

**M. Sc. DEGREE END SEMESTER EXAMINATION : NOVEMBER 2023****SEMESTER 1 : AQUACULTURE AND FISH PROCESSING****COURSE : 21P1AQCT02 : BIOPHYSICS, INSTRUMENTATION, MICRO TECHNIQUES AND RESEARCH METHODOLOGY***(For Regular - 2023 Admission and Improvement/Supplementary -2022/2021 Admissions)*

Duration : Three Hours

Max. Weights: 30

**PART A****Answer any 8 questions****Weight: 1**

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|--|-----------------------|
| 1. Temperature probe.                                      | (An, CO 2)            |
| 2. Define Gibbs – Donnan equilibrium.                      | (An, CO 2)            |
| 3. What are the characteristics of a good research report? | (An, CO 5)            |
| 4. Functions of membrane receptor.                         | (E, CO 3)             |
| 5. Define research?  | (U, CO 5)             |
| 6. What is observation method in data collection?          | (R, CO 5)             |
| 7. What is plagiarism?                                     | (U, CO 5)             |
| 8. DOWEX 50.   | (A, CO 1, CO 2, CO 3) |
| 9. Isoelectric point.                                      | (R, CO 2)             |
| 10. Isoelectric focusing.                                  | (A, CO 2)             |
|  | <b>(1 x 8 = 8)</b>    |

**PART B****Answer any 6 questions****Weights: 2**

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| 11. What is preparative chromatography? What are its uses?   | (A, CO 2)           |
| 12. In dark field microscopy, why must the N.A. of the objective be less than the N.A. of the condenser? | (A, CO 1, CO 3)     |
| 13. Discuss the importance of research design?   | (A, CO 5)           |
| 14. Describe briefly the methodology for collection and fixing of biological samples.                    | (U, CO 2, CO 3)     |
| 15. How do fish osmoregulate?  | (E, CO 4)           |
| 16. Distinguish between passive transport and active transport.  | (E, CO 4)           |
| 17. What is the difference between colorimetry and spectrophotometry?                                    | (An, CO 1, CO 2)    |
| 18. Discuss the principle and application of SDS-PAGE.   | (R, CO 1, CO 2)     |
|  | <b>(2 x 6 = 12)</b> |

**PART C****Answer any 2 questions****Weights: 5**

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|---|-----------------|
| 19. Explain the procedure for sectioning a tissue for its histological study. | (A, CO 2, CO 3) |
| 20. What are the advantages of LC-MS over HPLC?                               | (E, CO 1, CO 2) |

21. Explain separation of proteins using a suitable electrophoretic technique in a biological sample. (E, CO 1, CO 2)
22. Explain data collection and analytical techniques in a research. (Cr)  
**(5 x 2 = 10)**

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Understand the principles and operation of electroelectric equipment's in biological research	U	8, 12, 17, 18, 20, 21	17
CO 2	Create information on biophysics and instrumentation as applied to aquaculture	A	1, 2, 8, 9, 10, 11, 14, 17, 18, 19, 20, 21	28
CO 3	Evaluate detailed anatomic studies with the help of micro techniques	E	4, 8, 12, 14, 19	11
CO 4	Understand the basic principles of physiology as applied to aquaculture systems	U	15, 16	4
CO 5	Understand introduction to research methods as a prelude to research work at higher level.	U	3, 5, 6, 7, 13	6

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;