18395

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – M.Sc.(AG)-Agronomy-2025
Course Name – Modern Concepts in Crop Production
Course Code - AGRON501
(Semester I)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Define Leaf Area Index (LAI) in relation to canopy structure.

a) Ratio of leaf area to plant height
b) Leaf area per plant
c) Green leaf area per unit ground area
d) Photosynthetic rate

(ii) Identify the factor that regulates both germination and respiration in crops.

a) Water
b) Temperature
c) Light
d) Wind

(iii) Classify the type of crops that respond positively to increased CO2,, concentration.

a) C4 crops
b) Legumes
c) C3 crops
d) Root crops

(iv) Recall the correct expression used to calculate Harvest Index.

a) Economic Yield/Biological Yield x 100
b) Biological Yield/Economic Yield x 100
c) Economic Yield x LAI
d) Economic Yield - Biological Yield

(v) Describe the two key disciplines combined in crop growth analysis.

a) Morphology and pathology
b) Physiology and morphology
c) Genetics and ecology
d) Anatomy and taxonomy

(vi) Identify the growth index that indicates biomass increase without considering leaf area.

a) AGR
b) NAR
c) RGR
d) CGR

(vii) Explain what Net Assimilation Rate (NAR) tells us about plant productivity.

a) Biomass gain per plant
b) Net gain in biomass per unit leaf area and time
c) Root growth rate
d) Nutrient absorption rate

(viii) Recognize the environmental factor that may cause lodging in cereal crops.

a) Humidity
b) Wind
c) Temperature
d) Soil pH

(ix) Identify the growth index that is most significant during early plant development.

a) HI
b) AGR
c) RGR
d) BY

(x) Summarize how soil texture influences plant growth.

a) Pollination
b) Photosynthesis
c) Root growth and water retention
d) Light absorption

(xi) Name the index that results from the product of LAI and crop duration.

a) RGR
b) LAD
c) AGR
d) GE

(xii) Define economic yield with reference to crop productivity.

a) Total biomass produced
b) Photosynthetic surface area
c) Useful or harvestable portion of yield
d) Root weight

(xiii) Explain the importance of solar radiation in photosynthesis and yield.

a) Controls root elongation
b) Regulates transpiration
c) Influences photosynthesis and biomass production
d) Reduces LAI

(xiv) Identify the effects of wind on plant water loss and physical damage.

a) Increasing nutrient uptake
b) Enhancing flowering
c) Promoting photosynthesis
d) Increasing evapotranspiration and causing lodging

(xv) Describe how limited water availability affects plant physiology.

a) Enhances nutrient mobility
b) Stimulates stomatal opening
c) Reduces photosynthesis
d) Improves root respiration

Group-B

(Short Answer Type Questions) — 2.5 x 6=15

2. Define crop growth analysis and explain its role in agronomy. (2.5)
3. List any three major crop growth indices and their significance. (2.5)
4. Identify the environmental factors influencing crop growth. (2.5)
5. Describe the Absolute Growth Rate (AGR) and how it is calculated. (2.5)
6. Judge the application of phenological indices in managing irrigation scheduling. (2.5)
7. Design a research trial to assess RGR across crop genotypes under nutrient stress. (2.5)

OR

Recommend agronomic interventions for crops with inherently low LAI. (2.5)

Group-C

(Long Answer Type Questions) — 5 x 6=30

8. List any two examples of C4 crops and their significance. (5)
9. Formulate a phenology-based pest management schedule for vegetable crops. (5)
10. Compare the utility of CGR and HI for evaluating genotypic performance in pulses. (5)
11. Evaluate the role of crop phenology in synchronizing intercultural operations. (5)
12. Construct a decision support framework linking LAI dynamics to fertigation scheduling. (5)
13. Judge how crop duration influences water productivity in semi-arid agro-ecosystems. (5)

OR

Appraise the use of digital crop models in teaching growth analysis. (5)

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