Spring 2015 <u>**FORM A**</u> **Name Last:**_____ **First:** _____

Exam 1: Chapters 1, 2, 3   **Class Time:**_____

Directions:
- Print your **NAME** and **CLASS TIME** on **THIS EXAM**
- Print your **NAME** and **CLASS TIME** on your **SCANTRON**.
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- Each question has exactly one BEST answer. There are 21 questions.
- You may write on this exam. There is no scratch paper allowed.
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<u>**Questions 1 -2 refer to the following:**</u>
Two student reporters for a college newspaper are conducting a survey for an article about whether instructors require students to use online homework software.
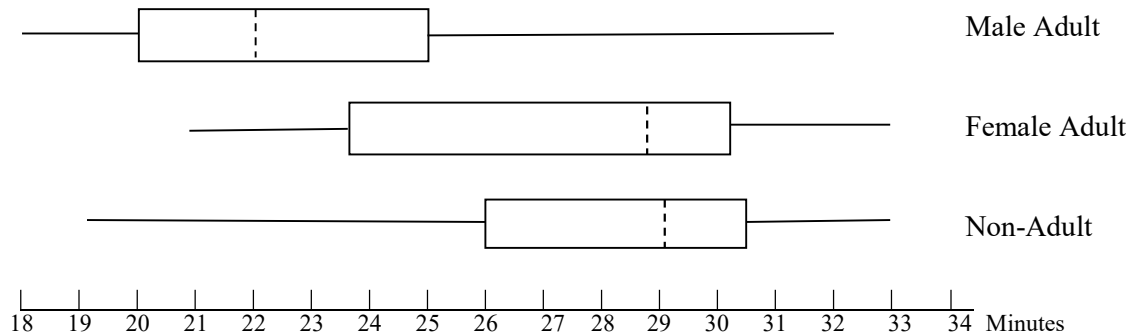
1. Ada lists all the buildings on campus that contain professors' offices and then randomly selects 5 buildings. She interviews every professor with an office in each of the selected buildings. Name the sampling method used.

    A. Simple Random   B. Cluster   C. Systematic   D. Stratified

2. Binh lists all the departments in the school and then randomly selects 20% of the professors from each department. Name the sampling method used.

    A. Simple Random   B. Cluster   C. Systematic   D. Stratified

3. A realtor is interested in the average monthly rent of all two-bedroom apartments in Cupertino. Which sample is most likely to be representative of the population?

    A. He collects data for the first 25 two-bedroom apartments he finds that are listed for rent in Cupertino on the internet.

    B. He collects data from all two-bedroom apartments in Cupertino whose landlords contact his rental agency to help rent out their apartments.

    C. He collects data by randomly selecting two-bedroom apartments in Cupertino from each of several different types of sources for apartment rental information.

    D. He drives around the neighborhood near his home in Cupertino, randomly stopping into buildings with "Apartment for Rent Available" signs.

Questions 4 -6 refer to the following:

Data based on information from "Table 28. (2014) Unemployed persons by reason for unemployment, race, and Hispanic or Latino ethnicity"; Bureau of Labor Statistics Labor Force Statistics Current Population Survey http://www.bls.gov/cps/cpsaat28.htm

The contingency table displays data for unemployed people currently seeking a job, categorized according to the reason for being unemployed and by ethnicity.

Ethnicity \ Reason	White (W)	Black (B)	Asian (A)	Hispanic (H)	TOTAL
Lost Previous Job (L)	343	101	20	94	558
Voluntarily Left Previous Job (V)	59	15	4	14	92
Re-entering Job Market (R)	184	71	13	56	324
New Job Seeker (N)	66	29	7	24	126
TOTAL	652	216	44	188	1,100

Suppose a person was randomly selected from among those included in the survey:

4. Find the probability that the person is Hispanic, GIVEN THAT he/she Voluntarily left his/her job

A. $\dfrac{188}{1100}$ B. $\dfrac{14}{188}$ C. $\dfrac{14}{92}$ D. $\dfrac{14}{1100}$

5. Find the probability that the person is Asian OR a New job seeker

A. $\dfrac{7}{1100}$ B. $\dfrac{163}{1100}$ C. $\dfrac{170}{1100}$ D. $\dfrac{7}{170}$

6. Which of the following is true about the events "Hispanic" and "Voluntarily Left Previous Job"?

    A. H and V are independent events
    B. H and V are mutually exclusive events
    C. H and V are independent and mutually exclusive
    D. H and V are not independent and not mutually exclusive

Questions 7 - 8 refer to the following:

Shoe & Luggage Outlet (SLO, Inc.)sells shoes and luggage both in their stores and on their website.
    45% of customers make their purchases on the website
    Overall, 23% of customers purchase luggage
    Of customers who purchase on the website, 32% purchase luggage.

    Events: W = shopper purchases on the website   L= shoppers purchases luggage

7. Find the probability that a shopper buys luggage and makes her purchase on the website.

  A. 0.144   B. 0.1035   C 0.0736   D 0.36

8. Find the probability that a shopper purchases on the website given that she buys luggage.

  A. 0.32   B. 0.45   C 0.1636   D 0.6261

A charity held a 5K family race as a fundraiser.
Racers are divided into 3 categories: Male adult, Female adult, and Non-Adult (under age 18).
The boxplots below represent the finish times, in minutes, for participants in the race.

9. Which data set is skewed to the **left**?

    A. Male Adult   B. Female Adult   C.Non-Adult   D. None

10. **Use the top boxplot** of Male Adult finish times: Which interval contains the most data?

    A. 18 to 20 minutes   B. 23-25 minutes   C. 25-30minutes

    D.   The graph does not give enough information to determine this.

11. What type of data is represented by the finish times for the race?

    A. Qualitative   B. Quantitative Discrete   C.Quantitative Continuous   D. Nominal

12. Assad, Gerardo and Tran compared how many hours they spent on campus each week,
    for a sample of eight weeks. Using the most appropriate measure of variation of data,
    who had the most variation in the hours per week spent on campus?

	$\bar{x}$	s	min	max
Assad	26	2.5	20	32
Gerardo	25	2.8	20	30
Tran	30	2.3	26	34

    A. Assad   B. Gerardo   C. Tran

    D. Can not determine because we are not given all the data values

13. Bart, Cal and Dave commute to work every day. Each commutes by a different method.
This morning they all encountered faster than usual conditions (faster commutes have shorter times).
The table shows their commute times today and their mean commute time and the standard deviation.

Name	Commute Method	Today's Commute Time (minutes)	Mean Commute Time (minutes)	Standard Deviation
Bart	BART	24	30	4
Cal	CalTrain	34	40	3
Dave	Drive	15	20	5

Whose commute time today is relatively fastest in comparison to his usual commute time?

   A. Both Bart and Cal   B. Bart   C. Cal   D. Dave

Questions 14 - 17 refer to the following:
A random sample of 50 students enrolled in a distance learning classes at a community college
were asked the total number of distance learning credit units they had ever taken at the school.

Number of Distance Learning credit units	Frequency	Relative Frequency	Cumulative Relative Frequency
4	6	0.12	0.12
5	9	0.18	0.30
8	6	0.12	0.42
9	110	0.20	0?.62
10	7?	?8	0?.76
12	4	0.0?8	0.84
16	6	0.1?2	0.96
20	2	0.04	1.00

14. The cumulative relative frequency for 10 distance learning credit units is:

   A. 0.76   B. 0.75   C. 0.62   D. 0.14

15. What data value represents the 20th percentile for the number of distance learning credit
   units taken by the students in this sample?

   A. 5   B. 8   C. 9   D. 20

16. The third (upper) quartile is 10. The most appropriate interpretation of the third quartile is

   A. 75% of students surveyed have taken 10 credit units of distance learning classes

   B. 25% of students surveyed have taken 10 or fewer credit units of distance learning classes

   C. 75% of students surveyed have taken 10 or fewer credit units of distance learning classes

   D. One third of all students have taken (3/4)(10) = 7.5 credit units of distance learning classes.

17. The average number of distance learning credit units for all students at this college is a

   A. Variable   B. Statistic   C. Data   D.   Parameter

Questions 18 - 19 refer to the following:

A researcher was studying the number of puppies in a litter for one particular breed of dog.

(A litter is the group of puppies born at the same time to one mother.)

The table shows the data for number of puppies born in a litter for a random sample of 22 litters

Number of Puppies in the Litter	Frequency
2	1
3	3
4	6
5	7
6	3
9	2

18. Find the mean and appropriate standard deviation:

   A. mean = 4.82, , standard deviation =1.67   B. mean = 4.82, standard deviation =1.71

   C. mean = 4.83, standard deviation =2.48   D. mean = 3.67, standard deviation =2.34

19. Are any of the litter sizes potential outliers?

     A. Litter sizes of 2, 3, 9 are potential outliers
     B. Litter sizes of 2, 9 are potential outliers
     C. Litter size of 2 is the only potential outlier
     D. Litter size of 9 is the only potential outlier

Questions 20 - 21 refer to the following: Based on Women in STEM: A Gender Gap to Innovation: 2011
http://www.esa.doc.gov/sites/default/files/womeninstemagaptoinnovation8311.pdf

A study examined people with jobs in STEM fields *(science, technology, engineering, &mathematics)*
It compared males and females and it compared people with science jobs *(physical & biological sciences)*
and with tech jobs *(computer science, mathematics, engineering)*

For people with STEM jobs included in the study:
   27 % of jobs are held by females.
   Of the females: 60% have jobs in science and 40% have jobs in tech
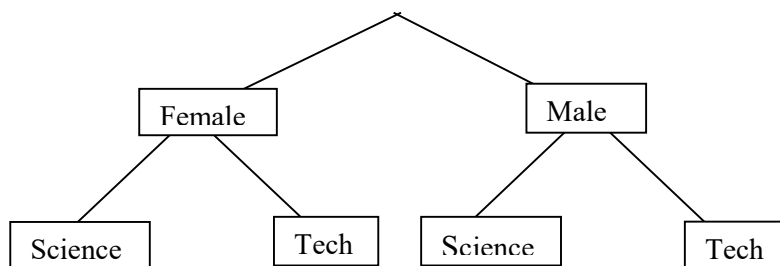   Of the males: 30% have jobs in science, while the rest of the males have jobs in tech.

20. 0.30 in the information above represents which probability?

   A. P(Science Job or Male)   B. P(Science Job and Male)

   C. P(Male | Science Job)   D. P(Science Job | Male)

21. Find the probability that a person in this study is employed in a science job.

   A. 0.381   B. 0.90   C. 0.18   D.   0.462

   Hint: use a tree diagram

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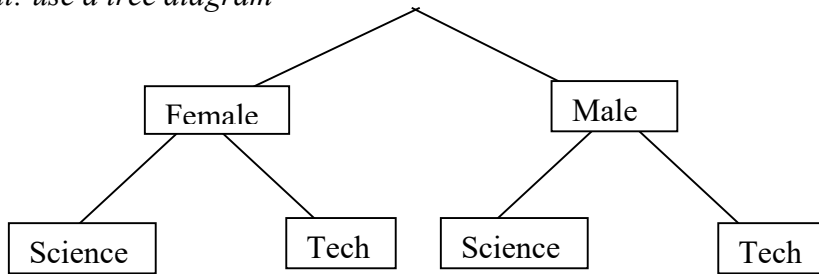   Of the males: 30% have jobs in science, while the rest of the males have jobs in tech.

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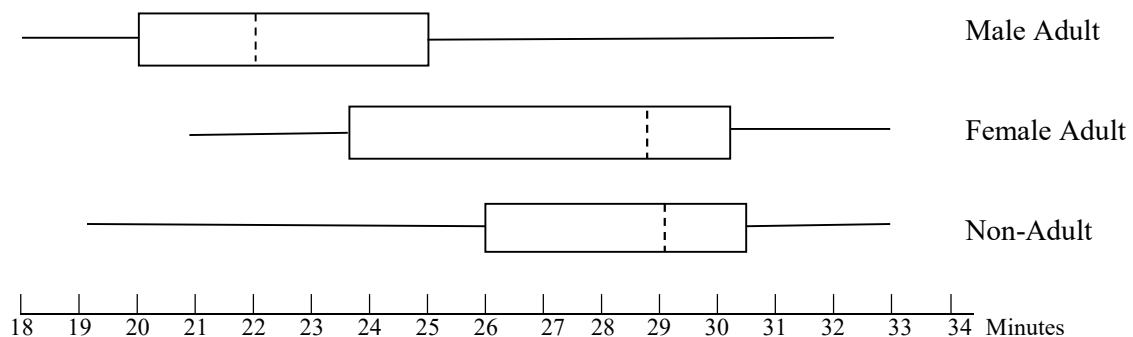
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	Form A	Form B
1	B	C
2	D	B
3	C	D
4	C	A
5	B	C
6	D	A
7	A	D
8	D	B
9	C	D
10	A	D
11	C	A
12	B	C
13	C	C
14	A	A
15	A	D
16	C	B
17	D	B
18	B	B
19	B	A
20	D	C
21	A	C