BRAC University
Department of Computer Science and Engineering

CSE 422: Artificial Intelligence (A)

Quiz 05: Spring 2025 Time: 30 Minutes Marks: 10

Name		ID		Section	

1. A transportation agency studies the commuting habits of 800 employees to understand delay patterns. Of these, 250 people work from home. Among them, 20 still use public transport (for errands or hybrid roles). Of the 550 on-site workers, 400 use public transport. When it comes to delays, 10 of the 20 remote workers who use public transport report delays. Additionally, 20 of the 230 remote workers who do not use public transport experience delays. For on-site workers, 220 public transport users and 50 non-users report delays. [2.5×4=10]

   (a) Calculate the following probabilities:

      i. $P(\text{WFH} = \text{yes})$

      ii. $P(\text{Transport} = \text{yes} \mid \text{WFH} = \text{yes})$

      iii. $P(\text{Delay} = \text{yes} \mid \text{WFH} = \text{yes}, \text{Transport} = \text{yes})$

   (b) Use the chain rule to compute:

   $$P(\text{WFH} = \text{yes}, \text{Transport} = \text{yes}, \text{Delay} = \text{yes})$$

   (c) Compute the marginal probability:

   $$P(\text{Delay} = \text{yes})$$

   (d) Does delay appear to be conditionally independent of work-from-home status given transport usage? Justify with appropriate probabilities.