

9. Which of the following RNA serves the regulatory functions including splicing, and gene silencing?
 mRNA tRNA rRNA siRNA
10. The inducer for switching on the *lac* operon in bacteria is
 presence of sucrose number of bacteria
 presence of lactose presence of structural genes in bacterial

Fill in the blank by most appropriate VALUE or WORD.

11. Staining materials of gram-positive bacterium is _____.
12. Bacterial culture prepared by pure culture is known as _____.
13. _____ is a bacterial cell wall hydrolyzing enzyme.
14. The distance between each turn in helical strand of DNA is _____.
15. The alpha and beta forms of D-glucose are known as _____.
16. In the peptide Ser-Lys-Arg-Gly, the N terminal is _____.
17. Palmitic acid is classified as _____.
18. The apparent K_m of an enzyme changes when the enzyme is treated with _____.
19. Malate dehydrogenase belong to _____ group of enzymes.
20. The biosynthesis reactions involving the formation of complex molecules from simple precursors are known as _____.

KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

18 JUL 2023

Level : B.E.
Year : II
Time : 2 hrs. 30 mins.

Course : CHEG 213
Semester : II
F. M. : 40

SECTION "B"

[8Q. × 5 = 40 marks]

Attempt *ANY EIGHT* questions. (Q.N. 1 is compulsory)

1. Discuss the oxidation of glucose via pentose phosphate pathway and give its significance.
2. a. What are cofactors? Explain various enzyme, coenzyme and electron carrier involved in biological oxidation. [3]
b. Highlight the importance of addition of Cap and Poly-A tail to mRNA. [2]
3. a. Show the glycosidic linkage in lactose, sucrose and maltose. Why are lactose and maltose are reducing sugar whereas sucrose is not? [2+1]
b. What are peptides? Draw the structure of tetrapeptide. [2]
4. a. Briefly compare the protozoa with algae in terms of their cellular structure and function. [2.5]
b. Explain with suitable example temperature dependence on microbial growth. What are the advantages and disadvantages of chemically defined and complex media? [1.5 + 1.0]
5. a. The enzyme fumarase has the following kinetics constant. [3]
$$E + S \xrightleftharpoons[k_{-1}]{k_1} ES \xrightarrow{k_2} P + E$$

Where, $k_1 = 10^9 M^{-1} S^{-1}$, $k_{-1} = 4.4 \times 10^4 S^{-1}$ and $k_2 = 10^3 S^{-1}$

 - (i) What is the value of the Michaelis constant for this reaction?
 - (ii) At an enzyme concentration of $10^{-6} M$, what will be the initial rate of product formation at a substrate concentration of $10^{-3} M$.
b. How lipids are classified? Explain with suitable example. [2.0]
6. a. Explain with suitable example, how rate of enzyme catalyzed reaction is affected by competitive inhibitors. [2.5]
b. How surface immobilization of enzyme carried out? Name any five therapeutically important enzymes and its application. [1.5 + 1.0]
7. a. Explain the working mechanism of polymerase chain reaction (PCR) and its application. [2.5]
b. Briefly explain any two methods involved in characterization of cloned DNA. [2.5]

8. Briefly describe the primary, secondary, tertiary and quaternary structure of protein. What would happen, if you substitute a tyrosine for cysteine in the active sites. [4.5 +0.5]
9.
 - a. Draw a labelled schematic sketch of replication for DNA. Explain the role of enzyme involved in DNA replication. [2.5]
 - b. Explain the significance of double reciprocal plot used in measurement of enzyme kinetics. [2.5]