## 2 0 1 8

### BOTANY

( Major )

Paper : 3·1

### ( Ecology, Plant Geography and Evolution )

*Full Marks* : 60

*Time* : 3 hours

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

1. Choose the correct answer of the following :

$1 \times 7 = 7$

(a) The various steps through which food energy passes into an ecosystem are called

   (i) food chain

   (ii) food web

   (iii) trophic level

   (iv) energy flow

(b) The pyramid of biomass is at times inverted in case of

   (i) tropical rain forest

   (ii) sub-tropical deciduous forest

   (iii) lentic ecosystem

   (iv) coniferous forest

*( Turn Over )*

(c) Environmentally induced temporary variations are called

   (i) ecotypes

   (ii) ecads

   (iii) varieties

   (iv) species

(d) In the climax stage of succession, the ratio between productivity ($P$) and respiration ($R$) becomes

   (i) $P/R \neq 1$

   (ii) $P/R = 1$

   (iii) $P/R > 1$

   (iv) $P/R < 1$

(e) Which of the following represents the simple logistic model for population growth ($dN/dt$)?

   (i) $N(K - N/N)$

   (ii) $rN(K - N/N)$

   (iii) $rN(K - N/K)$

   (iv) $Nr(N - 1/K)$

(f) The degree of dispersion of plant species in terms of percentage occurrence is called

   (i) abundance

   (ii) density

   (iii) frequency

   (iv) I V I

(g) Which of the following situations is occurred in a polluted wetland?

   (i) BOD increases, DO increases

   (ii) BOD increases, DO decreases

   (iii) BOD decreases, DO increases

   (iv) BOD decreases, DO decreases

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

   (a) Detritus food chain

   (b) Panspermia

   (c) Gene flow

   (d) Ecological amplitude

   (e) Nudation

   (f) Biomagnification

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

   *(a)* Ecological adaptations of xerophytes

   *(b)* Hydrological cycle

   *(c)* Genetic drift

   *(d)* Biological spectrum

   *(e)* Adaptive radiation

**4.** Answer any *three* of the following :  10×3=30

   *(a)* Describe the different qualitative characteristics of plant communities.  10

   *(b)* Explain the direct and indirect consequences of greenhouse effect in atmosphere, forestry and agriculture.  10

   *(c)* How does resilience stability regulate an ecosystem?  10

   *(d)* What is interpretive phytogeography? Explain the factors involved in the distribution of plants.  2+8=10

   *(e)* What is Hardy-Weinberg equilibrium? Describe the factors that affect the Hardy-Weinberg equilibrium.  2+8=10

   *(f)* Explain how speciation occurs in nature. Discuss, with the help of example, the allopatric speciation.  4+6=10

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