

2017**M.Sc. 4th Semester Examination****FISHERIES SCIENCE****PAPER—FSC-403***Full Marks : 40**Time : 2 Hours**The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.***Unit—I***(Aquaculture Engineering)*

1. Answer any *two* questions from the following : 2×2
- (a) Why pond aeration to be needed during early morning ?
 - (b) What is recombinant DNA ?
 - (c) Briefly explain the significance of sluice.
 - (d) State the functions of DNA polymerase.

(Turn Over)

2. Answer any *two* questions from the following : 2×4

(a) Briefly narrate the floating surface and coarse bubble aeration.

(b) Describe the functions of DNA ligase with proper illustration.

(c) What is gene cloning? Briefly explain with example.

$$1\frac{1}{2} + 2\frac{1}{2}$$

(d) Briefly describe the different factors influencing the dissolved oxygen (DO) content in pond water.

3. Answer any *one* question from the following : 1×8

(a) What is bio-filter? Briefly narrate the characteristics of an ideal bio-filter. Add a note on the advantages of bio-filter. 2+4+2

(b) Write note on : (any *two*)

(i) Gene therapy and molecular marker.

(ii) DNA amplification.

(iii) ELISA.

4+4

Unit—II**(Aquaculture Biotechnology)**

4. Answer any *two* questions from the following : 2×2
- (a) What is mono-sex fish culture ?
 - (b) State the role of extender used in cryopreservation.
 - (c) Write the application of biofermentation.
 - (d) What are the differences between primary and secondary culture ?
5. Answer any *two* questions from the following : 2×4
- (a) Briefly discuss hybridization in fish with suitable examples.
 - (b) What is sex reversal ? Explain the methods with suitable examples. 1+3
 - (c) Write in brief about polyploidy in fish and its utility in aquaculture.
 - (d) What is in-breeding depression ? How it can be overcome ? 2+2

6. Answer any *one* question from the following : 1×8
- (a) (i) Define genome manipulation.
- (ii) Describe induced Gynogenesis in fish with suitable diagrams. 2+6
- (b) (i) What is transgenic fish ? Explain its importance in aquaculture development. 1+3
- (ii) Briefly explain the procedure for the production of sterile fish. 4
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