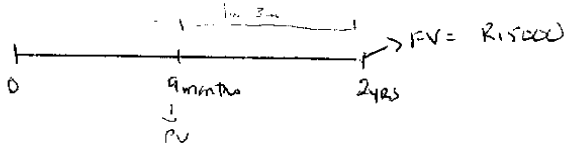
QMC 102

OU | NOV 07

Question 1



Value today

$$P = \frac{S}{(1+rt)}$$

$$= \frac{15000}{(1+0{,}125 \times 2)}$$

$$= R\,12000 \;[3]$$

Due in 9 months

$$S = P(1+rt)$$

$$= 12000(1+0{,}125 \times 9/12)$$

$$= R\,13125 \;[3]$$

Question 2

$$I = Prt$$

$$= 100 \times 0{,}24 \times t$$

$$= 24t$$

$$D = Sdt$$

$$24t = (100+24t) \times 0{,}205\,t$$

$$24t = 29{,}5t + 4{,}92t^2$$

$$\frac{3{,}5t}{4{,}92t} = \frac{4{,}92t^2}{4{,}92t}$$

$$t = 0{,}71138$$

No of days: $0{,}71138 \times 365$

$= 260$ days (Rounded) [1]

Question 3f

$$c = m\ln(1+i)$$

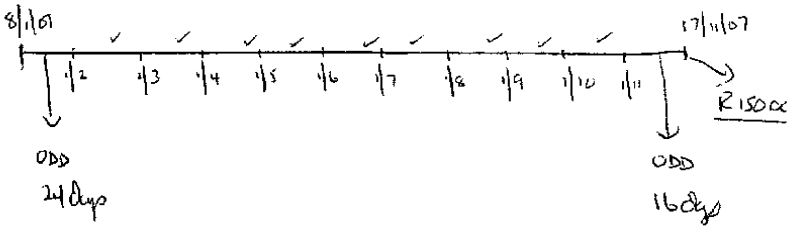
$$0{,}13974 = 4\ln(1+1/4)$$

$$0{,}03494 = \ln(1+1/4)$$

$$e^{0{,}03494} = 1+1/4$$

$$1{,}03555 - 1 = 1/4$$

Question 3



$$FV = R150{,}000$$

$$i = \frac{13{,}45}{12}$$

$$n = 12 \times \left[\frac{46}{365} + \frac{9}{12}\right]$$

$$PV = R133768{,}72 \;[2]$$

Question 5

$$S = Pe^{ct}$$

$$e^{ct} = \frac{S}{P}$$

$$ct = \ln\frac{S}{P}$$

$$t = \frac{\ln(S/P)}{c} \;[5]$$

Question 6

First convert to Effective, then back to nominal.

HP

14.75 2ND Nom

3 2ND P/YR

2ND EFF = 15,4871 %

Sharp 738 | 733

3 2ND EFF

14.75 = 15.4871 %

52 2ND APR

15.4871 = 14.419 %

Question 7

PV = 240000
i = 16
n = 10
FV = 1058744

PV = 1058744
i = -8
n = 5
FV = 697798,61

PV = 697798,61
i = 4
n = 6
FV = 882937,85
≈ 882938,40
[2]

Question 8

0,569 x 52 = 29,588

ITP
29,588 2ND Nom
52 2ND P/y
2ND Eff
34,318%

Sharp
52 2ND Eff
29,588 =
34,318%
[2]

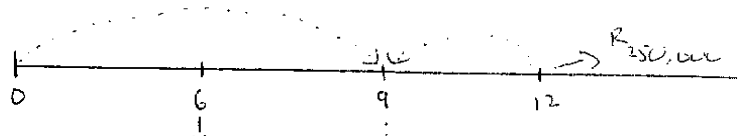
Question 9

FV = 34773,52
PV = -24000
n = 2x3
i = x/2
i = 12,75% ∴ original i = 12,75% - 2,5%
= 10,25% [2]

Question 10

FV = 24000
i = 10,25/4
n = 4x5
PV = 14469 03 [2]

Question 11



PV = 150,000
i = 15,5/12
n = 12x9
FV = 599 863,56

FV = 250,000
i = 16,4/2
n = 2 X 3
PV = 155803,23

R755667,10 [4]

Question 12

General Annuity. First Conver Interest Rate

ITP
10,61 2ND Nom
52 2ND P/YR
2ND EFF = 11,18129%
4 2ND P/YR
2ND Nom = 10,74%

Sharp
52 2ND EFF
10 61 = 11,18129%
4 2ND APR
11,18129 = 10,74%

PmT = 1200
i = 10,74/4
n = 4X9
PV = 27474,65
≈ 27470,00 [2]

Question 13

This no amortisation.

PMT = 10437.26
i = 13.25/12
n = 12x20
PV = 877500 → [Loan] [2]

Question 14

Downpayment = 35%
Loan = 65% 877500

877500 ÷ 65 x 35
= R472500 [2]

Question 15

PMT = 10437.26
i = 5.5%/12
n = ~~12x20~~ 12x20
PV = R1508608 →

Tr = Tv − P
= 1 508 608 − 877 500
= 631 108 [1]

[4]

Question 16

PMT = 8.25
FV = 100
i = 14.2/2
n = 2x16 = 32
PV = 114.39343

Ex Int [< 10 days]

FV = 114,39343
i = 14.2/2
n = 7/182
PV = 114,091204 % [All-in]

Accrued interest

= ~~7~~ −R/365 x 16.5
= −7/182 x16.5
= −0,63462 %

Clean Price. = R114,09204 − (−0,63462)
= R114,72666 % →

The Required was supposed to be; Calculate All-in.

Question 17

Given that the Price on 8/11/07 is R114,39343 / Per Stock
Then R1500,000 ÷ 114,39343 = 13111 [Ranked]
[2]

Question 18

He Pays 8400 ; 15 times.

8400 x15 = R126,000 →

He increases his Payment by 2100 each year.
So 15 years would have 14 increases.
(14x15) ÷ 2 = 105 payments of R2100.

2100 x105 = 220500

Total invested R126000 + 220500

Question 19

PV = 25000
i = 9.75/4
n = 4×5
FV = 40468,72 → [5]

This Amount will continue.
PV = 40468.72
i = 10/52
n = 52×5
FV = 66689.61

[This applies to Q19]

Question 20

PV = 40468.72
i = 10/52
n = 52×4
FV = 60349.05

PMT = 500
i = 10/52
n = 52×4
FV = 127725.46

R 188074.51 [5]

Question 21

Annuity due.
Calculator in Beg mode

PMT = 1403
i = 20,124/12
n = 12×2
PV = R 27995.08 [3]

Question 22

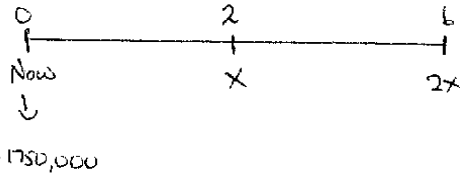
This is perpetuity. $P = \frac{R}{i}$

$1750000 = R / {}^{11.25}/_{12}$

$R = 1750,000 \times {}^{0.1125}/_{12}$

$= R\,16406.25$ [4]

Question 23



R 1750,000 grows for 2yrs; 'X' is Then Paid out.
The remain amount grows for 4yrs '2X' is Paid out. Balance is Then = Zero.

PV = 1750,000
i = 13.45/2
n = 2×2
FV = R2270401,70

R2270401.70 is now The Bal in yrs 2 and 'X' is Paid out So Balance is now [2270401.70 This now grows for 4yrs.

$S = P(1+i)^n$

$= (2270401,70 - X)(1 + \frac{0,1345}{2})^{2\times4}$

$= (2270401.70 - X)(1.65318)$

$= 3821483,70 - 1.65318X$

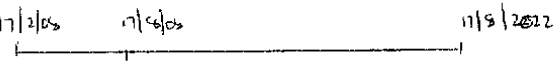
[This is The Bal after 6 years, N Payment '2X'

$3821483,70 - 1.65318X - 2X = 0$

$X = 1037550$

$\therefore 2X = 2075100.$ [4]

Question 24



PMT = 100 x 14.7% x 1/2
= 7.35
i = 13.5/2
n = 2 x 14.5
PV = R92,505885 [3]

Question 25

$$S = \frac{R\left[(1+i)^n - 1\right]}{i}$$

$$S = R\,\frac{\left[\left(1+\frac{6{,}14}{2}\right)^n - 1\right]}{0{,}07}$$

$$0{,}07S = R\left[(1{,}07)^n - 1\right]$$

$$R = \frac{0{,}07 \times S}{1.07^n - 1}$$

$$= S\left[\frac{0{,}07}{(1.07)^n - 1}\right] \quad [1]$$

Question 26

FV	100 000	490000	160000
i	14.35	14.35	14.35
n	3	5	10
PV	66.879127	250619.72	41 356.06

$ = 359 355.04 [5]

Question 27

$$MIRR = \left(\frac{FV\,Cash\,inflow}{PV\,outflow}\right)^{1/10} - 1$$

$$0{,}1816 = \left(\frac{FV\,inflow}{359\,355.04}\right)^{1/10} - 1$$

$$(1{,}1816)^{10} = \frac{FV\,inflow}{359355.04}$$

$$5{,}30524 = \frac{FV\,inflow}{359355.04}$$

FV inflow = R 1906464 [5]

Question 28

To calculate Weighted Ave.

12000 x 6%	=	720
15000 x 7%	=	1050
18000 x 7.25%	=	1305
20000 x 9%	=	1800
30000 x 9.25%	=	2775
40000 x 9.75%	=	3900
100000 x 11%	=	11000
235000		22550

Weighted Ave. = 22550 / 235000
= 9.6%

QUESTION 29

No of investors depend on Int Rate

∴ No of investors = y
Int Rate = x

HP
x → input
y → Σ+
a = ~~m~~ ŷ
b = m

Sharp. [STAT]
x ⟹ mR
y → m+

~~Type~~ a = 189.89962
b = −10,11472

y = a + bx
= 189,89962 − 10,11472x [2]

QUESTION 30

FV = 32620,38
I = 12/4
n = 4x10
PmT = 432,62

PmT = 432.62
i = 12/4
n = 4x10
PV = R10,000 →

[2]