REV-00
BBT/05/10

2017/08

B.Sc. BIOTECHNOLOGY
Sixth Semester
ENZYMOLOGY
(BBT - 27)

Duration: 3Hrs. **Full Marks: 70**

PART A (Objective) =20
PART-B (Descriptive)=50

PART-B (Descriptive)

Duration: 2 hrs. 40 mins. **Marks: 50**

1. Answer the following questions (any *five*): **2×5=10**

a) What is the significance of numbering system in enzyme classification?

b) Differentiate between activators and inhibitors.

c) Cite one example for each of monomeric and oligomeric enzymes?

d) What is the role of non-protein organic molecules and inorganic ions in enzymes?

e) What do you understand by bi-substrate reactions? What is the importance of K_{cat}/K_m?

f) State the use of lactase in dairy industry.

g) What is the use of glucose oxidase in enzyme electrodes?

2. Write short notes on (any *five*): **3×5=15**

a) Coenzymes.

b) Allosteric enzymes.

c) Use of proteases in leather industry.

d) Measurement of enzyme activity.

e) Enzyme catalysis.

f) Enzyme immobilization.

g) Holoenzyme.

3. Answer the following questions (any *five*): **5×5=25**

a) Discuss the classification of enzymes.

b) Describe the steps for the purification of enzyme.

c) Write the Michaelis-Menten equation. Define each term. Add a note on the significance of Km value.

d) Explain briefly the factors affecting enzyme activity.

e) Explain the different types of reversible enzyme inhibition. State the double reciprocal (Lineweaver Burk Plot) of each type of enzyme inhibition.

f) Discuss the role of different vitamins as coenzymes.

g) Write briefly on applications of enzymes in clinical and food industry.

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Duration: 20 minutes **Marks – 20**

PART-A (Objective)

Time: 20 mins **Total Marks: 20**

I. Choose the correct option: **1×20=20**

1. The function of an enzyme is to
   a) cause chemical reaction that would not otherwise take place.
   b) change the rates of chemical reactions.
   c) control the equilibrium points of reactions.
   d) change the directions of reactions.

2. Isomerase enzyme would have an EC number with first digit
   a) 2 b) 4 c) 5 d) 6

3. Enzymes are
   a) Thermolabile b) Thermophile
   c) Thermostable d) All of these

4. Which of the following statements is true?
   a) Enzymes have names ending ase
   b) Enzymes are highly specific in their action.
   c) Enzymes are living organisms.
   d) Enzymes get activated on heating.

5. An organic substance bound to an enzyme and essential for its activity is called
   a) holoenzyme b) apoenzyme c) isoenzyme d) coenzyme

6. In a Michaelis –Menten enzyme mechanism, what substrate concentration (relative to K_m) is needed for the reaction rate to be ½ V_{max}
   a) 1/9 K_m b) 1/3 K_m c) K_m d) ¼ K_m

7. Which of the following enzyme inhibition can be overcome simply by increasing the substrate concentration?
   a) non-competitive b) competitive c) uncompetitive d) none

8. Which one of the following statement is TRUE about non-competitive inhibitor?
   a) K_m increases b) K_m decreases
   c) V_{max} increases d) V_{max} decreases

9. An allosteric modulator influences enzyme activity by
   a) competing for the catalytic site with the substrate.
   b) binding to the enzyme molecule other than the active site.
   c) changing the specificity of the enzyme for its substrate.
   d) none of the above.

10. Enzymes are polymers of
    a) Hexose sugars b) Fatty acids
    c) Amino acids d) Inorganic phosphate

11. Enzymes are required in traces because they
    a) have high turnover number.
    b) remain unused at the end of reaction and are re used.
    c) show cascade effect.
    d) All correct.

12. Which vitamin is necessary for coenzyme A synthesis?
    a) Ascorbic acid b) Pyridoxine
    c) Biotin d) Pantothenic acid

13. The purity of an enzyme at various stages of purification is best measured by
    a) Specific activity of the enzyme b) Total activity of the enzyme
    c) Total protein d) Percent recovery of protein

14. The enzyme having low affinity for the substrate will have
    a) High Km b) Medium Km c) Low Km d) None

15. Which of the following vitamins does not act as a precursor for coenzymes?
    a) Thiamine b) Biotin c) Folic acid d) Ascorbic acid

16. In Lineweaver-Burk plot, the y-intercept represents
    a) Vmax b) 1/Vmax c) Km d) 1/Km

17. A sigmoidal plot of substrate concentration [S] verses reaction velocity (V) may indicate
    a) Allosteric kinetics b) Michaelis-Menten kinetics
    c) Competitive inhibition d) Non-competitive inhibition

18. The non protein part of an enzyme is known as
    a) Apoenzyme b) Cofactor
    c) Coenzyme d) None of these

19. Which of the following is not a cofactor?
    a) Mg b) Iron c) Cu d) Methylcobalamine

20. Who got Nobel Prize in 1978 for working on enzymes?

a) Koshland
b) Arber and Nathans
c) Nass and Nass
d) H.G. Khorana

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University of Science and Technology, Meghalaya

Date Stamp:_____

SESSION 2016-17

COURSE_____PAPER Code:_____

NAME OF THE PAPER:_____

SEMESTER_____

Instructions to Candidates

1. This answer booklet has 4 pages. Please check before writing whether it is complete or in good condition.
2. Do not write your name anywhere in the answer booklet.
3. Write legibly on both sides of the paper
4. You may use some space for any rough notes or calculation on the answer booklet if you need. These rough notes, calculations must be scored out before submitting the answer booklet.
5. Do not bring any book or loose paper in the examination hall.
6. Do not tear any page from the answer booklet.
7. Do not write anything on the question paper or blotting paper or any pieces of paper while you are in the examination hall.
8. Any act of indiscipline or misbehavior in the examination hall will result in your expulsion.
9. No examinee is allowed to leave the examination hall until 30 minutes lapse after the commencement of the examination.
10. Additional answer sheet will be supplied after the main answer booklet is completed.

For Objective Type Questions

Page No.	Marks
Total	

For Descriptive Type Questions

Question No.	Marks
Total	
Grand Total	

Session: 2016-17

Course_____

Roll No._____

Enrollment No._____

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Name of the Paper_____

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