63 (FY)SEM–2/MAJ2/ZOOMAJ1024

2025

ZOOLOGY

(MAJOR)

Paper : ZOOMAJ1024

(Biological Technique)

Full Marks : 50

Pass Marks : 20

Time : Two hours

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

1. Choose the correct answer of the following : ***(all compulsory)*** 1×5=5

   (a) What is the role of the electric field in electrophoresis ?

   (i) To separate molecules based on size and charge

   (ii) To denature proteins and nucleic acids

   (iii) To facilitate the movement of molecule through the gel

   (iv) To detect the presence of molecules

(b) What is the primary principle behind the electrophoresis ?

(i) Separation of molecules based on size and charge

(ii) Separation of molecules based on density and buoyancy

(iii) Separation of molecules based on solubility and polarity

(iv) Separation of molecules based on molecular weight and shape

(c) What is the primary function of a colorimeter ?

(i) To measure the concentration of a solution

(ii) To measure the absorbance of light by a solution

(iii) To measure the transmitterce of light by a solution

(iv) To measure the PH of a solution

(d) What is the role of paraffin in tissue embedding ?

(i) To provide support and stability to the tissue

(ii) To facilitate the penetration of stains into tissue

(iii) To enhance the contrast of the tissue for microscopy

(iv) To allow for the examination of tissue morphology

(e) What is the mobile phase in paper chromatography ?

(i) The solvent that moves up the paper by capillary action

(ii) The paper matrix itself

(iii) The compounds being separated

(iv) The stationary phase

2. Answer the following questions : ***(any five)*** 2×5=10

(a) Describe the principle of distillation plant.

(b) How is magnifying power of microscope calculated ?

(c) What are different types of stain used in microtomy to visualize tissue structure ?

(d) Describe the working principle of spectrophotometer.

(e) Write about the interpretation of Rf factors and explain its importance.

(f) Discuss the electron guns, lenses, specimen holder and detector of TEM.

(g) How does gas chromatography work ?

3. Answer the following questions : ***(any five)*** 5×5=25

(a) Discuss the principles and component of hot air oven.

(b) What are different types of blood chemistry tests and how are they used to diagnose and monitor metabolic disorder ?

(c) Explain the advantages and limitations of SEM. Mention its applications.

(d) Describe the principle of dark field microscopy, including the use of a condenser and a specialized objective lens.

(e) Write a note on different types of HPLC.

(f) How does centrifuge machine work ? What is the centrifugal force ? What is the principle of sedimentation ?

(g) Write a note on preparation of blood smear and cell count using haemocytometer.

(h) What are different methods used for testing blood glucose levels ?

4. Answer the following questions : ***(any one)*** 10

(a) Describe the diagnostic criteria for type-1 and type-2 diabetes. Describe the prevention strategies for both.

(b) What is urin analysis ? Discuss different components of urin analysis. Mention the significance of each component.
