King Abdul Aziz University
Faculty of Sciences
Statistics Department

Exam # 2
STAT 110

Second Term
1429- 1430

D

Name:	ID No:	Section:

You have 30 questions and 90 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. Consider the experiment of selecting one ball at random from a box containing an equal number of white balls (W) and blue balls(B). The sample space for this experiment is
   A) 4
   B) 2
   C) S={W, B}
   D) S={WW, WB, BW, BB}

2. What type of probability uses frequency distribution to determine the numerical probability that an event occurs?
   A) conditional probability
   B) empirical probability
   C) subjective probability
   D) classical probability

3. In a company there are seven employees, four of which are women, if three employees are selected at random, what is the probability that all of them are women?
   A) 1/35
   B) 4
   C) 64/343
   D) 4/35

4. 84% of U.S. children are covered by some type of health insurance. If 4 children are selected at random, what is the probability that at least one is covered?
   A) 0.0002
   B) 0.999
   C) 0.409
   D) 0.404

5. Two events are .... if the fact that A occurs does not affect the probability of B occurring.
   A) independent events
   B) mutually exclusive
   C) dependent events
   D) not mutually exclusive

In a recent study, the following data was obtained in response to the question, "Do you favor recycling in your neighborhood?

هل تؤيد إعادة تدوير النفايات في منطقتكم

	Yes	No	No opinion	Total
Males	25	15	10	50
Females	30	10	10	50
Total	55	25	20	100

If a person is selected at random, use the above table to answer questions (6 and 7).

6. The probability that a person is a male given that he answered **no** regarding recycling is:
   A) 1/3
   B) 3/5
   C) 3/10
   D) 5/10

7. The probability that a person is a female or answered **yes** regarding recycling is:
   A) 3/10
   B) 13/20
   C) 1/10
   D) 3/4

8. If a researcher wants to determine if there is a linear relationship between the number of hours a person goes without sleep (x) and the number of mistakes he makes on a simple test (y). The following data are recorded.
   $n = 10, \ \sum x = 36, \ \sum y = 50, \ \sum xy = 202, \ \sum x^2 = 138$

   The equation of the regression line is:
   A) $y' = 2.619 + 4.42x$
   B) $y' = 2.619 + 1.02x$
   C) $y' = -4.429 + 2.619x$
   D) $y' = 1.02 - 4.42x$

9. If the letters A,B,C,D, and E are to be used in a letter code consists of five digits, how many different codes are possible if the first letter must be A and repetitions are not permitted?
   A) 240
   B) 24
   C) 3125
   D) 120

10. <u>An emergency service center</u> مركز خدمة الطوارئ wishes to see whether a relationship between the outside temperature (x) and the number of emergency calls(y) exists. The data are shown here:

   $n = 5$ $\sum x = 15$ $\sum y = 25$ $\sum xy = 76$

   $\sum x^2 = 55$ $\sum y^2 = 151$

   Compute the value of the correlation coefficient.
   A) 0.279
   B) 0.062
   C) -0.006
   D) 0.274

11. The y' intercept in the regression line $y' = -2x + 5$ is:
   A) -5
   B) -2
   C) 2
   D) 5

12. On a lunch counter, there are 3 oranges, 5 apples and 2 bananas. If 3 pieces of fruit are selected, find the probability that 1 orange and 2 apples are selected.
   A) 0.25
   B) 0.535
   C) 0.267
   D) 0.125

13. The correlation coefficient between <u>the amount of fats</u> كمية الدهون which a person eats and his or her hair color may be:
   A) close to -1
   B) 0
   C) close to 2
   D) close to 1

14. A committee consisting of 4 people is to be formed from 20 males and 5 females. Find the probability that the committee will consist of females only.
    A) 0.791
    B) 0.451
    C) 0.0004
    D) 0.999

15. How many different 3-letter permutations can be formed from the letters in the word *bread* ?
    A) 60
    B) 120
    C) 125
    D) 10

16. How many different ways can an instructor select 2 textbooks from a possible 17?
    A) 0.007
    B) 0.0138
    C) 272
    D) 136

17. Determine the type of relationship shown in the figure below.
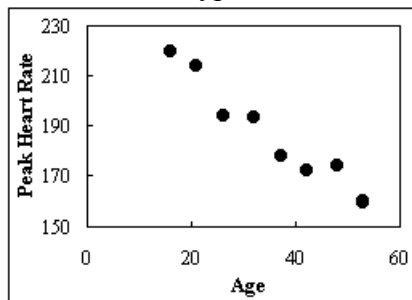
    A) negative
    B) there is no relationship
    C) positive
    D) curvilinear

The equation of the regression line between a person's age in years (x) and the number of hours he exercises per week (y) is given by : $y' = 10.944 - 0.18x$

(Use the above equation to answer the questions 18-19)

18. The correct statement that represents the relationship between (x) and (y) is:
    A) When the number of hours he exercises decreases by 1 hour, his age decreases by 10.944 on average.
    B) When a person's age increases by 1 year, the number of hours he exercises increases by 0.18 on average.
    C) When a person's age increases by 1 year, the number of hours he exercises decreases by 0.18 on average.
    D) When the number of hours he exercises increases by 1 hour, his age increases by 10.944 on average.

19. Predict the number of hours a person exercises per week when his age is 30 years.
    A) 1.492
    B) 10.041
    C) 19.912
    D) 5.544

20. In a large farm, 50% of the trees are apples, 30% are oranges and 20% are bananas. If 200 trees are randomly selected, find the mean and variance of the number of bananas trees.
    A) $\mu = 100, \sigma^2 = 50$
    B) $\mu = 40, \sigma^2 = 32$
    C) $\mu = 40, \sigma^2 = 1764$
    D) $\mu = 60, \sigma^2 = 42$

21. A study shows that 70% of drivers consider themselves above average in driving ability. If 10 drivers at random are selected at random, what is the mean and the variance of the number of driver who consider themselves above average?
    A) mean = 10 and variance = 1.45
    B) mean = 10 and variance = 10.
    C) mean = 7 and variance = 2.1.
    D) mean = 7 and variance = 7.

22. If a player rolls one die and gets number 2, he wins $15. The cost to play the game is $5. What is the expected value of his gain?
    A) $2.5
    B) $7.5
    C) $-2.5
    D) $-7.5

23. If the value of the correlation coefficient equals +0.12, then the type of the relationship is:
   A) strong negative
   B) weak positive
   C) strong positive
   D) weak negative

24. What is the probability distribution for tossing three coins? let X represent the number of tails.
   A)

X	0	1	2	3
P(X)	-1	0.8	3/8	1/8

   B)

X	0	1	2	3
P(X)	1/8	3/8	3/8	1/8

   C)

X	0	1	2	3
P(X)	1	0.4	-3/8	1/8

   D)

X	0	1	2	3
P(X)	1/4	3/16	0.2	1/5

25. In a survey, 3 out of 4 students said that "math course is easy". If 7 students are selected at random, find the probability that exactly 3 said that math course is easy.
   A) 0.058
   B) 0.134
   C) 0.071
   D) 0.173

26. Which of the following value would complete the following probability distribution?

X	0	1	2	3	4
P(X)	4/28	1/28	4/7	2/28	?

   A) 1/7
   B) 5/28
   C) 25/28
   D) -10/28

27. In the last year, 20% of businesses have failed. If 3 businesses are selected at random, find the probability that at least one have failed during the last year.
   A) 0.8
   B) 0.512
   C) 0.992
   D) 0.488

28. Which of the following is a binomial experiment?
    A) Drawing two fruits without replacement from a box contains 3 apples, 2 oranges and one banana.
    B) Asking 100 people if they have a job.
    C) Asking 100 people what kind of fruits they like.
    D) Rolling a die to see the number appears on the die.

29. Compute a Spearman rank correlation coefficient for the following data.

X values	1	3	2	5
Y values	3	7	5	4

    A) 0.6
    B) -0.4
    C) 0.4
    D) -0.6

30. A study was conducted by a TV station to determine the number of televisions per household. The data are shown here. Find the mean and standard deviation for the number of televisions per household ?

X	1	2	3	4
P(X)	0.32	0.51	0.12	0.05

    A) mean= 1.7,standard deviation= 0.63
    B) mean= 2.5,standard deviation= 4.24
    C) mean= 1.58,standard deviation= 4.241
    D) mean= 1.9,standard deviation= 0.794

Good luck
Stat 110 Team

Answer Key

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