

$$8.1 \quad d^{(4)} = 8\%$$

$$\frac{d^{(4)}}{4} = 2\%$$

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

$$(1 - 0.02)^4 = 1 - d$$

$$d = 1 - (1 - 0.02)^4$$

$$d = 0.07763184$$

$$i = \frac{d}{1 - d} = 0.084165785$$

$$i) \quad d = \ln(1 + i)$$

$$d = \ln(1.084165785)$$

$$d = 0.080810829$$

$$d = 8.0810829\%$$

$$ii) \quad i = 0.084165785$$

$$iii) \quad d^{(12)} = 12 \left(1 - (1 - 0.07763184)^{\frac{1}{12}}\right)$$

$$= 0.080539339$$

Q.2 $d(t) = 0.004t + 0.0002t^2$

$$PV = 1000 \times \frac{1}{e^{\int_0^{10} (0.04t + 0.0002t^2) dt}}$$

$$e^{\int_0^{10} (0.04t + 0.0002t^2) dt}$$

$$= \frac{1}{e} \left[\frac{0.04t^2}{2} + \frac{0.0002t^3}{3} \right]_0^{10}$$

$$= \frac{1}{e^{4\frac{1}{15}}}$$

$$PV = \frac{1000}{e^{4\frac{1}{15}}} = 765.928$$

$$AV(0,10) = 1000$$

$$AV_0 = 765.928$$

$$A(0,10) = \frac{1000}{765.928}$$

$$(1+i)^{10} = 1.3056057$$

$$i = 2.7025449\%$$

Q.5 (i) $d^4 = 0.06$

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

$$d = 1 - \left(1 - \frac{0.06}{4}\right)^4$$

$$d = 0.058663449$$

$$i = 0.062319315$$

a) $\left(1 + \frac{i^{(12)}}{2}\right)^2 = (1 + i)$

$$i^2 = 0.061377516$$

b) $d^{(12)} = 12 \left(1 - (1 - d)^{1/12}\right)$
 $= 0.060307525$

(ii)

Amt 200000
 15 April 2005 $\longrightarrow$ 17 June

May June 63 days

$$1 + i = 1.1$$

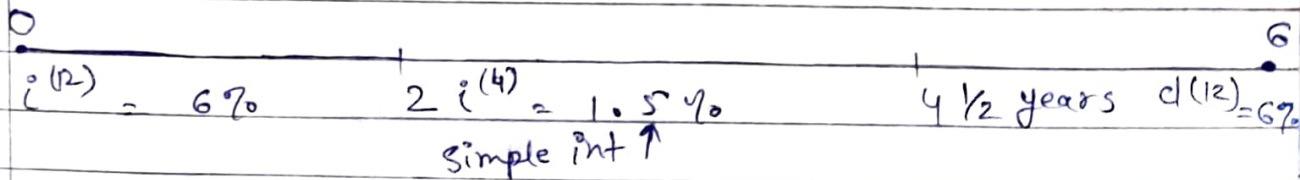
$$i = 0.1$$

$$\text{Amt paid} = 2,00,000 \times (1.1)^{\frac{63}{365}}$$

$$= \text{₹ } 203317.3715$$

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0.12



$$\begin{aligned} A(0, 2) &= \left(1 + \frac{j^{(12)}}{12}\right)^{12 \times 2} \\ &= \left(1 + \frac{0.06}{12}\right)^{24} \\ &= 1.127159776 \end{aligned}$$

$$\begin{aligned} A(2, 4.5) &= (1 + 10(0.015)) \\ &= 1 + 0.15 \\ &= 1.15 \end{aligned}$$

$$\left(1 - \frac{d^{(12)}}{12}\right)^{12 \times 6} = (1 - d)^{1.5}$$

$$\left(1 - \frac{0.06}{12}\right)^{18} = (1 - d)^{1.5}$$

$$0.913724886 = (1 - d)^{1.5}$$

$$\frac{1}{(1 - d)^{1.5}} = 1.094421325$$

$$\begin{aligned} AV &= 7049 \times (1.127159776)(1.15)(1.094421325) \\ &= 9999.893616 \end{aligned}$$

1.13

$$t = ?$$

$$\leftarrow i = 10\% \rightarrow$$

$$Av = PV \times A(0, t)$$

$$2K = K(1+i)^n$$

$$2 = (1+i)^n$$

$$\log 2 = n \log(1.1)$$

$$\frac{\log 2}{\log(1.1)} = n$$

$$\log(1.1)$$

$$7.2725 = n$$

$$(ii) \quad d^{(12)} = 10\% = 0.01$$

$$\frac{d^{(12)}}{12} = \frac{0.01}{120}$$

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

$$\left(1 - \frac{1}{120}\right)^{12} - 1 = -d$$

$$0.095541626 = d$$

$$2K = K \times \frac{1}{(1-d)^n}$$

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$$(1-d)^n = 0.5$$

$$(0.904458374)^n = 0.5$$

$$n \log(1-d) = \log 0.5$$

$$n = 6.90255 \text{ years}$$