1)

(a)	$5000 = PV(1 + 0.05)^{10}$ $$PV = \frac{5000}{(1+0.05)^{10}}$$ $PV = £3069.57$	M1 A1	For evidence of use of $FV = PV(1+r)^n$ Accept £3069, £3070
(b)	$= \left(1 + \dfrac{i}{12}\right)^{12} - 1$ $1.05 = \left(1 + \dfrac{i}{12}\right)^{12}$ $1.05^{\frac{1}{12}} = 1 + \dfrac{i}{12}$ $\dfrac{i}{12} = 0.0040741$ $i = 0.048889$ $i = 4.89\%$	M1 M1 A1 A1 ft	Must have power 12 nth root Condone 4.88%
	TOTAL	6	

(6)

2)

(a)	$\bar{x} = 2.9\dot{6}$ or 2.97 $\sigma_n = 0.163$	B1 B2	accept 2.96 or better accept $\sigma_{n-1} = 0.173$ B1 for 0.16 B1 for 0.17
(b)	Each Pendragon share costs roughly twice each Woolworths share or mean of Pendragon Shares is greater Woolworths share prices are more spread out than those of Pendragon.	B1 B2	Higher or lower B1 range is bigger B1 s.d is higher or lower
	TOTAL	6	

(6)

3)

(a)	$750 = \dfrac{1000}{(1+i)^2}$ $(1+i)^2 = \dfrac{1000}{750}$ $i = \sqrt{\frac{1000}{750}} - 1$ $i = 0.1547$ 15.47% or 15.5%	M1 M1 M1 A1	Taking square root
(b)	$[C =]\left(\dfrac{150}{1+0.131}\right) + \left(\dfrac{450}{(1+0.131)^2}\right)$ $C = 397.88 + 351.79$ $C = 749.67$ This is approximately £750 (error due to approximate value for APR)	M1 A1 A1 B1	Any one value correct
	TOTAL	8	

(8)

4)

i(a)	Addition of the interest rate[2.9%] to original debt		E1	1	
(b)	N	A_n			
	0	3800			
	1	3610.20			
	2	3414.90	B1		For months 1 and 2
	3	3213.93	B1		For months 3 and 4 ft
	4	3007.13 or 14	B1		For months 5 and 6 ft
	5	2794.34			Maximum B2 if 1 dp used
	6	2575.38 or 37		3	
(c)	$A_n = 1.031 A_{n-1} - 400$		B1 B1	2	1.031 400 Needs formula for B2
		Total		6	

(6)

5)

8.5 or 9.5 or 0.145 or 0.155 seen	B1	
$9.5 \div 0.145$ or 65.5...	M1	Condone $(9, 9.5] \div [0.145, 0.15)$
65	A1	Must be using 9.5 and 0.145

(3)

TOTAL: 45

6)

(a)	$450 = \dfrac{550}{(1+i)^2}$	M1		
	$(1+i)^2 = \dfrac{550}{450}$ $= 1.22222$ $1 + i = 1.10554$	A1		
	$i = 0.10554$ Interest rate is 10.6%	A1	3	Accept 10.5%
(b)	$\dfrac{R}{1.2} + \dfrac{R}{1.2^2} = 450$	M1		
	$2.2\,R = 648$	M1		
	Amount is £ 294.55	A1	3	Accept 294.54
	Total		**6**	

(6)

7)

(a)	certain subject examiners may not be included	B1	Randomness does not guarantee representativeness oe
(b)	$\dfrac{185}{400}$ or 0.4625	M1	oe
	their 0.4625 × 50 or 23.125	M1	oe
	23	A1	SC1 25 or 2

(4)

8)

Assumptions: 1 – 10 trips to the toilet per day ✓B1

Average length of time spent 5 – 15 minutes ✓B1

Life expectancy: 75 - 85 years ✓B1

Calculations: minimum: 1 × 5 minutes = 5 minutes per day ✓M1

5 minutes × 365 days × 75 years = 136,875 minutes ✓M1

136,875 ÷ 60 ≈ 2,280 hours ✓A1

OR

maximum: 10 × 15 minutes = 150 minutes per day ✓M1

150 minutes × 365 days × 85 years = 4,653,450 mins ✓M1

4,653,450 ÷ 60 ≈ 77,800 hours ✓A1

(6)