REV-01
MSB/06/10

2025/11

SET A

M.Sc. BOTANY
THIRD SEMESTER
BIOCHEMISTRY AND PLANT PHYSIOLOGY
MSB-303(B)

[USE OMR FOR OBJECTIVE PART]

Duration: 1.30 hrs. **Full Marks: 35**

Objective

Time: 15 min. **Marks: 10**

1X10=10

Choose the correct answer from the following:

1. Which of the following is a correct description of hydrogen isotopes?
   a. Hydrogen, Deuterium, and Tritium all have different numbers of protons.
   b. Deuterium and Tritium are both radioactive and decay into Hydrogen and Deuterium, respectively.
   c. Tritium is radioactive and decays to Helium.
   d. Both Deuterium and Tritium have one proton and one neutron.

2. Which of the following bonds will be most difficult to break?
   a. C-O
   b. C-C
   c. C-N
   d. C-S

3. Three unknown solutions are given with pH value of 6, 8 & 9.5 respectively. Which solution will contain the maximum OH- ion?
   a. Solution sample-1
   b. Solution sample-2
   c. Solution sample-3
   d. Data are insufficient

4. The melting of ice into liquid water is an example of ..... reaction.
   a. endergonic
   b. exergonic
   c. exothermic
   d. endothermic

5. Buffer solutions resist any change in pH This is because .....
   a. acids and alkalis in these solutions are shielded from attack by other ions
   b. these give unionised acid or base on reaction with added acid or alkali
   c. fixed value of pH
   d. large excess of H^+ or OH^- ions

6. Match the following enzymes and its product-

a. Succinyl thiokinase	1. citrate
b. Succinyl dehydrogenase	2.isocitrate
c. Aconitase	3. fumerase
d. Citrate synthase	4. Succinate

   a. a - 3 b - 4 c - 2 d - 1
   b. a - 4 b - 3 c - 1 d - 2
   c. a - 4 b - 3 c - 2 d - 1
   d. a - 4 b - 2 c - 3 d - 1

7. What powers the ATP synthase rotary motors?
   a. H+ gradient
   b. Coenzyme motive force
   c. C-AMP
   d. GTP hydroysis

8. What cellular conditions favor increased activity of the electron transport chain and oxidative phosphorylation?
   a. Low Oxygen concentrations
   b. High ADP concentrations
   c. High NAD+ concentrations
   d. Low NADH concentrations

9. Which enzyme catalyzes the first step of beta-oxidation?
   a. 3-Hydroxyacyl-CoA dehydrogenase
   b. Acyl-CoA dehydrogenase
   c. Enoyl-CoA hydratase
   d. Thiolase

10. What is the primary role of the Acyl Carrier Protein (ACP) in fatty acid synthesis?
   a. Fatty acid synthase
   b. Citrate lyase
   c. Acetyl-CoA carboxylase
   d. Malonyl-CoA-ACP transferase

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Descriptive

Time : 1 hrs. 15 min. **Marks : 25**

[Answer question no.1 & any two (2) from the rest]

1. What is buffer? Justify with examples why buffer keeps the pH of the solution contant? **5**

2. Discuss the process of oxidative phosphorylation . What is chemiosmotic theory? How it explains the ATP formation. **7+3=10**

3. Discuss the biosynthesis of fatty acids and its regulation. **10**

4. **Write short notes on** **2½ ×4=10**

   a)Enthalpy b)Entropy c) Ionic Bond d) Van der Walls interaction

5. **Write short notes on** **6+4=10**
   a) Biosynthesis of starch and sucrose
   b) Biological energy transducers

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