

U.G. 1st Semester Examination - 2020
Molecular Biology & Biotechnology
[HONOURS]

Generic Elective Course (GE)

Course Code : MBBT-H-GE-T-1 (A&B)

Full Marks : 40 Time : 2½ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions from selection Option.

OPTION-A

MBBT-H-GE-T-1A

1. Answer any **five** question from the following:
2×5=10
- a) Which form of thyroid hormone is metabolically most active? Where is peptidoglycan present? 1+1
 - b) What is fermentation? Give example. 1+1
 - c) What are coenzymes? Give an example. 1+1
 - d) What is Michaelis constant? 2
 - e) What is mutarotation? 2

- f) Write down the name of vitamin needed for
 - i) Vision
 - ii) Blood clotting
 - iii) Bone formation
 - iv) Immunity ½×4
- g) Give example of a disaccharide and mention the names of the monosaccharides present in it. 1+1
- h) What is saturated fatty acid? Write down the name of the two essential fatty acids. 1+1

2. Answer any **two** questions from the following:
5×2=10

- a) Describe about α-helix structure of protein. What do you mean by peptide bond? 3+2
- b) What is transamination reaction? What is the significance of transamination reaction? Cite the example of transamination reaction mentioning the name of enzyme and coenzymes involved in the reaction. 1+2+2
- c) What is oxidative phosphorylation? How does ETC help in synthesis of ATP? 2+3

[Turn over]

- d) Classify amino acids on the basis of their side chains. What is zwitterion? 4+1

3. Answer any **two** questions from the following: 10×2=20

- a) Which metallic ion is found to be present in chlorophyll? Write down the range of wave length of light showing most effectiveness in photosynthesis. What is Hill reaction? Write down the steps of non-cyclic photophosphorylation. 1+1+2+6
- b) Describe the de novo synthesis of purine biosynthesis mentioning the names of enzyme of synthesis and coenzyme involved. 10
- c) Where does glycolysis take place in the cell? What are the importances of glycolysis? Write down the steps of glycolysis mentioning the names of enzyme and coenzymes involved in steps. 1+2+7
- d) State the Michaelis-Menten equation. Write the units of Michaelis constant. What do you mean by competitive and non-competitive inhibition reaction in enzyme catalyzed system? What do you mean by optimum temperature of enzyme activity? What is ribozyme? 1+1+4+2+2

OPTION-B

MBBT-H-GE-T-1B

1. Answer any **five** of the following: 2×5=10

- a) How many Acetyl CoA molecules can be formed from the Beta oxidation of plasmatic acid?
- b) Draw the structure of a triglyceride.
- c) Write names of unusual amino acids involved in operation of urea cycle.
- d) Define Zwitterionic structure of amino acids.
- e) Name one coenzyme with its one biochemical function.
- f) What do you mean by mutarotation?
- g) Write down the names of essential fatty acids.
- h) What are reducing sugars? Give examples of two reducing disachharides. 1+1

2. Answer any **two** of the following: 5×2=10

- a) Discuss briefly the mode of action of thyroid hormone. Name the hormones released from adrenal cortex and state their functions. 3+2
- b) What is photophosphorylation? Discuss briefly the process of photophosphorylation. 2+3

c) State the structural differences in starch and cellulose. What is the monomeric unit of Insulin? What is heteropolysaccharide?

3+1+1

d) What is transamination reactions? Mention the name of enzyme and coenzyme involved in transamination reaction.

2+3

3. Answer any **two** of the following: 10×2=20

a) What is a photosystem? Explain Hill reaction. How is carbon assimilated in plants? Mention the names of enzyme involved in CO₂ fixation.

2+2+4+2

b) Describe the formation of osazone from glucose. Draw the Haworth projection for β-D-glucose. Define epimerism with example. Describe the general structure and significance of peptidoglycan.

3+2+2+3

c) Which forces stabilize the secondary and tertiary structure of a protein? Explain the structural parameters of an alpha helix. What is activation energy in an enzyme catalyzed system? Write down the differences between competitive and non-competitive inhibition reaction in enzyme-catalyzed system.

3+2+1+4

d) Write down the location of TCB cycle operation in a living cell. Schematically represent TCA Cycle (include all substrates, products and the enzymes and coenzymes involved). 1+9
