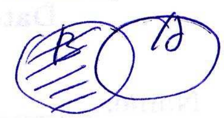
(2) (c) P(AUB) under no assumption about independence or mutually exclusive.

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= P(A) + P(A' \cap B)$

$= 0.2 + 0.4 = 0.6$



$A' \cap B$

3. A computer system uses passwords that consist of five letters followed by a single digit, also the computer system does not distinguish between the lower case and upper case of the same letter.

(2) (a) How many passwords are possible?

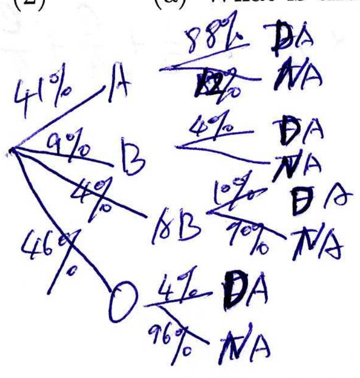
$26^5 \times 10$

(2) (b) How many passwords consist of three A's and two B's, and end in an even digit?

$\binom{5}{3} \times 5 = 50$

4. The blood type distribution in the United States is type A, 41%; type B, 9%; type AB, 4%; and type O, 46%. It is estimated that during World War II, 4% of the inductees with type O blood were typed as having type A; 88% of those with type A were correctly typed; 4% with type B blood were typed as A; and 10% with type AB were typed as A. A soldier was wounded and brought to surgery. He was typed as having type A blood.

(2) (a) What is the probability that this is his true blood type?



DA: Diagnosed as A, NA: diagnosed as not A.

$P(A \mid DA)$

$= \dfrac{P(A \cap DA)}{P(DA)}$

$= \dfrac{41\% \times 88\%}{41\% \times 88\% + 9\% \times 4\% + 4\% \times 10\% + 46\% \times 4\%}$

$= 0.9328$

(2) (b) What is the probability that his true blood type is O?

$P(O \mid DA) = \dfrac{P(O \cap DA)}{P(DA)}$

$= \dfrac{46\% \times 4\%}{P(DA)} = 0.0476$