



MSI

MATHEMATICS

MATERIAL FOR GRADE 12

FINANCE

QUESTIONS

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QUESTION 1

- 1.1 Determine the nominal interest rate if the investment received $r\%$ p.a. compounded monthly whereas effectively it receives 8,3% per annum. (3)
- 1.2 Mpho takes a loan of 400 000 at an interest rate of 11% p.a. compounded monthly. Mpho must amortise (pay off) the loan within 5 years with equal monthly repayments starting in one month's time. If he pays the loan over 5 years, his calculations gave him the monthly payments amounting to R8 696,97.
- 1.2.1 Determine the amount of interest Mpho would pay if he were to sign this agreement. (1)
- 1.2.2 How many full monthly repayments would Mpho pay if he were to increase the monthly payments by 303,03? (4)
- 1.2.3 What is the value of Mpho's final payment? (4)
- 1.2.4 How much interest will he save based on the decision he took in 1.2.2? (2)
- [14]**

QUESTION 2

- 2.1 Samuel invested an amount with ABC bank at an interest 12% p.a. compounded monthly. His investment grew to R8450 at the end of 10 years. Determine the amount that Samuel initially invested. (3)
- 2.2 If the inflation rate remains at a constant 4,7 % p.a., what period of time will it take for a certain amount to be worth half of the original amount. (3)
- 2.3 Lebogo buys a tractor for Rx . She plans to replace this tractor after 5 years. The tractor depreciates by 20% p.a. according to the reducing balance method. The price of a new tractor is expected to increase by 18% p.a. She calculates that if she deposits R8 000 into a sinking fund at the end of each month, it would exactly provide for the shortfall 5 years from now when she has to pay for the new tractor. The bank offers 10% p.a. interest compounded monthly.
- 2.3.1 Calculate the scrap value of the tractor after 5 years, in terms of x ? (1)
- 2.3.2 Determine the price of the new tractor after 5 years, in terms of x ? (1)

2.3.3 Calculate the amount accumulated in the sinking fund after 5 years. (4)

2.3.4 Determine the value of x , the price of the original tractor. (4)

[16]

QUESTION 3

Jake takes out a bank loan of R600 000 to pay for his new car. He repays the loan with monthly instalments of R9 000, starting one month after the granting of the loan. The interest rate is 13% per annum, compounded quarterly.

3.1 Show that the effective interest rate is 12,86% p.a. compounded monthly. (3)

3.2 How many instalments of R9 000 must be paid? (5)

3.3 What will the final payment be? (5)

3.4 What did the car cost Jake in total by the time it is paid off? (2)

[15]

QUESTION 4

4.1 Hein invests R12 500 for k years at a compound interest rate of 9% p.a. compounded quarterly. At the end of the k years his investment is worth R30 440. Calculate the value of k . (4)

4.2 Matt bought a car for R500 000 on an agreement in which he will repay it in monthly instalments at the end of each month for 5 years. Interest is charged at 18% p.a. compounded monthly.

4.2.1 Calculate the annual effective interest rate of the loan. (3)

4.2.2 Calculate Matt's monthly instalments. (4)

4.2.3 Matt decided to pay R12 700 each month as his repayment. Calculate the outstanding balance of the loan after 2 years. (4)

4.2.4 At the end of the 2 years, the market value of Matt's car had reduced to R304 200. Determine the annual interest rate of depreciation on the reducing value. (2)

[17]

QUESTION 5

A business installs a server for R500 000. The value of the server depreciates at 20% per annum according to the diminishing-balance method.

- 5.1 Calculate the scrap value of the server at the end of 6 years. (2)
- 5.2 The server needs to be replaced after 6 years. Calculate the cost of the new server if the inflation rate is at 7% per annum. The older server will be traded in. (3)
- 5.3 On the day the server gets installed, the business sets up a sinking fund into which equal monthly installments must be paid. Interest on this fund is 8% per annum compounded monthly. The first payment will be made immediately and the last payment will be made at the end of the 6 year period. Calculate the value of the monthly instalment into the sinking fund. (4)
- 5.4 The business decides to rather pay a monthly instalment of R15 000 into the sinking fund. After how many months will there be more than R1 000 000 in the fund? (5)

[14]

QUESTION 6

- 6.1 If a car valued at R255 000 depreciates on a reducing balance method at an interest rate of 12,5 % p.a., calculate the book value of the car after 7 years. (3)
- 6.2 A loan of R10 000, taken on 1 February 2016, is to be repaid in regular fixed instalments of R450 on the first day of each month. Interest is charged on the loan at 9,5 % p.a. compounded monthly. The first instalment is paid on 1 August 2016.

Calculate:

- 6.2.1 the total amount payable on 1 July 2016. (2)
- 6.2.2 the number of payments that will be needed to settle the loan. (5)
- 6.2.3 the balance outstanding on the loan after the 25th payment has been made. (4)

[14]

QUESTION 7

- 7.1 The estimated inflation rate is an average of 3% p.a.
How much will R800 000 today be worth 10 years from now? (2)
- 7.2 Peter saw an advert of a house worth R500 000 at an upmarket area.
He paid 20% deposit cash and took a loan from the bank to pay for the balance of the cost of the house.
- 7.2.1 What amount was the loan that Peter took from the bank? (1)
- 7.2.2 He planned to pay the loan back over 20 years starting from a month after the loan was taken. The bank offers loans at 12, 5% interest p.a. compounded monthly. If the loan is R400 000, calculate the value of his monthly instalments. (4)
- 7.2.3 After 10 years he won lotto and wants to pay off the house.
How much of the lotto winnings did he use to pay off the house? (4)
- 7.2.4 How much has he actually paid for the house when the debt is settled after 10 years? (3)

[14]

QUESTION 8

Thabo bought a house for R980 000. He paid a deposit of 10% of the selling price of the house. He obtained a loan from the bank at an interest rate of 11% per annum, compounded monthly, to pay the balance of the selling price. He agreed to pay monthly instalments of R10 000 on the loan.

- 8.1 How much money did Thabo borrow from the bank? (2)
- 8.2 How many months will it take to repay the loan? (6)
- 8.3 Calculate the balance of his loan immediately after his 90th instalment. (3)
- 8.4 Thabo experienced financial difficulties after the 90th instalment and did not pay the 91st to the 95th instalment. At the end of the 96th month he increased his monthly instalment so as to pay off the loan in the same time interval as planned initially. Calculate the value of his new monthly instalment. (5)

[16]

QUESTION 9

- 9.1 A car, bought for R128 000, depreciates annually at a compound rate. After 6 years it is worth R45 500. At what rate did the value depreciate? (4)
- 9.2 Keith sold his house for R250 000 and invested the money at 9,5% p.a., compounded quarterly.
- Twelve years later he used the proceeds of the investment to buy another house for R2 920 000 and obtained a mortgage bond for the remaining amount. The bond was granted for 20 years at 10,3% interest p.a. compounded monthly.
- 9.2.1 Calculate the value of Keith's original investment after 12 years. (3)
- 9.2.2 Determine the value of the bond that Keith obtained. (1)
- 9.2.3 Calculate the monthly payment that he has to make to pay off the bond. (4)
- 9.2.4 He paid off the bond in 20 years. How much interest did he pay on the bond? (2)
- [14]**