INSTRUCTIONS AND INFORMATION

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

2. 2.1   Use the ANNEXURES in the ADDENDUM to answer the following questions:

   - ANNEXURE A for QUESTION 2.1
   - ANNEXURE B for QUESTION 3.1
   - ANNEXURE C for QUESTION 4

   2.2   Answer QUESTION 5.2.7 on the attached ANSWER SHEET.

   2.3   Write your centre number and examination number in the spaces on the ANSWER SHEET. Hand in the ANSWER SHEET with your ANSWER BOOK.

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

Happy Life Superstore advertised the specials below for the annual Black Friday in 2017.

2 ℓ bottles			
Coke, Sprite and Fanta 30% OFF R11 each		Ariel 50% OFF R45 each	
Sunlight 35% OFF R18	Classic 45% OFF R15 each	Liquifruit 40% OFF R22 each	Weetbix Save R20 R44
Jacobs Save R35 R65 each	Airborne Save R25 R30 per pack	hth Save R70 R250	Gaviscon Save R30 R43

[Source: www.checkers.co.za]

NOTE:
- 1 ℓ = 1 000 mℓ
- ALL amounts given INCLUDE the discount

Study the advertisement above to answer the questions that follow.

1.1.1	Write down the number of day(s) on which these prices are valid.	(2)
1.1.2	Calculate the original price of hth before the saving.	(2)
1.1.3	Write down the name of the product which is now half price.	(2)
1.1.4	Convert 750 mℓ to litres.	(2)
1.1.5	Calculate the total price of ONE 2 ℓ-bottle of Coca Cola and TWO 2 ℓ-bottles of Fanta.	(2)
1.1.6	Arrange ALL the sale prices in ascending order.	(2)

1.2 The picture below is a scaled drawing of a T-shirt for Grade 12 learners.

FRONT OF T-SHIRT   **BACK OF T-SHIRT**

Keep
Calm
and
pass
Mathematical
Literacy

Celsius
60
50
40
30
20
10
0
-10
-20

— Length

Scale = 1 : 25
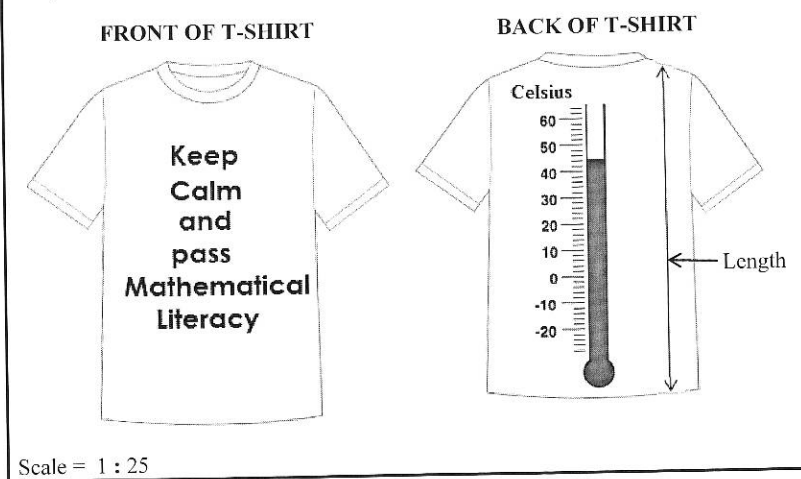
1.2.1 Calculate the number of letters needed to print the logo on the front of the T-shirt. (2)

1.2.2 Write down the temperature displayed on the thermometer in °C. (2)

1.2.3 Explain the meaning of the scale in the drawing above. (2)

1.2.4 Measure the length of the back of the T-shirt in mm, as indicated in the drawing. (2)

1.3 The Two Oceans Marathon and the Comrades Marathon are two of the most popular ultramarathons in the world.

TABLE 1 below shows the dates, distances and entry fees of these marathons.

TABLE 1: TWO OCEANS MARATHON VS COMRADES MARATHON

	TWO OCEANS	COMRADES
Date (2017)	15 April 2017	4 June 2017
Distance	56 km	89 km
Entry fee	R520,00	R460,00

[Adapted from www.capetownmagazine.com and www.news.comrades.com]

Use TABLE 1 above to answer the questions that follow.

1.3.1 Which race took place first? (2)

1.3.2 Which one of the two races had the longest distance? (2)

1.3.3 Determine the difference between the entrance fee of the Two Oceans Marathon and the entrance fee of the Comrades Marathon. (2)

1.4 The Comrades Marathon Association (CMA) has issued its medical statistics for the race held on Sunday 4 June 2017.
Start of the race: 05:30
End of the race: 17:30

TABLE 2 shows the medical statistics on race day.

TABLE 2: MEDICAL STATISTICS

Athletes starting the race	17 031
Athletes finishing the race	13 852
Athletes treated in the medical tent	400
Hospital-treated athletes	90
Hospital-admitted athletes	40

[Adapted from http://www.runnersworld.co.za]

Use TABLE 2 above to answer the questions that follow.

1.4.1 Write down the maximum time given to the athletes to complete the Comrades Marathon. (2)

1.4.2 State if the medical statistics data is discrete or continuous. (2)

1.4.3 Write down the ratio of athletes starting the race to the athletes finishing the race. (2)

[32]

QUESTION 2

2.1 | ANNEXURE A shows the student fees statement for Tamryn Abrahams, a second-year Architecture student at the University of Cape Town (UCT).

Use ANNEXURE A to answer the questions that follow.

2.1.1   Explain the meaning of the term *interest* with reference to the student fees statement.   (2)

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

2.1.3   Calculate the monthly interest rate that was used on the overdue fees for the previous year.   (3)

2.1.4   Write down the code and the name of the module/course that is the most expensive.   (2)

2.1.5   Show how the amount of R6 317,70 was calculated.   (2)

2.1.6   Calculate the total amount debited to this account for the courses studied in the 2017 academic year including interest on overdue fees in 2017.   (3)

2.1.7   State the payment method used to transfer money into this account.   (2)

2.1.8   A family friend paid the balance of R40 386,60 on condition that the amount could be paid back in equal monthly instalments, interest free.

Show how the monthly instalment of R8 077,32 was calculated if the first payment was due on 1 November 2017 and the last payment was due on 1 March 2018.   (2)

2.2   The graph below shows the effect of inflation from 2015 going back 50 years.

VALUE OF A TROLLEY COSTING R1 000 IN 2015
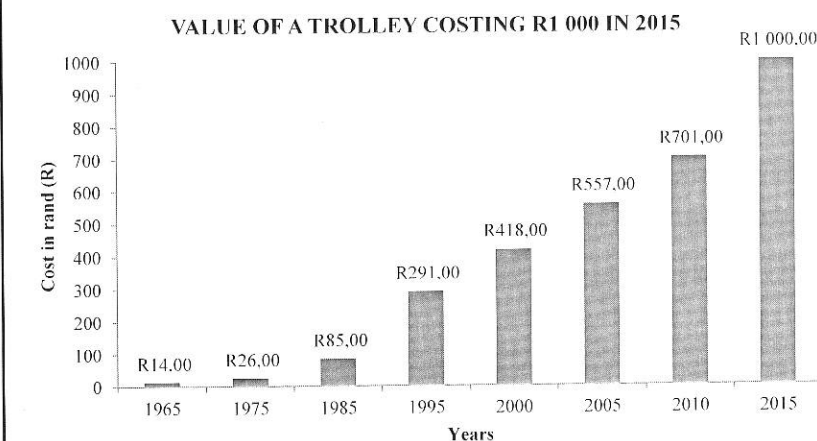
Below are certain South African items and their prices for the years 1970 and 2015.

		PRICE IN 1970	**PRICE IN 2015**
Spur burger		R0,30	R62,90
Cheddamelt steak		R0,50	R104,90
Ricoffy 750 g		R0,25	R75,00
Nestlé condensed milk		R0,10	R19,00

[Source: www.inflation.eu]

Use the information above to answer the questions that follow.

2.2.1   Explain the term *inflation* within the given context.   (2)

2.2.2   Write down the price of a Spur burger in 1970.   (2)

2.2.3   Calculate by how much the cost, in rand, of a trolley had increased from 2000 to 2005.   (3)

2.2.4   Calculate the percentage increase of Ricoffy from 1970 to 2015.
You may use the following formula:

$$\text{Percentage increase} = \frac{\text{new amount} - \text{original amount}}{\text{original amount}} \times 100 \%$$
   (3)

2.2.5   A cheddamelt steak was sold for R104,90 at a percentage profit of 17,5%. Determine the cost price.   (2)

2.3

TABLE 3 below shows the national budget and education budget of South Africa for 2017/18.

TABLE 3: NATIONAL BUDGET AND EDUCATION BUDGET OF SOUTH AFRICA FOR 2017/2018

NATIONAL BUDGET OF SOUTH AFRICA (IN RAND)		EDUCATION BUDGET OF SOUTH AFRICA (IN RAND)	
Economic affairs and agriculture	241,6 billion	Basic education	216,7 billion
Defence and public safety	198,7 billion	University subsidies	31,6 billion
Health	187,5 billion	Education administration	15,8 billion
General admin	70,7 billion	Skills development levy institutions	21,1 billion
Local development and infrastructure	195,8 billion	National student financial aid scheme (NSFAS)	15,3 billion
Debt service costs	162,4 billion	Technical and vocational education and training	7,5 billion
Social protection	180,0 billion	Other	12,5 billion
Education	320,5 billion		

[Adapted from www.graphics24.com]

Use TABLE 3 above to answer the questions that follow.

2.3.1 Which of the amounts below represents the economic affairs and agriculture budgets?

A   24 160 000
B   241 600 000 000
C   241 600 000
D   24 160 000 000 000   (2)

2.3.2 Explain the term *budget* within the context above.   (2)

2.3.3 Write down the item which receives the third most money from the education budget.   (2)

2.3.4 Calculate the percentage of the total education budget that is allocated to the NSFAS.   (3)

2.3.5 University subsidies comprise about 9,86% of the total education budget. Estimate the combined budget, as a percentage, for education administration and the NSFAS.   (2)

[41]

QUESTION 3

3.1   Liam and Amy are planning their wedding. Amy wants a four-layer red velvet wedding cake. She must still decide between a cylindrical or rectangular cake as shown on ANNEXURE B.

Use ANNEXURE B to answer the questions that follow.

3.1.1 Determine the total height of the cylindrical cake in millimetres.   (3)

3.1.2 The base (bottom) layer of the cylindrical cake has a radius of 14 cm.

(a) Determine the diameter of the base layer in cm.   (2)

(b) Calculate the volume (in cm³) of the base layer.

You may use the following formula:

Volume of a cylinder = π × (radius)² × height, and using π = 3,142   (3)

3.1.3 Define the term *perimeter*.   (2)

3.1.4 Calculate the area (in cm²) of the base of the pan needed to bake the top layer of the rectangular cake.

You may use the following formula:

Area = length × width   (2)

3.2   Aunt Abby will bake the wedding cake. She will be using a recipe from a recipe book published in England.

NOTE:
- 1 kg = 2,25 pounds
- 1 mℓ flour = 0,7 g flour

3.2.1 Aunt Abby needs 3 and a half pounds of butter.

Determine the mass of butter, in kilogram.   (2)

3.2.2 Aunt Abby only has a kitchen scale available.

If aunt Abby needs 625 mℓ of flour, determine the mass of the flour in grams.   (2)

3.2.3 The cake must be baked at 356 °F.

Determine to what degree Celsius the oven should be turned.

You may use the following formula:

°C = (°F – 32°) ÷ 1,8   (2)

[18]

QUESTION 4

4.1

> A parkrun is a weekly 5 km run. A group of runners drove from Upington to Springbok to take part in the weekly parkrun in Springbok.
>
> ANNEXURE C shows a route map from Upington to Springbok.

Use ANNEXURE C to answer the questions that follow.

4.1.1   Give the general direction from Upington to Springbok.   (2)

4.1.2   Write down the name of the national park close to Kamieskroon.   (2)

4.1.3   Name TWO towns the runners will pass through on their way to Springbok, following the N14.   (3)

4.1.4   Identify the type of scale used on the map.   (2)

4.1.5   Use the given scale to determine the actual distance (to the nearest km) between Upington and Springbok.   (4)

4.2

> On arrival in Springbok the runners must first pick up Joe, a fellow runner, before heading to the parkrun (**B**).
>
> ANNEXURE C shows a street map indicating the route from entering Springbok (**A**) to the parkrun (**B**).

Use ANNEXURE C to answer the questions that follow.

4.2.1   Name the road by which they will enter Springbok.   (2)

4.2.2   Joe gives them the following directions to his home:

- Enter Springbok from Upington.
- Turn right into Uitspan Street.
- Turn left into Lukhof Street.
- Turn left into the first street.

Use the directions above to determine in which street Joe lives.   (2)

4.2.3   Name of the lodge near the parkrun.   (2)

4.2.4   The distance from Joe's house to the parkrun is 2,34 km. They travel at an average speed of 40 km/h.

Determine how long it will take them (in minutes) to get from Joe's house to the parkrun.

You may use the following formula:

$$\text{Time} = \frac{\text{distance}}{\text{speed}}$$
(3)

4.2.5   29 of the 42 athletes who participated in the parkrun were female.

Determine the probability of randomly selecting a male athlete from this group.

(2)

[24]

QUESTION 5

5.1

> During certain seasons in South Africa, the wind can lead to fires that cause large damages. The fire losses in South Africa for the period 2010 to 2015 are shown in TABLE 4 below.

TABLE 4: LOSSES CAUSED BY FIRE FOR THE PERIOD 2010 TO 2015

	2010	2011	2012	2013	2014	2015
Total loss in rand (in millions)	1 323	2 085,6	3 162	2 158	1 847	2 732
GNI (in thousand millions)	2 608,5	2 897,6	3 066	3 441	3 694	3 913
Fire loss as a % of GNI	0,05%	0,07%	0,103%	**A**	0,05%	0,07%
Number of fires (in thousands)	26,5	37,7	41,4	42,3	46,1	45,7
Population (rounded) (in million)	49,9	51,7	52,2	52,9	53,5	54,3

[Adapted from: http://www.fpasa.co.za]

NOTE: GNI – gross national income

Study TABLE 4 above to answer the questions that follow.

5.1.1   Write down the total loss, in rand, caused by fire during 2011.   (2)

5.1.2   Calculate the mean total loss, in rand, caused by fires for the period 2010 to 2015.   (3)

5.1.3   Identify the maximum number of fires for the period 2010 to 2015.   (2)

5.1.4   Calculate the value of **A**, the fire loss as a percentage of the GNI for 2013. Round your answer to TWO decimal places.   (4)

5.2 | TABLE 5 below shows the labour force characteristics of South Africa for the fourth quarter of 2017.

TABLE 5: LABOUR FORCE CHARACTERISTICS IN SOUTH AFRICA IN 2017 (IN THOUSANDS)

	TOTAL LABOUR FORCE	TOTAL NEA	ECONOMICALLY ACTIVE		
			TOTAL	Employed	Unemployed
Eastern Cape	4 216	2 071	2 145	1 391	754
Free State	1 893	697	1 196	806	390
Gauteng	10 059	3 016	7 043	4 991	2 052
KwaZulu-Natal	6 948	3 638	3 310	2 513	797
Limpopo	3 704	1 941	1 763	1 417	346
Mpumalanga	2 878	1 130	1 748	X	506
Northern Cape	790	349	441	321	120
North West	2 534	1 221	1 313	999	314
Western Cape	4 507	1 412	3 095	2 492	603
South Africa	**37 529**	**15 475**	**22 054**	**16 172**	**5 882**

[Adapted from: www.statssa.co.za]

NOTE: NEA – not economically active

Use TABLE 5 above to answer the questions that follow.

5.2.1 Explain the meaning of the term *unemployed* within the context of the table above. (2)

5.2.2 Determine the value of **X**, the number of people employed in Mpumalanga. (2)

5.2.3 Name ONE data collection instrument that could be used to collect the data above. (2)

5.2.4 Calculate the percentage of people in the Western Cape who are NOT economically active (NEA). (3)

5.2.5 Write down the ratio of employed people to unemployed people in South Africa in the form ... : 1. (2)

5.2.6 Determine the probability (as a decimal) of randomly selecting a person in the Free State who is NOT economically active (NEA). (3)

5.2.7 The graph on the ANSWER SHEET represents the number of economically active people, as well as those who are not economically active (NEA) in South Africa. The bars for ALL economically active persons and only the bar for the people in the Eastern Cape who are NOT economically active (NEA) are drawn.

Use the ANSWER SHEET to draw the graphs for the rest of the provinces. (6)

5.2.8 Determine the probability, as a simplified fraction, of selecting a province where fewer than 350 000 people are unemployed. (4)

[35]

TOTAL: 150

ANNEXURE A

QUESTION 2.1

STUDENT FEES STATEMENT FOR TAMRYN ABRAHAMS FOR SEPTEMBER 2017

UNIVERSITY OF CAPE TOWN

FEES OFFICE
UCT
PRIVATE BAG X3
RONDEBOSCH
7701

☏ +27 21 650-1704
🖷 +27 21 650-4768
Email: fnd-feeenq@uct.ac.za
Web: http://www.uct.ac.za

Fees and Cashiers Office Hours/Location:
Monday - Friday   09h00 - 15h30
Thursday -   09h30 - 15h30
Level 3, Kramer Law Building, Middle Campus

STUDENT FEES STATEMENT   Page 1 of 1

Mrs Tamryn Abrahams Hoop Street Extension 12 ...ngton	Statement of account as on	06/10/17
	e-mail address	John.Abrms@gmail.com
	Invoice ID	UCT STAT NO. 0003399891
	Student name	Tamryn Jessica Abrahams
	Student number	ABRTAM002
	Account number	1567858
	Anticipated funding	R0,00

Date	Details*	Debit	Credit	Balance
	Balance brought forward	14 819,50		14 819,50
	Interest on overdue fees	148,20		14 967,70
12/16	No. 5 Bank Acc direct deposit Ref 950230173		–8 650,00	**6 317,70**
01/17	APG 2000F History & Theory of Arch	3 030,00		
03/17	APG 2000F History & Theory of Arch	3 030,00		
03/17	APG 2003S Theory Structures 3	2 280,00		
03/17	APG 2009F Theory Structures 4	2 280,00		
03/17	APG 2011S Technology 2	9 580,00		
03/17	APG 2038W Environ & Services II	4 530,00		
03/17	APG 2039W Design & Theory Studio II	29 460,00		
03/17	Late payment penalty	2 087,00		62 594,70
05/17	No. 5 Bank Acc direct deposit Ref 950241526		–23 000,00	39 594,70
08/17	Interest on overdue fees	395,95		
09/17	Interest on overdue fees	395,95		
			☞	R40 386,60
E. & O.E	Due to us			

[Adapted from www.srvwinpsw006.wf.uct.ac.za]
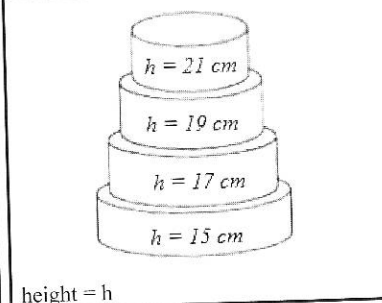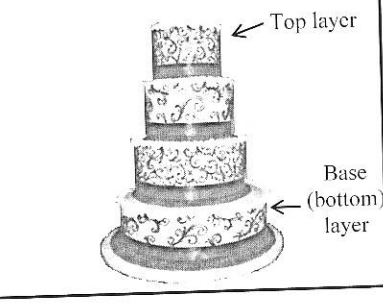
Details*: Balances/interest/course code/course name

ANNEXURE B
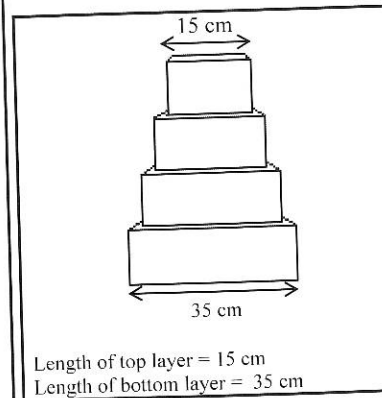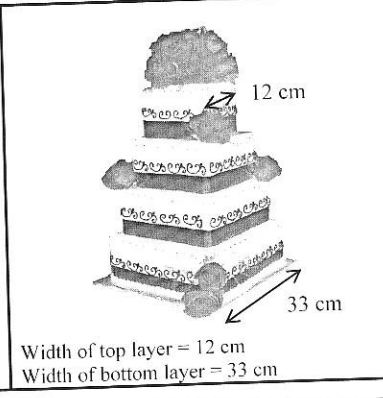
QUESTION 3.1

FOUR-LAYER RED VELVET WEDDING CAKES

AMY'S FOUR-LAYER CYLINDRICAL RED VELVET WEDDING CAKE

h = 21 cm
h = 19 cm
h = 17 cm
h = 15 cm

height = h

Top layer
Base (bottom) layer

AMY'S FOUR-LAYER RECTANGULAR RED VELVET WEDDING CAKE

15 cm
35 cm

12 cm
33 cm

Length of top layer = 15 cm
Length of bottom layer = 35 cm

Width of top layer = 12 cm
Width of bottom layer = 33 cm

[Adapted from www.pinterest.com]

ANNEXURE C

QUESTION 4

PARKRUN SOUTH AFRICA

STREET MAP OF SPRINGBOK

parkrun

Key:
→ Debs-Lodge

Lodge St
River St
Uitspan St
Lukhof St
Voortrekker Rd
Voortrekker Rd
T lo L St
A
B
N 14

[Adapted from http://www.parkrun.co.za]

ROUTE MAP FROM UPINGTON TO SPRINGBOK

N

Kamieskroon
Namaqua National Park
Springbok
Concordia
Vaalputs
Goodhouse
Aggeneys
Pofadder
Bladgrond
Augrabies National Park
Riemvasmaak
Kakamas
Toekoms
Melkboom
Lushof
De Niel
Kenhardt
Keimoes
Groblershoop
Grootdrink
Upington
N 14

Scale 1 : 3 007 874

[Adapted from http://www.google.maps.com]

ANSWER SHEET

QUESTION 5.2.7

CENTRE NUMBER:

EXAMINATION NUMBER:

NUMBER OF ECONOMICALLY ACTIVE AND NOT ECONOMICALLY ACTIVE PEOPLE IN SOUTH AFRICA

Number of people (in thousands)

12000
10000
8000
6000
4000
2000
0

Eastern Cape · Free State · Gauteng · KwaZulu-Natal · Limpopo · Mpumalanga · Northern Cape · North West · Western Cape

Provinces

Total
NEA