Math 131-03
Practice Questions for Exam# 3

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1) If $P(E) = \frac{1}{3}$, $P(F') = \frac{2}{5}$, and $P(E \cap F) = \frac{1}{5}$, find $P(E \mid F)$. 1) _____

2) Given the equiprobable sample space $S = \{1, 2, ,3, 4, 5\}$ and events $E = \{1, 2, 4\}$ and $F = \{1, 4, 5\}$, find $P(E \mid F)$. 2) _____

3) If a fair red die and a fair green die are rolled, find the probability that the sum is greater than 8, given that a 4 shows on the red die. 3) _____

4) If two cards are randomly drawn, without replacement, from a standard deck of 52 cards, find the probability that the second card is not a jack or queen, given that the first card is a jack or queen. 4) _____

5) An urn contains 3 green, 2 yellow, and 6 red marbles. If two marbles are randomly drawn without replacement, find the probability the second one is yellow, given that the first marble drawn is red. 5) _____

6) If three cards are randomly drawn without replacement from a standard deck of 52 cards, find the probability that all are queens. 6) _____

7) Urn I contains two red and three white marbles, and Urn II contains three red and four white marbles. A marble is randomly drawn from Urn I and placed into Urn II. A marble is then randomly drawn from Urn II. Find the probability that it is red. 7) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

8) An urn contains 4 red and 3 yellow marbles. If two marbles are randomly drawn without replacement, find the probability the second one is yellow, given that the first marble drawn is red. 8) _____

A) $\frac{2}{7}$

B) $\frac{3}{7}$

C) $\frac{3}{4}$

D) $\frac{1}{2}$

E) none of the above

9) Two cards are randomly drawn without replacement from a standard deck of 52 cards. Find the probability that the second card is a heart. 9) _____

A) $\frac{1}{4}$ B) $\frac{12}{13}$ C) $\frac{3}{4}$ D) $\frac{1}{3}$ E) $\frac{2}{3}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

10) If $P(E) = 0.2$, $P(F) = 0.6$, and $P(E \cap F) = 0.12$, determine if E and F are independent or dependent. 10) _____

11) If $P(E|F) = \frac{1}{2}$, $P(E \cup F) = \frac{9}{10}$, and $P(E \cap F) = \frac{2}{5}$, determine if E and F are independent or dependent. 11) _____

12) If a fair die is rolled three times, find the probability that a 3 or 5 comes up each time. 12) _____

13) An urn contains five chips numbered from 1 to 5. A chip is randomly drawn. Let E be the event of drawing a 3 and F be the event of drawing a 5. Are E and F independent? 13) _____

14) Two cards are randomly drawn with replacement from a standard deck of 52 cards. Find the probability of drawing, in order, the queen of hearts and a diamond. 14) _____

15) A quiz contains four multiple-choice problems. Each problem has five choices for the answer, but only one of them is correct. If a student randomly guesses the answer to each problem, find the probability that the student gets exactly three correct answers. 15) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

16) Three cards are randomly drawn, with replacement, from a standard deck of 52 cards. Find the probability that the cards chosen, in order, are a queen, the 3 of diamonds, and a diamond. 16) _____

A) $\frac{3}{8788}$

B) $\frac{12}{7341}$

C) $\frac{3}{8500}$

D) $\frac{2}{5525}$

E) none of the above

17) If a fair die is rolled three times, find the probability of getting an even number each time. 17) _____

A) 0.6

B) $\frac{1}{8}$

C) $\frac{1}{3}$

D) $\frac{3}{8}$

E) none of the above

18) Two fair dice are rolled twice. Find the probability of getting a total of 6 on one of the rolls and a total of 11 on the other one. 18) _____

A) $\frac{7}{36}$

B) $\frac{5}{324}$

C) $\frac{1}{3}$

D) $\frac{5}{648}$

E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

19) An urn contains 4 red and 6 green marbles. Two marbles are successively drawn at random with replacement and the number of red marbles, X, is observed. Construct the probability histogram for X. 19) _____

20) A random variable X has a distribution given by $f(0) = 0.3$, $f(1) = 0.6$, $f(2) = 0.1$. (a) Find μ. (b) Find σ. 20) _____

21) Suppose that you pay \$3 to play a game in which a fair die is rolled. You receive the number of dollars equal to the number of dots that appear. What is your expected gain (or loss) on each play? 21) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

22) From a group of 10 men and 10 women, two people are randomly selected to form a committee. If X is the number of women on the committee, then $P(X = 2) =$ 22) _____

A) $\frac{7}{380}$. B) $\frac{1}{5}$. C) $\frac{9}{38}$. D) $\frac{17}{380}$. E) $\frac{5}{38}$.

23) A random variable X has a distribution given by $f(1) = 0.6$, $f(2) = 0.2$, $f(3) = 0.2$. The mean of X is 23) _____

A) 1.8. B) 1.6. C) 0.4. D) 0.33. E) 3.

24) A random variable X has a distribution given by $f(0) = 0.4$, $f(1) = 0.3$, $f(2) = 0.3$. The variance of X is 24) _____

A) 0.54. B) 0.32. C) 0.47. D) 0.69. E) 0.50.

25) An urn contains 20 marbles, each of which shows a number. Eight marbles show 1, five marbles show 2, and seven marbles show 3. A marble is randomly selected and the number X that shows is observed. The mean of X is 25) _____

A) $\frac{39}{20}$. B) 1. C) $\frac{3}{2}$. D) $\frac{23}{20}$. E) $\frac{3}{10}$.

26) Suppose that you pay $1 to play a game in which a pair of fair dice are rolled. For each 2 that shows on a die you receive $2. To the nearest cent, your expected loss on each play is 26) _____

A) $0.15. B) $0.33. C) $0.07. D) $0.67. E) $0.25.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

27) A random variable X has a distribution given by $f(0) = 0.3$, $f(1) = 0.2$, $f(2) = 0.5$. (a) Find μ. (b) Find Var(X). 27) _____

Solve the problem.

28) The numbers of runs batted in that Sammy Sosa hit in the first 15 years of his major league baseball career are listed below. Find the mean and median number of runs batted in. Round the mean to the nearest whole number. 28) _____

13	70	33	25	93	70	119	100
119	158	141	138	160	108	103	

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

29) For the following data, approximate the mean miles per day. 29) _____

Miles (per day)	Frequency
1-2	22
3-4	30
5-6	3
7-8	28
9-10	5

A) 4 B) 18 C) 6 D) 5

30) For the following data, approximate the mean number of phone calls per day. 30) _____

Phone calls (per day)	Frequency
8-11	31
12-15	34
16-19	28
20-23	30
24-27	6

A) 15 B) 14 C) 16 D) 26 E) 17

31) Identify the class width used in the frequency distribution. 31) _____

Height (in inches)	Frequency
50 - 52	5
53 - 55	8
56 - 58	12
59 - 61	13
62 - 64	11

A) 2 B) 51 C) 5 D) 3

32) Identify the midpoint of the first class. 32) _____

Height (in inches)	Frequency
50 - 52	5
53 - 55	8
56 - 58	12
59 - 61	13
62 - 64	11

A) 50 B) 51 C) 52 D) 49.5

33) Identify the class boundaries of the first class. 33) _____

Height (in inches)	Frequency
50 - 52	5
53 - 55	8
56 - 58	12
59 - 61	13
62 - 64	11

A) 49.5 - 52.5 B) 50 - 64 C) 49 - 53 D) 50 - 52

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

34) For the data below, construct a frequency histogram, and a frequency polygon. 34) _____

Height (in inches)	Frequency
50 - 52	5
53 - 55	8
56 - 58	12
59 - 61	13
62 - 64	11

35) For the data below, construct a frequency histogram, and a frequency polygon. 35) _____

Weight (in pounds)	Frequency
135 - 139	6
140 - 144	4
145 - 149	11
150 - 154	15
155 - 159	8

36) The heights (in inches) of 30 adult males are listed below. Construct a frequency distribution, a frequency histogram using five classes, and a frequency polygon using five classes. 36) _____

70 72 71 70 69 73 69 68 70 71
67 71 70 74 69 68 71 71 71 72
69 71 68 67 73 74 70 71 69 68

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

37) The heights (in inches) of 20 adult males are listed below. Find the range of the data. 37) _____

70 72 71 70 69 73 69 68 70 71
67 71 70 74 69 68 71 71 71 72

A) 6 B) 5 C) 6.5 D) 7

38) The heights (in inches) of 10 adult males are listed below. Find the sample standard deviation. 38) _____

70 72 71 70 69 73 69 68 70 71

A) 2.38 B) 70 C) 1.49 D) 3

39) For the following data set, approximate the sample standard deviation. 39) _____

Miles (per day)	Frequency
1-2	9
3-4	22
5-6	28
7-8	15
9-10	4

A) 2.9 B) 5.1 C) 2.1 D) 1.6

40) For the following data set, approximate the sample standard deviation of phone calls per day. 40) _____

Phone calls (per day)	Frequency
8-11	18
12-15	23
16-19	38
20-23	47
24-27	32

A) 5.1 B) 18.8 C) 3.2 D) 2.9

41) If one card is drawn from a standard deck of 52 playing cards, what is the probability of drawing a heart? 41) _____

A) 1 B) $\frac{3}{4}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$

42) Which of the following cannot be a probability? 42) _____

A) 1 B) 0.0002 C) $\frac{4}{3}$ D) 85%

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

43) The distribution of Master's degrees conferred by a university is listed in the table. 43) _____

Major	Frequency
Mathematics	216
English	207
Engineering	86
Business	176
Education	222

Find the probability of randomly choosing a person graduating with a Master's degree who did not major in Education. Round your answer to three decimal places.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

44) A group of students were asked if they carry a credit card. The responses are listed in the table. 44) _____

Class	Credit Card Carrier	Not a Credit Card Carrier	Total
Freshman	24	36	60
Sophomore	37	3	40
Total	61	39	100

If a student is selected at random, find the probability that he or she owns a credit card given that the student is a freshman. Round your answer to three decimal places.

A) 0.393 B) 0.240 C) 0.600 D) 0.400

45) A group of students were asked if they carry a credit card. The responses are listed in the table. 45) _____

Class	Credit Card Carrier	Not a Credit Card Carrier	Total
Freshman	18	42	60
Sophomore	40	0	40
Total	58	42	100

If a student is selected at random, find the probability that he or she owns a credit card given that the student is a sophomore. Round your answer to three decimal places.

A) 1.000 B) 0.400 C) 0.690 D) 0.000

46) A group of students were asked if they carry a credit card. The responses are listed in the table. 46) _____

Class	Credit Card Carrier	Not a Credit Card Carrier	Total
Freshman	46	14	60
Sophomore	32	8	40
Total	78	22	100

If a student is selected at random, find the probability that he or she is a freshman given that the student owns a credit card. Round your answers to three decimal places.

A) 0.767 B) 0.590 C) 0.410 D) 0.460

47) Classify the events as dependent or independent. Events A and B where 47) _____
$P(A) = 0.6$, $P(B) = 0.3$, and $P(A \text{ and } B) = 0.17$

A) independent B) dependent

48) Classify the events as dependent or independent. 48) _____
The events of getting two aces when two cards are drawn from a deck of playing cards and the first card is replaced before the second card is drawn.

A) dependent B) independent

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

49) The probability it will rain is 40% each day over a three-day period. What is the probability it will not rain at least one of the three days? 49) _____