

PG (CBCS)
M.SC. Semester- III Examination, 2023
FISHERIES SCIENCE
PAPER: FSC 301

(Fisheries Statistics and Research Methodology and Immunology and
Genetic Engineering and Bioinstrumentation)

Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Write the answer for each unit in separate sheet

UNIT: FSC 301.1

FISHERIES STATISTICS AND RESEARCH METHODOLOGY

GROUP-A

1. Answer any TWO of the following questions: 2×2=4

- What do you mean by overlapping publication?
- What do you mean by frequency density?
- Systolic blood pressures of 566 male moonfish were recorded & the unbiased S.D. are 13.05 mm. Calculate S.E. of the mean.
- Calculate the median of following 6 observations:

75	97	100	120	150	175
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GROUP-B

2. Answer any TWO of the following questions: 2×4=8

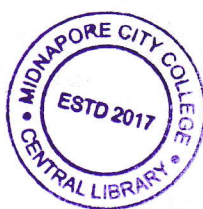
- The mean weight of 100 Koi carp fishes of a pond is 49.46 kg. The mean weight of 200 koi carp is 52.32 kg. Find the combined mean weight of all the koi carp fishes.
- Calculate the mean, SD, Variance and covariance from following data.

Length in cm	95-105	105-115	115-125	125-135	135-145
No of Fishes	19	23	36	70	52

- Write a note on research ethics.
- An incomplete data (frequency distribution) of aquaculture pond is given below:

Weight (g.)	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Number of fish	12	30	?	65	?	25	18

Median value is 46 g. Total frequencies 229. Determine the missing frequency.

**GROUP-C**3. Answer any **ONE** of the following questions:

1×8=8

- a) Explain about Predatory publishers and journals. How will you write a good research proposal? 4+4
- b) In cross between female *Labeo calbasu* and Male *Labeo rohita*, the F₂ individual segregated into female *L. calbasu* 787 & male *L. rohita* 277. Expected ration is 3:1 & P= 5%, calculate goodness of fit (X²)

UNIT: FSC 301.2**GENETIC ENGINEERING AND BIOINSTRUMENTATION****GROUP-A**4. Answer any **TWO** of the following questions:

2×2=4

- a) What are adjuvants? Give an example.
- b) State the functions of restriction endonucleases? What do you mean by palindromic sequences?
- c) What do you mean by ADCC?
- d) Write down the principle of PCR.

GROUP-B5. Answer any **TWO** of the following questions:

2×4=8

- a) Briefly describe the different barriers of innate immunity.
- b) Briefly explain the sandwich ELISA procedure.
- c) Haptens are antigenic but not immunogenic - explain.
- d) Briefly discuss the Southern Blotting Hybridization technique with its applications.

GROUP-C6. Answer any **ONE** of the following questions:

1×8=8

- a) What are the basic requirements of immunogenicity? Classify hypersensitivity according to Gell and Coomb. 4+4
- b) Briefly describe the construction of cDNA library. What is density gradient ultra-centrifugation? 5+3
