DEPARTMENT OF PHYSICAL AND CHEMICAL SCIENCES
2020/2021 FIRST SEMESTER B.Sc. DEGREE EXAMINATIONS

BCH 413: ENZYME BIOTECHNOLOGY

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS **TIME: 2 HOURS**

1. (a) Describe the following (*use illustration if possible*)

(i) Continuous stirred tank reactor (ii) Alternatives for continuous stirred tank reactor

(ii) Variations of backed bed reactors **(15 marks)**

2 (a) List the advantages and disadvantages of enzyme immobilization **(5 marks)**

(b) Describe enzyme formulation techniques with respect to functions and methods **(10 marks)**

3. (a.) Briefly highlight the biotechnological process of enzyme production **(5 marks)**

(b.) Illustrate a typical batch reactor **(10 marks)**

4. (a.) Define enzyme formulation and why it is of importance in enzyme biotechnology **(2 marks)**

(b) Define enzyme immobilization and briefly explain why we immobilize enzymes **(3 marks)**

(c) Discuss the procedures of enzyme immobilization by adsorption **(5 marks)**

(d) List five properties of an ideal matrix for enzyme immobilization **(5 marks)**

5. (a) Describe (using an appropriate illustration or otherwise) the production of

chymosin using *Aspergillus niger* **(10 marks)**

(b) Using an appropriate illustration describe the microbial production of industrial enzymes **(5 marks)**

6. a. Illustrate and briefly explain the microbial growth curve **(5 marks)**

b. Mention 10 industrial enzymes and their applications **(5 marks)**

c. List and briefly explain the types of fermentation **(5 marks)**