education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 11

MATHEMATICAL LITERACY

COMMON TEST

SEPTEMBER 2019

MARKS: 100

TIME: 2 Hours

This question paper consists of 8 pages and an addendum with 4 annexures.

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INSTRUCTIONS AND INFORMATION

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

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

   2.1 ANNEXURE A for Question 1.1
   2.2 ANNEXURE B for Question 1.2
   2.3 ANNEXURE C for Question 2.3
   2.4 ANNEXURE D for Question 4

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

4. Start EACH question on a NEW page.

5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

6. ALL the calculations must be clearly shown.

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

8. Maps and diagrams are NOT drawn to scale.

9. Units of measurement must be indicated where applicable.

10. Write neatly and legibly.

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QUESTION 1

1.1 Bradley Wood works for CHS Network Installations as a technician. ANNEXURE A shows Bradley's payslip for the period 01 June 2019 to 30 June 2019.

Use the information in ANNEXURE A to answer the questions that follow.

1.1.1 Explain the term "***net pay***" on the payslip? (2)

1.1.2 Calculate the value of **A**. (2)

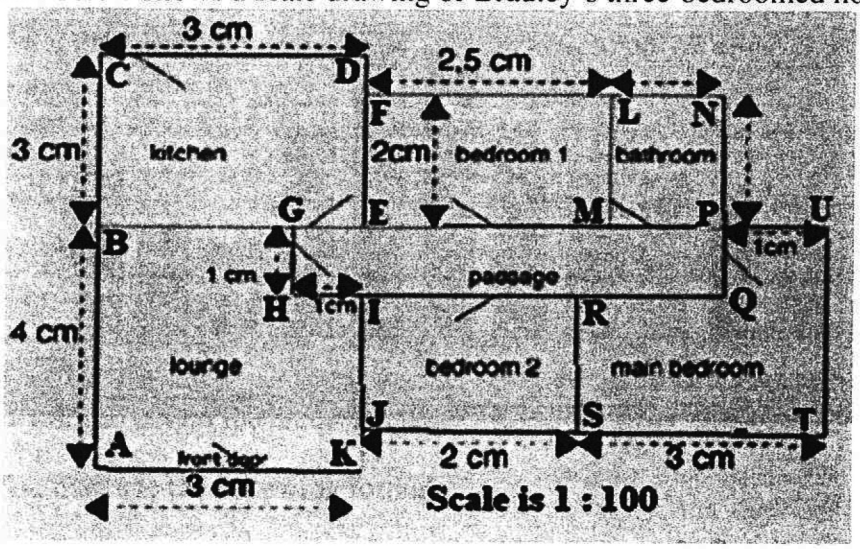
1.1.3 Calculate the value of **B**. (2)

1.1.4 Calculate the value of **C**. (2)

1.1.5 Explain why the UIF amount is R148,72. (2)

1.2 ANNEXURE B shows the side views and the respective elevations. Match each side view with the correct elevation. (3)

1.3 The picture below shows a scale drawing of Bradley's three-bedroomed house.



NOTE: Concrete ratio mix ***cement : sand : stone = 1 : 4 : 5***
$1m^3$ *of concrete has a mass of* **2 406, 53*kg***
1 *bag of cement has a mass of* **50*kg***

Source:www.google.com

Use the information above and answer the following questions:

1.3.1 Calculate the width (TU) of the main bedroom, in centimetres given that JK on the scale drawing is 0,5 cm. (2)

1.3.2 Calculate the actual perimeter of the floor of the house in metres. (6)

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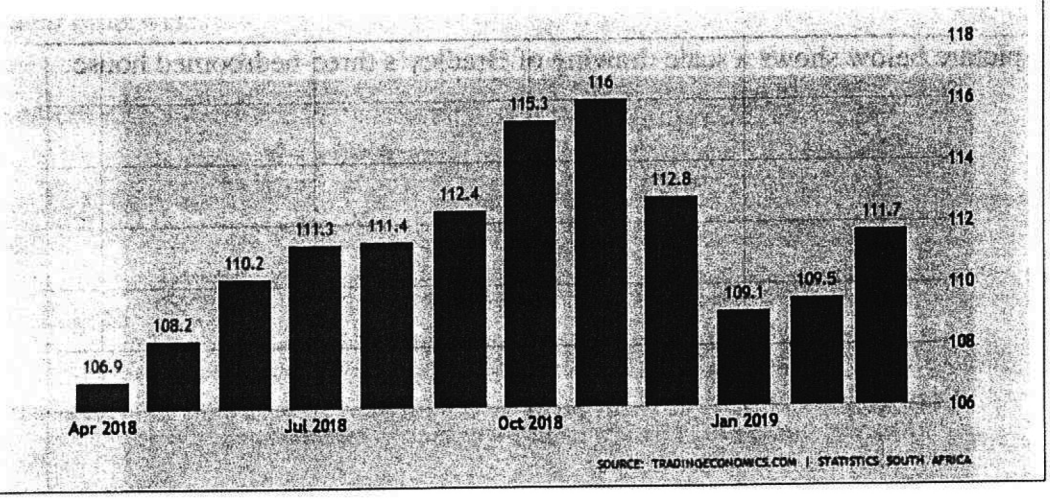
1.3.3 If the actual perimeter of the floor of the house is 30 m, the width of the external foundation trench is 50 cm and the trench depth is 40 cm, calculate the volume of concrete needed to be filled, in cubic metres.

You may use the formula: $\boldsymbol{Volume = length \times width \times depth}$ (3)

1.3.4 The builder told Bradley that he will need at least 30 bags of cement for the external foundation trench concrete.
Verify, showing all calculations, whether the builder's claim is correct. (7)
[31]

QUESTION 2

Vector High School economics learners are investigating the effects of inflation on transport cost in South Africa. The graph below shows how the Transportation Consumer Price Index (TCPI) has changed from April 2018 to March 2019.



2.1

2.1.1 Define the term ***inflation.*** (2)

2.1.2 Calculate the percentage change in the TCPI from January 2019 to March 2019.

You may use the following formula:

$$\textbf{Percentage Change} = \frac{\textbf{March 2019 TCPI} - \textbf{January 2019 TCPI}}{\textbf{January 2019 TCPI}} \times \mathbf{100\%}$$ (3)

2.2

CHS Network Installations was contracted by Vector High School to install and manage their network systems. Table 1 below shows the installation statement for April 2019.

TABLE 1: CHS NETWORK INSTALLATIONS STATEMENT FOR APRIL 2019

BSV BANK STATEMENT OF ACCOUNT ACCOUNT NUMBER: 016754328770

CHS NETWORK INSTALLATIONS (PTY)
No. 487 Anglers Road, Meerensee
Richards Bay
3901

Contact No: 035 793 0301
Fax No. 035 793 0300
Email: chsinst@chs.co.za

Period: 2019/04/01 to 2019/04/30

Date	Description	Transaction (R)	Balance (R)
	Balance brought forward		185 960,00
2019/04/01	Credit Interest	67,25	186 027,25
2019/04/03	Premises Rent: Debit Order	- 10 800,00	**A**
2019/04/03	Isolezwe Security: Debit Order	- 8 909,00	166 318,25
2019/04/09	Cheque Deposit: M A High School	**B**	183518.25
2019/04/15	Internet Transfer: Vector Academy	10 643,89	194 162,14
2019/04/23	Cheque Deposit: Excel Maths Academy	8 000,00	202 162,14
2019/04/30	Salary: M Zugu (Assistant Technician)	**C**	182 662,14
2019/04/30	Cheque Account Fees	-480,00	182 182,14
2019/04/30	Balance carried forward		**D**

Use TABLE 1 above to answer the questions that follow.

2.2.1 Write down the balance (excluding interest) that was brought forward on the last day of the previous month. (2)

2.2.2 Calculate the annual interest rate that was used on the balance brought forward to obtain the credit interest.

You may use the following formula:

$$\textbf{Annual Interest Rate} = \frac{\textbf{Credit Interest} \times 365}{\textbf{Balance Brought Forward}} \times 100\%$$ (2)

2.2.3 Calculate the missing values **A, B, C** and **D** in TABLE 1 above. (4)

2.2.4 Explain why the negative signs appear on some amounts in the statement. (2)

2.2.5 Calculate the total amount credited to CHS Network Installations account. (2)

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2.3 The change in the average annual salary for each Eskom employee and the increase in the number of employees from 2003 to 2017 is shown in ANNEXURE C. The pie chart on ANNEXURE C shows the amount of cash that Eskom needs to survive and the projected operating cost for 2018 – 2019.

Use the information in ANNEXURE C to answer the questions that follow.

2.3.1 According to the information in ANNEXURE C, how much of the government guarantees is still available to Eskom? (2)

2.3.2 Describe the trend on the average salary per annum for Eskom employees from 2003 to 2017 and state the financial implications it has on the power utility. (3)
[22]

QUESTION 3

3.1 The Gumede family lives in Mbongolwane. To alleviate the critical problem of water shortage, Mr Gumede bought a Jojo tank with a **diameter** of **1,80*m*** and a **height** of **2,34*m***.



NOTE: 1 = 1 000cm^3

3.1.1 Convert the diameter and height of the tank above to centimeters. (3)

3.1.2 Determine the radius of the tank in centimeters. (2)

3.1.3 Calculate the volume (in $\mathbf{cm^3}$) of the tank.

You may use the following formula:

Volume of a cylinder $= \pi \times (\textbf{radius})^2 \times \textbf{height}$, and using $\pi = 3{,}142$ (3)

3.1.4 Convert the volume in 3.1.3 to litres rounded off to TWO decimal places. (3)

3.1.5 After two days of heavy rainfall, the volume of water in the tank was a quarter of the tank's capacity.

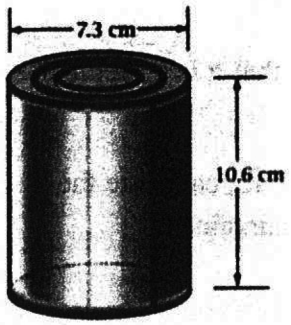
Calculate the height of the water in the tank. Round off your answer to the nearest metre.

You may use the formula:

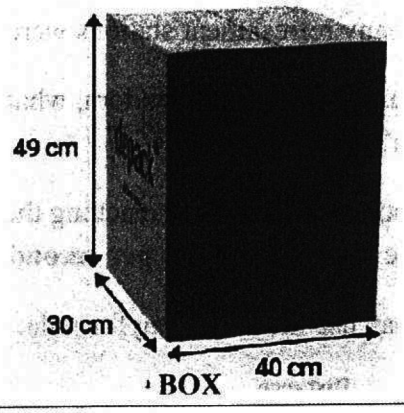
Volume of a cylinder $= \pi \times (\textbf{radius})^2 \times \textbf{height}$ (7)

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3.2 People living away from their families regularly send canned food packaged in rectangular boxes.



TIN



BOX

3.2.1 John, a Mathematical Literacy learner, stated that a maximum of 100 tins could be packaged into the box.

Verify, showing all calculations, whether John's statement is correct. (6)

3.2.2 If each tin of baked beans weighs 410 grams, calculate the total mass of the rectangular box (in kilograms) if a maximum of 80 tins have been packaged. (3)

[27]

QUESTION 4

4.1 Mnotho and his friend Tristen took part in the Two Oceans Marathon that was held in Cape Town on 11 April 2019. ANNEXURE D shows the route map for the Two Oceans Marathon.

Note:

Date of Race: 11 April 2019
Starting Time: 06:30
Distance: 56 km
Starting Point: Main Road in Newlands

Cut-off for 21 km

- Official cut-off time at the finish line is 09:20.
- Runners who fail to reach the 18 km mark by 09:00 are not ALLOWED to continue.
- Runners who CANNOT walk an average of 9 minutes per kilometer are strongly discouraged from participating.

Source: [www.twooceansmarathon.co.za]

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

4.1.1 How many kilometres is the Two Oceans Marathon? (2)

4.1.2 Name the finishing point of the marathon. (2)

4.1.3 How many refreshment stations were set for the marathon? (2)

4.1.4 If a station is chosen at random, what is the probability that it is a Medical Station? (2)

4.1.5 If Mnotho was aiming at reaching the 18 km mark at 07:15, calculate the average speed, in **metres per second** he should have maintained.

You may use the following formula:

$$\textbf{Speed} = \frac{\textbf{Distance}}{\textbf{Time}}$$ (7)

4.1.6 Tristen was confident that he would be able to sustain a constant speed of 15 km/h throughout the marathon.

Calculate the time, **in hours and minutes**, it took him to complete the marathon.

You may use the same formula given in 4.1.5 above. (5)

[20]

TOTAL: 100

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ADDENDUM

SEPTEMBER 2019

This addendum consists of 5 pages with 4 annexures.

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ANNEXURE A

QUESTION 1.1

BRADLEY WOOD'S PAYSLIP

CHS NETWORK INSTALLATIONS

No. 487 John Ross Highway
Eshowe
3815

Contact No: 035 474 0301
Fax No. 035 474 0300
Email: chsinst@chs.co.za

Name of Employee		Employee ID	Tax Reference Number
Bradley Wood		8407115428188	1592399017

Employee Designation	Number	Department	Salary Period
Technician	TI0153	Information Technology	01/06/2019 - 30/06/2019

Earnings		Deductions	
Basic Salary	R25 900	P.A.Y.E	R2 540,52
Travel Allowance	R 4 700	UIF	R 148,72
Housing Allowance	R 1 200	Pension Fund (7,5% of Basic Salary)	**B**
		Medical Aid (5 dependents)	R3 876,59
Gross	**A**	**Total Deductions**	

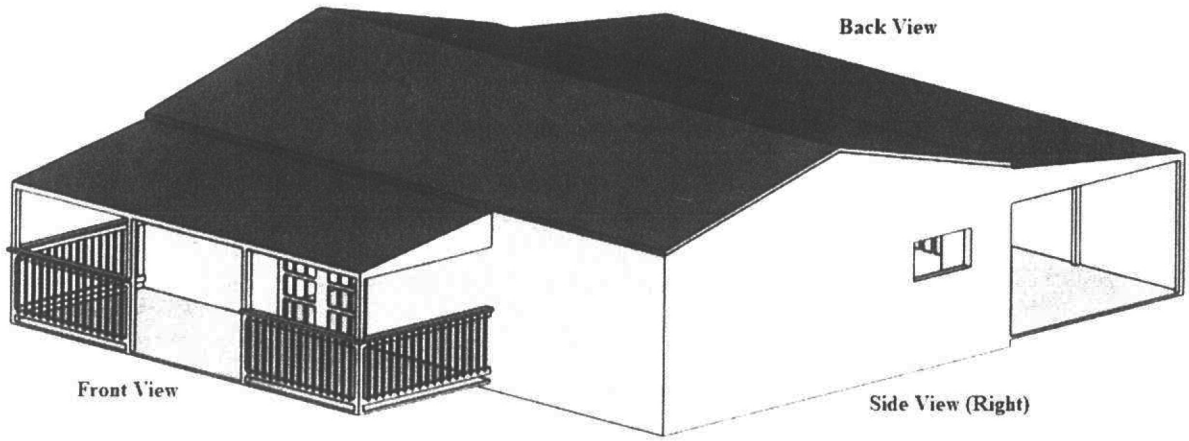
NET PAY	**C**

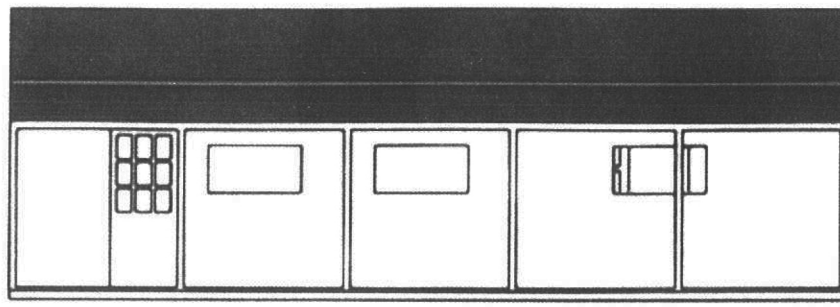
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ANNEXURE B

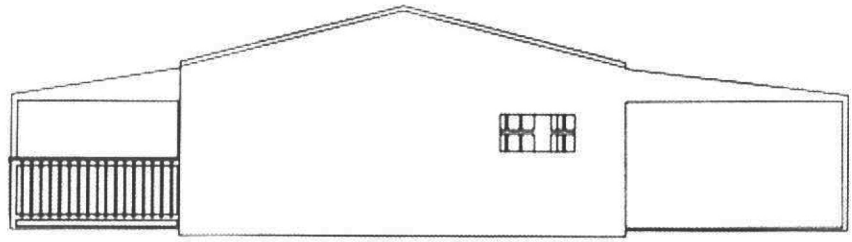
QUESTION 1.2

HOUSE SIDE VIEWS AND ELEVATIONS

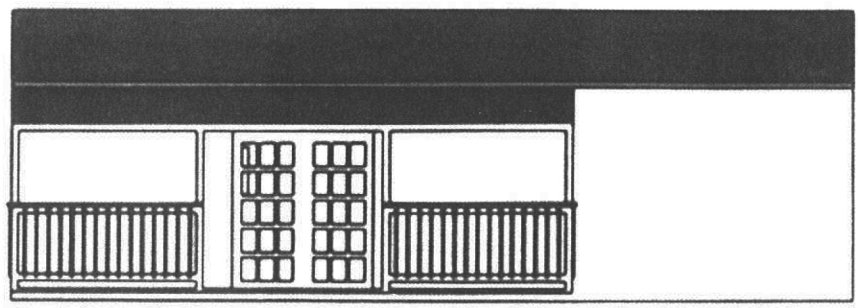




Elevation A



Elevation B



Elevation C

ANNEXURE C

QUESTION 2.3

ESKOM OPERATING COSTS (2018/2019)

This is how much Eskom needs to survive

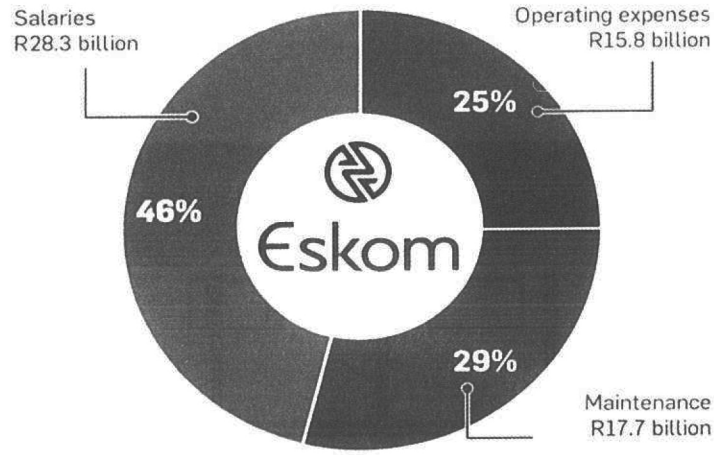
R350 billion government guarantees, of which R275 billion has already been used

The electricity utility will have a **R5 billion** cash gap by the end of the month

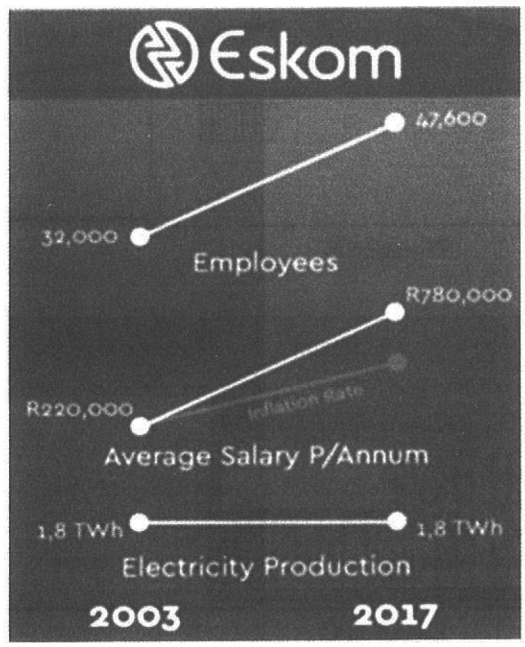
By the end of March, Eskom will need financing totalling **R20 billion**

Over the next four years Eskom will require **R60 billion** in financing per year

Projected operating costs for 2018/19 year:



Source: Treasury, Mail & Guardian, department of public enterprises, Eskom Graphics24

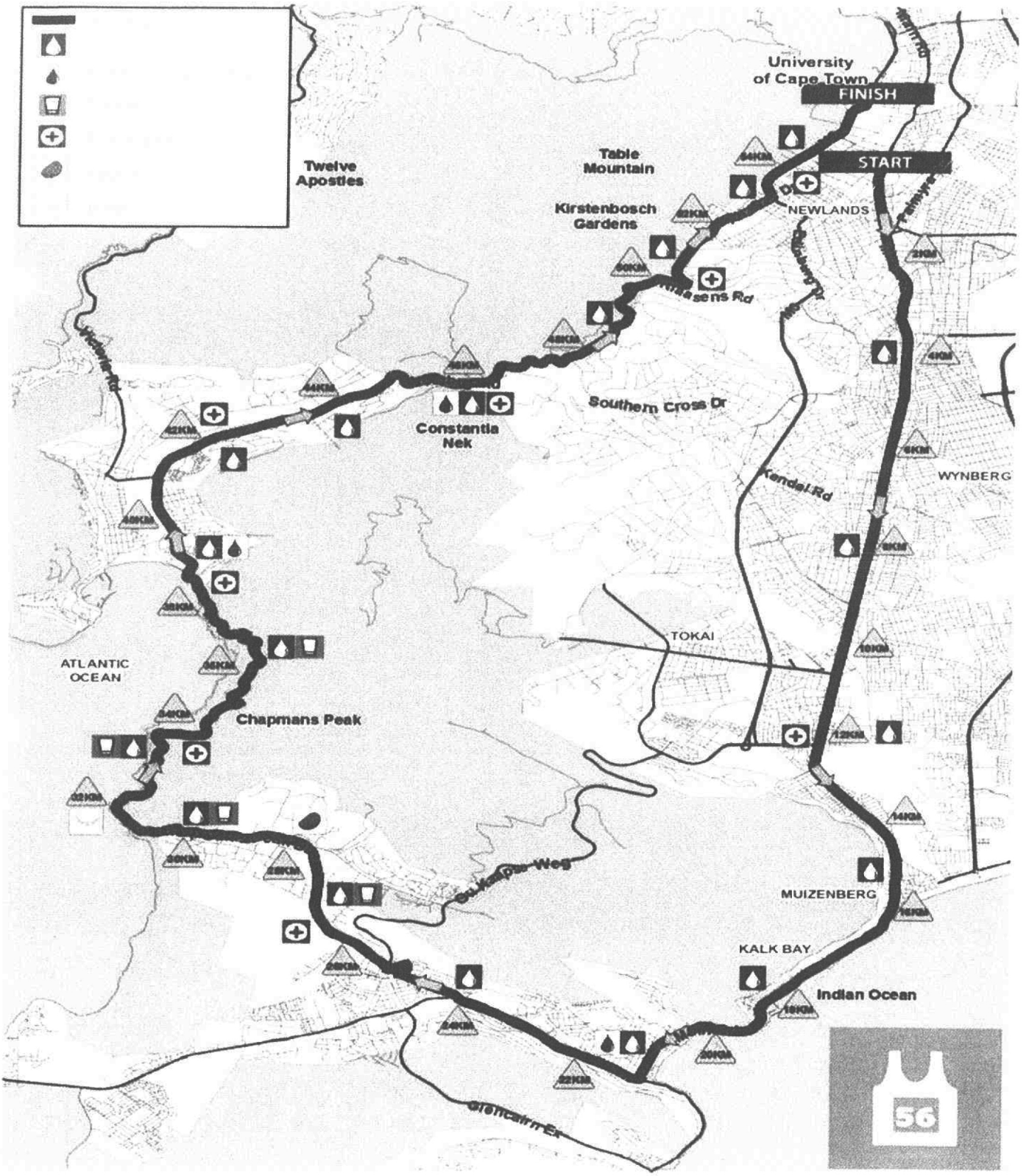


Source: [www.africacheck.org/reports/eskom]

ANNEXURE D

QUESTION 4

TWO OCEANS MARATHON ROUTE – CAPE TOWN 2019



Source: www.twooceansmarathon.com

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MARKING GUIDELINE

MARKS: 100

Symbol	Explanation
M	Method
M/A	Method with Accuracy
CA	Consistent Accuracy
A	Accuracy (Answer)
AO	Answer only full marks
C	Conversion
S	Simplification
RT / RG / RM/RP	Reading from table/graph /map/plan
F	Choosing the correct formula
E	Explanation/Comment
D	Correct definition
SF	Substitution in formula
O	Opinion
J	Justification
P	Penalty e.g. for no units, incorrect rounding, etc
R	Rounding off / Reason

This marking guideline consists of 6 pages.

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QUESTION 1 [31 marks]			
Question	**Solution**	**Explanation**	**T/L**
1.1.1	It is the amount that is deposited into Bradley's bank account after the deductions. ✓✓D	2D correct definition (2)	F L1
1.1.2	A = R25 900 + R4 700 + R1 200✓M = R31 800✓A	1M adding earnings 1A correct answer (2)	F L1
1.1.3	B = 7,5% x R25 900✓M = R1 942,50✓A	1M for multiplying by 7,5% 1A correct answer (2)	F L1
1.1.4	C = R31 800 − R8 508,33✓M = R23 291,67✓A	1M subtracting deductions from gross salary 1A correct answer (2)	F L1
1.1.5	Bradley's earns more thanR14 872 per month therefore his maximum contribution is R148,72 per month, which is the celing amount ✓✓J	2J for justification (2)	F L4
1.2	Front View: Elevation C✓A Back View: Elevation A✓A Right Side View: Elevation B✓A	1A correct match 1A correct match 1A correct match (3)	M L3
1.3.1	TU = 4 − 0,5✓M = 3,5cm✓A	1M for subtracting 0,5 cm 1A correct answer (2)	M L2
1.3.2	LN = 5 cm − 2,5 cm − 1cm ✓M = 1,5✓A PN = 3 cm – 1 cm = 2 cm ✓A P = 3 + 1 + 4 + 2 + 1 + 3,5 + 5 + 0,5 + 3 + 7 ✓M = 30cm✓CA Actual Perimeter = 30 × 100✓M = 30m ✓CA	1M for subtracting correct values 1A correct value for LN 1M adding all values 1CA correct perimeter 1M for multiplying by 100 1CA correct answer/accuracy (6)	M L3
1.3.3	Width = 0,5m and depth = 0,4 m ✓M Volume = 30 x 0,5 x 0,4 ✓SF = 6m^3 ✓A **OR** Volume = 3 000 × 50 × 40 ✓1SF = 6 000 000cm^3 ÷ 1 000 000 ✓M = 6m^3 ✓A	1C converting cm to m 1SF substitution 1A correct answer **OR** 1SF correct substitution 1M dividing by 1 000 000 1A correct answer (3)	M L2

Question	Solution	Explanation	T/L
1.3.4	$6m^3$ x 2406,53 kg = 14 439,18kg✓A Ratio = 1: 4 : 5 Sum of ratio mix = 10 Amount of cement $= \frac{1}{10} \times 14\ 439{,}18$✓M $= 1\ 443{,}918$kg✓A Number of bags of cement $= \frac{1443{,}918}{50}$ ✓M $= 28{,}9$ ✓A $= 29$ ✓R The builder is correct✓O	1A for 14 439,18kg 1M for multiplying by 1/10 1A answer 1M for dividing by 50 1A correct answer 1R correct rounding 1O correct opinion (7)	M L4
			[31]

QUESTION 2 [22 marks]			
Question	**Solution**	**Explanation**	**T/L**
2.1.1	General increase in transpotation cost over a given time period.✓✓E	2E correct explanation (2)	F L1
2.1.2	Percentage Change $= \frac{111{,}7 - 109{,}1\text{✓M}}{109{,}1\text{✓M}} \times 100\%$ $= 2{,}38\%$✓A	1M subtracting 109,1 from 111,7 1M dividing by 109,1 1A correct answer (3)	F L2
2.2.1	Balance Brought Forward is R185 960,00✓✓RT	2RT correct amount (2)	F 1
2.2.2	Annual Interest Rate $= \frac{\text{R67,25} \times 365}{\text{R185 960}} \times 100\%$✓SF $= 13{,}20\%$✓A	1SF correct substitution 1A correct answer (2)	F L2
2.2.3	$A = 186\ 027{,}25 - R10\ 800 = \text{R175 227,25}$✓A $B = R17\ 200$ ✓A $C = -R19\ 50$✓A D = R182 182,14✓A	1A for correct value 1A for correct value 1A for correct value 1A for correct value (4)	F L2

Question	Solution	Explanation	T/ L
2.2.4	Money that went out of the account reducing the available balance.✓✓E	2E correct opinion (2)	F L1
2.2.5	Total Amount Credited = R67,25 + R17 200 + R10 643,89 + R8 000✓M = R35 911,14✓A	**CA from 2.2.3** 1M for adding all the credit values 1A correct answer (2)	F L2
2.3.1	Available Amount = R350 billion − R275 billion✓M = R75 billion✓A	1M subtraction 1A correct answer (2)	F L2
2.3.2	The average salary per annum increased ✓ A from 2002 to 2017. The utlitity is unable to generate and distribute electricity due to the increase in salary. ✓✓O **OR** (any valid reason)	1A for increase 2O correct opinion (3)	F L4
			[22]

QUESTION 3 [27 marks]			
Question	**Solution**	**Explanation**	**T/L**
3.1.1	D = 1,8 m x 100 ✓M = 180cm✓A H = 2,34 m x 100 = 234 cm ✓A	1M multiplying by 100 1A correct diameter 1A correct height **AO** (3)	M L1
3.1.2	R = 180 ÷ 2 ✓M = 90cm✓A	1M dividing by 2 1A correct radius **AO** (2)	M L1
3.1.3	Volume $= 3{,}142 \times 90^2 \times 234$✓SF $= 5\ 955\ 346{,}8\ cm^3$ ✓A✓A	1SF correct substitution 1A correct answer 1A for unit (3)	M L2
3.1.4	Volume $= \frac{5\ 955\ 346{,}8}{1\ 000}$✓M $= 5\ 955{,}3468\ell$✓A = 5955,35 ℓ✓R	1M dividing by 1 000 1A correct answer 1R rounding (3)	M L2
3.1.5	Volume of water $= \frac{5\ 955\ 346{,}8}{4}$✓M $= 1\ 488\ 836{,}7 cm^3$✓A $1\ 488\ 836{,}7 = 3{,}142 \times 90^2 \times h$✓M $h = \frac{1\ 488\ 836{,}7}{25450{,}2}$✓M = 58,5cm✓CA = 58,5 ÷ 100 ✓C = 0,585 = 1 m ✓R	1M dividing by 4 1A correct answer 1M for changing the subject of the formula 1M dividing volume by 25450,2 1CA correct answer 1C for conversion 1R rounding (7)	M L3
3.2.1	$\frac{30}{7{,}3} = 4$ tins✓A $\frac{40}{7{,}3} = 5$ tins✓A Number of layers $= \frac{49}{10{,}6}$ $= 4$✓A Maximum number of tins is $4 \times 5 \times 4$ ✓M $= 80$✓A John's calculation is wrong✓O	1A for 4 tins 1A for 5 tins 1A number of layers 1M for multiplying the number of tins by 4 layers 1A number of tins 1O correct opinion (6)	
3.2.2	$410g \times 80 = 32\ 800g$✓M $= 32\ 800g \div 1\ 000$✓C $= 32{,}8kg$✓A **OR** ✓**C** Mass of container $= 0{,}41kg \times 80$ ✓M $= 32{,}8kg$ ✓A	1M multiplying 410 by 80 1C dividing 32 800 by 1 000 1A correct answer 1C conversion 1M multiplying by 80 1A correct answer (3)	M L2
			[27]

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QUESTION 4 [20 marks]			**T/L**
4.1.1	56km ✓✓RD	2RD correct reading (2)	MP L1
4.1.2	University of Cape Town✓✓A	2A correct answer (2)	MP L1
4.1.3	19✓✓A	2A correct answer (2)	MP L1
4.1.4	$P(\text{medical station}) = \frac{8✓A}{30✓A}$	1A number of medical stations 1A total number of stations (2)	MP L2
4.1.5	Time $= 07:15 - 06:30$ ✓M $= 45$ minutes x 60 ✓C $= 2\,700$ seconds✓A Distance $= 18 \times 1000$ ✓M $= 18\,000$m✓A Speed $= \frac{18\,000}{2\,700}$✓SF $= 6{,}67$m/sec✓CA	1M for subtraction 1C conversion to seconds 1A for correct seconds 1M multiplying by 1000 1A correct metres 1SF substitution 1CA correct answer (7)	MP L3
4.1.6	Time $= \frac{56}{15}$✓SF $= 3{,}733333333$ hours✓A $= 3$ hours $+ 0{,}733333333 \times 60$✓M $= 3$ hours ✓A 44 minutes✓CA	1SF correct substitution 1A correct hours 1M for multiplying by 60 1A correct hours 1 CA correct minutes (5)	MP L3
			[20]

TOTAL: 100

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