

SARDAR PATEL UNIVERSITY
M.Sc. (IV Semester- CBCS) Examination
Subject: Zoology
PS04EZOO24; Microtechniques
Thursday, March 28, 2019
Time: 10.00 a.m. to 1.00 p.m.

Total Marks: 70

Note: Figures in brackets indicate marks

Answer all the questions in the given answer book

- Q1. Choose the appropriate answer for the following multiple choice questions: (8x1=8)
- i) Which of the following light is suitable for getting maximum resolution
(a) Red (b) Green (c) Blue (d) Orange
 - ii) Which of the following is used to visualize living cells
(a) SEM (b) Phase contrast microscope
(c) DIC (d) Both 'b' & 'c'
 - iii) Following are all the components of light microscope except
(a) Stage clip (b) fine adjustment
(c) Electron gun (d) Binocular eyepiece
 - iv) The kind of electron microscope which is used to study internal structure of cell is
(a) Scanning electron microscope
(b) Transmission electron microscope
(c) Confocal microscope
(d) Light microscope
 - v) Which solvent is used extensively as a clearing agent for animal tissues
(a) Ethyl alcohol (b) clove oil
(c) Chloroform (d) Methyl alcohol
 - vi) The most common stains applied for histological study of animal tissues are
(a) Safranin and caramine (b) Safranin and fast green
(c) Haematoxylin and safrannin (d) Haematoxylin and Eosin
 - vii) The fixative commonly used immunohistochemical reactions is:
(a) glutaraldehyde (b) formaldehyde
(c) osmium tetroxide (d) ethanol
 - viii) In freeze-fracture studies, the replica of specimen is obtained by using:
(a) carbon and platinum (b) carbon and gold
(c) gold and platinum (d) platinum and nickel
- Q2. Answer any SEVEN of the following in brief: (7x2=14)
- (a) Define: 'resolving power'
 - (b) What is the function of analyzer in a polarizing microscope?
 - (c) What is meant by empty magnification?
 - (d) Why tungsten is preferred as a source of electron in a thermionic electron gun? Explain.
 - (e) List the properties of dehydrating agents.
 - (f) Write the method for whole mount preparations.
 - (g) What method do you follow to differentiate tonoplast from plasma membrane? Explain.
 - (h) What is role of osmium tetroxide in TEM studies?
 - (i) Differentiate between semi-thin and ultra-thin sections.

- Q3. (a) Write a note on aberrations and its correction (6)
(b) Describe the instrumentation of DIC. (6)

OR

- (b) Write a comparative note on bright field and dark field microscope (6)
Q4 (a) Explain the components of Transmission Electron Microscope. (6)
(b) Write comparative note on thermionic and field emission guns (6)

OR

- (b) Briefly explain the functioning of scanning transmission electron microscope. (6)
Q5 (a) Differentiate 'perfusion' and 'immersion'. How do select the fixatives for fixing the various animal tissues for light microscopy? Write the importance of fixatives. (6)
(b) What are different types of microtomes? Discuss their use in animal sample preparations? (6)

OR

- (b) What are stains? Give the chemicals and stains required to stain the animal material and the schedule of staining. (6)
Q6 (a) Explain fixation, dehydration and infiltration steps followed during sample preparation for TEM studies. (6)
(b) What is negative staining? Briefly explain the method and significance of negative staining. (6)

OR

- (b) Based on the electron micrograph observations how do you differentiate a plant cell from an animal cell? (6)

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2