HILLCREST HIGH SCHOOL

TRIAL EXAMINATIONS 2013

GRADE 12

MATHEMATICAL LITERACY PAPER 1

TIME: 3 HOURS

MARKS : 150

Instructions and Information

1. This question paper consists of **FIVE** questions and **THIRTEEN** pages.

2. Answer **ALL** the questions.

3. **QUESTION** 3.2.3, 4,3 and 5.1.3 must be answered on the **ANNEXURES** which are attached.

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

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

6. **ALL** working details must be shown clearly, even when a calculator is used.

7. All final answers must be rounded off to **TWO** decimal places, unless stated otherwise.

8. Show all units where necessary.

9. Start **EACH** question on a **NEW** page.

10. All diagrams are not necessarily drawn to scale, unless stated otherwise.

11. Write neatly and legibly.

QUESTION 1

1.1 Calculate the following: **(Show all steps)**

1.1.1 $3 \times \frac{2}{3} + 4 \div \frac{1}{8}$ (3)

1.1.2 12% of R 375,00 (2)

1.1.3 $\sqrt{73-9} + 6^3$ (2)

1.2 1.2.1 Write 18% as a common fraction in its simplest form. (2)

1.2.2 Write $1\frac{7}{20}$ as a percentage. (2)

1.2.3 You are travelling by bus from Cintsa (Eastern Cape) to Durban. The distance from Cintsa to Durban is 618*km*.

a) How far is the distance between Durban and Cintsa in metres? (2)

b) If it takes up approximately 6 hours to travel from Cintsa to Durban calculate the time of arrival at Durban if you leave Cintsa at 20:15. (2)

1.3 Convert 225°C to °F, rounding of your answer to the nearest 5°. Use the following formula:

Temperature in °F = $\frac{9}{5}$ X (Temperature in °C) + 32° (3)

1.4 According to the instructions on a tin of concentrated orange juice, the content should be diluted with water in the ratio 1 : 9.

1.4.1 What fraction of the drinkable solution is water? (1)

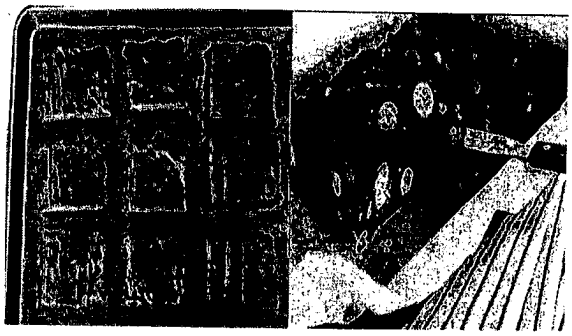
1.4.2 If you have 250 ml of concentrated orange juice, write down the amount of water (in ml) required to make it drinkable. (2)

1.4.3 How much of the concentrate (in ml) must be used to make 1 l (1 000 ml) of drinkable orange juice? (2)

1.5 Charlene uses the recipe below to make fudge. The ingredients are enough to make a tray of fudge measuring 32cm x 24cm x 2 cm.

Fudge
Ingredients to make 1 tray of fudge

420 grams of castor sugar
125 grams of butter
1 tin (385g) condensed milk
15 ml vinegar
25 ml vanilla essence



Picture showing fudge on part of the tray

Price of Ingredients:

500 g butter	R 36,99
500 g castor sugar	R 13,79
1 tin (385g) condensed milk	R 17,49
750 ml vinegar	R 10,99
40 ml vanilla essence	R 5,99

1.5.1 Calculate the total cost of making 1 tray of fudge. (Remember that she only uses 125g butter, etc.) (5)

1.5.2 Charlene cuts the fudge into blocks of 4cm x 4cm x 2cm. How many blocks of fudge can she fit into 1 tray? (4)

1.5.3 Charlene manages to get another tray half the size of the original one. Calculate how much butter she will need to make $1\frac{1}{2}$ trays of fudge. (Round off your answer to the nearest ten) (2)

1.5.4 If the total cost (including electricity) for one mixture is R72,00, what is the cost per block of fudge? (2)

1.5.5 Charlene's friend in London asks her to e-mail the recipe to her. She needs to convert the grams of the recipe to ounces. Calculate the number of ounces of butter required for one mixture of fudge, if 1 $ounce$ = 28 $gram$. (Round off your answer to 1 decimal place) (2)

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QUESTION 2

2.1 Bernie wants to transport 15 different oil drums on train from White River to Pretoria.

The mass of the drums (in kg) is listed below:

35 37 37 40 41 43 45 48 49 49 49 50 52 52 54

Calculate the following:

2.1.1 The range (3)

2.1.2 The mode (1)

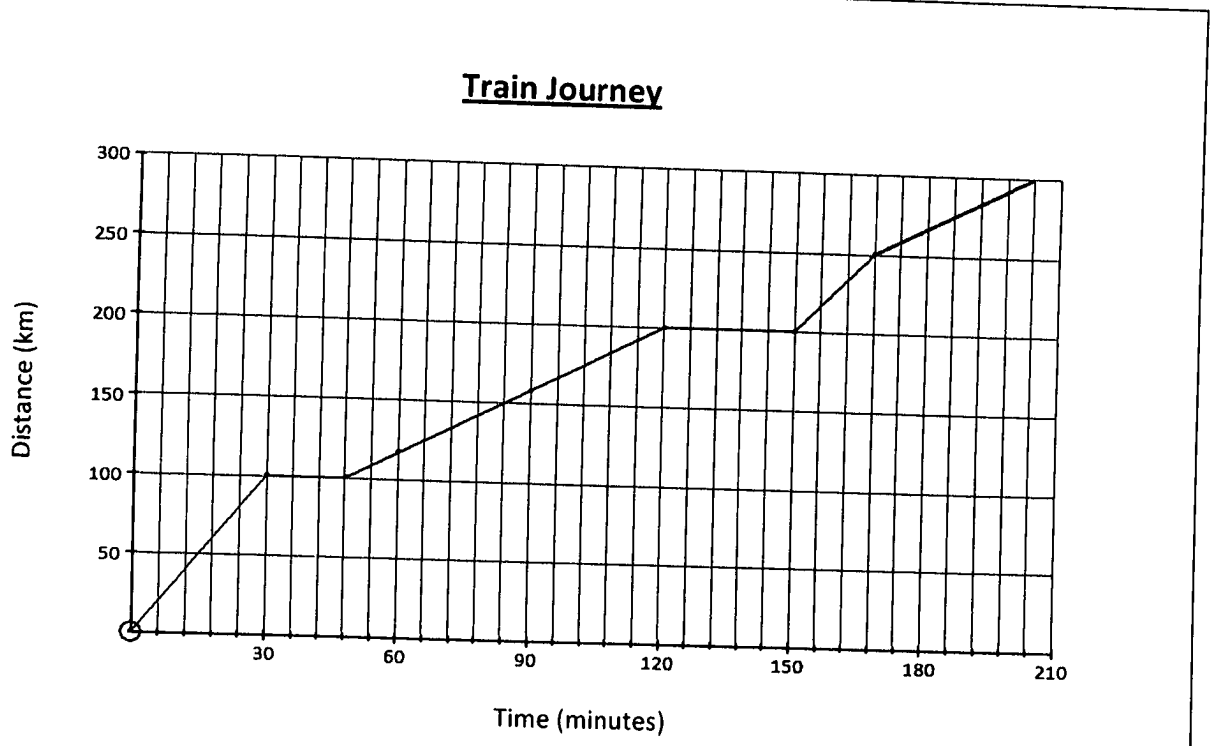
2.1.3 The median (2)

2.1.4 The mean mass of the drums rounded off to the nearest *kg.* (3)

2.1.5 Calculate the probability of selecting a drum with a mass of 49*kg*. Write your answer as a percentage . (3)

2.1.6 Calculate the probability of randomly selecting a drum weighting less than 45 *kg*. Write your answer as a decimal. (3)

2.2 The graph below indicates Bernie's train journey from White River to Pretoria. After leaving White River the train first stops at Machadodorp, then at Middelburg and finally at Pretoria.



2.2.1 Determine how far the train had travelled after exactly 40 minutes. (2)

2.2.2 What happened between 30 and 48 minutes? (2)

2.2.3 Determine how long it took the train to travel from Machadodorp to Middelburg. (2)

2.2.4 Calculate how long the train had stopped at Middelburg. (2)

2.2.5 Determine the distance between Middelburg and Pretoria. (2)

2.2.6 Calculate the average speed of the train between Middelburg and Pretoria.

(Leave your answer in *km/h*.) Remember:

$$speed = \frac{distance\ in\ km}{time\ in\ hours}$$

(4)

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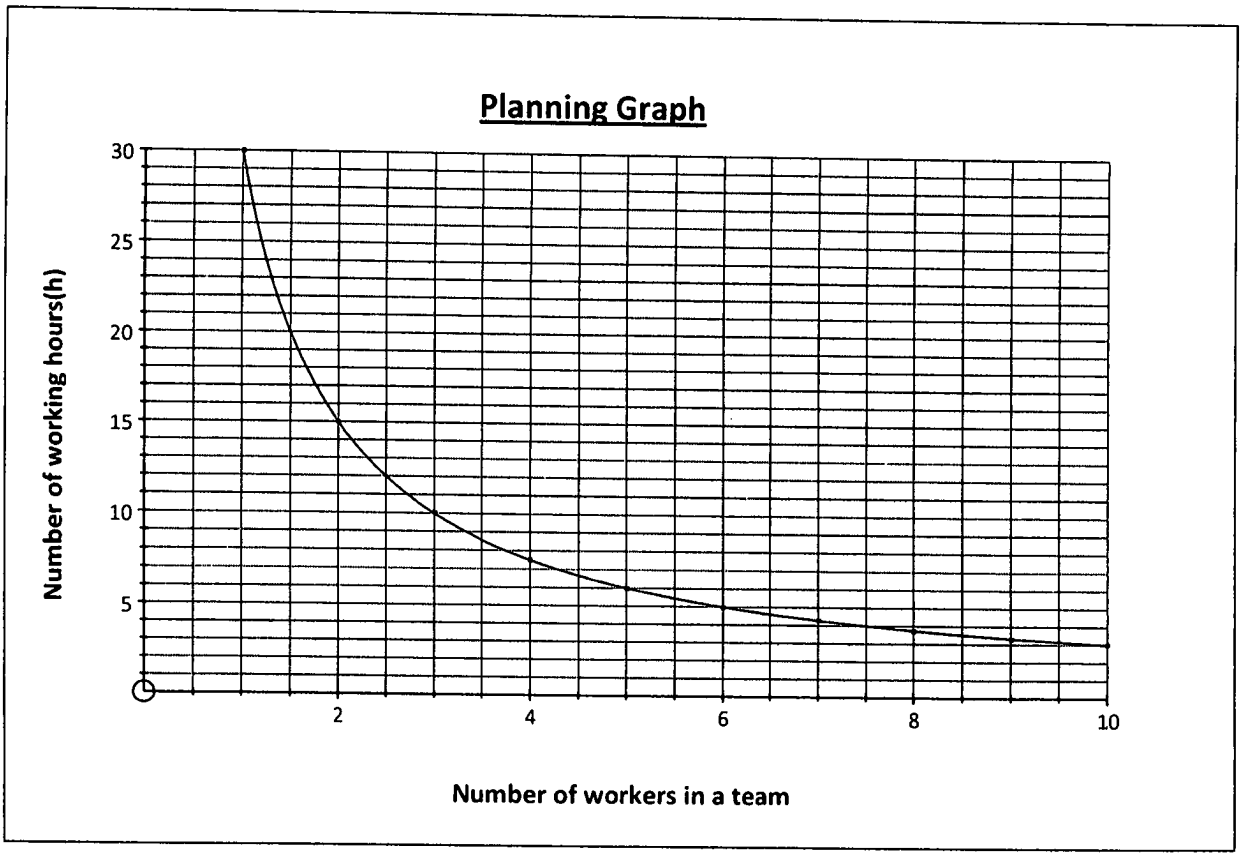
QUESTION 3

3.1 Henco, the maintenance manager at Boy's High, uses the graph below to plan how long it should take different teams of workers to clean all the classrooms at the School.



Use the graph above to answer the following questions:

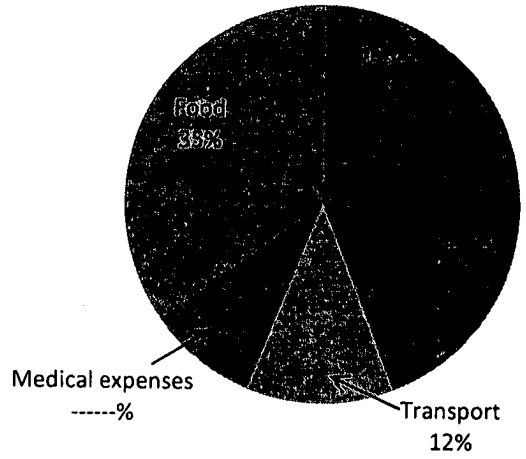
3.1.1 How long will it take exactly 5 workers to clean all the classrooms? (2)

3.1.2 How many workers will be required to clean all the classrooms in exactly 15 hours? (2)

3.1.3 How many hours will it take exactly 8 workers to clean all the classrooms? (2)

3.2 A budget is essential for healthy financial goals and planning. Henco makes use of the *CPIX* figures to draft his family budget. The pie chart below shows Henco's monthly expenditure for the month of April 2012.

Pie chart showing Henco's monthly expenditure for the month of April 2012



Study the graph above and then answer the questions that follow.

3.2.1 Calculate the percentage of Henco's budget that will go towards medical expenses. (2)

3.2.2 List 2 items that could be classified as other. (2)

3.2.3 If Henco earns R 16 500 per month, how much of his salary goes towards each component in the given graph above? Complete the budget on **Annexure A** showing all your calculations. (6)

3.3 Henco wants to buy a second hand vehicle costing R 35 000 for his wife. He pays R 7 000 deposit and takes a loan from the bank for the outstanding amount.

3.3.1 Calculate the loan amount to be borrowed from the bank. (2)

3.3.2 The bank charges an interest rate of 12% per annum, compounded annually. Calculate the total loan amount that Henco has to pay back to the bank over a period of 3 years. (Use the given formula):

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

A = the future value
P = the present value of money
i = the interest rate written as a decimal
n = the number of times interest rate is calculated

(5)

3.4 Henco has 5 cleaning staff. He pays them R 25,00 for normal hours work and R 30,00 per hour for overtimes work. The cleaning staff works 40 normal hours per week. (Monday to Friday).

3.4.1 Use the formula below to calculate Henco's weekly wage bill if each worker worked the normal 40 hours per week.

Wages = 5 x 40 hours x *n*, where *n* represents cost per normal hour. (2)

3.4.2 Mavis is an employee working for Henco. Mavis worked 45 hours during the week. Calculate Mavis' wage at the end of the week using the following formula:

Total wage(R) = (40 x 25) + 30(*n* - 40), where *n* represent the number of overtime hours worked. (3)

3.5 The table below indicates the exchange rate of the US Dollar and the British Pound in terms of the South African Rand as at 18 April 2012.

1 US Dollar ($)	**R 7,885**
1 British Pound (£)	**R 12,441**

Use the above table to answer the following questions:

3.5.1 If a Steers burger with chips and a soda costs £3,70 in England, how much will Henco pay for it in South African Rand? (2)

3.5.2 How many US dollars will Hencos' daughter, who lives in America, pay for a burger that costs R 25,90 in South African Rand? (2)

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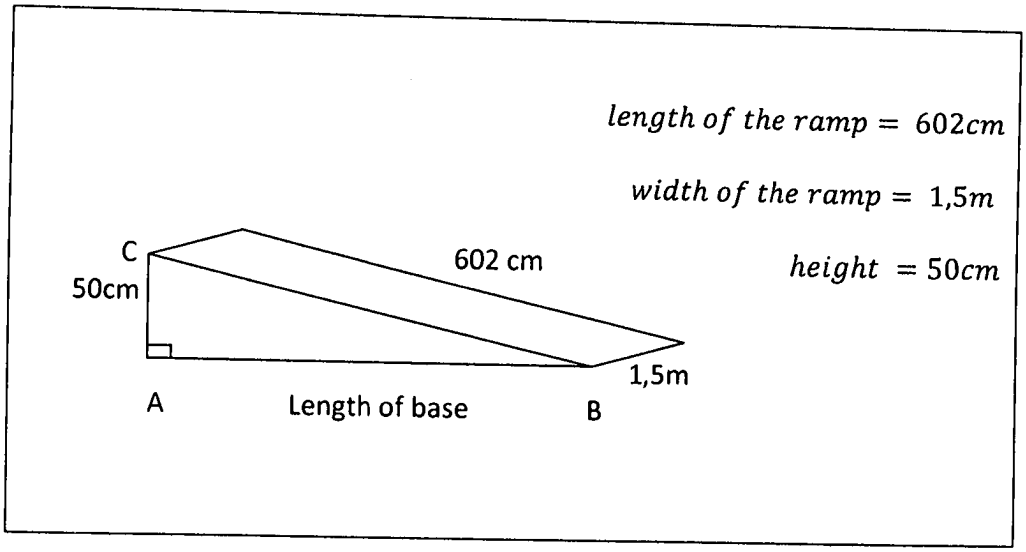
QUESTION 4

4.1 All public areas are required by law to have facilities and easy access available for people with physical disabilities. Ligbron High School has therefore decided to build a wheelchair ramp near the Mathematical Literacy classroom. Below is a sketch of the ramp to be built.



4.1.1 What name is given to the geometric solid above? (2)

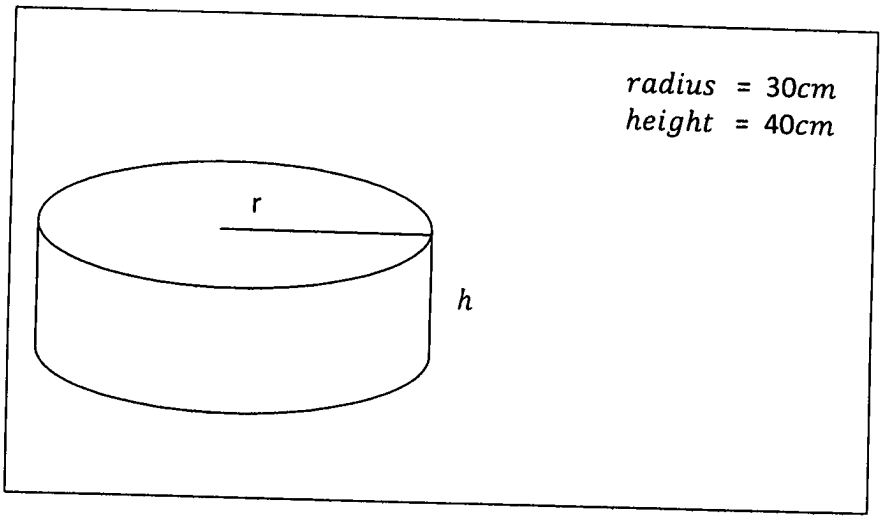
4.1.2 If the ratio of the height of the ramp to the length of the base of the ramp (AB) is 1:12, calculate the length of the base (AB). (3)

4.1.3 Calculate the volume of concrete required to build the ramp in m^3.

$$volume = \frac{1}{2}(length\ of\ base \times height \times width)$$

(4)

4.2 A cylindrical flowerbed is to be built close to the wheelchair ramp. The cylindrical flowerbed has a radius of $30cm$ and a height of $40cm$.



4.2.1 Calculate the total surface area of the open cylindrical flowerbed using the formula:

Total surface area of open flowerbed $= (\pi \times r^2) + (2 \times \pi \times r \times h)$, using $\pi = 3{,}14$

(4)

4.2.2 Calculate the number of flowers that could be planted in the flowerbed if the area to be planted is 5 024cm^2 and 1 flower needs 144cm^2. (3)

4.2.3 Determine the volume of sand required for the flowerbed using the formula:

Volume of flowerbed $= \pi \times r^2 \times h$, using $\pi = 3{,}14$

4.3 A teacher at Ligbron High gave her class consisting of 30 learners a test out of 100.

The following represents the marks of the 30 learners:

14	24	43	63	78	84
18	29	44	64	78	94
18	31	61	70	79	97
20	35	63	72	80	97
22	35	63	78	80	98

Complete the frequency table that appears on ANNEXURE B. (8)

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QUESTION 5

5.1 The following is Ms. Alexander's household electricity account for the month of April 2012.

Nelson Mandela Municipality

Electricity Account: April 2012
Account Holder: Ms AC Alexander
Kings Way 45,
Rigor Park

Account no: 100 987 463/8

	NUMBER OF UNITS	COST PER UNIT	TOTAL COST*
Basic tariff Units used	200 kWh	R 0,90	R 50,00 R 180,00
* VAT included		**Amount Payable: R 230,00**	

5.1.1 During February 2012 the Alexander household used 292 kWh electricity. Calculate the total amount payable for February 2012, using the formula below:

Amount payable = Basic Fee + (number of kWh used x R0,90) (3)

5.1.2 If the total amount payable is given by the formula below, calculate the values of *a* and *b* in the table below, using the given formula:

No of kWh	0	100	150	300	*b*	600
Amount(R)	50	140	185	*a*	410	590

(4)

5.1.3 Use the above table to draw a line graph on the grid provided on **ANNEXURE C.** (5)

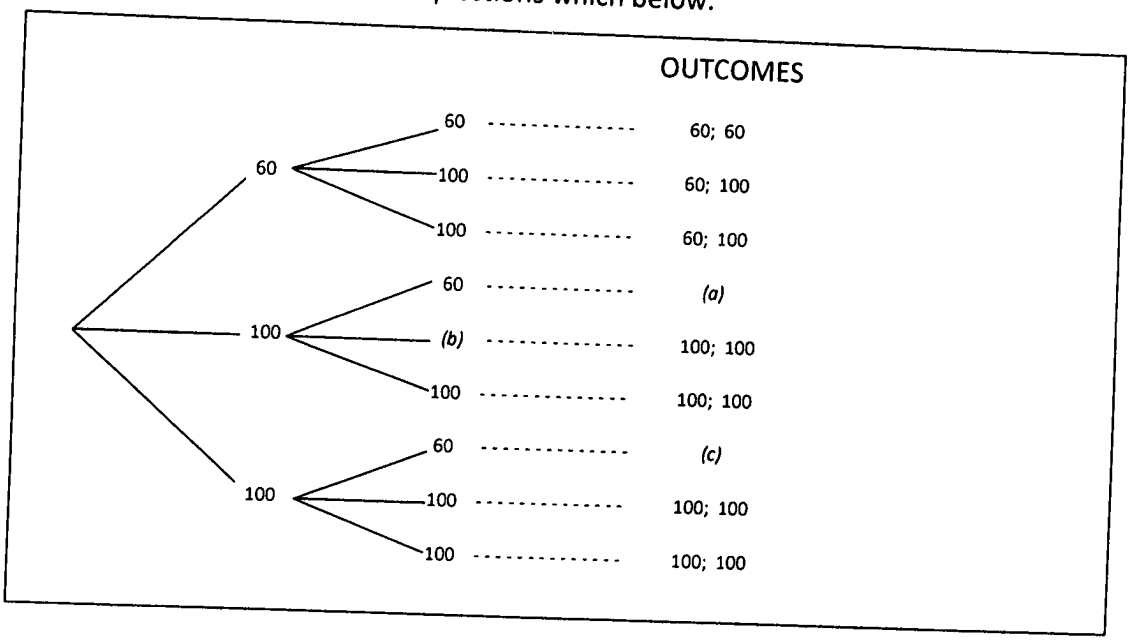
5.1.4 Use your graph to determine the units of electricity used by a household if their electricity bill was R 120 for a particular month. (2)

5.2 The Nelson Mandela Municipality offers households an alternative scheme to buy electricity. They install prepaid metering devices in houses. Households then have to buy prepaid electricity for which they receive a code which must be punched into a metering device. The rate per kWh is 95 cents for the first 400 kWh and 90 cents per kWh for each kWh over 400 kWh.

5.2.1 Calculate the cost for a household with a metering device using 600 kWh? (4)

5.2.2 Which of the two options of payment is the cheaper if a household uses 600 kWh? (1)

5.3 Marcel Alexander has a box with $1 \times 60watt$ and $2 \times 100watt$ globes in. He asks a friend to randomly take one globe out of the box, and to put it back. He asks another friend to randomly take a globe out of the box and put it back. Use the given tree diagram to answer the questions which below:



5.3.1 Determine the values of *a; b* and *c*. (3)

5.3.2 How many outcomes are there? (1)

5.3.3 What is the probability of both friends taking a $60watt$ globe? (1)

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TOTAL : 150

ANNEXTURE A

NAME AND SURNAME: _____

Question 3.2.3 - BUDGET

Expenditures	**Calculations**	**Answer**
Food		
Medical Expenses		
Transport		
Housing		
Other		
Total		

ANNEXURE B

NAME AND SURNAME: _____

Question 4.3

FREQUENCY TABLE

CLASS INTERVAL	TALLY	FREQUENCY
0 - 20	////	
21 - 40	~~////~~ /	
41 - 60		
61 - 80		
81 - 100		

ANNEXTURE B

NAME AND SURNAME : _____

Question 5.1.3

Relationship between the total cost of electricity used and the number of units used per month