education

Department of Education
FREE STATE PROVINCE

PREPARATORY EXAMINATION

GRADE 12

MATHEMATICAL LITERACY P1



TIME: 3 HOURS

This question paper consists of 13 pages,
1 answer sheet and an addendum with 2 annexures.

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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 5.1
3. Answer QUESTION 2.1 on the attached ANSWER SHEET.
   Write your name and surname in the spaces provided on the ANSWER SHEET. Hand in the ANSWER SHEET with your ANSWER BOOK
4. Start EACH question on a NEW page.
5. An approved calculator (non-programmable and non-graphical) may be used 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. Pictures and diagrams are NOT necessarily drawn to scale unless stated otherwise.
10. Write neatly and legibly.

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QUESTION 1

1.1 In TABLE 1 below is a list of explanations and definitions of concepts used in Mathematical Literacy.

TABLE 1: EXPLANATIONS AND DEFINITIONS OF CONCEPTS

A	Annual tax payable before rebates.
B	A special type of diagram is used to determine the outcomes of an event in a game.
C	A numerical description of how likely an event is to occur.
D	Ordinary and necessary costs of running a small business.
E	The financial benefit is realised when money generated from a business exceeds the expenses, costs, and taxes involved in keeping the business.
F	The process of using a research tool to gather information.
G	Chance of a particular outcome in a game of sport.
H	A tax relief is given to a taxpayer.

Use the information above to write down the letter of the explanation or definition (A to H) of EACH of the following:

1.1.1 Survey (2)

1.1.2 Tax rebate (2)

1.1.3 Probability (2)

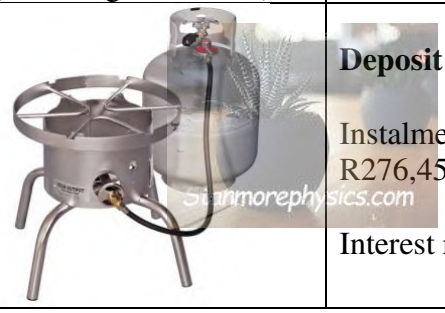
1.1.4 Profit (2)

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1.2 A gas cylinder and outdoor cooker are useful devices to provide an alternative energy source during camping.

Below is a picture of a set consisting of a gas cylinder and an outdoor cooker with different payment options.

PAYMENT OPTIONS OF A GAS CYLINDER AND OUTDOOR COOKER SET

CASH PRICE R10 099 (including 15% VAT)	**HIRE-PURCHASE**	**ONLINE CREDIT**
	**Deposit:** 10% Instalment: R276,45 p.m. × 36 months Interest rate: 9,5%	**Instalment:** R942,50 p.m. × 12 months Interest rate: 9,76%

[Source: walmat.com]

Use the information above to answer the questions that follow.

1.2.1 Name the TWO most costly payment options for this gas cylinder and outdoor cooker set. (2)

1.2.2 Define *hire-purchase* within the given context. (2)

1.2.3 Write down the interest rate if the gas cylinder and outdoor cooker set were bought on hire-purchase. (2)

1.2.4 Calculate the total cost of the gas cylinder and outdoor cooker set, using online credit. (2)

1.2.5 A 10% discount is given on the cash price.

Calculate the amount of discount given if the gas cylinder and outdoor cooker set are purchased for cash. (2)

1.2.6 Choose which ONE of the following **A, B or C** completes or explains the leading statement below the best.

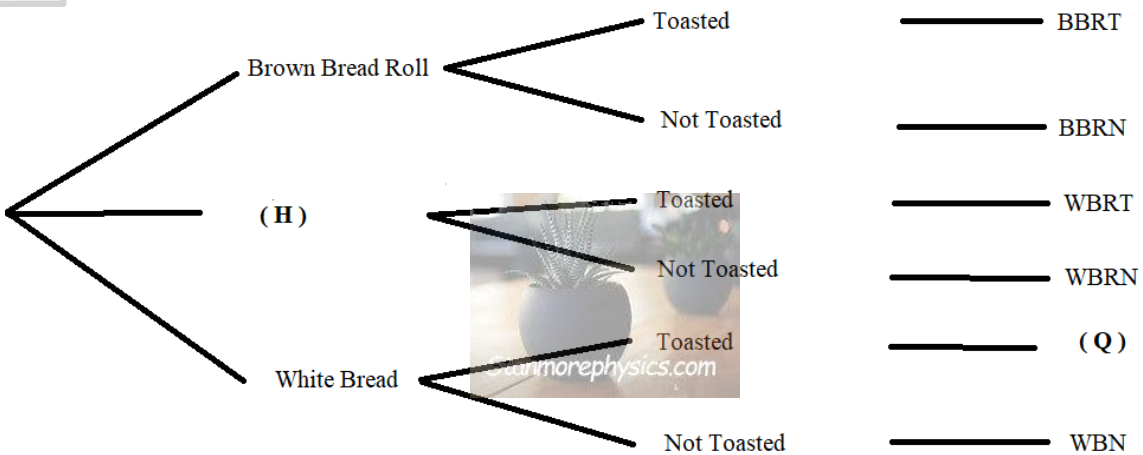
Statement: '15% VAT is an indirect form of tax because it is …'

A. included in the cash price.
B. paid straight to the government.
C. collected by a retail store from the customer who pays the tax included in the price of purchased goods. The store later files a tax return and forwards the tax takings to the government. (2)

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1.3 Keitumetse's catering lunch pack has the following bread rolls (either white or brown) and white bread options to choose from:

- White Bread Roll (**WBR**)
- Brown Bread Roll (**BBR**) and
- White Bread (**WB**)
- Where EACH being either Toasted (**T**) or Not Toasted (**N**)



Use the information above to answer the questions that follow.

1.3.1 Identify the type of diagram illustrated above. (2)

1.3.2 Complete the missing labels **(H)** and **(Q)**. (4)

1.3.3 Write down the total number of outcomes. (2)

1.3.4 Determine the number of bread rolls outcomes. (2)
[30]

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QUESTION 2

2.1 Goitsemodimo is an insurance saleslady and earns a basic salary of R12 000 per month plus a commission. In September 2024 she expects to make R22 000 in commission plus R8 120 bonus.

Her monthly expenses are as follows:

- Rent = R 8 500
- Fuel = R2 500
- Electricity = R800
- Monthly gym membership = R350
- Car payment = R 4 600
- Insurance = R1 975
- Cell phone = R800
- Groceries = R3 000
- Entertainment = R1 700
- Water usage = R400

Use the information above to answer the questions that follow.

2.1.1 Use the provided ANSWER SHEET to construct Goitsemodimo's September 2024 budget. (6)

2.1.2 Express Goitsemodimo's:

(a) ratio of entertainment expenses to rent expenses in the from **1: …** (2)

(b) variable expenses as a percentage of her basic salary. (4)

2.2 Goitsemodimo plans to purchase a FORD RANGER bakkie (light delivery vehicle) from her R1,25 million investment earnings. She received the following price quotation from a car dealer on 28 February 2024:

EXTRACT OF A PRICE QUOTATION FOR A BAKKIE FROM A DEALER:

		Rand (R)
Selling price (excluding VAT) without accessories (extras)		480 263,16
Discount		18 420,00
ACCESSORIES (EXTRAS)	**PICTURE OF AN ACCESSORY**	
Towbar		3 550,26
Rollbar		3 500,00
Nudge bar/Bullbar cost and fitting		6 898,25
Transaction fee		1 315,80
SUBTOTAL		**477 107,47**
VALUE-ADDED TAX		**…%**
TOTAL DUE		**548 673,59**

[Source: Group 1 Nissan and The Glen]

Use the information above to answer the questions that follow.

2.2.1 Define the word *price quotation* in the context above. (2)

2.2.2 Write R1,25 million in full, using numbers only. (2)

2.2.3 Calculate (rounded off to TWO decimal places) the percentage discount given on the bakkie's selling price, excluding VAT. (3)

2.2.4 Show with calculation how the amount of five hundred and forty-eight thousand six hundred and seventy-three rand and fifty-nine cents was determined. (3)

2.2.5 Give ONE reason why customers would prefer to install the accessory **Bullbar** as shown in the quotation. (2)

2.2.6 Goitsemodimo invested R1,25 million as follows:

- Thirty-three (33) months investment period.
- 6,7% interest per annum, compounded annually.

Show whether the **interest earned** on this investment is enough to purchase the bakkie. (9)

[33]

QUESTION 3

3.1 Virginia Health and Fitness Centre gives Spinning organised classes by three different instructors, Mpho, Andrea and Eve.

PICTURE OF A PERSON ON A SPINNING BICYCLE



[Source: https://m.media-amazon.com]

- **Mpho**: The evening group
- **Andrea**: A day group with 20 registered participants and
- **Eve**: The morning group has 8 registered participants.

ANNEXURE A shows the attendance records for the three groups over 18 days, as well as corresponding graphs representing the attendance for Mpho and Andrea's groups.

Note: The spinning studio may also be accessed by non-group or any member of the fitness centre beyond organised classes with no instructor leading spinning.

Use ANNEXURE A and the information above to answer the questions that follow.

3.1.1 State the best tool to collect respective data for attendance for the spinning groups. (2)

3.1.2 Determine the missing value, R, if the mean attendance for Mpho's group is 16. (4)

3.1.3 Determine for Andrea's group the:

(a) Median. (3)

(b) Interquartile range (IQR). (3)

3.1.4 Give ONE possible reason why Eve's group has full attendance on more days than Andrea's. (2)

3.1.5 Give ONE reason why on the box and whisker diagrams the attendance of Andrea's group only shows a lower whisker. (2)

3.2 The table below shows the number of children per province (in '000) living in the Republic of South Africa (RSA) in 2020 and 2021. Some values have been omitted.

TABLE 2: NUMBER OF CHILDREN IN RSA PER PROVINCE, 2020 and 2021

PROVINCE	Number of children (in thousands)		
	2020	2021	Percentage change
GP	A	4 417	– 4,08
WC	…	2 092	– 2,92
NW	…	1 439	– 0,96
LP	2 492	2 472	– 0,80
EC	2 569	2 554	– 0,58
KZN	4 300	4 302	0,05
NC	437	440	0,69
MP	1 710	1 722	0,70
FS	1 027	1 057	2,92
TOTAL	20 748	20 495	

[Adapted from www.childrencount.uct.ac.za]

NOTE

- The estimated population of RSA in 2021 is 60,14 million and children account for 34%.
- Children: a person under the age of 18.

Use the information above to answer the questions that follow:

3.2.1 Write down the province with the third-highest number of children in 2021. (2)

3.2.2 State whether the above provinces' percentage change for the number of children is arranged in *descending* or *ascending* order. (2)

3.2.3 Show with detailed calculation how the percentage change of 0,69% for NC was determined. (2)

3.2.4 Calculate the value of **A**, the number of children in GP in 2020. (4)

3.2.5 Determine, in millions, the difference between the number of children as shown in the table and the estimated population in 2021. (4)

[30]

QUESTION 4

4.1 Monowe is a 60-year-old nurse who started to work at Pelonomi Hospital on 1 January 1992. She contributed to the Govern Employee Pension Fund (GEPF) from 1 January 1992. She considered retirement on 31 December 2024 when her final salary per year will be R540 333.

She found the information and formula below, which the GEPF uses to calculate retirement pay-out packages.

GEPF NORMAL BENEFITS

Retiring with LESS THAN 10 YEARS of service	Retiring with MORE THAN 10 YEARS of service
You receive a once-off lump sum (gratuity).	Your benefits consist of two parts: • A once-off lump sum (gratuity) • A monthly pension called an annuity

The gratuity and annuity are calculated using the following formulae:

Gratuity = 6,72% × final salary per year × years of pensionable service

Annuity (per year)

$$= \left(\frac{1}{55} \times \text{final salary per year} \times \text{years of pensionable service}\right) + 360$$

[Source: *GEPF Member Guide 2023]*

Use the information above to answer the questions that follow.

4.1.1 State ONE benefit of contributing to GEPF. (2)

4.1.2 Calculate the total difference (rounded off to the nearest rand) of Monowe's gratuity if she extends her employment by another 4 years, it is when her salary will be R613 650. (6)

4.1.3 TABLE 3 below shows the income tax rates for the 2024/2025 tax year.

TABLE 3: 2024/2025 TAX YEAR RATES

TAXABLE INCOME (R)	RATES OF TAX (R)
R1–R237 100	18% of each R1 earned
R237 101–R370 500	R42 678 + 26% of the amount above R237 100
R370 50– R512 800	R77 362 + 31% of the amount above R370 500
R512 801–R673 000	R121 475 + 36% of the amount above R512 800

TAX REBATES 2024/2025

Primary (below 65)	R17 235
Secondary (65 and older)	R9 444
Tertiary (75 and older)	R3 145

[Source: www.sars.gov.za]

Calculate Monowe's monthly annuity after tax if she retires on 31/12/2024. (9)

4.2 Monowe lives near FUNTASIA FUN PARK and RESTAURANT (FFPR) open for all ages' entertainment and refreshment.

FUNTASIA FUN PARK AND RESTAURANT IN WELKOM

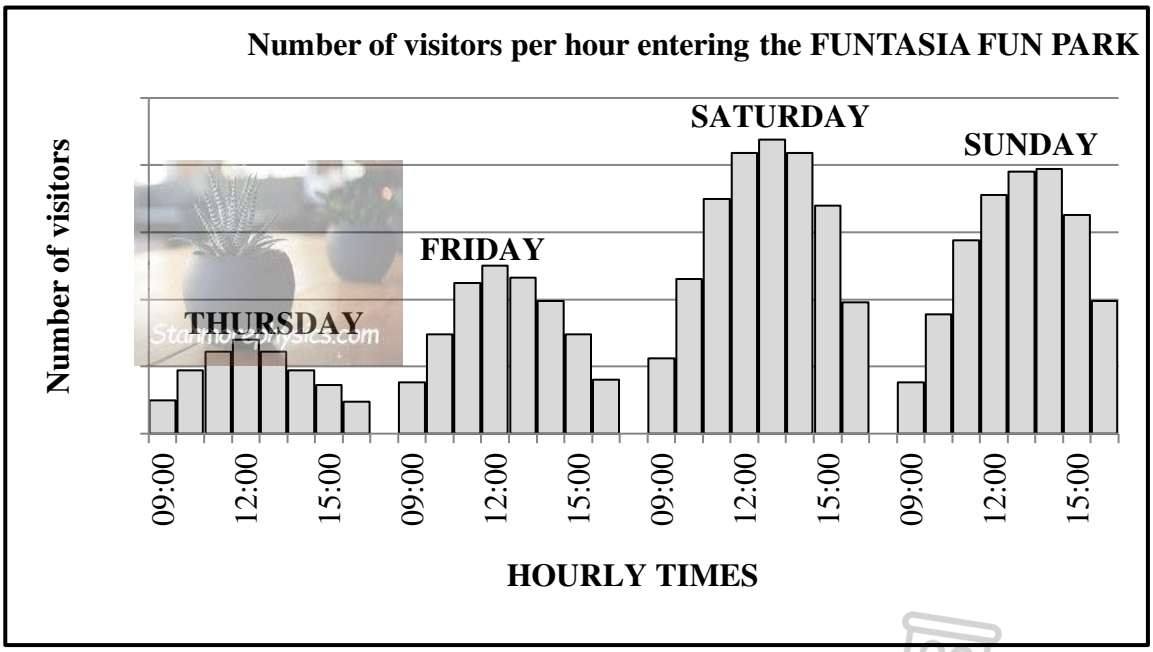


[Source: https://10619-2.s.cdn12/rests/original/105_51191448.jpg]

The bar graphs below show the number of visitors per hour entering the FUNTASIA FUN PARK on four days of the week.

Note:

- On Mondays the park is not open.
- The park is open from 09:00 to 19:00.



[Adapted from https://www.welkomcity.africa]

Use the graph and information above to answer the questions that follow.

4.2.1 Identify the type of bar graph used to display the data. (2)

4.2.2 Name the items missing on the graph regarding (a) and (b) as directed below.

(a) Days.
(b) Visitors (4)

4.2.3 Describe a trend that relates to the number of visitors per hour entering the park. (2)

[25]

QUESTION 5

5.1 Table 4 below and the pie charts on ANNEXURE B show the United States of America (USA) light vehicle production and total world vehicle production shares.

TABLE 4: USA Light Vehicle Production and Total World Vehicle Production Shares, 2017

MANUFACTURER	SHARE OF USA PRODUCTION	SHARE OF WORLD PRODUCTION
Ford (FOR)	20%	6%
General Motors (GM)	18%	6%
Fiat Chrysler (FCA)	…	7%
Honda (HON)	11%	4%
Toyota (TOY)	11%	10%
Nissan (NIS)	8%	4%
Subaru (SUB)	3%	1%
Hyundai (HYU)	4%	7%
Kia (KIA)	2%	With Hyundai
Volkswagen (VW)	1%	7%
Other	…	48%
Total Production (Million Vehicles)	**11,8**	**90,2**

[Source: www.energy.gov / ward's automotive group]

Stanmorephysics.com

Use the information above and ANNEXURE B to answer the questions that follow.

5.1.1 Determine the FCA share of United States of America production. (2)

5.1.2 Calculate the number of SUB vehicles produced in the USA. (2)

5.1.3 It is stated that three manufacturers contribute more than half of USA vehicle production. Verify the statement showing calculations. (3)

5.1.4 Identify the modal percentage in the world production share. (2)

5.1.5 The average production cost for a Toyota in 2017 was ¥ 1 870 500.

Calculate the rand value of the total world production in 2017.

Use: ¥ 1 = $0,0069
R1 = $0,054 (6)

5.2 Dukes owns a fleet of three passenger-type cabs (taxi cars) in the USA that he uses as Uber for transporting people according to the model of car needed.

Transportation is operated using TWO options as shown below.

Option 1:
UPFRONT fare = base fare (call-out fee) + (number of miles × per mile fare)

Option 2:
POST-TRIP fare = (number of minutes × per minute fare) + (number of miles × per mile fare)

TABLE 3 below shows the different passenger-type cars and their respective rates in CHICAGO for both UPFRONT and POST-TRIP fare options, including an example of a 10,5-mile trip using the UPFRONT fare option.

TABLE 3: RATES FOR TRANSPORT CARS BY TYPE IN CHICAGO FOR UPFRONT AND POST-TRIP FARE OPTIONS

	PASSENGER CAR BY TYPE		
COST	**Hatchback**	**Sedan**	**SUV**
Base fare (call-out fee)	$0,00	$ 18,00	$22,87
Per minute fare	$1,15	$ 0,55	$ 1,60
Per mile fare	$1,90	$ 4,05	$ 7,85
*Minimum fare	$14,98	$15,00	$40,00
Cancellation fee	$5,00	$10,00	$15,00
Total fare (for a 10,5 - mile trip using the UPFRONT option)	**$19,95**	**$60,53**	**UL**

[Adapted from www.rideester.com/uber-rates,2023]

***Minimum fare**: the lowest fare one would be charged per trip.
Note: Uber is a transportation company with an APP that enables one to book a cab to get from point A to point B.

Use the information above to answer the questions that follow.

5.2.1 Calculate the missing value **UL**. (3)

5.2.2 Calculate (rounded off to the nearest mile) the maximum distance for which a person can use the Hatchback if you pay the minimum upfront fare. (4)

5.2.3 Explain the importance of a **cancellation fee** for the Uber service provider. (2)

5.2.4 The user travelled a 30-mile distance with Sedan. The post-trip fare option was used, and the trip took 1 hour and 45 minutes to complete.

The user stated that she would have saved more than $20,00 if she had used the upfront fare option.

Show, with calculations, whether her statement is correct. (8)

[32]

TOTAL: 150

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Grade 12 Prep. Exam.

SURNAME: ……

NAME: ……..

CLASS: ……

ANSWER SHEET

QUESTION 2.1.1

Goitsemodimo's budget for September 2024

INCOME in Rand (R)	
TOTAL	**= …….**

EXPENSES in Rand (R)	
TOTAL	**= …….**

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ADDENDUM

SEPTEMBER 2024

This addendum consists of 3 pages with 2 annexures.

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ANNEXURE A

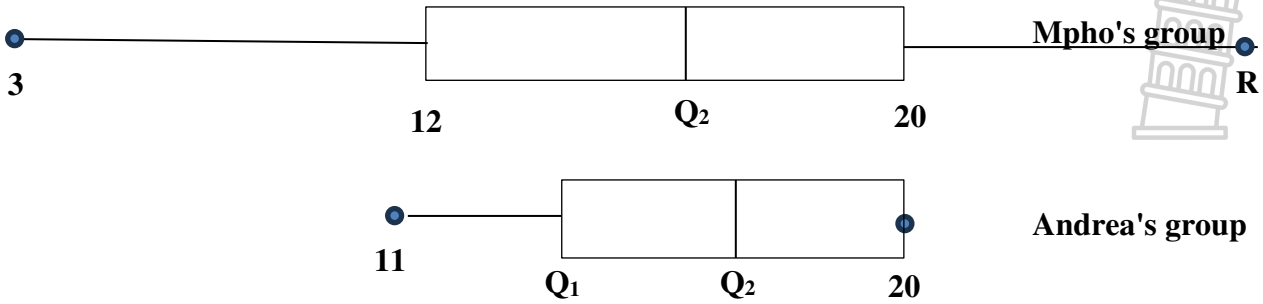
QUESTION 3.1

RECORDS OF ATTENDANCE FOR THREE GROUPS OVER A PERIOD OF 18 DAYS (D1–D18)

Mpho's group																	
D1	**D2**	**D3**	**D4**	**D5**	**D6**	**D7**	**D8**	**D9**	**D10**	**D11**	**D12**	**D13**	**D14**	**D15**	**D16**	**D17**	**D18**
20	**R**	9	10	12	3	15	15	14	8	**R**	17	19	20	17	17	20	**R**
Andrea's group																	
D1	**D2**	**D3**	**D4**	**D5**	**D6**	**D7**	**D8**	**D9**	**D10**	**D11**	**D12**	**D13**	**D14**	**D15**	**D16**	**D17**	**D18**
12	20	14	20	16	15	19	20	18	20	19	15	20	11	18	12	20	19
Eve's group																	
D1	**D2**	**D3**	**D4**	**D5**	**D6**	**D7**	**D8**	**D9**	**D10**	**D11**	**D12**	**D13**	**D14**	**D15**	**D16**	**D17**	**D18**
7	8	8	6	8	6	7	8	8	6	6	7	8	8	8	8	7	8

[Adapted from www.emorycommunityswimming.com]

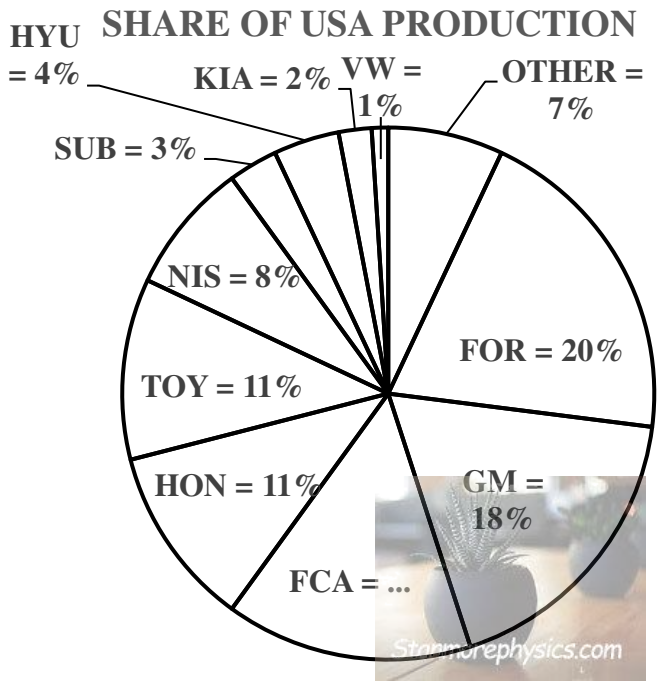
BOX AND WHISKER DIAGRAMS REPRESENTING ATTENDANCE FOR MPHO and ANDREA GROUPS OVER 18 DAYS

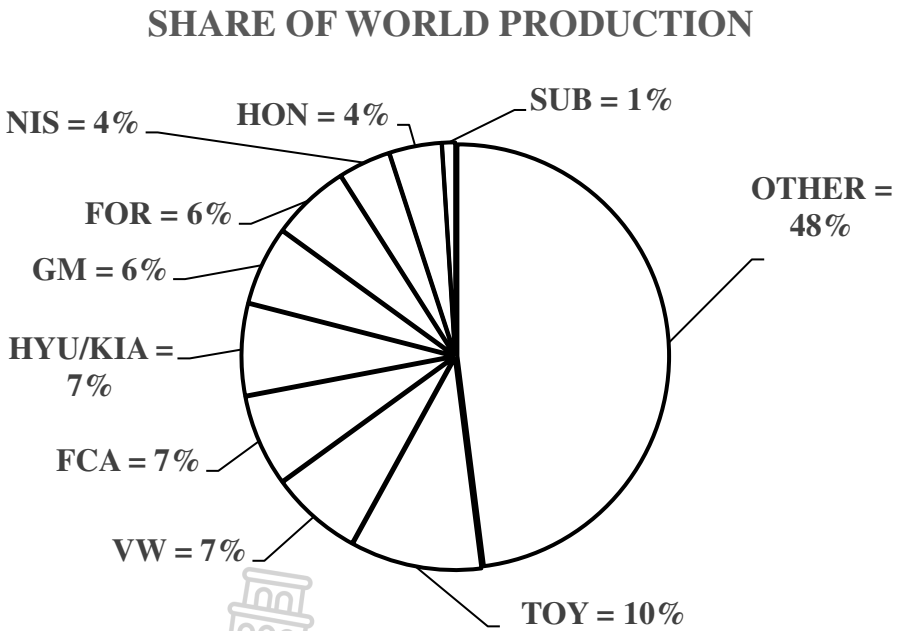


ANNEXURE B

QUESTION 5.1

UNITED STATES OF AMERICA (USA) LIGHT VEHICLE PRODUCTION AND TOTAL WORLD VEHICLE PRODUCTION SHARES, 2017





11,8 million vehicles – USA production	90,2 million vehicles – world production

NOTE:

- Some information is omitted.
- OTHER consist of several different types of vehicles contributing less than 1% each.

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