QUESTION 6/*VRAAG 6*

6.1	$A = P(1+i)^n$ $13\,459 = 12\,000\left(1+\frac{m}{400}\right)^8$ $\left(1+\frac{m}{400}\right)^8 = 1{,}121...$ $1+\frac{m}{400} = \sqrt[8]{1{,}121..}$ $\frac{m}{400} = 0{,}0144...$ $\therefore m = 5{,}78\%$	✓ 8 ✓ subst into correct formula ✓ $1+\frac{m}{400} = \sqrt[8]{1{,}121..}$ ✓ 5,78 % (4)
6.2	$F = \frac{x\left[(1+i)^n - 1\right]}{i}$ $F = \frac{1\,000\left[\left(1+\frac{0{,}075}{12}\right)^{12} - 1\right]}{\frac{0{,}075}{12}}$ $= R12\,421{,}22$ He won't be able to buy the computer because R13 000 – R12 421,22 = R578,78 **OR/OF** He won't be able to buy the computer because R12 421,22 < R13 000	✓ $\frac{0{,}075}{12}$ ✓ 12 ✓ answer ✓ conclusion (4)
6.3.1	Loan amount = 85% × R250 000 = R212 500 **OR/OF** Loan amount = R250 000 – (15% × R250 000) = R212 500	✓ answer (1) **OR/OF** ✓ answer (1)
6.3.2	$A = 212\,500\left(1+\frac{0{,}13}{12}\right)^5$ $A = 224\,262{,}53$ $P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$ $224\,262{,}53 = \frac{x\left[1-\left(1+\frac{0{,}13}{12}\right)^{-67}\right]}{\frac{0{,}13}{12}}$ $\therefore x = R4\,724{,}96$	✓ $A = 212\,500\left(1+\frac{0{,}13}{12}\right)^5$ ✓ answer ✓ substitution into correct formula ✓ – 67 ✓ answer (5)
		[14]

QUESTION 7

7.1	$A = P(1+i)^n$ $2 = 1\left(1+\frac{0,085}{4}\right)^{4n}$ $4n = \log_{\left(1+\frac{0,085}{4}\right)} 2$ $n = 8,24$ years	✓ 2 ✓ $\frac{0,085}{4}$ } In correct formula ✓ use of logs ✓ answer in years (4)
7.2.1	$A = P(1-i)^n$ $180\ 000 = 500\ 000(1-i)^5$ $\frac{9}{25} = (1-i)^5$ $\sqrt[5]{\frac{9}{25}} = 1-i$ $i = 0,1848068...$ $r = 18,48\%$	✓ subs into correct formula ✓ simplification ✓ $i = 0,1848\ldots$ ✓ answer (4)
7.2.2	$A = P(1+i)^n$ $A = 500\ 000(1+0,063)^5$ A = R678 635,11	✓ subs into correct formula ✓ answer (2)
7.2.3	Sinking Fund = 678 635,11 – 180 000 = R 498 635,11 $498\ 635,11 = \frac{x\left[\left(1+\frac{0,1025}{12}\right)^{58}-1\right]\left(1+\frac{0,1025}{12}\right)^3}{\frac{0,1025}{12}}$ $x = R6\ 510,36$	✓ value of sinking fund ✓ $\frac{0,1025}{12}$ ✓ $n = 58$ (A) ✓ $\left(1+\frac{0,1025}{12}\right)^3$ ✓ answer (A) (5)
		[15]

QUESTION/VRAAG 8

8.1	$A = P(1-i)^n$ $A = 980\ 000(1-0,092)^7$ $A = R498\ 685,82$	✓ correct formula ✓ substitution ✓ answer (A) (3)
8.2	$A = P(1+i)^n$ $116\ 253,50 = 75000\left(1+\frac{0,068}{4}\right)^{4n}$ $1,550\ 046\ 667 = (1,017)^{4n}$ $\log(1,550\ 046\ 667) = 4n\log(1,017)$ $4n = \frac{\log(1,550\ 046\ 667)}{\log(1,017)}$ or $4n = \log_{1,017}(1,550\ 046\ 667)$ $4n = 25,99\ldots$ $n = 6,50$ years	✓ $\frac{0,068}{4}$ ✓ substitution in correct formula ✓ correct use of logs ✓ answer (4)
8.3.1	$F = \frac{x\left[(1+i)^n - 1\right]}{i}$ $450\ 000 = \frac{x\left[\left(1+\frac{0,0835}{12}\right)^{60} - 1\right]}{\frac{0,0835}{12}}$ $x = R6\ 068,69$	✓ $i = \frac{0,0835}{12}$ ✓ substitution into correct formula ✓ answer (3)
8.3.2(a)	$P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$ $P = \frac{11\ 058,85\left[1-\left(1+\frac{0,12}{12}\right)^{-4\times12}\right]}{\frac{0,12}{12}}$ $P = R419\ 948,32$ **OR/*OF*** $\text{Balance} = A - F$ $= P(1+i)^n - \frac{x\left[(1+i)^n - 1\right]}{i}$ $=1\ 050\ 000\left(1+\frac{0,12}{12}\right)^{12\times21} - \frac{11\ 058,85\left[\left(1+\frac{0,12}{12}\right)^{12\times21} - 1\right]}{\frac{0,12}{12}}$ $=R12\ 887\ 702,20 - R12\ 467\ 749,81$ $=R419\ 952,39$	✓ $n = 48$ in P-formula ✓ substitution into correct formula ✓ answer (A) (3) **OR/*OF*** ✓ $n = 252$ in both formulae ✓ subst into correct formulae ✓ answer (A) (3)

8.3.2(b)	Total paid = 11 058,85 × 21 × 12 = 2 786 830,20 Loan Paid = 1 050 000 – 419 948,32 = 630 051,68 Interest paid = 2 786 830,20 – 630 051,68 = R2 156 778,52 **OR/OF** Total paid = 11 058,85 × 21 × 12 = 2 786 830,20 Loan Paid = 1 050 000 – 419 952,39 = 630 047,61 Interest paid = 2 786 830,20 – 630 047,61 = R2 156 782,59 **OR/OF** Interest paid = 11 058,85 × 21 × 12 – (1 050 000 – 419 948,32) = 2 786 830,20 – 630 051,68 = R2 156 778,52	✓ 11 058,85×21×12 ✓ 1 050 000 – Balance Outstanding ✓ answer (3) **OR/OF** ✓ 11 058,85×21×12 ✓ 1 050 000 – Balance Outstanding ✓ answer (3) **OR/OF** ✓ 11 058,85×21×12 ✓ 1 050 000 – Balance Outstanding ✓ answer (3)
		[16]

QUESTION/*VRAAG* 7

7.1	$13\,080 = 10\,000\left(1+\frac{i}{4}\right)^{16}$ $\left(1+\frac{i}{4}\right)^{16} = \frac{13080}{10000}$ $1+\frac{i}{4} = \sqrt[16]{\frac{13080}{10000}}$ $\frac{i}{4} = 0{,}0169227...$ $i = 0{,}06769...$ $i = 6{,}77\%$	✓substitution into correct formula ✓$n = 16$ ✓ simplification ✓answer (A) (4)
7.2.1	$F = \frac{x\left[(1+i)^n - 1\right]}{i}$ $F = \frac{9\,000\left[\left(1+\frac{0{,}075}{12}\right)^{60} - 1\right]}{\frac{0{,}075}{12}}$ $F = \text{R } 652\,743{,}95$	✓ $\frac{0{,}075}{12}$ ✓ substitution into correct Formula ✓ answer (3)
7.2.2	$60 \times 9000 = \text{R}540\,000$ $A = P(1+i)^n$ $652\,743{,}95\left(1+\frac{0{,}075}{12}\right)^n = 190\,214{,}14 + 540000$ $730\,214{,}14 = 652\,743{,}95\left(1+\frac{0{,}075}{12}\right)^n$ $1{,}1186.... = (1{,}00625)^n$ $n = \log_{1{,}00625}(1{,}1186)$ $\therefore n = 18$ months	✓ $60 \times 9000 = \text{R}540\,000$ ✓✓ equation ✓simplification ✓use of logs ✓ 18 months (6)

	OR/OF Interest over 5 years = 652 743,95 – 9 000 × 60 = 112 743,95 ∴ interest on n years = 190 214,14 – 112 743, 95 = 77 470,19 $652\ 743{,}95 + 77\ 470{,}19 = 652743{,}95\left(1+\frac{0{,}075}{12}\right)^{n}$ $1{,}1186.... = (1{,}00625)^{n}$ $n = \log_{1{,}00625}(1{,}1186)$ $\therefore n = 18$ months	**OR/OF** ✓ 60 × 9 000 ✓ answer ✓equating ✓simplification ✓use of logs ✓ 18 months (6)
		[13]