



ILARA-MOKIN, ONDO STATE
DEPARTMENT OF PHYSICAL AND CHEMICAL SCIENCES
2020/2021 FIRST SEMESTER B.Sc. DEGREE EXAMINATIONS
BCH 203: PROTEIN STRUCTURE AND FUNCTION

Chief Examiners

INSTRUCTIONS: ANSWER ANY THREE (3) QUESTIONS
TIME: 2 HOURS

1. a. List with examples the six different biological functions of proteins **(8marks)**
- b. In what order would the following proteins emerge upon gel filtration of a mixture on Sephadex G-200: myoglobin (16,000 Daltons); catalase (500,000 Daltons); cytochrome c (12,000 Daltons); chymotrypsinogen (26,000 Daltons) and serum albumin (65,000 Daltons). Provide detailed explanation on how you arrived at your answer **(12 marks)**
2. a. Mention the noncovalent interactions involved in protein structure and function **(5 marks)**
- b. Complete the table below

	Types
Non-polar, aliphatic	
Polar, aliphatic	
Aromatic	
Sulphur-containing	
Containing secondary amino-group	
Acidic	
Basic	

(15 marks)

3. a. Briefly discuss the levels/hierarchy of protein organization **(10 marks)**

b. Why do proteins fold? **(5 marks)**

c. In what direction will the following proteins move in an electric field (toward the anode, toward the cathode or remain stationary). (a) Ovalbumin (pHi = 4.6) at pH 5.0.

(b) Pepsin (pHi = 5.3) at pH 5.0 (c) Albumin (pHi = 5.3) at pH 7.0. **(5 marks)**

4. a. Illustrate using a flow chart, steps involved in protein isolation and purification **(5 marks)**

b. Complete the purification table below

	Total Activity (U)	Total Protein (mg)	Specific Activity (U/mg)	Yield (%)	Fold
Crude	250	25			
Gel-Filtration Chromatography	180	10			
Affinity Chromatography	100	3			

(12 marks)

c. What are the criteria for purity? **(3 marks)**

5. a. List three techniques used for studying protein-protein interaction **(4 marks)**

b. List the factors that determines the roles of protein in a biological system **(4 marks)**

c. Differentiate between essential and non-essential amino acid and give 2 examples each **(4 marks)**

d. Describe the process of biodegradation of one NAMED amino acid **(8 marks)**