King Abdul Aziz University
Faculty of Sciences
Statistics Department

Exam # 2
STAT 110

Second Term
1429- 1430

C

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 item at random from a box containing an equal number of defective (D) and non-defective(N) items. The sample space for this experiment is
   A) S={DD,DN,ND,NN}
   B) 4
   C) S={D,N}
   D) 2

2. At a local university 54.3% of incoming first-year students have computers. If 3 students are selected at random, the probability that at least one has a computer is:
   A) 0.157
   B) 0.160
   C) 0.095
   D) 0.905

3. Two events are .... if they cannot occur at the same time.
   A) not mutually exclusive
   B) independent events
   C) dependent events
   D) mutually exclusive

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

5. Given eight students, three of which are females. If two students are selected at random, what is the probability that both students are female?
   A) 9/56
   B) 3/32
   C) 3/28
   D) 3

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 female given that she answered **yes** regarding recycling is:
   A) 6/11
   B) 2/5
   C) 6/5
   D) 3/5

7. The probability that a person is a male or he has **no opinion** regarding recycling is:
   A) 7/10
   B) 3/5
   C) 3/10
   D) 4/5

8. 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 males only.
   A) 0.150
   B) 0.451
   C) 0.791
   D) 0.383

9. If the letters A,B,C,D,E, and F are to be used in a letter code consists of six digits, how many different codes are possible if the first letter must be A and repetitions are not permitted?
   A) 720
   B) 1440
   C) 46656
   D) 120

10. 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 is recorded.

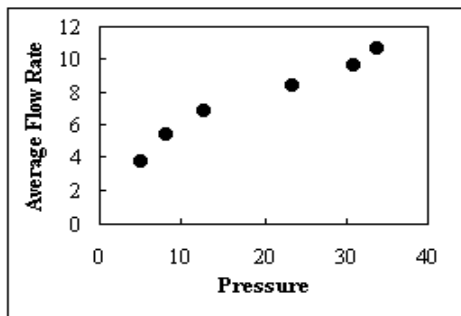$n = 10, \sum x = 46, \sum y = 60, \sum xy = 303, \sum x^2 = 238$

The equation of the regression line is:
A) $y' = 1.02 + 1.3x$
B) $y' = 1.3 - 1.02x$
C) $y' = 1.3 + 1.02x$
D) $y' = 1.02 - 1.3x$

11. The correlation coefficient between the amount of fats كمية الدهون which a person eats and his or her weight may be:
A) close to 2
B) close to 1
C) close to -1
D) 0

12. Determine the type of relationship shown in the figure below.

A) there is no relationship
B) curvilinear
C) positive
D) negative

13. An emergency service center 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:

$n = 5 \qquad \sum x = 9 \qquad \sum y = 17 \qquad \sum xy = 28$
$\sum x^2 = 23 \qquad \sum y^2 = 71$

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

14. How many different tests can be made from a test bank of 10 questions if the test consists of 3 questions?
    A) 720
    B) 360
    C) 120
    D) 240

15. How many different 4-letter permutations can be formed from the letters in the word *orange*?
    A) 840
    B) 420
    C) 120
    D) 360

16. The slope of the regression line $y' = -2x + 5$ is:
    A) 2
    B) 5
    C) -5
    D) -2

17. A newspaper advertises 5 different movies, 3 plays, and 2 baseball games for the weekend. If a couple selects 3 activities, find the probability that they attend 2 plays and 1 movie.
    A) 0.20
    B) 0.125
    C) 0.021
    D) 0.083

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 the number of hours he exercises increases by 1 hour, his age increases by 10.944 on average.
    C) When a person's age increases by 1 year, the number of hours he exercises increases by 0.18 on average.
    D) When a person's age increases by 1 year, the number of hours he exercises decreases by 0.18 on average.

19. Predict the number of hours a person exercises per week when his age is 50 years.
    A) 1.944
    B) 10.04
    C) 1.49
    D) 19.9

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 orange trees.
    A) $\mu = 100, \sigma^2 = 50$
    B) $\mu = 60, \sigma^2 = 1764$
    C) $\mu = 60, \sigma^2 = 42$
    D) $\mu = 40, \sigma^2 = 32$

21. What is the probability distribution for a family with three children? Let X represents the number of boys.
    A)

X	1	2	3	4
P(X)	1/8	5/8	0	1/4

    B)

X	0	1	2	3
P(X)	1/8	2/4	-1/4	1/2

    C)

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

    D)

X	0	1	2	3
P(X)	1/8	2/8	1/4	1/2

22. If a player rolls one die and gets number 4, he wins $12. The cost to play the game is $5. What is the expected value of his gain?
    A) $3.83
    B) $5.33
    C) $-2.17
    D) $-3

23. A survey found that 80% of students never smoked. If a sample of 10 students is selected at random, find the probability that 9 or more of them have never smoked.
    A) 0.123
    B) 0.107
    C) 0.268
    D) 0.376

24. Which of the following is a binomial experiment?
    A) Asking 100 people if they smoke.
    B) Rolling a die to see the number appears on the die.
    C) Asking 100 people which brand of cigarettes they smoke.
    D) Drawing two balls without replacement from a box contains 3 red balls, 2 blue balls and one green ball.

25. A survey found that 2 out of 6 students say they like statistics course. If 10 students are selected at random, find the probability that exactly five would have liked the statistics course.
    A) 0.333
    B) 0.132
    C) 0.137
    D) 1.63

26. If 40% of T.V.s are defective, find the mean and the standard deviation of the number of defective T.V.s for a sample of 200 T.V.s
    A) mean = 66, standard deviation = 21.
    B) mean = 80, and standard deviation = 6.928
    C) mean = 80, and standard deviation = 48
    D) mean = 35, and standard deviation= 5.331.

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

X	1	0	2	3
Y	5	4	1	2

    A) -0.41
    B) 0.6
    C) -0.6
    D) 2.4

28. If the value of the correlation coefficient equals -0.95, then the type of the relationship is:
    A) strong positive
    B) strong negative
    C) weak positive
    D) weak negative

29. Which of the following probability values would complete the following probability distribution

X	0	1	2	3	4
P(X)	4/27	1/27	5/9	2/27	?

    A) -10/27
    B) 25/27
    C) 5/27
    D) 1/9

30. The random variable X represents the number of credit cards that adults have along with the corresponding probabilities. Find the mean and the standard deviation .

X	0	1	2	3	4
P(X)	0.07	0.68	0.21	0.03	0.01

A) mean=1. 30, standard deviation =0.32.
B) mean=1.23, standard deviation =0.66.
C) mean=1.46, standard deviation=0.33.
D) mean=1.32, standard deviation =0.43.

Good luck
Stat 110 Team

Answer Key

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