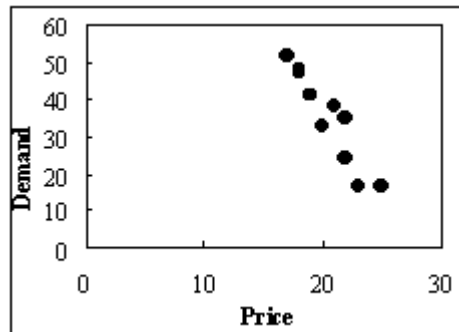


1. From the following scatter plot of price and demand, then the relationship can be described as:



- A) strong positive  
B) weak positive  
**C) strong negative**  
D) weak negative
2. Compute Pearson correlation coefficient for the data below:

X	5	-2	-1	4	3
Y	4	2	1	3	-3

Given that  $\sum x^2 = 55$ .

- A) 0.160**  
B) 0.204  
C) -0.160  
D) -0.002
3. If a researcher wants to determine if there is a linear relationship between the heights of buildings and the number of their floors. The following data is recorded.  
 $n = 10, \sum x = 50, \sum y = 20, \sum xy = 114$  and  $\sum x^2 = 300$   
The equation of the regression line is:  
A)  $y' = 0.28 + 0.6x$   
**B)  $y' = 0.6 + 0.28x$**   
C)  $y' = 0.28 - 0.6x$   
D)  $y' = -0.6 + 0.28x$
4. If the regression line is given by  $y' = 4 + 2x$ , then the correlation coefficient (r) is:  
**A) positive**  
B) negative  
C) zero  
D) 2

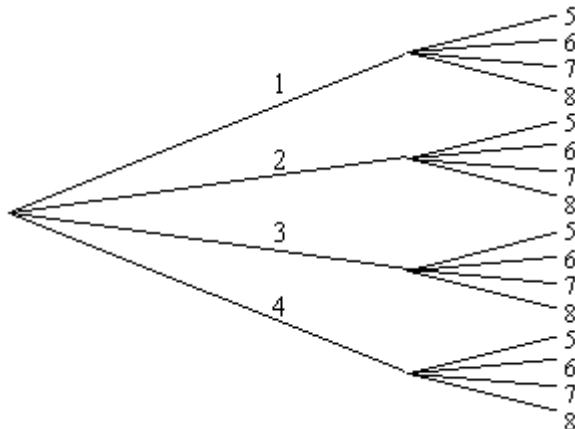
5. If the equation of the regression line is  $y' = 22.659 + 0.582x$ . When  $x=32$ , then  $y' = ?$
- A) -4.035  
**B) 41.283**  
 C) 0.726  
 D) 114.53
6. Two students were asked to rate six different books on a scale from 0 to 10 points. The data are shown in the following table:

Book	A	B	C	D	E	F
Student 1	10	8	9	1	5	4
Student 2	5	7	9	10	8	3

the Spearman rank correlation coefficient is:

- A) -0.257**  
 B) 0.257  
 C) 0.714  
 D) -0.714
7. If the correlation coefficient between two variables equals (-0.9) , this means the relationship between the two variables is :
- A) strong positive  
**B) strong negative**  
 C) weak positive  
 D) weak negative

8.Box A contains the numbers 1, 2, 3, and 4. Box B contains the numbers 5, 6, 7, and 8. A number is first drawn from Box A and then another number is drawn from Box B. Using the figure below, how many outcomes are possible if both numbers are even?



- A) 4**  
 B) 8  
 C) 16  
 D) 6

9- " The probability that an earthquake will happen next week is 50% ". This is an example of

- A) empirical probability
- B) a sample space
- C) subjective probability
- D) classical probability

Use the following to answer questions 10-11:

A Factory employs workers, managers, and cleaners. The distribution of employees according to their educational degree is shown here. (Use the following table to answer questions 10, 11)

	Worker	Manager	Cleaner	Total
High school	10	3	5	18
Bachelor	12	17	2	31
Total	22	20	7	49

10. Find the probability that the employee is a worker or has a bachelor degree?

- A)  $41/22$
- B)  $12/22$
- C)  $12/49$
- D)  $41/49$

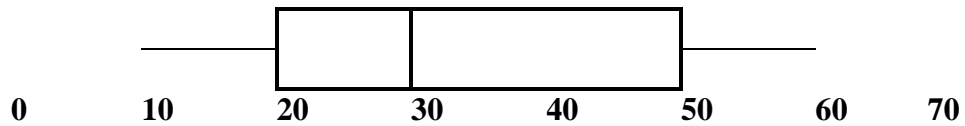
11. Find the probability that the employee is a manager given that he has a high school degree?

- A)  $3/18$
- B)  $3/49$
- C)  $18/20$
- D)  $20/49$

12. A researcher in a study has found that there is a relationship between the number of cars by 10000 that sold ( $x$ ) and the annual income by millions ( $y$ ). If the equation of the regression line is given by:  
 $y' = 0.396 + 0.106x$   
For each increase of the number of cars then.....
- A) the annual income increases by 0.106 on average.
  - B) the annual income increases by 0.396 on average.
  - C) the annual income decreases by 0.106 on average.
  - D) the annual income decreases by 0.396 on average.
13. Determine which events are dependent?
- A) Studying for the exam and getting high mark.
  - B) Drawing a ball from a box and replacing it, then drawing a second ball.
  - C) Rolling a die and getting a 6 and then rolling a second die and getting a 3.
  - D) Tossing a coin twice and getting head on the first time and tale on the second one.
14. The ID cards consist of three letters followed by two numbers. How many cards can be made if repetitions are not allowed?
- A) 1757600
  - B) 1404000
  - C) 15690
  - D) 17676
15. How many different ways can be selecting 4 bananas and 3 apples from 6 bananas and 8 apples?
- A) 71
  - B) 840
  - C) 120
  - D) 696
16. Given ten employees, three of them are males. If two employees are selected at random, what is the probability that both of them are females?
- A)  $7/15$
  - B)  $1/15$
  - C)  $21/50$
  - D)  $3/50$

17. A box contains six green cards, two red cards and three black cards. If a card was selected at random, the probability that it is black or red ?
- A)  $8/11$
  - B)  $9/11$
  - C)  $5/11$
  - D) 1

18. Use the next boxplot to identify the five-number summary

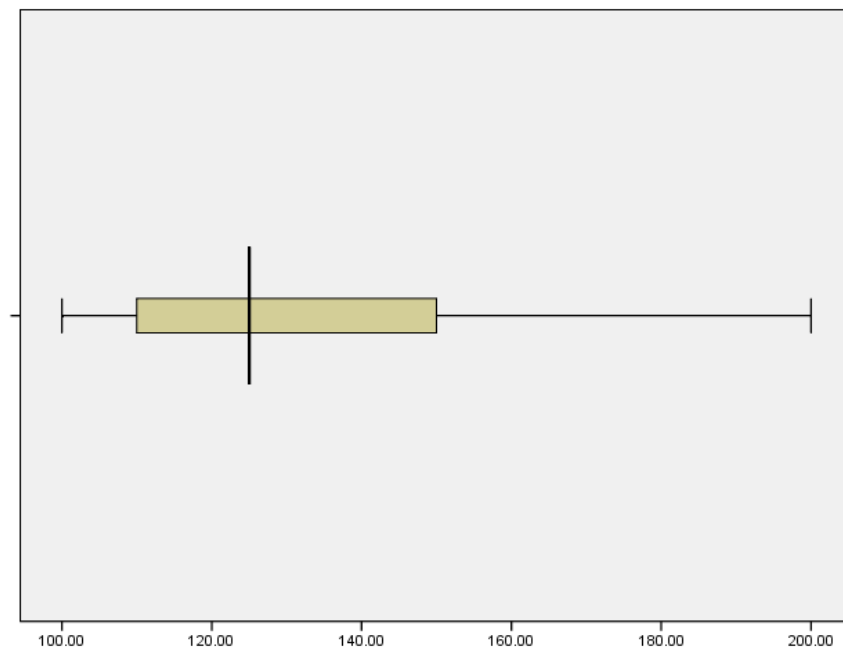


- A) Minimum = 10 ,  $Q_1 = 20$ ,  $Q_2 = 40$ ,  $Q_3 = 50$  , Maximum = 60
- B) Minimum = 10,  $Q_1 = 20$ ,  $Q_2 = 30$  ,  $Q_3 = 50$  , Maximum = 60
- C) Minimum = 0,  $Q_1 = 10$ ,  $Q_2 = 30$ ,  $Q_3 = 50$  , Maximum = 60
- D) Minimum = 0,  $Q_1 = 10$ ,  $Q_2 = 35$ ,  $Q_3 = 60$  , Maximum = 70

19. Given that the mean of a set of data is 25 and the standard deviation is 3, what is the coefficient of variation?

- A) 8.33
- B) 833%
- C) 12%
- D) 0.12

Use the following graph to answer the questions:



20. The distribution shape is:

- A) positively skewed.
- B) negatively skewed.
- C) symmetrical.
- D) left skewed.

21. Which of these exam scores has a better relative position?

Exam 1: A score of 90 on a test with  $\bar{x} = 92$  and  $S = 2$

Exam 2: A score of 72 on a test with  $\bar{x} = 70$  and  $S = 2$

- A) No difference between both exams
- B) Exam 1 is better.
- C) Exam 2 is better.
- D) Given information is not enough

22. The interquartile range of the following numbers  $\{22, 30, 29, 42, 20, 35, 10\}$  is

- A) 32
- B) 26
- C) 15
- D) 5

23. There are 4 major roads from city X to city Y and 3 major roads from city Y to city Z. How many different trips can be made from city X to city Z passing through city Y?

- A) 3
- B) 4
- C) 12
- D) 7

24. If 20 tickets are sold and 3 prizes are to be awarded, find the probability that one person will win 2 prizes if that person buys exactly 2 tickets.

- A) 0.004
- B) 0.016
- C) 0
- D) 0.001

25. Which is **not** a part the five-number summary?

- A)  $Q_1$  and  $Q_3$
- B) The mean
- C) The median
- D) The smallest and the largest data values

26. A married couple has three children, find the probability they are all boys .

- A)  $1/2$
- B)  $1/8$**
- C)  $1/4$
- D)  $3/8$

27. If there is a 20% chance that it will rain tomorrow, what is the probability that it will not rain tomorrow?

- A) 0
- B) 0.80**
- C) 0.20
- D) 0.08

28. At a local university 54.3% of incoming first-year students have computers. If 3 students are selected at random, find the probability at least one has a computer.

- A) 0.0954
- B) 0.457
- C) 0.1601
- D) 0.9046**

29. Math exam scores have a bell-shaped distribution with a mean of 90. Find the standard deviation of the scores if 68% of students have scores between 80 and 100?

- A) 10**
- B) 3.16
- C) 100
- D) 20

30. A box contains 6 white marbles, 5 red marbles, and 4 black marbles. If a marble were selected at random, then the probability that it is red or white.

- A) 0.133
- B) 0.343
- C) 0.733**
- D) 0

31. How many different ways can 2 tickets be selected from 40 tickets if each ticket wins a different prize.

- A) 80
- B) 2
- C) 780
- D) 1,560**

32. How many different ID cards can be made if there are 3 digits followed by 2 letters, and none of them can be used more than once.

- A) 676,000
- B) 1,370
- C) 1,377
- D) 468,000

33. Find the probability of selecting 3 history books and 4 techno books from a box containing 7 history books and 8 techno books?

- A) 2450
- B) 0.381
- C) 0.011
- D) 0.214

34. How many different arrangements of the letters in the word *dragon* can be made?

- A) 1
- B) 6
- C) 0.008
- D) 720

35. In a class there are 5 students, 3 of them are males, if a committee from two students one male and the other female will be formed, by how many ways this committee can be formed?

- A) 0.6
- B) 6
- C) 10
- D) 2

36. The probability that Mike has to work overtime and it rains is 0.028. Mike hears the weather forecast, and there is 0.5 probability of rain. Find the probability that he will have to work overtime, given that it rains.

- A) 0.972
- B) 0.5
- C) 0.056
- D) 1.786

37. If A and B are two not mutually exclusive events with  $P(A) = 0.5$ ,  $P(B) = 0.3$  and  $P(A \text{ or } B) = 0.6$ , then find  $P(A \text{ and } B)$ ?

- A) 0
- B) 0.8
- C) 0.1
- D) 0.2