

TELANGANA UNIVERSITY
S.S.R. PG COLLEGE, NIZAMABAD (C.C:5029)
MSC (BOTANY)
SEM – III PAPER – III (Stress physiology)
QUESTION BANK

I. Multiple choice questions

1. Describe what is primary hormone involved in regulating Stomatal closure during water stress?
(d)
a) Gibberellin b) Auxin c) Ethylene d) Absisic Acid
2. Water stress primarily affects plants by causing
(b)
a) Increased stomatal opening b) closure of stomata
c) Decreased wilting of Leaves d) Increased metabolic activity
3. The process by which ABA leads to Stomatal closure involves
(d)
a) Increased calcium Pons in the guard cell b) Increased efflux of Pons from guard cells
c) Decreased efflux of ions from the guard cells d) Increased turgor in the guard Cells
4. plants adapted to dry conditions are known as
(d)
a) Hydrophytes. b) Mesophytes C) Halophytes d) xexophytes.
5. water stress may following effect lead to which of the on plants?
(C)
a) Stomatal opening b) Increased metabolic c) willing
d) Enhanced cell growth
6. Stomatal closure due to ABA is a result of ?
(a)
a) An increase in the turgor pressure of guard cells
b) An influx of pottasium ions into guard cells
c) An efflux of ions and water from the guard cells
d) Increased photosynthesis rate fa guard cells
7. Which of the following is a key signalling molecule that work with ABA to cause Stomata closure
(b)
a) Ethylene b) Reactive oxygen species c) Nitric oxide d) Both b and c

8. How does ABA primarily affect the movement water Conditions during drought (c)
- a) It promote. Water absorption by roots
 - b) It Increases the state of transportation to cool the plant
 - c) It reduces water loss by promoting stomatal closure
 - d) It helps transport water from the leaves to the roots
9. Absicis acid is often refered to as the consequence of Stomatal closure. (b)
- a) Increased transpiration
 - b) decreased water loss
 - c) enhanced gaseous exchange
 - d) decreased carbon dioxide uptake
10. What is the final event that leads to guard cells becoming flacid and the stomata closing? (C)
- a) water enters the guard cells
 - b) Increased Solute concentration inside the guard cells
 - c)water exists the guard cell via osmosis
 - d)The guard cell walls become more elastic
11. The loss of following from guard cells is the direct cause of decreased turgor pressure and subsequent stomatal closure? (C)
- a) carbon dioxide
 - b) oxygen
 - c)Ions including k+ and anions
 - d) sucrose
12. The components of water potential that is determined by y the attraction between water and hydrating colloids is the ? (d)
- a) solute potential
 - b) pressure potential
 - c) osmotic potential
 - d)matric potential
13. water stress during the ripening stage of cereal crops can result in (a)
- a) Increased flowering synchrony
 - b) Increased leaf weight
 - c)Osmotic potential
 - d) Better grain filling.
14. which of the following le morphological adaptation to drought? (C)
- a) osmotic adjustment
 - b)synthesis of dehydrins
 - c) Altering root system architecture to increase depth and spread
 - d) Building up of osmoprotectants

15. Which of the following is primary physiological mechanism plant were Use to reduce water loss during drought? (d)
- a) Increase scoot length b) stomatal closure
c)synthesis of protective proteinsd)Increase scoot / shoot ratio
16. During prolonged flooding, plants may Switch from aerobic respiration to anaerobic fermentation A toxic by product of this process is (d)
- a) oxygen b)Carbon diosude. c) water d) Ethanol
17. what is the team of plant that is Specifically adapted to grow in water logged or flooded conditions? (C)
- a) xerophytes b) Mesophyle c)Hydrophyte d) Halophyte
18. which of the following is Not a typical plant response to flooding stress? (C)
- a) Stomatal closure by formation adventitious roots
c) Increased rate of photosynthesis
d)Production of reactive oxygen species (ROS)
19. The primary cause of flooding injury In plants (b)
- a) Excess sunlight and heat
b)oxygen deprivation In 100t zone
c) High wind Velocity during the flood
d)physical damage from fast moving water
20. Symptoms of flood injury in sensitive plants often Include (b)
- a)Rapid increase in shoot and root growth
b) Leaf chlorosis anal yellowing, wilting eventual death
c) Excessive fruit production
d) Increased efficiency of nutrients uptake

II. Fill in the blanks

1. The primary and most damaging effect of flooding stress on a plant's rootsystem is **Oxygen deficiency**
2. The formation of air filled cavities in the root,a key adaptation to waters logged soils is known as **Aerenchyma formation**
3. The accumulation of **Ethanol** substance In roots under anaerobic conditions can become toxic and damage plant cells during long term flooding.
4. **Ethylene** gaseous plant hormone plays a Central role in triggering adaptive responses to flooding such as aerenchyma formation and stem elongationji
5. **Terrestrial plant, with top root system** of plant would be most Susceptible to Injury from waterlogged soil.
6. Tissue culture experiments show that the ratio of auxin to cytokinin is too high the plant tissue will primarily develop into **Roots**
7. An over production of cytokinins in a plant would most likely lead to **Delayed deaf aging**
8. **Increased transpiration to promote evaporative cooling** is a primary physiological response of a plant to heat.
9. What is the sole of Heat shat proteins (HSPs) during heat stressis **To act as chaperones that preventor repair the misfolding of other proteins.**
10. **Leaf rolling and wilting** is a morphological change is Common system of heat stress In plants.
11. **Acclimation** process where a plant increases its freezing tolerance after exposure non-freezing temperature.
12. During freezing stress, the formation a of extracellular ice crystals can lead to Condition known as **Dehydration Stress**
13. **Absisic acid** hormone is commonly known as the stress hormone to plants and plays a key role in metabolic adjustments during water stress.
14. The loss of photosynthetic pigments due to stress is known as **chlorosis**
15. **DDT** Is the following major contributor to soil pollution because it is non-biodegradable
16. The process where a toxin becomes more concentrated at each successive level of the food chain is called **Bloaccumulation**
17. **chloride** toxin ions, Commonly found in Irrigation water can accumulat in plant leaves and cause damage.
18. How are PAHs (polynuclear Aromatic Hydrocarboms) related to soil pollution, **They are carcinogenic compounds.**
19. **Lead(pb)**is an example of inorganic toxin found in soil
20. At a soil pH below 5.5 **iron (fe)** following micronutrients may reach toxic levels for plants.

III. Short question and answer (1-10)

1) what are Reactive oxygen species Ros?

A) Ros are formed by electrons onto O₂ from electron transport activities of chloroplast

2) what is wilting in plants?

A) wilting is a loss of rigidity of non-woody plants as leaves become limp and may drop.

3) Describe the symptoms of water logging?

A) Yellowing of leaves- become yellow Root Rot - Roots becomes soft. Decayed, slow growth. Stunted growth.

4) Explain the condition called as ABA included stomatal closure

A) ABA effects on leaves is to reduce transpirational water loss by closing Stomata.

5) Define cellular affects of drought stress?

A) cellular energy depletion, loss of cellular turgidity, dysfunction of plasma endosome members.

6) what are drought tolerant mechanisms?

A) It encompasses four categories

Recovery

avoidance

tolerance

Drought escape

7) what are the effects of flooding stress on metabolism

A) Reduction in aerobic Respiration

carbohydrate starvation

Ethylene biosynthesis

8) Define the conditions hypoxia and anoxia?

A) Hypoxia- less Oxygen levels

Anoxia- Completely devoid of oxygen

9) what are effects of flooding stress on water logged soil?

A) Increased -soil run off. nitrate leaching Decreased soil Nitrogen availability.

10) explain the role of phytohormones against flooding stress?

A) Ethylene-accumulates more during flooding stress facilitated by production of Acc

Gibberellins-under flooding stress GA increases