[This question paper contains 4 printed pages.]

Sr. No. of Question Paper	:	6018	D	Your Roll No
Unique Paper Code	:	217365		
Name of the Course	:	B.Sc. (Honours) Ch	emistry	
Name of the Paper	:	CHHT-514 : Bioche	emistry and	Environmental Chemistry
Semester	:	V		

Duration : 3 Hours

Maximum Marks: 75

Instructions for Candidates

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- 1. Write your Roll No. on the top immediately on receipt of this question paper.
- 2. Attempt all four questions in Section A.
- 3. Question 5 in Section B is compulsory.
- 4. Attempt any three other questions from Section B (four questions per section, eight questions in all).
- 5. Clearly mention Section A and Section B in the heading before starting the respective sections.

SECTION A

(Biochemistry)

Attempt all four questions in this Section. Maximum Marks : 38

- 1. (a) What is glycolysis? Give the steps involved in the conversion of glucose to glyceraldehyde-3-phosphate, during glycolysis.
 - (b) Complete loss of α-helical conformation takes place, when a protein is dissolved in urea solution. Explain.
 - (c) What are phospholipids ? Give their structure and biological significance.
 - (d) Describe the transcription process in Prokaryotes. (3,3,3,2)

P.T.O.

- 2: Do any two of the following :
 - (a) Explain the Watson-Crick model of DNA.
 - (b) What is denaturation of proteins ? Give two examples. At which pH does denaturation occur most readily ? What is the reversal of denaturation known as ?
 - (c) Explain why there is no increase in the rate of catalysis, with increase in substrate concentration, at high concentration of the substrate in an enzyme catalyzed reaction. $(4\frac{1}{2}\times2)$
- 3. (a) Differentiate between any two of the following :
 - (i) Simple, conjugated and derived proteins
 - (ii) Lock and Key model and Induced Fit model of enzyme activity
 - (iii) Reversible and irreversible inhibition of enzyme activity
 - (b) Give the structure of ATP. How many ATP molecules are generated in the complete oxidation of glucose to CO_2 and H_2O ? (3×2,3)
- 4. (a) Explain the followings terms (any three) :
 - (i) Allosteric enzymes
 - (ii) Ribozymes
 - (iii) Holoenzyme
 - (iv) Apoenzyme
 - (v) Zymogen
 - (b) What is K_{M} value ? Explain its significance.

 $(2 \times 3, 3)$

SECTION B (Environmental Chemistry)

Question 5 is compulsory. Attempt any three other questions from this Section. Maximum Marks : 37

- 5. (a) Fill in the blanks :
 - (i) _____ is a secondary pollutant.
 - (ii) Two belts of ionized particles encircling the earth are known as
 - (iii) _____ is used to slow down the neutrons in a nuclear reactor.
 - (iv) Ecosystems found in a running water body like a river are known as
 - (v) Unit for measuring hardness of a water sample is _____.
 - (vi) _____ is the material which does not occur in nature but is introduced by human activity in the environment.
 - (b) Give a complete labelled diagram of biogeochemical nitrogen cycle and specify the role of microorganisms at different levels. $(1 \times 6,4)$
- 6. (a) Differentiate between any two of the following :
 - (i) Biodegradable and non-biodegradable pollutants
 - (ii) Nuclear fission and nuclear fusion
 - (iii) Photochemical smog and reducing smog
 - (b) How are CFCs harmful to environment? Suggest a substitute of CFCs.
 - (c) Briefly discuss the phenomenon of acid rain. $(2 \times 2, 3, 2)$
- 7. (a) How does molecular chlorine disinfect water ? List two other methods of disinfecting a water sample.
 - (b) Give two ways in which an oil spill affects the aquatic ecosystem. List a method of cleaning a marine oil spill.

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(c) How do detergents harm a water body? (4,3,2)

- 8. (a) Write short notes on **any two** of the following :
 - (i) Wind energy
 - (ii) Geothermal energy
 - (iii) Breeder reactors
 - (b) What are the advantages and disadvantages of large scale hydroelectricity plants ?
 - (c) Describe different methods of safe disposal of nuclear waste. $(2 \times 2,3,2)$
- 9. (a) Mention common causes of nuclear accidents. Describe one such accident.
 - (b) Briefly discuss different categories of chemical pesticides.
 - (c) How are different forms of coal graded with reference to energy generation?

OR

Discuss a method of controlling the amount of SO_x in flue gases. (4,3,2)

(2200)