Mark scheme

Interest, growth and decay

Mathematics 0580 · Questions from Paper 1, Paper 2, Paper 3 and Pape…

Total marks

52

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
2	2	3	3	3	5	5	6	8	15	**52**

Question 1 [2]

1	2.65	**2**	**M1** for $\frac{5400\times 3\times r}{100} = 429.3[0]$ oe or better

Question 2 [2]

2	3826 or 3826.38	**2**	**M1** for $8000\times\left(1-\frac{10}{100}\right)^{7}$ oe

Question 3 [3]

3	74.3 or 74.34…	**3**	**B2** for 574 or 574.3… or **M2** for $500\left(1+\frac{2}{100}\right)^{7}$ - 500 oe or **M1** for $500\left(1+\frac{2}{100}\right)^{7}$ oe

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Question 4 [3]

4	2.5[0] or 2.501… nfww	**3**	**M2** for $2.1\times\left(1+\frac{6}{100}\right)^{3}$ oe or **M1** for $2.1\times\left(1+\frac{6}{100}\right)^{n}$ oe where $n\geq 2$ or for figs $21\times\left(1+\frac{6}{100}\right)^{3}$ oe

Question 5 **[3]**

5	6290[.0…]	**3**	**M2** for $\frac{6999.31}{\left(1+\frac{2.16}{100}\right)^5}$ or **M1** for $[A]\left(1+\frac{2.16}{100}\right)^5$

Question 6 **[5]**

6	A 46.28	**5**	**M1** for 5000×1.035^6 **A1** for 6146.27 to 6146.28 **M1** for 5000×1.22 **A1** for 6100

Question 7 **[5]**

7	1.96 cao	**5**	**M4** for $\left(\left(\left(\sqrt[3]{\frac{\frac{2500\times1.6\times3}{100}+2000}{2000}}\right)-1\right)-1\right)$ [× 100] oe or 1.96…or [0].0196... or 101.96… or 1.0196… or **M3** for $\sqrt[3]{\frac{\frac{2500\times1.6\times3}{100}+2000}{2000}}$ or **B2** for [SI =] 120 or [CI total=] 2120 or **M1** for $\frac{2500\times3\times1.6}{100}$ and **M1** for $2000\times(k)^3$

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Question 8 **[6]**

8(a)	662.45	**2**	**M1** for $600 \times \left(1+\frac{2}{100}\right)^5$ oe
8(b)(i)	800	**2**	**M1** for $x\left(1+\frac{5}{100}\right)^2 = 882$ oe or **SC1** for answer 82
8(b)(ii)	5 nfww	**2**	**M1** for trial with $882 \times \left(1+\frac{5}{100}\right)^n$ with $n > 1$

Question 9 **[8]**

9	**(a)**	**(i)**	640×1.02^6 oe $= 720.7\ldots$	**M1** **B1**	Must be seen
		(ii)	3.02 or 3.020 to 3.024… nfww	**4**	**M3** for $[x =]\ \sqrt[4]{721 \div 640}$ or better (implied by answer of 1.03[02…] or $r = 0.0302[4\ldots]$ or **M2** for $(\textit{their } x)^4 = 721 \div 640$ or **M1** for $640 \times (\textit{their } x)^4 = 721$ oe
	(b)		874.8[0] final answer	**2**	**M1** $1200 \times (1-0.1)^3$ oe

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Question 10 **[15]**

10(a)(i)	6925.5[0] cao	**2**	**M1** for $7695 \times \frac{100-10}{100}$ oe or **B1** for answer 769.5
10(a)(ii)	8550	**2**	**M1** for $X \times \frac{100-10}{100} = 7695$ oe
10(b)	660	**3**	**B2** for 60 or **M2** for $600 + \frac{600 \times 2 \times 5}{100}$ oe or **M1** for $\frac{600 \times 2[\times 5]}{100}$ oe
10(c)	1.55 or 1.549 to 1.550	**3**	**M2** for $\sqrt[12]{\frac{601.35}{500}}$ or **M1** for $500 \times (...)^{12} = 601.35$
10(d)(i)	26.3 or 26.25 to 26.26	**2**	**M1** for $[k]\left(\frac{100-3}{100}\right)^{10}$ oe
10(d)(ii)	23	**3**	**M2** for a correct trial evaluated with n =22 or n = 23 or **M1** for $[k]\ (0.97)^n < 0.5[k]$ oe soi or for $[k](0.97)^n = 0.5[k]$ oe soi, implied by one correct trial $n > 10$ or for $[k](0.97)^{23}$ oe seen If 0 scored **SC1** for answer 22

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