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 ——.

(*Turn Over*)

(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

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

★ ★ ★