NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2013

MATHEMATICAL LITERACY P1

MARKS: 150

TIME: 3 hours

MLITE1

This question paper consists of 14 pages, including annexures.

**INSTRUCTIONS AND INFORMATION**

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

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

3.   QUESTION 4.1.1 must be answered on ANNEXURE 1. QUESTION 4.1.6 must be answered on ANNEXURE 2. QUESTION 5 should be answered with the help of the map on ANNEXURE 3. QUESTION 6.4.1 to be answered on ANNEXURE 4. All ANNEXURES are at the end of this question paper.

4.   Write your name in the spaces provided and hand in the ANNEXURES with the ANSWER BOOK.

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

6.   ALL the calculations and steps must be clearly shown.

7.   ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise. Do NOT round off until you get to the final answer.

8.   Start EACH question on a NEW page.

9.   Write neatly and legibly.

QUESTION 1

1.1   1.1.1   Simplify: 65% of $580 + \frac{1}{4}(247,68 + 3\,246,32)$ (2)

       1.1.2   Convert 5,75 kg into grams.   (1)

       1.1.3   Write 2 453 000 in scientific notation.   (1)

       1.1.4   Calculate: $\sqrt[3]{64} + \sqrt{121} - 3^2$ (2)

       1.1.5   If 1 dozen cans of coke cost R58,20, what is the cost of 1 can of coke?   (2)

       1.1.6   If it takes 4 men 6 days to build a boundary wall, how long will it take 12 men to build the same wall presuming they all work at the same rate?   (2)

1.2   1.2.1   If your parents spend $\frac{1}{4}$ of their salary on rent, $\frac{2}{5}$ on food, what fraction of their income is spent on *other things*?   (2)

       1.2.2   If their combined income is R26 560 calculate the following:

             (a)   The amount spent on rent every month   (2)

             (b)   The amount spent on food every month   (2)

       1.2.3   Name TWO items that could be included under *other things* that your parents could spend money on every month.   (2)

1.3   You have been invited to a friend's birthday party at the local pizza restaurant. Eighteen of you are at the party and have been placed at 2 tables. Table A can seat 10 people and Table B can seat 8 people. When the pizzas are ready, 8 pizzas are brought to Table A and 6 pizzas are brought to Table B.

       1.3.1   Calculate what fraction of pizza each person at Table A will get.   (2)

       1.3.2   Calculate what fraction of pizza each person at Table B will get.   (2)

       1.3.3   You really like pizza. Which table would you like to sit at?   (1)

1.4   Your family is going to Cape Town on holiday in December this year. Your accommodation has been booked from the 16th December to the end of the month.

       Calculate the following:

       1.4.1   How many days will you be staying in Cape Town?   (2)

       1.4.2   If the accommodation costs R450 per day, how much will your parents pay for accommodation?   (2)

[27]

QUESTION 2

Recently the Minister of Finance, Mr Gordhan, announced the 2012 Budget. The pie chart below shows how the budget was divided up for the different departments in government.

2012 National Budget

Other 16% · Education 20% · Defence 4% · Public Order & Safety 9% · Social protection 15% · Health 12% · Housing & Community 11% · Economic Affairs 13%
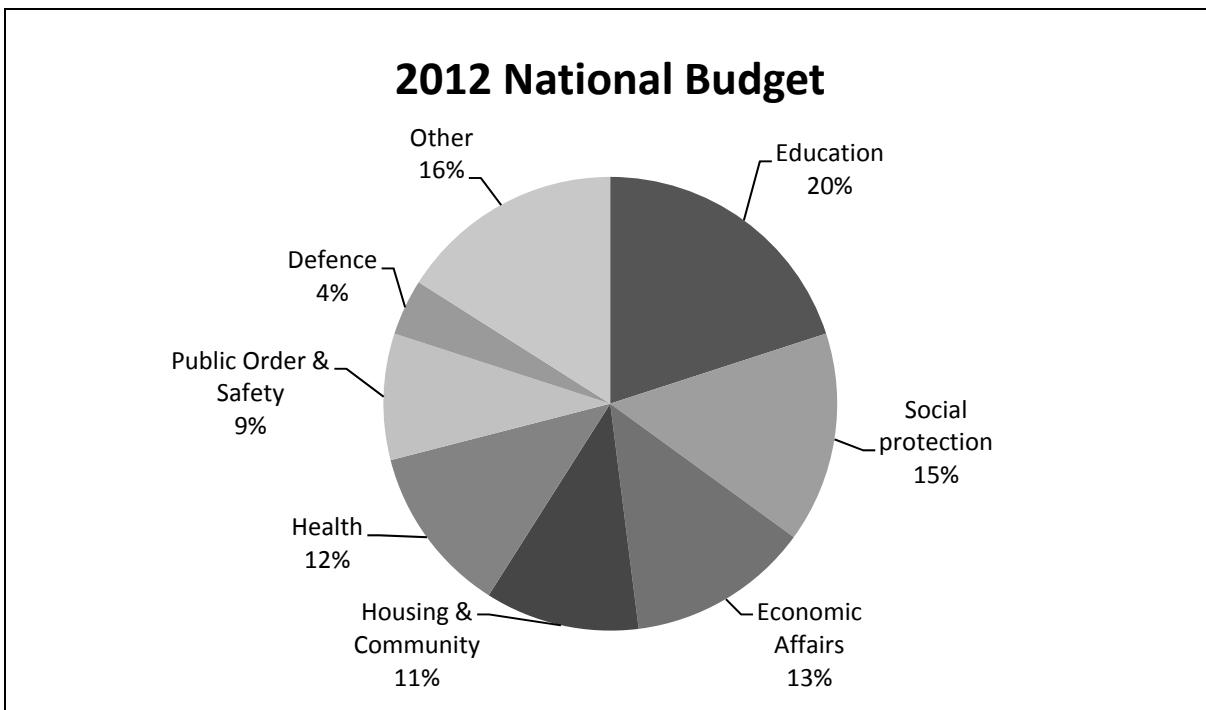
2.1 The National Budget for 2012 was 1 058,4 billion rand.

     2.1.1   Which department got the biggest share of the budget?   (1)

     2.1.2   Which department got the smallest share of the budget?   (1)

     2.1.3   Calculate how much money was allocated to Education.   (3)

     2.1.4   How much money was allocated to Health?   (3)

     2.1.5   Name TWO items that you think fall under the health budget.   (2)

2.2 The amount allocated to Education in 2013 was increased to 250 billion rand. Salaries take up 65% of the budget and Teaching and Learner materials are allocated 23%. The remainder is for Buildings and Maintenance.

     2.2.1   What percentage of the Education Budget in 2013 is used for Building and Maintenance?   (3)

     2.2.2   How much of the Education Budget is used for salaries of staff?   (3)

     2.2.3   How much of the Education Budget is used for Teaching and Learning materials?   (3)

     2.2.4   Do you think the government spends enough money on Education? Give a reason for your answer.   (2)

                                                                               [21]

QUESTION 3

Xolani has purchased a plot of land just outside town. A sketch of the plot of land can be found below. (This is not drawn to scale.)
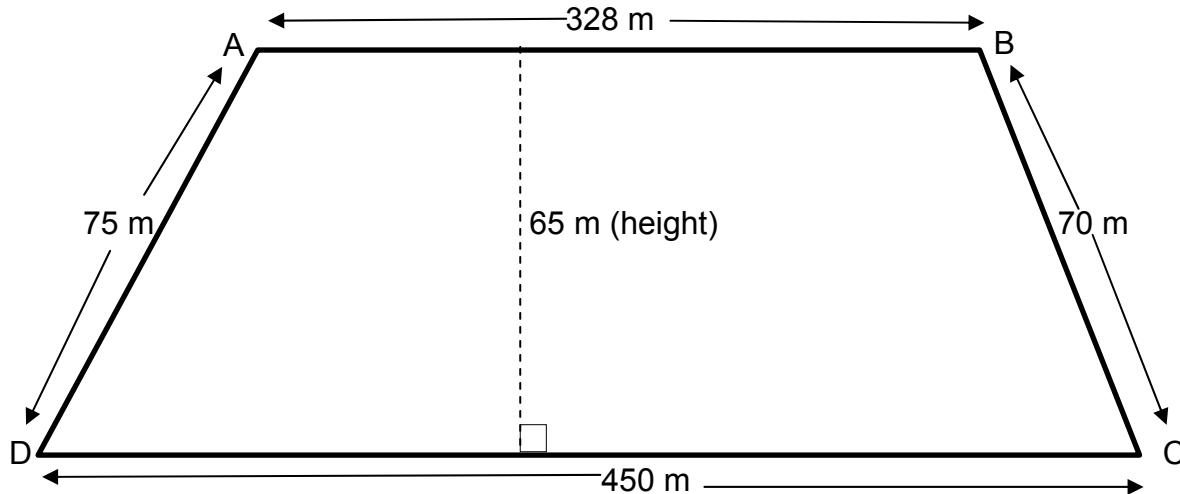
3.1 Using the formula provided below, calculate the area of land in m^2, that Xolani has purchased.

$$\textbf{Area} = \frac{\textbf{AB} + \textbf{DC}}{\textbf{2}} \times \textbf{perpendicular height}$$

(3)

3.2 How many hectares has Xolani purchased? Remember one hectare (1 ha) is a square measurement of 100 m by 100 m. (2)

3.3 The land needs to be fenced off to stop the neighbour's cattle from getting onto the property.

3.3.1 Calculate the perimeter of Xolani's plot of land. (3)

3.3.2 Xolani plans to fence off the land with a barbed wire fence. He will use 5 strands of wire on his fence. Calculate how much wire he needs to buy. (3)

3.3.3 If the wire costs R2,75 per metre, how much will the fencing cost him? (3)

3.4 Xolani plans to plant vegetables on his plot of land, which he then plans to sell at the local market. He has decided to plant a $\frac{1}{4}$ of the land with cabbages, $\frac{2}{5}$ with potatoes, $\frac{1}{10}$ to green beans, $\frac{1}{5}$ with carrots and $\frac{1}{20}$ with green peppers.

Use the following formula:

Area = the fraction allocated for the vegetables × total area of land

3.4.1 Calculate how much land, in m^2, Xolani will use for cabbages. (3)

3.4.2 Calculate how much land, in m^2, Xolani will use for carrots. (3)

3.5 Xolani has to fertilise the lands. The instructions tell him to use 12,5 g for every m^2. Calculate how much fertiliser he needs to purchase if he has to fertilise each crop twice during the growing season. (4)

[24]

QUESTION 4

4.1 Recently 2 classes wrote a Mathematical Literacy test. Below are the results given in percentages:

Grade 12 A							
85	25	53	57	49	75	78	54
87	37	44	72	90	29	59	66
55	51	60	67	62	49	53	58
50	52	54	49	57	52	31	44

Grade 12 B							
23	53	40	29	48	60	69	12
50	50	60	59	52	60	55	60
26	46	50	58	47	38	52	80
50	58	54	44	84	44	57	52

4.1.1 Using **ANNEXURE 1**, organise the data above into the frequency tables provided. (4x2) (8)

4.1.2 Which grade scored the most marks in the 51 – 60 range? (2)

4.1.3 How many learners scored between 41 – 60 in:

    (a) Grade 12 A? (2)

    (b) Grade 12 B? (2)

4.1.4 Which class had the most learners scoring 50% or less? (2)

4.1.5 How many learners in total scored above 70% in the test? (3)

4.1.6 Use **ANNEXURE 2** to draw a compound bar graph showing the test results for both classes. (6)

[25]

QUESTION 5

5.1   Use the map of South Africa provided on **ANNEXURE 3** to answer the following questions.

      5.1.1   Complete the following:

           (a)   1 cm on the map = … in real life.   (1)

           (b)   1 cm = … kilometres.   (2)

      5.1.2   In actual distance, as the crow flies (in a straight line), how far is it from:

           (a)   Cape Town to Johannesburg?   (2)

           (b)   Durban to Kimberley?   (2)

      5.1.3   If a pilot is flying from Johannesburg to Cape Town, in what general direction must he/she fly?   (2)

5.2   SAA (South African Airways) flies from Durban to Cape Town, then from Cape Town to Johannesburg and finally from Johannesburg back to Durban. Calculate how far, in kilometres, the crew on SAA flew that day.   (7)

5.3   If the plane uses 3 litres of fuel per kilometre, calculate the following:

      5.3.1   How much fuel would be needed to do the round trip in QUESTION 5.2?   (3)

      5.3.2   If fuel costs R12,06 per litre, calculate the cost of the fuel used.   (3)

5.4   You are given a different map and told that the distance of a game drive in Kruger Park is 7 cm on the map and 28 km in real life. Calculate the scale of the map.   (4)

                                                               [26]

QUESTION 6

6.1   When Xolani purchased his plot of land he had enough to start up his vegetable business, but had to take out a loan of R358 000,00 with the bank to pay for the plot. He went to two different banks to get the best possible loan available. The following is what he was offered by the banks.

       Bank A

       He has to put down 10% deposit, and he can borrow the remainder at 12,5% p.a. paid off over 10 years with simple interest being applied.

       Bank B

       He can get a personal loan and pay it off after 10 years. He will be charged 11% p.a. compounded annually.

       6.1.1   Calculate how much deposit Xolani will have to pay if he uses Bank A.   (3)

       6.1.2   Calculate how much money Xolani will actually borrow from Bank A.   (2)

       6.1.3   Calculate how much Xolani will actually pay back to Bank A after 10 years, using the following formula:

$$A = P + P \times i \times n$$

           Where A = future value P = principal amount borrowed
                      i = interest n = number of years   (3)

       6.1.4   Calculate how much Xolani will pay back if he takes a personal loan with Bank B. Use the following formula:

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

           Where A = future value P = principal amount borrowed
                      i = interest n = number of years   (3)

       6.1.5   Which bank would you recommend Xolani uses for his loan?   (1)

6.2   Xolani has to put up a reservoir so he can irrigate the lands. He has decided
       to build a circular reservoir. The dimensions of the reservoir are given in the
       diagram below.

5,5 m diameter

2,5 m height
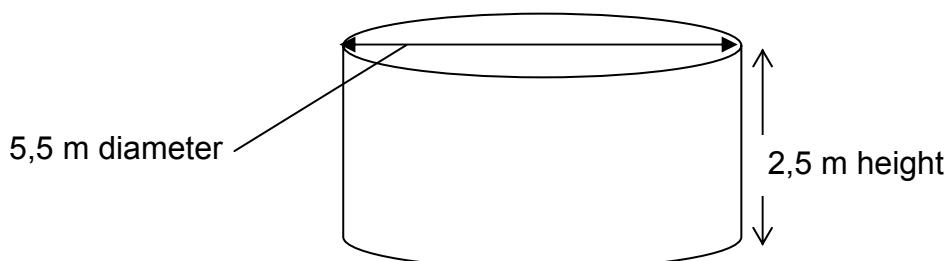
       6.2.1   Calculate the volume of water the reservoir can hold. Give your
                answer in m³.

                Use the formula: $Volume = \pi r^2 \times height$

                Let $\pi = 3,14$ (3)

       6.2.2   How many kilolitres does the reservoir hold?   (1)

6.3   Xolani needs to cover the reservoir with netting to prevent the local children
       from falling into the reservoir when it is full.

       6.3.1   Calculate the surface area of the top of the reservoir.

                Use the formula: $Surface\ Area = \pi r^2$ where π = 3,14   (3)

       6.3.2   Calculate the cost of the netting needed if the netting cost
                R125,00 per m².   (3)

6.4 Xolani has to buy lunch for his staff, as they are working longer than expected this Saturday. At the local garage he has the option of hamburgers or pies to eat and the choice of Coke, water or juice to drink.

6.4.1 Using **ANNEXURE 4**, fill in the missing items to complete the Tree Diagram.

<u>**Outcomes**</u>

```
                                      Coke          Hamburger : Coke

                  Hamburger           (a) _____     Hamburger : Water

                                      Juice         (b) _____ : _____

                                      Coke          Pie : Coke

                  Pie                 Water         (c) _____ : _____

                                      Juice         Pie : Juice
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(3)
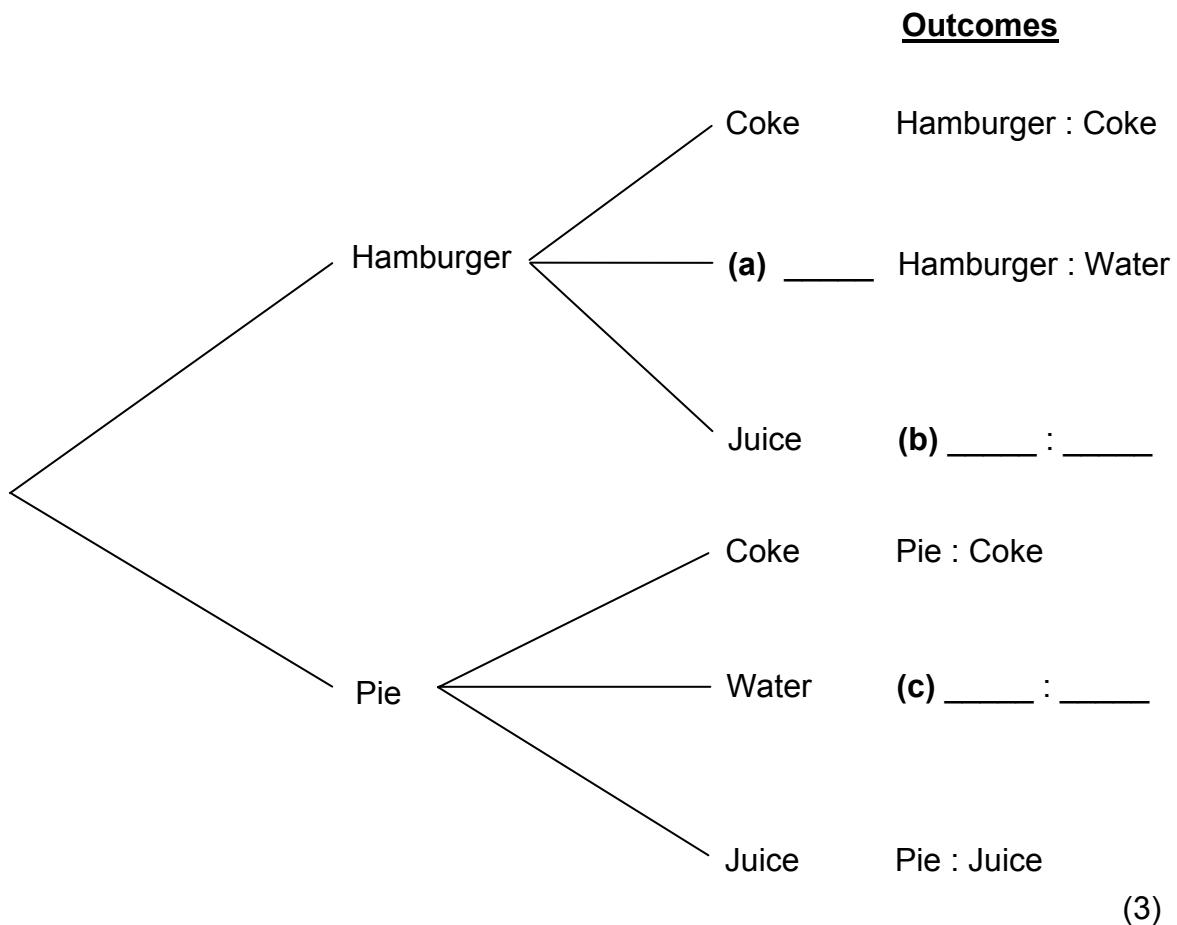
6.4.2 Calculate the probability of one staff member receiving a pie and a juice. Give your answer in fraction form and as a percentage. (2)

[27]

TOTAL: 150

ANNEXURE 1

NAME: _____

QUESTION 4.1.1

GRADE 12 A		
Class Interval	**Tally**	**Frequency**
0 – 10		
11 – 20		
21 – 30		
31 – 40		
41 – 50		
51 – 60		
61 – 70		
71 – 80		
81 – 90		

(4)

GRADE 12 B		
Class Interval	**Tally**	**Frequency**
0 – 10		
11 – 20		
21 – 30		
31 – 40		
41 – 50		
51 – 60		
61 – 70		
71 – 80		
81 – 90		

(4)

ANNEXURE 2

NAME: _____

QUESTION 4.1.6

GRADE 12 TEST RESULTS

Blank grid graph with FREQUENCY on the vertical axis (marked 0, 5, 10, 15) and CLASS INTERVALS on the horizontal axis (1-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90).
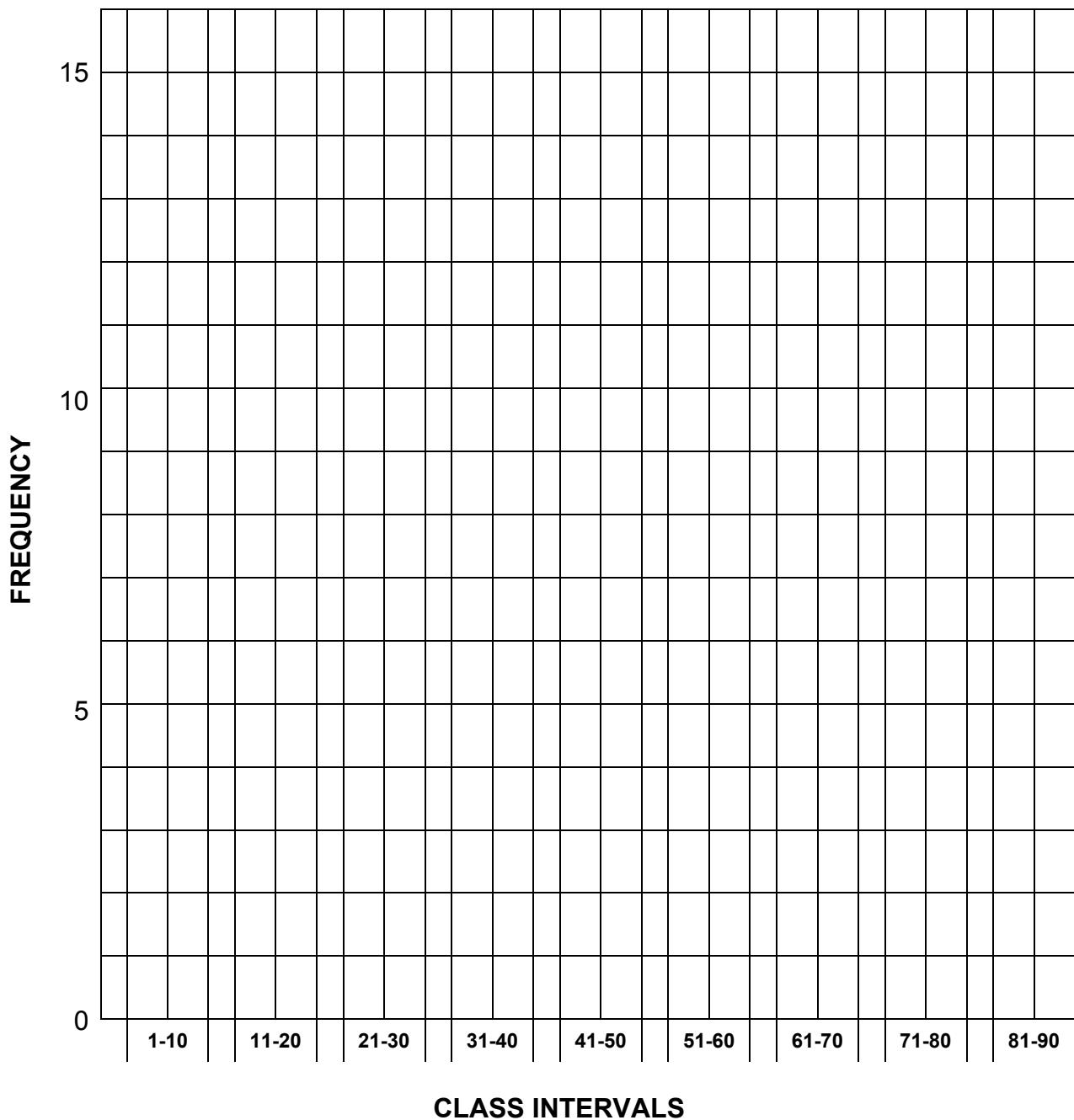
ANNEXURE 3
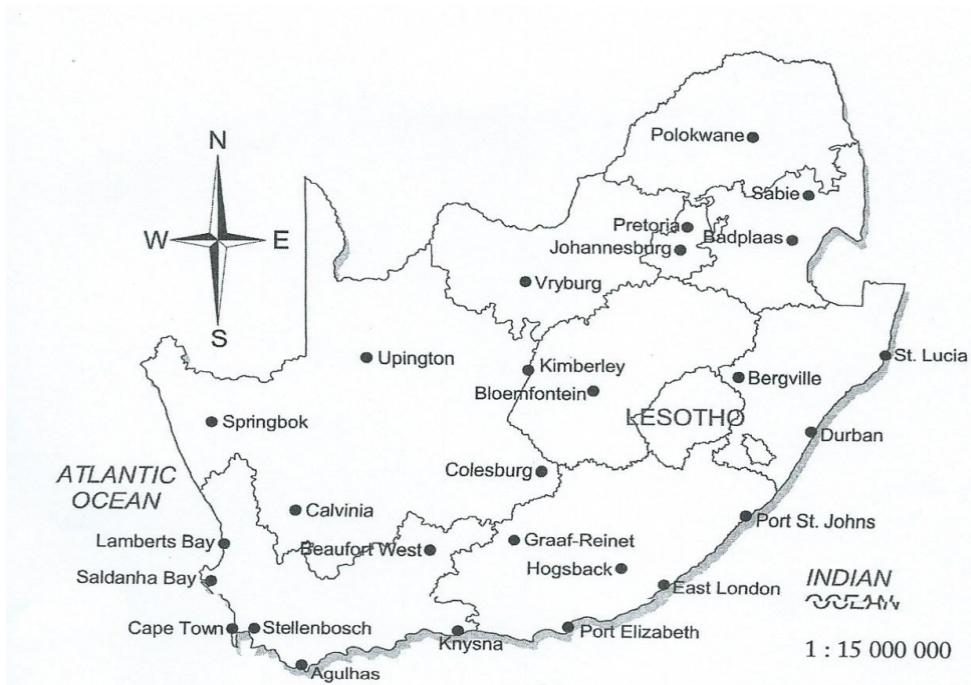
QUESTION 5

ANNEXURE 4

NAME: _____

QUESTION 6.4.1

                                               <u>**Outcomes**</u>

                              Coke   Hamburger : Coke

              Hamburger   **(a)** _____ Hamburger : Water

                              Juice   **(b)** _____ : _____

                              Coke   Pie : Coke

              Pie   Water   **(c)** _____ : _____

                              Juice   Pie : Juice

                                                    (3)