



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2016/2017**

COURSE NAME : EVOLUTIONARY GENETICS & CONSERVATION

COURSE CODE : BWJ 20703

PROGRAMME CODE : BWW

EXAMINATION DATE : JUNE 2017

DURATION : 3 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS

**TERBUKA**

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

- Q1** (a) Discuss contribution of Russel Alfred Wallace in the field of evolution. (5 marks)
- (b) For many years, population geneticists based estimates of intraspecific diversity on phenotypic differences between individuals, such as different colors of seeds or flowers or variation in markings. DNA analysis is a more modern and direct molecular approach for detecting and quantifying genetic differences between individuals.
- (i) Demonstrate the genetic markers used in molecular study involving genetic diversity. (3 marks)
- (ii) Demonstrate the molecular form of genetic variations. (2 marks)
- (c) Outline the **THREE (3)** principles proposed by Gregor Mendel in his crossing experiments and propose a crossing experiment of your own to support each principle. (10 marks)
- Q2** (a) Demonstrate the effects of genetic drift on population, and how does it affect large and small populations? (5 marks)
- (b) Outline the **FOUR (4)** factors involves in determining effective population size. (4 marks)
- (c) Differentiate Founder effect from Bottleneck effect. (6 marks)
- (d) Hypothetically there is only 10 individuals of *Panthera tigris jacksonii* left in Peninsular Malaysia. Propose how can we conserve the genetic diversity of the species and at the same time ensure the sustainability of the populations for the next 50 years. (5 marks)
- TERBUKA**
- Q3** (a) State the most common spatial patterns described in Landscape Ecology. (5 marks)
- (b) (i) Identify **ONE (1)** effect of why a low amount of genetic diversity in a species is detrimental to the survival of that species. (2 marks)
- (ii) 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) Referring to **Figure Q4 (a)**, 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. (6 marks)
- (b) (i) Describe the concept of Life History Theory. (2 marks)  
(ii) Explain **TWO (2)** factors that involve in the Life History Theory analysis. (4 marks)
- (c) There are **TWO (2)** types of breeding structures. Compare these **TWO (2)** types by giving examples. (8 marks)
- Q5** (a) Define 'species'. (2 marks)
- (b) (i) Describe the concept of 'Population Variability Analysis (PVA)'. (2 marks)  
(ii) Demonstrate the application of PVA to the **THREE (3)** aspects of threatened species management. (6 marks)
- (c) (i) Determine **TWO (2)** factors that make a species invasive. (4 marks)  
(ii) Describe **THREE (3)** threats of invasive species to ecology. (6 marks)

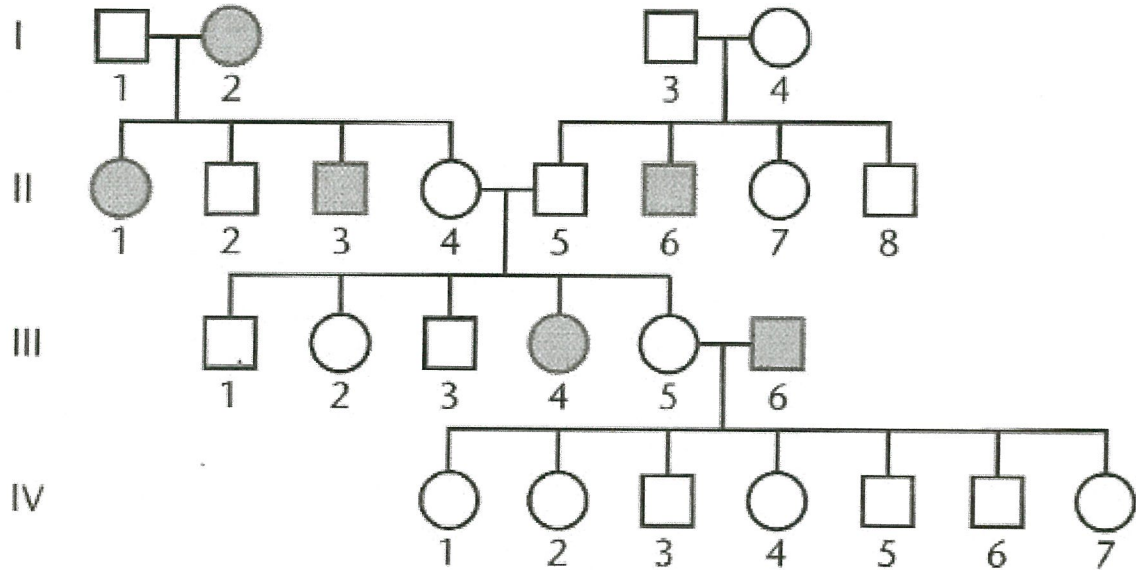
- END OF QUESTIONS -

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**Figure Q4 (a)**

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