2018

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 : 1×7=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

(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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2018

BOTANY

(Major)

Paper : 3·2

(Instrumentation and Laboratory Techniques)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Fill in the blanks : 1×7=7

(a) The fluorescence microscope exposes a specimen to UV, violet or blue light and forms an image of the object with the resulting _____ light.

(b) Scanning electron microscopy is mostly used to reveal _____.

(c) _____ cuvettes should not be used in case of UV spectroscopy.

(d) In case of microbial media, MSM stands for _____.

(e) Nessler's reagent is used to detect the presence of _____ in a sample.

(f) The interior of a glass electrode in pH meter is filled with _____ solution.

(g) The size of the label in a standard herbarium sheet is _____.

2. Briefly write on the following : 2×4=8

(a) Lux meter

(b) Fixatives

(c) Paper chromatography

(d) Indicator solutions

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

(a) Working principle and applications of UV-Vis spectrophotometer

(b) Bacteriological incubators

(c) Somogyi's reagent

(d) Preparation of the stain acetocarmine

(e) Mounting media

4. Answer the following questions : 10×3=30

(a) What do you mean by microscopy? Briefly write about the working principles and applications of electron and fluorescence microscope. 2+(4+4)=10

Or

What is sterilization? Why is sterilization necessary in microbiological works? Briefly write about the different bacterial culture media and their sterilization process. 2+2+6=10

(b) What do you mean by thin-layer chromatography? How does it differ from paper chromatography? Briefly write about the principle, application and limitations of thin-layer chromatography. 2+2+6=10

Or

Write notes on the following : 5+5=10

(i) Principles and applications of autoclave and centrifuge

(ii) Application of camera lucida

(c) Briefly write about the field and herbarium techniques associated with botanical samples. Write a special note about the preservation of succulent and xerophytic plants. 5+5=10

Or

Write about the following : 5+5=10

(i) The method of preparation of molar, ppm and percentage solutions

(ii) Biological applications of digital camera

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