84.

a. $P(A_1 A_2 A_3) = P(A_1) P(A_2) \cdot P(A_3)$

$= .95 \times .98 \times .8 = \boxed{.7448} \rightarrow 74.5\%$ chance that all the three components of audio system function

b. $P(\bar{A}_1 \cup \bar{A}_2 \cup A_3) = 1 - P(A_1 A_2 A_3)$

$= 1 - 0.7448 = p.2552 = \boxed{.255}$

25.5% of chance for the event that at least one component needs service during the warranty period

c. $P(\bar{A}_1 \bar{A}_2 A_3) = P(\bar{A}_1) \times P(\bar{A}_2) \times P(A_3) = 0.05 \times .02 \times .2 = \boxed{0.0002}$

.02% chance that all three components needs service during the warranty period.

d. $P(A_1 A_2 A_3) = P(\bar{A}_1) P(\bar{A}_2) P(A_3) = 0.05 \times .98 \times .8 = \boxed{.0392}$

3.92% chance that only the reciever needs service during the warranty period.

e. $P\begin{pmatrix} \text{exactly one of} \\ \text{the components} \\ \text{need service} \end{pmatrix} = \begin{matrix} P(A_1 A_2 A_3) + P(A_1 A_2 A_3) + \\ P(A_1 A_2 A_3) \end{matrix}$

$= \begin{bmatrix} 0.05 \times .98 \times .8 + \\ .95 \times .02 \times .8 + \\ .95 \times .98 \times .2 \end{bmatrix} = \begin{matrix} 0.0392 + 0.0152 + 0.1862 = \\ \boxed{0.2406} \end{matrix}$

24.06% of chance for the event that exactly one of the three components need service

f.

There is no chance that all three components function property throughout the warranty period but at least one fails within a month after the warranty period.