UNIVERSITAS INDONESIA
FACULTY OF ECONOMICS AND BUSINESS

MidtermExam
First Semester 2018/2019

Subject : **Statistics for Economics and Business (ECEU601200)**
Date : **Saturday, October 20, 2018**
Time : **150 minutes**

Note: You may use calculator.
The use of cellular phone for calculator is strictly prohibited.
Theexam is divided into four problems with similar contribution to the total mark.
Figures in bold and italic at the end of questions are the mark for each answer.

Problem A.

A Sample of 12 houses sold last month in Depok, revealed the following information :

No	House Size (in square meter)	House Selling Price (Billion Rupiah)
1	140	1.50
2	130	1.65
3	120	1.58
4	110	1.80
5	140	1.20
6	100	1.58
7	130	1.65
8	80	1.28
9	120	1.58
10	90	1.13
11	110	1.05
12	110	1.43
Mean	115.00	1.45
Median	112.92	1.45
Standard Deviation	111.49	1.43

Based on the data and the statistic in the table above, answer the following questions:

a. Perform an analysis of house sizes and selling prices by comparing the mean and median of both variables! Which data has a symmetrical distribution and which are asymmetrical in distribution? **(8 points)**

b. From the statistics given in the table above, can you conclude which data is more varied, the size or the price of the house? What statistics do you use to draw these conclusions? **(9 points)**

c. If you want to analyze descriptively the relationship between the size and the price of the house, what kind of graph that you should use to analyze it? Draw the graph and draw a conclusion! **(8 points)**

Problem B.

In monitoring national inflation rate, the government observes price movement of several basic foods especially at wholesale markets. Central Bureau of Statistic (CBS) has surveyed and collected data of several basic foods routinely for several years, as follow:

Price and Quantity of Basic Foods at PasarKramatJati (in Rp and 000 kg)

Year		Rice	Sugar Cane	Egg
2014	Price	6,000	11,300	17,800
	Quantity	116	24	6
2015	Price	6,400	11,450	18,500
	Quantity	118	22	8
2016	Price	6,850	12,000	19,000
	Quantity	210	21	10
2017	Price	7,650	12,100	22,250
	Quantity	215	25	12

Based on the data:

1. CBS calculates **Price Index** in monitoring the movement of prices of those basic foods. Explain what does it means by Price Index. **(4 points)**
2. Calculate Price Index of each commodity with 2014 as base year. Give explanation of your the results. **(4 points)**
3. CBS also calculates weighted index using Laspeyres and Paasche methods. Explain what is (are) the difference(s) between the two and which method is better to be used? Explain why. **(5 points)**
4. Calculate the Price Index using Laspeyres method year 2014 as the base year. **(8 points)**
5. Calculate the inflation rate based on Consumer Price Index. **(4 points)**

Problem C.

An analyst thinks that next year there is a 10% chance that the world economy will be good, a 40% chance that it will be neutral, and a 50% chance that it will be poor. (S)he also predicts probabilities that a firm will be good, neutral, or poor for each of the economic states of the world economy. The following table presents probabilities for three states of the world economy and the corresponding conditional probabilities for the firm.

State of the World Economy	Probability of State	Performance of the firm	Conditional Probability of the firm
Good	0.10	Good	0.7
		Neutral	0.2
		Poor	0.1
Neutral	0.40	Good	0.3
		Neutral	0.5
		Poor	0.2
Poor	0.50	Good	0.1
		Neutral	0.3
		Poor	0.6

1. Explain what is joint probability! What is the joint probability for events that are mutually exclusive? **(4 points)**
2. Answer the following questions according to the information above:
   (i) What is the probability that the performance of the world economy will be neutral and that of the firm will be poor? **(3 Points)**
   (ii) What is the probability that the performance of the firm will be poor? **(5 Points)**
   (iii) The performance of the firm was poor. What is the probability that the performance of the world economy had also been poor? **(5 Points)**
3. Explain the differences between dependent and independent events **(4 Points)** and explain whether "Poor Economic State" event and "Poor firm performance" event are dependent or independent **(4 Points)**!

Problem D.

1. The Dean of Kartini University estimated the distribution of student admissions for the year 2018/2019 on the basis of past experience.

Admissions	Probability
1000	0.6
1200	0.3
1500	0.1

   a. What is the expected number of admissions in that year? **(4 Points)**
   b. Find the standard deviation of the number of admissions. **(4 Points)**

2. Another recent survey initiated by the Dean of Kartini University revealed that 23 percent of students have already read the textbook before the lecture. Suppose we select a sample of 15 students.

   a. What is the probability two students have the textbook? **(6 Points)**

   b. What is the probability less than 4 students have read the textbook? **(6 Points)**

   c. How many students would you expect to have read the textbook? **(5 Points)**

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Key Formulas :

$$\bar{x} = \frac{\sum x_i}{n} \; ; \; \bar{x} = \frac{\sum m_i f_i}{n} \; ; \; \mu = \frac{\sum x_i}{N} \; ; \; \mu = \frac{\sum m_i f_i}{N}$$

$$s^2 = \frac{\sum (x_i - \bar{x})^2}{n-1} \; ; \; s^2 = \frac{\sum (m_i - \bar{x})^2 f_i}{n-1} \; ; \; \sigma^2 = \frac{\sum (x_i - \mu)^2}{N} \; ; \; \sigma^2 = \frac{\sum (m_i - \mu)^2 f_i}{N}$$

$$P(B_i \mid A) = \frac{P(A \mid B_i) P(B_i)}{P(A \mid B_1) P(B_1) + P(A \mid B_2) P(B_2) + \text{L} \; + P(A \mid B_n) P(B_n)}$$

$$E(X) = \mu = \sum x_i P(X = x_i) \; ; \; Var(X) = \sigma^2 = \sum \left[(x_i - \mu)^2 P(X = x_i) \right]$$

$$P(X = x) = \binom{n}{x} p^x q^{n-x} \; ; \; E(X) = \mu_X = np \; ; \; Var(X) = \sigma^2 = npq$$