Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018

COURSE NAME	:	EVOLUTIONARY GENETICS & CONSERVATION
COURSE CODE	:	BWJ 20703
PROGRAMME CODE	:	BWW
EXAMINATION DATE	:	JUNE / JULY 2018
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 (a) Explain your understanding on Darwin's theory of evolution.

(6 marks)

(b) As opposed to popular views during the time, Darwin hypothesized that species are not fixed entities. Describe this statement.

(4 marks)

Q2 (a) Differentiate the **THREE (3)** important principles proposed by Gregor Johann Mendel from his ground-breaking experiment with *Pisum sativum*.

(6 marks)

(b) Compare the concept of incomplete dominance, codominance and lethal alleles in organism and perform crossing experiment to prove the concept.

(15 marks)

(c) State **THREE (3)** inherited conditions/disease in humans that follows Mendelian genetics concept.

(3 marks)

(d) Demonstrate **THREE (3)** important consequences of Hardy-Weinberg principles in conservation genetics research.

(6 marks)

Q3 (a) Define effective population size.

(2 marks)

(b) Outline **FOUR (4)** different circumstances that can influence the effective population size. Demonstrate **ONE (1)** of the circumstances that you explained.

(6 marks)

(c) Explain the term 'genotype flow'.

(2 marks)

(d) Behaviour can evolve through natural selection. Identify **TWO (2)** categories of behaviour.

(2 marks)

(e) According to World Wildlife Fund (WWF), *Panthera pardus orientalis* (Amur Leopard) is a critically endangered species. Determine **FOUR (4)** conservation approaches that can be applied to this severely endangered species.

(8 marks)

Q4 (a) Restrictions or outright bans on the production of genetically modified organisms (GMOs) exist in many countries worldwide. Yet Malaysia has approved eight genetically modified (GM) maize/corn products and six GM soybean products for food, feed and processing purposes.

(i) Define GMO.

(2 marks)

(ii) Analyze whether GMO products are safe or harmful.

(10 marks)

(b) Referring to **Figure Q4 (b)**, predict the mode of inheritance and the most probable genotypes of each individual. Assume that the alleles A and a control the expression of the trait.

(8 marks)

Q5 (a) (i) Describe **TWO (2)** factors that make a species invasive.

(4 marks)

(ii) Determine **THREE (3)** threats of invasive species to ecology.

(6 marks)

(b) Explain the differences in the biological species concept and ecological species concept.

(4 marks)

(c) The Endangered Species Act (ESA) was enacted by Congress in 1973. Under the ESA, determine **THREE (3)** responsibilities of the federal government.

(6 marks)

- END OF QUESTIONS -

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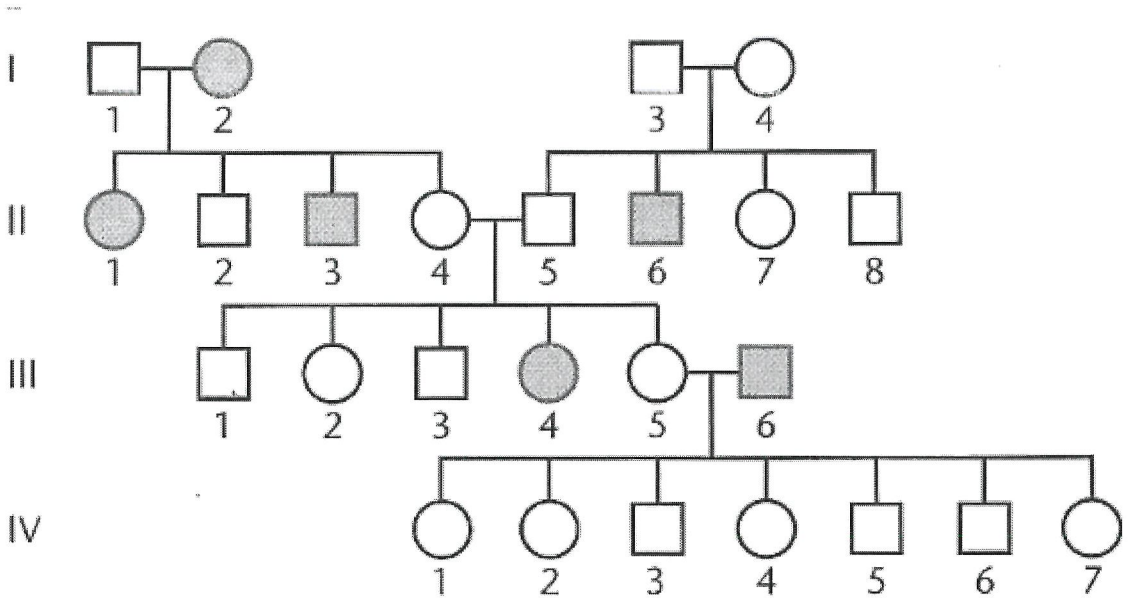

Figure Q4 (b)