KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

MATHEMATICS

KZN INFORMAL TEST

Memorandum

FINANCE, GROWTH AND DECAY

GRADE 12

Marks 25

QUESTION 1

1.1.	$i_{effective} = \left(1 + \frac{i_{nor\,min\,al}}{m}\right)^{m} - 1$ $i_{effective} = \left(1 + \frac{0.23}{12}\right)^{12} - 1$ $i_{eff} = 0.2558637702$ $Eff\,rate = 0.2558637702 \times 100$ $= 25,59\%$	✓Correct sub into correct formula ✓Answer (2)
1.2	$A = P(1+i)^{n}$ $= 10\,000\left(1 + \frac{0.10}{4}\right)^{8}$ $= R12184,03$	✓Correct sub into correct formula ✓Answer (2)
1.3.1	$A = P(1-i)^{n}$ $A = R180\,000(1-0.15)^{3}$ $A = R110\,542.50$ Is the book value of the car.	✓Correct sub into correct formula ✓Answer (2)
1.3.2	$A = P(1+i)^{n}$ $A = R180\,000(1+0.12)^{3}$ $A = R\,252\,887,04$	✓Correct sub into correct formula ✓Answer (2)
1.3.3	$Sinking\,Fund = R\,252\,887,04 - R110\,542.50$ $= R142\,344,54$	✓SF=A(new)- A(old) ✓Answer (2)
1.3.4	$F = \frac{x\left[(1+i)^{n} - 1\right]}{i}$ $R142\,344,54 = \frac{x\left[\left(1 + \frac{0,09}{12}\right)^{36} - 1\right]}{\frac{0,09}{12}}$ $x = \frac{R142\,344,54 \times \frac{0,09}{12}}{\left[\left(1 + \frac{0,09}{12}\right)^{36} - 1\right]}$ $x = R3458.93$	✓ $i = \frac{0,09}{12}$ and $n = 36$ ✓Correct sub F=142 344,54 in Fv Formula ✓Answer (3)
		[13]

QUESTION 2

2.1	$delayed\ by\ 3\ months$ $A = P(1+i)^n$ $= 350\,000\left(1+\frac{0.15}{12}\right)^3$ $= R\,363\,289,75$	✓correct sub in correct formula ✓Answer (2)
2.2	$P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$ $363\,289,75 = \frac{x\left[1-\left(1+\frac{0.15}{12}\right)^{-57}\right]}{\frac{0.15}{12}}$ $x = \frac{363\,289,75\times\frac{0.15}{12}}{\left[1-\left(1+\frac{0.15}{12}\right)^{-57}\right]}$ $x = R8949.56$	✓ n=57 ✓correct sub in correct formula ✓Answer (3)
2.3	$P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$ $363\,289,75 = \frac{9300\left[1-\left(1+\frac{0.15}{12}\right)^{-n}\right]}{\frac{0.15}{12}}$ $\frac{363\,289,75\times\frac{0.15}{12}}{9300} = 1-\left(1+\frac{0.15}{12}\right)^{-n}$ $\left(1+\frac{0.15}{12}\right)^{-n} = 1-\frac{363\,289,75\times\frac{0.15}{12}}{9300}$ $n = \frac{\log_{\left(1+\frac{0.15}{12}\right)}\left[0.4882926747\right]}{-1}$ $n = 53.93450345$ $n = 54\,months$	✓correct sub $i\ and\ n$ ✓application of Log ✓ $n = 53.93450345$ ✓ $n = 54\,months$ (4)

2.4	$OB_{(at\ n=53)} = \frac{9300\left[1-\left(1+\frac{0.15}{12}\right)^{-0,93450345}\right]}{\frac{0.15}{12}} = 8587.04$ $Final\ Payment = R8587.07\left(1+\frac{0.15}{12}\right)$ $= 8694.41$	✓ correct sub in OB formular n=0.93450345 ✓OB at n=53 ✓ Final answer (3)
		[12]

TOTAL: 25