$1-d = \left[1 - \frac{d^{(p)}}{p}\right]^p$

DATE
PAGE

(1) $\frac{d^{(p)}}{p} = 8\%$ $\quad p = 4$

$(e)^{\delta}$

$$\frac{1}{1-d} = 1+i$$

$$1-d = \left[1 - \frac{0.08}{4}\right]^4$$

$$1-d = \left[1-0.02\right]^4$$

$$1-d = \left[0.922368\right]$$

$d = 7.7632\%$

$\log(1+i) = \delta$

$\log\left(\frac{1}{1-d}\right) = \delta$

$\delta = 0.0808$ (8.08%)

$$\frac{1}{0.922368} = 1+i$$

$i = 8.416\%$

$$1-d = \left[1 - \frac{d^{(12)}}{12}\right]^{12}$$

(iii) $d^{(12)} = 8.053\%$

$\frac{t}{100}$ $\frac{1}{200}$

(1) (i) $\delta(t) = 0.004t + 0.002t^2$

$$\int_0^{10} 0.004t + 0.002t^2$$

$$\left(\frac{\cancel{0.004}\,0.002\, t^2}{\cancel{2}}\right)_0^{10} + \left(0.000\,\frac{t^3}{3}\right)_0^{10}$$

$0.2 + \frac{0.2}{3}$

$= \cancel{\boxed{0.8667}}$ $= 0.2667$

(e) $^{-0.2667} \times 1000 = 765.9283384$

(ii)

$$1+i = \frac{1}{1-d}$$

$$1-d = \frac{1}{1+i}$$

$$d = 1 - \frac{1}{1+i}$$

$$= \frac{1+i-1}{1+i}$$

$$= \frac{i}{1+i}$$

$d^{(i)}$

~~7 + 0.025~~

(i) Given

$$\frac{d^4}{4} = 0.0225$$

$$\left(1 - \frac{d^4}{4}\right)^4 = 1 - d$$

$$\left(1 - \frac{0.0225}{4}\right)^4 = 1 - d$$

$$\cancel{0.977689 = 1 - d}$$

$$\cancel{d = 1 - 0.977689}$$

$$\cancel{d = 2.2311\%}$$

$$0.9129 = 1 - d$$

$$d = 1 - 0.9129$$

$$= 0.8700780621$$

$$1 - d = \left[1 - \frac{d^2}{2}\right]^2$$

~~E 0.2994~~

$$0.955458 \quad 1 - \frac{d^{(2)}}{2}$$

$$\frac{d^{(2)}}{2} = 1 - 0.955458$$

$$d^{(2)} = 8.9083\%$$

DATE
PAGE

(b) convertible ~~every~~ every 2 years $= \frac{5\%}{2} = 2.5\%$

$d = 2.5\%$

$1-d = \left[1 - \frac{d^{(2)}}{2}\right]^2$

$(1-0.025)^{1/2} = 1 - \frac{d^{(2)}}{2}$

$(0.975)^{1/2} = 1 - \frac{d^{(2)}}{2}$

$\frac{d^{(2)}}{2} = 1 - 0.987420$

$d^{(2)} = 0.025158$

$[2.5158\%]$

ii) $\left(1 + \frac{i^{(4)}}{4}\right) = 1 + i$

$\frac{1}{1-d} = 1+i$

$\frac{1}{1-d} = 1.05$

$1-d = \frac{1}{1.05}$

$d = 1 - 0.95238$

$d = 0.0476$

(4.76%)

(4) (ii) a) $i = 0.08$

$$1+i = \frac{1}{\left(1-\frac{d^{(12)}}{12}\right)^{12}}$$

$$1.08 = \frac{1}{\left(1-\frac{d^{(12)}}{12}\right)^{12}}$$

$$\left(1-\frac{d^{(12)}}{12}\right)^{12} = \frac{1}{1.08}$$

$$1-\frac{d^{(12)}}{12} = 0.993607$$

$$1-0.993607 = \frac{d^{(12)}}{12}$$

$$7.67167 = d^{(12)}$$

b) $$\left(1+\frac{i^{(365)}}{365}\right)^{365} = 1+i$$

$$\cancel{1+\frac{0.08}{365}}\; 1+\frac{i^{(365)}}{365} = (1.08)^{1/365}$$

$$\frac{i^{(365)}}{365} = 1.000210874-1$$

$$i^{(365)} = 0.076596915$$

$$(7.6596915\%)$$

e) $\delta = \log(1.08)$

$= 7.696104114\%$

f) $\left(1 + \frac{i^{(0.5)}}{0.5}\right)^{0.5} = 1.08$

$1 + \frac{(i)^{0.5}}{0.5} = 1.1664$

$\frac{(i)^{0.5}}{0.5} = 0.1664$

$(i)^{0.5} = 58.32\%$

(5) (i) a) $(i)^{4} = 0.06$

$\left(1 + \frac{0.06}{4}\right)^{4} = 1 + i$

$i = 6.13635\%$

(6) $31 + 30 + 31 = 92$ days.

$\frac{\cancel{10{,}000}}{\cancel{1{,}00{,}000}_{10}} \times 10\cancel{0} = 10\%$

$\left(1 + \frac{i^{(365)}}{365}\right)^{365} = 1.1$

$\frac{(i)^{(365)}}{365} = 0.0261157876\,1$

$(i)^{365} = 0.095322$

DATE

PAGE

$2{,}00{,}000\left(1+\frac{0.95322}{365}\right)^{365} = 204862.8548$

(6) (i) $\frac{d^{(2)}}{2}$ $\frac{d}{\cancel{}}= 0.3$

$\cancel{\left(1-\frac{d^{(2)}}{2}\right)^{2}=1-d}$ $(1-0.3)^2 = 1-d$

$1-$

$(0.7)^2 = 1-d$

$0.49 = 1-d$

$d =$

(b) $\frac{6000}{20{,}000} \times \frac{12}{17} \times 100 = 21.1764\%$ ESI

$PV \times AF = AV$

$\cancel{20000 \times \left(1+\frac{i^{(17)}}{17}\right)^{17} = 26000}$

$\cancel{1+\frac{i^{(17)}}{12} = (1.3)^{1/17}}$

$= 1.01$

(a) $20000\left(1+i\right)^{17/12} = 26000$

$i = 20.34370672$

(9) i) Force of interest

A nominal rate of interest compounded infinitely many times during a time period

ii) $i^{(2)} = 0.0775$

~~Calcu~~:

$$\left(1 + \frac{0.0775}{2}\right)^2 = 1 + i$$

$i = 7.90015625\,\%$

$\delta = \log(1.07900156) = 7.603613206\,\%$

DATE
PAGE

$$1 - d = \frac{1}{1+i}$$

$$1 - d = 0.9267827194$$

$$d = 0.07321728061$$

$$(7.321728\ \%)$$

$$50000\cancel{(1-d)}\frac{1}{(1-d)^n}$$