KING ABDULAZIZ UNIVERSITY
Faculty of Sciences
Statistics Department
Final Exam STAT 110
Second Term
1429-1430

40

| Name: | ID \#: | Section: |
| :--- | :--- | :--- |

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. The score on an IQ test is an example of which level of measurement
A) ordinal
B) interval
C) ratio
D) nominal
2. In a pie graph, if the blood type A represents $9 / 72$ of the distribution, how many degrees would be needed to represent A ?
A) $9^{\circ}$
B) $45^{\circ}$
C) $8^{\circ}$
D) $72^{\circ}$
3. Nursing Supervisors are selected using random numbers in order to determine annual salaries. This is an example of
A) systematic sampling
B) stratified sampling
C) random sampling
D) cluster sampling
4. The average life expectancy in New Zealand is 78.49 years. This statement is an example of $\mathrm{a}(\mathrm{an})$. $\qquad$ statistics
A) descriptive
B) quantitative
C) qualitative
D) inferential
5. The data set that is collected over a period of time can be best represented by a (an) ...
A) pie graph
B) ogive
C) histogram
D) time series graph
6. Nationality represents a
A) quantitative variable
C) qualitative variable
B) discrete variable
D) continuous variable
7. In the relationship between the number of studying hours and an exam grade, the number of studying hours is assumed to be
A) independent variable
C) confounding variable
B) nominal variable
D) dependent variable
8. In a frequency distribution, if the relative frequencies are $0.20,0.28, X$ and 0.16 , then the relative frequency $X$ is
А) 0.46
B) 0.63
C) 0.64
D) 0.36

The following table shows the distribution of the blood type for 32 students:

| Classes | A | B | O | AB |
| :--- | :---: | :---: | :---: | :---: |
| Frequency | 5 | 10 | 8 | 9 |

9. The mode value is
А) 10
B) B
C) AB
D) cannot be calculated
10. The mean value is
A) 8
B) 2
C) B
D) cannot be calculated
11. A negative relationship between two variables means that for the most part , as the $X$ variable increases, the Y variable
A) increases
B) equals X
C) remains the same
D) decreases
12. If the value $X=6$ has a $z$-score of $\mathbf{- 0 . 5 0}$ in a data set, then the mean
$\mathrm{A})$ is 6.00
B) is 6.50
C) is 5.50
D) cannot be determined from the given data
13. Which measures are mostly affected by outliers?
A) Mean and median
B) Mean and mode
C) Mode and midrange
D) Mean and midrange
14. Which one of the following is referred to as a statistic?
A) The population data
C) The sample mode
B) The population mean
D) The sample data

In the study of relationship between the number of absences X and the final grade Y of 6 students in the statistic class, the data are shown as follows
$\sum X=42, \sum Y=470, \sum X Y=3143, \sum X^{2}=354$ and $\sum Y^{2}=37358$
answer the following two questions:
15. The slope of the regression line is
А) 3.45
B) -2.45
C) -3.45
D) 2.45
16. The correlation coefficient is
А) -0.82
B) 1
C) 0.92
D) 0.82
17. Determine the number of all possible outcomes of guessing the last two digits in a telephone number if repetition of digits is allowed.
А) 20
B) 30
C) 100
D) 1000
18. A committee of 4 people is to be formed from 6 doctors and 8 engineers. Find the probability that the committee will consist of at least two doctors.
А) 0.41
В) 0.83
C) 0.59
D) 0.17
19. If the Spearman rank correlation coefficient ( $r_{s}$ ) equals 0.6 , then the relationship can be described as
A) weak and linear
C) positive, strong and non linear
B) moderate and non linear
D) positive, moderate and linear
20. How many different ways can 4 tickets be selected from 10 tickets if each ticket wins a different prize?
A) 120
B) 5040
C) 270
D) 720
21. The probability that a student has a computer is 0.91 and the probability that he has a car is 0.49 while the probability that he has either a computer or a car is 0.94 . Find the probability that the student has both.
А) 0.84
В) 0.46
C) 0.43
D) 0.05

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. Use this problem to answer the following two questions

|  |  | Male | Female |
| :---: | :---: | :---: | :---: |
| Level of Degree | Bachelor's | 300 | 200 |
|  | Master's | 35 | 15 |

Find the probability of selecting someone who:
22. is a female given that the person earned a bachelor's degree.
A) 0.67
В) 0.6
C) 0.4
D) 0.36
23. earned a master's degree or is a female
А) 0.45
В) 0.64
C) 0.48
D) 0.7
24. The outcomes of each trial in a binomial experiment
A) must be fixed
B) are dependent
C) are unlimited
D) are independent
25. A box contains 3 red balls and 5 black balls. 4 balls are selected with replacement. The standerd deviation of the number of red balls that will be obtained is
А) 0.968
B) 4
C) 0.938
D) 5
26. A die is rolled 5 times. the probability of getting a number 4 one time only is
A) 0.015
В) 0.386
C) 0.167
D) 0.402
27. If $X$ is a discrete random variable with $\sum\left[X^{2} P(X)\right]=6$ and $E(X)=2$. The variance for the probability distribution of $X$ is
А) 1.141
B) 4
C) 1.732
D) 2

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

|  | Die 1 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Sums | 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 |

28. The probability of $X=15$ is
А) 0.028
В) 0.083
C) 0
D) 0.056
29. The probability of $X=4$ is
А) 0.833
В) 0.028
C) 0.083
D) 0
30. When the distribution is positively skewed, the relationship of the mean, median, and mode from left to right will be
A) Median, mode, mean
C) Mean, mode, median
B) Mean, median, mode
D) Mode, median, mean

The time $T_{1}$ to travel from A to $B$ through city center $\left(\operatorname{road} \mathrm{R}_{1}\right)$ is normally distributed with mean 20 minutes and standard deviation 5 minutes. The time $T_{2}$ to travel from A to $B$ through a new ring road (road $R_{2}$ ) is normally distributed with mean 15 minutes and standard deviation 8 minutes. You have 17 minutes to travel from A to B on an important appointment. Using this information, solve the following three questions
31. $\mathrm{P}\left(\mathrm{T}_{2}>17\right)$
А) 0.4013
В) 0.5987
C) 0.9013
D) 0.0987
32. $\mathrm{P}\left(\mathrm{T}_{1}>17\right)$
А) 0.2257
В) 0.2743
C) 0.7743
D) 0.7257
33. Your correct decision is
A) Both $R_{1}$ and $R_{2}$ are the same
C) $R_{1}$ is better than $R_{2}$
B) $R_{2}$ is better than $R_{1}$
D) Insufficient information to make a decision

The monthly income, $X$, of a family in a given city is normally distributed with mean $\$ 3000$ and standard deviation $\$ 500$. Use this information to find
34.

If a random sample of size 9 is selected at random, find the probability that the mean income of the sample is between $\$ 2500$ and $\$ 3500$
А) 0.9974
В) 0.4987
C) 0.5601
D) 0.0013
35. The probability that a person selected at random earns a monthly income between $\$ 2500$ and $\$$ 3500
А) 0.3174
В) 0.3413
C) 0.6826
D) 0.1587

Let $X$ be a normally distributed random variable with mean 100 and a standard deviation 10. Use this information to find the value of $a$ in the following two questions such that
36. $P(95<X<a)=0.6309$
A) 101.5
В) 15.5
C) 115.5
D) 84.5
37. $P(X>a)=0.0427$
А) 82.8
В) 117.2
C) 101.72
D) 17.2
38. Approximately what percentage of normally distributed data values will fall within 1 standard deviation above or below the mean
А) $99.7 \%$
В) $68 \%$
C) $13.5 \%$
D) $95 \%$
39. Find the value of z such that the shaded tail areas equals 0.10

А) -1.96
В) 1.64
C) 0.25
D) 1.28
40. "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
C) central limit theorem
B) sampling error
D) sampling distribution

## Answer Key

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