

Chittagong Veterinary and Animal Sciences University, Chittagong

Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology, Jul-Dec Semester, Final Exam/2017

Course No&Title.: BSI- 502 (T), Fish Breeding and Stock Improvement

Time: 2hrs,

Full Marks: 40

Answer **any five (05)** from the followings. Figure in the right margins indicates full marks. Splits answers is not acceptable.

1. a. What do you mean by hybridization? Mention the merits and demerits of hybridization. 3.0
b. Explain the different types of crossbreeding program. 3.0
c. What is out breeding depression? How does it occur? 2.0
2. a. Define selective breeding for quantitative traits. 2.0
b. Briefly explain a suitable model of selective breeding for major carps. 6.0
3. a. What is heterosis? Explain heterosis with an example. 4.0
b. What are the effects of unplanned hybridization? 2.0
c. Differentiate between cross breeding and hybridization. 2.0
4. a. What do you mean by effective breeding number and inbreeding co-efficient? 2.0
b. How will you minimize the rate of inbreeding in hatchery populations for executing stock improvement programme? 6.0
5. a. What is brood bank? 1.0
b. How will you develop brood bank of fish for sustainable aquaculture? 7.0
6. a. What is genetic drift and how does it happen? 3.0
b. Discuss the effects of genetic drift on a finite fish population. 5.0
7. a. What do you mean by genetic management of broodstock? 1.0
b. Briefly describe the present scenario of broodstock management in fish hatcheries of Bangladesh. 5.0
c. Mention the existing broodstock management problems in hatcheries of Bangladesh. 2.0

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MS in Fish Biology and Biotechnology, Jul-Dec Semester, Final Exam/2017

Course No&Title.: EMF- 502 (T), Embryology of Fishes

Time: 2hr,

Full Marks: 40

Answer **any five (05)** from the following. Figure in the right margins indicates full marks.

1. a. What do you mean by embryology of fishes? 2.0
b. What are the phases of embryogenesis? 1.0
c. Discuss the different types of sexual reproduction with examples. 5.0
2. a. What is spermiogenesis? Describe the changes occurred in spermatids during spermiogenesis with figures. 6.0
b. Differentiate between spermatogenesis and oogenesis. 2.0
3. a. Define fertilization. How eggs are activated during fertilization? 3.0
b. Explain egg-sperm interaction during zygote formation. 5.0
4. a. What is polyspermy? 1.0
b. Describe briefly the prevention mechanism of polyspermy. 7.0
5. a. What is meant by gastrulation? 1.0
b. Describe the gastrulation process in sea urchin. 5.0
c. Diagrammatically show the fate of germ layers formed during gastrulation. 2.0
6. a. What are the different types of cleavage? 2.0
b. Describe the cleavage pattern in fish. 4.0
c. Differentiate between holoblastic and meroblastic cleavage. 2.0
7. a. 'Embryonic induction initiates organ formation'-Explain the statement. 2.0
b. Briefly describe the stages of embryonic development in zebra fishes. 6.0

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Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology, Jul-Dec Semester, Final Exam/2017

Course No&Title.: GBO- 502 (T), Genetics and Breeding of Ornamental Fishes

Time: 2hr,

Full Marks: 40

Answer **any five (05)** from the following. Figure in the right margins indicates full marks. Splits answers is not acceptable.

1. a. Discuss the current status and prospects of ornamental fish breeding in Bangladesh. 6.0
b. Explain with example ornamental fish as model animal for biological research. 2.0
2. a. What do you mean by Mendelian inheritance? 2.0
b. Explain the pattern of colour polymorphism in *Poecilia* 6.0
3. a. Make a list of eight ornamental fishes with their common name and scientific name. 2.0
b. Briefly explain the feed requirements and spawning requirements of the following ornamental fishes: angel fish, sucker mouth cat fish and guppy. 6.0
4. a. What are the different types of aquarium? 2.0
b. Briefly describe the major steps of setting up an aquarium. 6.0
5. a. What do you mean by sexual dimorphism? 2.0
b. Describe the secondary sexual characters in fish. 6.0
6. a. What is selective breeding for ornamental fish? 1.0
b. Describe the artificial breeding of angel fish (*Pterophyllum scalare*)? 7.0
7. a. Differentiate between sex determination and sex differentiation. 2.0
b. Explain the factors affecting sex differentiation in fishes. 5.0
c. Mention the phases of ontogenetic development in fishes. 1.0

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MS in Fish Biology and Biotechnology, Jul-Dec. Semester, Final Exam/2017

Course No&Title.: MBI- 502 (T), Molecular Biology

Time: 2hr,

Full Marks: 40

Answer **any five (05)** from the following. Figure in the right margins indicates full marks. Splits answers is not acceptable.

1. a. What is chromatin and nucleosome? 2.0
b. What are the chromosomal proteins? Mention the functions of chromatin. 2.0
c. Describe the process of chromatin organization. 4.0
2. a. What do you mean by gene expression? 1.0
b. Explain the mechanism of gene expression in eukaryotes? 7.0
3. a. What is mutation and mutagenesis? Mention importance of mutation. 2.0
b. Differentiate between germinal mutation and somatic mutation. 2.0
c. Briefly describe the chromosomal mutation with appropriate figures. 4.0
4. a. What do you mean by gene mapping? What are the major types of gene mapping? 2.0
b. Describe the genetic mapping of the chromosomes of a fish species. 6.0
5. a. What is MHC? Mention the structural differences between MHC class I and MHC class II molecules. 3.0
b. What are antigen presenting cells? Illustrate the MHC-associated cellular defense system of fish. 5.0
6. a. Why is gene regulation necessary? 2.0
b. What are the regulated stages of gene expression? 1.0
c. Explain the post-transcriptional regulation of gene expression. 5.0
7. a. What do you mean by genetic code, codon and anti-codon? 2.0
b. Briefly discuss the major steps of protein synthesis. 6.0

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MS in Fish Biology and Biotechnology, Jul-Dec Semester, Final Exam/2017

Course No&Title.: RPF- 502 (T), Reproductive Physiology of Fishes

Time: 2hrs,

Full Marks: 40

Answer any five (05) from the followings. Figure in the right margins indicates full marks.

1. a. Define reproduction. Discuss with appropriate examples different types of mode of reproduction observed in fishes. 6.0
b. Write the importance of studying reproductive physiology of fishes. 2.0
2. a. What is meant by spermiogenesis? 1.0
b. Discuss briefly the mechanism of hormonal regulation of spermatogenesis. 4.0
c. Discuss how sperm motility is regulated. 3.0
3. a. What do you mean by puberty? 1.0
b. Describe with diagram different phases of puberty? 3.0
c. Discuss how puberty is regulated. 4.0
4. a. What is hermaphroditism? Describe the different types of hermaphroditism in fishes with examples. 4.0
b. Briefly describe the osteichthyan viviparity with examples. 4.0
5. a. Differentiate among oviparous, viviparous and ovo-viviparous. 3.0
b. Briefly discuss different types of maternal-embryonic relationships in fishes. 5.0
6. a. What do you mean by reproductive behavior? 1.0
b. Describe the breeding behavior of three spines Stickleback (*Gasterosteus aculeatus*). 7.0
7. a. What are the sources of water pollution? Make a list of affecting site of water pollution in fish. 2.0
b. Explain the effect of water pollution especially on hormone synthesis, fecundity and embryonic development of fish. 6.0

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MS in Fish Biology and Biotechnology, Jul-Dec semester, Final Exam/2017

Course No&Title.: AIC- 502 (T), Advanced Ichthyology

Time: 2hr,

Full Marks: 40

Answer **any five (05)** from the following. Figure in the right margins indicates full marks. Splits answers is not acceptable.

1. a. What is taxonomy and how does it differ from systematics? 1.0
b. Write the importance of understanding phylogeny. 2.0
c. Make an ecological classification of fresh and marine water bony fishes in the world. 5.0
2. a. What do you know about the evolutionary trends in fish morphology? 3.0
b. Describe the structure of swim bladders of fish. 3.0
c. Explain the role of gas bladder in sound production. 2.0
3. a. What do you mean by phylogeny and phylogenetics? 2.0
b. Describe phylogenetic tree construction process with example. 6.0
4. a. What do you know about sensory mechanism in fishes? 2.0
b. Describe lateral line sensing system in aquatic vertebrates. 6.0
5. a. What do you mean by evolution? 1.0
b. Explain the evolutionary pattern of bony fish with diagram. 7.0
6. a. What is meant by zoogeography? 1.0
b. Make a list of freshwater zoogeographic regions. 1.0
c. Describe any three important zoogeographical regions mentioning dominant fish fauna. 6.0
7. a. What do you mean by adaptation? 1.0
b. How do deep sea fishes adapt themselves to their environment? 7.0