Chattogram Veterinary and Animal Sciences University, Chattogram

Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology, Jul-Dec Semester, Final Exam/2019

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

Time: 2 hours **Full Marks: 40**

Answer ***any 05 (Five)*** from *the followings. Figures in the right margin indicate full marks.*

1.	a.	Why is improvement of fish brood stock important?	3.0
	b.	Mention the merits and demerits of hybridization.	3.0
	c.	How does unplanned hybridization affect in genetics of fish population?	2.0
2.	a.	Explain the following terms: selection, cut-off value and cull. Mention the goals of selective breeding.	3.0
	b.	Discuss the methods of selection in aquaculture.	5.0
3.	a.	What do you mean by gene introgression and heterosis.	2.0
	b.	Explain family selection with example from fish.	4.0
	c.	Distinguish between cross breeding and hybridization.	2.0
4.	a.	'Inbreeding changes the genotypic frequencies' justify the statement.	3.0
	b.	How will you minimize the rate of inbreeding in hatchery populations for executing stock improvement programme?	5.0
5.	a.	What is effective breeding number and inbreeding co-efficient?	2.0
	b.	Why effective breeding number and inbreeding co-efficient are inversely related?	2.0
	c.	How will you calculate inbreeding value using path analysis?	4.0
6.	a.	What is chromosome manipulation? Mention the techniques used to assess the success of chromosome manipulation.	2.0
	b.	How will you produce gynogenetic fish by chromosome manipulation?	5.0
	c.	Mention the applications of androgenesis.	1.0
7.	a.	Why genetic management of broodstock is important for sustainable aquaculture?	2.0
	b.	Outline the present scenario of broodstock management in fish hatcheries of Bangladesh.	4.0
	c.	'Brood bank of fish is necessary for sustainable aquaculture'- justify?	2.0

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Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology, Jul-Dec Semester, Final Exam/2019

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

Time: 2hours **Full Marks: 40**

Answer ***any 05 (FIVE)*** questions from the following. Figures in the right margin indicate full marks.

1.	a.	Enumerate the current status and prospects of ornamental fish breeding in Bangladesh.	6.0
	b.	Why ornamental fishes are used as model animal for biological research?	2.0
2.	a.	Make a list of eight ornamental fishes with their common and scientific name.	2.0
	b.	Discuss the feeding and spawning requirements of the following ornamental fishes: discuss, sucker mouth cat fish and guppy.	6.0
3.	a.	What is Mendelian inheritance?	2.0
	b.	Explain sex linked inheritance in guppy, *Poecilia reticulata*.	6.0
4.	a.	What is aquarium? What are the different types of aquarium?	3.0
	b.	Explain the basic principles to setting up and maintaining aquarium for ornamental fish breeding.	5.0
5.	a.	What do you mean by sexual dimorphism?	2.0
	b.	Give a brief account on embryonic and larval development of ornamental fishes.	6.0
6.	a.	What is selective breeding for ornamental fish?	1.0
	b.	Describe the considerations and preparatory steps for effective breeding of ornamental fishes.	7.0
7.	a.	What is reproductive behavior?	1.0
	b.	Describe the artificial breeding of angel fish, *Pterophyllum scalare*.	7.0

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

Time: 2hr **Full Marks: 40**

Answer ***any Five (05)*** from the followings. Figures in the right margin indicate full marks.

1.	a.	What is chromatin and nucleosome?	2.0
	b.	What are the chromosomal proteins? Mention the functions of chromatin.	2.0
	c.	Illustrate the process of DNA packaging in eukaryote chromosome.	4.0
2.	a.	What is gene expression?	2.0
	b.	Explain the transcription process of gene expression in eukaryotes?	6.0
3.	a.	What is mutation and mutagenesis?	2.0
	b.	Explain the gene mutation methods with figures.	6.0
4.	a.	What is gene mapping? Why gene mapping is important?	2.0
	b.	Illustrate 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.	What is regulation of gene expression?	1.0
	b.	Diagrammatically show the regulated stages of gene expression.	2.0
	c.	Explain the transcriptional regulation of gene expression.	5.0
7.	a.	What do you mean by genetic code, codon and anti-codon?	2.0
	b.	Illustrate the DNA replication process in eukaryotes.	6.0

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

Time: 2 hours **Full Marks: 40**

Answer ***any 05(Five)*** questions from the followings. Figures in the right margin indicate full marks.

1.	a.	What do you mean by embryology of fishes?	1.0
	b.	Explain why studying embryology of fishes is important?	2.0
	c.	Discuss the different types of sexual reproduction with examples.	5.0
2.	a.	What is gametogenesis? Explain the changes occur in spermatids of fish during spermiogenesis with figures.	5.0
	b.	Diagrammatically show the structural components of a mature sperm and egg of fish.	3.0
3.	a.	Define fertilization. What are the different types of fertilization?	3.0
	b.	What is polyspermy? Explain how polysparrmy is prevented in sexually reproducing organisms.	5.0
4.	a.	How eggs are activated during fertilization?	3.0
	b.	Illustrate the egg-sperm interaction and gamete fusion during zygote formation in fishes.	5.0
5.	a.	Characterize the embryonic development of fishes with figures?	6.0
	b.	Diagrammatically show the fate of germ layers formed during gastrulation.	2.0
6.	a.	Define cleavage. What are the different types of cleavage?	2.0
	b.	Describe the cleavage pattern in different groups of fish.	4.0
	c.	Make comparison between early development in protostomes and deuterostomes.	2.0
7.	a.	'Embryonic induction initiates organ formation'-explain the statement with example.	3.0
	b.	Illustrate the embryonic development with an example from fish?	5.0

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MS in Fish Biology and Biotechnology, Jul-DecSemester, Final Exam/2019

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

Time: 2hours, **Full Marks: 40**

Answer ***any 05(Five)*** from the followings. Figures in the right margin indicate full marks.

	a.	What is reproductive physiology?	1
	b.	Justify the importance of studying reproductive physiology of fishes.	2
	c.	Explain the modes of reproduction in fishes with example?	5
2.	a.	How oocyte maturation is regulated by hormone?	5
	b.	Explain hormonal regulation of acquirement of sperm motility	3
3.	a.	What is puberty? Mentionthe determinants for the timing of onset of puberty.	3
	b.	How puberty can be manipulated for aquaculture species?	3
	c.	Outline the factors affecting sex differentiation.	2
4.	a.	Write short notes on morphology of fish eggs and micropyle.	3
	b.	Illustrate the representative types of urogenital system in female fishes.	5
5.	a.	Differentiate among oviparous, viviparous and ovo-viviparous.	3
	b.	Briefly discuss different types of maternal-embryonic relationships in fishes.	5
6.	a.	What do you mean by reproductive behavior?	1
	b.	Describe the breeding behavior of Salmon.	7
7.	a.	Mention the factors that regulate reproduction of fish.	2
	b.	Describe how social and environmental factors influence the reproduction of fishes.	6

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

Time: 2 Hours **Full Marks: 40**

Answer ***any 05 (Five)*** from the following. Figure in the right margins indicates full marks.Split answer is not acceptable.

1.	a.	Justify the importance of studying fish systematics?	2.0
	b.	Mention the main requirements to describe a taxon?	2.0
	c.	Classify gnathostomes upto sub-class level with example.	4.0
2.	a.	What do you know about the evolutionary trends in fish morphology?	3.0
	b.	Illustrate the structure of swim bladders of fish.	3.0
	c.	Explain the role of gas bladder as respiratory organ.	2.0
3.	a.	What do you mean by phylogeny and phylogenetics?	2.0
	b.	Diagrammatically show the different parts of a phylogenetic tree.	3.0
	c.	'Phylogenetic tree reveals evolutionary history of life'-explain with example.	3.0
4.	a.	What do you know about sensory mechanism in fishes? Mention the sensing system found in different group of fishes.	2.0
	b.	Give a brief account on lateral line and electric sensing system in bony fishes.	6.0
5.	a.	What do you mean by evolution?	1.0
	b.	Discuss evolutionary history of fish.	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