

COMBINED COMPETITIVE EXAMINATION (MAIN)

AGRICULTURE

Paper—II

Time : 3 hours

Full Marks : 200

- Note :** (1) The figures in the right-hand margin indicate full marks for the questions.
(2) Attempt **five** questions in all.
(3) Question No. 1 is compulsory.

1. Answer any ten of the following : 4×10=40

- (a) What is inheritance? Enlist the reasons of Mendel's success.
- (b) State the relationship between center of origin and biodiversity of species.
- (c) What is plant breeding? Write its scope and importance.
- (d) Differentiate between self-incompatibility and male sterility.
- (e) Explain seed health testing and its importance in quality seed production.
- (f) What do you mean by transpiration, osmosis and diffusion?
- (g) What are plant hormones and their different types?
- (h) What is pesticide formulation? Enumerate the salient features of solid formulations.
- (i) Define parasite predator, disease and symptom.
- (j) Enlist the sources of infestation of stored grain pest.
- (k) What is plant quarantine in insect pest management?
- (l) Write the objective of 'National Food Security Mission' and its major components.

2. Answer any *eight* of the following :

5×8=40

- (a) Briefly discuss the origin and domestication of field crops.
- (b) What are modifying gene? Discuss their effects and uses in crop improvement.
- (c) Explain a suitable breeding method for transfer of single gene from an undesired genotype to a well-adopted improved self-pollinated crop variety.
- (d) Differentiate between photoperiodism and photosynthesis.
- (e) What are the scope and importance of landscape gardening?
- (f) Distinguish between early blight and late blight of tomato.
- (g) What is Koch's postulate? State the importance of Koch's postulate in plant pathology.
- (h) Describe in brief the significance of Integrated Pest Management (IPM).
- (i) Explain the requirement of certified seeds.

3. Answer any *five* of the following :

8×5=40

- (a) State Mendel's law of dominance and explain it using a monohybrid cross.
- (b) Define seed dormancy. Discuss briefly various methods for breaking seed dormancy.
- (c) Define coenzymes and isoenzymes. Briefly discuss the properties of enzymes.
- (d) What is mutation? Explain briefly different types of mutation.
- (e) Describe the principle and methods of preservation of fruits and vegetables.
- (f) Write the symptoms and disease cycle of late blight of potato.
- (g) Enumerate the major constraints in food production in Arunachal Pradesh.

4. Answer any *four* of the following :

10×4=40

- (a) Discuss the significance of cytoplasmic inheritance in crop plant with examples.
- (b) Give an account of glycolysis. Mention the names of the various enzymes involved in the process.
- (c) Briefly discuss the reasons for malnutrition among Indians.
- (d) What are the major pests of coconut? Write the symptoms and control measures of any two diseases.
- (e) Differentiate between aerobic respiration and anaerobic respiration.

5. Answer any *two* of the following :

20×2=40

- (a) What are the major diseases of rice grown in North-Eastern region? Write the symptoms and control measures of any two fungal diseases with causal organisms.
- (b) Write the package of practices of banana with special reference to variety, propagation and planting, manures and fertilizer and plant protection measures.
- (c) What are the major constraints of pulse production in India? Discuss briefly.

6. Answer any *four* of the following :

10×4=40

- (a) What do you mean by heterosis? Discuss the importance of heterosis in crop improvement.
- (b) What are plant growth regulators? Describe their uses in horticulture with suitable examples.
- (c) What do you mean by monophagous and polyphagous pests? Give a concise note on pests of vegetables with special reference to fruit flies.
- (d) What are transgenic plants? Discuss in brief their merits and demerits.
- (e) Name the important storage pests and pulses. Describe briefly the biology and management of any one of them.

7. Answer any *two* of the following : 20×2=40
- (a) What is pesticide? Discuss in detail the classification of insecticides based on their chemical nature with examples.
 - (b) Describe India's food security system. Enumerate the reasons for disturbance in food demand and supply.
 - (c) Describe the potato production technology with reference to varieties, nutritional requirements, sowing time, seed rate and plant protection measures.
8. Name the national organizations involved in Indian seed industry. Explain in detail the role of public and private sectors in seed production and marketing in India. 40
9. Enlist the important fruits and vegetables grown in India. Briefly discuss the major constraints in the production of fruits and vegetables in India. Describe the importance of fruits and vegetables in the human nutrition. 40
10. Write short notes on the following : 40
- (a) Propagation of ornamental plants
 - (b) Euploidy
 - (c) Mechanism of transpiration
 - (d) Seed certification
 - (e) Bt cotton
 - (f) Bunchy top of banana
 - (g) Citrus decline
 - (h) Biopesticides
 - (i) Sex pheromone
 - (j) Orchids
