Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME	:	EVOLUTIONARY GENETICS AND CONSERVATION
COURSE CODE	:	BWJ 20703
PROGRAMME CODE	:	BWW
EXAMINATION DATE	:	JULY / AUGUST 2023
DURATION	:	3 HOURS
INSTRUCTIONS	:	1. ANSWER ALL QUESTIONS 2. THIS FINAL EXAMINATION IS CONDUCTED VIA ☐ Open book ☒ Closed book 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS ANSWER SCHEME PAPER CONSISTS OF **THREE (3)** PAGES

Q1 Over extremely long time, the micro-evolutionary forces will eventually give rise to the macro-evolutionary patterns that distinguish the higher taxonomic groups.

(a) Outline **EIGHT (8)** differences between neutral and adaptive variation.

(16 marks)

(b) Define the term "evolutionary genetics". Discuss **FOUR (4)** evolutionary forces acting within and among populations.

(9 marks)

Q2 The variety of animals, plants, fungi, and even microorganisms like bacteria and fungi that make up our natural environment are all included in what is known as biodiversity.

(a) Define the term "genetic markers". Using **EIGHT (8)** points of view, differentiate between Type I and Type II markers.

(13 marks)

(b) Outline **SIX (6)** differences between mitosis and meiosis.

(12 marks)

Q3 Genetic diversity refers to the total number of genetic traits that make up a species' genetic composition. It varies greatly depending on the number of species present as well as across species, and it can be linked to a species' longevity.

(a) Define the terms "allele frequency". Compare random genetic drift to gene flow by providing **FIVE (5)** viewpoints.

(11 marks)

(b) Outline **SEVEN (7)** differences between the Unweighted Pair Group Method with Arithmetic Mean (UPGMA) and Neighbor Joining (NJ) tree building methods.

(14 marks)

Q4 Land use - mainly for large-scale food production - is the primary direct cause of biodiversity loss. Overexploitation for goods including food, medicine, and timber through overfishing, overhunting, overharvesting and other activities is also another contributing factor.

(a) Define the term "conservation". Differentiate between *ex-situ* and *in-situ* conservation by providing **SIX (6)** viewpoints.

(13 marks)

(b) Describe the functions of the DNA template, primers, *Taq* polymerase, nucleotides, mix buffer and thermocycler in a polymerase chain reaction (PCR).

(12 marks)

- END OF QUESTIONS -