education

MPUMALANGA PROVINCE

REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

SEPTEMBER 2023

MARKS: 150

TIME: 3 hours

Stanmorephysics

This question paper consists of 12 pages and an addendum with 3 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   ANNEXURE A for QUESTION 3.1.
   ANNEXURE B for QUESTION 3.2.
   ANNEXURE C for QUESTION 5.1.

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. Diagrams are NOT necessarily drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

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QUESTION 1

1.1 Mrs. T Ngomane is a Geography teacher at Walter Combined School. She received her salary advice.

SALARY ADVICE FOR MRS T NGOMANE

Surname & Initials	Organisation	Pay point
Ngomane, T	Walter Combined School	1065/23

Identity number	Job title	Appointment date
6806280198084	Teacher	1999/01/01

Tax number	Medical tax credits	Pension number	Salary notch
17238723	620,00	129873	440 628,00

Pay date	Deposit institution	Account nr	Gross salary	Deductions	Nett salary
2023/04/22	ABSA	12495324	37 619,00	13791,40	23 827,60

EARNINGS			DEDUCTIONS		
Item	Description	Amount	Item	Description	Amount
0001	Basic salary	36719,00	0001	TAX RSA	8780,74
0003	Housing allowance	900,00	0002	GEPF	2753,92
			0005	GEMS	2131,00
			0192	SACE	16,50
			0192	Union	109,24

[Adapted from Department Education Salary advice]

Use the information above to answer the questions that follow.

1.1.1 Write down Mrs. Ngomane's tax number. (2)

1.1.2 Define the term *nett salary* in the given context. (2)

1.1.3 Show how the amount of R13 791,40 was calculated. (2)

1.1.4 Mrs. Ngomane transfers 4,5% of her nett salary into a savings account. Calculate the amount she transfers every month. (2)

1.1.5 Show how the salary notch amount of R440 628,00 was calculated. (2)

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1.2 Caves are found all around the world. TABLE 1 below shows data of the TOP 10 longest known caves in the world.

TABLE 1: THE TOP 10 LONGEST CAVES IN THE WORLD.

CAVE NAME	LENGTH (in kilometres)	WHERE IS IT FOUND (City, Country)
Jewel cave	345,5	South Dakota, United States
Shuanghedong cave	311,5	Guizhou, China
Fisher ridge cave	212,1	Kentucky, United States
Lechuguilla cave	242,0	New Mexico, United States
Mammoth cave	686,6	Kentucky, United States
Sistema ox bel ha cave	318,0	Quintana Roo, Mexico
Optymistychna cave	264,5	Korolivka, Ukraine
Sistema sac actun cave	376,7	Quintana Roo, Mexico
Clearwater cave	238,0	Sarawak, Malaysia
Wind cave	260,2	South Dakota, United States

[Adapted from very interesting Junior magazine, Nov 2022, Issue #49]

Use TABLE 1 above to answer the questions that follow.

1.2.1 State whether the lengths of the caves are discrete or continuous data. (2)

1.2.2 Identify the cave in the table with the shortest length. (2)

1.2.3 Arrange, in ascending order, the lengths of the caves. (2)

1.2.4 Calculate the difference between the length of the Jewel cave and the Wind cave. (2)

1.2.5 Write down the ratio (in simplified form) of the length of the Clearwater cave to the length of the Lechuguilla cave. (2)

1.2.6 How many of these top 10 longest caves are found in the United States? (2)



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1.3 Cassandra is hosting a function at her house.
She found great specials at her local supermarket.
TABLE 2 shows the specials of all the items that she bought and their respective prices.

TABLE 2: PRICES OF ITEMS THAT WERE ON SPECIAL

ITEM	SPECIAL
Coca-Cola 4 × 1,5 litre	*SAVE R12* BUY 4 for R60
Lancewood Gouda Cheese	*SAVE R30* R99,99 for 900g
Lay's Potato Chips	*SAVE 20%* Any 2 for R35
Whole chicken	R59,99 per kg
2 ×1 litre ULTRA MEL Vanilla flavoured custard	*SAVE R18* Any 2 for R48

[Adapted from www.checkers.com]

Use TABLE 2 above to answer the questions that follow.

1.3.1 Calculate the original price of the Lancewood Gouda Cheese. (2)

1.3.2 Determine how much Cassandra paid for one 1,5 litre Coca-Cola original. (2)

1.3.3 Cassandra bought a 1,25 kg chicken.
Calculate the amount that she paid for the chicken. (2)

1.3.4 Cassandra bought four 1 litre Ultra Mel vanilla flavoured custard boxes.
Determine what she paid for them. (2)

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QUESTION 2

2.1 The Mokoena family consisting of two adults, age 45 and 48, three children aged 3, 7 and 15 and a grandmother aged 72, planned to visit the Two Oceans Aquarium in Cape Town.

The aquarium has an after 15:00 special where you get discounted prices if you enter after 15:00.

TABLE 3 below indicates the entrance fees at normal and discounted prices.

TABLE 3: THE TWO OCEANS AQUARIUM ENTRANCE FEES

TWO OCEANS AQUARIUM		
Age group	**Normal price (Enter before 15:00)**	**Discount price (Enter after 15:00)**
Adults	R220	R165
Children 14-17 years	R165	R125
Pensioners (older than 65 years)	R165	R125
Children 4-13 years	R105	R80
Children under 4 years	Free	Free

[Adapted from https://www.aquarium.co.za]

#All prices are 15% VAT inclusive.

Use TABLE 3 and the information above to answer the questions that follow.

2.1.1 Calculate the amount of VAT payable on an adult's normal price ticket. (3)

2.1.2 The family decided to visit the aquarium after 15:00 instead of before 15:00, in order to save money.

(a) Determine the amount the family would have saved, on the total cost of the tickets. (7)

(b) Determine the percentage the family would save if they visited the Aquarium after 15:00. (3)

2.1.3 Provide a reason why pensioners often pay less than adults. (2)

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2.2 John Mokoena wants to buy a second hand Volkswagen Amarok. He found the following advertisement.

SPECIAL DEAL!!!
2021 VOLKSWAGEN
Amarok

Cash Option
Now: R641 900
(incl. 15% VAT)



2021 VOLKSWAGEN Amarok 2.0 Bitdi Highline – Instalment Option						
Months	**Interest rate**	**Vehicle price**	**Deposit**	***Residual**	**Monthly instalments**	**Total payment**
72	10%	R641 900	11%	R57 265,60	R11 900	***

*Residual is an amount that must be paid at the end of the term after all the monthly payments have been made.

[Adapted from webuycars.co.za]

Use the information above to answer the questions that follow.

2.2.1 Write down the cash price of the 2021 Volkswagen Amarok. (2)

2.2.2 Calculate the amount of deposit needed. (3)

2.2.3 Determine the total payment on the 2021 Volkswagen Amarok. (4)

2.2.4 Determine the difference between the cash option and the instalment option. (2)

2.2.5 What method of payment is the best for John to choose if he wants to pay the least amount of money after 72 months? Explain your answer. (2) **[28**

QUESTION 3

3.1 Mica and her brother Sheldon have an application on their watches that calculates the number of steps they take every day. They post their weekly report on Instagram.

ANNEXURE A shows the weekly report for 9 December – 15 December 2022. The application differentiates between steps where you walk or climb.

Use the graph on ANNEXURE A to answer the questions that follow.

3.1.1 On which day did Mica have the third highest step count? (2)

3.1.2 Calculate **A**, the steps that Mica took on the 15th of December 2022. (3)

3.1.3 Determine **B**, the daily average steps that Sheldon took during this week. Round off your answer to the nearest whole number. (5)

3.1.4 The weekly report stated that Mica climbed 5% less than Sheldon. Calculate the number of steps Mica climbed during the week. (3)

3.1.5 Mica stated that the steps she took on the 10th and 11th of December were more than 35% of the total steps for the week. Verify, showing ALL calculations, whether her statement is valid. (5)

3.2 Instagram is a social media platform used worldwide.
Data published in the platform's self-service advertising tools shows the ten countries with the most Instagram users for 2022.

ANNEXURE B shows the following graphs:

- The data for the six countries with the most Instagram users. (Name of Country; number of users).
- The percentage (%) of Instagram users in India, for 2022, divided into age groups and male or female groups.

Use the graphs on ANNEXURE B to answer the questions that follow.

3.2.1 Write down, in words, the number of Instagram users, in Brazil, for 2022. (2)

3.2.2 Determine, as a percentage, the probability of randomly selecting an Instagram user in India in 2022, younger than 25 years. (2)

3.2.3 Calculate the percentage female Instagram users in India, in the age group 35 - 44 years. (3)

3.2.4 Determine the number of male Instagram users in India, in the age group 18 - 24 years.
Round off your answer to the nearest hundred thousand. (4)

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QUESTION 4

4.1 The most expensive private day schools in South Africa is listed below. TABLE 4 provides information on the school fees (per learner, per year) of these schools for 2022 and 2023.

TABLE 4: THE MOST EXPENSIVE PRIVATE DAY SCHOOLS IN SOUTH AFRICA FOR 2023

NAME OF SCHOOL	SCHOOL FEES			
	2022 (Rand)	2023 (Rand)	Increase (Rand)	% Increase (2022 to 2023)
Roedean School	176 204	191 181	14 977	8,5
St Mary's School	163 550	176 640	13 090	8,0
Reddam Waterfall	162 495	175 051	12 556	7,7
King David High School	**B**	174 360	-----	---
Kearsney College	209 000	224 620	15 620	7,5
St John's College	179 000	194 148	15 148	8,5
Bishops Diocesan College	170 520	185 020	14 500	8,5
Crawford College	164 470	178 000	-------	**C**
Clifton College	163 398	175 697	12 299	7,5

[Adapted from https://www.Businessinsider.co.za]

Use TABLE 4 above to answer the questions that follow.

4.1.1 Dina's two daughters are in Kearsney College and her son is in St John's College.
How much more school fees is she paying for them in 2023 than in 2022? (3)

4.1.2 Determine the median of the 2023 school fees for these schools. (2)

4.1.3 The mean total school fees for 2022 is R172 093.
Calculate **B**, the value of the school fees of King David High School. (4)

4.1.4 Determine the probability, as a percentage, of randomly selecting a school from the list whose school fees for 2023 was less than R178 000. (3)

4.1.5 Calculate value **C**, the percentage increase of Crawford College school fees from 2022 to 2023. Round your answer to one decimal.

The following formula may be used.

$$\textbf{\% Increase} = \frac{\textbf{School fees for 2023 - School fees for 2022}}{\textbf{School fees for 2022}} \times \textbf{100\%}$$

(4)

4.1.6 Determine what the school fees of St Mary's School would be for 2024, if the percentage increase is 7,5%. (3)

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4.1.7 Diego wanted to save money to enrol his son in Crawford College, Sandton. He invested R150 000 for one year and nine months in a fixed deposit account with an annually compounded interest rate of 9,55%.

(a) Define the term *interest* in the given context. (2)

(b) He stated that he would have sufficient funds, after one year and nine months, to enrol his son in Crawford College Sandton in 2023.

Verify, showing ALL calculations, whether this statement is CORRECT. (6)

4.2 Thato and her friend are planning to visit Weltevrede Lion Farm during their school holiday.
The return trip distance between Nelspruit and Heilbron is 944 km.

TABLE 5 shows the rates for Alama car rental and Enterprise car rental.

TABLE 5: FEES FOR CAR RENTAL COMPANIES

	ALAMA CAR RENTAL 	**ENTERPRISE CAR RENTAL** 
BOOKING DEPOSIT	R2 000	None
FREE KILOMETRES	200 km	None
TARIFF	R5,06 per km	R6,15 per km

[Adapted from www.Hertz.co.za]

Use TABLE 5 and the information above to answer the questions that follow.

4.2.1 The formula below is used to calculate the cost of Enterprise car rental.

Cost (R) = 6,15 × d, where d = number of kilometres travelled

Provide the formula to calculate the cost of Alama car rental. (3)

4.2.2 Thato decided to use Enterprise car rental.
Verify, showing ALL calculations, whether her choice is the most economical. (5)

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QUESTION 5

5.1 Soccer is being played worldwide and fans are following their favourite soccer players on Instagram.
TABLE 6 on ANNEXURE C shows the top 10 highest paid soccer players, for 2022, in the world.

Use TABLE 6 on ANNEXURE C to answer the questions that follow.

5.1.1 Write down the name of the team for which the youngest player on the list is playing. (2)

5.1.2 Determine the probability, as a decimal, of randomly selecting a soccer player from the top 10 list who is older than 30 years. (3)

5.1.3 Calculate the inter-quartile range for the Instagram followers of the soccer players.
Round off your answer to the nearest million.

You may use the following formula:

Inter-quartile range = Quartile 3 – Quartile 1 (6)

5.1.4 Determine (in South African rand) Neymar Jr's ON FIELD salary for 2022.

TABLE 7 shows the exchange rate for five countries on 24 May 2023.

TABLE 7: EXCHANGE RATE FOR FIVE COUNTRIES ON 24 MAY 2023

CURRENCY	UNITS PER ZAR	ZAR PER UNITS
British pound	0,042007	23,805798
Canadian dollar	0,070602	14,163902
Euro	0,048304	20,702018
US dollar	0,051947	19,250546
Japanese Yen	7,240478	0,138112

[Adapted from https://www.x-rates.com] (3)

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5.2 Jimmy is a 66-year-old entrepreneur, earns an annual taxable income of R627 010. Jimmy's spouse is on his medical aid.

TABLE 8 indicates the tax tables for the 2022/2023 tax year.

TABLE 8: TAX RATES FOR THE 2022/2023

TAXABLE INCOME (R)	RATES OF TAX (R)
1 – 226 000	18% of taxable income
226 001 – 353 100	40 680 + 26% of taxable income above 226 000
353 101 – 488 700	73 726 + 31% of taxable income above 353 100
488 701 – 641 400	115 762 + 36% of taxable income above 488 700
641 401 – 817 600	170 734 + 39% of taxable income above 641 400
817 601 – 1 731 600	239 452 + 41% of taxable income above 817 600
1 731 601 and above	614 192 + 45% of taxable income above 1 731 600

ANNUAL TAX REBATES

AGE	AMOUNT (R)
Primary	16 425
Secondary (65 years and older)	9 000
Tertiary (75 years and older)	2 997

MEDICAL AID TAX CREDITS

CRITERIA	AMOUNT PER MONTH (R)
For the taxpayer	347
For the taxpayer and one dependant	694
For each additional dependant	234

[Adapted from www.sars.gov.za/tax-rates]

Use TABLE 8 and the information above to answer the questions that follow.

5.2.1 Define the term *annual tax rebates* in the given context. (2)

5.2.2 Verify, showing ALL calculations, that Jimmy's tax that he pays per month is more than R11 000. (8)

5.2.3 Explain why citizens who are 75 years and older pay less tax than citizens younger than 75 years, even though they earn the same taxable income. (2)

5.2.4 Jimmy's annual gross salary of R677 848,65 increased by 5,8% in 2022. Calculate his gross salary in 2021, before the increase. (2)

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TOTAL: 150

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ADDENDUM

SEPTEMBER 2023

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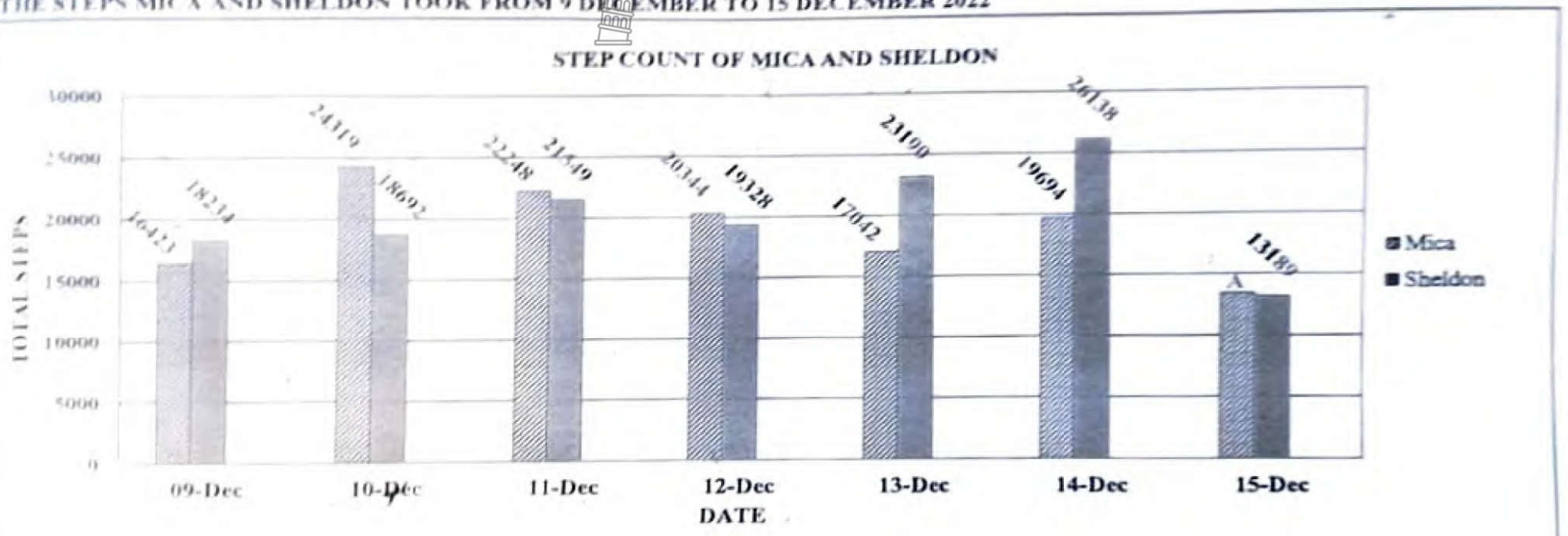
This addendum consists of 4 pages and 3 annexures.

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ANNEXURE A

QUESTION 3.1

THE STEPS MICA AND SHELDON TOOK FROM 9 DECEMBER TO 15 DECEMBER 2022



	MICA	SHELDON
Total steps for the week	133 514	---
Daily average	19 073	B
% Walking	---	91%
% Climbing	---	9%

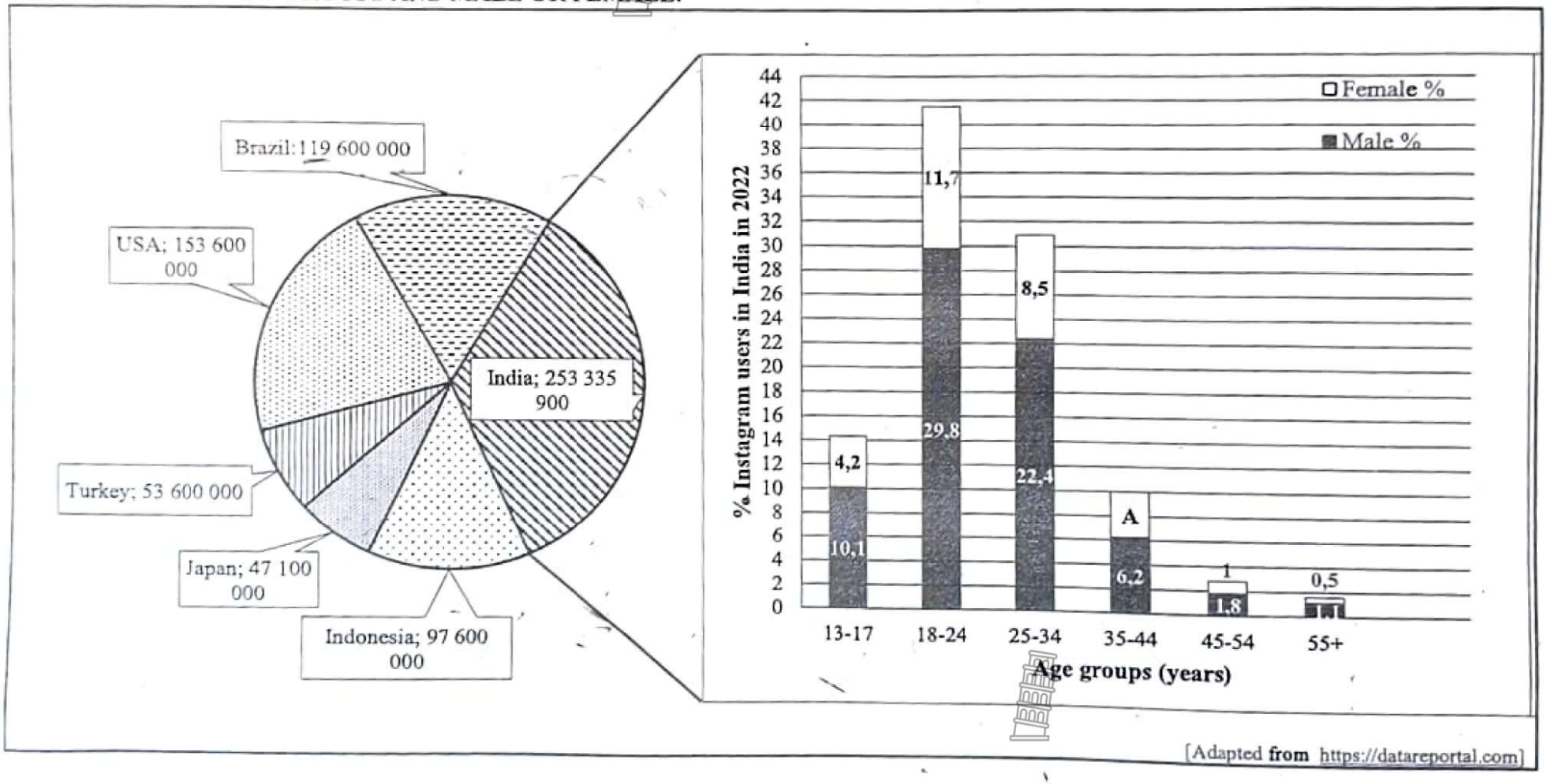
[Adapted from HUAWAI health app]

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ANNEXU1

QUESTION 3.2

COUNTRIES WORLDWIDE WITH THE MOST INSTAGRAM USERS IN 2022 AND THE % INSTAGRAM USERS IN INDIA FOR 2022, ACCORDING TO AGE GROUPS AND MALE OR FEMALE.



[Adapted from https://datareportal.com]

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ANNEXURE C

QUESTION 5.1

TABLE 6: TOP 10 HIGHEST PAID SOCCER PLAYERS IN THE WORLD FOR 2022

NAME	TEAM	NATIONALITY	AGE	INSTAGRAM FOLLOWERS (in 100 000)	SALARY (in million US $)		
					ON FIELD	OFF FIELD	TOTAL
Kylian Mbappé	Paris Saint-Germain	France	23	727	110	18	128
Lionel Messi	Paris Saint-Germain	Argentina	35	3 640	65	55	120
Cristiano Ronaldo	Manchester United	Portugal	37	4 860	40	60	100
Neymar Jr.	Paris Saint-Germain	Brazil	30	1 790	55	32	87
Mohamed Salah	Liverpool	Egypt	30	530	35	18	53
Erling Haaland	Manchester City	Norway	22	193	35	4	39
Robert Lewandowski	Barcelona	Poland	34	302	27	8	35
Eden Hazard	Real Madrid	Belgium	31	271	27	4	31
Andrés Iniesta	Vissel Kobe	Spain	38	402	25	5	30
Kevin de Bruyne	Manchester City	Belgium	31	191	25	4	29

[Adapted from www.forbes.com]

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