

PRINTABLE VERSION

Quiz 6

You scored 100 out of 100

Question 1

Your answer is CORRECT.

A manufacturer of matches randomly and independently puts 24 matches in each box of matches produced. The company knows that one-tenth of 5 percent of the matches are flawed. What is the probability that a matchbox will have one or fewer matches with a flaw?

- a) ☐ 0.004456
- b) ☐ 0.9950
- c) ☐ 0.1069
- d) ☒ 0.9936
- e) ☐ 0.8867
- f) ☐ None of the above

Question 2

Your answer is CORRECT.

Let X be the number of flaws on the surface of a randomly selected boiler of a certain type and suppose X is a Poisson distributed random variable with parameter $\mu = 4$. Find $P(4 \leq X \leq 7)$

- a) ☐ 0.4846
- b) ☐ 0.7046
- c) ☐ 0.0595
- d) ☐ 0.5703
- e) ☒ 0.5153
- f) ☐ None of the above

Question 3

Your answer is CORRECT.

Suppose you have a distribution, X , with mean = 18 and standard deviation = 6. Define a new random variable $Y = 6X - 2$. Find the mean and standard deviation of Y .

- a) ☐ $E[Y] = 106; \sigma_Y = 216$
- b) ☐ $E[Y] = 106; \sigma_Y = 34$
- c) ☐ $E[Y] = 108; \sigma_Y = 34$
- d) ☒ $E[Y] = 106; \sigma_Y = 36$
- e) ☐ $E[Y] = 108; \sigma_Y = 216$
- f) ☐ None of the above

Question 4

Your answer is CORRECT.

Each year a company selects a number of employees for a management training program. On average, 30 percent of those sent complete the program. Out of the 11 people sent, what is the probability that exactly 6 complete the program?

- a) ☐ 0.9783
- b) ☐ 1.0783
- c) ☐ 0.2566
- d) ☒ 0.0566
- e) ☐ 0.1006
- f) ☐ None of the above

Question 5

Your answer is CORRECT.

Each year a company selects a number of employees for a management training program. On average, 50 percent of those sent complete the program. Out of the 17 people sent, what is the probability that 5 or more complete the program?

- a) ☐ 0.0717
- b) ☐ 0.1717
- c) ☐ 0.0245

- d) ☒ 0.9754
- e) ☐ 0.9282
- f) ☐ None of the above

Question 6

Your answer is CORRECT.

A fish tank in a pet store has 24 fish in it. 5 are orange and 19 are white. Determine the probability that if we select 3 fish from the tank, at least 2 will be white.

- a) ☐ 0.7916
- b) ☐ 0.0988
- c) ☒ 0.9011
- d) ☐ 0.1208
- e) ☐ 1.1211
- f) ☐ None of the above

Question 7

Your answer is CORRECT.

The number of people arriving for treatment at an emergency room can be modeled by a Poisson process with a mean of 7 people per hour. How many people do you expect to arrive during a 40-minute period?

- a) ☐ 0.59
- b) ☒ 4.66
- c) ☐ 1.00
- d) ☐ 280.00
- e) ☐ 7.00
- f) ☐ None of the above

Question 8

Your answer is CORRECT.

Determine the type of distribution for the following situation:
Draw marbles from a bag which contains 5 red marbles, 6 blue marbles and 4 green marbles with replacement until you get a blue marble.

- a) ☐ Binomial
- b) ☐ Poisson
- c) ☐ Hypergeometric
- d) ☒ None of these

Question 9

Your answer is CORRECT.

Suppose two random variables, X and Y are independent, which statement is **false**?

- a) ☐ $P(X | Y) = P(X)$
- b) ☐ $\text{Cov}(X, Y) = 0$
- c) ☒ $P(X \cup Y) = P(X) + P(Y)$
- d) ☐ $P(X \cap Y) = P(X) \cdot P(Y)$
- e) ☐ None of the above are false.

Question 10

Your answer is CORRECT.

Using the joint probability table below, determine $P(X = 1, Y = 7)$.

$Y \backslash X$	-1	0	1
3	0.05	0.05	0.05
5	0.15	0.1	0.15
7	0	0.15	0.3

- a) ☐ 0.65
- b) ☐ 0.1
- c) ☐ 0.45
- d) ☒ 0.3
- e) ☐ 0.95
- f) ☐ None of the above.

Question 11**Your answer is CORRECT.**Using the joint probability table below, determine the marginal distribution of X .

$Y \backslash X$	-1	0	1
3	0	0.05	0.15
5	0.05	0.05	0.1
7	0.3	0.15	0.15

a) ☒

X	-1	0	1
$P(X)$	0.35	0.25	0.4

b) ☐

X	-1	0	1
$P(X)$	0.2	0.2	0.6

c) ☐

X	-1	0	1
$P(X)$	0.3	0.15	0.15

d) ☐

X	-1	0	1
$P(X)$	0	0.05	0.15

e) ☐ None of the above.**Question 12****Your answer is CORRECT.**Using the joint probability table below, determine $P(X = 0 \mid Y = 5)$.

$Y \backslash X$	-1	0	1
3	0.15	0.15	0.05
5	0.05	0.15	0.3
7	0	0.05	0.1

- a) ☐ 0.429
- b) ☒ 0.3
- c) ☐ 0.03
- d) ☐ 0.043
- e) ☐ 0.15
- f) ☐ None of the above.

Question 13

Your answer is CORRECT.

Using the joint probability table below, determine $E(XY)$.

$Y \backslash X$	-1	0	1
3	0.05	0.05	0.15
5	0.15	0.3	0.1
7	0.15	0	0.05

- a) ☐ 4.85
- b) ☐ 4.90
- c) ☒ -0.65
- d) ☐ -0.05
- e) ☐ 1.0
- f) ☐ None of the above.

Question 14

Your answer is CORRECT.

Suppose that a fair, 6 sided die is rolled. Let X indicate the event that an even number is rolled (in other words, $X = 1$ if an even number is rolled and $X = 0$ otherwise). Let Y indicate the event that 1, 2, or 3 is rolled (in other words, $Y = 1$ if 1, 2, or 3 is rolled and $Y = 0$ otherwise). Find $P(X = 0, Y = 1)$.

- a) ☒ $\frac{1}{3}$

- b) ☐ $\frac{5}{6}$
- c) ☐ $\frac{1}{6}$
- d) ☐ $\frac{1}{2}$
- e) ☐ $\frac{2}{3}$
- f) ☐ None of the above

Question 15

Your answer is CORRECT.

Suppose $p(x, y) = \frac{x + y}{21}$, $x = 1, 2, 3, y = 1, 2$ is the joint pmf of X and Y . Determine $P(Y = 2)$.

- a) ☒ $\frac{4}{7}$
- b) ☐ $\frac{1}{3}$
- c) ☐ $\frac{1}{6}$
- d) ☐ $\frac{5}{6}$
- e) ☐ $\frac{1}{2}$
- f) ☐ None of the above