

3 (Sem-3) BOT M 2

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 —.

(2)

- (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) : $2 \times 4 = 8$

- (a) Resolving power
- (b) pH
- (c) % solution
- (d) Mordant
- (e) Fixatives

3. Write briefly on any three of the following : $5 \times 3 = 15$

- (a) Differential tissue staining
- (b) Herbarium indexing
- (c) BOD incubator
- (d) Partition coefficient
- (e) Microphotography

(3)

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. $3+2+5=10$

(4)

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

★ ★ ★