

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

- 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.

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

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

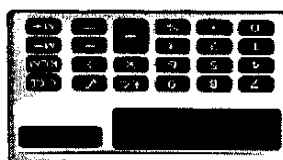
This paper consists of 17 pages including a list of formulae, a table with the number of each day of the year and four sheets of paper for rough work, plus instructions for completing a mark-reading sheet.

Programmable pocket calculator permissible.

EXAMINERS : FIRST : MRS S ROTHMANN
SECOND : DR EHA VENTER
Duration : 2 Hours
100 Marks
MRS MC STRYDOM

INTRODUCTORY FINANCIAL MATHEMATICS DEPARTMENT OF DECISION SCIENCES

QM102-Q (480819)
QMS102-E (480827)
RQG102-M (480983)
RQM102-G (480991)
May/June 2008



Question 1

In 20 months' time Joan will need R18 000. For this she opens a savings account, that earns 8,47% simple interest per year. The amount that she must invest now equals

- [1] R15 459,00.
- [2] R15 718,93.
- [3] R15 773,33.
- [4] R16 813,26.
- [5] R20 541,00.

Question 2

A discount rate of 14,29% for eight months is equivalent to a simple interest rate of

- [1] 6,668%.
- [2] 9,527%.
- [3] 13,047%.
- [4] 14,29%.
- [5] none of the above.

Question 3

The accumulated amount that Susan will receive after 38 months if she deposits R13 300 into an account where money is worth 11,35% per year compounded every two months equals

- [1] R14 117,08.
- [2] R15 690,19.
- [3] R18 080,24.
- [4] R18 865,83.
- [5] R18 988,31.

Question 4

The equivalent nominal rate, compounded monthly, for a 17,69% continuous compounding rate equals

- [1] 11,58%.
- [2] 17,561%.
- [3] 17,69%.
- [4] 17,821%.
- [5] 19,19%.

[TURN OVER]

Questions 5 and 6 relate to the following situation:
Alicia wants to open the Green Finger Nursery. She estimates that she will have R850 000 available on 1 July 2008 from her investment made on 17 April 2007 in an account earning 8,5% per year, compounded on the 1st day of every month.

Question 5

If simple interest is used for odd periods and compound interest for the rest, then the amount that she deposited on 17 April 2007 equals

- (1) R767 519,80.
- (2) R767 698,00.
- (3) R770 022,13.
- (4) R852 771,23.
- (5) R941 343,79.

Question 6

If fractional compounding is used for the whole period then the amount that Alicia deposited on 17 April 2007 equals

- (1) R767 494,87.
- (2) R767 524,55.
- (3) R767 702,68.
- (4) R911 119,55.
- (5) R941 337,97.

Question 7

Juan's investment of R1 050 000 in the Keep the Ball shop is expected to yield the following sequence of yearly cash flows over the next six years: R350 000; R320 000; R240 000; R500 000; R80 000 and R60 000. The IRR (internal rate of return) equals

- (1) 6,706%.
- (2) 7,94%.
- (3) 12,41%.
- (4) 14,76%.
- (5) none of the above.

Questions 8 and 9 relate to the following situation:

Roland borrowed money from his friend Gerhard to open the Kick and Swim Boutique. He realises that he will not be able to repay anything for the first five years. Thereafter he is prepared to pay back R40 000 every six months for seven years. Money is worth 9,56% per year, compounded half yearly.

Question 8

The amount of money that Roland owes Gerhard after five years when he starts paying him back equals

- [1] R305 216,09.
- [2] R312 196,08.
- [3] R352 959,83.
- [4] R401 574,29.
- [5] R560 000,00.

Question 9

The amount of money that Gerhard lends Roland to open the Kick and Swim Boutique equals

- [1] R162 379,02.
- [2] R191 347,80.
- [3] R195 723,74.
- [4] R221 279,58.
- [5] R251 757,23.

Question 10

The Girls' Best Friend Boutique sells diamonds. The following table represents the number of diamonds sold (x) and the carat value of the diamonds (y):

x	0,5	1	2	5
y	1 000	800	500	20

Suppose there is a linear relationship between the carat value of the diamonds and the number of diamonds sold. The coefficient of correlation between the carat value of the diamonds and the number of diamonds sold is

- [1] -2,0758.
- [2] -0,98185.
- [3] 0,98185.
- [4] 1,20213.
- [5] 1,6250.

Question 11

Monique wants to upgrade her studio in four years' time and estimates that it will cost her R350 000. She starts to save *immediately* by depositing R5 000 at the *beginning* of every month in an account earning 12,4% per year, compounded monthly. The amount still needed just before she starts to renovate her studio equals

- (1) R38 117,25.
- [2] R41 307,07.
- [3] R49 591,37.
- [4] R51 538,80.
- [5] R110 000,00.

Questions 12 and 13 relate to the following situation:

Lewis borrowed R275 000 from Ellertine at an interest rate of 16% per year, compounded quarterly, payable in five years' time. This debt will be discharged by the sinking fund method. (This means that the debt interest payments are made every three months.) The sinking fund will earn interest at a rate of 14% per year, compounded half yearly.

Question 12

The half yearly deposits in the sinking fund approximately equals

- [1] R9 235.
- [2] R13 750.
- (3) R19 904.
- [4] R20 235.
- [5] R27 500.

Question 13

The total yearly cost to discharge the debt approximately equals

- (1) R11 000.
- [2] R39 800.
- [3] R55 000.
- [4] R61 800.
- [5] R83 808.

Questions 14 and 15 relate to the following situation:
The following table represents the cash flows of the Scrambler Bike Company.

Months	Cash flows R
3	-220 000
7	-50 000
9	120 000
10	340 000
12	650 000
15	-10 000

Money can be borrowed at 15,6% per year, compounded monthly while an investment will yield 11,25% per year, compounded monthly.

Question 14

The present value of the negative cash flows approximately equals

- (1) R265 555.
- (2) R268 097.
- (3) R269 459.
- (4) R278 733.
- (5) none of the above.

Question 15

If the future value of the positive cash flows is R1 151 603, then the MIRR equals

- (1) 10,168%.
- (2) 10,205%.
- (3) 10,275%.
- (4) 26,578%.
- (5) 26,673%.

Question 16

..... is the method by which the relationship between two variables is determined and expressed as an equation.

The missing word is

- (1) Correlation.
- (2) Determination.
- (3) Deviation.
- (4) Regression.
- (5) Variance.

Questions 17, 18 and 19 relate to the following situation:
Susan bought a house and made a down payment of 40% of the price of the house. She managed to secure a loan for the remainder for 20 years at 13,5% per year compounded monthly. Her monthly payment is R7 026,92.

Question 17

Her down payment equals

- [1] R232 800.
- [2] R349 200.
- [3] R388 000.-
- [4] R582 000.
- [5] none of the above.

The following is an extract from Susan's amortisation schedule:

Month	Outstanding principle at beginning of the month	Interest due at end of the month	Monthly payment	Principal repaid
...	137	A	B	C
138	427 289,55	D	7 026,92	E
139	425 069,63	F		H
...				

240

Question 18

The value of A equals

- [1] R429 484,77.
- [2] R429 509,47.
- [3] R432 121,25.
- [4] R434 316,47.
- [5] none of the above.

check a-n of above

Question 19

Susan's equity in the house after 17,5 years equals

- [1] R178 079,14.
- [2] R403 920,86.
- [3] R566 079,14.
- [4] R791 920,86.
- [5] none of the above.

Questions 20 and 21 relate to the following situation:

Four years ago Jackie borrowed R120 000 from Brett at 12,65% per year, compounded quarterly, due two years from now. Six months ago he also borrowed R65 000 from Brett at 15,2% per year compounded monthly due two years from now.

Question 20

The amount that Jackie must pay Brett two years from now equals

- [1] R185 000,00.
- [2] R285 408,03.
- [3] R341 265,67.
- [4] R348 163,14.
- [5] R385 752,04.

Question 21

After seeing what he owes Brett two years from now, Jackie decides to reschedule the debt. He will pay Brett R85 000 *now* and the rest five years from now. Brett agrees on the condition that the new agreement will run from *now*, and will be subject to 13,7% interest per year, compounded half yearly. The amount that Jackie will pay Brett five years from now equals

- [1] R164 878,56.
- [2] R193 974,78.
- [3] R353 240,95.
- [4] R354 164,33.
- [5] R519 042,89.

Question 22

Consider Stock F234

Coupon rate (half yearly)	10,5% per year
Yield to maturity	7,955% per year
Maturity date	8 October 2042
Settlement date	29 May 2008

The all-in-price equals

- [1] R123,49852%.
- [2] R126,13814%.
- [3] R129,73733%.
- [4] R131,24248%.
- [5] R134,98733%.

[TURN OVER]

Question 23

The equation for the present value of Stock ELM on 17/06/2008 is given by

$$107,55174 = da_{\overline{n}|z} + 100 \left(1 + \frac{0,135}{2} \right)^{-29}$$

The yearly coupon rate is

- [1] 6,75%.
- [2] 7,35%.
- [3] 8,55%.
- [4] 14,70%.
- [5] none of the above.

Question 24

If the profitability index of the Soft Serv Parlour is 1,0514 and the NPV (net present value) equals R25 700, then the original investment approximately equals

- [1] R12 528.
- [2] R13 172.
- [3] R24 444.
- [4] R25 700.
- [5] R500 000.

Question 25

Trinette decides not to accept the offer from the Flower Fund to receive R18 900 every three months indefinitely from her R600 000 investment. She asks to rather receive two payments: one four years from now and the second one twice the size of the first one, eight years from now. If money is worth 12,6% per year compounded quarterly, then the amount of money that Trinette expects to receive eight years from now equals

- [1] R442 658,98.
- [2] R444 391,83.
- [3] R885 317,96.
- [4] R888 783,66.
- [5] R1 079 134,12.

Question 26

Rudy took out an endowment policy. He increases his initial yearly payment of R7 500 with R1 200 per year. If the applicable interest rate is 12,0% per year, the amount of money that he can expect to receive on the maturity date 20 years later equals

- [1] R540 393,32.
- [2] R587 520,00.
- [3] R626 856,25.
- [4] R1 060 917,74.
- [5] R1 260 917,74.

Question 27

If $S = Rsm$, then n is denoted by

- [1] $\frac{\ln\left(\frac{R}{S}+1\right)}{\ln(1+i)}$
- [2] $\frac{\frac{R}{S}+1}{(1+i)}$
- [3] $\frac{\frac{R}{S}-1}{\ln(1+i)}$
- [4] $\frac{1}{iR}$
- [5] none of the above.

Question 28

If the discounted value of a promissory note of R5 000 at a discount rate of 18% per year is R4 200, then the length of time (in years) under consideration is given by the expression

- [1] $\left(1 - \frac{4200}{5000}\right) \times \frac{100}{18}$
- [2] $\left(1 + \frac{4200}{5000}\right) \times \frac{100}{18}$
- [3] $\left(1 + \frac{4200}{5000}\right) \times \frac{100}{18}$
- [4] $\left(\frac{5000}{4200} - 1\right) \times \frac{1}{0,18}$
- [5] $\left(1 + \frac{4200}{5000}\right) \times 0,18$

Question 29

The Eye Opener Money lender has a finance charge of 0,0763% per day on outstanding balances. The effective interest rate equals

- [1] 7,63%.
- [2] 7,928%.
- [3] 27,85%.
- [4] 32,10%.
- [5] none of the above.

[TURN OVER]

Question 30

Agnes deposited R100 000 in an account earning 9,71% per year, compounded quarterly. After four years she decided to deposit an additional R12 000 in this account every three months. If the interest rate stays at 9,71% per year, compounded quarterly, the total balance in this account after seven years equals

- [1] R264 869,85.
- [2] R311 649,27.
- [3] R360 602,85.
- [4] R451 854,23.
- [5] R477 588,50.

check