



INTRODUCTORY FINANCIAL MATHEMATICS

Duration : 2 Hours

EXAMINERS :
FIRST :
SECOND :

MRS S ROTHMANN
MISS J LE ROUX

Programmable pocket calculator is permissible.

100 Marks

This paper consists of 17 pages, including a list of formulae, a table with the number of each day of the year and four sheets of paper for rough work, plus instructions for completing a mark-reading sheet.

Please complete the attendance register on the back page, tear it off and hand it to the invigilator.

Answer all the questions on the mark-reading sheet supplied. Carefully follow the instructions for completing the mark-reading sheet. Also pay attention to the following:

- Only one option (indicated as [1] [2] [3] [4] [5]) per question is correct. Do not mark more than one option per question on the mark-reading sheet.
- Marks will not be deducted for incorrect answers.
- There are 30 questions for a total of 100 marks.

You are strongly advised to write your name on the mark-reading sheet. Thus, if you have entered your student number incorrectly, we will still be able to link you to the mark-reading sheet.

[TURN OVER]

Question 1

Lewis estimates that he will need R10 500 ten months from now to replace his welding machine. He invested R9 000 for this purpose two months ago at 11,5% simple interest. The amount that Lewis will still be short equals

- [1] R292,50.
- [2] R408,67.
- [3] R465,00.
- [4] R637,50.
- [5] none of the above.

Question 2

Jeremy invests R25 000 in a special account on 5 March 2008 and will leave it there until 27 November 2008. Interest is credited on the first day of every month at 12,35% per year, compounded monthly. Simple interest is used for the odd periods and compounded interest for full periods. When fractional compounding is used, the accumulated amount will equal

- [1] R27 258,53.
- [2] R27 335,72.
- [3] R27 341,09.
- [4] R27 351,06.
- [5] R27 482,83.

Question 3

A promissory note of R30 000 is due eight months from now. The applicable discount rate is 16,5% per year. The present value of the note equals

- [1] R26 700,00.
- [2] R27 027,03.
- [3] R33 300,00.
- [4] R33 463,26.
- [5] R33 707,87.

Question 4

You are quoted a continuous compounding rate of 19,06204% per year. The equivalent nominal rate per year, compounded every six months, equals

- [1] 18,49%.
- [2] 19,06%.
- [3] 19,37%.
- [4] 19,67%.
- [5] 20%.

[TURN OVER]

Question 5

Charlie received R32 412,87 after investing an amount of money in an account earning interest at a continuous compounding rate of 10,15% per year. The amount of money that he invested 57 weeks earlier equals approximately

- [1] R29 000,00.
[2] R29 153,86.
[3] R29 167,68.
[4] R32 768,16.
[5] R36 227,38.

Question 6

A loan of x rand is to be paid off in 25 payments. The first 15 payments are R4 000 each, paid at the beginning of each month. Thereafter the payments are R6 000 each per month, paid at the end of each month. The present value of this loan can be denoted by

- [1] $x = (1 + i)^{10} 000 a_{\overline{25}|i}$.
[2] $x = 4 000 a_{\overline{15}|i} + 6 000 a_{\overline{10}|i}$.
[3] $x = (1 + i)^4 000 a_{\overline{15}|i} + 6 000 a_{\overline{10}|i}$.
[4] $x = (1 + i)^4 000 a_{\overline{15}|i} + 6 000 a_{\overline{10}|i} (1 + i)^{-15}$.
[5] $x = (1 + i)^4 000 s_{\overline{15}|i} + 6 000 s_{\overline{10}|i}$.

Question 7

Four years ago Sunnyboy borrowed R35 000 from Minette at 11,3% per year, compounded semi-annually payable three years from now. He must also pay her R50 000 five years from now. The applicable interest rate for this transaction was 10,1% per year, compounded quarterly. The amount of money that Sunnyboy will owe Minette three years from now equals

- [1] R85 000,00.
[2] R89 630,00.
[3] R110 488,22.
[4] R116 508,49.
[5] R125 551,15.

Questions 8 and 9 relate to the following situation:
The Sleep Safety Security Services charges R19 500 monthly, paid in advance, for their services. The Garden Complex wishes to make use of their services and agrees to pay in advance the present value of these monthly payments in one lump sum for a whole year's service. An interest rate of 12,35% per year, compounded monthly, is applicable.

Question 8

The lump sum that the Garden Complex must pay equals

- [1] R151 663,91
- [2] R153 224,79
- [3] R162 000,00
- [4] R171 491,86
- [5] R173 256,80

Question 9

The amount saved (or the interest earned) by paying the lump sum in advance equals

- [1] R0,00
- [2] R2 243,20
- [3] R8 775,21
- [4] R10 336,09
- [5] R13 500,00

Question 10

The accumulated amount of payments of R5 000 into an account every three months for ten years, earning interest at an interest rate of 9,5% per year, compounded quarterly, equals

- [1] R128 197,89
- [2] R150 000,00
- [3] R244 404,87
- [4] R327 821,53
- [5] none of the above

Question 11

Thulani borrowed an amount of money from his father to open the Generous Papaw Shop. The loan will be paid back by means of payments of R25 000 each every second month for six years. An interest rate of 7,5% per year compounded every two months will be applicable. The amount of the loan equals

- [1] R238 067,35.
- [2] R400 738,72.
- [3] R721 181,68.
- [4] R900 000,00.
- [5] R1 127 887,64.

Question 12

After a golf ball struck Charl on the head he was awarded an amount from the Three Iron Fund as compensation for his injuries. He chose to receive R18 900 per month indefinitely. If money is worth 9,95% per year, compounded monthly, then the amount awarded equals approximately

- [1] R189 950.
- [2] R2 279 397.
- [3] R6 565 554.
- [4] R7 252 333.
- [5] none of the above.

Question 13

The future value of an annuity is R219 464,29. The term of this annuity is ten years. The interest rate is 9,65% per year, compounded monthly. The present value of this annuity equals

- [1] R7 681,25.
- [2] R14 003,24.
- [3] R83 935,53.
- [4] R87 352,94.
- [5] R111 686,66.

Questions 14 and 15 relate to the following situation:

Miles bought a house, and after making a down payment of 40% on the price of the house, managed to secure a home loan for the remainder. Since money is worth 14,75% per year, compounded monthly, and the period of the loan is 25 years, his monthly payments will be R8 325,67.

Question 14

The price of the house equals

- [1] R660 000.
- [2] R924 000.
- [3] R1 100 000.
- [4] R2 497 701.
- [5] none of the above.

Question 15

The interest rate stays the same for the full term of the loan. The amount of interest paid by Miles will equal

- [1] R440 000.
- [2] R1 397 701.
- [3] R1 573 701.
- [4] R1 837 701.
- [5] R2 497 701.

Question 16

The initial investment into the Fancy Dress Shop as the only cash outflow was R400 000. Its profitability index is 1,0875. The net present value (NPV) equals

- [1] R35 000.
- [2] R367 816.
- [3] R435 000.
- [4] R835 000.
- [5] none of the above.

Questions 17 and 18 relate to the following situation:
Desmond will discharge a debt of R500 000 six years from now, using the sinking fund method. The debt's interest is 15,6% per year, paid quarterly. The sinking fund will earn interest at a rate of 8,4% per year, compounded monthly.

Question 17

The monthly deposit into the sinking fund will equal

- [1] R4 236,10.
- ~ [2] R5 364,60.
- [3] R10 736,10.
- [4] R12 958,53.
- [5] R16 235,96.

Question 18

The total yearly cost to discharge the debt (to the nearest rand) will equal

- [1] R42 000.
- [2] R78 000.
- [3] R93 834.
- [4] R128 833.
- ~ [5] R142 375.

Question 19

Consider Stock E738.

- Coupon rate: 9,75% per year
- Yield to maturity: 11,25% per year
- Settlement date: 15 November 2008
- Maturity date: 7 August 2031

The amount of money that you should expect to receive per stock if you sell it on the coupon date following the settlement date equals

- [1] R85,63641%.
- ~ [2] R87,80282%.
- [3] R87,86673%.
- [4] R90,39112%.
- [5] R92,67782%.

Questions 20 and 21 relate to the following situation:
The following table represents the cash flows of the Plain Sailing Rowing Club. Money can be borrowed at 17,5% per year, while an investment can earn 12,86% per year.

Year	Cash Flows
2	+5 000
3	-30 000
4	-10 000
7	+25 000
8	+15 000
10	-5 000

Question 20

The future value of the cash inflows equals approximately

- [1] R50 787.
- [2] R57 928.
- [3] R63 339.
- [4] R68 206.
- [5] R79 432.

Question 21

If the present value of the cash outflows equals R24 736, then the MIRR will equal

- [1] 7,46%.
- [2] 8,89%.
- [3] 12,37%.
- [4] 18,42%.
- [5] none of the above.

Question 22

If $S = R \left[\frac{i}{(1+i)^n - 1} \right]$, then n can be denoted by

[1] $\frac{\ln \left(\frac{R}{S} + 1 \right)}{\ln (1+i)}$

[2] $\frac{\frac{R}{S} + 1}{iS}$

[3] $\frac{1+i}{\frac{R}{S} - 1}$

[4] $\frac{\ln \left(\frac{R}{S} + 1 \right)}{1+i}$

[5] none of the above.

Question 23

The accrued interest for Stock DEF was R2,10959%. The half-yearly coupon rate was 5,5%. The coupon date that follows the settlement date was 25 October 2008. The settlement date for Stock DEF was

[1] 25 April 2008.

[2] 4 July 2008.

[3] 6 August 2008.

[4] 12 September 2008.

[5] 25 October 2008.

Question 24

The following table represents the cash inflows (after tax) of an investment of R3 800 000:

Year	Cash inflows
1	200 000
2	400 000
3	100 000
4	300 000
5	600 000
6	500 000

The average annual rate of return equals

[1] 7,46%.

[2] 9,21%.

[3] 10,39%.

[4] 13,05%.

[5] 13,49%.

Question 25

Rinaldo bought a house and managed to secure a home loan for R650 000 with monthly payments of R8 439,31 at a fixed rate of 14,75% per year, compounded monthly over a period of 20 years. If an average yearly inflation rate of 8,75% is expected, then the real cost of the loan will equal approximately

- [1] R291 307.
- [2] R304 986.
- [3] R941 307.
- [4] R954 986.
- [5] none of the above.

Question 26

The is the square of the standard deviation.
The missing word is

- [1] correlation.
- [2] mean.
- [3] regression.
- [4] variance.
- [5] none of the above.

Questions 27 and 28 relate to the following situation:

Laurette takes out an endowment policy with yearly payments of R1 750 and an applicable interest rate of 15% per year. The policy matures in 20 years' time.

Question 27

If she decides to annually increase her payment by R750, then the total amount that she would pay for this policy would equal

- [1] R49 250,00.
- [2] R100 000,00.
- [3] R177 500,00.
- [4] R591 494,18.
- [5] R691 494,18.

Question 28

The amount that she could expect to receive would equal

- [1] R179 276,26.
- [2] R256 108,96.
- [3] R279 276,26.
- [4] R591 494,18.
- [5] R691 494,98.

[TURN OVER]

Questions 29 and 30 relate to the following situation:

The following table represents the number of home loans approved per month and the prices of the houses. Assume that a linear relationship exists between the price of a house and number of loans approved.

Price of house in millions of rand	x	Number of loans approved	y
3,50	10	5	10
3,00	5	15	12
2,75	15	20	18
2,00	12	22	20
1,50	20	25	22
1,25	18	27	25
1,00	22	35	35
0,90	20		
0,80	27		
0,70	25		
0,60	35		

Question 29

The slope of the regression line is

- [1] -7,08.
- [2] -0,86.
- [3] 1,02.
- [4] 1,64.
- [5] 30,59.

Question 30

The correlation coefficient is

- [1] -7,08.
- [2] -0,86.
- [3] 1,02.
- [4] 1,64.
- [5] 30,59.