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PG (Agriculture)
M.SC. Semester- III Examination, 2023
GENETICS AND PLANT BREEDING
PAPER: PPH 301
(PHYSIOLOGICAL AND MOLECULAR RESPONSES OF PLANTS TO ABIOTIC STRESSES)

Full Marks: 50 **Time: 2 Hours**

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

1. Answer any **FIVE** questions from the following: 2×5=10

a) Differentiate between Escape and avoidance.
b) Explain Electrical Conductivity (EC) of soil? List the different crops suitable for high EC, moderate EC and low EC condition.
c) What is oxidative stress.
d) Write down the deficiency symptoms of following essential nutrients i. Fe ii. Zn.
e) What are the symptoms of alkali stress in plants?
f) Mention the biochemical indices related with drought resistance.
g) List the transcription factor associated with abiotic stress.
h) What is chlorophyll stability index?

GROUP-B

2. Answer any **FOUR** of the following questions: 5×4=20

a) Define temperature stress and give its different types. Mention the scale used for scoring the heat tolerance. 3+2
b) What is heavy metal stress? Explain the various methods to reduce heavy metal stress? 2+3
c) Explain the physiological effects of Heat stress. 5
d) Write the reasons for limited success in abiotic stress breeding in crops. 5
e) Briefly explain about drought hardening. 5
f) Explain the selection criteria for dehydration avoidance. 5

GROUP-C

3. Answer any **TWO** of the following questions: 10×2=20

a) Classify different abiotic stresses. Write the reasons for limited success in abiotic stress breeding in crops. Describe the way by which you can test whether a major QTL for drought tolerance effective over a range of environment and cultivars. 2+2+6

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b) Differentiate between saline and sodic soil. Which chromosome of rice carry a major QTL for the salt-tolerance ability and what are the major genes located within that QTL? Describe the traits of an ideal high-yielding salinity tolerant rice variety. 2+4+4

c) Explain the breeding strategy for improving salinity tolerance in rice. 10

d) What is drought stress? Explain plant traits affecting drought response. Write down the plant breeding approaches for drought resistance. 2+4+4

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