Note: 
$$E[D|C] = \frac{3}{3}C$$

$$V[D|C] = \frac{1}{12}C^{2}$$

$$V[E[D|C]] = V[\frac{3}{2}c] = E[(\frac{3}{2}c)^{2}] - (E[\frac{3}{2}c])^{2}$$

$$E[(\frac{3}{2}c^{2})] = {}^{2}[(\frac{3}{2}c^{2})^{2}] - (E[\frac{3}{2}c])^{2}$$

$$\begin{bmatrix} \left( \frac{3}{2} c^{2} \right) \end{bmatrix} = \begin{bmatrix} 2 & 2 & 2 & 4 \\ 2 & 2 & 4 & 2 \end{bmatrix}$$

$$\left(\frac{3}{2}c^{3}\right) = \int_{0}^{2} \frac{q}{4}c^{3} dc$$

$$\begin{bmatrix} D(C) \end{bmatrix} = V \begin{bmatrix} \frac{3}{2}C \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ \frac{3}{2}C \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$E\left[\left(\frac{3}{2}c^{3}\right)^{2}\right] = \int_{0}^{2} \frac{9}{4}c^{2} \frac{1}{2}dc = \frac{3}{8}\left[\frac{c^{3}}{8}\right]^{2} = \frac{3}{8}\left[\frac{3}{8}\right]^{2}$$

 $V[E[D]c] = 3 - \left(\frac{3}{2}\right)^2 = \frac{3}{4}$ 

= 38 = 3

 $\left[ \left[ \frac{3}{2} c \right] = \int_{2}^{3} \frac{3}{2} \left( \frac{1}{2} dc \right) = \frac{3}{4} \left( \frac{1}{2} \right) = \frac{3 \cdot 4}{4 \cdot 2} = \frac{3}{2}$ 

$$= \int_{0}^{2} \frac{1}{24} c^{2} dc = \frac{c^{3}}{24 \cdot 3} \Big|_{0}^{2} = \frac{8^{1}}{34 \cdot 3} = \frac{1}{9}$$

$$V[D] = V[E[D]] + E[V[D]]$$

 $= \int_{0}^{2\pi} \frac{1}{12} c^{2} f_{c}(c) dc = \int_{0}^{2\pi} \frac{1}{12} c^{2} \frac{1}{2} dc$ 

$$=\frac{\frac{3}{4}}{\sqrt{20}}$$

 $E[V[D]] = E\left[\frac{1}{12}c^2\right]$