MIZORAM PUBLIC SERVICE COMMISSION

AGRICULTURE & ALLIED SERVICES (COMBINED TECHNICAL) EXAMINATION, 2024 FOR RECRUITMENT OF FISHERIES EXTENSION OFFICER UNDER FISHERIES DEPARTMENT, GOVERNMENT OF MIZORAM, DECEMBER-2024

FISHERIES PAPER-II

Time Allowed : 3 hours FM : 200

SECTION - A *(Multiple Choice questions) (100 Marks)*

All questions carry equal mark of 2 each. Attempt all questions.

*This Section should be answered only on the **OMR Response Sheet** provided.*

1. Fish migration within river is known as:

(a) Diadromous (b) Anadromous

(c) Potamodromous (d) Catadromous

2. What is the term for the shedding of exoskeleton in crustaceans?

(a) Metamorphosis (b) Moulting

(c) Tagging (d) Spawning

3. Which method is not used in age determination of fish?

(a) Scale reading (b) Length-weight analysis

(c) Otolith examination (d) Tagging

4. What is the main site of gas exchange in fish?

(a) Skin (b) Fin

(c) Gill (d) Heart

5. Which organ is primarily involved in osmoregulation in fish?

(a) Liver (b) Kidneys

(c) Stomach (d) Lungs

6. The primary nitrogenous waste excreted by fish is-

(a) Urea (b) Ammonia

(c) Uric acid (d) Nitrite

7. Who is considered the father of genetics?

(a) Charles Darwin (b) Gregor Mendel

(c) Jean-Baptiste Lamarck (d) Alfred Wallace

8. In fish breeding, hybrid vigor is also known as-

(a) Dominance (b) Heterosis

(c) Epistasis (d) Polyploidy

9. What is gynogenesis?

(a) Development of gametes without fertilization (b) Crossbreeding of male and female fish

(c) Increase in genetic variation (d) Breeding only male fish

10. To be designated as cold water fisheries minimum altitude should be-

(a) 914 msl (b) 1500 msl

(c) 887 msl (d) 1050 msl

11. Which river in India is famous for the hilsa fishery?

(a) Brahmaputra (b) Ganga

(c) Godavari (d) Krishna

12. Which type of fishery is practiced in high-altitude lakes?

(a) Marine fishery (b) Coldwater fishery

(c) Brackish water fishery (d) Estuarine fishery

13. The main fish species of flood-plain capture fisheries are-

(a) Anchovies (b) Carps

(c) Tunas (d) Shrimps

14. Which of the following is a live food organism used in aquaculture?

(a) Amoeba (b) Cestoda

(c) Lernea (d) Spirulina

15. What type of organism is Artemia commonly known as?

(a) Brine shrimp (b) Rotifer

(c) Diatom (d) Algae

16. Brine shrimp (Artemia) is primarily cultured for-

(a) Water quality improvement (b) Fish fry feed

(c) Pond fertilization (d) Disease treatment

17. The purpose of chain surveying is to measure:

(a) Water quality (b) Pond dimensions

(c) Fish weight (d) Fish growth

18. A primary characteristic of a rearing pond is-

(a) Small size for fry (b) Large size for adult fish

(c) Contains no fish (d) Brackish water only

19. The primary nutrient found in fish flesh is-

(a) Carbohydrates (b) Lipids

(c) Protein (d) Vitamins

20. Which vitamin is particularly abundant in fatty fish?

(a) Vitamin C (b) Vitamin B

(c) Vitamin A (d) Vitamin D

21. The protein efficiency ratio (PER) is a measure of-

(a) Lipid quality
(b) Vitamin absorption
(c) Protein quality
(d) Mineral content

22. The main fatty acids in fish oil beneficial to human health are-

(a) Omega-3
(b) Omega-6
(c) Saturated fats
(d) Trans fats

23. Which is a traditional fishing craft in India?

(a) Trawler
(b) Dugout canoe
(c) Gill netter
(d) Factory ship

24. Which material is commonly used for modern fishing nets?

(a) Cotton
(b) Nylon
(c) Silk
(d) Hemp

25. What type of fishing gear is a purse seine?

(a) Trap
(b) Net
(c) Line
(d) Harpoon

26. Which hormone regulates fish reproduction?

(a) Insulin
(b) Cortisol
(c) Gonadotropin
(d) Thyroxine

27. Which species is known to undergo catadromous migration?

(a) Salmon
(b) Eel
(c) Tilapia
(d) Tuna

28. What is the primary benefit of live food in aquaculture?

(a) Enhanced nutrition
(b) Water clarity
(c) Disease prevention
(d) Increased water temperature

29. Which nutrient is particularly important for human health in fish lipids?

(a) Omega-3 fatty acids
(b) Carbohydrates
(c) Protein
(d) Fibre

30. Which fishery resource is found in estuarine environments?

(a) Salmon
(b) Hilsa
(c) Cod
(d) Tuna

31. What is the main function of the lateral line in fish?

(a) Balance
(b) Sensory perception
(c) Breathing
(d) Digestion

32. Which part of the fish brain is responsible for olfactory functions?

(a) Cerebellum
(b) Olfactory bulb
(c) Medulla
(d) Optic tectum

33. What structure in crustaceans is used for grinding food?

(a) Mandibles (b) Maxillipeds

(c) Chelipeds (d) Antennules

34. Oxygen is transported in fish blood primarily by-

(a) Haemoglobin (b) Plasma

(c) Myoglobin (d) Albumin

35. Which is a primary excretory organ in crustaceans?

(a) Antennal glands (b) Nephridia

(c) Kidneys (d) Gill filaments

36. Which type of vessel is used for deep-sea fishing?

(a) Canoe (b) Trawler

(c) Gill netter (d) Coracle

37. What is buoyancy determined by in fishing gear?

(a) Sinkers (b) Floats

(c) Net size (d) Line length

38. The death points pH of fish is?

(a) Above 11 below 4 (b) Below 11 above 4

(c) Below 6 above 7 (d) Above 4 below 11

39. What does the term "pond seepage" refer to?

(a) Evaporation loss (b) Water infiltration into the soil

(c) Overflow discharge (d) Silt deposition

40. What is the primary food source for larval fish?

(a) Insects (b) Mustard oil cake

(c) Rice Bran (d) Zooplanktons

41. Which type of respiration occurs in mollusks?

(a) Cutaneous (b) Branchial

(c) Tracheal (d) Pulmonary

42. Which are considered as "living carbon manuring machine" in integrated fish ponds?

(a) Pig (b) Cow

(c) Chicken (d) Duck

43. Which instrument measures water depth?

(a) Hygrometer (b) Altimeter

(c) Echo sounder (d) Refractometer

44. What is the primary use of aerators in aquaculture?

(a) Increase water temperature (b) Supply dissolved oxygen

(c) Remove sediment (d) Control pH

45. What is the term for spawning in controlled conditions?

(a) Induced breeding (b) Natural spawning

(c) Gynogenesis (d) Cryopreservation

46. Which fish species is known for high omega-3 content?

(a) Carp (b) Salmon

(c) Catfish (d) Tilapia

47. Which vitamin is abundant in fish liver oil?

(a) Vitamin A (b) Vitamin B12

(c) Vitamin C (d) Vitamin D

48. The most important mineral in fish bones is-

(a) Iron (b) Calcium

(c) Phosphorus (d) Magnesium

49. World fisheries day is celebrated on-

(a) 21st October (b) 21st November

(c) 10th July (d) 15th August

50. What is a raceway culture system?

(a) Open water fish farming (b) Controlled flow culture in tanks

(c) Intensive Pond culture (d) Integrated agriculture system

SECTION - B *(Conventional Type) (100 Marks)*

*This Section should be answered only on the **Answer Sheet** provided.*
Marks for each question is indicated against it.
Attempt all questions.

1. Compare the traditional and modern fishing crafts used in India. Explain the principles behind the design and use of trawl nets, gillnets, and purse seines. **(5+5=10)**

2. Describe the external and internal anatomy of *Labio rohita*, focusing on its digestive, circulatory, respiratory, and reproductive systems with figures. **(10)**

3. Discuss the principles and applications of selective breeding in aquaculture. **(5)**

4. Explain chromosome manipulation techniques like androgenesis, gynogenesis, and polyploidy, and their significance in improving aquaculture productivity. **(8)**

5. Evaluate the potential and challenges of fresh water and cold water fisheries in India. **(7)**

6. Discuss the role of rivers, lakes, and reservoirs in inland fish production, and examine the importance of sustainable fishing practices in maintaining these resources. **(10)**

7. Describe the types of live food organisms commonly used in aquaculture and their roles in the early life stages of finfish and shellfish. **(5)**

8. Explain the culture techniques for key live food organisms such as Artemia, rotifers, and Infusoria, and discuss the nutritional benefits they provide to larval fish and shellfish. **(10)**

9. Provide a detailed overview of the design and construction of aquaculture ponds, including site selection criteria, soil and water management. **(10)**

10. Analyze the nutritional value of fish in human diets, focusing on proteins, essential amino acids, fatty acids, vitamins, and minerals. **(5)**

11. Describe the structure and functions of the respiratory, circulatory, and reproductive systems in commercially important finfish and shellfish. **(10)**

12. Discuss the methods for determining age and growth in fish, and explain the significance of these metrics in fisheries management. **(10)**

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