

COMBINED COMPETITIVE EXAMINATION (MAIN)

BOTANY

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* questions from the following : 4×10=40
- Write a note on xerophytic adaptation.
 - Describe man as an ecological factor.
 - Write a note on human genome project.
 - Define standard deviation. How is it determined?
 - Define central dogma.
 - Mention the evolutionary significance of polyploidy.
 - Describe the ultrastructure of endoplasmic reticulum.
 - Write a note on red drop and Emerson's effect.
 - Write on law of segregation.
 - Describe briefly about vernalization.
 - Write a note on community dynamics.
 - Write the symptoms of zinc and manganese deficiency.
2. Answer any *eight* questions from the following : 5×8=40
- Mention the plant parts used, alkaloids present and uses of *Rauwolfia serpentina* and Cinchona.
 - Write about the products and uses of jute and ramie.
 - Write a note on Fermentation.

- (d) Write a note on non-genetic RNA.
- (e) Write the significance of meiosis.
- (f) Describe the characteristics of energy flow in an ecosystem.
- (g) What is ecosystem resilience?
- (h) What are edaphic factors? How do they influence the diversity of plants?
- (i) Write on fruit ripening.
- (j) Describe mass or pressure flow hypothesis of the transport of organic solutes.
3. Answer any *four* questions from the following : 10×4=40
- (a) What are the major causes of deforestation and what steps will you take to check deforestation?
- (b) Write the impacts of intensity and duration of light on plants.
- (c) Write a note on medicinal plant resources of Northeast India.
- (d) Define non-timber plant resources and also give some examples.
- (e) Briefly describe the structure and functions of Golgi apparatus.
- (f) DNA is the basic genetic material in all living organisms. Deduce experimental evidences in support of the statement.
- (g) Describe briefly about the significance of photorespiration.
4. Write notes on any *five* of the following within 200 words each : 8×5=40
- (a) Parthenocarpy
- (b) Concept of biosphere
- (c) Pentose phosphate pathway and its significance
- (d) Crassulacean acid metabolism
- (e) Rubber yielding plants including plantation, extraction and uses
- (f) Senescence.
5. Answer any *two* questions from the following : 20×2=40
- (a) Discuss various methods of inducing or breaking of seed dormancy.
- (b) What is osmosis? Describe briefly about the significance of this process in plant life along with the osmotic relation within the cell.
- (c) What is genetic engineering? Discuss its mechanism and practical utility.

6. Answer any *two* questions from the following : 20×2=40
- (a) What do you mean by cytoplasmic inheritance? Point out the differences between cytoplasmic and nuclear inheritances. Giving suitable examples, discuss the role of chloroplast in cytoplasmic inheritance.
 - (b) Discuss the operon model or gene regulation in prokaryotes.
 - (c) What are enzymes? Describe their structure, mechanism of action and various factors affecting enzyme activity.
7. Answer the following questions : 10×4=40
- (a) What are hormones? Write down the application of hormones in agriculture.
 - (b) Write, in detail, on insecticides and pesticides.
 - (c) Classify the plants according to their response to photoperiods in bringing about flowering in plants. What role of phytochrome pigments play on flowering?
 - (d) Discuss the process of glycolysis.
8. What is photosynthesis? Explain the mechanism of photosynthesis in the light of recent researches including light and dark reaction. 5+35=40
9. Define mutation. Discuss about different types of mutation. 5+35=40
10. Giving suitable diagram, write an account on the ultrastructure of prokaryotic and eukaryotic cells. 10+30=40
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