

Fisheries
M.Sc. I (Semester II),
Physiological Chemistry (MZFT 201)

1 one sentence answer Question (2 Marks)

1. Define pH and buffer
2. Define polysaccharide with example
3. What are the different types of protein?
4. What is B-oxidation?
5. Draw the structure of hydrogen atom
6. Define nucleic acid with example
7. Summarize the glycolysis pathway in one reaction.
8. Draw the structure of glucose
9. State the two functions of protein
10. Give the names of phospholipids.
11. Give the names of steroidal hormones.
12. State the law of thermodynamics
13. Define Molecule with example
14. How many total ATPs (energetics) are produced from TCA cycle?
15. Define transamination.
16. What is gluconeogenesis?
17. Give the two examples of complex lipids
18. Why the carnitine shuttle is important in the B-oxidation?
19. Draw the structure of triacylglycerol.
20. What are the building blocks of proteins?
21. State the forms of DNA?
22. Which Bond is present between two amino acids?
23. What are the constituents of RNA?
24. What is Nucleotides ?
25. What are the Nucleosides?

26. What is the diameter between two strands of DNA?

Ong Answer Questions (6 marks)

1. Describe the structure and function of water.
2. Describe biosynthesis of cholesterol
3. Describe Krebs cycle in brief.
4. Explain in detail transamination.
5. What is pH explain in detail with example.
6. What is Lipid? Give detail account of classification of Lipid.
7. What is chemical bond? Describe the types of chemical bonds
8. Describe in detail B- oxidation of fatty acids.
9. Describe the structure and function of water.
10. Describe urea cycle
11. What is buffer explain in detail with example.
12. Describe the alternative pathway for the glycolysis or HMP Shunt
13. What is protein? Give detail account of classification of protein.
14. Describe in detail gluconeogenesis pathway
15. Describe the pathway that converts glucose to pyruvate or lactate.
16. Explain in detail uronic pathway.
17. What is phospholipids? Describe biosynthesis of membrane phospholipids.
18. Describe the structure and function of water.
19. Describe in detail biosynthesis of triacylglycerides.
20. Describe the synthesis of phosphatidic acid.
21. Describe the Watson and Crick model of DNA.
22. Describe the classification of Protein.
23. Describe in detail structural organization of protein.
24. Describe in detail different types of RNA.
25. Describe in detail biosynthesis of Nucleotides.
26. Describe in detail biosynthesis of amino acids.

27. Explain in detail biosynthesis of nucleosides.
28. Explain in detail synthesis of DNA and RNA.
29. Describe in detail Functions of carbohydrates.
30. Describe Watson and Crick model of DNA.
31. Explain in detail HMP shunt.

Short answer Question - 4 marks

1. Explain transamination process
2. Write a note on synthesis of cardiolipin.
3. Write a note on Electron transport chain
4. Write a note on buffer
5. Write a note Oxidative decarboxylation
6. Describe basics of solution preparation
7. Write short note on glycogenolysis.
8. Write a note pH
9. Explain Ramchandran plot
10. Describe Glycogenesis pathway
11. Describe Classification of protein
12. Write short note on synthesis of phosphatidyl serine
13. Write a note on molecule
14. Write a note on polysaccharides.
- 15.** Explain deamination process
16. Write a note on buffer with example.
17. Describe B-oxidation process
18. Describe the deamination pathway.
19. Write short note on prostaglandin
20. Describe Glycogenesis pathway
21. Write short note on Chemical bonds

22. Write a note on classification of carbohydrates.
23. Write a note on properties of water
24. Describe the formation of Plasmalogen
25. Describe the formation of spingomyalin
26. Write note on law of thermodynamics.\
27. Primary structure of protein
28. Biological function of DNA
29. Biological significance of protein
30. Clover leaf model of RNA
31. Secondary structure of protein
32. Purine and Pyrimidine structure.
33. Describe the formation
34. Write a note on synthesis of lecithin.
35. Write a note on synthesis of phospholipid cephalin
36. Write a note on synthesis of phosphatidic inositol
37. Describe Hexose monophosphate pathway
38. Describe the synthesis of pyruvate from Glucose.
39. Describe gluconeogenesis by amino acids.
40. Explain how ATP are produced from Glycerol and fatty acids.
41. Draw the structure of glycerol and fatty acids.
42. Write a note on disaccharides.
43. Write a note on phospholipids.
44. Write a note on essential amino acids.
45. Write a note on Covalent bond
46. Write a note on atom
47. Write a note on hydrogen bond
48. Describe pyruvate dehydrogenate complex.
49. Write difference between ionic and covalent bond
50. Write a note on ionic bond.

M.Sc. I Semester II, Examination
Subject: Zoology
Quantitative Biology and Tools and Techniques in Biology MZT 202

Question Bank

Q.1: Define following Terms/ Answer in One Sentence (2 marks)

- 1) What is Arithmetic mean?
- 2) What is the Karl Pearson's coefficient of correlation?
- 3) Who invented the first microscope?
- 4) What is Chromatography ?
- 5) What is Formula of median for continuous data?
- 6) What is the full form of ELISA?
- 7) Define Molecular Sieve Chromatography.
- 8) Define Probability.
- 9) What is ANOVA?
- 10) What is Central Tendancy?
- 11) Give long form of NMR.
- 12) Define Electrophoresis.
- 13) Define Density gradient centrifugation.
- 14) Give long form of SEM.
- 15) Give long form of TEM.
- 16) What is HPLC?
- 17) Define TLC
- 18) Define GLC
- 19) What is Ion exchange chromatography?

- 20) Define Chi- square test.
- 21) Define Student t- test.
- 22) What is Immunoblotting?
- 23) Write any two applications of Electrophoresis.
- 24) What is isoelectric point?
- 25) Define mean.

Q2) Attempt the Following questions .

(6 Marks)

- 1) In a class there are 20 students and they have secured a percentage of 88, 82, 88, 85, 84, 80, 81, 82, 83, 85, 84, 74, 75, 76, 89, 90, 89, 80, 82, and 83. Find the mean percentage obtained by the class.
- 2) Write note on Thin layer chromatography .
- 3) Write note on Types of Electrophorsis.
- 4) Differentiate between SEM And TEM.
- 5) Explain Different Parts of light microscope.
- 6) Explain in detail Gel Eletrophoresis.
- 7) Explain in details various separation techniques.
- 8) Give detail procedure of Gas chromatography.
- 9) Write note on labeling antibodies.
- 10) Write in detail about Applications of Spectroscopy .

Q.3) Attempt the Following questions .

(6 Marks)

- 1) Define microscope? Explain in details any three types of light microscope?
- 2) Find the median & median class of the data given below.

Class boundaries	15-25	25-35	35-45	45-55	55-65	65-75
Frequency	4	11	19	14	0	2

- 3) Write note on Centrifugation and its types.
- 4) Write note on measurement of central tendency.
- 5) What is correlation explain its types.
- 6) What is regression and its applications?
- 7) Write in detail about Null hypothesis.
- 8) Write in detail about Ion exchange chromatography.
- 9) Write in detail about phase contrast microscope.
- 10) Write note on probability distribution.

Q.4) Attempt the Following questions .

(6 Marks)

- 1) What is coefficient of variation? State its importance?
- 2) Describe Fluorescence microscope and its application.
- 3) Describe Affinity Chromatography and its applications.
- 4) Describe procedure of electrophoresis of protein.
- 5) Write procedure of ANOVA and its uses.
- 6) Write about binomial distribution and its uses.
- 7) What are the Applications and limitations of size exchange chromatography?
- 8) Write in detail Null hypothesis and its applications.
- 9) Draw well labeled diagram of Rotar.
- 10) Write note on Immunochemistry.

Q.5) Attempt the Following questions .**(4 Marks)**

- 1) Describe in detail Electron microscope?
- 2) Find the mode Of the following data

Marks	1-5	6-10	11-15	16-20	21-25
Number of students	7	10	16	32	24

- 3) Write a note on Electrophoresis and its uses.
- 4) Draw well labeled diagram of HPLC
- 5) Write applications of GLC.
- 6) Write applications of Affinity chromatography.
- 7) Write applications of isoelectric focusing
- 8) Draw diagrams of SEM.
- 9) Draw diagrams of TEM.
- 10) Write a note on methods of correlation.
- 11) Write note on multiplication theory.
- 12) Write note on applications of Level of significance.
- 13) Draw diagram of Light Microscope.
- 14) Write note on cytometry.
- 15) Write note on procedure of Alternative hypothesis.

Q.6) Attempt the Following questions .**(4 Marks)**

- 1) The following data are the marks of 10 students. Calculate S. D.

Marks in Zoology- 8, 9, 15, 23, 5, 11, 19, 8, 10, 12

- 2) Write note process of labeling antibodies.
- 3) Write limitations of Ion exchange chromatography.
- 4) Write note on applications of Light Microscope.
- 5) Write note on Applications of Alternative hypothesis.
- 6) Draw well labeled diagrams of Affinity chromatography
- 7) Write note on types of immunoprecipitation.
- 8) Draw flowchart of Thin layer Chromatography.
- 9) Write flowchart of HPLC.
- 10) Write flowchart of GLC.
- 11) Give one Example of Discrete series.
- 12) Draw a well labeled diagram of molecular sieve chromatography.
- 13) Write note on ELISA.
- 14) Write note and Formula of median for continuous data?
- 15) Write applications of coefficient of correlation?

Q.7) Attempt the Following questions .

(4 Marks)

- 1) Write note on Affinity chromatography.
- 2) Write note limitations of immunoprecipitation.
- 3) Example Find the value of mode from following:

Weight (kg)	30-34	35-39	40-44	45-49	50-54	55-59	60-64
No. of students	3	5	12	18	14	6	2

4. Find the median & median class of the data given below.

Class boundaries	15-25	25-35	35-45	45-55	55-65	65-75
Frequency	4	11	19	14	0	2

5. Calculate the mode of the following frequency distribution.

Height in inch	58	59	60	61	62	63	64	65	66	67	Total
No. of person	4	6	5	10	20	22	24	6	2	1	100

6. Calculate the correlation coefficient between X and Y from the following data

X	5	9	13	17	21
Y	12	20	25	33	35

7. Calculate the correlation coefficient between X and Y from the following data

X	1	2	3	4	5	6	7	8	9
Y	10	11	12	14	13	15	16	17	18

8. In an examination 10 students obtained the following marks in Mathematics and Physics. Find the coefficient of rank correlation.

Mathematics	90	30	82	45	32	65	40	88	73	66
Physics	85	42	75	68	45	63	60	90	62	58

9) Calculate the mode of the following frequency distribution.

Height in inch	58	59	60	61	62	63	64	65	66	67	Total
No. of	4	6	5	10	20	22	24	6	2	1	100

person											
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10) Give flowchart of NMR.

11) Write Process of ESR.

12. Ten students got the following percentage of marks in Mathematics and statistics. Find the coefficient of rank correlation.

Mathematics	8	36	98	25	75	82	92	62	65	35
Statistics	84	51	91	60	68	62	86	58	35	49

13. Find out the value of quartile deviation and its coefficient from the following data

Roll no.	1	2	3	4	5	6	7
marks	20	28	40	12	13	15	50

14. Calculate Q.D. and coefficient of Q.D. from the following data.

Wages(R)	Less than 35	35-37	38-40	41-43	Over 43
Number of wage earner	14	62	99	18	7

15. Find range, Q.D. and their coefficients from the following data

Value	10	20	30	40	50	60	70
Frequency	6	9	15	28	12	6	3

M. Sc. – I (Semester – II) Examination
Subject – Fisheries
MZFT -203, Aquaculture Biotechnology
Course code - 91708

Question Bank

Instructions: 1. Question No. 1 is compulsory.
2. Attempt any four questions from question No. 2 to 7
3. Figures to right indicate full marks.

Q1. Answer the following questions

- 1) Define- Embryo transfer.
- 2) Define - Transgenic fish.
- 3) What is full form of IPR?
- 4) What is mean by immunohistochemistry ?
- 5) Define - Gynogenesis
- 6) Staining methods in disease diagnosis?
- 7) What is the function of immunodiagnosis?
- 8) Define cryopreservation.
- 9) What is the use of Latex Agglutination Test
- 10) Define - Androgenesis
- 11) Give few Applications of nutritional biotechnology in aquaculture.
- 12) What is the purposes of the development of transgenic fish?
- 13) Define - Nutraceuticals.
- 14) Which mammalian hormones are used for spawning of carps and catfishes?
- 15) What are the type of feed according to stage of life cycle.
- 16) Define - Triploids
- 17) Define - Hypophysation
- 18) Define - Cryobanks.
- 19) Which anesthetizing agent is used in milt collection?
- 20)

Q2. Attempt the following

- 1) Explain applications of nutritional biotechnology in aquaculture.
- 2) Describe the method of producing triploid fish.
- 3) Explain in brief immunological diagnosis in fishes.

- 4) Define Biotechnology. Give an account on applications of fish biotechnology.
- 5) Describe probiotics in fish nutrition
- 6) Explain in detail cryopreservation of fish egg and embryo.
- 7)
- 8)
- 9)
- 10)

Q3. Attempt the following

- 1) Describe the classification of disease diagnostic methods
- 2) Explain in detail cryopreservation of spermatozoa.
- 3) Describe the classification of disease diagnostic methods
- 4) Describe cryopreservation of fish egg and embryo.
- 5) Describe forms of feeds in detail.
- 6) Describe the process of androgenesis.
- 7)
- 8)
- 9)
- 10)

Q4. Attempt the following

- 1) Describe induced breeding and Hormones involve in it .
- 2) Describe methods of creating transgenic animals.
- 3) Describe biofloc culture technique in detail
- 4) Describe the method of producing tetraploid fish.
- 5) Describe pellet feed in brief
- 6)

- 7)
- 8)
- 9)
- 10)

Q5. Attempt the following

- 1) Spawning agents.
- 2) Write note on gene bank.
- 3) Give a brief account on probiotics.
- 4) Hormonal Manipulation for Sex Control
- 5) Applications of nutritional biotechnology in aquaculture
- 6) Write note on cryoprotectant
- 7) ELISA
- 8) Significance of gynogenesis
- 9) Induced breeding
- 10)
- 11)
- 12)

Q6. Attempt the following

- 1) Factors influence spawning in fish
- 2) Hormonal Manipulation for Sex Control
- 3) Write note on milt collection.
- 4) Write a short note on Nutraceuticals
- 5) Meiotic gynogenesis
- 6) Write note on types of gene bank
- 7) Immunohistochemistry

8) Write note on IPR issues in biotechnology.

9) Environmental impact of transgenic fish

10)

11)

12)

Q7. Attempt the following

1) Write a short note on Biofloc

2) Environmental impact of transgenic fish

3) Significance of ploidy manipulations

4) Synthetic hormones

5) Write note on benefits of cryopreservation techniques

6) Potentialities of transgenesis

7) Microencapsulated feeds

8) Write note on milt collection.

9) PCR technique

10)

11)

12)

M. Sc. – I (Semester – II) Examination
Subject – Fisheries
MZFT -204, Applied genetics in Aquaculture

QUESTION BANK

Q1. Answer the following questions

1. What is mean by endangered species.
2. Define ecological diversity.
3. Enlist the fishes having polyploid origin.
4. Define Hybrid.
5. What is the chromosome formula of *Catla catla*.
6. Define haploidy.
7. Define molecular marker.
8. Define introgression.
9. What is heterosis?
10. Which technique used to visualize specific cytogenetic abnormalities?
11. State two types of molecular markers used in fisheries
12. Which technique is used for the amplification of selected regions of DNA?
13. Define vulnerable species
14. Define genetic diversity.
15. What is the chromosome formula for *Labeo rohita*.
16. Define molecular marker.
17. Define introgression.
18. Which technique is used for the amplification of selected regions of DNA?
19. Define critically endangered species.
20. Name few freshwater threatened fishes.
21. What is the chromosome formula for *Cirrhinus mrigala*.
22. What is heterosis?
23. Which technique used to visualize specific cytogenetic abnormalities?
24. State two types of molecular markers used in fisheries.
25. What is sex differentiation.

Q2. Answer the following questions

- 1) Describe mode of reproduction in fishes.
- 2) Describe androgenesis in detail .
- 3) Describe nuclear DNA markers

- 4) Describe nuclear DNA markers.
- 5) Describe mode of reproduction in fishes.
- 6) Describe origin and advancement in genetics.
- 7) Explain advantages and disadvantages of polyploids.
- 8) Explain sex reversal in fishes.
- 9) Explain in brief T V Hybridization.
- 10) Describe sex control and its role in aquaculture.
- 11) Explain marker assisted selection-biochemical and molecular markers
- 12) Give a brief account on Inbreeding: Methods of estimation.
- 13) Describe molecular tools for stock differentiation for selection.
- 14) Explain introgression.
- 14) Explain Scope, application and methods of selection in applied aquaculture.
- 15) Describe conservation dependent species.

Q3. Answer the following questions

- 1) Explain in brief sex determination in fishes.
- 2) Give a brief account on inbreeding and its consequences
- 3) Describe the technique of cryopreservation in detail.
- 4) Explain in brief sex determination in fishes.
- 5) Describe in detail molecular markers in fisheries.
- 6) Give a brief account on chromosome manipulation.
- 7) Explain Gynogenesis.
- 8) Explain physical basis of heredity.
- 9) Describe in brief hybrid vigour .
- 10)) Describe in brief inbreeding depression.
- 11) Describe in brief inbreeding consequences .

- 12) Describe the process of measures to reduce inbreeding in hatcheries.
- 13) Explain the concept of Conservation genetics.
- 14) Explain Genetic resources of India and conservation.
- 15) Describe endangered species,

Q4. Answer the following questions

- 1) Describe nuclear DNA markers
- 2) Explain conservation of genetic diversity.
- 3) Describe hybridization in fishes
- 4) Describe in brief types of reproduction in fishes.
- 5) Describe in detail inbreeding and its consequences.
- 6) Describe Androgenesis.
- 7) Explain genetic stock structure in Fish.
- 8) Give a brief account Cytogenetics
- 9) Describe the importance and karyotyping.
- 10) Explain the methods of fish breeding.
- 11) Explain breeding programmes and goals.
- 12) Describe the genetic management strategies used in aquaculture.
- 13) Explain lessons from the green revolution.
- 14) Describe GMOs and their detection.
- 15) Describe bioprospecting

Q5. Answer the following questions

- 1) Polyploidy in fishes
- 2) Cryopreservation of sperms
- 3) Measures to avoid inbreeding
- 4) Give a brief account on hybridization.
- 5) Explain the types of conservation.
- 6) Sex chromosome of fishes.
- 7) History and advancement of fish breeding

- 8) Environmental impacts
- 9) Describe the importance of GMOs and their detection.
- 10) Applications of inbreeding technique.
- 11) Viviparity in fishes.
- 12) Explain basic breeding methods and breeding programmes and goals.
- 13) Give a brief account on applied genetics in aquaculture.
- 14) Explain in brief conservation of ecological diversity.
- 15) Explain non evaluated species.

Q6. Answer the following questions

- 1) Characteristics of endangered fishes.
- 2) Measures for fish conservation
- 3) Hybridization
- 4) Describe the cryopreservation of fish gametes.
- 5) Describe the characteristics of endangered species.
- 6) Risk associated with cryopreservation.
- 7) Write a short note on chromosome manipulation
- 8) Describe risk associated with cryopreservation.
- 9) sex control and its role in aquaculture.
- 10) Describe advantages and disadvantages of GMOs and their detection.
- 11) Give a brief account on critically endangered species.
- 12) Explain threatened freshwater species.
- 13) Give a brief account on measures of fish conservation needs.
- 14) Describe applications of conservation of sperms.
- 15) Give a brief account on cryopreservation of eggs and embryo.

Q7. Answer the following questions

- 1) In situ conservation
- 2) Uses of inbreeding
- 3) Viviparity in fishes
- 4) RAPD
- 5) Allozyme markers
- 6) AFLP
- 7) Heterosis
- 8) Genetic stock structure in Fish
- 9) Importance of marker assisted selection in fish breeding.
- 10) Androgenesis.
- 11) Measures to avoid inbreeding.
- 12) Oviparity in fishes.
- 13) Importance of marker assisted selection in fish breeding .
- 14) Allozyme markers.
- 15) Introgression.