

2018
CHEMISTRY
CHM 306
BIOCHEMISTRY
Full Marks: 80
Time: 3 hours.

The figures in the margin indicate full marks for the questions

1. Answer the following questions. 2×6= 12
- a) What is the role of Na⁺/K⁺ pump?
 - b) Name few iron storage and transport proteins of the human body.
 - c) Explain why d-metals such as Mn, Fe, Co, and Cu are involved in redox enzymes in preference to Zn, Al, and Ca.
 - d) What is the difference between Glycolysis and Krebs cycle.
 - e) Why anabolic pathway is referred as biosynthetic pathway?
 - f) What are the different functions of metabolism?
2. Answer the following questions. 3×5= 15
- a) Explain the characteristics of nitrogenase enzymes.
 - b) Gluconeogenesis is energetically expensive, but essential. Explain.
 - c) Write the difference between catabolism and anabolism.
 - d) List the role of Fe, Cu and Co in biological processes.

e) How does plastocyanine differ from haemoglobin.

3. Answer the following questions.

- a) What do you mean by chelate therapy? What is the role of chelate therapy in cardiovascular diseases? $2+2=4$
- b) What is Krebs cycle? Describe the steps and explain why can't citric acid cycle operate in absence of oxygen? $1+3+1=5$
- c) Show and explain the two phases of glycolysis. $2+2=4$
- d) Show that the free-energy change for ATP hydrolysis is large and negative. 4
- e) Write a short note on $2+2+2=6$
- i. Iron-sulphur proteins
 - ii. Vitamin B₁₂
 - iii. Cisplatin

4. Answer the followings (Any three)

- a. Define nucleosides and nucleotides. What are the basic differences between the different types of nucleic acids? $2+3=5$
- b. Write the function of various types of RNA. 5
- c. Write short notes on chemical hydrolysis of nucleic acid. 5
- d. Write briefly the different steps of DNA replication. 5

e. What is cloning? What are the five general procedures for DNA cloning? $1+4=5$

5. Answer the following (any three)

- a. Describe briefly about the different structures of protein. 5
- b. Write short notes on biosynthesis of amino acids. 5
- c. What are polypeptides? What are the different bonds involved in proteins? Draw a schematic diagram to show the structure of polypeptides. $1+2+2=5$
- d. What do you mean by transcription and translation? 5
