

$$3. a. \Delta t = \text{OPTION life} / \text{Steps}$$

$$= 10.08333$$

$$DF = e^{(r \Delta t)}$$

$$= 0.94792$$

$$u = e^{(\sigma \sqrt{\Delta t})}$$

$$= 1.05638$$

$$d = 1/u$$

$$= 0.94663$$

$$p = \frac{e^{(r \Delta t)} - d}{u - d}$$

$$= 0.50529$$

$$b. V_1 = \text{MAX}(S - X, 0)$$

$$= 9.81$$

$$V_2 = 6.04$$

$$V_3 = 2.66$$

$$V_4 = 0$$

$$V_5 = DF \times (p V_1 + (1-p) V_2)$$

$$= 7.93$$

$$V_6 = 4.36$$

$$V_7 = 1.34$$

$$V_8 = 6.15$$

$$V_9 = 2.86$$

$$V_{10} = 4.51$$

$$\text{Theoretical Price} = D + S_0 - X e^{-rT}$$

$$= 4.51$$