
UNIVERSITI SAINS MALAYSIA

Kursus Semasa Cuti Panjang
Academic Session 2007/2008

Jun 2008

BOI 109/4 – Biostatistics
[Biostatistik]

Duration: 3 hours
[Masa : 3 jam]

Please ensure that this examination paper contains NINE printed pages and ELEVEN Appendixs before you begin the examination.

[Sila pastikan bahawa kertas peperiksaan ini mengandungi SEMBILAN muka surat dan SEBELAS Lampiran 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.]

1. A biology student has conducted an experiment on growth of catfish fries in concrete ponds in USM. The body weights (g) of the catfish after 4 months are as follows. Present these data in the form of a histogram. List five (5) most important conclusions or characteristics that can be derived from your histogram in relation to the population of the catfish in the ponds after 4 months.

157 165 200 167 200 185 192 173 174 176 160
203 209 185 163 190 170 174 164 201 181 182
185 169 183 156 168 172 180 170 175 182 175
178 193 183 159 194 191 165 165 196 192 166
150 149 162 189 195 172 166 202 171 190 160
189 177 161 180 177

(20 marks)

2. [a] Based on Question No. 1 above, conduct a suitable statistical analysis to show that the concrete ponds built by USM student are better than those built by officers in the Fisheries Department who managed to get an average of 169 g of catfish after the same period of time. $\alpha = 0.05$.

(11 marks)

- [b] What is the probability in having the weight of a catfish between:

[i] 135 -150 g

(3 marks)

[ii] 190 - 200 g

(3 marks)

[iii] 140 - 190 g

(3 marks)

3. Write an essay on sampling techniques, sizes and errors.

(20 marks)

4. A researcher is trying to investigate whether different feeding methods can affect the life span of the rats. She randomly assigned newborn rats to the three methods under study: (1) unlimited access of food, (2) 90% of the amount of food that a rat that size would normally eat, (3) 80% of the amount of food that a rat normally would eat. He maintained the rats on three modes of feeding throughout their lives and recorded their life spans (years). The data collected were tabulated below:

Unlimited	90% diet	80% diet
2.5	2.7	3.1
3.1	3.1	2.9
2.3	2.9	3.8
1.9	3.7	3.9
2.4	3.5	4.0

- [a] Analyze the data and conclude whether the different mode of feeding has affected the lifespan of the rats.

(12 marks)

- [b] Make a recommendation which feeding method would be suitable prolonging the life span of the rats.

(8 marks)