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Paper 1

Preliminary Examinations 2020

-1 for dp.
mark

Time: 3 hours

Marks: 150

Examiner: Ms C Sam

Moderator: Mr CVD Venter

NAME & SURNAME:

Memo

READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 16 pages and 5 questions. An annexure booklet of 3 pages is also included. Please ensure that no pages are missing.
2. Write your name on this question paper.
3. Answer all questions in the spaces provided on the question paper
4. You may use a non-programmable calculator.
5. **Round off to 2 decimal places unless otherwise stated or where the context requires rounding up or rounding down.**
6. It is in your interest to **show all working**, to write legibly, and to present your work neatly.
7. All diagrams are not drawn to scale.
8. **Use 3,14** wherever you must substitute for π .

Question One

[52]

"Tea is an aromatic beverage commonly prepared by pouring hot or boiling water over cured or fresh leaves of the *Camellia sinensis*, an evergreen shrub (bush) native to East Asia. After water, it is the most widely consumed drink in the world. Tea has a stimulating effect in humans primarily due to its caffeine content. Tea originated in the region encompassing today's Northeast India, north Myanmar, Southwest China and Tibet, where it was used as a medicinal drink by various ethnic groups in the region. An early credible record of tea drinking dates to the 3rd century AD, in a medical text written by Hua Tuo. It was popularised as a recreational drink during the Chinese Tang dynasty, and tea drinking spread to other East Asian countries. During the 17th century, drinking tea became fashionable among the English, who started to plant tea on a large scale in India. Combined, China and India supplied 62% of the world's tea in 2016." (Source: <https://en.wikipedia.org/wiki/Tea>)

- a) **Table1: Showing the Prices of Ten Brands and Types of Teas in South Africa on 12 August 2020.**

Brand of Tea	Prices of Different Types of Tea after VAT (15%) (100 teabags)			
	Black Tea	Rooibos	Earl Grey	English Breakfast
Joko's	R44,99	R49,99	R52,25	R79,10
Five Roses	R46,00	R79,99	R120,22	R149,00
Twinings	R72,17	R85,50	R134,99	R169,86
Ceylon	R120,00	R125,00	R130,00	R145,60
Freshpak	R50,28	R49,99	R79,99	R85,45
Glen	R27,00	R35,55	R52,25	R58,99
Kericho Gold	R149,00	R149,99	R169,00	R195,00
Tetley	R108,77	R126,94	R158,50	R199,61

- 1) State which brand of tea is a premium brand. (2)

Tetley or Kericho Gold ✓ a (2)

- 2) State which type of tea is the most expensive. (2)

English Breakfast ✓ a (2)

- 3) Calculate the price of Earl Grey Five Roses per teabag. (3)

$120,22 \div 100$ ✓ m
 $= R 1,20$ ✓ a (rounding to 2dp) (3)

- 4) Calculate the price of Joko's English Breakfast tea before VAT is included. (3)

$OP = 79,10$ ✓ values
 115% ✓ m
 $= R68,78$ ✓ a (3)

- 5) If the price of Ceylon Black Tea was R95,50 in August 2019, calculate the percentage change in 2020. Hence, state if this is a percentage decrease or increase.

Use: **Percentage change** = $\frac{\text{New Price} - \text{Old Price}}{\text{Old Price}} \times 100\%$ (3)

$\% \Delta = \frac{120,00 - 95,50}{95,50} \times 100$ ✓ m
 $= 25,65\%$ ✓ a (increase) ✓ a (3)

- 6) Calculate the profit margin percentage of Kericho Gold if the cost is R87,10 to manufacture. Use: $\text{Profit Margin} = \frac{\text{Profit}}{\text{Selling Price}} \times 100\%$ (3)

$$\begin{aligned} \text{PM} &= \frac{149,99 - 87,10}{149,99} \times 100 \\ &= 41,93\% \end{aligned}$$

- 7) Refer to the Earl Grey Tea prices to answer the following questions:

- I. Determine the range of the prices. (2)

$$\begin{aligned} \text{Range} &= 169 - 52,25 \\ &= R116,75 \end{aligned}$$

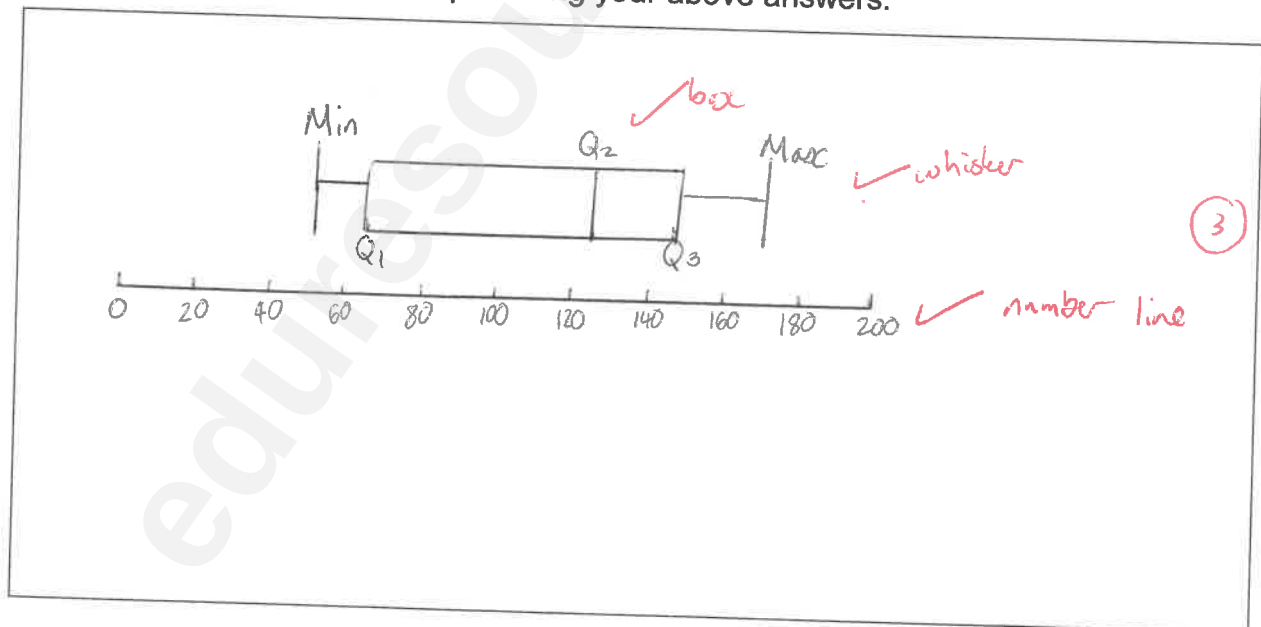
- II. Give the modal price of the tea. (2)

$$R52,25$$

- III. Give the five-number summary of the prices. (5)

Minimum	Quartile 1	Quartile 2	Quartile 3	Maximum
52,25	66,12	125,11	146,75	169

- IV. Draw a Box-and-Whisker plot using your above answers. (3)



- b) Qiuyi enjoys drinking tea. She decides to buy a tea strainer. Study the slip below and answer the questions that follow:

CheckersHyper

Customer Care: **0800 01 07 09**
Welcome to Checkers Hyper Pavilion

EHK-Tea Ball Mesh Infuser	R78,00
Balance Due	R78,00
Cash	R100,00
Change	A:
Total before VAT	R67,83
Total after VAT	R78,00

Tax-code
15% VAT
Use your XTRA SAVINGS virtual card to receive discounts and earn points.

Cashier name: Tyler Alicks
C0013 #0708 09:07:45 13Aug2020

Thank you for shopping at Checkers Hyper

- 1) What is the phone number that customers must call if they have any inquiries? (2)

0800 01 07 09 = a (2)

- 2) Give the name of the tea strainer. (2)

EHK Tea Ball Mesh Infuser = a (2)

- 3) Calculate the value of 'A'. (2)

$A = 100 - 78$ ✓ m (2)
 $= R22,00$ ✓ a

- 4) If Qiuyi only uses the tea strainer on the 14th of August 2020 at 17:50:30, calculate the time taken for her to use the strainer from the point of sale. Answer in hours, minutes, and seconds. (3)

$24:00:00 - 9:07:45 = 14:52:15 + 17:50:30$
 $= 32h 42min 45sec$ ✓ a ✓ a ✓ a (3)

- c) Qiuyi purchases tea leaves from the Tea Merchant shop. Use the credit card slip below to answer the following questions:



TEA MERCHANT

13-08-2020	11:28:15
V: 0150	R: 20180422

**CUSTOMER COPY
(**APPROVED**)**

Credit Card Purchase	R474,75
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Thank You

- 1) Qiuyi purchased one 250g bag of Cederberg Mountain tea leaves. Determine the cost per ounce of tea leaves if 1 oz : 0,0283495 kg. (4)

④	$0,250 \text{ kg} : R 474,75$ $1 \text{ kg} : R 1899$	$0,250 \text{ kg} : R 474,75$ $1 \text{ kg} : R 1899$ $1899 \times 0,0283495 = R 53,84 / \text{oz}$
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- 2) Qiuyi's dad is living in America for 3 months and he is getting homesick. He asks Qiuyi to buy him five 250g bags of Cederberg Mountain tea leaves. Calculate how many US dollars Qiuyi's dad has to forward to her if the exchange rate is \$1 : R17,41. (3)

	$5 \times 474,75 = R 2373,75$	
	$\$1 : R 17,41$	
	$\$136,34 : R 2373,75$	③

or

$$\begin{aligned} \$1 &: R 17,41 \\ \$27,26... &: R 474,75 \\ \$27,26... \times 5 &= R 136,34 \end{aligned}$$

- d) As Qiuyi's family drinks a lot of tea, it significantly impacts on their water usage per month. Use the tariff table below to answer the questions that follow.

Table 2: Water Tariff for August 2020

Water consumption	Price per kilolitre excluding VAT
0kl to 8kl	R8.50
9kl to 24kl	R10.22
25kl to 31kl	R13.95
32kl to 45kl	R22.05
More than 45kl	R25.30

- 1) If Qiuyi's family uses 12 000 gallons of water on average per month, calculate her family's monthly water bill including VAT. Use 1 gal = 0,00378541 kl. (5)

1gal : 0,00378541 kl
12000 gal : 45,42492 kl ✓ a
8 × 8,50 + 16 × 10,22 + 7 × 13,95 + 14 × 22,05 + 0,42492 × 25,30 ✓ m
= 648,00... × 1,15 ✓ m
= R745,91 ✓ a

- 2) Using your answer in (d1), calculate her family's water cost per day in August 2020. (3)

745,91 ÷ 31 = R24,06 / day ✓ a

Question Two

[29]

"Beneath the cultural and historical warmth of the Zululand sun, stands a majestic oasis of retail and leisure innovation, cradling over 69893.73 m² of shopping pleasure. Affectionately known as 'the Heart of Zululand', Boardwalk Inkwazi boasts over 160 stores - ranging from culinary couture to en vogue fashions, chic home décor and digital alternatives."

(Source: <https://www.boardwalkinkwazi.co.za/about-us/about-us>) Bah visits the Boardwalk Inkwazi Shopping Centre with his family over the weekend. Refer to **Annexure A** to answer the following questions.

- a) State the level that Truworthis is on. (2)

Upper level ✓ a

- b) Give the number of escalators that are present on all levels. (2)

3 ✓ a (2)

- c) Give the code of the Panarottis store. (2)

L50 ✓ a (2)

- d) Name the store that has the code U54 and state which store category it falls under. (2)

Fabiani ✓ - Fashion, Shoes & Accessories ✓ a (2)

- e) Bah is standing at the entrance of The Hub and L39 is directly in front of him. Determine:

- 1) The direction Ster Kinekor Cinema is from The Hub. (2)

West ✓ a (2)

- 2) The largest Fashion, Shoes and Accessories store that is North of North West from The Hub. (2)

H & M ✓ a (2)

- f) "Dis-Chem was founded when recently qualified pharmacists, Ivan and Lynette Saltzman, opened their first retail pharmacy in Mondeor, south of Johannesburg, South Africa. The retail pharmacy introduced the concept of a discount pharmacy with product categories not previously offered in South African pharmacies." (Source: www.dischem.co.za)

- 1) If the actual length of Dis-Chem is 50 m, give the scale of the map in simplest form. (4)

M : R
28 mm : 50 m ✓ m
28 mm : 50 000 mm ✓ m
7 : 12500 ✓ a (4)

- 2) If the total floor area of Dis-Chem is 1800m^2 , calculate the width (in m) of the store. (3)

$1800 \div 50 = 36\text{ m}$ ✓ a (3)

*

- 3) Using the scale of the map in (b), calculate the actual width of the Woolworths store. Round off your answer to the nearest metre. (4)

7 : 125 00
4 cm : 7142,85 ... cm ÷ 100
= 71,42 ✓ ca
≈ 71 m ✓ ca m

- 4) Determine what percentage is Dis-Chem of the total floor area of the Boardwalk Inkwazi Shopping Centre. (3)

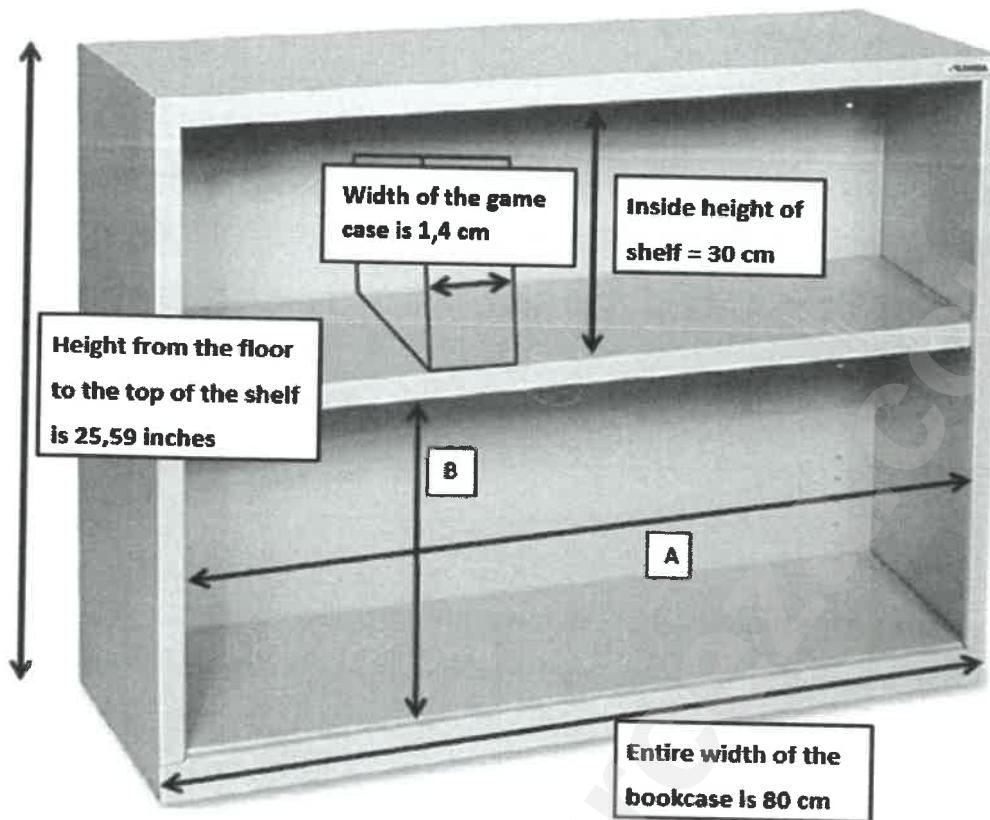
% = $\frac{1800}{69893,73} \times 100$
= 2,58 % ✓ a

- g) If Bah is standing at the entrance of House & Home, and Mr Price Home is North of him, give him clear and concise directions to the carpark at entrance 5. (3)

- Take your left turn / walk north westerly ✓ a
- Take your left turn / walk north until L56/57 ✓ a
- Take your left turn / walk north until L31/32 ✓ a
- Turn left into the entrance 5.

-1 for 1 incorrect direction ...

Jihan wants to build a game shelf to store his PlayStation 4 games. He decides to buy a basic bookcase with two shelves as illustrated below:



Width of game case is
1.4 cm

$$\text{Area}_{\text{rectangle}} = l \times b$$

- a) Determine A, the inside length of the shelf, if the thickness of the wood on both sides of the shelf is 1 cm each. (2)

$$\begin{aligned} A &= 80 - 1 - 1 \text{ cm} \\ &= 78 \text{ cm} \end{aligned}$$

- b) The average width of a game case when placed on the shelf (see picture) is 1.4 cm. Determine the maximum number of files that could fit on one shelf. (3)

$$\begin{aligned} 78 &\div 1.4 \text{ cm} \\ &= 55.71 \\ &\approx 55 \text{ game cases} \end{aligned}$$

rounding off (down)

c) With the knowledge that 1 m = 100 cm, convert the height (25,54 m) to the nearest centimetre.

(3)

$25,54 \times 100 = 2554 \text{ cm}$
$\approx 2554 \text{ cm}$

d) The base of the bookcase is made from wood that is 2 cm thick. The middle shelf and the top piece of wood is 1 cm thick. Determine B, the inside height (in cm) of the bottom shelf.

(4)

$65 - 2 - 30 - 1 - 1 = 31 \text{ cm}$

e) Jihan bought the bookcase at a discounted price because the back board (which covers the entire width and height of the bookcase) was damaged. He decides to replace this board and paint it.

1) Calculate the area of the board to the nearest cm^2 .

(3)

$A = 65 \times 80$
$= 5200 \text{ cm}^2$

2) Convert the answer in (e1) above, to square metres.

(2)

$5200 \div (100)^2 = 0,52 \text{ m}^2$
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3) How many litres of paint will be required to paint the board if 1 litre of paint covers 6 m^2 ?

Round off your answer to 3 decimal places.

(2)

$1 \text{ l} : 6 \text{ m}^2$
$0,087 \text{ l} : 0,52 \text{ m}^2$

- 4) Convert your answer in (a3) above to millilitres (ml) to show that one can of 500ml of paint is sufficient to paint the board. (2)

$$0,087 \times 1000 = 87 \text{ ml}$$

②

Question Four

[22]

a) Tashyle's mother is having a baby. Parents have to take their babies for relatively frequent check-ups at the clinic when they are 3 years old and younger to assess their growth among other things. Tashyle investigates the 'Weight-for-Age Percentile Chart' as practice for when his little sister or brother is born. The 50th percentile represents a normal growing child. Using **Annexure B1** and **B2**, help Tashyle answer the following questions:

- 1) What is the weight (kg) of a 12-month old baby girl that has a weight-for-age ratio that lies on the 95th percentile? (2)

11,5 kg

- 2) A 3-month old baby boy weighs 7,2 kg. Would this baby have an above average or below average weight? (2)

Above Average

- 3) A 21,5 month old baby girl weighs 10,4kg. On which percentile would the baby lie? (2)

± 15th percentile or between 10th & 25th percentile

- 4) What is the age of a 10 lb baby boy on the 75th percentile? (2)

± 0,5 months

- b) Tashyle also investigates the Body Mass Index (BMI) of his friends' younger siblings by conducting a survey. He gathers the following information from his friends, which he arranges in the form of the table shown below.

Table 3: BMI of 14 Babies Between 5 Months to 8 Months of Age

Baby	1	2	3	4	5	6	7	8	9	10	11	12	13	14
BMI	26,1	19	20,2	32,6	23,4	25	27	24,5	22,9	16,8	16	27,3	30,7	31

- 1) Tashyle decides to turn the BMI table above into a more manageable form by compiling a frequency table. Complete the frequency table below. (5)

Table 4: Frequency Table of Babies According to BMI

Weight Classification	Tally	Number of Babies (Frequency)
Underweight ($< 18,5$)	II ✓✓ ^a	2 ✓✓ ^a
Normal weight ($18,5 \leq w < 25$)	IIII	5
Overweight ($25 \leq w < 30$)	IIII	4
Obese (≥ 30)	III	3
	Total	14 ✓✓ ^a (5)

- 2) Complete the table below by writing the percentage of babies who fall within each weight category. Your answer must be rounded off to the nearest percentage. (4)

Table 5: Weight Status Percentage (%)

	Weight Status	Percentage (%)
Un	Underweight	14 ✓✓ ^a
N	Normal	36 ✓✓ ^a
Over	Overweight	29 ✓✓ ^a
Ob	Obese	21 ✓✓ ^a

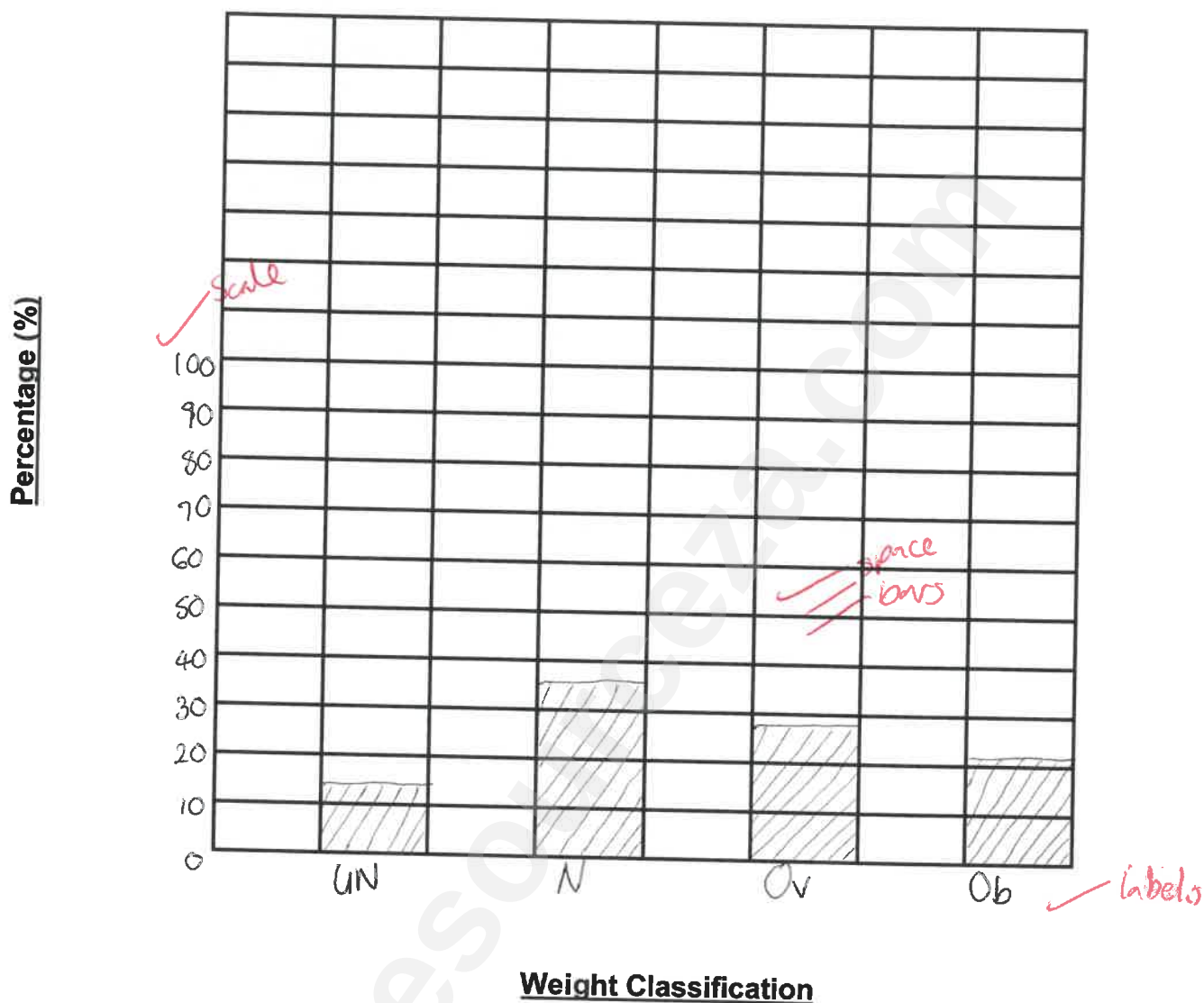
↑ -1 for not

(4)

- 3) Use the answers in (b2) to draw a bar graph showing percentage versus weight classification.

(5)

Figure 1: Bar Graph Showing Percentage Versus Weight Classification



- a) Kiana starts her own brand of makeup called Kiki's Kosmetics.

The production of each **Kiki Lip Kit** includes:

- 1 Matte Lipstick: R15
- 1 Pencil Lip Liner: R10
- The packaging: R5
- Manual labour: 10% of the total cost of the kit (lipstick, liner, and packaging).



Use the above information to answer the following questions.

- 1) Calculate the total cost of the kit excluding the manual labour. (2)

$15 + 10 + 5 = R30$	(2)

- 2) Calculate the manual labour costs involved in making each kit. (2)

$30 \times 10\% = R3$	(2)

- b) Kiana decides to sell each Lip Kit at R40,00. Her rent costs R2 000,00 per month.

- 1) Assuming her total production cost of making one kit (k) is R33,00, determine her Income (I) and Expense (E) equation. (2)

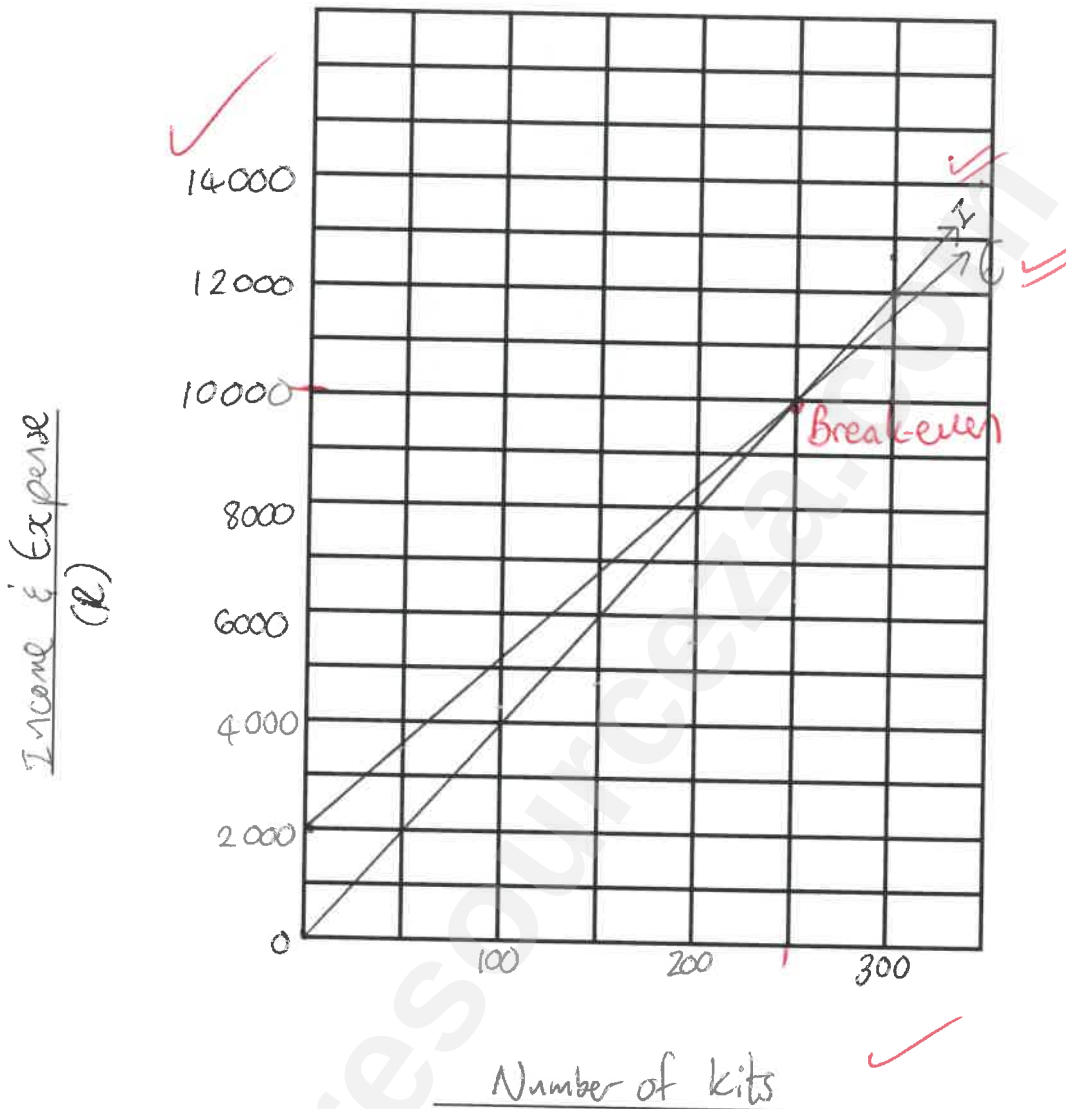
$I = 40k$	(2)
$E = 2000 + 33k$	

- 2) Using your equations in (b1), complete the table below: (4)

Number of Kits (K)	0	75	150	225	C: 300
Income (I)	0	3 000	6 000	A: 9 000	12 000
Expense (E)	2 000	B: 4 475	6 950	9 425	11 900

- 3) Using the values in your table in (b), draw an Income and Expense graph on the same set of axes. (6)

Title: Kiki's Kosmetics Income and Expense Graph



max 2 marks
for wrong axis

- 4) Give the number of Lip Kits that Kiana must sell to break even and indicate this on the graph above. (2)

1 for indicating

1 for number

± 250

✓ or ②

-1 for no $\pm$

- c) Kiana celebrates her company's 1 year birthday by creating a limited addition product offering called Kiki's Glam Box.

Customers can customise their box by choosing the following:

- Lip Glam Option: 1 Lip Kit (Colours – Pink, Nude, Red, Brown, Maroon or Coral)
- Cheek Glam Options: 1 Bronzing Kit or Concealing Kit or Contouring Kit or Blush Kit
- Eye Glam Options: 1 Eyeshadow Palette or Eyebrow Kit or Lash Kit



- 1) If one item on the list is chosen at random, what is the probability of choosing a Concealing Kit as a Cheek Glam Option? (2)

$$P(\text{concealing kit}) = \frac{1}{4} \quad \text{a} \quad \text{(2)}$$

- 2) What is the percentage probability of choosing a Pink Lip Kit, a Contouring Kit, and an Eyeshadow Palette in your Glam Box? (3)

$$\begin{aligned} P(P \cap CK \cap EP) &= \frac{1}{6} \times \frac{1}{4} \times \frac{1}{3} \quad \text{values} \\ &= \frac{1}{72} \times 100 \\ &= 1.39\% \quad \text{percentage} \end{aligned} \quad \text{(3)}$$

- 3) What is the probability of choosing a Red Lip Kit, a Bronzing Kit or a Blush Kit, and a Lash Kit in your Glam Box? (3)

$$\begin{aligned} P(R \cap BK \cup BIK \cap LK) &= \frac{1}{6} \times \left(\frac{1}{4} + \frac{1}{4} \right) \times \frac{1}{3} \quad \text{values} \\ &= \frac{1}{36} \quad \text{a} \end{aligned} \quad \text{(3)}$$

END OF PAPER

150 MARKS