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3 (Sem-4/CBCS) BOT HC 2

2022

**BOTANY**

(Honours)

Paper : BOT-HC-4026

**(Plant Ecology and Phytogeography)**

Full Marks : 60

Time : Three hours

***The figures in the margin indicate full marks for the questions.***

1. Choose the correct answer of the following :  
**(any seven)** 1×7=7
- (a) The two important ecological factors that determine the distribution of various natural biomes of world are
- (i) temperature and light
  - (ii) temperature and precipitation
  - (iii) soil and precipitation
  - (iv) light and wind

*Contd.*

(b) Transitional zone between two or more diverse communities which harbours organisms of overlapping communities besides additional species is called

(i) ecoline

(ii) ecad

(iii) ecotone

(iv) ecotype

(c) The occurrence of high percentage of chamaephytes in an area would indicate

(i) warm and dry climate

(ii) warm and moist climate

(iii) cold climate

(iv) cold and dry climate

(d) The process of successful establishment and growth of a species in a bare area during the process of succession is called

(i) nudation

(ii) ecesis

(iii) aggregation

(iv) stabilization

- (e) The range of ecological conditions which a given species is able to carry on normal vital activities and tolerate various stresses is called the
- (i) edge effect
  - (ii) ecological amplitude
  - (iii) ecological niche
  - (iv) ecological equivalent
- (f) The zone of a lake which have abundant phytoplanktons is called
- (i) littoral zone
  - (ii) profundal zone
  - (iii) limnetic zone
  - (iv) benthic zone
- (g) The maximum reproduction rate of a population under ideal environmental conditions along with the absence of competitors and disease is called
- (i) natality
  - (ii) carrying capacity
  - (iii) fidelity
  - (iv) biotic potential

- (h) Solubility and availability of various nutrients to plants are dependent on
- (i) soil plot
  - (ii) soil porosity
  - (iii) soil temperature
  - (iv) soil texture
- (i) Myrmecophytes are interesting group of plants that provide special structures for colonization of ants and such association is one best example of
- (i) parasitism
  - (ii) commensalism
  - (iii) neutralism
  - (iv) symbiosis
- (j) According to Shelford's law of tolerance, the organisms with wide tolerance limit for various environmental factors show
- (i) less chances of survival, narrow distribution with low population size
  - (ii) less chances of survival, narrow distribution with high population size

(iii) better chances of survival, wide distribution with high population size.

(iv) better chances of survival, wide distribution with low population size

2. Write short notes on **any four** of the following : 2×4=8

(a) Standing crop

(b) Pedogenesis

(c) Detritus-based food chain

(d) Secondary productivity

(e) Neo-endemism

(f) Photograph

(g) Sympatric speciation

(h) Permafrost

3. Write briefly on **any three** of the following : 5×3=15

(a) Raunkiaer's life forms

(b) Cybernetic nature of ecosystem

- (c) Importance of studying ecological pyramids
- (d) Theory of tolerance
- (e) Ecological efficiencies
- (f) Edge effect
- (g) Adaptive features of plants to temperature extreme
- (h) Concept of multidimensional niche

4. Answer **any three** of the following :  $10 \times 3 = 30$

- (a) Define age structure with labelled diagram. Describe briefly various types of age pyramids as observed among natural populations.  $2+8=10$
- (b) List various steps involved in the process of succession in a particular habitat. Write briefly the process of ecological succession in xeric ecosystem with special reference to plant community.  $3+7=10$
- (c) Citing suitable examples, discuss briefly various types of biotic interactions as observed between plants and animals.

(d) With reference to biogeochemical cycle, how does sedimentary cycle differ from gaseous cycle ? Discuss briefly various steps involved in nitrogen cycling along with the role of microbes.

3+7=10

(e) What do you mean by ecosystem productivity ? State briefly the relationship between energy flow and productivity in an ecosystem. 2+8=10

(f) Differentiate between r-selected and k-selected species. Discuss the role of density-dependent factors in regulating population growth. 4+6=10

(g) Mention few important features that characterize biome. Write briefly the physico-chemical characteristics and biota of *any one* of the terrestrial biome you have studied. 3+7=10

(h) "In all ecosystems, the arrangement of producers and consumers leads to development of trophic organisation and performs definite functions." Explain the statement.