

# Techniques in Molecular Biology I (MMBB0504)

## Short Questions

1. Which of the following is a key principle of good lab practices?
  - a) Using expired chemicals
  - b) Wearing personal protective equipment
  - c) Ignoring safety guidelines
  - d) Improper waste disposal
2. How do you prepare a buffer solution?
  - a) By mixing an acid and a base
  - b) By dissolving a solid in water
  - c) By heating the components
  - d) By filtering the solution
3. What is the principle behind centrifugation?
  - a) Separation based on density differences
  - b) Separation based on charge differences
  - c) Separation based on size differences
  - d) Separation based on solubility differences
4. What is the purpose of spectrophotometry in a laboratory?
  - a) To measure the absorbance of light by a sample
  - b) To visualize protein bands on a gel
  - c) To quantify the concentration of DNA
  - d) To separate DNA fragments based on size
5. What is the growth curve of bacterial culture?
  - a) A graph showing the growth of bacterial cells over time
  - b) A method for isolating bacterial DNA
  - c) A technique for measuring protein concentration
  - d) A procedure for purifying plasmid DNA
6. Which method is used for isolating genomic DNA from bacteria?
  - a) Agarose gel electrophoresis
  - b) Spectrophotometry
  - c) PCR
  - d) Phenol-chloroform extraction
7. How do you isolate plasmid DNA from bacteria?
  - a) By using gel filtration chromatography
  - b) By performing restriction digestion
  - c) By using affinity chromatography
  - d) By using alkaline lysis and precipitation
8. What is the purpose of growing lambda phage?
  - a) To study viral replication in bacteria
  - b) To isolate plant DNA
  - c) To perform western blotting

- d) To measure protein concentration
9. Which method is commonly used for quantifying DNA?
- a) Agarose gel electrophoresis
  - b) Southern hybridization
  - c) Dot blot analysis
  - d) Spectrophotometry
10. How does agarose gel electrophoresis separate DNA fragments?
- a) Based on size
  - b) Based on charge
  - c) Based on solubility
  - d) Based on density
11. Which technique is used to visualize DNA fragments on a gel?
- a) PAGE gel electrophoresis
  - b) Southern hybridization
  - c) Dot blot analysis
  - d) Western blotting
12. What is the purpose of restriction digestion?
- a) To break down plasmid DNA into smaller fragments
  - b) To amplify DNA using PCR
  - c) To separate DNA fragments based on size
  - d) To measure protein concentration
13. What is the process of joining DNA fragments using DNA ligase called?
- a) PCR
  - b) Transformation
  - c) Ligation
  - d) Gel filtration chromatography
14. What is the purpose of transforming *E. coli* with recombinant DNA?
- a) To select transformants
  - b) To isolate plasmid DNA
  - c) To perform gel filtration chromatography
  - d) To quantify DNA concentration
15. Which chromatographic technique separates molecules based on their charge?
- a) TLC
  - b) Gel filtration chromatography
  - c) Ion exchange chromatography
  - d) Affinity chromatography
16. What is the purpose of dot blot analysis?
- a) To visualize RNA molecules
  - b) To detect protein-protein interactions
  - c) To measure protein concentration
  - d) To detect the presence of specific DNA sequences

17. Which technique is used to detect specific DNA sequences in Southern hybridization?
- Northern hybridization
  - Dot blot analysis
  - Western blotting
  - ELISA
18. What is the purpose of Western blotting?
- To detect specific DNA sequences
  - To detect specific RNA sequences
  - To detect specific protein sequences
  - To measure protein concentration
19. Which method is commonly used for quantifying proteins?
- Agarose gel electrophoresis
  - Spectrophotometry
  - Southern hybridization
  - Dot blot analysis
20. What is the main concern when working with radioactive isotopes in the lab?
- Proper waste disposal
  - Personal protective equipment
  - Electrical safety
  - Radiation safety
21. Which method can be used as a non-radioactive alternative to radioactive procedures?
- Agarose gel electrophoresis
  - Spectrophotometry
  - Gel filtration chromatography
  - Western blotting
22. What is the role of a buffer in a biological experiment?
- To maintain a stable pH
  - To amplify DNA
  - To separate proteins based on size
  - To visualize DNA fragments on a gel
23. How does centrifugation separate different components in a sample?
- Based on their size
  - Based on their charge
  - Based on their solubility
  - Based on their density
24. Which method is commonly used for quantifying the concentration of DNA in a sample?
- Agarose gel electrophoresis
  - Spectrophotometry
  - Southern hybridization
  - Dot blot analysis
25. What is the purpose of PCR using isolated DNA?

- a) To amplify specific DNA sequences
  - b) To separate DNA fragments based on size
  - c) To visualize DNA fragments on a gel
  - d) To measure protein concentration
26. How does gel filtration chromatography separate molecules?
- a) Based on their size
  - b) Based on their charge
  - c) Based on their solubility
  - d) Based on their density
27. Which technique is used to detect the presence of specific RNA sequences?
- a) Dot blot analysis
  - b) Southern hybridization
  - c) Northern hybridization
  - d) Western blotting
28. What is the purpose of ELISA?
- a) To detect specific DNA sequences
  - b) To detect specific RNA sequences
  - c) To detect specific protein sequences
  - d) To measure protein concentration
29. What is the main concern when working with radiation in the lab?
- a) Proper waste disposal
  - b) Personal protective equipment
  - c) Electrical safety
  - d) Radiation safety
30. Which method can be used as a non-radioactive alternative to radioactive procedures?
- a) Agarose gel electrophoresis
  - b) Spectrophotometry
  - c) Gel filtration chromatography
  - d) Western blotting