

M.Sc. ZOOLOGY  
FOURTH SEMESTER  
FISH & FISHERY BIOLOGY – II  
MSZ - 402C

( Use Separate Answer Scripts for Objective & Descriptive )

Duration:3 hrs.

Full Marks:70

[ PART-A: Objective ]

Time: 20 min.

Marks:20

*Choose the correct answer from the following:*

**1X20=20**

1. The \_\_\_\_\_ fishes are useful as they are sterile, avoid Gametogenesis and undergo more somatic growth during polyploidy.
  - a. Haploid
  - b. Diploid
  - c. Triploid
  - d. Tetraploid
2. Statement A: Post spermiation phase contains vacant seminiferous tubules.  
Statement B: Primary spermatogonia are present in the testis.
  - a. Both A and B are true
  - b. Only A is true
  - c. Both A and B are false
  - d. Only B is true
3. Aneuploids are also called as fishes with \_\_\_\_\_ chromosome.
  - a.  $2N + 1$
  - b.  $2N - 1$
  - c. Both of the above
  - d. None of the above
4. The first person to begin transgenesis in fishes is
  - a. Zhu
  - b. Pough
  - c. Conover
  - d. Lakra
5. Which among these is a primary synthetic source for inducing reproductive behaviour in *Cirrhinus mrigala*?
  - a. Ovaprime
  - b. Ovadirect
  - c. Ovafish
  - d. Ovasperm
6. Salmon fries treated with \_\_\_\_\_ mg/kg of food reverses the sex to female of all individuals.
  - a. 10
  - b. 15
  - c. 20
  - d. 25
7. The first fish species to be spawn artificially using mammalian thyroid gland extracts for hypophysation is
  - a. *Labeorohita*
  - b. *Clarias batrachus*
  - c. *Esomus danricus*
  - d. *Catlacatla*
8. Which part of fish body is used for making liquid glue to be used for paper and wood?
  - a. Scales
  - b. Air bladder
  - c. Skin
  - d. Kidney

9. To achieve 100% male population in Tilapia, the gonad should be
  - a. Ethyl testosterone inj.
  - b. Heat treatment
  - c. Methyl testosterone inj.
  - d. Cryotreatment
10. Androgenic super males if breeds with normal females (XX) would produce
  - a. All males
  - b. All females
  - c. 50:50
  - d. All sterile
11. Waste heat is a by-product of many industrial processes, especially from the production of-----
  - a. Electrical energy
  - b. Distilled water
  - c. Ice
  - d. None of the above
12. Eutrophication and organic pollutants responsible for depletion of dissolve oxygen
  - a. Increase the CO<sub>2</sub> level in water bodies
  - b. Decrease the CO<sub>2</sub> level in water bodies
  - c. Both Increase and decrease the CO<sub>2</sub> level in water bodies
  - d. All of the above
13. Water polluted by agricultural wastes, soil erosion and organic pollutants (sewage & biodegradable synthetic detergents) are rich in
  - a. Nitrates and phosphates
  - b. Acetic acid
  - c. Calcium
  - d. All of the above
14. A long-term exposure of sub lethal concentration of pollutants may make an organism more susceptible to
  - a. Disease
  - b. Long life
  - c. Increase energy
  - d. None of the above
15. The best example of mountain valley rice fish culture in the NE region is
  - a. Burma Border
  - b. Apatani plateau of Arunachal Pradesh
  - c. Nagaland
  - d. Trans Himalayan region
16. For better management and easy operation
  - a. Pens of 0.1 to 0.2 ha area is recommended
  - b. Pens of 10 ha area is recommended.
  - c. Less than 20 ha is recommended
  - d. Above 20 ha is recommended.
17. Since the objective of pen farming is to utilize the natural productivity of the water body, the role of supplementary feeding is
  - a. Necessary
  - b. Marginal
  - c. Both
  - d. None of the above
18. Fish culture in rice fields may be attempted in two ways, viz
  - a. Simultaneous culture and rotation culture
  - b. Alternate and raceway culture
  - c. Daylight culture and nocturnal
  - d. None of the above

19. In waste water treatment in sewage fed fish culture Primary treatment is done by
- a. Screening , skimming , sedimentation
  - b. Filtering and skimming
  - c. Skimming
  - d. None of the above
20. The carbon and nitrogen ratio of sewage fed fisheries is around
- a. 3:1
  - b. 1:1
  - c. 5:5
  - d. None of the above

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**( PART-B :Descriptive )**

Time : 2 hrs. 40 min.

Marks : 50

***[Answer question no.1 & any four (4) from the rest]***

1. What is air-breathing fish? Discuss some of the air-breathing fish present in India with suitable examples. 2+8=10
2. What is water pollution? Write the impact of aquatic water pollution on fish and Fisheries. 2+8=10
3. What is pen culture? Discuss pen culture practiced in NE India highlighting the advantages. 2+8=10
4. a. Elucidate in detail about some of the fish diseases present in India with suitable examples. Draw suitable sketches wherever necessary. 2+8=10

**OR**

- b. Discuss in detail about some of the fish diseases present in India. Draw suitable diagrams wherever necessary.
5. Mention in detail the various forms and types of genetic processes engaged in hybridization of fishes. 10
6. Mention with diagrammatic representation of fishing craft and gear used in Northeast India. Also elucidate the ones used for primary fish catching activities. 7+3=10
7. Write down in detail about the various functional morphology of gonads in fishes with respect to reproductive season and breeding pattern. 10
8. What are transgenic fishes? Write the various aspects of merits and demerits involved in transgenesis with more focus on human health. 2+8=10

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