

**Chapter 7**  
**Analytical Techniques**

1. Which of the following are correct about Oligonucleotide Design in A microarray?  
(A) DNA microarrays are generated by fixing oligonucleotides onto a solid support  
(B) The oligonucleotide array slide represents thousands of preselected genes from an organism  
(C) The length of oligonucleotides is typically in the range of twenty-five to seventy bases long  
(D) The oligonucleotides don't react with cDNA samples
  
2. What are the correct steps involve in immunohistochemistry staining?  
(A) Structural integrity of tissues is done by the cross link fixatives  
(B) To detect the phosphorylated group, cryopreserve (freeze) of sample should be done by formalin  
(C) Proteolytic-induced antigen retrieval uses heat to break cross-linked bonds and unwind proteins  
(D) The IHC-validated antibodies from CST are verified as having a strong signal in tissue and confirm specificity of the signal
  
3. Concentration polarization can be reduced further by  
(A) pre filtering the solution  
(B) reducing the flow rate per unit membrane surface area  
(C) Increased salt leakage through the membrane  
(D) back washing periodically
  
4. Which of the following used to reduce ripple in High pressure liquid chromatography?  
(A) Using bellows  
(B) Using restrictors  
(C) Using long nylon tube between pump and column  
(D) Avoiding the use of the solvent pump
  
5. Which of the following are true about Hydraulic capacitance flow control system used in HPLC?  
(A) It can be used only for liquids with low viscosity  
(B) It is irrespective of solvent compressibility  
(C) It maintains a constant flow  
(D) It smoothens high pressure pump pulsations
  
6. From the following which is the type of filtration centrifuge?  
(A) Pushers centrifuges  
(B) Peelers centrifuges  
(C) Screen/scroll centrifuges  
(D) Decanter centrifuge
  
7. Which of the following are type of centrifugation?  
(A) Hydro cyclone  
(B) Tubular centrifuge  
(C) Microfiltration  
(D) Disk stack separator

8. Which of the following are the advantage of Fourier Transform Spectrometers?  
 (A) Signal to noise ratio is high  
 (B) Information could be obtained on all frequencies  
 (C) Retrieval of data is possible  
 (D) Easy to maintain
9. Among the following compounds, which of these will show two singlets in their  $^1\text{H-NMR}$  spectrum?  
 (A) 1,4-Dichlorobenzene (B) 1,2-Dichlorobenzene  
 (C) Dimethoxymethane (D) Methyl-acetate
10. In the  $^1\text{H NMR}$  spectrum of 1-bromopropane (structure shown below), which of the following statements are CORRECT?
- $$\begin{array}{c} a \quad b \quad c \\ \text{Br}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$$
- (A) Protons 'a' resonate upfield to protons 'c'  
 (B) Protons 'b' resonate downfield to protons 'c'  
 (C) There are two triplets and one quartet in the spectrum  
 (D) Protons 'a' appear as triplet with high chemical shift in comparison to protons 'c'
11. If an optician prescribes a corrective lens of power  $-2.0\text{ D}$ , the required lens  
 (A) is a concave lens.  
 (B) is a convex lens.  
 (C) has a focal length of  $+50\text{ cm}$ .  
 (D) has a focal length of  $-50\text{ cm}$ .
12. Which of the following statements is/are CORRECT?  
 (A) Absorption occurs at all wavelengths if light passes through a given solution.  
 (B) The efficiency of a photochemical process is often expressed in terms of quantum yield.  
 (C) The unit of molar extinction coefficient is  $\text{liter mole}^{-1}\text{cm}$ .  
 (D) The extent of absorption in a dilute solution would be the same if the concentration is doubled and the path-length of light passing through solution is halved.

### Answer Key

1. (A), (B), (C)  
 2. (A), (C), (D)  
 3. (A), (B), (D)  
 4. (A), (B)  
 5. (B), 3), (D)  
 6. (A), (B), (C)  
 7. (A), (B), (D)  
 8. (A), (B), (C)  
 9. (C), (D)  
 10. (B), (D)  
 11. (A), (D)

**12. (B), (D)**