Name		ID		Section	

1. An ed-tech company analyzes user behavior on its platform by tracking logins, video quality settings, and course module completions. Out of 500 users, 300 logged into the platform this week. Among those who logged in, 180 watched at least one video in high-quality mode. Of the 200 users who did not log in, 20 still watched in high quality through direct video links shared via email. Among the logged-in users who watched in high quality, 100 completed a course module. Of those who logged in but did not use high-quality, 60 completed a module. For users who didn't log in but still used high quality, 10 completed a module, while only 5 people who neither logged in nor used high-quality video completed a module. [2.5×4=10]

   (a) Estimate the following probabilities:

        i. $P(\text{Login} = \text{yes})$
        ii. $P(\text{HighQuality} = \text{yes} \mid \text{Login} = \text{yes})$
        iii. $P(\text{Complete} = \text{yes} \mid \text{Login} = \text{yes}, \text{HighQuality} = \text{yes})$

   (b) Use the chain rule to compute:

   $$P(\text{Login} = \text{yes}, \text{HighQuality} = \text{yes}, \text{Complete} = \text{yes})$$

   (c) Compute the marginal probability:

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

   (d) Does module completion appear to be conditionally independent of login, given video quality? Justify with conditional probabilities.