

1. Define the following terms: (30%)
 1. DNA microarray
 2. Apoptosis
 3. Tumor suppressor genes
 4. β -oxidation
 5. Monoclonal antibodies
 6. Lagging strand
 7. Cell cycle
 8. SDS-PAGE
 9. TATA box
 10. Reverse transcriptase
2. Explain briefly the meaning of primary, secondary, tertiary and quaternary structures of protein. (10%)
3. TK⁻ (thymidine kinase) mammalian cells cannot grow in the HAT medium. What is HAT stand for? And why are the TK⁻ cells not able to grow in the medium? (10%)
4. Give three examples of hormones or neurotransmitters that are derived from amino acids. Give two examples of amino acids that contains carboxyl group in its side chain. (10%)
5. Electron transport and oxidative phosphorylation occurred in inner membrane of mitochondria can generate ATPs. Both cyanide (CN⁻) and dinitrophenol are inhibitors of oxidative phosphorylation. Please explain the different inhibition mechanisms of cyanide and dinitrophenol. (10%)
6. What are the noncarbohydrates that convert to glucose or glycogen in a process known as gluconeogenesis? (10%)
7. Describe the function and location (membrane, cytosol, endoplasmic reticulum, mitochondria, nucleus) of the following proteins: (10%)
 - a. uracil-N-glycosylase
 - b. cytochrome c
 - c. citrate synthase
 - d. Na⁺-K⁺ ATPase
 - e. cytochrome P-450 monooxygenase
8. What are the structure and physiological function of S-Adenosylmethionine? (10%)