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## **TELEMATIC SCHOOLS PROJECT 2021**

# **Mathematical Literacy Grade 12**

| SESSION | DATE        | TIME          | TOPIC                        |
|---------|-------------|---------------|------------------------------|
| 1       | 5 May 2021  | 15:00 – 16:00 | Finance: Income Tax pg. 2-10 |
| 2       | 19 May 2021 | 15:00 – 16:00 | Maps and plans pg. 11-20     |

# INCOME TAX

Income tax is an amount deducted from your earnings by the Government. This money is used to run the country. The amount of income tax paid depends on the amount of money you earn.

There are several steps to calculating a person's income tax and you therefore have to make sure that you understand the important terminology and can perform the steps in the right order.

## DEFINITIONS

|                           |  |
|---------------------------|--|
| Gross Salary              | The total amount earned in a month. This includes all types of salary (e.g. salary, overtime, bonuses, etc.)   |
| Deductions                | These are amounts that need to be subtracted from the gross salary before money is deposited into the employee's bank account. These include items such as UIF, Pension, Medical Aid, Trade Union Fees, Loan repayments, Tax, etc.   |
| Net Salary                | Also known as 'take home pay'. This is the amount that is deposited into an employee's bank account. It is calculated as follows:<br>$\text{Net Salary} = \text{Gross Salary} - \text{Deductions}$   |
| Income Tax                | This is a tax on all sources of income (e.g. salary, interest income, rental income, etc.). It is calculated on the taxable income.  |
| Taxable Income            | This is different from Net Salary although the calculation looks similar.<br>$\text{Taxable Income} = \text{Gross Income} - \text{Tax-deductible Deductions}$  |
| Gross Income              | This is different from gross salary (above) because it includes all forms of income, e.g. salary, rental income, textbook royalties, etc.  |
| Tax-deductible Deductions | These are <b>specific</b> deductions that are subtracted from the gross income before tax is calculated.<br><b>INDIVIDUAL Deductions</b> <ul style="list-style-type: none"><li>• Pension fund contributions.</li><li>• Retirement annuity fund contributions.</li><li>• Provident fund contributions (only from 1 March 2016)</li><li>• Legal costs – under certain qualifying circumstances.</li><li>• Wear-and-tear – in respect of certain assets.</li><li>• Donations – to approved bodies</li></ul> |
| UIF                       | Unemployment insurance fund – employees have to contribute 1% of their gross salary.   |

Summary of the steps followed to determine the amount of income tax payable annually:

| Steps           | Actions  | Explanation   |
|-----------------|--|---|
| 1               | Calculate <b>Gross Income</b>                                | This is the total amount of all individual's income before deductions.  |
| 2               | Subtract Tax-deductible deductions                           | See specific deductions which are allowed to subtract from the gross income before tax is calculated. You have now determined the Taxable Income.   |
| 3               | Use the Tax Table's sliding scale and do the calculation     | Take the taxable income amount and look up the sliding scale rate on the Tax Table as provided by SARS each year. Do the calculations to determine income tax payable. You will therefore need to choose the correct bracket that the person falls in and then use that information in your calculation.<br>Remember the Tax Table uses ANNUAL INCOME. (if you get monthly income you need to x 12) |
| 4               | Deduct rebate amounts  | There are certain rebate amounts which can now be deducted from the payable income tax calculated in step 3. There are primary, secondary and tertiary rebates; these are linked to ages. Everyone qualifies for a primary rebate and people above 65 get a primary AND secondary rebate etc.<br>It is therefore important to check the person's age in the question                                |
| 5               | Deduct Medical Credits                                       | This is a deduction for the main medical aid scheme member and its dependents.  |
| Optional Step 6 | <i>If asked for a monthly income tax take answer and ÷12</i> |   |

## Your ANNUAL income tax Cheat sheet:

1. Calculate gross income (before deductions)

2. Subtract tax deductible deductions

3. a) Calculate annual taxable income,  
b) use tax rate table to determine amount of income tax

4. Subtract applicable rebate amounts

5. Subtract medical aid tax credit amounts

## How to use the tax rate table:

### 1. Before you get started make sure you have the:

ANNUAL TAXABLE INCOME

THE AGE OF THE INDIVIDUAL

### 2. Use the annual taxable income to determine the correct bracket.

(Bracket 1 – 7)

## RATES OF TAX FOR INDIVIDUALS

2021 tax year (1 March 2020 - 28 February 2021) - See the changes from the previous year

| Taxable income (R)  | Rates of tax (R)                                |
|---------------------|---|
| 1 – 205 900         | 18% of taxable income                           |
| 205 901 – 321 600   | 37 062 + 26% of taxable income above 205 900    |
| 321 601 – 445 100   | 67 144 + 31% of taxable income above 321 600    |
| 445 101 – 584 200   | 105 429 + 36% of taxable income above 445 100   |
| 584 201 – 744 800   | 155 505 + 39% of taxable income above 584 200   |
| 744 801 – 1 577 300 | 218 139 + 41% of taxable income above 744 800   |
| 1 577 301 and above | 559 464 + 45% of taxable income above 1 577 300 |

Bracket

Fixed amount

%

Bottom of bracket

### 3. Use the information in the “rates of tax” column to perform the calculation:

Income tax = Fixed amount + [ % x ( your taxable income – bottom of bracket)]

### 4. Subtract applicable tax rebates.

| Tax Rebate               |         |
|--------------------------|---------|
|                          | 2021    |
| Primary                  | R14 958 |
| Secondary (65 and older) | R8 199  |
| Tertiary (75 and older)  | R2 736  |

### 5. Divide answer by 12 if monthly tax is asked.

**Question 1:**

Peter is a sales person. He is 37 years old and earns a monthly gross salary of R32 750. Calculate his monthly income tax. Peter does not belong to a medical or pension fund.

## RATES OF TAX FOR INDIVIDUALS

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**Tax Rebates - see changes from previous year**

| Tax Rebate               | 2021    | 2020    |
|--------------------------|---------|---------|
| Primary                  | R14 958 | R14 220 |
| Secondary (65 and older) | R8 199  | R7 794  |
| Tertiary (75 and older)  | R2 736  | R2 601  |

**Question 2:**

A certified gas dealer who is 48 years old earned a taxable income of R0,742 million during the 2014/2015 tax year and contributed to a registered medical aid scheme for herself and four dependents. She projected that her taxable income would remain the same during the 2015/2016 tax year.

Study the tax tables and the medical aid credits to answer the questions that follow.

- 2.1 Explain the impact of the tax rebate and the medical aid credits on the tax payable.
  
- 2.2 The dealer calculated that her annual tax due to SARS (South African Revenue Service) would increase by only R 150,00 from the 2014/2015 tax year to the 2015/2016 tax year.

Verify, showing ALL calculations, whether her calculation is valid.

TABLE BELOW: SARS tax rates plus medical aid credits for two tax years ending 29 February 2016 and 28 February 2015

**YEAR OF ASSESSMENT ENDING 29 FEBRUARY 2016**

| TAXABLE ANNUAL INCOME | RATES OF TAX                                  |
|-----------------------|---|
| 0 - 181 900           | 18% of taxable income                         |
| 181 901 - 284 100     | 32 742 + 26% of taxable income above 181 900  |
| 284 101 - 393 200     | 59 314 + 31% of taxable income above 284 100  |
| 393 201 - 550 100     | 93 135 + 36% of taxable income above 393 200  |
| 550 101 - 701 300     | 149 619 + 39% of taxable income above 550 100 |
| 701 301 and above     | 208 587 + 41% of taxable income above 701 300 |

**YEAR OF ASSESSMENT ENDING 28 FEBRUARY 2015**

| TAXABLE ANNUAL INCOME | RATES OF TAX                                  |
|-----------------------|---|
| 0 - 174 550           | 18% of taxable income                         |
| 174 551 - 272 700     | 31 419 + 25% of taxable income above 174 550  |
| 272 701 - 377 450     | 55 957 + 30% of taxable income above 272 700  |
| 377 451 - 528 800     | 87 382 + 35% of taxable income above 377 450  |
| 528 001 - 673 100     | 140 074 + 38% of taxable income above 528 000 |
| 673 001 and above     | 195 212 + 40% of taxable income above 673 100 |

**TAX REBATES**

|  | 2016    | 2015    |
|--|---------|---------|
| Primary rebate   | R13 257 | R12 726 |
| Secondary rebate (for persons 65 years and older) in addition to primary rebate              | R7 407  | R7 110  |
| Tertiary rebate (for persons 75 years and older) in addition to primary and secondary rebate | R2 466  | R2 367  |

**MEDICAL AID CREDITS IN RESPECT OF MONTHLY MEDICAL AID CONTRIBUTIONS**

|                       | 2016      | 2015      |
|-----------------------|-----------|-----------|
| Tax payer only        | R270      | R257      |
| First dependent       | R270      | R257      |
| Additional dependents | R181 each | R172 each |

### **Question 3**

Ulwazi received his employee tax certificate (IRP5) (ANNEXURE A) for the financial year ending 28 February 2013. Some of the information has been omitted.

Use ANNEXURE A to answer the following questions.

- 3.1 Write down the taxable amount that Ulwazi received as an annual payment.
- 3.2 Did Ulwazi receive a non-taxable reimbursive travel allowance? Give a valid reason for your answer.
- 3.3 Calculate the average monthly medical scheme fees tax credit.
- 3.4 Calculate the missing amount **A**.
- 3.5 Indicate how the gross non-retirement funding income was calculated.
- 3.6 From 1 March 2012 to 31 July 2012 Ulwazi contributed a total of R4 975,25 to his pension fund.

Determine the average monthly contribution for the remainder of the financial year.

## ANNEXURE A

### EMPLOYEE TAX CERTIFICATE

Transaction year: 2013      Year of Assessment: 2013      Period of reconciliation: 2012/2013

**TYPE OF CERTIFICATE: IRPS**

| <b>EMPLOYEE INFORMATION</b>                    |                               |
|--|-------------------------------|
| Surname: Ramile                                | Date of birth: 19750616       |
| First name: Ulwazi                             | Income tax number: 0804858209 |
| <b>EMPLOYER INFORMATION</b>                    |                               |
| Trading or other name: Department of Education |                               |

| <b>INCOME RECEIVED</b>          |             | <b>INCOME RECEIVED CONTINUED ...</b> |             | <b>TAX CREDITS, CONTRIBUTIONS</b>       |             |
|---------------------------------|-------------|--------------------------------------|-------------|---|-------------|
| AMOUNT                          | SOURCE CODE | AMOUNT                               | SOURCE CODE | AMOUNT                                  | SOURCE CODE |
| R 185 463                       | <b>3601</b> | GROSS RETIREMENT FUNDING INCOME      |             | PAY-AS-YOU-EARN                         |             |
| R 15 521                        | <b>3605</b> | R 185 463                            | <b>3697</b> | R 30 075,79                             | <b>4102</b> |
| R 26 188                        | <b>3713</b> | GROSS NON-RETIREMENT FUNDING INCOME  |             | TOTAL TAX AND UIF                       |             |
| R 8 640                         | <b>3810</b> | R 50 349                             | <b>3697</b> | R 30 075,79                             | <b>4149</b> |
|                                 |             |                                      |             | MEDICAL SCHEME CONTRIBUTIONS TAX CREDIT |             |
|                                 |             |                                      |             | R 2 760,00                              | <b>4116</b> |
| <b>DEDUCTIONS/CONTRIBUTIONS</b> |             |                                      |             |   |             |
|                                 |             | R 13 909                             | <b>4001</b> |   |             |
|                                 |             | R 20 013                             | <b>4005</b> |   |             |
|                                 |             | R 8 640                              | <b>4474</b> |   |             |
|                                 |             | TOTAL DEDUCTIONS/CONTRIBUTIONS       |             |   |             |
|                                 |             | R A                                  | <b>4497</b> |   |             |

| <b>SOME SOURCE CODES</b> |   |             |  |             |                                      |
|--------------------------|---|-------------|--|-------------|--------------------------------------|
| <b>3601</b>              | INCOME – TAXABLE                            | <b>3713</b> | OTHER ALLOWANCES – TAXABLE                           | <b>4005</b> | MEDICAL AID CONTRIBUTIONS            |
| <b>3605</b>              | ANNUAL PAYMENT – TAXABLE                    | <b>3810</b> | MEDICAL AID CONTRIBUTIONS PAID ON BEHALF OF EMPLOYEE | <b>4474</b> | EMPLOYER'S MEDICAL AID CONTRIBUTIONS |
| <b>3703</b>              | REIMBURSIVE TRAVEL ALLOWANCES – NON-TAXABLE | <b>4001</b> | CURRENT PENSION FUND CONTRIBUTIONS                   | <b>4497</b> | TOTAL DEDUCTIONS/CONTRIBUTIONS       |

#### **Question 4**

Dean, a 25-year-old male, earns a taxable annual income of R305 174,44. He started his first job on 1 March 2019.

Tax payable by an individual for the tax year 1 March 2019 to 29 February 2020 is indicated in TABLE 1 below.

**TABLE 1: INCOME TAX RATES FOR INDIVIDUALS  
2019/2020 TAX YEAR (1 MARCH 2019 TO 29 FEBRUARY 2020)**

| TAX BRACKET | TAXABLE INCOME (R)  | TAX RATES (R)                                       |
|-------------|---------------------|---|
| 1           | 0–195 850           | 18% of taxable income                               |
| 2           | 195 851–305 850     | $35\ 253 + 26\%$ of taxable income above 195 850    |
| 3           | 305 851–423 300     | $63\ 853 + 31\%$ of taxable income above 305 850    |
| 4           | 423 301–555 600     | $100\ 263 + 36\%$ of taxable income above 423 300   |
| 5           | 550 601–708 310     | $147\ 891 + 39\%$ of taxable income above 555 600   |
| 6           | 708 311–1 500 000   | $207\ 448 + 41\%$ of taxable income above 708 310   |
| 7           | 1 500 001 and above | $532\ 041 + 45\%$ of taxable income above 1 500 000 |

**NOTE:** Dean is not a member of a medical aid.

Use TABLE 1 to answer the questions that follow.

- 4.1 Name the government institution responsible for collecting tax return forms.
- 4.2 Write down the tax bracket that will be used to calculate Dean's tax payable.
- 4.3 Calculate the monthly tax payable by Dean before any rebates are deducted.
- 4.4 TABLE 2 below indicates the rebates for the 2018/2019 and 2019/2020 tax years.

**TABLE 2: REBATES FOR 2018/2019 AND 2019/2020 TAX YEARS**

| TAX REBATES                  | TAX YEAR 2019/2020 | TAX YEAR 2018/2019 |
|------------------------------|--------------------|--------------------|
| Primary (age below 65)       | R14 067            | R14 220            |
| Secondary (age 65 and above) | R7 713             | R7 794             |
| Tertiary (age 75 and older)  | R2 574             | R2 601             |

- 4.4.1 Identify the tax rebate(s) that Dean qualifies for in the 2019/2020 tax year.
- 4.4.2 State the number of tax rebates a 75-year-old man will qualify for in any tax year.

# MAPS AND PLANS

## SCALE

We begin the lesson by first focusing on the aspects of scale.

- Scale can be applied to maps, plans and objects
- A scale is ratio which indicates how many times bigger or smaller the reality (lengths/distances/objects) is.

We can use two types of scales:

### 1. NUMBER/RATIO SCALE

- If the scale is expressed as a ratio like 1:100
- This means 1 unit on the map represents 100 units on the ground
- Disadvantages of number scale: Scale not applicable if the map/plan is resized.

### 2. BAR/LINEAR SCALE

- Measure the bar scale to determine the distance given
- Equate the distance measured to the value on the bar scale
- Convert units to be similar.
- Advantages of number scale: This is not affected by the resizing of the map.

## NUMBER SCALE

Using a given **number scale** to calculate real/actual length or distances:

Given scale: 1 : 20 000

If 20 cm is measured on a map, calculate the real distance in km.

### METHOD 1

$$\begin{array}{r} \xrightarrow{\times} \\ 1 : 20\,000 \\ \div \\ 20 : ? \end{array}$$

### METHOD 2

$$\begin{array}{r} \xrightarrow{\times 20} \xrightarrow{\times 20} \\ 1 : 20\,000 \\ \times 20 \quad \times 20 \\ 20 : ? \end{array}$$

**METHOD 1:** Divide up Multiply down

$$\text{Real distance} = 20 \div 1 \times 20\,000$$

$$= 400\,000 \text{ cm}$$

(Convert to km)

$$\text{In km} = 400\,000 \div 100\,000$$

$$= 4 \text{ km}$$

### **METHOD 2:** Multiply down

$$\begin{aligned}\text{Real distance} &= 20\ 000 \times 20 \\ &= 400\ 000 \text{ cm}\end{aligned}$$

(Convert to km)

$$\begin{aligned}\text{In km} &= 400\ 000 \div 100\ 000 \\ &= 4 \text{ km}\end{aligned}$$

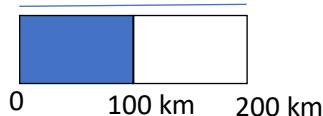
Summary:

1. If needed **MEASURE lengths** on paper
2. Write down the scale.
3. Write the corresponding lengths beneath each other.
4. Apply one of the two methods or the method that you're used to or know.
5. Convert to appropriate/unit requested. Know your conversions!

### **BAR SCALE**

Using a given **bar scale** to calculate real/actual length or distances:

Given: Bar scale to determine the missing lengths to the given unit:



Measured: length on paper = 15 cm

Actual length = ..... km

### **STEPS:**

(If needed **MEASURE lengths** on paper)

1. Measure the length of segments of bar scale:  
..... cm or mm = 100 or 200 km
2. Write as a ratio/scale:  
..... cm : 200 km
3. Convert now the km to the same measured unit (cm/mm).
4. Apply Method 1 (It is the most appropriate method to use in this case or the method that you're used to or know)
5. Convert to appropriate / unit as requested. Know your conversions!

EXAMPLES:

- If a house plan is drawn with a scale of 1 : 50 calculate missing dimensions the following table:

| Room              | Dimension on plan in <b>mm</b> | Actual / Real length in <b>m</b> |
|-------------------|--------------------------------|----------------------------------|
| Length of Kitchen | 90 mm                          | <b>A</b>                         |
| Width of bathroom | <b>B</b>                       | 2 m                              |
| Height of windows | 24 mm                          | <b>C</b>                         |

**A** 1 : 50

90 mm : ...

$$\begin{aligned}1 : 50 \times 9 \text{ cm } (\text{mm convert to cm}) \\= 450 \text{ cm}\end{aligned}$$

**Actual length in m**

$$\begin{aligned}= 450 \div 100 \\= 4,5 \text{ m}\end{aligned}$$

**B** 1 : 50

$$\begin{aligned}\dots : 2 \text{ m convert to mm} \\2 \times 1\,000 = 2\,000 \text{ mm}\end{aligned}$$

$$\text{On plan in mm} = 2\,000 \div 50 \times 1$$

$$= 40 \text{ mm}$$

**C** 1 : 50

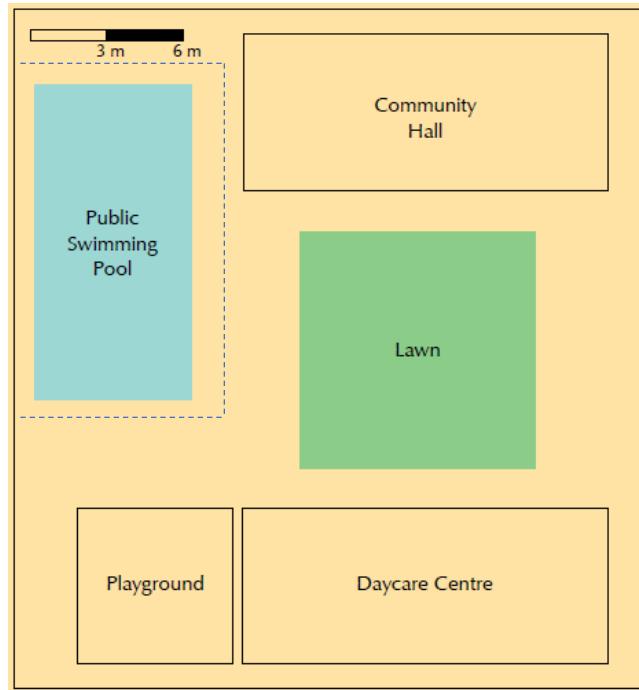
24 mm : ...

$$\begin{aligned}1 : 50 \times 24 \text{ mm} \\1\,200 \text{ mm}\end{aligned}$$

**Actual length in m**

$$\begin{aligned}= 1\,200 \div 1\,000 \\= 1,2 \text{ m}\end{aligned}$$

2.



Use the bar scale to determine the actual length of the swimming pool in metres.

Pool's measured length = 4 cm

Scale measured : 2cm = 6 m

Pool's length in m

$$= 2 \times 6$$

$$= 24 \text{ m}$$

3.



If the length of the reduced Jetstream is 9.9 cm, while the actual length is 19.25m, determine the scale (rounded to the nearest 10) in the form 1: ...

Measured : Actual length

9,9 cm : 19,25 m

9,9 cm : 19,25 m × 100

1 925 cm

9,9 ÷ 9,9 : 19 250 ÷ 9,9

1 : 1 94,444

1 : 190

### **TYPES OF MAPS AND PLANS**

**A map is a two-dimensional representation of an area e.g. country-, street-, building map, etc.**

#### **ROUTE MAP**

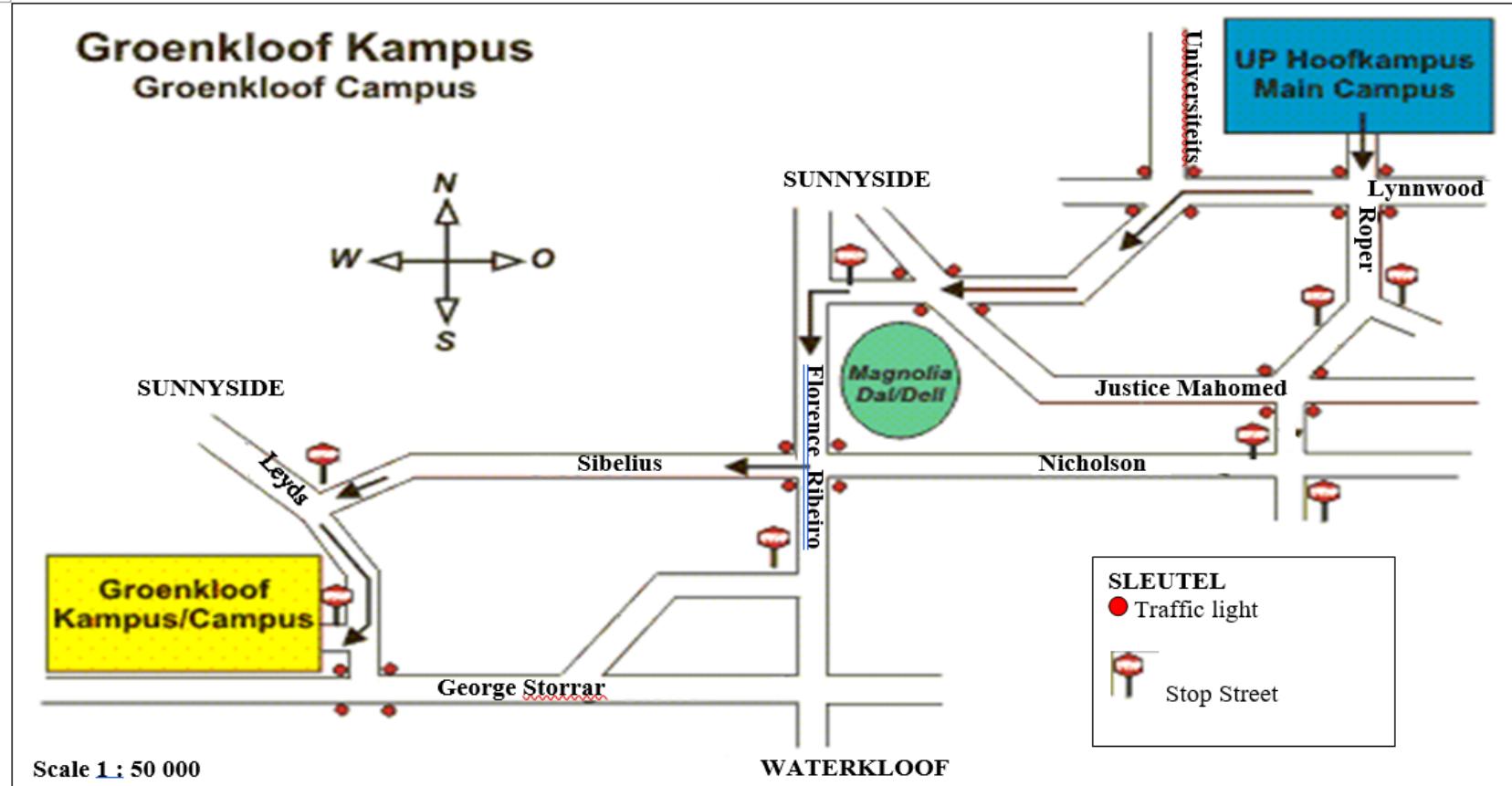
- 1      The route map from the main campus of the UP (University of Pretoria) to the Groenkloof campus is shown on ANNEXURE A.

Use ANNEXURE A to answer the following questions.

- 1.1 In which street is the entrance to the main campus of the UP?
- 1.2 In which general direction is the Groenkloof campus from the main campus of the UP?
- 1.3 Which neighborhood/area will you reach when you continue in a southerly direction with Florence Ribeiro street?
- 1.4 The Magnolia Dal is situated on the corner of two streets. Name the two streets.
- 1.5 The directions on how to get from the UP's main campus to the Groenkloof campus is indicated by the arrows.  
Provide a set of written directions for the route that is indicated by the arrows if you DO NOT use the route along Roper street.
- 1.6 A set of traffic lights consists of 4 traffic lights, one at each corner.  
How many sets of traffic lights are indicated on the route map?
- 1.7 Use the given scale to determine the actual distance (in km) from Florence Ribeiro street from the traffic light to the intersection with George Storrar Street if the measured distance is 30 mm.

## ANNEXURE A

### DIRECTIONS FROM UP MAIN CAMPUS TO GROENKLOOF CAMPUS



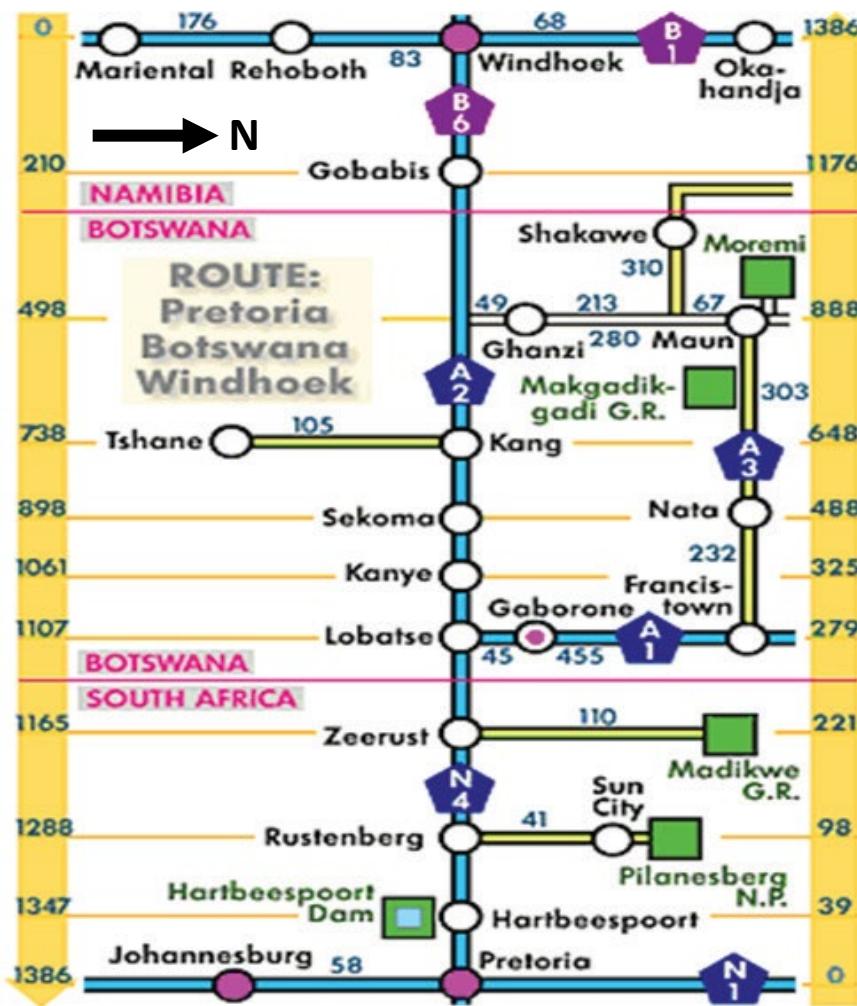
[Adapted from [www.ais.up.ac.za](http://www.ais.up.ac.za)]

## STRIP CHART

It is not drawn to scale

Study the **strip chart** below of the route from Gauteng to Namibia and answer the questions that follow.

- 2.1 What is the direction of Okahandja to Johannesburg?
- 2.2 James travelled from Gaborone, turning south at Lobatse via N4. At Zeerust, he turned left and travelled 110 km. What is his current destination?
- 2.3 Describe the route in sequence; when one is travelling from Johannesburg to Sun City, by mentioning the national roads and towns where roads are changing/joining.
- 2.4 What is the probability of passing a town that has a name that starts with the letter 'K' if you are travelling from Zeerust to Tshane? Give your answer as a percentage.



- 3 Emnandi Mall is a new mall in Johannesburg North. Some of the new tenants have already opened their stores but there are still a few unoccupied stores.

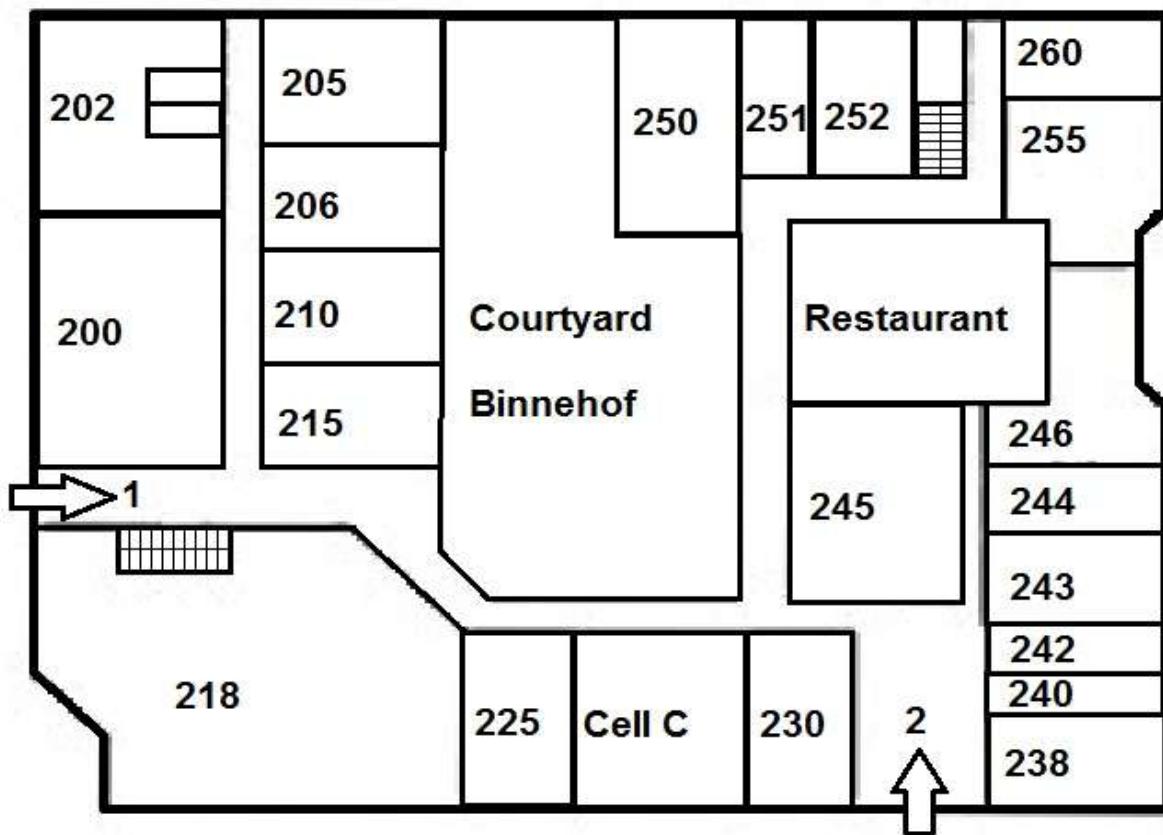
Refer to ANNEXURE B to answer the questions that follow.

- 3.1 Which entrance is the closest to Top Tupperware store?
- 3.2 Woolworths sell clothes, household accessories, meat, fruits and vegetables. Give the number of the shop that would suit them best?
- 3.3 Follow the directions and give the name and number of the shop that Thandi will reach.
  - Thandi enters Emnandi Mall at entrance 2 and walks in a northern direction past Vodacom.
  - She turns in a north-western direction at Vodacom.
  - At the first corridor, she turns right.
  - She continues straight and walks past the restaurant situated on her right-hand side.
  - She turns right and walks straight ahead where she will find the shop.
- 3.4 Thandi enters Emnandi Mall at Entrance 2 and needs to go to "Chops & T-Bones".  
Give her directions to reach the store.
- 3.5 Give the general direction from store 218 to store 255.
- 3.6 It takes Thandi 15 minutes to travel 215 metres through the mall. Calculate her average speed. Give your answer in metres per second.  
You may use the following formula:

$$\text{Average Speed} = \frac{\text{Distance travelled}}{\text{Time taken}}$$

**ANNEXURE B**

**FLOORPLAN OF EMNANDI MALL**



**KEY / SLEUTEL**

|     |                   |     |         |     |                   |
|-----|-------------------|-----|---------|-----|-------------------|
| 200 | Mistique Boutique | 230 | Vodacom | 246 | Fashion Fuse      |
| 202 | Top Tupperware    | 238 | —       | 250 | —                 |
| 205 | Chops & T-Bones   | 240 | —       | 251 | Electronic Empire |
| 206 | Lila Laundromat   | 242 | —       | 252 | —                 |
| 210 | Fish & Chips      | 243 | —       | 255 | Bandit Brothers   |
| 215 | Magnolia Flowers  | 244 | —       | 260 | —                 |
| 218 | —                 | 245 | —       |     |                   |
| 225 | MTN               |     |         |     |                   |
|     |                   |     |         |     |                   |

4 Study the seating plan of an airplane and answer the questions that follow.

4.1 How many exit doors are indicated on the seating plan?

4.2 Write down the row numbers of the Economy Plus class seats that have in-seat power.

4.3 The actual length of the airplane (from the cockpit to the end of the passenger cabin) is given as 50 m. If the scale of the seating plan is 1: 200, calculate the length of the airplane on the seating plan in mm.

