

UNIVERSITY OF RUHUNA
BACHELOR OF SCIENCE IN FISHERIES AND MARINE SCIENCES DEGREE

Level III Semester II Examination

Dec/Jan 2015/2016

FAQ 3211 - Advanced Molecular Genetics applicable to Fisheries & Aquaculture

Time: 01 hour

Answer Two (02) questions

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01. a) What is Polymerase Chain Reaction (PCR)? (2.5 marks)
- b) The following is a PCR program. Explain the purpose of each step in the PCR program (12.5 marks)
- I. 94°C – 3 min
 - II. 94°C – 40 sec (35 cycles)
 - III. 55°C – 1 min (35 cycles)
 - IV. 72°C – 1 min (35 cycles)
 - V. 72°C – 10 min
- c) In the method of PCR, explain the purposes of the following;
- I. Primers 3' ends should not be complementary to each other (7.5 marks)
 - II. Taq DNA polymerase is preferred to other polymerases (7.5 marks)
- d) The complete genome of a pathogenic single stranded RNA virus X is available in a genetic database. Outline the steps that would be taken in order to develop a PCR based assay for the specific detection of the above virus X. (20 marks)
02. Briefly discuss **any four (4)** of the followings. (12.5 marks each)
- a) DNA hybridization
 - b) Basic steps of DNA cloning procedure
 - c) Structure and function of "Lac Operon"
 - d) Fidelity (accuracy) of DNA replication
 - e) Gel electrophoresis as a technique for DNA identification and isolation
03. Write an account on the application of molecular genetics for the development of fisheries and aquaculture. (50 marks)

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