basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

2022

MARKS: 150

TIME: 3 hours

This question paper consists of 13 pages and an addendum with 4 annexures.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.

2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   - ANNEXURE A for QUESTION 2.1
   - ANNEXURE B for QUESTION 2.2
   - ANNEXURE C for QUESTION 4.1
   - ANNEXURE D for QUESTION 5.2

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

6. Show ALL calculations clearly.

7. Round off ALL final answers appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.

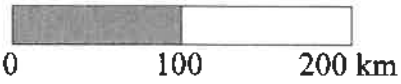
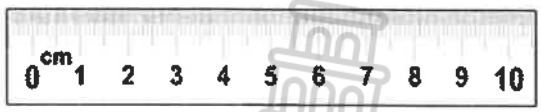
10. Write neatly and legibly.

QUESTION 1

1.1 Sifiso is a builder who uses building plans and measuring instruments.

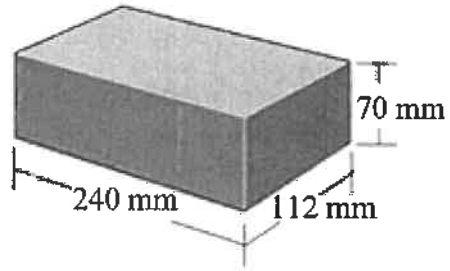
Some measuring instruments and scales used by builders are shown below.

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–G) next to the question numbers (1.1.1 to 1.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B
1.1.1	The most appropriate scale to draw a map of South Africa	A 
1.1.2	The instrument most suited to measure the circumference of a dinner plate	B 
1.1.3	The most appropriate scale to draw a plan of a house	C 
1.1.4	The instrument most suited to measure the width of a soccer field	D 1 : 50 000
1.1.5	The instrument most suited to measure the length of a pencil	E 
		F 
		G 1 cm = 1 m

(5 × 2) (10)

1.2 The sketch below shows a standard brick, with dimensions, used in South Africa.

SKETCH OF A STANDARD BRICK	DIMENSIONS OF THE BRICK
	Height = 70 mm Width = 112 mm Length = 240 mm

Use the information above to answer the questions that follow.

1.2.1 State which formula (**A**, **B** or **C**) below can be used to calculate the total surface area (TSA) of the given brick.

A $TSA_{(brick)}$ = Area of front side + Area of right-hand side + Area of top

B $TSA_{(brick)} = (2 \times 240 \times 70 + 2 \times 240 \times 112 + 2 \times 112 \times 70)\ mm^2$

C $TSA_{(brick)} = (240 \times 70 + 240 \times 112 + 112 \times 70)\ mm^2$ (2)

1.2.2 State the unit of measurement for the volume of this brick. (2)

1.2.3 Convert the length of this brick to metres. (2)

1.2.4 Determine the maximum number of rows of bricks that can be stacked height-wise to a height of 2 100 mm. (3)

1.3 Maria uses the recipe below to bake scones.

Ingredients (makes 1 dozen)	Picture of the scones
75 g butter 2 large eggs 75 g sugar 4 teaspoons baking powder 230 mℓ milk 500 g flour 1 cup raisins	
Baking Instruction	
Bake for 15 minutes at 200 °C.	

Use the information above to answer the questions that follow.

1.3.1 Convert the mass of the flour to kilograms. (2)

1.3.2 Determine the number of large eggs needed to make **30** scones. (2)

1.3.3 Each scone has an average diameter of 7 cm.

Write down the average radius of EACH scone. (2)

1.3.4 Calculate how many full dozen scones can be made with 500 g of butter. (3)

1.3.5 The scones were placed in the oven to bake at 14:10.

Write down, in words, the time the scones were placed in the oven. (2)

[30]

QUESTION 2

2.1 Busisiwe participated in a Vhi Women's Mini Marathon. ANNEXURE A shows the route for the mini-marathon.

Use ANNEXURE A and the information above to answer the questions that follow.

2.1.1 Write down the starting time of the mini-marathon using the 24-hour format. (2)

2.1.2 Determine the number of places where an ambulance can be found. (2)

2.1.3 State which mode of transport is NOT allowed on the mini-marathon route. (2)

2.1.4 The distance of a standard marathon is 42,2 km.

(a) Determine, in simplified form, what fraction of a standard marathon the Vhi Women's Mini Marathon is. (4)

(b) Give ONE reason why the Vhi Women's Mini Marathon is called a mini-marathon. (2)

2.1.5 Choose the answer and write only the letter (A–C) next to the question number (2.1.5).

The probability of a runner crossing the railway line during the mini-marathon is …

A definite.

B 0%.

C 100%. (2)

2.2 Busisiwe lives in Irene.

ANNEXURE B shows the layout plan of Irene. Some streets end in a cul-de-sac[1]. The arrows on some streets show the traffic flow in one direction only (one-way streets).

NOTE:
[1]Cul-de-sac – a street ending in a dead end, that is, having only one entry/exit

Use ANNEXURE B and the information above to answer the questions that follow.

2.2.1 Write down the place of interest that is situated at the corner of Krige Street and Bruce Street. (2)

2.2.2 Give the general direction from Bastion Guest House to the Station & Shopping Centre. (2)

2.2.3 Name the street that the railway lines cross. (2)

2.2.4 Give the name of the church found in King Street. (2)

2.2.5 Busisiwe gives David the following travelling instructions to meet her:

- Drive from Irene Pre-Primary east along Crawford Street.
- Turn left into Queen Street.
- Take the first right into Stanley Street and continue to King Street.
- Turn right into King Street, pass five streets and then turn left.
- Continue across the first street. Before the next intersection Busisiwe will be waiting for David.

Identify the place where Busisiwe will be waiting for David. (3)

2.2.6 The actual straight-line distance (as the crow flies) from the entrance of Irene Pre-Primary to the entrance of Irene Primary School is 1,9 km.

Determine, rounded to the nearest thousand, the scale of the layout plan in the form **1 :** … (5)

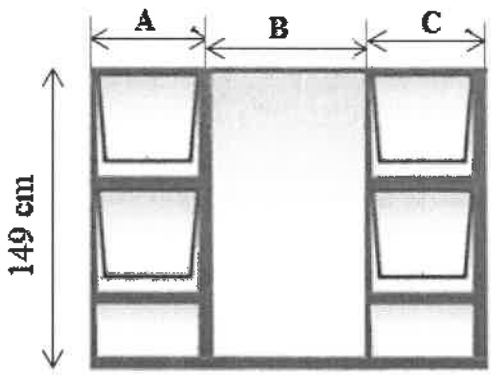
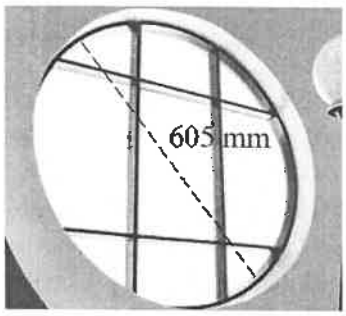
2.2.7 Explain why a driver travelling along King Street cannot turn right into Bruce Street. (2)
[32]

QUESTION 3

3.1 Tshego is renovating her home. She is removing the wooden-framed windows and is replacing them with aluminium-framed windows.

The dimensions and the shape of two of the window frames are given below.

In the rectangular window frame, four windows can open. It has three sections: A, B and C. The circular window frame has no windows that can open.

RECTANGULAR WINDOW FRAME	CIRCULAR WINDOW FRAME
	
Outer dimensions of the window frame: Length **A** = 55 cm, **B** = 99 cm and **C** = 55 cm. Width = 149 cm	Inner diameter = 605 mm

[Source: www.premiumaluminium.co.za]

The following formulae may be used:

Area of a rectangle = length × width

Area of a circle = 3,142 × (radius)^2

Perimeter of a rectangle = 2(length + width)

Circumference of a circle = 3,142 × diameter

Use the information above to answer the questions that follow.

3.1.1 Determine the perimeter of the rectangular window frame. (3)

3.1.2 Calculate the inner area in cm^2 of the circular window frame. (4)

3.1.3 One of the windowpanes of the rectangular window frame broke.

Write the probability, as a decimal, that it is NOT one of the windowpanes that can open. (3)

3.2 Tshego also intends tiling the dining room and lounge floors.

The dimensions of the lounge floor are 4 m by 5 m and of the dining room floor 3 m by 4 m.

Information and cost:

- Tshego intends using tiles that are 35 cm by 35 cm.
- One box of 4 tiles costs R143,84.
- Tile cement costs R99,90 per 20 kg bag, which covers 3 m^2.
- She needs 4 bags of tile grout at R89,90 per 5 kg bag.
- The cost of labour is R2 500.
- Tshego's total budget for the tiling project is R15 000.

Use the information above to answer the questions that follow.

3.2.1 Show that the total floor area to be tiled is 32 m^2.

You may use this formula:

Area of a rectangle = length × width (2)

3.2.2 Determine how many boxes of tiles Tshego will need if an extra 10% of the number of tiles must be added for cutting and breakages. (9)

3.2.3 Show by means of calculations if Tshego's budget is enough to finish the tiling project. (8)

[29]

QUESTION 4

4.1 ANNEXURE C shows the seating plan for a cinema during the Covid-19 pandemic. Seats marked with an 'X' need to be left vacant in order to comply with social distancing regulations.

Use ANNEXURE C and the information above to answer the questions that follow.

4.1.1 On which side of the cinema is seat E4 from seat E15 when a person is facing the screen? (2)

4.1.2 Assume that pre-Covid-19 conditions apply and all the seats are occupied.

(a) Name the row and seat number of the middle seat in the 8^{th} row from the screen. (2)

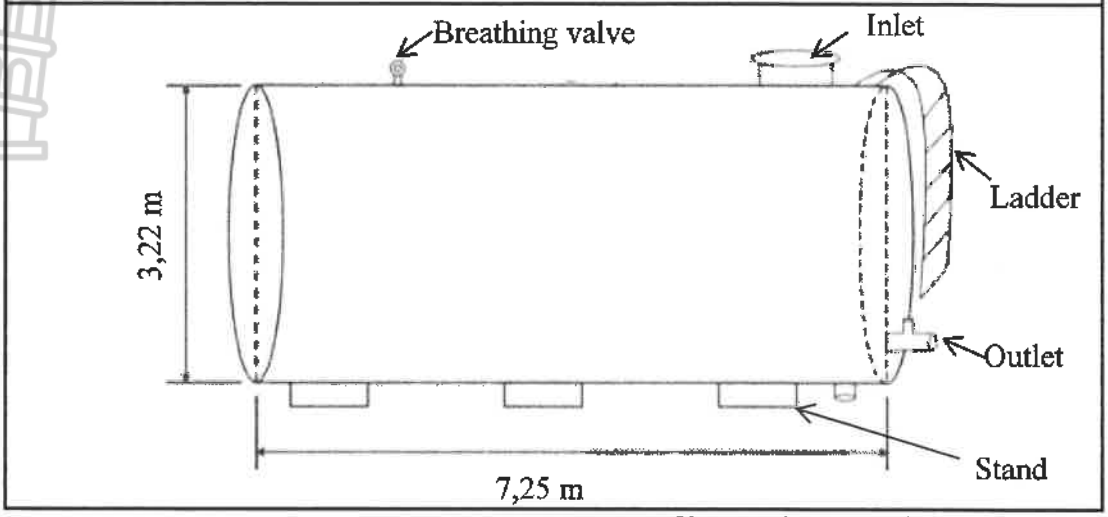
(b) Write down the ratio of the number of wheelchair spaces to the number of seats for patrons NOT in wheelchairs. (3)

4.1.3 On Friday evenings, pre-Covid-19, all the seats in the cinema (excluding the wheelchair spaces) were always occupied.

Calculate the percentage income lost due to social distancing during the pandemic if ALL the tickets for the seats are equally priced. (3)

4.2 The cinema owners use a generator to continue showing movies during load shedding. The diesel for the generator is stored in a cylindrical diesel tank, as shown below.

CYLINDRICAL DIESEL TANK



[Source: abovegroundstoragetanks.com]

INFORMATION:

- The stand and all external attachments are made of stainless steel and will not be painted.
- The base area of these external attachments is 1 m^2.
- 1 m^3 = 1 000 ℓ
- All dimensions shown are outer measurements.

Use the information above to answer the questions that follow.

4.2.1 State the purpose of the breathing valve on the tank. (2)

4.2.2 The steel used to make the tank is 5 mm thick all around. For safety reasons, the tank is filled to 95% of its capacity.

(a) Show that the inner diameter of the tank is 3,21 m. (2)

(b) Calculate the maximum litres of diesel that this tank can hold according to safety regulations.

You may use this formula:

Volume of a cylinder = 3,142 × (radius)^2 × height (8)

4.2.3 The external surface area of the tank, excluding the base area of the external attachments, needs to be painted. The spread rate of the paint is 3 $m^2/ℓ$. The manager states that he would need less than 30 litres of paint to complete the task.

Verify, by showing ALL calculations, whether the manager is CORRECT.

You may use this formula:

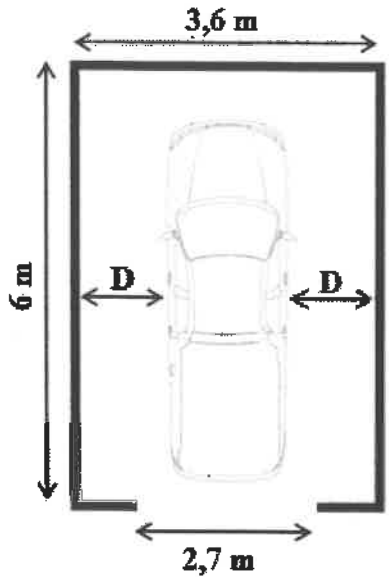
Surface area of a cylinder (in m^2) = 2 × 3,142 × r (r + h),
where **r** = radius and **h** = height. (8)

[30]

QUESTION 5

5.1 Letitia buys a new bakkie with a portion of her retirement funds.

Dimensions of her bakkie and her existing garage are shown below.

DIMENSIONS OF HER BAKKIE	INNER DIMENSIONS OF HER GARAGE
 [Source: www.automobiledimensions.com]	
Width = 1 860 mm Length = 5 362 mm Height = 1 815 mm	

[Source: www.bing.com]

Use the information above to answer the questions that follow.

5.1.1 Identify which view of the bakkie is represented by the dimensions 1 815 mm × 1 860 mm. (2)

5.1.2 Calculate the value of **D** (the space between the sides of the bakkie and the side walls of the garage) if the bakkie is parked exactly in the middle of the garage. (4)

5.1.3 Letitia needs to choose a colour and window tint.

The bakkie comes in four colours: white, black, blue and green. The windows can be tinted using 35% tint or 50% tint.

State how many different choices there are for this bakkie. (2)

5.2 Letitia studied a strip chart connecting Springbok in South Africa with Windhoek in Namibia.

On ANNEXURE D is a strip chart showing road distances in kilometres from Springbok to Windhoek.

Use ANNEXURE D to answer the questions that follow.

5.2.1 State ONE difference between a *strip chart* and a *normal road map.* (2)

5.2.2 Determine the distance between Springbok and Gobabis. (3)

5.2.3 Identify the Namibian town found on the border between South Africa and Namibia. (2)

5.2.4 Letitia undertook the following trip:

- She left Solitaire at 04:00 and travelled 140 km south on C14.
- She then turned right and travelled 289 km east on C19.
- At Mariental she turned, then drove to Keetmanshoop and arrived at 12:25.

(a) Calculate the total distance Letitia travelled during this trip. (3)

(b) Letitia travelled on different types of roads and she maintained the average speed limit prescribed for these types of roads. She stopped three times during the trip to take a break.

Letitia stated that the three breaks were approximately 25 minutes each.

Verify, with calculations, whether Letitia's statement is CORRECT.

You may use this formula: $\textbf{Time} = \frac{\textbf{Distance}}{\textbf{Speed}}$ (11)

[29]

TOTAL: 150

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ADDENDUM

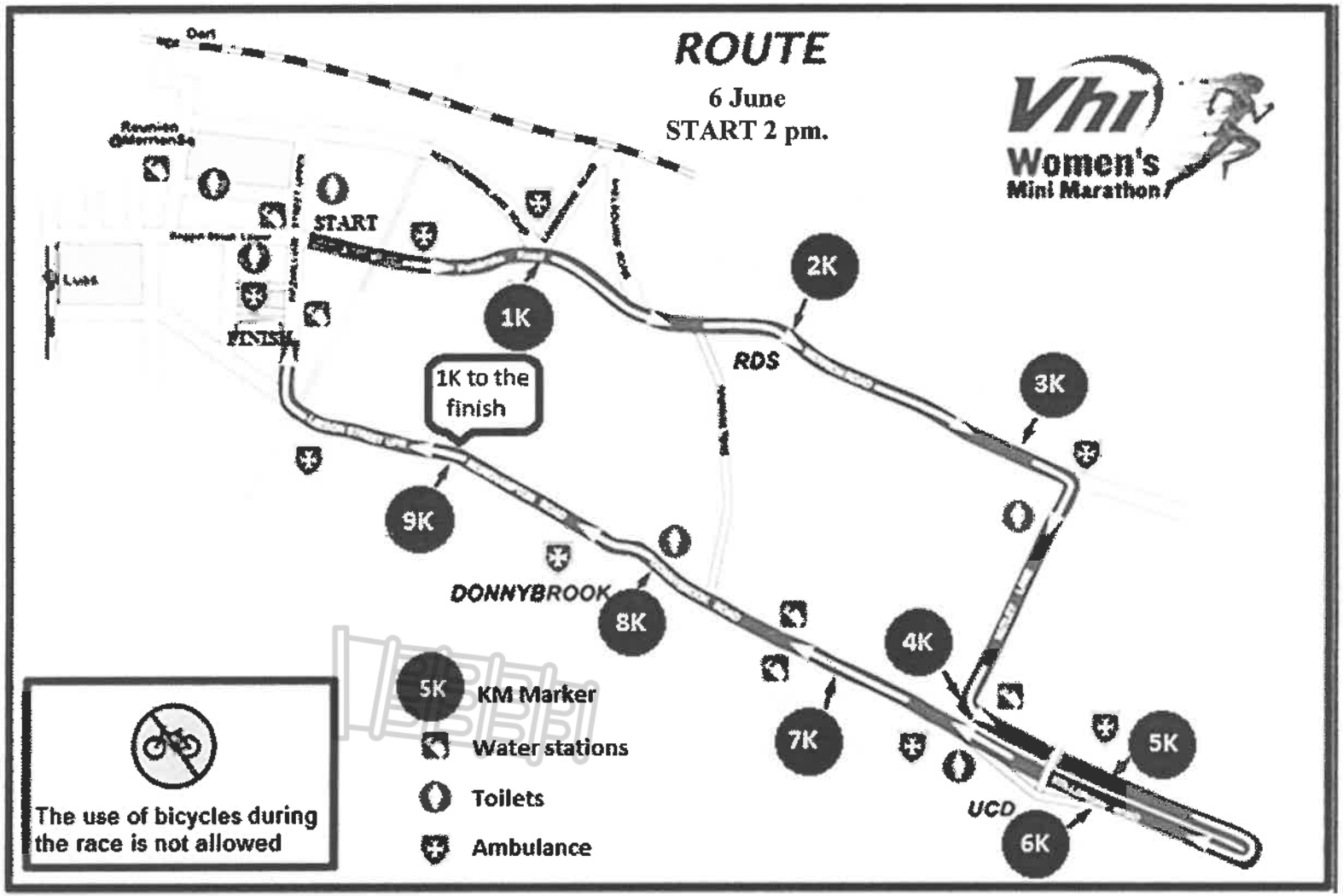
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This addendum consists of 5 pages with 4 annexures.

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ANNEXURE A

QUESTION 2.1



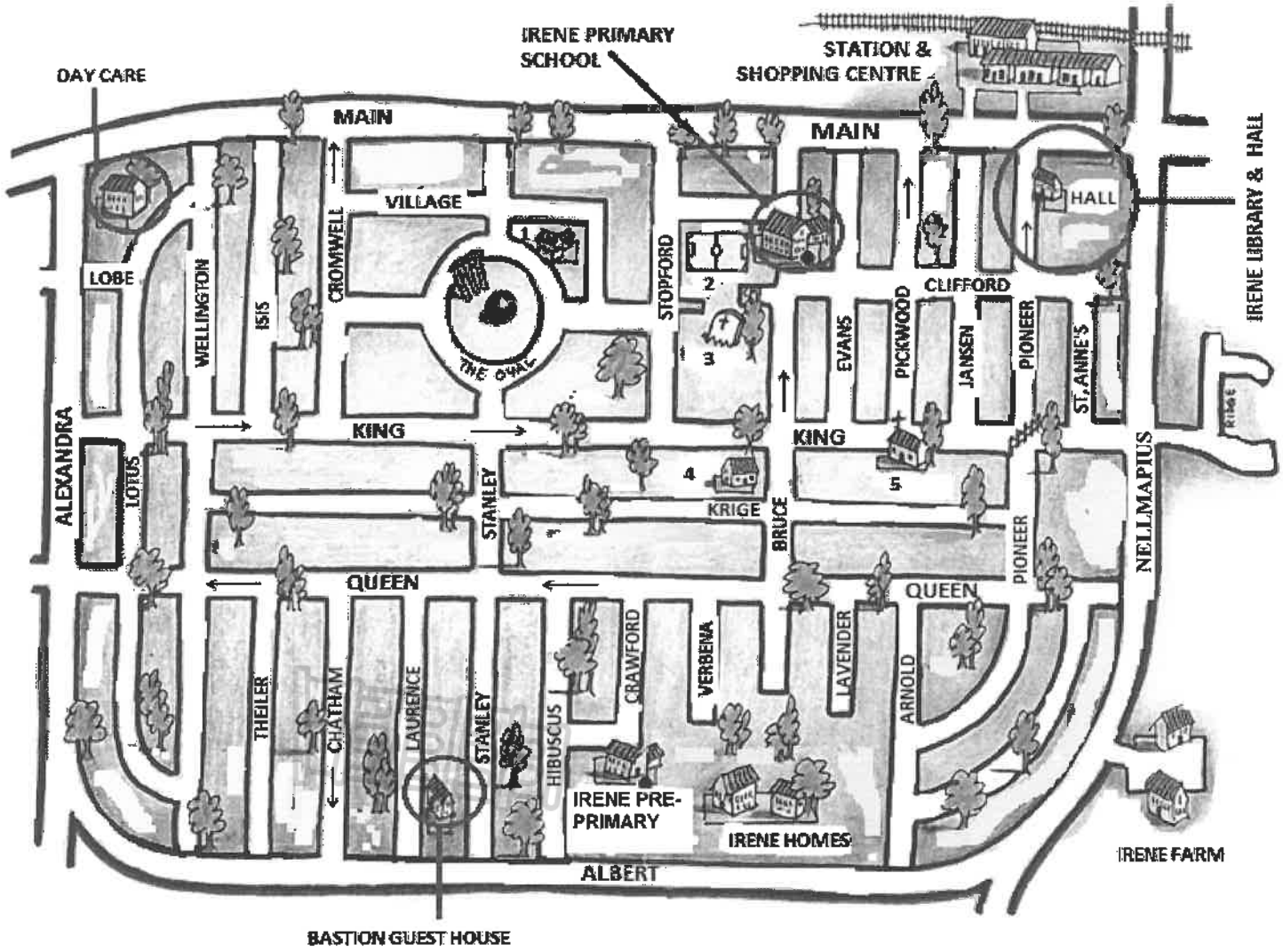
KEY

K	=	1 000 m
	=	Railway line

[Adapted from www.vhiwomensminimarathon.i.e]

ANNEXURE B

QUESTION 2.2





Other places of interest:

1 Colonial Guest House

2 Irene Primary multi-purpose sport field

3 Concentration camp memorial

4 Scout House

5 St Martin's Church

KEY

● Entrance of the school

Railway line

[Adapted from Irenevillagehall.co.za]

ANNEXURE C

QUESTION 4.1

THE SEATING PLAN FOR A CINEMA DURING THE COVID-19 PANDEMIC

			SCREEN																			
A			♿	♿	♿	♿	15	14	X	X	11	10			X	X	5	4				A
B	21	20	X	X	17	16	X	X	13	12	X	X			7	6	X	X				B
C	X	X	19	18	X	X	15	14	X	X	11	10			X	X	5	4				C
D	21	20	X	X	17	16	X	X	13	12	X	X			7	6	X	X				D
E	X	X	19	18	X	X	15	14	X	X	11	10			X	X	5	4				E
F	21	20	X	X	17	16	X	X	13	12	X	X			7	6	X	X				F
J	X	X	19	X	X	X	15	14	X	X	11	10			X	X	X	X	X	X	X	J
K	21	20	X	X	17	16	X	X	13	12	X	X	X	X	7	6	5	4	3	2	1	K

Aisle Aisle

KEY:

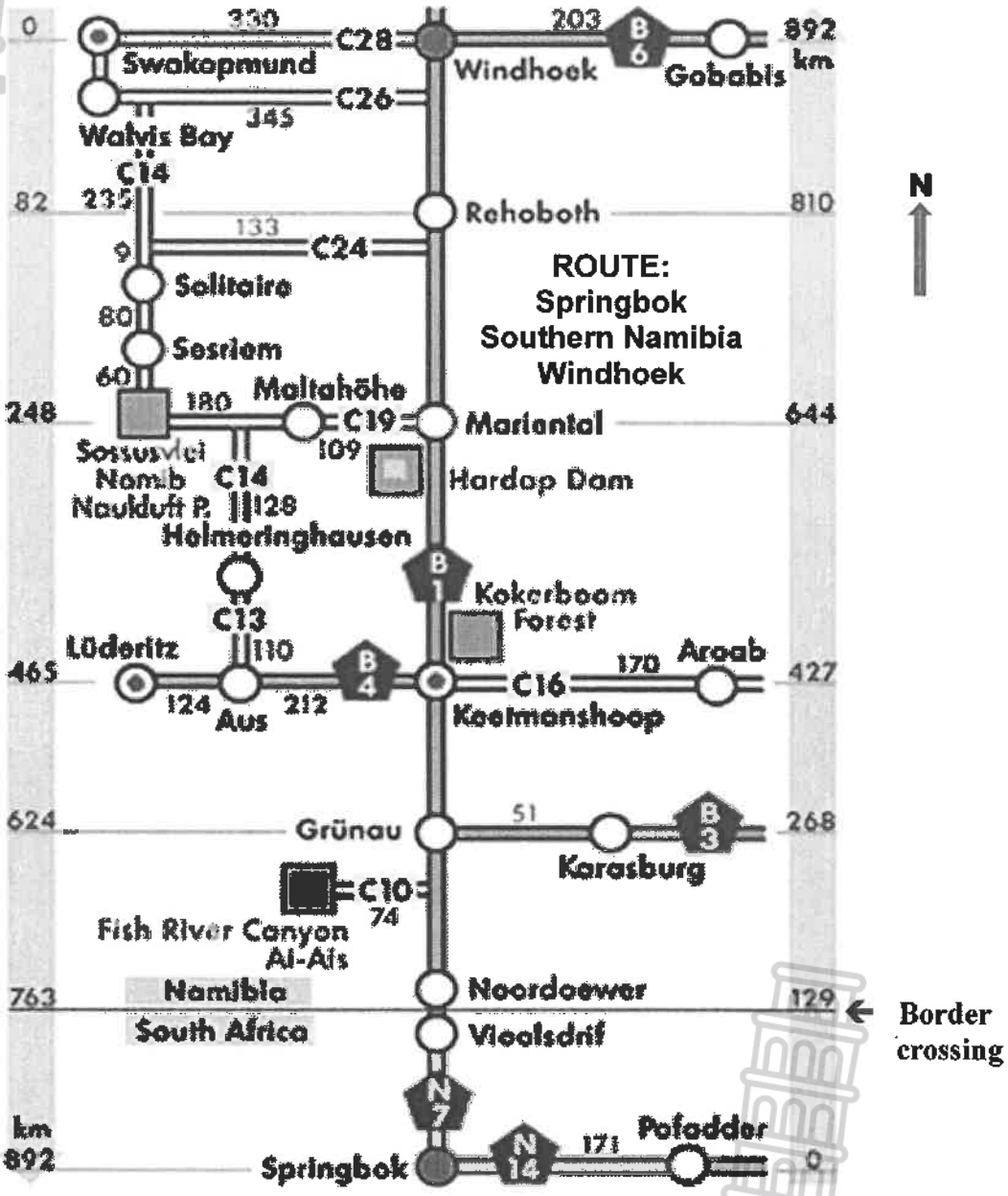
♿ Wheelchair space | 4 Available seat | X Vacant seat

[Source: www.screendaily.com/features/Hong Kong]

ANNEXURE D

QUESTION 5.2

STRIP CHART WITH ROAD DISTANCES IN KILOMETRES (km) FROM WINDHOEK TO SPRINGBOK



ROUTE:
Springbok
Southern Namibia
Windhoek

KEY

Symbol		Description	Average speed on the road
N or B	⬟	National or highway roads	120 km/h
C	═	Gravel road	80 km/h
	■	Places of interest	

NB: B1 is a national high way in Namibia.

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