Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

1) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Would this be an application of descriptive or inferential statistics? 1) _____
   A) Inferential statistics B) Descriptive statistics

2) An assembly line is operating satisfactorily if fewer than 4% of the phones produced per day are defective. To check the quality of a day's production, the company randomly samples 50 phones from a day's production to test for defects. Define the population of interest to the manufacturer. 2) _____
   A) the 50 phones sampled and tested
   B) all the phones produced during the day in question
   C) the 50 responses: defective or not defective
   D) the 4% of the phones that are defective

3) As part of an economics class project, students were asked to randomly select 500 New Your Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the variable of interest for this study. 3) _____
   A) the entire set of stocks that are traded on the NYSE
   B) the current price (or closing price) of a NYSE stock
   C) a single stock traded on the NYSE
   D) the 500 NYSE stocks that current prices were collected from

4) Which data about paintings would *not* be qualitative? 4) _____
   A) the value B) the style C) the theme D) the artist

5) What method of data collection would you use to collect data for a study where a drug was given to 40 patients and a placebo to another group of 40 patients to determine if the drug has an effect on a patient's illness? 5) _____
   A) designed experiment B) observational study
   C) published source D) survey

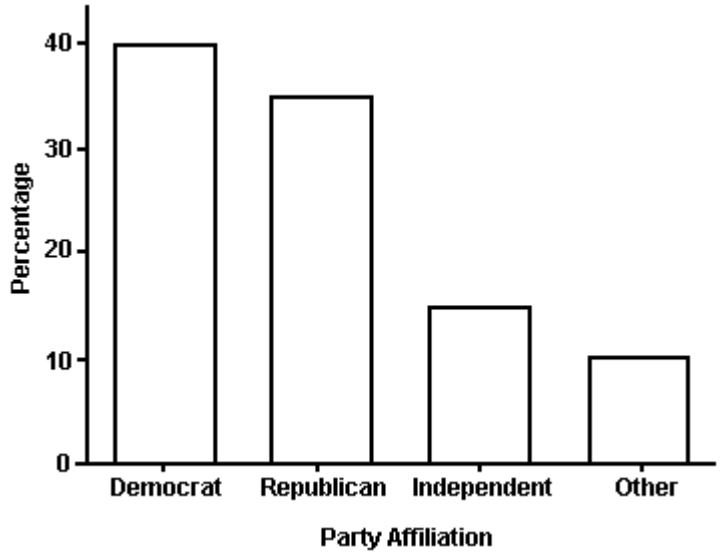
6) A university was interested in student reaction to a proposal to spend more on athletic scholarships and less on academic scholarships. 35 student athletes were surveyed. What type of problem has occurred? 6) _____
   A) nonresponse bias B) measurement error C) selection bias

7) What number is missing from the table? 7) _____

Year in College	Frequency	Relative Frequency
Freshman	600	.30
Sophomore	560	.28
Junior		.22
Senior	400	.20

A) 220 B) 440 C) 480 D) 520

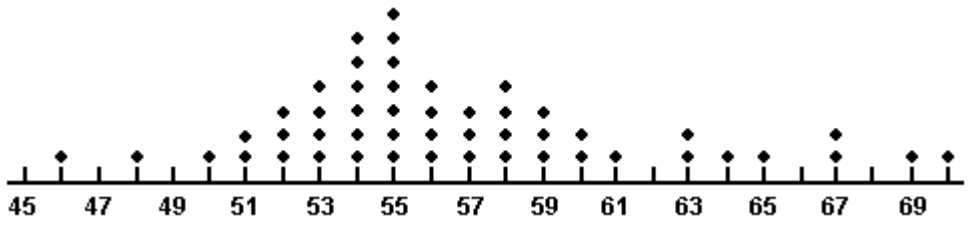
8) 8) _____



The bar graph shows the political affiliation of 1000 registered U.S. voters. What percentage of the voters belonged to one of the traditional two parties (Democratic or Republican)?

A) 35% B) 75% C) 40% D) 25%

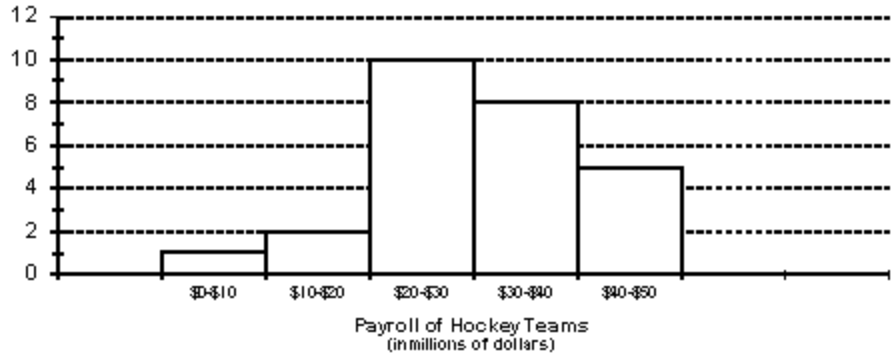
9) A dot plot of the speeds of a sample of 50 cars passing a policeman with a radar gun is shown below. 9) _____



What proportion of the motorists were driving above the posted speed limit of 65 miles per hour?

A) 1 B) 0.08 C) 0.02 D) 0.10

10) The payroll amounts for all teams in an international hockey league are shown below using a graphical technique from chapter 2 of the text. How many of the hockey team payrolls exceeded $20 million (Note: Assume that no payroll was exactly $20 million)? 10) _____



A) 10 teams B) 18 teams C) 8 teams D) 23 teams

11) The amount spent on textbooks for the fall term was recorded for a sample of five university students – $400, $350, $600, $525, and $450. Calculate the value of the sample mean for the data. 11) _____

A) $400 B) $450 C) $600 D) $465

12) The amount spent on textbooks for the fall term was recorded for a sample of five university students – $400, $350, $600, $525, and $450. Calculate the value of the sample median for the data. 12) _____

A) $450 B) $600 C) $465 D) $400

13) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 99 miles per hour. Suppose that the statistician indicated that the serve speed distribution was skewed to the left. Which of the following values is most likely the value of the median serve speed? 13) _____

A) 99 mph B) 104 mph C) 89 mph D) 94 mph

14) The top speeds for a sample of five new automobiles are listed below. Calculate the standard deviation of the speeds. Round to four decimal places. 14) _____

115, 185, 170, 175, 145

A) 148.21 B) 178.7750 C) 28.1957 D) 251.4060

15) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 101 miles per hour (mph) and the standard deviation of the serve speeds was 14 mph. Assume that the statistician also gave us the information that the distribution of the serve speeds was mound–shaped and symmetric. What proportion of the player's serves was between 129 mph and 143 mph? 15) _____

A) 0.0235 B) 143 C) 0.047 D) 0.997

16) By law, a box of cereal labeled as containing 24 ounces must contain at least 24 ounces of cereal. The machine filling the boxes produces a distribution of fill weights with a mean equal to the setting on the machine and with a standard deviation equal to 0.03 ounce. To ensure that most of the boxes contain at least 24 ounces, the machine is set so that the mean fill per box is 24.09 ounces. Assuming nothing is known about the shape of the distribution, what can be said about the proportion of cereal boxes that contain less than 24 ounces. 16) _____

A) The proportion is at most 5.5%.
B) The proportion is at least 89%.
C) The proportion is at most 11%.
D) The proportion is less than 2.5%.

17) A radio station claims that the amount of advertising each hour has a mean of 16 minutes and a standard deviation of 1.6 minutes. You listen to the radio station for 1 hour and observe that the amount of advertising time is 17 minutes. Calculate the z-score for this amount of advertising time. 17) _____

A) $z = -0.62$ B) $z = 0.96$ C) $z = 1.6$ D) $z = 0.63$

18) The test scores of 30 students are listed below. Which number could be the 30th percentile? 18) _____

31	41	45	48	52	55	56	56	63	65
67	67	69	70	70	74	75	78	79	79
80	81	83	85	85	87	90	92	95	99

A) 56 B) 90 C) 64 D) 67

19) A hospital reports that two patients have been admitted who have contracted Crohn's disease. Suppose our experiment consists of observing whether each patient survives or dies as a result of the disease. The simple events and probabilities of their occurrences are shown in the table (where *S* in the first position means that patient 1 survives, *D* in the first position means that patient 1 dies, etc.). 19) _____

Simple Events	Probabilities
SS	0.55
SD	0.11
DS	0.17
DD	0.17

Find the probability that at least one of the patients does not survive.

A) 0.45 B) 0.11 C) 0.28 D) 0.17

20) Each manager of a corporation was rated as being either a good, fair, or poor manager by his/her boss. The manager's educational background was also noted. The data appear below: 20) _____

Educational Background

Manager Rating	H. S. Degree	Some College	College Degree	Master's or Ph.D.	Totals
Good	2	9	26	2	39
Fair	5	11	47	24	87
Poor	1	6	3	24	34
Totals	8	26	76	50	160

If we randomly selected one manager from this company, find the probability that he or she has an advanced (Master's or Ph.D.) degree and is a good manager.

A) $\frac{89}{160}$ B) $\frac{79}{80}$ C) $\frac{63}{80}$ D) $\frac{1}{80}$

21) The overnight shipping business has skyrocketed in the last ten years. The single greatest predictor of a company's success is customer service. A study was conducted to determine the customer satisfaction levels for one overnight shipping business. In addition to the customer's satisfaction level, the customers were asked how often they used overnight shipping. The results are shown below in the following table: 21) _____

	Satisfaction level			
Frequency of Use	High	Medium	Low	TOTAL
< 2 per month	250	140	10	400
2 – 5 per month	140	55	5	200
> 5 per month	70	25	5	100
TOTAL	460	220	20	700

Suppose that one customer who participated in the study is chosen at random. What is the probability that the customer did not have a medium level of satisfaction with the company?

A) $\frac{11}{35}$ B) $\frac{5}{7}$ C) $\frac{2}{7}$ D) $\frac{24}{35}$

22) Suppose that for a certain experiment $P(A) = .47$ and $P(B) = .25$ and $P(A \cap B) = .14$. Find $P(A \cup B)$. 22) _____

A) .86 B) .36 C) .72 D) .58

23) In a class of 40 students, 22 are women, 10 are earning an A, and 7 are women that are earning an A. If a student is randomly selected from the class, find the probability that the student is a woman given that the student is earning an A. 23) _____

A) $\frac{7}{22}$ B) $\frac{7}{10}$ C) $\frac{5}{11}$ D) $\frac{11}{20}$

24) Suppose a basketball player is an excellent free throw shooter and makes 91% of his free throws (i.e., he has a 91% chance of making a single free throw). Assume that free throw shots are independent of one another. Find the probability that the player misses three consecutive free throws. 24) _____

A) 0.7536 B) 0.9993 C) 0.0007 D) 0.2464

25) A basketball player has an 80% chance of making the first free–throw he shoots. If he makes the first free–throw shot, then he has a 90% chance of making the second free–throw he shoots. If he misses the first free–throw shot, then he only has a 70% chance of making the second free–throw he shoots. Suppose this player has been awarded two free–throw shots. Find the probability that he makes at least one of the two shots. 25) _____

A) 0.80 B) 0.86 C) 0.72 D) 0.94

26) A number between 1 and 10, inclusive, is randomly chosen. Events A, B, C, and D are defined as follows. 26) _____

A: {The number is even}
B: {The number is less than 7}
C: {The number is less than or equal to 7}
D: {The number is 5}

Identify one pair of independent events.

A) A and C B) A and B C) A and D D) B and D

27) Classify the following random variable according to whether it is discrete or continuous. 27) _____
The number of goals scored in a soccer game

A) discrete B) continuous

28) Consider the given discrete probability distribution. Find $P(x > 3)$. 28) _____

x	1	2	3	4	5
$p(x)$	.1	.2	.2	.3	.2

A) .7 B) .5 C) .2 D) .3

29) According to a recent study, 1 in every 10 women has been a victim of domestic abuse at some point in her life. Suppose we have randomly and independently sampled twenty–five women and asked each whether she has been a victim of domestic abuse at some point in her life. Find the probability that at least 2 of the women sampled have been the victim of domestic abuse. Round to six decimal places. 29) _____

A) 0.265888 B) 0.728794 C) 0.462906 D) 0.271206

30) A literature professor decides to give a 10–question true–false quiz. She wants to choose the passing grade such that the probability of passing a student who guesses on every question is less than .10. What score should be set as the lowest passing grade? 30) _____

A) 7 B) 8 C) 6 D) 9

31) It a recent study of college students indicated that 30% of all college students had at least one tattoo. A small private college decided to randomly and independently sample 15 of their students and ask if they have a tattoo. Find the standard deviation for this binomial random variable. Round to the nearest hundredth when necessary. 31) _____

A) 10.5 B) 3.15 C) 1.77 D) 4.5

32) Use the standard normal distribution to find $P(-2.25 < z < 0)$. 32) _____

A) .0122 B) .4878 C) .6831 D) .5122

33) Find a value of the standard normal random variable z, called z_0, such that $P(z \geq z_0) = 0.70$. 33) _____

A) –.98 B) –.47 C) –.53 D) –.81

34) The volume of soda a dispensing machine pours into a 12–ounce can of soda follows a normal distribution with a mean of 12.18 ounces and a standard deviation of 0.12 ounce. The company receives complaints from consumers who actually measure the amount of soda in the cans and claim that the volume is less than the advertised 12 ounces. What proportion of the soda cans contain less than the advertised 12 ounces of soda? 34) _____

A) .9332 B) .0668 C) .5668 D) .4332

35) The price of a gallon of milk follows a normal distribution with a mean of $3.20 and a standard deviation of $0.10. Find the price for which 12.3% of milk vendors exceeded. 35) _____

A) $3.316 B) $3.084 C) $3.238 D) $3.215

Answer Key
Testname: MIDTERM1_FALL2016

1) B
2) B
3) B
4) A
5) A
6) C
7) B
8) B
9) B
10) D
11) D
12) A
13) B
14) C
15) A
16) C
17) D
18) C
19) A
20) D
21) D
22) D
23) B
24) C
25) D
26) B
27) A
28) B
29) B
30) B
31) C
32) B
33) C
34) B
35) A