



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. (4½×2)

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<sub>2</sub> and H<sub>2</sub>O ? (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<sub>M</sub> value ? Explain its significance. (2×3,3)

**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. (1×6,4)
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. (2×2,3,2)
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. (2×2,3,2)
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  $\text{SO}_x$  in flue gases. (4,3,2)