sequencing

Answer: b) Blue-white screening

3. Insertional inactivation is used to detect:

a) RNA interference

b) Recombinant plasmids

c) Protein expression

d) DNA methylation

Answer: b) Recombinant plasmids

4. Which method involves chemical cleavage of DNA for sequencing?

a) Sanger's method

b) Maxam-Gilbert method

c) Automated sequencing

d) Next Generation Sequencing

Answer: b) Maxam-Gilbert method

5. Fluorescent in situ hybridization (FISH) is used to visualize:

a) Proteins in cells

b) Specific DNA/RNA sequences in cells

c) Enzymatic activity

d) Lipid membranes

Answer: b) Specific DNA/RNA sequences in cells

6. Colony hybridization is used to screen bacterial colonies for:

a) Antibiotic resistance

b) Specific DNA sequences

c) Protein production

d) Phage infection

Answer: b) Specific DNA sequences

7. DNA arrays with short synthesized sequences are called:

a) Spotted DNA arrays

b) Oligonucleotide chips

c) Protein chips

d) Microfluidic chips

Answer: b) Oligonucleotide chips

8. Which blotting technique is used for RNA detection?

a) Southern blot

b) Western blot

c) Northern blot

d) South-Western blot

Answer: c) Northern blot

9. Sanger's sequencing method uses:

a) Chemical degradation

b) Dideoxy chain termination

c) Pyrosequencing

d) Hybridization

Answer: b) Dideoxy chain termination

10. Hybrid arrest translation is used to identify:

a) DNA-binding proteins

b) mRNA corresponding to a cloned DNA

c) DNA methylation patterns

d) Protein-protein interactions

Answer: b) mRNA corresponding to a cloned DNA

1. Which technique is used to introduce specific mutations at a defined site in DNA?

a) RNA interference

b) Site-directed mutagenesis

c) Knock-out technology

d) DNA sequencing

Answer: b) Site-directed mutagenesis

2. CRISPR-Cas9 is used for:

a) Protein purification

b) Genome editing

c) DNA sequencing

d) RNA detection

Answer: b) Genome editing

3. Knock-out technology is used to:

a) Increase gene expression

b) Delete or inactivate a gene

c) Insert a reporter gene

d) Mutate RNA

Answer: b) Delete or inactivate a gene

4. RNA interference (RNAi) works by:

a) Degrading DNA

b) Degrading or blocking mRNA

c) Enhancing translation

d) Methylating genes

Answer: b) Degrading or blocking mRNA

5. TALENs are used for:

a) Protein visualization

b) Genome editing

c) DNA sequencing

d) RNA interference

Answer: b) Genome editing

6. Next Generation Sequencing is different from Sanger sequencing because it is:

a) Slower

b) Low-throughput

c) High-throughput and parallel

d) Only for proteins

Answer: c) High-throughput and parallel

7. Zinc finger nucleases function by:

a) Binding RNA and cutting DNA

b) Binding DNA and creating double-strand breaks

c) Methylating DNA

d) Degrading proteins

Answer: b) Binding DNA and creating double-strand breaks

8. Knock-in technology involves:

a) Deleting a gene

b) Inserting or replacing a gene at a specific locus

c) Random mutagenesis

d) RNA silencing

Answer: b) Inserting or replacing a gene at a specific locus

9. Golden Rice is an application of rDNA technology in:

a) Medicine

b) Agriculture

c) Industry

d) Animal husbandry

Answer: b) Agriculture

10. Which of the following is NOT a type of NGS platform?

a) Illumina

b) Pyrosequencing

c) Maxam-Gilbert

d) Ion Torrent

Answer: c) Maxam-Gilbert

Fill-in-the-Blanks

1. Alpha complementation in blue-white screening uses the ____ gene.

Answer: lacZ

2. Southern blotting is used for detecting ____ sequences.

Answer: DNA

3. The Maxam-Gilbert sequencing method uses ____ cleavage of DNA.

Answer: chemical

4. ____ blotting is used for detecting proteins with antibodies.

Answer: Western

5. In colony hybridization, colonies are transferred to a ____ membrane.

Answer: nitrocellulose / nylon

6. Automated DNA sequencing often uses ____ labeling.

Answer: fluorescent

7. DNA arrays allow high-throughput analysis of gene ____.

Answer: expression

8. Oligonucleotide chips contain ____ DNA sequences synthesized on a chip.

Answer: short / synthetic

9. South-Western blot is used to study ____ interactions.

Answer: protein-DNA

10. Zoo blotting compares DNA sequences across different ____.

Answer: species

1. Site-directed mutagenesis allows ____ changes in DNA sequences.

Answer: specific / targeted

2. RNA interference involves ____ RNA molecules that silence genes.

Answer: small / siRNA / miRNA

3. CRISPR-Cas9 uses a ____ RNA to guide Cas9 to target DNA.

Answer: guide (gRNA)

4. Knock-out mice are created by ____ a specific gene.

Answer: deleting / inactivating

5. TALENs stand for ____.

Answer: Transcription Activator-Like Effector Nucleases

6. Next Generation Sequencing allows ____ sequencing of DNA fragments.

Answer: parallel / high-throughput

7. Zinc finger nucleases contain DNA-binding domains and a ____ domain.

Answer: nuclease / cleavage

8. Recombinant DNA technology is used to produce ____ in medicine, such as insulin.

Answer: proteins / therapeutics

9. In agriculture, rDNA technology helps create ____ resistant crops.

Answer: pest / herbicide / disease

10. ____ is a genome editing tool derived from bacterial immune systems.

Answer: CRISPR-Cas9

short Questions

1. What is alpha complementation

2. What are Nucleic acid probes

3. What is southern blotting

4. What is RNAi

5 what is crisper cas9 system