Sample Paper 7: Paper 1

Question 7 (50 marks)

Question 7 (a)

$P = €60\ 000,\ t = 5$ years, $i = 0{\cdot}065$

$$A = P\frac{i(1+i)^t}{(1+i)^t - 1}$$

$$A = 60\ 000\left(\frac{0{\cdot}065(1{\cdot}065)^5}{(1{\cdot}065)^5 - 1}\right) = €14\ 438{\cdot}07$$

Question 7 (b)

Payment #	Fixed Payment	Interest	Debt Payment	Balance
0				€60 000
1	€14 438·07	€3900	€10 538·07	€49 461·93
2	€14 438·07	€3215·03	€11 223·04	€38 238·89
3	€14 438·07	€2485·53	€11 952·54	€26 286·35
4	€14 438·07	€1708·61	€12 729·46	€13 556·89
5	€14 438·07	€881·20	€13 556·87	0

Calculation for Year 1

Payment Number 1: €14 438·07

Interest: €60 000 × 0·065 = €3900

Debt Payment: €14 438·07 – €3900·00 = €10 538·07

Balance: €60 000 – €10 538·07 = €49 461·93

Question 7 (c) (i)

$$P = \frac{5000}{(1{\cdot}045)^8} = €3515{\cdot}93$$

$$P = \frac{F}{(1+i)^t}$$

Question 7 (c) (ii)

$$P = 250 + \frac{250}{1{\cdot}045^1} + \frac{250}{1{\cdot}045^2} + \frac{250}{1{\cdot}045^3} + \frac{250}{1{\cdot}045^4} + \frac{250}{1{\cdot}045^5} + \frac{250}{1{\cdot}045^6} + \frac{250}{1{\cdot}045^7}$$

$$P = 250\left(1 + \frac{1}{1{\cdot}045^1} + \frac{1}{1{\cdot}045^2} + \frac{1}{1{\cdot}045^3} + \frac{1}{1{\cdot}045^4} + \frac{1}{1{\cdot}045^5} + \frac{1}{1{\cdot}045^6} + \frac{1}{1{\cdot}045^7}\right)$$

$$a = 1,\ r = \frac{1}{1{\cdot}045},\ n = 8$$

$$\therefore P = 250\left(\frac{\left(1 - \left(\frac{1}{1{\cdot}045}\right)^8\right)}{1 - \frac{1}{1{\cdot}045}}\right) = €1723{\cdot}18$$

Question 7 (c) (iii)

Minimum price = €3515·93 + €1723·18 = €5239·11

Minimum price bonds can be offered is €5239 to the nearest euro.