2017

ZOOLOGY

Paper : 402 F

BIOTECHNOLOGY AND SUSTAINABLE AQUACULTURE IN FISHERY DEVELOPMENT

Full Marks: 80

Time: 3 hours

The figures in the margin indicate full marks for the questions

1. **Multiple choice questions (any eight)** 1 X 8 = 8

I. Gynogenesis can be combined with sex reversal to produce .....

a) Monosex

b) Single sex

c) Diploid

d) Haploid

II. The technique used in animal biotechnology for the rapid multiplication and production of animals with a desirable genotype is

a) hybrid selection and embryo transfer

b) protoplast fusion and embryo transfer

c) in vitro fertilization and embryo transfer

d) all of the above

III. Fishes reared in culture fishery in India are

a) Salmon and Catla

b) Salmon and Rohu

c) Catla ad Magur

d) Rohu and Catla

IV. Fish introduced in India by foreigners is

a) Labeo rohita

b) Mystus singhala

c) Pomfret

d) Clarias batrachus

V. Which one of the following is not a cloning vector?

a) Plasmid

b) Histone

c) Cosmids

d) Bacteriophage

VI. Which one of the following technique uses several restriction enzymes to produce different DNA fragments?

a) Restriction Fragment Length Polymorphism

b) Random Amplified Polymorphic DNA

c) Simple Sequence repeats

d) Amplified Fragment Length Polymorphism

VII. Have GMOs been proven to be safe for consumption?

a) Some GMOs have been proven safe by the FDA.

b) Yes, GMOs are more nutritional then old fashioned "natural" food.

c) No. There have been no in-depth, long-term studies and in reality, the FDA has absolutely no safety testing requirements.

d) The USDA requires rigorous safety testing of all GMOs.

VIII. AFLP is a

a) method to detect polymorphism in the DNA throughout the genome

b) method that detects the presence or absence of a fragment

c) PCR based method

d) all of these

IX. The set of DNAs fragments generated by using random primers in a PCR reaction is called

a) AFLP

b) RAPD

c) RFLP

d) in situ hybridization

2. **Answer the following short questions (any five)** 2 X 5 = 10

a) What is a Genetic Marker?

b) What do you understand by monosex population?

c) What is super fish?

d) Write short notes on advantages of liming the ponds.

e) What are the important marine fishes of India?

f) What is hormonal sex reversal in fish?

3. **Answer the following questions (any four)** 5 X 4 = 20

a) Write different types of Cloning Vectors and its importance.

b) Write in short about the culture of Channa species.

c) What are the various animal farming practices that can be integrated with fish farming for recycling their wastes?

d) What are the various advantages of induced breeding?

e) Write a note on composite fish culture.

4. **Answer the following long type questions (any two)**

$9 \times 2 = 18$

a) What is Cell Culture? Explain different types of cell cultures. (2+7)

b) What is transgenic fish? Describe three common methods to create transgenic animals. (2+7)

c) What are the different types of ponds used in hatchery? Write salient features of each pond. (4+5)

5. **Answer the following very long type questions (any two)**

$12 \times 2 = 24$

a) What are cold water fishes? Write an account of different cold water fisheries of north-east India. (2+10)

b) Describe the method of induced breeding of fishes. (12)

c) Write a detail note on role of aquatic resources in food and nutrition. (12)

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