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You have 40 questions. You have 120 minutes to solve the exam. Please mark all your answers on the answer sheet provided to you. Make sure that the answer sheet form matches the question form. You have to submit both question paper and answer sheet but **only answer sheets will be graded.** Good luck

**Choose the best answer for each of the following questions:**

1. Data that can be classified according to color are measured on what scale?  
A) Ordinal B) Nomial C) Ratio D) Interval
2. A researcher divided subjects into seven groups according to nationality and then interviewed all members from four groups that have been selected randomly. What sampling method was the researcher using?  
A) Systematic B) Stratified C) Random D) Cluster

Use the following to answer questions 3-6:

In the study of relationship between the number of absences  $X$  and the final grade  $Y$  of 32 students in the statistic class, the data are shown as follows

$$\sum X = 130, \sum Y = 649, \sum XY = 2288, \sum X^2 = 708 \text{ and } \sum Y^2 = 14865$$

3. The value of the Pearson correlation coefficient is ...  
A) -0.775 B) -0.903 C) -0.458 D) -0.630
4. The value of the Pearson correlation coefficient means that there is a ... linear relationship between and the number of absences and the final grade.  
A) very strong negative B) strong negative C) moderate negative D) weak negative
5. The final grade is called ... variable.  
A) independent B) dependent C) predictor D) explanatory
6. The slope of the regression line is ...  
A) -1.938 B) 7.728. C) 2.086 D) -2.086
7. The class width for the class boundary 5.05 - 8.15 is ...  
A) 3.11 B) 3.1 C) 3.51 D) 3.5
8. A box contains 20 red balls and 22 black balls. 10 balls are selected with replacement. The standard deviation of the number of red balls that will be obtained is ...  
A) 1.579 B) 1.505 C) 1.563 D) 1.576
9. A committee of 7 people is to be formed from 13 doctors and 15 engineers. Find the probability that the committee will consist of at least two doctors.  
A) 0.940 B) 0.883 C) 0.938 D) 0.973

10. The  $z$  value that is corresponding to a number above the mean is ...  
 A) always positive. B) always negative. C) mostly positive. D) mostly negative.
11. A survey found that the microwave ovens have an average life of 2 years with a standard deviation of 0.5 year. Assume the variable is normally distributed. What percent of microwave ovens would be replaced if a warranty of 21 months were given?  
 A) 6.68% B) 30.85% C) 93.32% D) 69.15%

Use the following to answer questions 12-16:

The monthly income,  $X$ , of a family in a given city is normally distributed with mean \$1666 and standard deviation \$674.

12. The standard error of the mean for a random sample of size 34 is ...  
 A) 121.328 B) 115.590 C) 117.328 D) 123.055
13. The probability that a person selected at random earns a monthly income greater than \$2150  
 A) 0.7358 B) 0.2358 C) 0.7642 D) 0.2642
14. If a random sample of size 32 is selected at random, find the probability that the mean income of the sample is between \$1515 and \$1818  
 A) 0.0017 B) 0.3997 C) 0.3980 D) 0.7977
15. The probability that a person selected at random earns a monthly income between \$1300 and \$3100  
 A) 0.6888 B) 0.2054 C) 0.2780 D) 0.4834
16. The probability that a person selected at random earns a monthly income less than \$1200  
 A) 0.2451 B) 0.2549 C) 0.7549 D) 0.5451

Use the following to answer questions 17-19:

Use the following probability distribution to answer the following three questions.

$X$	1	2	5	7	9
$P(X)$	0.125	0.025	0.125	0.573	0.152

17. The value of the sample size ...  
 A) is 5 B) cannot be determined C) is 24 D) is 1
18. The value of the mean for the previous probability distribution ...  
 A) cannot be determined B) is 4.8 C) is 6.179 D) is 1/5
19. The value of the variance for the previous probability distribution ...  
 A) is 4.830 B) cannot be determined C) is 2.358 D) is 5.559
20. Which measures are mostly affected by outliers?  
 A) Mode and median B) Mean and median C) Mode and range D) Range and variance

Use the following to answer questions 21-22:

Two dice are rolled. Let  $X$  represents the summation of the two faces that will appear.

Die 2	Die 1						
	$X$	1	2	3	4	5	6
	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

21. The probability of  $X \leq 1$  is ...  
 A) 0 B) 0.056 C) 1 D) 0.065
22. The probability of  $X \geq 8$  is ...  
 A) 0.417 B) 0.278 C) 0.583 D) 0.722
23. Find the value of  $z$  such that the shaded tail areas equals 0.011



- A) 2.43 B) 2.54 C) 2.17 D) 2.29
24. The number of trials in a binomial experiment  
 A) must be fixed B) are unlimited C) are independent D) are dependent

Use the following to answer questions 25-26:

Let  $X$  be a normally distributed random variable with mean 18 and a standard deviation 10. Use this information to find the value of  $a$  such that

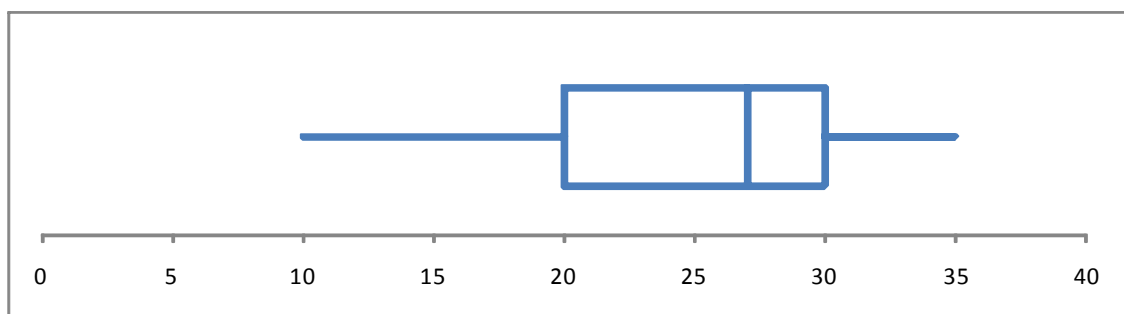
25.  $P(X < a) = 0.3085$   
 A) 23 B) 22 C) 14 D) 13
26.  $P(a < X < 20) = 0.1586$   
 A) 16 B) 14 C) 13 D) 11
27. A researcher stood at a busy intersection to see if the color of the automobile that a person drives is related to running red lights. The type of study used here is ... study.  
 A) convenience B) observational C) experimental D) quasi-experimental
28. A measure obtained from population data is called a(n) ...  
 A) parameter. B) sample. C) population. D) statistic.
29. "A distribution using the means computed from all possible random samples of a specific size taken form a population." The previous statement is the definition of  
 A) empirical distribution B) central limit theorem C) sampling distribution D) sampling error

30. Six different summer theater actors were ranked by male and female patrons on the basis of diction and appearance. The data are shown here (1 is the highest rating).

Actors	A	B	C	D	E	F
Males	6	3	2	1	5	4
Females	4	5	1	3	6	2

The Spearman rank correlation coefficient ( $r_s$ ) equals ...

- A) -0.029 B) 0.486 C) 0.657 D) -0.200
31. Which is **not** a property of the standard normal distribution?  
A) It is bell-shaped. B) It is symmetric. C) It is continuous. D) It is bimodal.
32. A die is rolled 4 times. The probability of getting a number 4 one time only is ...  
A) 0.402 B) 0.347 C) 0.278 D) 0.386
33. The midrange value for the following Boxplot is ...



- A) 20 B) 40 C) 22.5 D) 25
34. If the value  $X=9$  has a z-score of -0.05 and standard deviation 8 in a data set, then the mean value ...  
A) cannot be determined B) is 9.4 C) is -8.6 D) is 8.6

Use the following to answer questions 35-38:

The following table shows the distribution of the blood type for 95 students:

Classes	A	B	O	AB
Frequency	37	12	35	11

35. The mode value  
A) cannot be calculated B) is 95 C) is 37 D) is A
36. The probability of selecting a student with AB blood type is ...  
A) 15 B) 0.842 C) 0.158 D) 0.116
37. In a pie graph, how many degrees would be needed to represent A?  
A)  $53.05^\circ$  B)  $140.21^\circ$  C)  $87.16^\circ$  D)  $75.79^\circ$

38. The type of the frequency distribution is ... distribution.

- A) ungrouped frequency   B) grouped frequency   C) categorical frequency   D) probability

Use the following to answer questions 39-40:

The table below shows the number of earned degrees in the year 2008 in a university by level and gender. A person who earned a degree in the year 2008 from this university is randomly selected. Find the probability of selecting someone who

		Male	Female
Level of Degree	Bachelor's	540	888
	Master's	250	155
	PhD's	150	50

39. earned a master's degree or is a female.

- A) 0.712      B) 0.602   C) 0.658   D) 0.661

40. is a female given that the person earned a bachelor's degree.

- A) 0.507   B) 0.521   C) 0.620   D) 0.622

Good luck  
Stat 110 Team

## Answer Key

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