

## ENZYMES

### Questions carry two marks:

1. Define an enzyme. Mention its chemical nature.
2. Write a note on ribozymes.
3. Compare the nature of enzyme with a physical catalyst.
4. Draw energy profile diagram for uncatalysed and catalysed reactions and explain.
5. What is bond specificity? Give example.
6. Define coenzyme. Give two examples.
7. Mention the deficiency syndrome associated with following coenzymes  
(i) TPP (ii) PLP
8. Mention the reaction catalysed by following coenzymes  
(i) NAD (ii) FAD
9. Write Michalis-Menten equation and explain the terms.
10. What is reversible inhibition? Give example.
11. Write a note on non-competitive inhibition.
12. What are allosteric enzymes? Give an example.
13. Mention the diagnostic importance of the following  
(i) LDH (ii) CK
14. Expand the following and mention their importance  
(i) SGOT (ii) SGPT
15. Define: (i) IU (ii) Katal
16. Define: (i) Specific activity (ii) Turnover number

### Questions carry Four marks:

1. Explain the classification of enzymes with examples.
2. What is enzyme specificity? Explain the different types of specificities exhibited by the enzymes.
3. Define active site. Mention the general features of active sites.
4. Explain the Lock and Key Theory and Induced Fit Theory of enzyme-substrate interactions.
5. How does the following factors influence the rate of enzyme catalysed reaction  
(i) Enzyme concentration  
(ii) Substrate concentration
6. Explain the influence of following factors on rate of enzymatic reaction  
(i) Temperature (ii)  $p^H$
7. How do you determine  $k_M$  and  $V_{max}$  by using Lineweaver-Burk plots?
8. Draw LB plots for non-competitive and uncompetitive inhibitions and explain.
9. Explain the structure of allosteric effectors and give examples.
10. What are Isozymes? Explain with any two examples.

11. Mention the clinical applications of the following enzymes:  
(i) Streptokinase                      (ii) Urokinase  
(iii) Uricase                              (iv) Asparaginase
12. Explain the biotechnological applications of:  
(i) Amyloglucosidase in alcohol production  
(ii) Pectinase in wine and fruit juice clarification
13. Mention the biotechnological importance of following enzymes in brewing industry  
(i) Cellulase      (ii) Protease      (iii) Amylase
14. Explain the principle and method involved in enzyme assay by calorimetric method with an example.
15. How spectrophotometric method is employed in enzyme assay? Explain with an example.

## **MOLICULAR BIOLOGY**

### **Questions carry two marks:**

1. What is the central dogma of molecular biology?
2. What are Okazaki fragments?
3. How many  $3^1 - 5^1$  phosphodiester linkages would be present in a linear polynucleotide containing 20 nucleotide sequences?
4. If a DNA strand contains the base sequence AATCGTAGGC. What will be the base sequence transcribed on to the mRNA?
5. Name the enzyme catalysing the synthesis of DNA and RNA.
6. Explain the terms 'leading strand' and 'lagging strand'.
7. What is genetic code? How many nucleotides are involved in a single codon?
8. Genetic code is universal. Explain.
9. What are codons? What is the relation between codon and anticodon?
10. Name the codons which specify initiation and termination of the synthesis of a polypeptide chain.
11. What is antisense strand?
12. Explain the terms initiation, elongation and termination of the protein synthesis. What are polysomes?
13. Why are nucleic acids called informational molecules?
14. List the proteins required for DNA replication.
15. What is replication fork?
16. Write the note on E.coli RNA polymerase.
17. What are promoters?
18. What is an operon?
19. What is meant by negative control?
20. How does rifampin inhibit transcription?

### **Questions carry Four marks:**

1. Explain the terms replication, transcription and translation.
2. Outline the semiconservative mode of replication of DNA.
3. What are the functions of mRNA, tRNA and rRNA?
4. What is DNA finger printing? Mention its applications.
5. Explain nucleic acid – protein interaction in chromatin and viral nuclear capsid.
6. List the models of DNA replication.

7. Write a note on initiation of translation.
8. Describe the reverse transcription of HIV – RNA.
9. What are constitutive and induced enzymes?
10. Describe the organization of Lac operon of E.coli.
11. What are structural and regulatory genes?
12. Explain the regulation of Lac operon of E.coli
13. List the antibiotics that inhibit translation. How do they inhibit?

## **MUTATIONS**

### **Questions carry 2 marks:**

1. What are mutations? Give any two causes.
2. What do you mean by transition and transversion?
3. Mention the types of point mutations.
4. What is point mutation?
5. Explain a. silent mutation b. missense mutation c. nonsense mutation d. frame shift mutation.
6. What are mutagens?

### **Questions carry 4 marks**

1. Explain the genetic consequences of point mutation.
2. Explain how chemical agents cause mutations.
3. How intercalating agents and radiations cause mutation?
4. Explain how oxidation and alkylation acting as causative factors for mutation.