Exam 1 (A)

$\boxed{1}$ 10 char words from A .. Z, 0 ... 9

(a) 36^{10} (b) $36^6 + 36^6$ (c) 34^{10}

(d) $\underset{\text{no } E}{35^{10}} + \underset{\text{No } H}{35^{10}} - \underset{\text{both}}{34^{10}}$

(e) $\binom{10}{4} \cdot 35^6$ (f) $\binom{10}{3}\binom{7}{4} 34^3$

(g) A_i: 8 Hs from i to $i+7$,

$|A_1 \cup A_2 \cup A_3| = 3 \cdot 36^2 - 36 - 36 - 1 + 1$

(h) $36 \cdot 35^9$ (i) $P(36, 10)$

(j) $P(36,10) - P(35,10) = \underset{E}{\binom{10}{1}} P(35,9)$

(k) $2 \cdot 9 \cdot P(34, 8)$

$\boxed{2}$ 45 cake donuts to 9 friends

(a) 9^{45} (b) $\binom{45}{7} \cdot 8^{38}$

(c) $9^{45} - 8^{45}$ (d) $\frac{45!}{(5!)^9}$ (e) $\frac{45!}{(4!)^9\, 9!}$

(f) $\binom{53}{8}$ (g) $\binom{45}{7}$

(h) $\binom{53}{8} - \binom{46}{8}$ (i) $\binom{54}{9}$ (j) 1

$\boxed{3}$ (a) place 1 $40 \cdot 32$
place 2 $39 \cdot 31$ $\Big\}$, $\Rightarrow$

$\vdots$

place 11 $\quad 30 \cdot 22 \quad \int$

$$P(40,11) \cdot P(32,11) = \frac{40!}{29!} \cdot \frac{32!}{21!}$$

(b) Each solution gives 11! to part (a),

so $\dfrac{P(40,11) \cdot P(32,11)}{11!}$

$\boxed{4}$ (a) $\binom{35}{18}$ (b) $\binom{35}{18} - \binom{25}{18}$ all to men

(c) $\binom{35}{18} - \binom{25}{8}$ all women get prize