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MAIN EXAMINATION

JANUARY – APRIL 2018 TRIMESTER

FACULTY OF ARTS AND SOCIAL SCIENCES

DEPARTMENT OF SOCIAL SCIENCES

REGULAR PROGRAMME

ECN 301: ECONOMIC STATISTICS II

Date: APRIL 2018	Duration: 2 Hours
INSTRUCTIONS: Answer Question ONE and any other TWO Questions	

Q1. a) John sells new cars for Pelican ford. John usually sells the largest number of cars on Saturday. He has developed the following probability distribution for the number of cars he expects to sell on a particular Saturday.

Number of cars Sold (x)	Probability P(x)
0	0.1
1	0.2
2	0.3
3	0.3
4	0.1

   i)   What type of probability distribution is this?   **(2 marks)**
   ii)   On a typical Saturday, how many cars does John expect to sell?
                                                              (4 marks)
   iii) What is the variance of the distribution?   **(6 marks)**

   b) Suppose a coin is tossed 10 times. What is the probability that there will be three tails?   **(4 marks)**

   c) Sales personnel make a sale to 10% of the customers on whom they call. If a member of the sales team call on 15 customers today. What is the probability he or she will sell:
       i)   Exactly 2 products   **(3 marks)**
       ii)   At most 2 products   **(3 marks)**

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iii)   At least 3 products **(3 marks)**

d)   Simple observations for the last 80 hours has shown that 800 customers enter a certain bank. What is the probability 5 customer will arrive at the bank in the next 1 hour? **(5marks)**

Q2.   a)   Explain four characteristics of the normal probability distribution. **(8 marks)**

b)   The weekly incomes of shift foremen in the glass industry follow the normal probability distribution with a mean of $1,000 and a standard deviation of $100. What is the z-value for the income, let's call it x, of a foreman who earns $1,100 per week? For a foreman who earns $900 per week? **(6 marks)**

c)   i)   What is hypothesis testing? **(1 mark)**

        ii)   Outline the five step procedure for testing a hypothesis? **(5 marks)**

Q3.   a)   Samuel industries have seven production employees (considered the population). The hourly earnings of each employee are given below.

Employee	Hourly earnings ($)
Joe	7
Sam	7
Sue	8
Bob	8
Jan	7
Art	8
Ted	9

        i)   What is the population mean? **(3 marks)**
        ii)   What is the sampling distribution of the sample mean for samples of size 2? **(10 marks)**
        iii)   What is the mean of the sampling distribution? **(3 marks)**

b)   Explain the two types of errors that can occur in a test of hypothesis. **(4 marks)**

Q4.   Births in a hospital occur randomly at an average rate of 1.8 births per hour.
        i)   What is the probability of observing 4 births in a given hour at the hospital? **(6marks)**

        ii)   What is the probability of observing more than or equal to 2 births in a given hour at the hospital? **(8marks)**

        iv)   Explain the three approaches to probability **(6marks)**

Q5.   i)   Explain the characteristics of student 't' probability distribution **(8marks)**

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ii)   Explain the four qualities of a good estimator   **(8 marks)**

iii)   Define a confidence interval   **(4marks)**

END

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