**4.** Answer the following : 10×3=30

*(a)* Write a note on the structural characteristics of ecosystem.

*Or*

Elucidate the importance of Eltonian pyramid concept in understanding trophic relationships in an ecosystem.

*(b)* Write a note on the role of pesticides in polluting crop field soil. What is biological amplification?

*Or*

Write an essay on phytoclimatic spectrum giving suitable examples.

*(c)* Write what you know about tropical evergreen forests of India. Do evergreen forests also occur elsewhere?

*Or*

"Founder principle is associated with the genetic drift." Justify and elucidate the statement.

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**2014**

BOTANY

( Major )

Paper : 3.1

*Full Marks* : 60

*Time* : 2½ hours

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

**1.** Choose and write the correct answer of the following : 1×7=7

*(a)* Biosphere is made up of

*(i)* living things and their remains

*(ii)* living things, lithosphere, hydrosphere and atmosphere

*(iii)* living things and lithosphere

*(iv)* living things, hydrosphere and atmosphere

*(b)* The most characteristic feature of xeric environment is

*(i)* low atmospheric humidity

*(ii)* extremes of temperature

*(iii)* low rate of precipitation

*(iv)* high rate of evaporation

(c) The age structure of a population is its
  (i) relative number of individuals at each age
  (ii) number of newborns each year
  (iii) number of youngs attaining maturity
  (iv) relative number of death at each stage

(d) A climax community can be recognized on the basis of
  (i) grasses, herbs and shrubs
  (ii) trees
  (iii) high biomass
  (iv) uniform composition

(e) The ecological factors important for determining various biomes are
  (i) light and wind
  (ii) soil and wind
  (iii) temperature and precipitation
  (iv) temperature and light

(f) Which of the following is not a photo-chemical oxidant?
  (i) Ozone
  (ii) CFC
  (iii) PAN
  (iv) Phenol





(g) Diversity in living beings is because of
  (i) long-term evolutionary changes
  (ii) short-term evolutionary changes
  (iii) gradual changes
  (iv) mutation

**2.** Define any *four* of the following : 2×4=8

(a) Trophic niche

(b) Epharmony

(c) Compensation point

(d) Eutrophication

(e) Paleoendemics

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

(a) Physiological adaptive characters of xerophytes

(b) Terrestrial detritus food chain

(c) Impacts of acid rain on plants

(d) Typical flora of Eastern Himalayas

(e) Agents of evolutionary change

*Or*

Define normal, molal and molar solutions. What is the formula generally used for dilution of a solution? Explain how this formula can be used for dilution of a solution from high to low concentrations with suitable examples. What is the application of Somogyi's reagent and Nessler's reagent in biology? 3+2+2+3=10

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**2 0 1 4**

BOTANY

( Major )

Paper : 3.2

**( Instrumentation and Laboratory Techniques )**

*Full Marks* : 60

*Time* : 2½ hours

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

Answer **all** questions

**1.** Fill in the blanks : 1×7=7

*(a)* During herbarium preparation, mercuric chloride is used for ——.

*(b)* The full form of HEPA is ——.

*(c)* —— is used to view and draw the image of a microscopic object.

*(d)* Heat sensitive solution can be sterilized by either —— or radiation.

*(e)* Wavelength of light used to determine the concentration of nucleic acid in spectrophotometer is ——.

(f) If a solution of 10 *M* is diluted to 4 times, the final concentration will be ——.

(g) If 16 × eyepiece and 40 × objective lenses are used for viewing an object under the compound microscope, the magnification of the image will be ——.

**2.** Define the following terms (any *four*) : 2×4=8

(a) Resolving power

(b) pH

(c) % solution

(d) Mordant

(e) Fixatives

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

(a) Differential tissue staining

(b) Herbarium indexing

(c) BOD incubator

(d) Partition coefficient

(e) Microphotography





**4.** Give a comparative account on the working principle and utility of electron, phase contrast and fluorescence microscopes. Distinguish between resolving power and magnification of a microscope. 7+3=10

*Or*

What do you understand by micro-techniques? Describe different types and processes of microtechnique. 3+7=10

**5.** Describe different techniques of sterilization process. How do the working principles of hot-air oven and autoclave differ from each other? 7+3=10

*Or*

Elaborate the process of Gram's staining of bacteria. What is the function of iodine and ethanol solutions in Gram's staining? 7+3=10

**6.** What are the basic requirements for a biological field study? Justify the importance of collection number during sample collection for a floristic study. Describe the procedure of herbarium specimen preparation and preservation in detail. 3+2+5=10