Total Tweets = 18 +ve = 10, -ve = 8 (1+1)

$P(+ve) = \frac{10}{18}$ (1) $P(-ve) = \frac{8}{18}$ (1)

Words. Happy = H, Learning = L, NLP = N. (1)

$P(H|+ve) = \frac{6}{10} = 0.6$ (1) $P(L|+ve) = \frac{7}{10} = 0.7$ (1) $P(N|+ve) = \frac{6}{10} = 0.6$

$P(H|-ve) = \frac{3}{8} = 0.375$, $P(L|+ve) = \frac{4}{8} = 0.5$, $P(N|-ve) = \frac{4}{8}$ 0.5

Law of Total Probability A: Probability of Sentimed. (1)

$P(A) = P(+ve)\,P(H|+ve)\,P(L|+ve)\cdot P(N|+ve) + P(-ve)\,P(H|-ve)\cdot P(L|-ve)\cdot P(N|-ve)$

$P(A) = \left(\frac{10}{18}\cdot\frac{6}{10}\cdot\frac{7}{10}\cdot\frac{6}{10}\right) + \left(\frac{8}{18}\cdot\frac{3}{8}\cdot\frac{4}{8}\cdot\frac{4}{8}\right) = 0.14 + 0.0417$ (2)

$P(A) = 0.1817$

(1) New Tweet will be +ve.

$$P(+ve|H\cap L\cap N) = \frac{P(+ve)\cdot P(H|+ve)\,P(L|+ve)\cdot P(N|+ve)}{P(A)}$$

$$P(+ve|H\cap L\cap N) = \frac{0.14}{0.817} = 0.7705$$

(2) New Tweet will be -ve.

$$P(-ve|H\cap L\cap N) = \frac{P(-ve)\cdot P(H|-ve)\cdot P(L|-ve)\cdot P(N|-ve)}{P(A)}$$

$$P(-ve|H\cap L\cap N) = \frac{0.0417}{0.817} = 0.2293$$

As the Probability of +ve is greater than -ve so the Now tweet is more likely to be classified as +ve tweet. (2) (1)

TABLE NO.2

Sr.	SCENARIOS	RESPONSE
1	The proportion of people who respond to a certain email is modeled as a continuous random variable with the probability density function: $f(x) = \frac{2(x+2)}{5}$, where $0 < x < 2$. Is this a valid pdf?	○ Yes ✓ No $\int_0^2 \frac{2(x+2)}{5} \neq 1$ $\frac{2}{5}\left(\frac{x^2}{2}+2x\right)\Big\|_0^2 = \frac{12}{5} \neq 1$
2	A coffee shop tracks the number of loyalty card holders (X) who redeem their free coffee reward on Mondays. The probability distribution of X is [x, $f(x)$]: [2, 1/10], [3, 1/11], [4, 1/6], [5, 1/7]. The shop also offers an additional discount (in hundreds) on further purchases, calculated as $g(X) = X + 2$. Find the shop's expected total discount amount on Mondays.	$\Sigma x f(x) = 2.85$ $E(X+2) = E(X)+2$ $= 3.85$ $\Sigma (x+2) f(x) = 2.85$
3	A software engineering team is analyzing the relationship between code compilation time (X) in seconds and model accuracy (Y) as a proportion for a machine learning system. The following statistics are given for a set of experiments: $\sigma_X = 2.5$, $\sigma_Y = 0.70$, $\sigma_{XY} = -1.20$. Calculate the correlation between X and Y.	$\rho_{xy} = \frac{Cov(X,Y)}{\sigma_X \sigma_Y} = \frac{\sigma_{XY}}{\sigma_X \sigma_Y}$ $= \frac{-1.20}{(2.5)(0.70)} = -0.69$
4	A network administrator is monitoring the time (X) taken to transmit a data packet across different routers in a network. Due to network traffic variations, the transmission time X is a continuous random variable with a probability density function, $f(x) = \frac{1}{b-a}$ with $a \leq x \leq b$, for the interval [-2, 10]. Calculate and define its probability function.	$f(x) = \frac{1}{b-a}$ $f(x) = \frac{1}{10-(-2)} = \frac{1}{12}$
5	A database server processes read and write queries in parallel. Both query types are randomly distributed, representing the number of queries completed within a fixed 1-second interval. Based on historical logs, the system administrator aims to analyze the probability distribution of read and write queries to assess system performance and reliability under varying load conditions. How would you represent the distribution: Is this a univariate or joint distribution model? Also, classify it as discrete or continuous.	✓ Univariate ✓ Bivariate ✓ Discrete ○ Continuous

writing in a cell, as it will