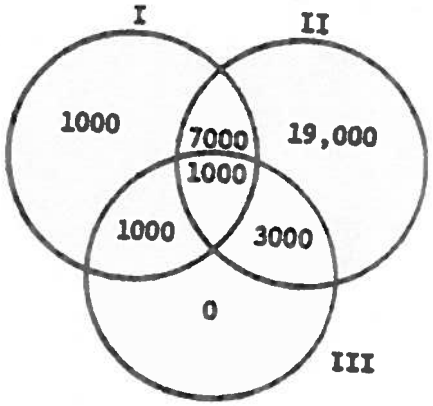
HW #2A - SOLUTIONS

(1.)



(a) 20,000

(b) 12,000

(c) 11,000

(d) 10,000

(2.) a) $\{5\}$ b) $\{1,3,4,5,6,7,8,9,10\}$

c) $\{2,3,4,5\}$ d) $\{1,5,6,7,8,9,10\}$ e) $\{1,2,5,6,7,8,9,10\}$

(3.) a) $\frac{\binom{1}{1}\binom{5}{2}\binom{4}{0}}{\binom{10}{3}} = \frac{1}{12}$ b) $\frac{\binom{1}{1}\binom{4}{2}\binom{5}{0}}{\binom{10}{3}} = \frac{1}{20}$

(4.) a) $\frac{\binom{400}{90}\binom{1100}{110}}{\binom{1500}{200}}$ b) $1-P(0)-P(1) = 1-\frac{\binom{400}{0}\binom{1100}{200}}{\binom{1500}{200}} - \frac{\binom{400}{1}\binom{1100}{199}}{\binom{1500}{200}}$

(5.) a) $\frac{\binom{4}{0}\binom{2}{0}\binom{10}{1}}{\binom{16}{1}} = \frac{5}{8}$ b) $\frac{\binom{2}{0}\binom{14}{1}}{\binom{16}{1}} = \frac{7}{8}$

c) $P(G)+P(MD) = \frac{5}{8}+\frac{1}{8} = \frac{3}{4}$

(6.) a) $\frac{\binom{10}{2}\binom{4}{0}\binom{2}{0}}{\binom{16}{2}} = \frac{3}{8}$ b) $\frac{\binom{10}{0}\binom{4}{0}\binom{2}{2}}{\binom{16}{2}} = \frac{1}{120}$

c) $P(16)+P(26) = \frac{\binom{10}{1}\binom{6}{1}}{\binom{16}{2}} + \frac{3}{8} = \frac{7}{8}$

d) $P(06)+P(16) = \frac{\binom{10}{0}\binom{6}{2}}{\binom{16}{2}} + \frac{\binom{10}{1}\binom{6}{1}}{\binom{16}{2}} = \frac{5}{8}$ e) $\frac{1}{2}$

f) $\frac{\binom{2}{0}\binom{14}{2}}{\binom{16}{2}} = \frac{91}{120}$ g) $\frac{\binom{6}{2}\binom{10}{0}}{\binom{16}{2}} = \frac{1}{8}$

(7.)

$P(\text{product is positive}) = P(0 \text{ neg.}) + P(2 \text{ neg.}) + P(4 \text{ neg.})$

$= \frac{\binom{8}{0}\binom{6}{4}}{\binom{14}{4}} + \frac{\binom{8}{2}\binom{6}{2}}{\binom{14}{4}} + \frac{\binom{8}{4}\binom{6}{0}}{\binom{14}{4}} = \frac{505}{1001}$