

ECON 2201A

Midterm Examination I

September 28, 2016

Duration: 1 hour and 20 minutes

Instructions: Calculators are permitted. Please answer all the questions and write the exam **in pen ONLY!** This question paper has **2** pages.

Good Luck!

1. (20 Marks) The company for which you work wishes to determine the percentage of Internet sales made by the companies with which it competes. You are assigned this task. You are deciding between two survey questions to use:
 - (1) List the percentage of your sales obtained through the Internet; or
 - (2) The percentage of your sales obtained through the Internet is (1) 0 – 10, (2) 11 – 20, . . . , (10) 91 – 100, where 0 – 10 means the percentage is between 0 and 10, and so on for other 9 categories.
 - (a) (5 Marks) State the level of measurement the responses would be to each of these survey questions.
 - (b) (5 Marks) State whether each survey question's responses would be qualitative or quantitative.
 - (c) (10 Marks) Which of these two survey questions would allow you to calculate the average percent of sales obtained through the Internet?
2. (20 Marks) The Fishing Bureau has contracted with a university biologist to study the length of walleyes (fish) caught in some lakes. The biologist collected data on a sample of **1000 fish** caught and developed the following relative frequency distribution

Class Length (inches)	Relative Frequency f_i
8 to less than 10	0.22
10 to less than 12	0.15
12 to less than 14	0.25
14 to less than 16	0.24
16 to less than 18	0.06
18 to less than 20	0.05
20 to less than 22	0.03

- (a) (10 Marks) Construct a frequency distribution from this relative frequency distribution and then produce a histogram based on the frequency distribution.
- (b) (10 Marks) Construct a pie chart from the relative frequency distribution. Discuss which of the two graphs, the pie chart or the histogram, you think is more effective in presenting the fish length data.
3. (30 Marks) It is well known that there are, at least, three numerical measures of the center for a set of data:

Mean, Median, and Mode.

- (a) (10 Marks) Define the three terms **in words** clearly. (Hint: The detailed procedure for calculating each of them is not necessary!)
- (b) (20 Marks) Explain in detail which one of the above three measures should be used for each of the following cases:
- i. (8 Marks) An instructor of Course ECON 9999 determines the overall grade from all the midterm exams and final exam;
 - ii. (8 Marks) A family is considering to immigrate either to US or Canada based on the information of all the family incomes of the two countries; and
 - iii. (4 Marks) A manager of shoe store wants to know what the most frequently occurring size of shoes the customers would like to buy.
4. (30 marks) One company builds many homes in Ottawa every year. In planning for each job, the manager of the company needs some idea about the direct labor hours required to build a home. To do this, the manager has collected sample information on the labor hours for 10 jobs during the past years:

645 802 791 651 653 542 418 695 552 575

- (a) (5 marks) Find the mean for this sample and explain what it represents.
- (b) (5 marks) Find the standard deviation for this sample.
- (c) (5 marks) Find the median for this sample.
- (d) (15 marks) The manager wishes to be able to finish at least 75% of the houses he contracts to build within two weeks. Each of his workers works 40 hours a week. If the manager asks you to determine the number of workers, how many workers he should hire? (Hint: The data are not assumed to be **bell** shaped.)