UNIVERSITY OF RUHUNA

FACULTY OF FISHERIES AND MARINE SCIENCES & TECHNOLOGY

Academic Year 2023/2024

Bachelor of Science Honours in Fisheries and Marine Sciences Degree

Level I Semester II Examinations –April/May 2025

FAQ 1213: Cytology, Histology and Embryology of Fish **Time: 2 hours**

Answer <u>all questions in Part A</u> and <u>any two questions from Part B</u>

PART A (Answer <u>all questions</u>)

01. Differentiate the composition of the cell wall of bacteria, archaea, fungi, and plant cells.

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(04 marks)

02. Write five differences between prokaryotes and eukaryotes.

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(05 marks)

03. Name two membranous and two non-membranous organelles found in eukaryotic cells.

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(04 marks)

04. Mention the functions of mitochondria and lysosomes of a cell.

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(04 marks)

05. What are the roles of cytoplasm in eukaryotic cells?

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(03 marks)

06. Classify the epithelial cells based on the shape and arrangement.

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(03 marks)

07. Briefly describe the structure of a chromosome. Use diagrams if necessary.

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(05 marks)

08. Define mitosis.

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(02 marks)

09. Briefly explain the involvement of prophase1 in meiosis for leading new combinations of daughter chromatids in meiosis division. Use diagrams wherever necessary.

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(05 marks)

10. "Aneuploidy is involved in causing genetic abnormalities." Justify the given statement.

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(04 marks)

11. Describe the processes of apoptosis and necrosis.

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(04 marks)

12. What are the advantages of considering Zebrafish (*Danio rerio*) as one of the latest models in fish embryological studies?

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(03 marks)

13. Describe the histological arrangement of the smooth muscles of fish.

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(04 marks)

14. Classify the fish cartilages depending on the type and the quantity of fibers.

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(03 marks)

15. What is the main histological difference between cartilaginous bones and fibrous bones?

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(03 marks)

16. Mention the tissue layers that can be seen in fish heart.

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(02 marks)

17. Mention the histological differences found in the nephrons of freshwater and marine teleosts.

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(05 marks)

18. Compare the histological arrangement of fish arteries and veins.

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(05 marks)

19. Explain the histological structures of fish gill and how its arrangement affects the aquatic life of fish.

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(08 marks)

20. Write a short description on the histology of fish thyroid tissue.

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(06 marks)

21. Describe the histological arrangement of the liver of fish.

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(06 marks)

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22. Categorize the ovaries of fish according to the degree of covering of the peritoneal membrane. Provide examples for each.

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(03 marks)

23. What are the major features that can be observed in the germinal vesicle breakdown stage in fish oocyte development?

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(04 marks)

24. Define the following terms with respect to the reproductive histology of fish.

i. Oogenesis

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ii. Folliculogenesis

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iii. Vitellogenesis

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iv. Spermatogenesis

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v. Ovulation

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(05 marks)

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PART B (Answer any two questions)

01. "Fish skin is a dynamic and multifunctional layer composed of diverse specialized cell types, each contributing to the organism's physiological integrity in aquatic environment." Justify this statement.

(100 marks)

02. Describe the general histological structure of the fish alimentary canal, highlighting the morphological variations observed in its different regions.

(100 marks)

03. Write short notes on **any 04** of the following.

I. Importance of histological structure of forebrain of fish
II. Comparison between two types of fish testes
III. Histological arrangement of fish skeletal muscles and cardiac muscles
IV. Histological structure of spinal cord of fish
V. Phases of embryonic development of fish

(100 marks)

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