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You have 30 questions. You have 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 the answer sheet will be graded.** Good luck

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

1. In a large farm, 28% of the trees are apples, 22% of trees are grapes, 33% are oranges and 17% are bananas. If 200 trees are randomly selected, find the mean and variance of the number of apple trees.

A) $\mu = 44, \sigma^2 = 34.32$

C) $\mu = 56, \sigma^2 = 40.32$

B) $\mu = 34, \sigma^2 = 28.22$

D) $\mu = 66, \sigma^2 = 44.22$

2. 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)	0.03	0.68	0.22	0.02	0.05

A) mean=0.51, standard deviation =0.933

C) mean=1.38, standard deviation=0.797

B) mean=0.85, standard deviation =1.108

D) mean=0.97, standard deviation =1.024

3. If a player rolls one die and gets a number greater than 4, he wins \$15. The cost to play the game is \$5. What is the expected value of his gain?

A) \$5

B) \$2.5

C) \$0

D) \$-2.5

4. The number of outcomes in a compound event can be ...

A) $E=\{3\}$

B) 1

C) $E=\{2, 4, 6\}$

D) 3

5. An ID card consists of 2 letters followed by 3 digits. How many different ID cards can be made if repetitions are allowed?

A) 486720

B) 468000

C) 676000

D) 650000

6. The complement of guessing 10 incorrect answers on a 10-question true/false exam is

A) guessing at least 1 correct answer

C) guessing 10 correct answers

B) guessing 10 incorrect answers

D) guessing at least 1 incorrect answer

7. The sample space for the children gender (B for boy and G for girl) in a family with three children is ...

A) 4

B) $S=\{BBB, BBG, BGB, GBB, BGG, GBG, GGB, GGG\}$

C) $S=\{BBB, BBG, GGB, GGG\}$

D) 8

8. A graph of the independent variable, X, and the dependent variable, Y, is called ...

A) frequency polygon.

B) histogram.

C) scatter plot.

D) pie graph.

Use the following to answer questions 9-11:

An statistics instructor is interested in finding the relationship between the quiz grades of students enrolled in Statistics I (x) and Statistics II (y) at his college.

$$n = 8, \sum x = 20, \sum y = 15, \sum x^2 = 66, \sum y^2 = 45, \sum xy = 40 \text{ and } \text{slop}(b) = 0.156$$

9. The value of Pearson correlation coefficient (r) is
A) 0.082 B) 0.068 C) 0.079 D) 0.152
10. The equation of the regression line is
A) $y' = 0.1 + 1.7 * x$ B) $y' = 1.7 + 0.1 * x$ C) $y' = 0.156 + 1.5 * x$ D) $y' = 1.5 + 0.156 * x$
11. Predict a Statistics II quiz score for a student who receives a 10 in Statistics I.
A) 15.2 B) 17.1 C) 3.1 D) 2.7
12. It has been found that 8% of all automobiles on the road have defective brakes. If 8 automobiles are stopped and checked by the police, find the probability that at least one will have defective brakes.
A) 0.487 B) 0.572 C) 0.398 D) 0.310
13. Suppose that every man's age(x) is exactly 2 years greater than his wife's age(y). Then the correlation coefficient(r) between x and y is
A) 1 B) -1 C) -0.5 D) 0.5
14. The range of the Pearson correlation coefficient value (r) for the positive linear relationship is ...
A) $0 \leq r \leq 1$ B) $-1 \leq r \leq 1$ C) $0 < r \leq 1$ D) $0 \leq r < 1$

Use the following to answer questions 15-17:

A student takes a 7-question multiple choice quiz with 4 choices for each question. If the student guesses at random on each question, answer the following three questions:

15. What is the standard deviation of the number of correct answers?
A) 1.146 B) 0.968 C) 1.225 D) 1.061
16. What is the mean number of incorrect answers?
A) 1.25 B) 2 C) 4.5 D) 5.25
17. If the lowest grade to get an A in the quiz is 6 correct out of 7, what is the probability of getting A in this quiz?
A) 19/4096 B) 25/65536 C) 11/8192 D) 1/64
18. A(n) ... probability is used when a sportscaster makes a guess on how well a team will do next season depending on historical information.
A) empirical B) classical C) conditional D) subjective

Use the following to answer questions 19-22:

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

	Yes	No	<i>No opinion</i>	Total
Males	23	17	8	48
Females	7	8	12	27
Total	30	25	20	75

If a person is selected at random, use the above table to answer the following two questions.

19. The probability that a person is a female given that she answered yes regarding recycling is:
A) 0.767 B) 0.68 C) 0.233 D) 0.32
20. What is the probability that a person has no opinion regarding recycling?
A) 0.333 B) 0.4 C) 0.64 D) 0.267
21. What is the probability that a person is a male and he answered no regarding recycling?
A) 0.227 B) 0.16 C) 0.107 D) 0.093
22. The probability that a person is a male or he has no opinion regarding recycling is:
A) 0.8 B) 0.587 C) 0.467 D) 0.747

Use the following to answer questions 23-25:

If the differences between the ranks of two variables are (-1, -4, 2, 1, -2, 2, 2) then answer the following three questions:

23. The sample size is
A) 14 B) 5 C) 7 D) 0
24. The value of the Spearman correlation coefficient is
A) 0.393 B) -0.371 C) -0.6 D) 0
25. The Spearman correlation coefficient value means that there is
A) weak negative linear relationship C) weak positive linear relationship
B) moderate negative linear relationship D) no linear relationship
26. How many different 5-letter permutations can be formed from the letters in the word **question**?
A) 840 B) 6720 C) 56 D) 120
27. Two events that can occur at the same time are called ...
A) dependent. B) mutually exclusive. C) not mutually exclusive. D) independent.
28. Given 10 students, 6 of which are females. If 4 students are selected at random, what is the probability that the 4 students are female?
A) 1/6 B) 1/30 C) 1/210 D) 1/14
29. A survey found that 4 out of 6 students say they like statistics course. If 10 students are selected at random, find the probability that exactly 5 would have liked the statistics course.
A) 0.171 B) 0.137 C) 0.273 D) 0.057

30. Which of the following is a binomial experiment?
- A) Asking 100 people about the type of vegetables they like.
 - B) Drawing two balls without replacement from a box that contains 20 different balls.
 - C) Asking 100 people if they can eat vegetables.
 - D) Asking 100 people about the type of vegetables they eat.

Answer Key

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