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**UNIVERSITI SAINS MALAYSIA**

First Semester Examination  
2013/2014 Academic Session

December 2013 / January 2014

**BAT 215/3 – Ichthyology**  
***[Iktiologi]***

Duration: 3 hours  
*[Masa: 3 jam]*

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Please ensure that this examination paper contains **FOUR** printed pages before you begin the examination.

*[Sila pastikan bahawa kertas peperiksaan ini mengandungi **EMPAT** muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]*

**Instructions:** Answer **FIVE** (5) out of **SIX** (6) questions, in English or Bahasa Malaysia. Each question carries 20 marks.

**Arahan:** *Jawab **LIMA** (5) daripada **ENAM** (6) soalan yang diberikan dalam Bahasa Inggeris atau Bahasa Malaysia. Tiap-tiap soalan bernilai 20 markah.]*

In the event of any discrepancies, the English version shall be used.

*[Sekiranya terdapat sebarang percanggahan pada soalan peperiksaan, versi Bahasa Inggeris hendaklah digunapakai].*

1. [a] Describe diadromous, anadromous and catadromous fish.  
*[Huraikan ikan diadromus, anadromus dan katadromus.]*

(10 marks / 10 markah)

- [b] Describe the characteristics of whitefish, grayfish and blackfish.  
*[Huraikan ciri ikan putih, ikan kelabu dan ikan hitam.]*

(10 marks / 10 markah)

2. [a] Describe the mechanism of osmoregulation in :  
*[Huraikan mekanisme osmoregulasi dalam :]*

[i] Freshwater fish and  
*[Ikan air tawar dan]*

[ii] Marine fish.  
*[Ikan air laut.]*

(10 marks / 10 markah)

- [b] Explain the dissimilarities between the white and red muscle.  
*[Terangkan ketidaksamaan antara otot putih dan otot merah.]*

(10 marks / 10 markah)

3. [a] What are the differences between lamprey and hagfish ?  
*[Apakah perbezaan antara lamprey dan hagfish ?]*  
  
(10 marks / 10 markah)
- [b] Briefly describe the differences between pelagic and demersal fishes.  
*[Huraikan secara ringkas perbezaan antara ikan pelagik dan demersal.]*  
  
(10 marks / 10 markah)
4. Describe the methods of prey-capture in fish.  
*[Huraikan kaedah penangkapan mangsa oleh ikan.]*  
  
(20 marks / 20 markah)
5. Discuss the following topics.  
*[Bincangkan topik yang berkaitan.]*
- [a] Spawning types  
*[Jenis peneluran]*  
  
(5 marks / 5 markah)
- [b] Spawning capability types  
*[Jenis keupayaan peneluran]*  
  
(5 marks / 5 markah)

[c] Fecundity types  
*[Jenis fekunditi]*

(5 marks / 5 markah)

[d] Fish Oocyte development types  
*[Jenis perkembangan oosit ikan]*

(5 marks / 5 markah)

6. Discuss the importance of nasal organ in fish.  
*[Bincangkan kepentingan organ nasal pada ikan.]*

(20 marks / 20 markah)