Probability Assignment 1
Fares Ahmed

Q1. ①

$$\boxed{\text{delay 1 Hour} = \text{Hour}}$$

P(Hour |A) = 0.3   P(A) = 0.4
P(Hour |B) = 0.4   P(B) = 0.35
P(Hour |C) = 0.2   P(C) = 0.25

شركات صلاح أبو دنقل
SALAH ABO DONKOL COMPANIES

P(A) * P(Hour|A) = 0.12
P(B) * P(Hour |B) = 0.14
P(C) * P(Hour |C) = 0.05

P(Hour) = 0.12 + 0.14 + 0.05 = 0.31

② $P(B | \text{Hour}) = \dfrac{P(B) P(\text{Hour} |B)}{P(\text{Hour})} = \dfrac{14}{31} = 0.45$

③ P(C) * P(Hour|C) = 0.05

④ P(Hour)' = 1 - P(Hour) = 0.69

⑤ P(ontime) = P(Hour)' = 0.69

⑥ 0.1 + 0.3 + 0.4 + 0.2 = 1
(without any negative values) → distribution
                               is Valid

⑦ 0 × 0.1 = 0 , 1 × 0.3 = 0.3, 2 × 0.4 = 0.8, 3 × 0.2 = 0.6
Sum = 0 + 0.3 + 0.8 + 0.6 = 1.7 delay per hour
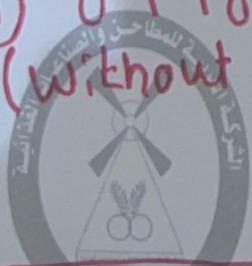
⑧ $E(x^2) = 0^2 \times 0.1 + 1^2 \times 0.3 + 2^2 \times 0.4 + 3^2 \times$
$$0.2 = 3.7$$
$$\text{Var}(X) = 3.7 - (1.7)^2 = 0.81$$
$$SD(X) = \sqrt{0.81} = 0.9$$

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⑨ $P(X = 2) + P(X = 3) = 0.4 + 0.2 = 0.6$

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⑩

1. exclected delays Per hour are 1.7 which is Moderate.

2. Std. variability around mean is also Moderate

3. Since $P(X \geq 2) = 0.6$, ~~the~~ add extra buses and more flexible drivers.