

Question 1: A group of 15 smokers were asked about the number of cigarettes they smoke per day. Sample data were as follows:

No. of cigarettes	10	15	17	20	22
No. of smokers	1	3	5	2	4

Find the following measures:

- The sample mean
- The sample standard deviation
- The sample interquartile range

Question 2: The grades in a general exam had mean, standard deviation, Q_1 , Q_3 and the range were 70, 5, 30, 30, 90, respectively. Let X be the grade of a student and assume that each grade X is changed to $Y = -2X + 3$. Find

- The mean \bar{Y} of the transformed grades Y
- The standard deviation of the transformed grades Y
- The range of the transformed grades Y
- The first quartile of Y

Question 3: The mean and standard deviation for the final grades of 500 students in a statistics course are 70 and 8, respectively.

- Find the largest number of grades outside the interval [54, 86]
- If only one grade was mistakenly recorded 10 instead of 100, what is new mean?

Question 4: Given that $P(A)=0.45$, $P(B)=0.50$ and $P(\bar{A} \cap \bar{B})=0.20$. Obtain

- $P(A \cap B)$
- $P(\bar{A} | \bar{B})$

Question 5: Given the information that

Box I : contains 3 Red (R) and 2 white (W) balls

Box II: contains 2 Red (R) and 1 white (W) balls.

One ball was drawn randomly from Box I and put in Box II, then one ball is drawn randomly from Box II. Determine

- The probability that the ball drawn from Box II is red =
- If the ball drawn from Box II is red, what is the probability that the ball transferred from Box I to Box II is red?

Question 6: Three balls are drawn without replacement from a box containing 2 red and 2 black balls. Let X be the number of red balls. Find

- The mean of X is
- The Std. of X is

Question 7: A class has 12 Math. Students (2 males and 10 females) and 8 physics students (3 males and 5 females).

- (a) What is the probability of selecting 2 students from the 20 students such that all are physics students?
- (b) What is the probability that there is at most one physics student among the 5 students selected from the entire class?

Question 8: A family has 5 children (3 girls and 2 boys). Two of the girls and one boy wear glasses

- (a) What is the probability of randomly selecting 2 children wearing glasses from the 5 children?
- (b) If children are asked to stand in one line. What is the probability that only girls stand next to each other?

Question 9: A random variable takes the values 1, 2, 3 where $P(X=1) = 0.5$ and $E(X)=1.7$. Find

- (a) $P(X = 3)$
- (b) Variance of X
- (c) $P(X > 2 | X > 1)$

Question 10: Let (X, Y) be bivariate random variable such that $E(X) = E(Y)=0$, $\text{Var}(X)=1$, $\text{Var}(Y)=4$ and $\text{Corr.}(X, Y)=\rho = -\frac{1}{2}$. Compute

- (a) $\text{Cov}(X, Y)$
- (b) $E(3 X^2 - 4Y + 1)$
- (c) $\text{Var}(2X-3Y+1)$