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AB-234550

M.Sc. (Semester-IV) Examination, June-2025

(Backlog)

BOTANY

(Plant Biochemistry)

Time Allowed : Three Hours

Maximum Marks : 70

Note : This question paper is divided into **four** sections. Attempt questions from **all four** sections as per given direction. Distribution of marks is given in each section.

SECTION-A

(Objective Type Questions)

Note : Attempt **any ten** questions. Each question carries **1** mark. [10×1=10]

1. (i) The application of law of thermodynamics to the enthalpy change was done by :

(a) Newton

(b) Hess

(c) Lewis

(d) Sophocles

(ii) In the law of mass action, the c term denotes :

(a) Concentration

(b) Moles

(c) Mole fractions

(d) Celcius

(iii) What is the pk_w at 298K?

(a) 0

(b) 1

(c) 14

(d) 7

(iv) The first law of thermodynamics states that energy cannot be :

(a) Created only

(b) Destroyed only

(c) Converted

(d) Created and destroyed

(v) Which of the following is a tricarboxylic acid?

(a) Acetic acid

(b) Succinic acid

(c) Oxaloacetic acid

(d) Citric acid

(vi) Beta-oxidation of fatty acids occurs in :

(a) Mitochondria

(b) Peroxisome

(c) Peroxisome and ER

(d) Endoplasmic Reticulum

(vii) The coenzyme is :

(a) Often a metal

(b) Always a protein

(c) Often a vitamin

(d) Always an inorganic compound

(viii) The high affinity ammonium uptake system in plant's roots involves transporters in the AMT/Rh family. Which of the following AMT genes is expressed in cortex and endodermis?

(a) AMT 1.1

(b) AMT 1.2

(c) AMT 1.3

(d) AMT 1.5

(ix) Heterocyst from cyanobacteria contains the enzyme :

(a) Pectinase

(b) Cellulase

(c) Nitrogenase

(d) Phosphorylase

(x) Which form of sulphur is absorbed by plants?

(a) Sulphate

(b) S_8

(c) S_4

(d) SO_2^{--}

(xi) Plant obtain iron in the form of :

(a) Ferric ions

(b) Ferrous ions

(c) FeO

(d) Both (b) and (c)

(xii) Plants obtain phosphorus in the form of :

(a) Orthophosphates

(b) Paraphosphates

(c) Phosphoric acid

(d) None of the above

SECTION-B

(Very Short Answer Type Questions)

Note: Attempt **any five** questions. Each question carries **2** marks. (Word limit : **25-30** words) [5×2=10]

2. (i) Define pH.

(ii) What is Entropy?

(iii) What are Amino Acids?

(iv) What are Ribozymes?

(v) What are Phospholipids?

(vi) Define primary structure of protein.

(vii) Define Physiological buffers.

SECTION-C

(Short Answer Type Questions)

Note: Attempt **any five** questions. Each question carries **4** marks. (Word limit : **250-300** words) [5×4=20]

3. (i) Describe synthesis of monosaccharide in plants.

(ii) Describe beta-oxidation of fatty acid.

(iii) Describe the ionization of weak acid and weak base.

(iv) Describe the mechanism of enzyme action.

(v) Describe Ammonia Assimilation.

(vi) Describe the Law of Mass Action.

(vii) Describe energy rich phosphorus compounds.

SECTION-D

(Essay Type Questions)

Note: Attempt **any three** questions. Each question carries **10** marks. (Word limit : **500** words) [3×10=30]

4. (i) Give an account on the degradation of carbohydrates in higher plants.

(ii) Describe Michaelis-Menton equation.

(iii) Describe the structure of proteins.

(iv) Describe inorganic nitrogen metabolism in plants.

(v) Give an account on sulphate uptake, activation and transfer in plants.

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