

MNF2023 GROUP DISCUSSION

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Topics To Be Discussed

- Ratio analysis
- Time value of money
- Risk and return
- Bond and share valuation
- Working capital management
- Examinations

Ratio Analysis

- Ratio analysis - involves methods of calculating and interpreting financial ratios to assess a firm's financial condition and performance.
- Interested parties - shareholders, creditors, and the firm's own management.

Types Of Ratio Comparisons

- Trend or time-series analysis - evaluate firm's performance over time
- Cross-sectional analysis - compare similar ratios for firms within similar industries (benchmarking)
- Combined analysis - combination of both time series & cross-sectional analysis

Categories Of Financial Ratios

- Liquidity ratios- ability to satisfy short-term obligations, e.g. CR & QR (AT)
- Activity ratios- speed to convert accounts into sales or cash, e.g. Inv. Turn, ACP, APP & TAT
- Debt ratios- measures proportion of assets financed by creditors, e.g. DR, TIER, FPCR.

FINANCIAL RATIOS (cont.)

- Profitability ratios- evaluate firm's profits, e.g. GPM, OPM, NPM, EPS. ROA/ROI & ROE
- Market ratios- firm's market value as measured by its current share price, e.g. P/E & M/B
- DuPont System of Analysis- multiply firm's net profit margin by its total asset turnover

FINANCIAL RATIOS (cont.)

Which ONE of the following ratios may indicate poor collections procedures or a lax credit policy?

1. Average payment period
2. Inventory turnover
3. Quick ratio
4. Average collection period

A firm has a current ratio of 1; in order to improve its liquidity ratios, this firm might ...

1. improve its collection procedures, thereby increasing cash and increasing its current and quick ratios
2. improve its collection practices and pay accounts payable, thereby decreasing current liabilities and increasing the current and quick ratios
3. decrease current liabilities by utilising more long term debt, thereby increasing the current and quick ratios
4. increase inventory, thereby increasing current assets and the current and quick ratios

Solutions

- The Average Collection Period indicates poor collection procedures (See Page 60 of the prescribed text book)
- Option 3 is the best because if you reduce your current liabilities by utilising more long term debt, you will increase the current ratio. Note that option 1 is not the best because improving collection procedures reduces debtors and increases cash at the same time.

The following information is available for JJ Holdings. Use this information to answer questions 1 to 7:

Sales	R3 850 000
Cost of Goods sold	R3 250 000
Inventory Turnover	3.89
Total assets turnover	0.75
Earnings available for ordinary shareholders	R900 000
Ordinary shares equity	R2 500 000
Book value of shares	R6
Number of days in a year	365

1. Suppose the average age of inventory (AAI) for a rival company is 80 days. The AAI for JJ Holdings indicates that it ...
 1. has a higher average number of days' sales in inventory than the rival Company
 2. has a lower average number of days' sales in inventory than the rival company
 3. is more effective in utilising its inventory to generate sales
 4. turns over its inventory faster than the rival company
2. Assuming that the total liabilities for JJ Holdings are R3 500 000 and that the industry average for the debt ratio is 50%, The current debt ratio for JJ Holdings indicates that it has ...
 1. a lower risk of becoming bankrupt compared to the firms in its industry
 2. a higher risk of becoming bankrupt compared to the firms in its industry
 3. half of its assets financed by debt
 4. a lower proportion of lenders' funds that are being used to generate profits compared to the industry

Solutions

$$\text{AAI (JJ Holdings)} = \frac{365}{3.89} = 94 \text{ days}$$

Therefore the correct option is 1 because its AAI is higher than for the rival company

$$\text{Debt ratio (JJ Holdings)} = \frac{3\,500\,000}{\text{Total Assets}}$$

To calculate total assets we need to work out the Total ASSETS Turnover ratio:

$$\text{Total Asset Turnover} = \frac{\text{sales}}{\text{Total Assets}}$$

$$0.75 = \frac{R\,3\,850\,000}{\text{Total Assets}}$$

$$\text{Total Assets} = \frac{R\,3\,850\,000}{0.75} = R\,5\,133\,333$$

$$\text{Debt ratio} = \frac{R\,3\,500\,000}{5\,133\,333} = 68\%$$

Therefore the correct option is 2 since JJ Holdings has a higher debt ratio compared to the industry

Time value of money

Instructions:
Sharp EL 733A, EL 735:

Clear Memory: 2nd FN CA
Set to FIN Mode: 2nd FN MODE
Make sure calculator is not in BEGIN mode: To
remove, press 2nd FN BGN
Set to at least 4 decimal places

HP 10B11:

Set to 1 P/YR : 1 Orange Button P/YR
Press Orange Button C
Make sure calculator is not in BEGIN mode. To remove, press Orange
Button BEG/END
Set to at least 4 decimal places: Orange
Button DISP 4

Time Value of Money

Sharp EL 738:

Calculator should display TAB and DEG.

(Normal Mode)

Make sure payments are set to 1 Payment
per Year: Press 1 2nd FN P/YR

Make sure its not in BEGIN mode: Press 2nd
FN BGN/END

Examples

ASSESSMENT STUDY GUIDE

pp.38-40

Examples

1. Calculate the present value of a R25 000 perpetuity at a 14% discount rate.
2. Calculate the present value of R50 000 to be received at the end of 2 years, at an interest rate of 10% compounded semi-annually.
3. Calculate the future value of a R2 000 annuity due, deposited at 8%, compounded annually for each of the next 10 years.
4. Donald makes annual end of year payments of R6260.96 on a 5 year loan with an 8 % interest rate. What is the original principal amount?

Example

1. $R25\ 000/0.14 = R178\ 571$

2. 50 000 FV

4 N

5 I

COMP PV:

R41 135.12

Example

3. 2000 +/- PMT

8 I

10 N

COMP FV:

R31 290.97

4. 6260.96 +/- PMT

5 N

8 I

COMP PV:

R24 998.20

Examples (cont)

1. James is considering buying a car for R40 000. The bank has quoted him an interest rate of 12% per annum, compounded monthly. If he wishes to repay the principal amount over 50 months, what is his monthly instalment?
2. Joy is planning to send her parents on a cruise costing R15 000 and has 5 years to accumulate this amount. Calculate the amount Joy must deposit at the **beginning** of each month to achieve this. Assume interest rate is 6%

Example

1. 40 000 PV
1 I
50 N
COMP PMT:
R1020.51
2. 15 000 FV
60 N
0.5 I
COMP PMT:
R213.92

Example

Shrell Industries, a cabinet manufacturer, expects to receive the following mixed stream of cash flows over the next 5 years from one of its customers:

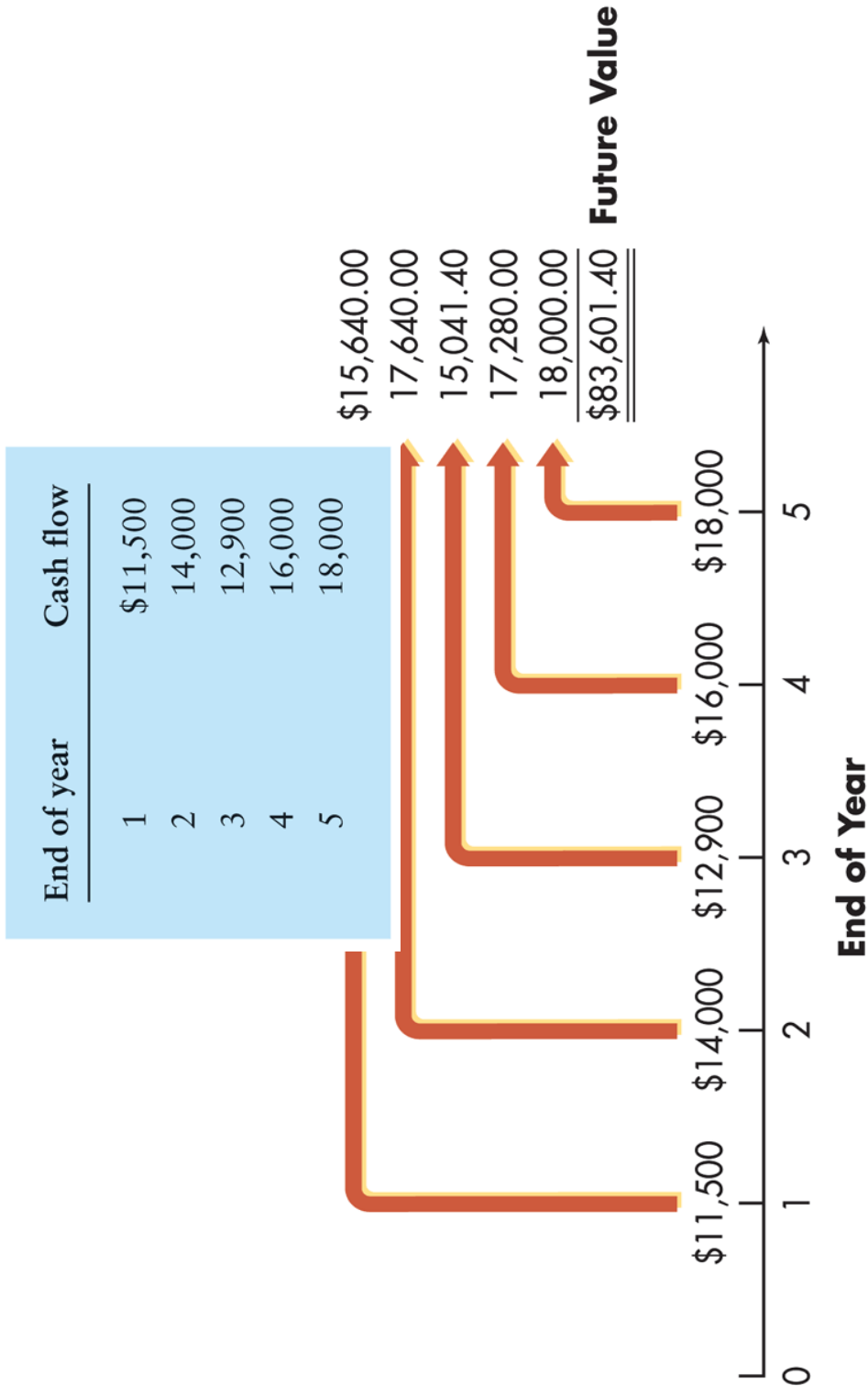
End of year	Cash flow
1	R11 500
2	R14 500
3	R12 900
4	R16 000
5	R18 000

If Shrell expects to earn 8% on its investment, how much will it accumulate by the end of year 5 if it immediately invest these cash flows when they are received?

Calculating the PV using Sharp EL 738

Inputs:
Press: CFI 2nd FN CA
0 ENT
11 500 ENT
14500 ENT
12900 ENT
16 000 ENT
18 000 ENT
2ND FN CFI
8 ENT
Down arrow key
Press: COMP
NPV =R57 331

Future Value of a Mixed Stream



Future Value of a Mixed Stream (cont.)

TABLE 4.3

Future Value of a Mixed Stream of Cash Flows

Year	Cash flow (1)	Number of years earning interest (n) (2)	$FVIF_{8\%,n}^a$ (3)	Future value [(1) \times (3)] (4)
1	\$11,500	5 - 1 = 4	1.360	\$15,640.00
2	14,000	5 - 2 = 3	1.260	17,640.00
3	12,900	5 - 3 = 2	1.166	15,041.40
4	16,000	5 - 4 = 1	1.080	17,280.00
5	18,000	5 - 5 = 0	1.000 ^b	18,000.00
Future value of mixed stream				<u>\$83,601.40</u>

^aFuture value interest factors at 8% are from Table A-1.

^bThe future value of the end-of-year-5 deposit at the end of year 5 is its present value because it earns interest for zero years and $(1 + 0.08)^0 = 1.000$.

Examples (cont.)

- 7 Fred Company, a shoe manufacturer, has been offered an opportunity to receive the following mixed stream of cash flows over the next 5 years:

End of year	Cash flow
1	R400
2	R800
3	R500
4	R400
5	R300

If the firm must earn at least 9% on its investment, what is the most it should pay for this opportunity?

Present Value of a Mixed Stream

TABLE 4.4

Present Value of a Mixed Stream of Cash Flows

Year (<i>n</i>)	Cash flow (1)	$PVIF_{9\%,n}^a$ (2)	Present value [(1) × (2)] (3)
1	\$400	0.917	\$ 366.80
2	800	0.842	673.60
3	500	0.772	386.00
4	400	0.708	283.20
5	300	0.650	195.00
		Present value of mixed stream	<u>\$1,904.60</u>

^aPresent value interest factors at 9% are from Table A-2.

Risk Defined

- In the context of business and finance, **risk** is defined as the chance of suffering a financial loss.
- Assets (real or financial) which have a greater chance of loss are considered more risky than those with a lower chance of loss.
- Risk may be used interchangeably with the term **uncertainty** to refer to the variability of returns associated with a given asset.
- Other sources of risk

Return Defined

- **Return** represents the total gain or loss on an investment.
- The most basic way to calculate return is as follows:

$$k_t = \frac{C_t + P_t - P_{t-1}}{P_{t-1}} \quad (5.1)$$

where

k_t = actual, expected, or required rate of return² during period t

C_t = cash (flow) received from the asset investment in the time period $t - 1$ to t

P_t = price (value) of asset at time t

P_{t-1} = price (value) of asset at time $t - 1$

EXAMPLE Q2 SG p.46

RISK OF A SINGLE ASSET (cont.)

TABLE 5.3

Assets A and B

	Asset A	Asset B
Initial investment	\$10,000	\$10,000
Annual rate of return		
Pessimistic	13%	7%
Most likely	15%	15%
Optimistic	17%	23%
Range	4%	16%

RETURN MEASUREMENT FOR A SINGLE ASSET: EXPECTED RETURN

- The most common statistical indicator of an asset's risk is the **standard deviation**, σ_k , which measures the dispersion around the expected value.
- The **expected value of a return**, $k\text{-bar}$, is the most likely return of an asset.

$$\bar{k} = \sum_{j=1}^n k_j \times Pr_j \quad (5.2)$$

k_j = return for the j th outcome

Pr_j = probability of occurrence of the j th outcome

n = number of outcomes considered

Risk Measurement For A Single Asset: Standard Deviation

- The expression for the standard deviation of returns, σ_k , is given in Equation 5.3 below.

$$\sigma_k = \sqrt{\sum_{j=1}^n (k_j - \bar{k})^2 \times Pr_j} \quad (5.3)$$

10. The formula that is commonly used to find the standard deviation of returns, σ_k , in a situation in which *all* outcomes are known *and* their related probabilities are assumed equal, is

$$\sigma_k = \sqrt{\frac{\sum_{j=1}^n (k_j - \bar{k})^2}{n - 1}} \quad (5.3a)$$

where n is the number of observations. Equation 5.3 is emphasized in this chapter because returns and related probabilities are often available.

EXAMPLES Q5 SG p.47

EXAMPLES Q6 SG p.47

Risk Measurement for a Single Asset: Coefficient of Variation

- The coefficient of variation, CV , is a measure of relative dispersion that is useful in comparing risks of assets with differing expected returns.
- Equation 5.4 gives the expression of the coefficient of variation.

$$CV = \frac{\sigma_k}{k}$$

(5.4)

EXAMPLES Q7 SG p.47

PORFOLIO RETURN

- The return of a portfolio is a weighted average of the returns on the individual assets from which it is formed and can be calculated as shown in Equation 5.5.

$$k_p = (w_1 \times k_1) + (w_2 \times k_2) + \dots + (w_n \times k_n) = \sum_{j=1}^n w_j \times k_j \quad (5.5)$$

w_j = proportion of the portfolio's total dollar value represented by asset j

k_j = return on asset j

Risk and Return: The Capital Asset Pricing Model (CAPM) (cont.)

- After estimating beta, which measures a specific asset or portfolio's systematic risk, estimates of the other variables in the model may be obtained to calculate an asset or portfolio's required return.

$$k_j = R_F + [b_j \times (k_m - R_F)] \quad (5.8)$$

k_j = required return on asset j

R_F = risk-free rate of return, commonly measured by the return on a U.S. Treasury bill

b_j = beta coefficient or index of nondiversifiable risk for asset j

k_m = market return; return on the market portfolio of assets

EXAMPLES Q'8,10 SG p.48

Example

Armstrong Mining Ltd is expecting to pay a dividend of R4 a share at the end of year

1. Its beta is currently 1.2 and the return on the treasury bills is 7%. The return on the JSE All share index is 16%. Due to the political violence in Kenya, its beta has jumped to 1.4. Calculate the new share price assuming a constant dividend growth of 10%.

Example

First, calculate the required rate of return using the CAPM:

$$7 + 1.4(16-7) = 19.6\%$$

Then calculate the price of the share using the constant growth model:

$$\frac{D_1}{k_s - g}$$

$$\frac{4}{0.196 - 0.1} = R41.67$$

Example

Security	Expected Return	Standard deviation	Beta
X	20%	20%	1.5
Y	10%	30%	1.0
Risk free asset	5%		

Example (cont)

1. Which asset has the least total risk and which asset has the least systematic risk
2. What is the systematic risk for a portfolio with two thirds of the funds invested in X and one third invested in Y?
3. What is the portfolio expected return and the portfolio beta if you invest 35% in X, 45% in Y and 20% in the risk free asset?

Example

1. Compute CV for both assets and compare the CVs. The asset with the least total risk is the one with the lowest CV.

$$\text{Asset X: } 20/20 = 1$$

$$\text{Asset Y: } 30/10 = 3$$

Asset X has the least total risk

$$2. \text{ Systematic risk} = 2/3(1.5) + 1/3(1) = 1.33$$

$$3. \text{ Portfolio Return: } 0.35(20) + 0.45(10) + 0.2(5) = 12.5\%$$

$$\text{Portfolio beta: } 0.35(1.5) + 0.45(1) + 0.2(0) = 0.975$$

BASIC VALUATION MODEL

$$V_0 = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \dots + \frac{CF_n}{(1+k)^n} \quad (6.5)$$

V_0 = value of the asset at time zero

CF_t = cash flow *expected* at the end of year t

k = appropriate required return (discount rate)

n = relevant time period

$$V_0 = [CF_1 \times (PVIF_{k,1})] + [CF_2 \times (PVIF_{k,2})] + \dots + [CF_n \times (PVIF_{k,n})] \quad (6.6)$$

BOND VALUATION Q's 3,5 pp.54,55

SG

BOND VALUATION: BASIC BOND VALUATION

$$B_0 = I \times \left[\sum_{t=1}^n \frac{1}{(1+k_d)^t} \right] + M \times \left[\frac{1}{(1+k_d)^n} \right] \quad (6.7)$$

$$= I \times (PVIFA_{k_d,n}) + M \times (PVIF_{k_d,n}) \quad (6.7a)$$

B_0 = value of the bond at time zero

I = *annual* interest paid in dollars¹²

n = number of years to maturity

M = par value in dollars

k_d = required return on a bond

BOND VALUATION: BOND FUNDAMENTALS Q5 p. 57 SG

Bond Valuation

- Semi Annual Coupon pmts

A company has issued a bond that has a par value of R1, 000 and a maturity of 20 years. The coupon interest rate of 10 per cent is paid semi -annually. The required rate of return is 8 per cent per year. How much will you pay for the bond?

Bond Valuation

- Using Financial Calculator

- 40 N
- R1, 000 FV
- 4 i
- 50 PMT

Compute PV = R1 197.92

Bond YTM

- Mills Company bond currently sells at R740 and has a coupon rate of 10% and a R1000 par value. The bond pays interest semi annually and has 10 years to maturity. Calculate the YTM

Yield To Maturity

-740 PV

50 PMT

1000 FV

20 N

Compute I = 7.56%

Stock Valuation Models: The Basic Stock Valuation Equation

$$P_0 = \frac{D_1}{(1 + k_s)^1} + \frac{D_2}{(1 + k_s)^2} + \dots + \frac{D_\infty}{(1 + k_s)^\infty} \quad (7.2)$$

where

P_0 = value of common stock

D_t = per-share dividend *expected* at the end of year t

k_s = required return on common stock

Ordinary Share Valuation

Models:

The Zero Growth Model

- The zero dividend growth model assumes that the share (stock) will pay the same dividend each year, year after year.

$$P_0 = D_1 \times \sum_{t=1}^{\infty} \frac{1}{(1 + k_s)^t} = D_1 \times (PVIFA_{k_s, \infty}) = D_1 \times \frac{1}{k_s} = \frac{D_1}{k_s} \quad (7.3)$$

ORDINARY SHARE VALUATION Q7 p.58 SG

Share (stock) Valuation Models: Constant Growth Model

- The constant dividend growth model assumes that the share (stock) will pay dividends that grow at a constant rate each year—year after year forever.

$$P_0 = \frac{D_0 \times (1+g)^1}{(1+k_s)^1} + \frac{D_0 \times (1+g)^2}{(1+k_s)^2} + \dots + \frac{D_0 \times (1+g)^\infty}{(1+k_s)^\infty} \quad (7.4)$$

$$P_0 = \frac{D_1}{k_s - g} \quad (7.5)$$

SHARE (STOCK) VALUATION Q8

p.58 SG

Variable Growth Model

- Assume ABC Corporation currently pays a dividend of R0.50 per share. You have estimated that the company's dividend will grow at a rate of 15 per cent per year for the next three years. After that, the dividend will grow at a constant rate of 6 per cent. The required rate of return is 12 per cent.

Variable Growth Model

Calculate the expected future dividends using the growth rate of 15 per cent.

1	2	3	4
Year	Do	$FVIF_{0.15,t}$	FV (2) x (3)
1	50	1.150	57.5
2	50	1.323	66.15
3	50	1.521	76.05

Variable growth model

Calculate the sum of the present values of expected future dividends using the required rate of return of 12 per cent.

(1)	(2)	(3)
D_t	$PVIF_{0.12,t}$	FV
		(1) x
		(2)
57.5	0.893	51.35
66.15	0.797	52.72
76.07	0.712	54.22

Sum of PVs is 158.22. This yields the value of 158 cents.

Variable Growth Model

- Calculate the value of the share for the constant growth period from year 4 onwards. Note we use the growth rate of 6 per cent and not 15 per cent.
- $D4 = D3 \times (1+g) = 76.05 \times (1+0.06)$
 $= 76.05 \times 1.06$
 $= 80.61 \text{ cents}$

Variable Growth Model

- Using the formula P3

$$= \frac{D_4}{k - g}$$

- = $\frac{80.61}{0.12 - 0.06}$

- = 1,336 cents

Variable Growth Model

$$\text{PV of 1, 336} = 1, 336 \times \text{PVIF}_{0.123}$$

$$= 1, 336 \times 0.712$$

$$= 951.232$$

$$= 951 \text{ cents}$$

Variable Growth Model

Add the PVs of the two growth periods.

$$P0 = 158 + 951$$

$$= 1, 109 \text{ cents}$$

$$= R111.09$$

SHARE (STOCK) VALUATION Q9

p.56 SG

Other Approaches to Share Valuation

P/E Approach

- $P/E = 18$
- $EPS = R2.50$
- Value per Share = $18 \times 2.5 = R45.00$

THE CASH CONVERSION CYCLE

- Both the OC and CCC may be computed as shown below.

$$OC = AAI + ACP \quad (14.1)$$

$$CCC = OC - APP \quad (14.2)$$

$$CCC = AAI + ACP - APP \quad (14.3)$$

C/A and WC Management

A car manufacturer uses 20 000 motors per year and the cost of carrying the motors in inventory is R2.00 per motor and the cost of ordering a motor is R200.(Assume a 365 day year)

Required:

- Calculate EOQ
- Determine the re order quantity, assuming that it takes 20 days to receive an order and that a safety stock of 10 motors is required

Solutions

$$EOQ = \sqrt{\frac{2 \times S \times O}{C}} = \sqrt{\frac{2 \times 20000 \times 200}{2}} = 2\,000 \text{ units}$$

Re order quantity = lead time x daily usage

$$= 20 \times \frac{20000}{365}$$

$$= 20 \times 55$$

$$= 1\,096 \text{ units}$$

Add safety/buffer stock of 10:

$$1\,096 + 10 = 1\,106 \text{ units}$$

EXAMINATION

- 50 MCQs 1 mark each
- 2 Long questions, Total of 20 marks
- Section B will be from chapter 14 and 15 of Gitman
- Total marks: 70; Duration: 2 hours
- Study all units, assessments & assignments questions