

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

**SET**  
**A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

( Objective )

Time: 30 mins.

Marks: 20

*Choose the correct answer from the following:*

*1 × 20 = 20*

- When two ice cubes are pressed over each other, they unite to form one cube. Which of the following forces is responsible to hold them together?
  - Van der Waals forces
  - Hydrogen bond formation
  - Ionic interaction
  - Covalent attraction
- The Atoms of solid Ar are held together by:
  - Hydrogen bonds
  - Hydrophobic forces
  - Ionic bonds
  - Van der Waals forces
- In a crystal, covalent molecules are held together by:
  - Dipole-dipole attraction
  - Hydrogen bonds
  - Van der Waals attraction
  - Electrostatic attraction
- Which ONE of the following is the best description of a protogenic solvent?
  - A protogenic solvent accepts electron lone pairs
  - A protogenic solvent neither accepts or donates protons
  - A protogenic solvent accepts protons
  - A protogenic solvent donates protons
- The melting of ice into liquid water is an example of tube..... reaction.
  - Endergonic
  - Exergonic
  - Exothermic
  - Endothermic
- In an open system, for maximum work, the process must be entirely:
  - Irreversible
  - Reversible
  - Adiabatic
  - None of the above
- Second law of thermodynamics defines:
  - Heat
  - Work
  - Enthalpy
  - Entropy
- Whenever a system undergoes either a change in state or an energy or mass transfer at a steady state, it is said to undergo:
  - A change of state
  - A process
  - A steady state transfer
  - An equilibrium
- 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  
c. a - 4 b - 3 c - 2 d - 1
- b. a - 4 b - 3 c - 1 d - 2  
d. a - 4 b - 2 c - 3 d - 1
10. What do inhibitors of complex III of electron transport system in oxidative phosphorylation do?
- a. Blocks the transfer of reducing equivalents from Fe-S to ubiquinone-Q  
c. ETC takes place but inhibits phosphorylation
- b. Prevents transfer of electrons from cytochrome aa<sub>3</sub> to molecular oxygen  
d. Prevent transfer of electrons from cytochrome b to cytochrome C1
11. Which of the following supplies the two carbon units that are added to the elongation of fatty acids?
- a. acetyl CoA  
c. β-keto-acylCoA
- b. malonyl CoA  
d. Pyruvate
12. Chemi-osmotic theory was first put forward by:
- a. Peter Mitchell  
c. Paul Boyer
- b. John Walker  
d. All of the above
13. All the following correctly describe the active site of an enzyme except:
- a. It is small relative to the entire enzyme  
c. It is two dimensional in structure
- b. Specificity is defined by arrangement of certain atoms  
d. It initially binds substrates by weak interactions
14. Which of the following class of enzyme catalyze the joining of C - O and hydrolyses the C -N bond respectively?
- a. Lyases and ligases  
c. Lyases and hydrolyses
- b. Ligases and Lyases  
d. Ligases and Hydrolyses
15. The coenzyme is:
- a. Always a protein  
c. Always an inorganic compound
- b. Often a metal  
d. Often a vitamin
16. The immobilized enzyme produced by micro encapsulation technique provides:
- a. An extremely large surface area  
c. Relatively smaller surface area
- b. Smaller surface area  
d. High amount of solvent
17. The following points are true for chilling stress except the one:
- a. Disappearance of rough ER  
c. Shrinking of chloroplast
- b. Increase in permeability of plasmalemma  
d. Tonoplast injury
18. Which of the following are more prone to water stress?
- a. Xerophytes  
c. Hydrophytes
- b. Mesophytes  
d. Both Mesophytes and Xerophytes
19. Presence of salt glands on leaf surfaces is characteristics of:
- a. *Suaeda fruticosa*  
c. *Atriplex spongiosa*
- b. *Tamarix pentandra*  
d. None of the above

20. The halophytes which can resist a wide range of salt concentrations are called as:
- a. Glycophytes
  - b. None of the above
  - c. Stenohaline
  - d. Euryhaline

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**( Descriptive )**

Time : 2 hr. 30 mins.

Marks : 50

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

1. Write the physiological effect of high temperature stress in plants. 10
2. Write short notes on: 4×2.5=10
  - a) Coupled reaction
  - b) Classification of enzymes
  - c) PR proteins
  - d) Electrostatic bond
3. Discuss: 5+5=10
  - a) Why pH of pure water is 7?
  - b) Buffer resists any change in pH after adding acid or base in any solution.
4. Write short notes on: 2+2+6=10
  - a) Enthalpy
  - b) Entropy
  - c) Adaptation strategies adopted by plants to combat flood stress.
5. Discuss the process of electron transport following ATP formation by oxidative phosphorylation. 10
6. Describe the various steps of  $\beta$ -oxidation of saturated fatty acid? Why it is called as the most energy yielding process of biological oxidation. Justify. 7+3=10
7. Discuss the various process of enzyme immobilization. 10
8. Discuss the physiological effect of salinity stress in plants. Discuss the adaptation strategies adopted by plants to combat salinity stress. 5+5=10

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