

- Instruction :-**
- * All questions are compulsory.
 - * Draw diagrams wherever necessary.
 - * Figures to right indicate marks.

Q. 1 A) Answer the following questions in one sentence. (any 4)

- 1) Define osmosis
- 2) How is viscosity affected by molecular conformation?
- 3) What is diffusion pressure?
- 4) What is the relation of concentration and osmotic pressure?
- 5) Which phenomenon is responsible for removal of ions against concentration gradient?
- 6) Give equation for calculation of viscosity.
- 7) What is osmolarity?
- 8) Explain Endosmosis and Exosmosis.

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B) Answer the following in brief. (Any 2)

- 1) Define mole. Explain molarity
- 2) Explain viscosity
- 3) Write a note on mechanism of osmosis
- 4) Describe colloidal state.

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C) Answer the following in detail. (Any 1)

- 1) Explain Donan's Equilibrium with example.
- 2) Give any two methods of measuring viscosity.

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Q. 2 Answer the following in one sentence. (Any 4)

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- 1) What is a fixative?
- 2) State the use of collagenase.
- 3) What is microdissection?
- 4) What is an isotonic solution?
- 5) Give two examples of chemicals used for cell disruption.
- 6) What is the significance of paraffin wax in tissue studies?
- 7) Give the name of the plant used as a model organism.
- 8) What is serum-free medium?

B) Answer the following in brief. (Any 2)

- 1) Write a short note on C. elegans as a model organism.
- 2) Describe coulter counter.
- 3) Explain the use of mouse as an experimental model.
- 4) What is liquid shear?

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C) Answer the following in detail. (Any 1)

- 1) Give an account of Centrifugation as a tool for cell fractionation.
- 2) Give an account of E. Coli as a model organism.

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Q. 3 A) Answer the followings in one sentence. (Any 4)

- 1) What is the source of light in compound microscope?
- 2) What is the function of a mirror in microscope?
- 3) What is the function of fine focus knob?

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- 4) Which objectives are known as Wet objectives?
- 5) What is resolving power?
- 6) What is Fluorescence?
- 7) What is a barrier filter?
- 8) What is Numerical aperture?

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B) Answer the following in brief. (Any 2)

- 1) Draw ray diagram of Fluorescence microscope.
- 2) Draw ray diagram of phase contrast microscope.
- 3) Give the advantages of TEM.
- 4) Give the disadvantages of light microscope.

C) Answer the following questions in detail. (Any 1)

- 1) Give the working of SEM.
- 2) Give the working of light microscope.

Q. 4 A) Explain the followings. (Any 1)

- 1) Dialysis
- 2) Factors affecting viscosity

B) Match the following. (Any 3)

- | | |
|-----------------------|--------------------------------------|
| 1) Diffusion pressure | a) Movement of solvent |
| 2) Osmosis | b) Shear force |
| 3) Colloids | c) Donan's Equilibrium |
| 4) Viscosity | d) Particles less than a micron |
| 5) Osmotic pressure | e) Pressure required to stop osmosis |
| 6) Dialysis | f) Force generated by diffusion |

C) Explain the following. (Any 1)

- 1) Osmotic shock
- 2) Tissue embedding

D) Fill in the blanks. (Any 3)

- 1) _____ are capable of bringing some hydrophobic compounds into aqueous solutions.
(Enzymes / Chaotropic agents / Acids)
- 2) A _____ is an appliance that can count cells as well as measures their volume.
(Coulter counter / Micrometer stage slide / Colorimeter)
- 3) Cell cultures prepared directly from the tissues of an organism are called as _____.
(organ culture / secondary culture / primary culture)
- 4) The _____ has been a crucial model organism in developmental biology.
(E.coli / Dictyostelium / Drosophila)
- 5) When centrifuged, the various components in a mixture move as a series of distinct bands through the salt solution, each at a different rate, in a process called _____.
(Velocity sedimentation / Gradient centrifugation / Ultra centrifugation)
- 6) _____ employs high frequency sound for cell disruption.
(osmosis/sonication/solid shear)

E) Write short note on : (Any 1)

- 1) Application of phase contrast microscope.
- 2) Application of Fluorescence microscope.

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F) Fill in the blanks. (Any 3)

- 1) The resolving power is limited by the _____ of illuminating Beam.
(Wavelength / Frequency / Electrons)
- 2) The direction and magnitude of bending of light is determined by the _____ of the two media forming the interface. (Refractive indices / Refraction / Prism)
- 3) The distance between the center of the lens and the focal point is called as _____.
(Focal point average / Focal length / Refraction)
- 4) The ability of a lens to gather light is known as _____.
(Frequency / Wavelength / Numerical aperture)
- 5) _____ is used as an intense beam of light of epifluorescence microscope.
(Mercury vapour lamp / UV light / Sunlight)
- 6) Thin slices of sample embedded in solid epoxyplastic is cut by using _____.
(Ultramicrotome / Knife / Prism)

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— The End —