

M.Sc. BOTANY
FOURTH SEMESTER
ADVANCED PLANT PHYSIOLOGY & BIOCHEMISTRY
MSB-402 B

Duration: 3 Hrs.

Marks: 70

{ Part : A (Objective) = 20 }
{ Part : B (Descriptive) = 50 }

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.

Marks: 50

[Answer question no. One (1) & any four (4) from the rest]

1. Discuss physiological effects of water deficit in plants . (10)
2. Discuss the biosynthesis of fatty acid. (10)
3. Write short notes on: (2.5×4=10)
 - a) Coupled reactions.
 - b) ATP and its significance.
 - c) Concept of free energy.
 - d) Van der Waals attraction and Hydrogen bonding.
4. Discuss physiological effects of salt stress in plants. (10)
5. Discuss the various steps of β -oxidation. Why it is called as the most energy yielding process of biological oxidation justify. (7+3=10)
6. What are the differences of oxidative phosphorylation and photophosphorylation? Discuss the various steps of electron transport chain and how electron transport chain favours ATP formation? (2+8=10)
7. Describe briefly about enzyme immobilization. (10)
8. Define allosteric enzymes. Discuss the different models in support of mechanism of actions of allosteric enzymes. (2+8=10)

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[PART-A : Objective]

Choose the correct answer from the following:

1X20=20

1. Hydrolysis of ATP over ADP and AMP generates highest energy because
 - a. ATP on hydrolysis generates thermodynamically stable structure.
 - b. ATP is highly unstable.
 - c. Hydrolysis of ATP is pH dependent.
 - d. Hydrolysis of ADP and AMP do not generate thermodynamically stable structure.
2. Which of the following statement is correct?
 - a. Nonpolar gases are highly soluble in water.
 - b. Water is a nonpolar solvent.
 - c. During melting or evaporation the entropy of aqueous system increases.
 - d. Water forms ionic bonds with polar solutes.
3. Synthesis of glucose from fat is called
 - a. Glycolysis
 - b. Krebs cycle
 - c. Saponification
 - d. Gluconeogenesis
4. Weakest force is
 - a. Vander walls
 - b. Ionic bond
 - c. Hydrogen bonding
 - d. Covalent bond
5. Reactions with $-\Delta G$ is
 - a. Exothermic
 - b. Endargonic
 - c. Endothermic
 - d. Both a and b
6. The actual free energy change of a given biochemical reaction carried out under standard conditions with 1M initial concentration of each of the reactants and products will be
 - a. Equal to zero.
 - b. Equal to standard free energy change for the reaction.
 - c. Less than standard free energy change for the reaction.
 - d. Greater than standard free energy change for the reaction.
7. Malonyl CoA is a direct inhibitor of which enzyme of fatty acid oxidation?
 - a. Carnitine Acyl Transferase I
 - b. Carnitine Acyl Transferase II
 - c. Thiokinase
 - d. None of the above

8. Which of the following supplies the 2 carbon units that are added to the elongation of fatty acid chain?
 - a. Acetyl CoA
 - b. Malonyl CoA
 - c. β -keto acyl CoA
 - d. Glucose
9. The active site of an enzyme is formed by a few of the enzymes
 - a. R group of the enzymes.
 - b. Carboxyl group of the amino acids.
 - c. Exposed sulphur bonds.
 - d. Amino groups of amino acids.
10. Of the following statements of the enzymes which is true?
 - i) Enzymes lack in nucleophilic groups.
 - ii) Enzymes are highly specific both in binding chiral substrates nand in catalyzing their reactions.
 - iii) Enzymes catalyze chemical reactions by lowering the activation energy.
 - iv) Pepsin is a proteolytic enzyme.
 - a. i & iv
 - b. i & iii
 - c. i only
 - d. ii, iii & iv
11. In each round of fatty acid oxidation
 - a. NADH and ATP is released.
 - b. NADH_2 and ATP is released.
 - c. NADH_2 , FADH_2 and Acetyl CoA is released.
 - d. FADH_2 and Acetyl CoA is released.
12. An enzyme promotes chemical reaction by
 - a. Lowering the energy of activation.
 - b. Causing the release of heat, which acts as a primer.
 - c. Increasing the molecular motion.
 - d. Changing the free energy difference and product.
13. ATP synthesis occurs in
 - a. Chloroplasts
 - b. Mitochondria
 - c. Chloroplasts and mitochondria both
 - d. All cell organelles
14. The role played by ATP in biochemical reactions is that of
 - a. A reducing agent
 - b. A coenzyme
 - c. An energy donor substance
 - d. An energy donor substance or a coenzyme



15. DNA, RNA, ATP all are composed of
- a. Nucleotides
 - b. Purines
 - c. Nucleic acids
 - d. Pentose sugars
16. Azide is the inhibitor in which step of electron transport chain?
- a. Blocks electron transport at complex I.
 - b. Blocks electron transport at complex II.
 - c. Blocks electron transport at complex IV.
 - d. Blocks electron transport and proton pumping at complex III.
17. Iron containing compound that act as hydrogen acceptors in the respiratory chain are
- a. Flavoproteins
 - b. Dehydrogenases
 - c. Cytochromes
 - d. Oxidases
18. Consider the following fatty acids
- i) Linolenic acid
 - ii) Oleic acid
 - iii) Palmitic acid
 - iv) Stearic acid
- Which of these is /are unsaturated fatty acids?
- a. i only
 - b. i and ii
 - c. iii and iv
 - d. ii, iii, iv
19. During flood
- a. Anaerobic respiration increases.
 - b. Nureient absorption increases.
 - c. Cytokinin level increases.
 - d. Blocking of ethylene biosynthesis.
20. Which of the following statement is wrong?
- a. Chilling stress increases cell membrane leakage.
 - b. Unsaturated fatty acid level decrease in cell membrane in chilling stress.
 - c. ABA activity increases in drought.
 - d. Proline concentration increases in water stress.

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Course :

Semester : Roll No :

Enrollment No : Course code :

Course Title :

Session : 2016-17 Date :

Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- The student shall write the answer in the box where it is provided.
- The student shall not overwrite / erase any answer and no mark shall be given for such act.
- Hand over the question paper cum answer sheet (Objective) within the allotted time (20 minutes / 10 minutes) to the invigilator.

Full Marks	Marks Obtained	Remarks
20		

Scrutinizer's Signature

Examiner's Signature

Invigilator's Signature