Course No: TEC 1307 **Course Title: Statistics** **Date: 28 / 05 / 2014** **No. of Questions: 4 Questions** **Time: 120 Minutes** **Using Calculator (YES)**	**University of Palestine** **Final Exam** **2nd semester 2013/2014** **Total Grade: 60**	**Instructor Name: Mr.Ahmed Al Astal** **Student No.: _____** **Student Name: _____** **College Name: IT** **Using Dictionary (No)**

First Question	No. of Branches (1)	(16/50)

Q1 B1 **(16/16)**

Choose the best Answer:

1) The experiment of tossing a coin 3 times has:
   A) 2 outcomes B) 8 outcomes C) 6 outcomes D) 5 outcomes

2) You randomly select two households and observe whether or not they own a telephone answering machine. Which of the following is a simple event?
   A) Exactly one of them owns a telephone answering machine.
   B) At least one of them owns a telephone answering machine.
   C) At most one of them owns a telephone answering machine.
   D) Neither of the two owns a telephone answering machine.

3) You select one person from a group of eight males and two females. The two events "a male is selected" and "a female is selected" are:
   A) independent C) not equally likely
   B) equally likely D) collectively exhaustive

4) Two mutually exclusive events:
   A) always occur together
   B) can sometimes occur together
   C) cannot occur together
   D) can occur together, provided one has already occurred

Use the following to answer questions 5-7 :

The following table gives the two-way classification of 500 students based on sex and whether or not they suffer from math anxiety.

	Suffer From Math Anxiety	
Sex	**Yes**	**No**
Male	167	73
Female	168	92

5) If you randomly select one student from these 500 students, the probability that this selected student is a female is _____?

6) If you randomly select one student from these 500 students, the probability that this selected student suffers from math anxiety, given that he is a male is_____?

7) Which of the following pairs of events are mutually exclusive:
   A) Female and male C) Male and no
   B) Female and no D) Female and yes

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8) In a class of 49 students, 11 are math majors. The teacher selects two students at random from this class. The probability (to three decimal places) that both of them are math majors is _____?

9) The probability that an adult possesses a credit card is 0.71. A researcher selects two adults at random. The probability (rounded to three decimal places) that the first adult possesses a credit card and the second adult does not possess a credit card is _____?

10) The probability that a person is a college graduate is 0.40 and that he/she has high blood pressure is 0.18. Assuming that these two events are independent, the probability (to four decimal places) that a person selected at random is a college graduate or has high blood pressure is _____?

11) For the probability distribution of a discrete random variable x, the sum of the probabilities of all values of x must be
A) equal to zero B) in the range zero to 1 C) equal to 0.5 D) equal to 1

12) Which of the following is an example of a binomial experiment?
A) Rolling a die 10 times and observing for a number
B) Selecting five persons and observing whether they are in favor of an issue, against it, or have no opinion
C) Tossing a coin 20 times and observing for a head or tail
D) Drawing three marbles from a box that contains red, blue, and yellow marbles

13) The probability that a continuous random variable x assumes a single value is always:
A) less than 1 B) greater than zero C) equal to zero D) between zero and 1

14) Which of the following is not a characteristic of the normal distribution?
A) The total area under the curve is 1.0
B) The curve is symmetric about the mean
C) The value of the mean is always greater than the value of the standard deviation
D) The two tails of the curve extend indefinitely

15) Let x have a normal distribution with a mean of 49.2 and a standard deviation of 4.90. The z value for x = 56.05, rounded to two decimal places, is:_____?

16) For a normal curve, changing the mean from 35 to 46 will cause the curve to shift
A) to the left. B) to the right. C) up. D) down.

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Second Question **No. of Branches (3)** **(15/60)**

Q2 B1 **(6/15)**

A consumer agency randomly selected 1700 flights for two major airlines, A and B. The following table gives the two-way classification of these flights based on airline and arrival time. Note that "less than 30 minutes late" includes flights that arrived early or on time.

	Less Than 30 Minutes Late	30 Minutes to 1 Hour Late	More Than 1 Hour Late
Airline A	429	390	92
Airline B	393	316	80

If one flight is selected at random from these 1700 flights, find the following probabilities.

a. P(more than 1 hour late or airline A)

b. P(airline B or less than 30 minutes late)

c. P(airline A or airline B)

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Q2 B2 **(3/15)**

The probability that a randomly selected elementary or secondary school teacher from a city is a female is 0.68, holds a second job is 0.38, and is a female and holds a second job is 0.29. Find the probability that an elementary or secondary school teacher selected at random from this city is a female or holds a second job.

Q2 B3 **(6/15)**

A certain state's auto license plates have three letters of the alphabet followed by a three-digit number.

a. How many different license plates are possible if all three-letter sequences are permitted and any number from 000 to 999 is allowed?

b. Arnold witnessed a hit-and-run accident. He knows that the first letter on the license plate of the offender's car was a B, that the second letter was an O or a Q, and that the last number was a 5. How many of this state's license plates fit this description?

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Third Question **No. of Branches (5)** **(21/60)**

Q3 B1 **(5/21)**

Let x be the number of emergency root canal surgeries performed by Dr. Sharp on a given Monday. The following table lists the probability distribution of x

x	0	1	2	3	4	5
$P(x)$	.13	.28	.30	.17	.08	.04

Draw a graph of this distribution and then Calculate the mean and standard deviation of x.

Q3 B2 **(4/21)**

According to a survey, 60% of adults believe that all college students should be required to perform a specified number of hours of community service to graduate. Assume that this percentage is true for the current population of all adults.

Find the probability that the number of adults in a random sample of 12 who hold this view is less than 3.

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Q3 B3 **(4/21)**

20 corporations were asked whether or not they provide retirement benefits to their employees. 14 of the corporations said they do provide retirement benefits to their employees, and 6 said they do not. Five corporations are randomly selected from these 20.

Find the probability that at most one of them provides retirement benefits to employees.

Q3 B4 **(4/21)**

The student health center at a university treats an average of 7 cases of mononucleosis per day during the week of final examinations.

Using the appropriate formula, find the probability that on a given day during the finals week exactly four cases of mononucleosis will be treated at this health center.

Q3 B5 **(4/21)**

A company employs a total of 16 workers. The management has asked these employees to select 2workers who will negotiate a new contract with management. The employees have decided to select the 2 workers randomly.

a. How many total selections are possible?
b. Considering that the order of selection is important, find the number of permutations.

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Fourth Question **No. of Branches (2)** **(8/60)**

Q4 B1 **(4/8)**

A machine at Kasem Steel Corporation makes iron rods that are supposed to be 50 inches long. However, the machine does not make all rods of exactly the same length. It is known that the probability distribution of the lengths of rods made on this machine is normal with a mean of 50 inches and a standard deviation of .06 inch. The rods that are either shorter than 49.85 inches or longer than 50.15 inches are discarded. What percentage of the rods made on this machine are discarded?

Q4 B2 **(4/8)**

The print on the package of 100-watt General Electric soft-white lightbulbs states that these bulbs have an average life of 750 hours. Assume that the lives of all such bulbs have a normal distribution with a mean of 750 hours and a standard deviation of 50 hours.

Let x be the life of such a lightbulb. Find x so that only 2.5% of such lightbulbs have lives longer than this value.