

**CRITICAL AND CREATIVE THINKING ITEMS**

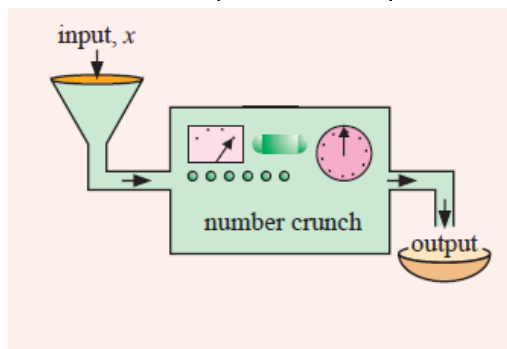
**CLASS VII : CHAPTER I : INTEGERS**

**INDEX**

<b>S.No.</b>	<b>Theme of the item</b>
1.	Number Crunching Machine
2.	Pocket Money
3.	Number & Shapes
4.	Grocery Shopping
5.	World of Titan
6.	Board Game – Who will win?
7.	Stack of cards
8.	GROCERY
9.	LIBRARY CHARGES
10.	TEMPERATURE
11.	GAME OF DICE
12.	Social studies
13.	Integer Product
14.	Property Addition & Subtraction
15.	Basic Operations
16.	Magic Square
17.	Temperature
18.	Equinoxes`
19.	Sea Level
20.	Sign Rules
21.	Absolute value of integer
22.	Patterns
23.	Body Mass Index
24.	Scientific Experiment
25.	Water Tank
26.	Playing with Stairs
27.	Water Level
28.	Class Room Problem
29.	Flipping of coin

<b>Domain:</b> Mathematical Literacy	<b>Theme 1:</b> Number Crunching Machine	<b>Class(es):</b> VII <b>Expected time:</b> 15 minutes <b>Total Credit:</b> 6
<b>Description of Item:</b>	<b>Learning Outcome:</b>	
✓	Text	
✓	Image	
	Table	
	Graph	
	Map	
	Poem	

The figure shows a number crunching machine in which any integer can be fed as input. There are a set of instructions which produces output as follows:



If a positive integer is fed into the number crunching machine, it produces one of two results:

- If the integer fed in is EVEN, the machine divides the number by 2.
- If the integer fed in is ODD, the machine subtracts one from the number.

If a negative integer is fed into the number crunching machine, it produces its additive inverse.

**Question1.** Find the result when the following numbers are fed into the machine:

- (i) 123      (ii) -72

**Question2.** What can be the input to the machine if the output is 18?

- (a) 36      (b) 19      (c) -18      (d) All of the above

**Question3.** It is possible to feed the output from the machine back into the input, and continue to do so until the output reaches zero. For example, with an initial input of 11, the following would occur:

11 → 10 → 5 → 4 → 2 → 1 → 0

We see that 6 steps are required to reach zero.

Give the number of steps required to reach zero if you start with **-24**. Show the steps.

## MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Change and Relationship
Context	Scientific
Item format	MCQ and Objective
Cognitive Process	Employing Mathematical concepts, facts and reasoning
Proficiency Level	7

### Credit Pattern:

**Full Credit: 2 Marks**

**Partial Credit: 1 Mark**

**No Credit: 0 Mark**

### Description of Answer Key and Credits:

#### Question 1

Full Credit: (i) 122, (ii) 72

No Credit: Any other or missing response

#### Question 2

Full Credit: (d) All of the above

No Credit: Any other or missing response

#### Question 3

Full Credit: (Seven Steps)

-24 → 24 → 12 → 6 → 3 → 2 → 1 → 0

No Credit: Any other or missing response

<b>Domain:</b> Mathematical Literacy	<b>Theme 2:</b> Pocket Money	<b>Class(es):</b> VII <b>Expected time:</b> 12 minutes <b>Total Credit:</b> 6												
<b>Description of Item:</b>	<b>Learning Outcome:</b>													
<table border="1"> <tr><td>✓</td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	✓	Text		Image		Table		Graph		Map		Poem	Students will be able to interpret the problem and apply basic operation on integers	
✓	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

During a twelve week school term, Tej and his sister Smriti agreed to wash the dishes for their parents from Monday to Friday. Tej did them on Monday, Wednesday and Friday, leaving Smriti to do them on Tuesday and Thursday. They negotiated with their parents to be paid Rs. 2 for the first week, Rs.4 for the second week, Rs.8 for the third week, and so on. If anyone forgets to do his/her job on any weekday, he/she has to return Rs.3.

Consider the following questions:

**Question1.** How *much* will they be paid in weeks 4, 5 and 6?

**Question2.** What amount of money would *Tej* be paid for the *final* week of term?

**Question3.** If Smriti forgets to wash dishes on 3 days in the first four weeks of their school term, how much money would she be getting during the entire four weeks?

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Mathematical Thinking
Overarching Idea	Quantity
Context	Personal
Item format	Answer the questions
Cognitive Process	Formulating situations mathematically
Proficiency Level	7

**Credit Pattern:**

**Full Credit: 2 Marks**

**Partial Credit: 1 Mark**

**No Credit: 0 Mark**

**Description of Answer Key and Credits:**

**Question 1**

Full Credit: Rs. 16, Rs.32 and Rs.64

Partial Credit: Any two correct responses.

No Credit: Any other or missing response

**Question 2**

Full Credit: Rs.4096

No Credit: Any other or missing response

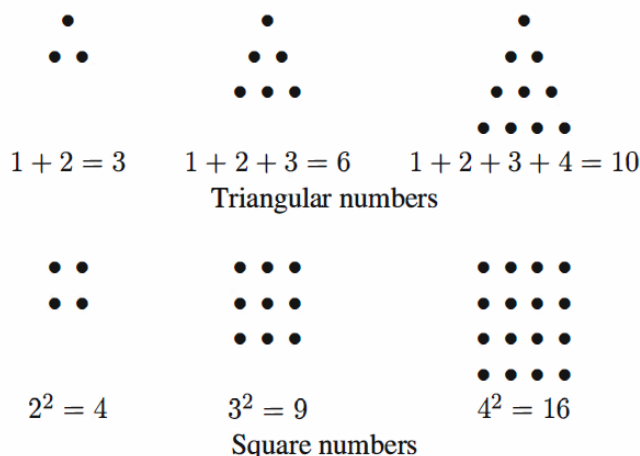
**Question 3**

Full Credit: Rs.(2+4+8+16) – 3x3 = Rs.21

No Credit: Any other or missing response

<b>Domain:</b> Mathematical Literacy	<b>Theme 3:</b> Number & Shapes	<b>Class(es):</b> VII <b>Expected time:</b> 07 minutes <b>Total Credit:</b> 4
<b>Description of Item:</b>	<b>Learning Outcome:</b> Students will be able to define and understand triangular and square numbers.	
✓ Text		
✓ Image		
Table		
Graph		
Map		
Poem		

The square numbers are the numbers 1, 4, 9, 16,... that can be arranged in the shape of a square. The triangular numbers are the numbers 1, 3, 6, 10,... that can be arranged in the shape of a triangle. The first few triangular and square numbers are illustrated in Figure



**Question 1.** Check if there are any triangular numbers that are also square numbers (other than 1). If exists, find smallest such number.

**Question 2.** How many such numbers are there?

**MATHEMATICAL LITERACY**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Representing
Overarching Idea	Space and Shape
Context	Scientific
Item format	Answer the questions
Cognitive Process	Interpreting Mathematical Outcomes
Proficiency Level	7

**Credit Pattern:**

**Full Credit: 2 Marks**

**Partial Credit: 1 Mark**





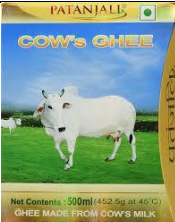
**No Credit: 0 Mark**

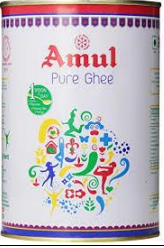

**Description of Answer Key and Credits:**

<p><b>Question 1</b> Full Credit: Yes, 36 No Credit: Any other or missing response</p> <p><b>Question 2</b> Full Credit: Infinite No Credit: Any other or missing response</p>
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<b>Domain:</b> Mathematical Literacy	<b>Theme 4:</b> Grocery Shopping	<b>Class(es):</b> VII <b>Expected time:</b> 15 minutes <b>Total Credit:</b> 4												
<b>Description of Item:</b> <table border="1"><tr><td>✓</td><td>Text</td></tr><tr><td>✓</td><td>Image</td></tr><tr><td>✓</td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>	✓	Text	✓	Image	✓	Table		Graph		Map		Poem	<b>Learning Outcome:</b> Students will be able to interpret the problem and apply basic operations on integers	
✓	Text													
✓	Image													
✓	Table													
	Graph													
	Map													
	Poem													

The following table shows the price (in rupees) of various brands of clarified butter (ghee) available at different marketplace:

500 ml Pack of Clarified Butter (Ghee)			
	254	250	262
	285	280	276

	246	250	244
	271	293	287
Delivery Charges	Rs. 30 for orders less than Rs. 499	Rs. 30 for orders less than Rs. 599	Rs. 50 for orders less than Rs.299

**Question 1.** Anu wants to buy 500 ml of cow's ghee and 500 ml of pure ghee, which e commerce sight should be chosen by him? How ~~money~~ much she requires.

**Question 2.** Khushi wishes to purchase only cow ghee as it is considered healthier than other forms. She wants to try both Amul and Patanjali's cow ghee for their taste and quality. As there are 8 members in her family, she decides to buy 2000 ml of ghee. Which e commerce sight offers best rates? (Assume equal quantity for both brands)

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Problem Tackling
Overarching Idea	Uncertainty and Data
Context	Occupational
Item format	Answer the questions
Cognitive Process	Employing Mathematical Concepts, facts, procedures and reasoning.
Proficiency Level	7

**Credit Pattern:**

**Full Credit: 2 Marks**

**Partial Credit: 1 Mark**

**No Credit: 0 Mark**

**Description of Answer Key and Credits:**

<p>Question 1  Full Credit: Amazon, Rs. 556  No Credit: Any other or missing response</p> <p>Question 2  Full Credit: Big Basket  No Credit: Any other or missing response</p>
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<b>Domain:</b> Mathematical Literacy	<b>Theme 5:</b> World of Titan	<b>Class: VII</b> <b>Expected Time: 10 minutes</b> <b>Total credits: 4</b>
<b>Description of item:</b>	<b>Learning outcomes:</b> Students will learn about integers, its use in daily life situation etc.	
✓	Text	
✓	Image	
	Table	
	Graph	
	Map	
	Poem	

At the occasion of new year-2020, Anand went to the shop of watches to purchase a wrist watch for her daughter. He purchased a wrist watch of cost Rs 795.00. At the time of payment the shopkeeper told to pay amount of Rs 717.00. Anand asked shopkeeper about the difference of amount. Shopkeeper told that there is a discount of Rs 79.50 for the New Year and a discount of Rs. 30 for loyalty points due to membership card that he had. The invoice is given as below. NOTE: Rs 0.50 will be rounded off to 0.00

**WORLD OF TITAN**  
Unit No.4A, Lower Ground Floor,  
Survery No.144, Yelahanka,  
Allalassandra Village  
560064, BANGALORE

**TAX INVOICE**

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STORE GSTIN NO: 29AAACT5131A1ZT  
STORE STATE CODE: 29  
CIN: L74999TZ1984PLC0  
INVOICE NO : 100003226  
INVOICE DATE AND TIME : 31/12/2019 21:06

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DETAILS OF RECEIVER(BILLED TO)  
NAME: Mr. ANAND SRIVASTAVA  
ADD: N/10/27-3-M  
YELAHANKA, BANGALORE, KARNATAKA  
CITY: BANGALORE PINCODE: 560064  
CUST STATE CODE: 29  
MOBILE NO: 9474565306  
ENCIRCLE NO: 700186255670

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SRNO	ITEM NUMBER	QTY	MRP	AMT (INR)
001	NL26012PP02 ZOP HSN CODE 9102	1.00	795.00	795.00
002	GA0057 GIFT WITH PURCHASE HSN CODE 3924	1.00	59.00	59.00
	DISCOUNT			58.00
<b>TOTAL AMOUNT :</b>				796.00
<b>BILL DISCOUNT:</b>				-79.50
<b>ROUND OFF:</b>				0.50
<b>AMOUNT PAYABLE</b>				<b>717.00</b>

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**TAX DETAILS :**

SR NO	TAXABLE VALUE		%	AMT
001	606.46	CGST	9.00	54.57
		SGST	9.00	54.57
002	0.74	CGST	9.00	0.08
		SGST	9.00	0.08
<b>TOTAL : 607.20</b>		<b>TOTAL CGST</b>		54.65
		<b>TOTAL SGST</b>		54.65

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**AMOUNT IN WORDS: RS. SEVEN HUNDRED AND SEVENTEEN ONLY**

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CARD	687.00
LOYALTY POINTS	30.00
<b>NO OF ITEMS: 2</b>	<b>TOTAL QTY: 2.00</b>

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For, TITAN COMPANAY LTD  
AUTHORIZED SIGNATORY

CUSTOMER SIGNATURE \_\_\_\_\_ Customer copy

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\*~TBKS10000322620\*

Q1: What is the final amount paid by Anand to the shopkeeper for the wrist watch?

- a) Rs 796.00
- b) Rs 717.00
- c) Rs 687.00
- d) Rs 79.00

Q2: What will be the total discount that Anand got on the wrist watch?

- a) Rs 79.00
- b) Rs 0.50
- c) Rs 109.00
- d) Rs 110.00

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Mathematical Thinking
Overarching Ideas	Uncertainty and Data
Context	Occupational
Item Format	MCQ
Cognitive Process	Employing Mathematical Concepts, facts and reasoning
Proficiency Level	7

#### CREDIT PATTERN:

**FULL CREDIT: FC, 2 MARKS**

**PARTIAL CREDIT: PC, 1 MARK**

**NO CREDIT: NC, 0 MARK**

#### Description of Answer Key and Credits:

ANSWER1: Its answer is {C} Rs. 687.00 , which can be seen from the invoice, it is final amount written at the bottom. If answer is right then full credit, 2 marks.

For other answer no credit, 0 mark.

ANSWER2: Its answer is {C} Rs109.00,it can be calculated by adding  $79.50 + 30.00 = 109.50$  rounded off to 109.00. If answer is right then full credit, 2 marks.

For other answer no credit, 0 mark.

<b>Domain:</b> Mathematical Literacy	<b>Theme 6:</b> Board Game – Who will win?	<b>Class(es):</b> VII <b>Expected time:</b> 15 minutes <b>Total Credit:</b> 6
<b>Description of Item:</b>	<b>Learning Outcome:</b>	
✓ Text	Students will be able to apply the properties of addition and subtraction of integers.	
✓ Image		
✓ Table		
Graph		
Map		
Poem		

Two friends Anjali and Ashish are playing a board game. The rules are: If ODD number turns up on the dice, they will move their token backward (negative side) and if EVEN number appears on the throw of dice, they will move the token forward (positive side). The game consists of 10 moves and the winner will be the one whose token is on the greater number.

					50	49	48	47	46
36	35	34	33	32	31	30	29	28	27
16	17	18	19	20	21	22	23	24	25
15	14	13	12	11	10	9	8	7	6
-4	-3	-2	-1	0 Start	1	2	3	4	5
-5	-6	-7	-8	-9	-10	-11	-12	-13	-14
-24	-23	-22	-21	-20	-19	-18	-17	-16	-15
-25	-26	-27	-28	-29	-30	-31	-32	-33	-34
-44	-43	-42	-41	-40	-39	-38	-37	-36	-35
-45	-46	-47	-48	-49	-50				

The following table shows their first 10 outcomes:

Anjali	4	1	2	6	3	4	2	5	6	3
Ashish	1	2	6	4	1	4	5	4	4	2

**Question 1.** Who will win the game, Anjali or Ashish?

**Question 2.** If the forward/backward rules were reversed, what will be the final positions of both Anjali and Ashish?

## Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Mathematical Thinking
Overarching Ideas	Uncertainty and Data
Context	Personal
Item Format	Answer the questions
Cognitive Process	Employing Mathematical Concepts, facts and reasoning
Proficiency Level	7

### CREDIT PATTERN:

**FULL CREDIT: FC, 2 MARKS**

**PARTIAL CREDIT: PC, 1 MARK**

**NO CREDIT: NC, 0 MARK**

### Description of Answer Key and Credits:

ANSWER1: Full Credit: Ashish

No Credit: Any other or missing response

ANSWER2: Full Credit : Anjali at -12 , Ashish at -19

No Credit: Any other or missing response

## Theme- Integers

<b>Domain:</b> Mathematical Literacy	<b>Theme:6</b> Stack of cards	<b>Class: VII</b> <b>Expected time: 10 M</b> <b>Total Credit:6</b>
<b>Description of Item:</b>		<b>Learning Outcome:</b> <b>(As per NCERT)</b> Student will be able to learn algebraic operation of integers.
*	<b>Text</b>	
	Image	
	<b>Table</b>	
	<b>Graph</b>	
	<b>Map</b>	
	<b>Poem</b>	

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Data
Context	scientific
Item format	MCQ
Cognitive Process	Problem solving
Proficiency Level	<b>7</b>

### Sub-Theme1:- Card game

There were two stacks of cards. Stack A contained cards having different numbers written on them and Stack B contained cards that were either black or red in colour. Red and Black denoted +1 and -1 respectively. The players had to pick one card each from both the stacks on every chance they got.

Every player was given two chances. The number on the card picked from stack A was to be assigned positive or negative value depending on the colour of the card picked from stack B.

Stack A

5	8	12	7	4	2	15	1
---	---	----	---	---	---	----	---

Stack B

R	B	B	R	R	R	B	R
---	---	---	---	---	---	---	---

The final score was to be the product of both the numbers picked by the players along with their respective signs.

PLAYER	CHANCE 1		CHANCE 2	
	Number	Colour	Number	Colour
CHANDRA	5	B	4	R
AMIT	2	R	8	R
MOON	12	B	2	B

Q.(1) What was Chandra's final score?

- (a) -20
- (b) 20
- (c) 9
- (d) -1

Q.(2) who scored the maximum points?

- (a) Chandra
- (b) Moon
- (c) Amit
- (d) All scored equal points

Q.(3) The class teacher changed the rules of the game slightly.

The score of each chance was to be obtained by dividing the number on the card picked from stack A by the one on the card picked from stack B.

And the rules for calculating the final score were the same as before.

Ramesh picked 7 and Black both times. what was his final score?

- (a) -1
- (b) +1
- (c) -49
- (d) +49

Ans:- 1(d)

Ans. 2(c)

Ans:-(d)

**Credit Pattern:**

Full Credit: 2 marks

Partial Credit: 0

No Credit:0

<b>Domain:</b> Mathematical Literacy	<b>Theme:7</b> (Integers) <u>GROCERY</u>	<b>Class(es): VII</b> <b>Expected time:</b> <b>Total Credit:8</b>												
<b>Description of Item:</b> <table border="1"><tr><td>*</td><td>Text</td></tr><tr><td>*</td><td>Table</td></tr><tr><td></td><td>Image</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>	*	Text	*	Table		Image		Graph		Map		Poem	<b>Learning Outcome:</b> <b>(As per NCERT)</b> Students will be able to solve question	
*	Text													
*	Table													
	Image													
	Graph													
	Map													
	Poem													

## MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Data
Context	SCIENTIFIC
Item format	
Cognitive Process	Problem solving
Proficiency Level	7

Following is the account of the shopkeeper which shows the cost price and quantity of certain products

S.No	Product sold	Cost price	quantity
1.	Rice	750	30kg
2.	Bread	210	21pcs
3.	Egg	500	100 pcs
4.	Wheat	660	40kg
5.	Sugar	450	25kg

Q.1 What is the profit amount of the shopkeeper if he sold 30 kg of rice at INR 26 per kg.

Q.2 How much did he pay to the wholesale retailer if he bought 75pieces of eggs?

Q.3 The Shopkeeper sold two breads and 20 kg of wheat. How much money did he get from the buyer?

Q.4 The shopkeeper earned 50 rupees profit by selling 20kg of sugar. How much is the selling price of the sugar

1.Ans.  $780-750=\text{Rupees } 30$

2.Ans.  $75 \times 5 = 375$  rupees

3.Ans. 350 rupee

4.Ans. Rs.410

**Credit Pattern:**

Full Credit: 2 marks

Partial Credit: 0

No Credit:0

<b>Domain:</b> Mathematical Literacy	<b>Theme:8</b> Integers <b>(EXAMINATION SCORE)</b>	<b>Class: VII</b> <b>Expected time:</b> <b>Total Credit:</b>
<b>Description of Item:</b>		<b>Learning Outcome:</b> <b>(As per NCERT)</b> Student will be able to solve algebraic expression
*	Text	
	Image	
	Table	
	Graph	
	Map	
	Poem	

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Reflection
Context	Scientific
Item format	Solving
Cognitive Process	
Proficiency Level	7

If there are four friends Eric, Mech, Kin and Rocky attended an examination. There are 10 questions in the question paper. Every correct answer awarded 4 marks and 3 marks are deducted for every incorrect answer and zero for questions not attempted.

Question:1 What is the marks difference between ROCKY and ERIC. If both attempt 8 question,  
Eric gave 6 correct answer and Rocky gave 5 correct answer.

Question:2 If KIN attempt 7 questions and she get only 14 marks. How many correct answer she give.

#### Credit Pattern:

Full Credit: 2 marks

Partial Credit: 0

No Credit:0

1.Ans.  $18-11=7$

2.Ans. 5.



<b>Domain:</b> Mathematical Literacy	<b>Theme:9</b> (Integers) <b><u>LIBRARY CHARGES</u></b>	<b>Class(es): VII</b> <b>Expected time: 10 M</b> <b>Total Credit:6</b>
<b>Description of Item:</b>	<b>Learning Outcome:</b> (As per NCERT) Student will be able to learn algebraic operation of integers.	
<b>*</b>	<b>Text</b>	
	Image	
	<b>Table</b>	
	<b>Graph</b>	
	<b>Map</b>	
	<b>Poem</b>	

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Data
Context	scientific
Item format	MCQ
Cognitive Process	Problem solving
Proficiency Level	<b>7</b>

Richardson wants to borrow a book from library for 7 days. There is a fixed charge for first four days and an additional charge for each extra day. The relation between fixed charge and additional charge is

$$\text{Total charge} = 4 \times \text{fixed charge} + 3 \times \text{additional charge}$$

Question :1 If the fixed charge is ₹5 and additional charge is ₹3. How much money will he pay?

Question: 2 If total money paid to the library is ₹40 and additional charge is ₹6. What is the fixed charge?

1. Ans. Rs.29

2. Ans. Rs.5.50

**Credit Pattern:**

Full Credit: 2 marks

Partial Credit: 0

No Credit:0

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> 10 Integers ( <b>TEMPERATURE</b> )	<b>Class:</b> VII <b>Expected time:</b> 10 M <b>Total Credit:</b> 6
<b>Description of Item:</b>		<b>Learning Outcome:</b> (As per NCERT) Student will be able to learn algebraic operation of integers.
*	<b>Text</b>	
	Image	
	<b>Table</b>	
	<b>Graph</b>	
	<b>Map</b>	
	<b>Poem</b>	

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Data
Context	scientific
Item format	MCQ
Cognitive Process	Problem solving
Proficiency Level	<b>7</b>

In Mumbai, Temperature is  $+15^{\circ}\text{C}$  at 8:00AM . Temperature increased by  $2^{\circ}\text{C}$  every hour till 12:00 noon. After 12:00 noon temperature decreased by  $1^{\circ}\text{C}$  every hour.

In Kochi, Temperature is  $+18^{\circ}\text{C}$  at 8:00AM . Temperature increased by  $1^{\circ}\text{C}$  every hour till 12:00 noon. After 12:00 noon temperature decreased by  $0.5^{\circ}\text{C}$  every hour.

Ques. 1 What is the temperature difference between Mumbai and Kochi at 12:00 noon?

- (a)  $2^{\circ}\text{C}$     (b)  $3^{\circ}\text{C}$     (c)  $1^{\circ}\text{C}$     (d)  $4^{\circ}\text{C}$

Ques. 2: What is the difference of temperature in Kochi at 8 AM to 5 PM?

- (a)  $1.5^{\circ}\text{C}$     (b)  $-1.5^{\circ}\text{C}$     (c)  $2^{\circ}\text{C}$     (d)  $1^{\circ}\text{C}$

1.Ans.  $23-22=1^{\circ}\text{C}$

2.Ans.  $18-19.5=-1.5^{\circ}\text{C}$

**Credit Pattern:**

Full Credit: 2 marks

Partial Credit: 0

No Credit:0

<b>Domain:</b> Mathematical Literacy	<b>Theme:11</b> Integers <b><u>GAME OF DICE</u></b>	<b>Class(es): VII</b> <b>Expected time: 10 M</b> <b>Total Credit:6</b>												
<b>Description of Item:</b>	<b>Learning Outcome:</b> (As per NCERT) Student will be able to learn dice operation													
<table border="1"> <tr> <td>*</td> <td><b>Text</b></td> </tr> <tr> <td></td> <td>Image</td> </tr> <tr> <td></td> <td><b>Table</b></td> </tr> <tr> <td></td> <td><b>Graph</b></td> </tr> <tr> <td></td> <td><b>Map</b></td> </tr> <tr> <td></td> <td><b>Poem</b></td> </tr> </table>	*	<b>Text</b>		Image		<b>Table</b>		<b>Graph</b>		<b>Map</b>		<b>Poem</b>		
*	<b>Text</b>													
	Image													
	<b>Table</b>													
	<b>Graph</b>													
	<b>Map</b>													
	<b>Poem</b>													

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	DICE
Context	scientific
Item format	MCQ
Cognitive Process	Problem solving
Proficiency Level	<b>7</b>

The faces of two dice are marked +1, +2, +3, +4, +5, +6 and -1, -2, -3, -4, -5, -6, respectively.

Two players throw the pair of dice alternately and record the sum of the numbers that turn up each time and keep adding their scores separately. The player whose score reaches 20 or more first, wins the game.

QUESTION 1. What can be the possible scores in a single throw of the pair of dice?

What is the maximum and minimum score?

QUESTION 2. A player gets his score 20 as follows:

$$(5) + (-4) + (6) + (2) + (+5) + (4) + (2)$$

Is he a winner?

1. Ans. 0, -1, -2, -3, -4, -5, 1, 2, 3, 4, and 5.

$$\text{Max} = 5 \quad \text{Min} = -5.$$

2. Ans. No. (why ?)

**Credit Pattern:**

Full Credit: 2 marks

Partial Credit: 0

No Credit: 0

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> 12 Integers <b>Social studies</b>	<b>Class(es):</b> VII <b>Expected time:</b> 10 M <b>Total Credit:</b> 8
<b>Description of Item:</b>		<b>Learning Outcome:</b> (As per NCERT) Student will be able to learn to solve this question
*	<b>Text</b>	
	Image	
	<b>Table</b>	
	<b>Graph</b>	
	<b>Map</b>	
	<b>Poem</b>	

### MATHEMATICAL LITERACY

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Data
Context	Scientific
Item format	
Cognitive Process	Problem solving
Proficiency Level	<b>7</b>

Remembering that 1AD came immediately after 1BC, While solving this problem take 1BC as -1 and 1AD as +1.

QUESTION 1. The Greece-Roman era when Greece and Rome ruled Egypt started in the year 330BC and ended in the year 395AD. How long did this era last?

QUESTION 2. Bhaskaracharya was born in the year 1114AD and died in the year 1185AD. What was his age when he died?

QUESTION 3. Turks ruled Egypt in the year 1517AD and Queen Nefertis ruled Egypt about 2900 years before the Turks ruled. In which year did she rule ?

QUESTION 4. Greek mathematician Archimedes lived between 287 BC and 212BC and Aristotle lived between 380BC and 322BC. Who lived during earlier period as per the chronological order?

1. Ans.  $330 + 395 = 725$  yrs.

2. Ans. 71 yrs

3. Ans. 1384 BC

4. Ans. Aristotle

**Credit Pattern:**

Full Credit: 2 marks

Partial Credit: 0

No Credit: 0

Domain: Mathematical Literacy	Theme:11 INTEGERS Integer Product	Class: VII Expected Time: 5 MIN Total credit: 4
Description of Items: Text, Table	Learning Outcome: Property of Multiplication of Integers.	

**Product Rule**

See the table and answer the questions given below:

Expression	# of Integers	Product	Sign of product
$-1(-2)$	2	2	positive
$-1(-2)(-3)$	3	-6	negative
$-1(-2)(-3)(-4)$	4	24	positive
$-1(-2)(-3)(-4)(-5)$	5	-120	negative

**Question 1:** Write a rule for the sign of the product of more than two negative integers.

Ans: .....

**Credit Pattern:**

Full Credit: 2      Partial Credit: 1      No Credit: 0

**Question 2:** Suppose that the product in Expression included one positive integer. Would your rule change ? (Yes/No) **Ans:**.....

**Credit Pattern:**

Full Credit: 2      Partial Credit: 1      No Credit: 0

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	Short answer
Cognitive Progress	Problem Solving
Proficiency level	VII

Description of Answer Key and credits:

- |   |
|---|
| <p>1. Positive – if the No. of integers is even<br/>Negative - if the No. of Integers is Odd.<br/>2. Positive – if the No. of integers is Odd.<br/>Negative - if the No. of Integers is Even.</p> |
|---|

Domain: Mathematical Literacy	Theme:12 INTEGERS Property Addition & Subtraction	Class: VII Expected Time: 5 MIN Total credit: 6
Description of Items: Text	Learning Outcome: Property of Addition and Subtraction of Integers	

Suppose that the product in Expression included one positive integer. Solve the following riddles.

(a) Minus of minus six

Minus minus-minus-seven

What do you get if this is added to minus-minus-seven again?

Ans: .....

(b) Now add the value in riddle (a) to minus four and then minus two you take away

Divide this by minus two

What is this value can you say?

Ans: .....

(c) Take the result of riddle (b) and subtract from it minus six

Multiply this by minus two

What will the answer be?

Ans:.....

**Credit Pattern:**

Full Credit: 2      Partial Credit: 0      No Credit: 0

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	Short answer
Cognitive Progress	Problem Solving
Proficiency level	VII

Description of Answer Key and credits:

Ans: 1. 62. 03. -12
---------------------



Domain: Mathematical Literacy	Theme:14 INTEGERS Magic Square	Class: VII Expected Time: 5 MIN Total credit: 4
Description of Items: Text	Learning Outcome: Property of Addition and Subtraction of Integers	

### Magic Square

Fill in the blank space of the following magic square so that

- (i) the sum of the numbers in each row, each column and each of the diagonals is  $-6$ .

-1		
3	-2	
	5	

- (ii) In this magic square, sum of the numbers in every row, column

and each of the diagonals is  $-2$ . Fill in the blank:

7		-6	
		1	
0	-2		
-5		6	-8

### Credit Pattern:

Full Credit: 2      Partial Credit: 1      No Credit: 0

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	Short answer
Cognitive Progress	Problem Solving
Proficiency level	VII

Description of Answer Key and credits:

1.	7	-7	-6	4
-1	-9	4		
3	-2	-7		
-8	5	-3		
	-4	2	1	-1
	0	-2	-3	3
	-5	5	6	-8



Domain: Mathematical Literacy	Theme:15 Integers Temperature	Class: VII Expected Time: 2 MIN Total credit: 2
Description of Items: Text	Learning Outcome: Ascending and Descending Order of Integers	

**Temperature**

5. The table shows the lowest recorded temperatures for each continent.

<b>The Lowest Recorded Temperatures</b>	
<b>Continent</b>	<b>Temperature (in Fahrenheit)</b>
Africa	-11°
Antarctica	-129°
Asia	-90°
Australia	-9°
Europe	-67°
North America	-81°
South America	-27°

Question: 1. Write the continents in order from the lowest recorded temperature to the highest recorded temperature.

Ans.: .....

**Credit Pattern:**

Full Credit: 2      Partial Credit: 1      No Credit: 0

Mathematical Literacy

<b>Framework</b>	<b>Characteristics</b>
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	Short answer
Cognitive Progress	Problem Solving
Proficiency level	VII

Description of Answer Key and credits:

Antarctica , Asia ,North America ,Europe ,south America ,Africa ,Australia
--

Domain: Mathematical Literacy	Theme:16 INTEGERS Equinoxes	Class: VII Expected Time: 10 MIN Total credit: 2
Description of Items: Text	Learning Outcome: Basic Operations On Integers	

Equinoxes are the two days of the year when the sun is directly above the earth's equator, due to which the day and nights are of nearly equal length everywhere on the Earth. Find the name of the month of Autumn equinox using suitable properties of integers by solving the following questions: match your answer with the data given in the table and fill in the box provided in each question:

- i)  $(-1) \times (-2) \times (-3) \times (-4) \times (-5)$
- ii)  $18946 \times 99 - (-18946)$
- iii)  $(-1) + (-2) + (-3) + (-9) + (-8)$
- iv)  $15 \times (-99)$
- v)  $(-143) + 600 - 257 + 400$
- vi)  $0 \div (-12)$
- vii)  $(-125) \times 9 - 125$
- viii)  $(-1) \times (-1) \times \_ (-1)$  [20 times]
- ix)  $(-4) + 4 + (-4) + 4 - \_ + 4$  [21 times]

600	E
1	E
-23	p
-4	R
0	M
1894600	E
-1250	B
-120	S
-1485	T

ANS:

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	Short answer
Cognitive Progress	Problem Solving
Proficiency level	VII

**Credit Pattern:**

Full Credit: 02

Partial Credit: 1

No Credit: 00

Description of Answer Key and credits:

Answer: September (-120, 600,-30,-1485,1,0,-1250,189400,-4)
---

Domain: Mathematical Literacy	Theme:17 INTEGERS Sea Level	Class: VII Expected Time: 3 MIN Total credit: 6
Description of Items: Text	Learning Outcome: Position of Integers on Number Line	

### Sea Level

The table given below shows the elevations relative to sea level of four locations.

Location	Elevation (in m)
A	-180
B	1600
C	-55
D	3200

Taking sea level as zero, answer the following questions:

(a) Which location is closest to sea level?

Ans.:

(b) Which location is farthest from sea level?

Ans.:

(c) Arrange the locations from the least to the greatest elevation.

Ans.:

### Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	Short answer
Cognitive Progress	Problem Solving
Proficiency level	VII

### Credit Pattern:

Full Credit: 02

Partial Credit: 0

No Credit: 00

### Description of Answer Key and credits:

Ans) (a) place A (b) Place D (c) D,B,C,A
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Domain: Mathematical Literacy	Theme:18 INTEGERS Sign Rules	Class: VII Expected Time: 5 MIN Total credit: 4
Description of Items: Text, Table	Learning Outcome: Property of Multiplication of Integers.	

**Amazing Table**

1. See the table and answer the questions given below:

**Question 1:** Write a rule for the sign of the product of more than two integers.

Ans:

	Second number						
	(-)	-3	-4	-2	0	-1	1
First number	-2	1	2	0	-2	-1	-3
	-3	0	1	-1	-3	-2	-4
	0	3	4	2	0	1	-1
	+1	4	5	3	1	2	0
	-1	2	3	1	-1	0	-2
	2	5	6	4	2	3	1

**Credit Pattern:**

Full Credit: 2      Partial Credit: 1      No Credit: 0

**Question 2:** FIND THE PRODUCT OF THIRD INTEGER OF FIRST COLUMN AND FIFTH INTEGER OF FIFTH ROW. ALSO DISCUSS THE SIGN OF THE ANSWER OBTAINED .

Ans:.....

**Credit Pattern:**

Full Credit: 2      Partial Credit: 1      No Credit: 0

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	Short answer
Cognitive Progress	Problem Solving
Proficiency level	VII

Description of Answer Key and credits:

- |   |
|---|
| <p>1. Positive – if the No. of integers is even<br/>         Negative - if the No. of Integers is Odd.<br/>         2. Positive – -3<br/>         Negative - NEGATIVE</p> |
|---|

Domain: Mathematical Literacy	Theme: 19 <b>Absolute Value of Integer</b>	Class: VII Expected Time: 02 min Total credit: 04
Description of Items: Text	Learning Outcome: understanding about absolute value of integers	

### Absolute Value of an Integer

**The absolute value of an integer is the numerical value without regard to whether the sign is negative or positive. On a number line it is the distance between the number and zero.**

**The absolute value of -15 is 15. The absolute value of +15 is 15**

**The symbol for absolute value is to enclose the number between vertical bars such as  $|-20| = 20$  and read "The absolute value of -20 equals 20".**

**Question 1.** Mt. Everest, the highest elevation in Asia, is 29,028 feet above sea level. The Dead Sea, the lowest elevation, is 1,312 feet below sea level. What is the difference between these two elevations?

- (a) 30340 feet
- (b) 27716 feet
- (c) both are at same level
- (d) none of them

**Credit Pattern:**

Full Credit: for correct response

Partial Credit: no partial credit

No Credit: any other response

Description of Answer Key and credits:

Ans) (a)
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**Question 2.** Roman Civilization began in 509 B.C. and ended in 476 A.D. How long did Roman Civilization last?

- (a) 33 Years
- (b) 887 Years
- (c) 118 Years
- (d) 985 Years

**Credit Pattern:**

Full Credit: for correct response

Partial Credit: no partial credit

No Credit: any other response

Description of Answer Key and credits:

Ans) (d)
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**Question 3.** In the Sahara Desert, one day the temperature was 136°F. In the Gobi Desert a temperature of -50°F was recorded. What is the difference between these two temperatures?

- (a) 100 °F
- (b) 0 °F
- (c) 186 °F
- (d) 86 °F

**Credit Pattern:**

Full Credit: for correct response

Partial Credit: no partial credit

No Credit: any other response

Description of Answer Key and credits:

Ans) (c)
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## Mathematical Literacy

Framework		Characteristics	
Competency Cluster		Analytical Thinking	
Overarching Idea		Quantity	
Context		Scientific	
Item Format		MCQ	
Cognitive Progress		Problem Solving	
Proficiency level		VII	
Domain: Mathematical Literacy	Theme: 20 Integers Patterns	Class: VII Expected Time: 3 MIN Total credit: 4	
Description of Items: Text	Learning Outcome: Understanding and use of Property of Addition of integers		

### Pattern

Series: 3, 4, 6, 8, 12, \_\_, \_\_, 20

Question 1. What is the rule for the given pattern?

- (a) Composite numbers
- (b) Adding 1 to prime numbers
- (c) Subtracting 1 from squares
- (d) Prime numbers

Question 2. What will be the missing numbers?

- (a) 14, 17
- (b) 18, 19
- (c) 14, 18
- (d) 16, 18

### Credit Pattern:

Full Credit: 2

Partial Credit: 1

No Credit: 0

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	MCQ
Cognitive Progress	Problem Solving
Proficiency level	VII

Description of Answer Key and credits:

Ans 1) Full credit: (b) Partial credit: any other response No credit: any other response

Ans 2) Full credit: (c) Partial credit: any other response No credit: any other response

Domain: Mathematical Literacy	Theme:21 INTEGERS	Class: VII Expected Time: 3 MIN Total credit: 2
Description of Items: Text	Learning Outcome: Learners will be able to solve daily life problems related to integers.	

Description of Item:

√	Text
	Image
	Table
	Graph
	Map
	poem



## Mathematical Literacy

Frame work	Characteristics
Competency Cluster	Connections
Overarching Idea	Integers
Context	Mathematical
Item Format	MCQ
Cognitive Process	Problem Solving
Proficiency Level	3

### BodyMass Index

Health report says that Body Mass Index of a healthy person should be in between 18.5 – 24.9 . This BMI is considered normal. This healthy weight reduces the risk of serious health conditions and you are close to your fitness goals. If your BMI is between 25 – 29.9. You are overweight.

Formula to calculate BMI is given as below

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height} \times \text{height}}$$
 here weight is measured in kg and height in meter.

Height of Mr. Jack is 160 cm and weight is 80 Kg.

Q1. At least how much weight he need to reduce to get a healthy weight?

- (a) 16 kg      (b) 14 kg      (c) 10 kg      (d) 12 kg.

Q2. What are any two the benefits of a Healthy weight?

### Credit Pattern

Ans 1. Full Credit: Option (a)

Otherwise No Credit

Ans 2. Full Credit for correct two benefits.

Partial credit for one correct benefits.

No credits for others.

Description of answer key and credit

--

Answer 1. Healthy weight =  $24.9 \times 1.6 \times 1.6 = 63.74$  kg or it may be 63.75 kg or 64 kg.

Weight to be reduced =  $80 - 63.74 = 16.26$  kg or 16 kg.

Answer 2: Correct health benefits may be different for person to person.

Domain : Mathematical Literacy	Theme :22 Integers Scientific experiment	Class :VII Expected time -10 min minutes Total credit:4
Description of item:- Text	Learning outcome: students will be able to interpret the problem and apply basic operation on integers.	

Description of Item:

√	Text
	Image
	Table
	Graph
	Map
	poem

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Comprehension

Overarching idea	Integers
Context	General
Item Format	MCQ
Cognitive progress	Problem solving
Proficiency level	VII

Pixy is a student of microbiology .She is verymuch interested in cryogenics (the science of very low temperatures). With the help of her science teacher she is doing an experiment on the effect of low temperatures on bacteria. On the1<sup>ST</sup> day she cools one sample of bacteria to a temperature of -51°C and another to -76°C but she is unable to succeed. 2<sup>ND</sup> day she cools one sample of bacteria to a temperature of - 40 °C and another sample to - 32°C .  
Question 1.What was the temperature difference in the two experiments in day 1?

- (a)25                      (b) -127                      (c) -25                      (d)127

Question 2 .what was the temperature different in the day 2?

- (a)8                      (b)72                      (c) -72                      (d) -8

**Credit Pattern**

Ans 1:-Full credit: option (a)

No credit: other options

Ans2:-Full Credit: Option (d)

No Credit: other options

Description of Answer key and credits:

Ans Q No 1: a
Q No .2 d

<b>Domain: Mathematics Literacy</b>	<b>Theme :23 Water Tank</b>	<b>Class: VII</b> <b>Expected time: 5min to 10 min</b> <b>Total Credit: 10</b>												
<b>Description of items:</b> <table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">√</td> <td><b>Text</b></td> </tr> <tr> <td style="text-align: center;">√</td> <td><b>Image</b></td> </tr> <tr> <td></td> <td><b>Table</b></td> </tr> <tr> <td></td> <td><b>Graph</b></td> </tr> <tr> <td></td> <td><b>Map</b></td> </tr> <tr> <td></td> <td><b>Poem</b></td> </tr> </table>		√	<b>Text</b>	√	<b>Image</b>		<b>Table</b>		<b>Graph</b>		<b>Map</b>		<b>Poem</b>	<b>Learning Outcome( As per NCERT):</b> <b>Students are able to apply the properties of addition and subtraction along with the concept of additive inverse.</b>
√	<b>Text</b>													
√	<b>Image</b>													
	<b>Table</b>													
	<b>Graph</b>													
	<b>Map</b>													
	<b>Poem</b>													

**Q.** With the increase in Deforestation, thousands of birds and animals are losing their habitat and starving due to the decrease of forests supplies. So once a monkey came to the market place in search of food and was chased away by the people. So he rushed out of the place to save his life and entered in to an unknown forest. After all the running, he was thirsty and searched for water in the jungle. Suddenly he found a water tank which has steps inside it as shown in the figure. The monkey was sitting on the topmost step (i.e., the first step) for a while. If the water level is at the ninth step, then solve the followings as per given situations.



**(1)** He jumps 3 steps down and then jumps back 2 steps up. In how many jumps will he reach the water level?

- (A) 11 jumps (B) 10 jumps (C) 8 jumps (D) 9 jumps

**Answer:** .....

**(2)** After drinking water, he wants to go back. For this, he jumps 4 steps up and then jumps back 2 steps down in every move. In how many jumps will he reach back the top step?

(A) 8 jumps (B) 7 jumps (C) 6 jumps (D) 5 jumps

**Answer:**.....

**(3)** If the number of steps moved down is represented by negative integers and the number of steps moved up by positive integers, represent his moves in part (i) and (ii) by completing the following:

**(a)**  $-3 + 2 - \dots = -8$

**Answer :**

.....

**(b)**  $4 - 2 + \dots = 8$ .

**Answer:**.....

.....

**(c)** In (a) the sum  $(-8)$  represents going down by eight steps. So, what will the sum 8 in (b) represent?

**Answer:**.....

.....

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Analytical thinking
Overarching Idea	Change and Relationship.
Context	Scientific
Item format	MCQ and VSA
Cognitive Process	Employing mathematical concepts (Integers), facts and reasoning.
Proficiency Level	7

**Credit Pattern:**

**Full Credit: 2 marks**

**Partial Credit: 1 marks**

**Nil Credit: Zero.**

**Description of Answer and Credits:**

**Question 1:**

Full credit :(A) 11 jumps

No credit: Any other or missing response.

**Question 2:**

Full credit: (A) 8 jumps

No credit: Any other or missing response.

**Question3(a)**

Full credit :  $-3+2-3+2-3+2-3+2-3+2-3=-8$

No credit: Any other or missing response.

**Question3(b)**

Full credit :  $4-2+4-2+4=8$

No credit: Any other or missing response.

**Question3(c)**

Full credit: 8 in(b) represents going up 8 steps.

No credit: Any other or missing response.

Domain: Mathematical Literacy	Theme: 24  A boy playing with stairs in his house	Class: VII  Expected Time: 5 MIN  Total credit: 4
Description of Items: Text	Learning Outcome: develop the computational skill about integer	

Description of Item:

√	Text
√	Image
	Table
	Graph
	Map
	poem

Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	MCQ
Cognitive Progress	Problem Solving
Proficiency level	VII



A house has steps outside it. A boy is standing on the lowest step (i.e., first step). The roof is at the 21<sup>th</sup> step. He moves 5 steps up and then moves back 3 steps down.

Q.1 In how many moves will he reach the roof?

- (a) 15
- (b) 17
- (c) 12
- (d) 10

Q.2 After reaching the roof he wants to go back at the floor. For this, he moves 3 steps down and then back 1 step up in every move. In how many moves will he reach back the lowest steps?

- (a) 15
- (b) 17
- (c) 19
- (d) 16

Ans1:

**Credit Pattern:**

Full Credit: for correct response

Partial Credit: no partial credit

No Credit: any other response

Description of Answer Key and credits:

Ans (b) 17
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Ans 2:

**Credit Pattern:**

Full Credit: for correct response

Partial Credit: no partial credit

No Credit: any other response

Description of Answer Key and credits:

Ans) (c) 19
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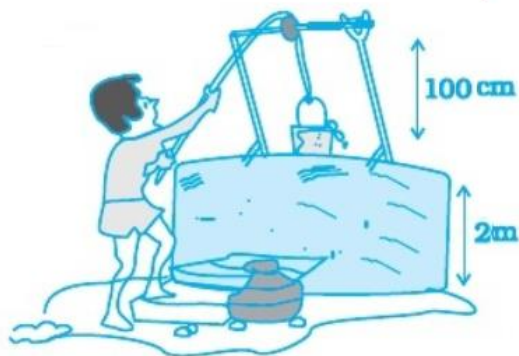
Domain: Mathematical Literacy	Theme:25 Addition of integers Water Level	Class: VII Expected Time: 3 min Total credit: 02
Description of Items: Text, Image	Learning Outcome: Learning the basic operations on integers	

### Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	MCQ
Cognitive Progress	Problem Solving
Proficiency level	VIII

In a village there is a well, the water level in which is 30m below ground level. During rainy season the villagers collect rain water in different water tanks. The collected water is then drained into the well. Last year when the collected water was drained into the well, the water level rose 5 m above the previous level. The wall of the well is 2 m high and the pulley is fixed at a height of 100 cm.

Ramesh wants to draw water from the well. What should be the minimum length of the rope that he can use?



- a) 27 m
- b) 28 m
- c) 32 m
- d) 35 m

### Description of Answer Key and credits:

**Ans (b)**

Full Credit: For correct response

Partial Credit: No partial credit

No Credit: Any other response

Domain: Mathematical Literacy	Theme: 26 Integers	Class: VII Expected Time: 4 MIN Total credit: 02
Description of Items: Text, Figure	Learning Outcome: Student will be able to apply the concept of integers and take interest as a game.	

### Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific, quantitative
Item Format	MCQ
Cognitive Progress	Problem Solving
Proficiency level	VII

Question 1. The nine square in the table shown are to be filled so that every row and every column contains each of the numbers 3, 4, and 5. Find the value of A-B.

3		
	4	A
		B

- A.3      B.4      C.2      D. None of these

#### Credit Pattern:

Full Credit: 02 on option(c)

Partial Credit: 01 on finding the values of A and B

No Credit: 00 on any other option

#### Description of Answer Key and credits:

Ans) Value of A= 5

Value of B= 3

(b) 2

Domain: Mathematical Literay	Theme: 27 Classroom Problem	Class: VII Expected Time: 5 MIN Total credit: 6
Description of Items: Text, Image	Learning Outcome: Understanding of Integers	

### Mathematical Literacy

Framework	Characteristics
Competency Cluster	Analytical Thinking
Overarching Idea	Quantity
Context	Scientific
Item Format	MCQ
Cognitive Progress	Problem Solving
Proficiency level	VII

There are 40 students in a class. Each student is sitting one after the other occupying 1 bench at a time. They got a task to count themselves that how many students are present on that day. They started counting from 1 and finished at 38.



Question 1. How many students are absent?

- (a) 38
- (b) All present
- (c) 2
- (d) Cannot be answered

Question 2. How many students are sitting at odd places?

- (a) 38
- (b) All
- (c) 2
- (d) 19

**Credit Pattern:**

Full Credit: Option D

Partial Credit:

No Credit: Other Options

Question 3. If students sitting at prime number of places went for practising cultural program, then how many students are left in the class.

- (a) 36
- (b) 26
- (c) 19
- (d) 40

**Ans :1 Credit Pattern:**

Full Credit: Option C

Partial Credit:

No Credit: Other Options

**Ans 2: Credit Pattern:**

Full Credit: Option B

Partial Credit:

No Credit: Other Options

Description of Answer Key and credits:





Q.1 Ans) (c), Q.2 Ans) (D), Q.3 Ans) (B)
--

<b>Domain:</b> Mathematical literacy	<b>Theme:28</b> <b>Flip a Coin, Take a Step</b> <b>(Integers)</b>	<b>Class: VII</b> <b>Expected Time: 10 minutes</b> <b>Total credits: 4</b>												
<b>Description of item:</b>	<b>Learning outcomes:</b> Students will learn about integers and use of integers in daily life..													
<table border="1"> <tr><td>√</td><td>Text</td></tr> <tr><td></td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	√	Text		Image		Table		Graph		Map		Poem		
√	Text													
	Image													
	Table													
	Graph													
	Map													
	Poem													

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	OBSERVATION
Overarching Ideas	Change and relationship
Context	Societal
Item Format	MCQ/Explain
Cognitive Process	Employing mathematical concepts, facts, procedures and reasoning.
Proficiency Level	Research and inquiry

### Flip a Coin, Take a Step

				Target
				Step5
				Step4
				Step3
				Step2
				Step1
A ↑	B ↑ 	C ↑	D ↑	

A walking competition was held among A, B, C and D. This was a very funny kind of walk, "... we're going to let coin flips be your guide. In a group of two members, we require one volunteer walker and another student to flip a coin. With the walker standing in a suitable location i.e. starting point and that the walker will take one step forward when the coin lands heads, and one step back when the coin lands tails. With each flip, have the volunteer take a step forward or backward. The coin is tossed 10 times and the members reached the positions as shown in the fig which shows the student's motion.

Q1: Which of the following will be the number of heads and tails for A?

- e) H-6, T-4
- f) H-8, T-2
- g) H-2, T-8
- h) H-7, T-3

Q2: List the number of heads and tails for C and D.

Q.3. How many tails was occurred for B?

- e) 6
- f) 5
- g) 7
- h) 4

Q.4. Can the competitors reach in step 3 or 5? Justify.

**CREDIT PATTERN:**

**FULL CREDIT: FC, 2 Marks**

**PARTIAL CREDIT: No partial credit**

**NIL CREDIT: NC, 0 Mark**

**Description of Answer Key and Credits:**

ANS 1: (b)

ANS 2: H-6,T-4 and H-7,T-3

ANS 3: H-5, T-5

ANS.4 : No, because difference of the numbers from 1 to 10 whose sum is 10 can't be an odd number.

**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VII : CHAPTER 2 : FRACTION AND DECIMALS**

**INDEX**

<b>S.No.</b>	<b>Theme of the item</b>
<b>1.</b>	Wingspan
<b>2.</b>	Long Jump
<b>3.</b>	Cushions
<b>4.</b>	Fruits Sale
<b>5.</b>	Table Tennis Board
<b>6.</b>	My Data Speed
<b>7.</b>	Dice Game
<b>8.</b>	Lines
<b>9.</b>	Train Fare Hike
<b>10.</b>	Logistics

## Practice Item for Mathematical Literacy -11

Domain:- Mathematical Literacy	Theme:- Wingspan	Class:- VII Expected Time: 15 M Total Credit:10 Points
<p>Item: - The birds Blue Jay, Golden Eagle, Albatross &amp; Sea Gull are some dangerous hunters with powerful wings. The wandering Albatross has the largest &amp; most powerful wingspan among all the living birds. It is the only bird that can fly 10,000 miles without landing. The Golden Eagle is one of the best known birds of prey in the Northern Hemisphere. Seagulls are sea birds of the Laridae family in the suborder Lari. Blue Jay is a passerine bird in the family of Corvidae, native to North America. The diagram shows the length of wingspans (approx. in metre) of these species of birds.</p> <div data-bbox="159 728 845 1008"><p>The diagram illustrates the wingspan of four bird species. Each bird is shown in flight with a horizontal line below it indicating the wingspan. The measurements are as follows:</p><ul style="list-style-type: none"><li>Blue jay: <math>\frac{41}{100}</math> m</li><li>Golden eagle: <math>2\frac{1}{2}</math> m</li><li>Albatross: <math>3\frac{3}{5}</math> m</li><li>Sea gull: <math>1\frac{7}{10}</math> m</li></ul></div> <p>(image source-Google)</p>		<p><b>Learning Outcome: (As per NCERT)</b></p> <ul style="list-style-type: none"><li>❖ Interprets Multiplication and division of two fractions &amp; decimals.</li><li>❖ Uses algorithm to multiply / divide fractions &amp; decimals</li><li>❖ Solves problems related to daily life situations involving fraction and decimals.</li></ul>



## Questions

Question 11.1 Which bird has the smallest wingspan?

- (a) Golden eagle (b) Albatross (c) Sea Gull (d) Blue Jay

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	1

### Credit Pattern:

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

### Description of Answer Key and Credits:

11.1 Full Credit:-1 Points ( Blue Jay)	
Partial Credit:- 0 Points (Other response)	
Nil credit:-Other response	

Question 11.2 Which bird has the longest wingspan? What will be one fifth of the length of wingspan of this bird?

.....

.....

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

11.2 Full Credit:-1 Points (Albatross)

One fifth of the length of the Wingspan =  $\frac{18}{5} \times \frac{1}{5} = \frac{18}{25}m$

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

Question 11.3 What is the one hundredth of the length of the wings span of the bird that has the shortest wingspan?

.....

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

11.3 Full Credit:-1 Point (Blue Jay) one hundredth of the length of the wings span of the bird of the shortest wingspan

$$= \frac{41}{100} \times \frac{1}{100} = \frac{41}{10000} = 0.0041m$$

Partial Credit:- 0(Other response)

Nil credit:-Other response

Question 11.4 What is the ratio of the wingspan of Albatross to the wingspan of Golden eagle?

.....

.....

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

11.4 Full Credit:-1 Point  
( $36/25$  ,  $3\frac{3}{5} \div 2\frac{1}{2} = \frac{18}{5} \div \frac{5}{2} = \frac{18}{5} \times \frac{2}{5} = \frac{36}{25}$ )

Partial Credit:- 0 Points (Other response)

Nil Credit:-Other response & missing

---

Question 11.5 Is the product of the length of the wingspan of Golden Eagle & sea Gull greater than the lengths of wingspan of the Albatross? How will you reach at the result?

.....

.....

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

11.5 Full Credit:-2 Points

(Product of the length of the Wingspan of Golden Eagle & Sea Gull is  $\frac{17}{4} = 4\frac{1}{4}$

& length of the wingspan of Albatross is  $\frac{18}{5} = 3\frac{3}{5}$

Therefore, answer will be yes )

Partial Credit:- 1 Points

(Product of the length of the Wingspan of Golden Eagle & Sea Gull is  $\frac{17}{4} = 4\frac{1}{4}$  )

Nil credit:-Other response

Question 11.6 If Length of wingspan of Blue Jay becomes three times its original length, will it be the bird with the longest wingspan among the given birds?

.....

.....

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point Nil

Credit : 0 point

Description of Answer Key and Credits:

11.6 Full Credit:-1 Points

(No since  $\frac{41}{100} \times 3 = \frac{123}{100} < 3\frac{3}{5}$ )

Partial Credit:- 0 Points (Other response)

Nil Credit:-Other response & missing

Question 11.7 Arrange the birds in ascending order according to the length of their wingspan.

.....  
.....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point Nil

Credit : 0 point

Description of Answer Key and Credits:

11.7 Full Credit:-2 Points

*(Make like fraction then arrange in ascending order*

*Blue Jay < Sea Gull < Golden Eagle < Albatross )*

Partial Credit:- 1

(if out of three of them two are in correct order)

Nil credit:-Other response & missing

Question 11. 8 How many times the wingspan of Albatross is larger than that of the wingspan of Sea Gull?

.....

Mathematical Literacy

FRAMEWORK

CHARACTERISTICS



Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point



Description of Answer Key and Credits:

11.8 Full Credit:-1 Point (  $3\frac{3}{5} \div 1\frac{7}{10} = \frac{18}{5} \div \frac{17}{10} = \frac{36}{17} \text{ times}$  )

Partial Credit:- 0 Points (Other response)

Nil credit:-0 Points (Other response & missing)

## Practice Item for Mathematical Literacy -12

Domain:- Mathematical Literacy	Theme:- Long Jump	Class:- VII Expected Time: 20 M Total Credit:-10 Points
Item: We may marvel at the long jumping abilities of our top Olympic athletes. The current world record is held by Mike Powell of America i.e. $29\frac{1}{3}$ feet (approx.) .In India M. Sreeshankar of Kerala is the national record holder in long jump with a jump of i.e. $26\frac{3}{4}$ feet (approx.). But their abilities are overshadowed by some of the animals in the animal’s kingdom. A grey Kangaroo can take a long jump up to $44\frac{1}{2}$ feet (approx.) A Snowshoe Hare can cover $28\frac{1}{2}$ feet (approx.) in three jumps but on the other hand a frog can cover only $\frac{1}{16}$ feet (approx.) in four jumps.	<b>Learning Outcome: (As per NCERT)</b> <ul style="list-style-type: none"> <li>❖ Interprets Multiplication and division of two fractions &amp; decimals.</li> <li>❖ Uses algorithm to multiply / divide fractions &amp; decimals</li> <li>❖ Solves problems related to daily life situations involving fraction and decimals.</li> </ul>	
<div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">(image source-Google)</p>		

## Questions

12.1. How much distance will the frog cover in 15 jumps?

.....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result Finding, Evaluate
Overarching idea	Change & Relationships/ Multiplication and division of fraction.
Context	Fraction (Reasoning & Calculation)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	1

### Credit Pattern:

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

<p>12.1 Full Credit:-2 Points</p> <p><i>(Distance covered in one jump = <math>\frac{1}{64}</math> feet</i></p> <p><i>Distance covered in 15 jumps = <math>\frac{15}{64}</math> feet</i></p> <p>Partial Credit:- 1 Points (<i>Distance covered in one jump = <math>\frac{1}{64}</math> feet</i>)</p> <p>Nil credit:-0 Points (Other response)</p>
--

12.2. How much distance will the snowshoe hare cover in 6 jumps?

.....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result Finding, Evaluate
Overarching idea	Change & Relationships/ Multiplication and division of fraction.
Context	Fraction (Reasoning & Calculation)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving

Proficiency Level

1

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

12.2 Full Credit:-2 Points

(*Distance covered in one jump =  $\frac{57}{6}$  feet*

*Distance covered in 6 jump = 57 feet*

Partial Credit:- 1 Points

(*Distance covered in one jump =  $\frac{57}{6}$  feet*

Nil credit:-0 Points (Other response)

12.3 If the frog takes 672 jumps and the snowshoe hare takes 1 jump, who will be ahead of the other and by how much?

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result Finding, Evaluate
Overarching idea	Change & Relationships/ Multiplication and division of fraction.
Context	Fraction (Reasoning & Calculation)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

12.3 Full Credit:-2 Points

Distance covered by frog in 672 jumps:  $\frac{1}{64} \times 672 = 10\frac{1}{2}$  feet

Distance covered by Snowshoe Hare in 1  $\frac{57}{6} \times 1 = \frac{57}{6}$  feet =  $9\frac{1}{2}$  feet jumps:

(Frog, So, frog will be ahead of the  $10\frac{1}{2} - 9\frac{1}{2} = 1$  feet Snowshoe Hare by

Partial Credit:- 1 Points

( Distance covered by frog in 672 jumps:  $\frac{1}{64} \times 672 = 10\frac{1}{2}$  feet

Distance covered by rabbit in 1 jumps:  $\frac{57}{6} \times 1 = \frac{57}{6}$  feet =  $9\frac{1}{2}$  feet

Nil credit:-Other response

12.4 Will the product of the distance covered in one jump by frog and snowshoe hare be greater than 1?

.....

.....

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result Finding, Evaluate
Overarching idea	Change & Relationships/ Multiplication and division of fraction.
Context	Fraction (Reasoning & Calculation)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

**Description of Answer Key and Credits:**

12.4 Full Credit:-2 Points  
 (No, Product of distance covered is  $\frac{57}{384} < 1$  )

Partial Credit:- 1 Points  
 (No or Product of distance covered is  $\frac{57}{384}$  )

Nil credit:-Other response

12.5 What is the ratio of distance covered by kangaroo in 1 jump to the distance covered by snowshoe hare in 5 jumps?

.....

.....

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result Finding, Evaluate
Overarching idea	Change & Relationships/ Multiplication and division of fraction.
Context	Fraction (Reasoning & Calculation)

Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

12.5 Full Credit:-2 Points

$$\text{Distance covered in one jump Hare} = \frac{57}{6}$$

$$\text{Distance covered in 5 jumps} = \frac{57}{6} \times 5 = \frac{285}{6}$$



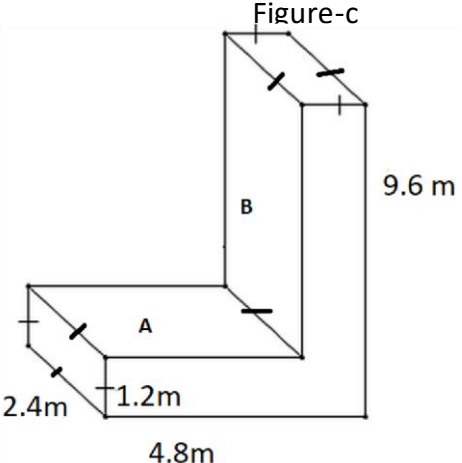
$$\text{Ratio is } 44 \frac{1}{2} \div \frac{285}{6} = \frac{89}{2} \times \frac{6}{285} = \frac{89}{95}$$

Partial Credit:- 1 Points

$$(\text{Distance covered in one jump Hare} = \frac{57}{6} \text{ or } \text{Distance covered in 5 jumps} = \frac{57}{6} \times 5 = \frac{285}{6})$$

Nil credit:-Other response

## Practice Item for Mathematical Literacy -13

<p>Domain:- Mathematical Literacy</p>	<p>Theme:- Cushions</p>	<p>Class:- VII Expected Time: 15 M Total Credit:-10 Points</p>
<p>Item:- Sitting postures in class/ office needs attention as they can cause problems to your body in long run. Given below are few postures.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Figure-a <b>correct</b></p>  </div> <div style="text-align: center;"> <p>Figure-b <b>incorrect</b></p>  </div> <div style="text-align: center;"> <p>Figure-c</p>  </div> </div> <p>To keep people in proper sitting positions people in olden days used to make chairs that were perfectly in L shape. Later they found it hard to sit and introduced cushions. The word cushion comes from middle east cushin&amp; from Anglo-French Cussin. The</p>		<p><b>Learning Outcome: (As per NCERT)</b></p> <ul style="list-style-type: none"> <li>❖ Interprets Multiplication and division of two fractions &amp; decimals.</li> <li>❖ Uses algorithm to multiply / divide fractions &amp; decimals</li> <li>❖ Solves problems related to daily life situations involving fraction and decimals.</li> </ul>
<p>first known use of the word cushion was in the 14<sup>th</sup> century. It may be of different sizes and styles as per the need of the furniture's shapes .Here two cuboidal shaped cushions are combined and a 'L' shaped chair cushion is made as shown above (Figure-c) with given dimension(L,B ,H for cuboid 'B' &amp;l,b,h for cuboid 'A')</p>		



## Questions

13.1 What is the unknown dimension of the cuboidal shaped cushion A? What will be the quotient When the longest dimension of cushion 'A' is divided by the longest dimension of cushion 'B'?

.....  
 .....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding, Evaluate
Overarching idea	Multiplication & Division of decimals.
Context	Fraction & Decimals( in area & volume)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

**Description of Answer Key and Credits:**

13.1 Full Credit:-2 Points (Length = 3.6 m Quotient= $2.4 \div 9.6 = \frac{1}{4}$ ) Partial Credit:- 0 Points (Other response) Nil credit:-Other response
---

13.2 The length of cushion A is 4 times that of cushion B. What is the relationship between the dimensions of the cuboidal shaped cushion A & B? Other

.....  
 .....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding, Evaluate
Overarching idea	Multiplication & Division of decimals.
Context	Fraction & Decimals( in area & volume)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

---

13.2 Full Credit:-2 Points

( $L=4 \times l = 4 \times 2.4 = 9.6$  m)

B=  $L=2 \times l = 2 \times 2.4 = 4.8$  m

Thickness is same in both the cases

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

---

13.3 Which cushions A or B, required more volume of cotton to make & by how many times than other one?

.....

.....

---

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding, Evaluate
Overarching idea	Multiplication & Division of decimals.
Context	Fraction & Decimals( in area & volume)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

13.3 Full Credit:-2 Points

$(V_A=1.2 \times 2.4 \times 2.4=6.912 \text{ cubic m,}$

$V_B=9.6 \times 2.4 \times 1.2=27.648 \text{ cubic m)}$

Then ratio= $27.648 \div 6.912=4$

$(V_A=4V_B)$

Partial Credit:- 1 Points

$(V_A=1.2 \times 2.4 \times 2.4=6.912 \text{ cubic m,}$

$V_B=9.6 \times 2.4 \times 1.2=27.648 \text{ cubic m)}$

Nil credit:-Other response

13.4 If you want to cover the 'L' shaped cushion with a decorative cloth then how much decorative cloth is required to cover it?

.....  
 .....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding, Evaluate
Overarching idea	Multiplication & Division of decimals.
Context	Fraction & Decimals( in area & volume)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

**Description of Answer Key and Credits:**

13.4 Full Credit:-2 Points  
 (By finding area of each rectangular faces using Area=Length X Breadth we got:- (Area of decorative cloth used )<sub>A</sub>=25.92 sq.  
 (Area of decorative cloth used )<sub>B</sub>=54.72 sq.,  
 Total Area=80.64 sq. cm (except common part)  
 Partial Credit:- 1 Points  
 (One of response (Area of decorative cloth used) <sub>A</sub>=25.92 sq.  
 Area of decorative cloth used) <sub>B</sub>=54.72 sq.)  
 Nil credit:-Other response

13.5 What will be the total amount paid by you if you buy the decorative cloth at the rate of Rs 0.50 per square m.?

.....  
 .....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding, Evaluate
Overarching idea	Multiplication & Division of decimals.

Context	Fraction & Decimals( in area & volume)
Item Format	Closed Constructed
Cognitive Process	Interpreting, Problem Solving
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

13.5 Full Credit:-2 Points

( $0.50 \times 80.64 = \text{Rs. } 40.32$ )

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

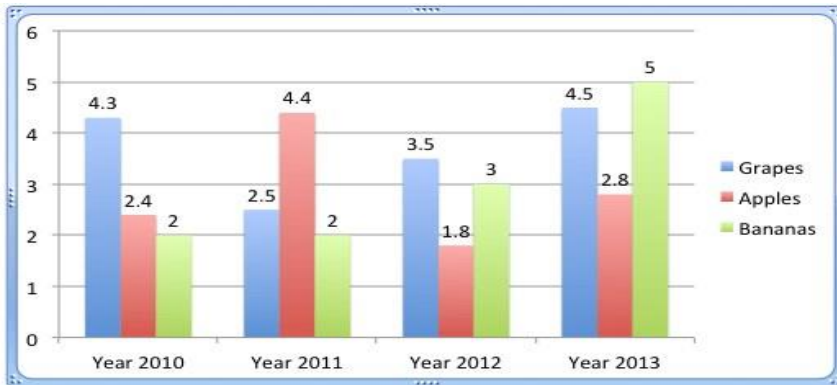
## Practice Item for Mathematical Literacy -14

Domain:-  
Mathematical Literacy

Theme:-  
Fruits  
Sale

Class:- VII  
Expected Time: 20 M  
Total Credit:-10 Points

**Item:** - Eating fruits regularly benefits your body as they are natural sources of vitamins and minerals, which are essential for the proper functioning of body. Apple, Grapes & Bananas are the good source of carbohydrates. A grape is botanically a berry of deciduous woody vines of the flowering plant genus Vitis. Apple contains high level of boron which stimulates electrical activity of brain and increases mental alertness. Bananas are officially considered as herbs .It is good source of fiber .It can float in water because they are less dense in comparison with water. Due to rich sources of carbohydrates & fiber these are most sold fruits worldwide. Given bar graph shows the fruits Apple, Grapes & Bananas sold (in tons) through the year 2011 to 2013 in a city.



(image source-Google)

**Learning Outcome: (As per NCERT)**

- ❖ Interprets Multiplication and division of two fractions & decimals.
- ❖ Uses algorithm to multiply / divide fractions & decimals
- ❖ Solves problems related to daily life situations involving fraction and decimals.

## Questions

14.1 Observe the graph and write the ratio of the amount of Bananas and Apples that were sold from 2010 to 2013?

- a) 25:37                      (b) 60:57                      (c) 59:57                      (d) 19:20

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Evaluate
Overarching idea	Relationships, Multiplication and Division of decimals.
Context	Decimals (in Statistics)
Item Format	MCQ /closed constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

14.2 How many times apple were sold in the year 2010 in comparison to bananas sold in 2011?

(a) 1.2 (b) 1.5 (c) 1.8 (d) 2.4

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Evaluate
Overarching idea	Relationships, Multiplication and Division of decimals.
Context	Decimals (in Statistics)
Item Format	MCQ /closed constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

14.2 Full Credit:-1 Points (Apple sold =2XBananas Sold=2X1.2=2.4 tons) Partial Credit:- 0 Points (Other response) Nil credit:-Other response
---

14.3 How many times the apples were sold in the years 2010, 2012 and 2013 in comparison to the grapes sold in the year 2012?

(a) 2 (b) 3 (c) 4 (d) 5

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Evaluate
Overarching idea	Relationships, Multiplication and Division of decimals.
Context	Decimals (in Statistics)
Item Format	MCQ /closed constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	2



**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

14.3 Full Credit:-1 Points  
(2 times, Apple sold =7.0 tons, Grapes sold =3.5 tons,  
No of times=  $7.0 \div 3.5= 2$ )  
Partial Credit:- 1 Points  
(Apple sold =7.0 tons & Grapes sold =3.5 tons)  
Nil credit:-Other response

14.4 In which year was the growth of total amount of fruits sold is least and maximum? What is the product of total sold fruits in these two years?

.....  
.....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Evaluate
Overarching idea	Relationships, Multiplication and Division of decimals.
Context	Decimals (in Statistics)
Item Format	MCQ /closed constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

14.4 Full Credit:-2 Points  
(Most sold fruits in the year 2013=12.3 tons)  
Most sold fruits in the year 2012=8.3 tons)  
Product= $12.3 \times 8.3=102.09$  tons)  
Partial Credit:- 0 Points  
Nil credit:-Other response

14.5 Name the fruit which is sold the most from 2010 to 2013?

- (a) Apple                                      (b) Grapes                                      (c) Bananas                                      (d) a & b

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Evaluate
Overarching idea	Relationships, Multiplication and Division of decimals.
Context	Decimals (in Statistics)
Item Format	MCQ /closed constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

- 14.5 Full Credit:-1 Points (Grapes)  
 Partial Credit:- 0 Points (Other response)  
 Nil credit:-Other response

14.6 How many tons apples were sold from 2010 to 2013?

- (a) 10.4 tons                                      (b) 11.4 tons                                      (c) 10.5 tons                                      (d) 12.4 tons

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Evaluate
Overarching idea	Relationships, Multiplication and Division of decimals.
Context	Decimals (in Statistics)
Item Format	MCQ /closed constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

- 14.6 Full Credit:-1 Points  
 (2.4+4.4+1.8+2.8=11.4 tons)  
 Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

14.7 What is the ratio between the grapes sold in year 2011& 2012 and Bananas sold in the year 2013?

.....  
.....

### Mathematical Literacy

#### FRAMEWORK

#### CHARACTERISTICS

Competency Cluster

Evaluate

Overarching idea

Relationships, Multiplication and Division of decimals.

Context

Decimals (in Statistics)

Item Format

MCQ /closed constructed

Cognitive Process

Interpreting, Analysis/Observations

Proficiency Level

2

#### Credit Pattern:

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

#### Description of Answer Key and Credits:

14.7 Full Credit 2 Points

Yes, Amount of Grapes sold from 2011 & 2012=6.0 tons,

Amount of Bananas sold in 2013=5 tons
















$6.0 \div 5 = 1.2$  ie

Grapes sold in tons =1.2 X bananas sold( in tons )

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

## Practice Item for Mathematical Literacy -15

Domain:- Mathematical Literacy	Theme:- Table Tennis Board	Class:- VII Expected Time: 15 M Total Credit:-10 Points																		
Item: - After seeing Sharath Kamal India's top table tennis player, playing in Khelo India Youth Games 2020 (Guwahati) under the ministry of youth affairs & sports, Jack got Inspired & decided to play this game table tennis .For the same he visited a shop to check some prices to assemble a table tennis board .At a shop he can buy a complete board with all supporting equipment or he can buy a table, a set of 4 poles, a set of two table tennis rackets and a set of support objects and assemble his own board.		<b>Learning Outcome: (As per NCERT)</b> <ul style="list-style-type: none"> <li>❖ Interprets Multiplication and division of two fractions &amp; decimals.</li> <li>❖ Uses algorithm to multiply / divide fractions &amp; decimals</li> <li>❖ Solves problems related to daily life situations involving</li> </ul>																		
The price for the shop's products are		fraction and decimals.																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Product</th> <th style="width: 15%;">Price in Rs</th> <th style="width: 65%;">Objects picture</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Complete table tennis board with other items</td> <td style="padding: 5px;">Rs.4227.50</td> <td style="padding: 5px; text-align: center;"></td> </tr> <tr> <td style="padding: 5px;">Table</td> <td style="padding: 5px;">Rs.2156.50</td> <td style="padding: 5px; text-align: center;"></td> </tr> <tr> <td style="padding: 5px;">One set of 4 Poles</td> <td style="padding: 5px;">Rs.975.80 or Rs.1256.90</td> <td style="padding: 5px; text-align: center;"></td> </tr> <tr> <td style="padding: 5px;">One set of two Tennis racket</td> <td style="padding: 5px;">Rs.845.50</td> <td style="padding: 5px; text-align: center;"></td> </tr> <tr> <td style="padding: 5px;">One set of supporting objects(containing nuts , bolts rope, Trap</td> <td style="padding: 5px;">Rs.500.00</td> <td style="padding: 5px; text-align: center;">                       (image source-Google)                 </td> </tr> </tbody> </table>	Product	Price in Rs	Objects picture	Complete table tennis board with other items	Rs.4227.50		Table	Rs.2156.50		One set of 4 Poles	Rs.975.80 or Rs.1256.90		One set of two Tennis racket	Rs.845.50		One set of supporting objects(containing nuts , bolts rope, Trap	Rs.500.00	 (image source-Google)		
Product	Price in Rs	Objects picture																		
Complete table tennis board with other items	Rs.4227.50																			
Table	Rs.2156.50																			
One set of 4 Poles	Rs.975.80 or Rs.1256.90																			
One set of two Tennis racket	Rs.845.50																			
One set of supporting objects(containing nuts , bolts rope, Trap	Rs.500.00	 (image source-Google)																		

## Questions

15.1 Jack wants to assemble his own table tennis board with all items. What is the minimum price and the maximum price in this shop for self-assembled table tennis board?

(a) Minimum price.....

(b) Maximum Price .....

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding & Evaluate
Overarching idea	Relationships & Multiplication o& Division of decimals
Context	Decimal (in real life )
Item Format	MCQ/closed Constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	3

#### Credit Pattern:

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

#### Description of Answer Key and Credits:

15.1 Full Credit:-2 Points (a)Minimum price – Rs 4477.80

(b) Maximum Price- Rs 4758.90

Partial Credit:- 1 Points

(a)Minimum price – Rs 8705.30 or

(b) Maximum Price- Rs 8986.40)

Nil credit:-Other response

15.2 What can be the maximum cost of 200 sets of 4 Poles of Table?

.....

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding & Evaluate
Overarching idea	Relationships & Multiplication o& Division of decimals
Context	Decimal (in real life )
Item Format	MCQ/closed Constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

15.2 Full Credit:-1 Points

(Rs.1256.90 X 200= Rs 25138)

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

15.3 If jack wants to buy two and a half set of table tennis rackets what is the amount that he has to pay?

.....

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding & Evaluate
Overarching idea	Relationships & Multiplication o& Division of decimals
Context	Decimal (in real life )
Item Format	MCQ/closed Constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

15.3 Full Credit:-2 Points

(cost of one racket= Rs 422.75)

Cost of 5 such rackets= Rs 422.75 X 5=2113.75)

Partial Credit:- 1 Points (One of them above is right)

Nil credit:-Other response

15.4 In the cost of one complete table tennis board how many sets of two Tennis rackets can be bought?

.....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding & Evaluate
Overarching idea	Relationships & Multiplication o& Division of decimals
Context	Decimal (in real life )
Item Format	MCQ/closed Constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

15.4 Full Credit:-2 Points (5 sets,  $4227.50 \div 845.50 = 5$ )

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

15.5 In the cost of one table how many sets (approx...) of supporting objects can be bought?

.....

Mathematical Literacy	
FRAMEWORK	CHARACTERISTICS



Competency Cluster	Result finding & Evaluate
Overarching idea	Relationships & Multiplication o& Division of decimals
Context	Decimal (in real life )
Item Format	MCQ/closed Constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

15.5 Full Credit:-2 Points ( Approx., 4 sets,  $2156.50 \div 500 = 4.3$  )

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

15.6 The shop offers three different tables, two different type of poles and two different sets of supporting objects. There is only one choice for a set of table tennis racket. How many different table tennis boards can Jack construct?

- (a) 6      (b) 2      (c) 10      (d) 12

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Result finding & Evaluate
Overarching idea	Relationships & Multiplication o& Division of decimals
Context	Decimal (in real life )
Item Format	MCQ/closed Constructed
Cognitive Process	Interpreting, Analysis/Observations
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

15.6 Full Credit:-1 Points ( Ans :2)

Partial Credit:- 0 Points (Other response)

Nil credit:-Other response

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KVS Region: - Tinsukia

## Practice Item for Mathematical Literacy -16

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> My Data speed	<b>Class:</b> VII <b>Expected Time:</b> 20 minutes
		<b>Total Credit:</b> 10 Points

**Description of item:** A cellular company data packs are as given below.( 1 GB = 1024 MB ) where MB stands for Mega Byte.

FREE VOICE + UNLIMITED DATA (2 GB)	<b>₹98</b> 2 GB DATA VALIDITY: 28 DAYS			
1 GB/DAY 1.5 GB/DAY PACKS	<del>₹199</del> <b>₹149</b> 28GB 42 GB DATA VALIDITY: 28 DAYS	<del>₹399</del> <b>₹349</b> 70GB 105 GB DATA VALIDITY: 70 DAYS	<del>₹459</del> <b>₹399</b> 84GB 126 GB DATA VALIDITY: 84 DAYS	<del>₹509</del> <b>₹449</b> 91GB 136 GB DATA VALIDITY: 91 DAYS
1.5GB/DAY 2 GB/DAY PACKS	<del>₹198</del> <b>₹198</b> 42GB 56 GB DATA VALIDITY: 28 DAYS	<del>₹398</del> <b>₹398</b> 105GB 140 GB DATA VALIDITY: 70 DAYS	<del>₹448</del> <b>₹448</b> 126GB 168 GB DATA VALIDITY: 84 DAYS	<del>₹498</del> <b>₹498</b> 136GB 182 GB DATA VALIDITY: 91 DAYS

**Learning Outcome: (As per NCERT)**

- ❖ Interprets Multiplication and division of two fractions/ decimals.
- ❖ Uses algorithm to multiply / divide two fractions / decimals
- Solves problems related to daily life involving Fractions / Decimals.

### QUESTIONS

16.1 How much data can a customer use by choosing plan – 349? Show your calculation.

---

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

**Answers:**

16.1 Full Credit:  $70 \times 1.5 \text{ GB} = 105 \text{ GB}$  Any other response: No credit Explanation:

16.1  $70 \times 1.5 \text{ GB} = 105 \text{ GB}$  Full Credit : (credit for procedure only not for answer)

16.2 A video of size 1.5 GB is to be uploaded and a customer could do it in 0.2 hours. What is the upload speed in (Mb per minute)?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction

Description of Answer Key and Credits:

**Answers:**

16.2 Full Credit: 128 MB per Second Any other Response: Nil Credit

Explanation:

16.2 0.2 Hours =  $\frac{1}{5}$  of 60 minutes = 12 minutes. 1.5 GB X 1024 mb = 1536 mb.  
 $1536 / 12 = 128$  mb per minute.

Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point Nil

Credit : 0 point

16.3 A customer's month end bill indicated that he used 5/8 of his total entitled data. How much did he use if he is in Plan-448?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration

Proficiency Level	2
-------------------	---

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

<p><b>Answers:</b></p> <p>16.3 Full Credit: 105 GB Explanation:  16.3 168 GB <math>\times \frac{5}{8} = 21 \times 5 = 105</math> GB.</p>
--

16.4 Suggest a money saving plan for the customer based on his usage (keeping his validity days same). What part of his money will be saved?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points


Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

<p><b>Answers:</b></p> <p>16.4 Full Credit: Plan 349 and he can save 99/448 of his money. Partial Credit :  Plan 349      Any other response: No credit Explanation:</p> <p>16.4 Plan – 349    Savings: <math>448 - 399 = 49</math>    Part : 49/448</p>
--

## Practice Item for Mathematical Literacy -17

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Dice game	<b>Class:</b> VII <b>Expected Time:</b> 15 min <b>Total Credit:</b> 10 points
 <p><b>Description of item :</b> A game of dice is played with a coloured dice shown in picture.</p> <p>The rules of the games are as follows. Each player starts with 1000 points. On throwing the dice if a player gets</p> <ul style="list-style-type: none"> <li>Red Colour – Points become <math>\frac{1}{2}</math> times.</li> <li>Orange Colour – points become 1.25 times.</li> <li>Blue Colour – Points get <math>\frac{1}{4}</math> of his existing score.</li> <li>Violet colour – Points get doubled</li> <li>Yellow colour – Points become 3.001 times</li> <li>Green colour – Point become 0.912 times.</li> </ul>		
<p><b>Learning Outcome:</b> (As per NCERT)</p> <ul style="list-style-type: none"> <li>➤ Interprets Multiplication and division of two fractions/ decimals.</li> <li>➤ Uses algorithm to multiply / divide two fractions / decimals</li> <li>➤ Solves problems related to daily life involving Fractions / Decimals.</li> </ul>		

### Questions:

17.1 To get more points which colour should the player seek?

---

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	1

### Credit Pattern:

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

Answers

17.1 Full Credit: Yellow Colour Any other responses: Nil Credit

17.2 Which colour should the player avoid?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

Answers

17.2 Full Credit: Blue Colour , As it reduces the score to  $\frac{1}{4}$  times Any other responses: Nil Credit.

17.3 If a player starts with 1000 points and gets 4 reds back to back how many points will he have now?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

Answers

17.3 Full Credit: 62.5, Any other responses: Nil Credit

Explanation:

$$17.3 \quad 1000 \times 0.5 \times 0.5 \times 0.5 \times 0.5 = 62.5$$

17.4 A player started with 1000 points and got all colours in the given order once. What will be his final score?

---

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2 points

Partial Credit: 1 point

Nil Credit : 0 point

Description of Answer Key and Credits:

Answer

17.4 Full Credit: 856.653456 , Any other responses: Nil Credit

Explanation:

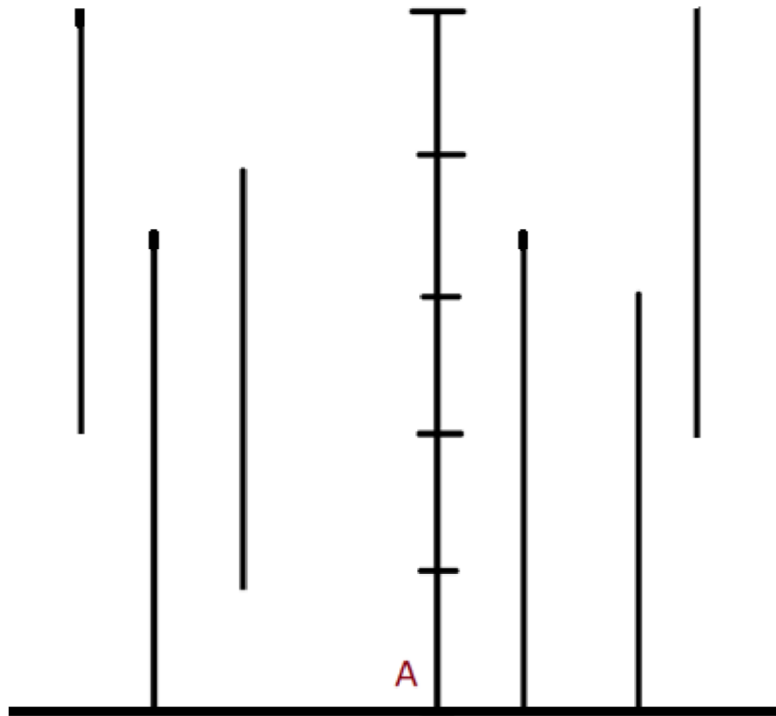
$$17.4 \quad 1000 \times \frac{1}{2} = 500 : 500 \times 1.25 = 625 : 625 \times \frac{1}{4} = 156.25 : 156.25 \times 2 = 313 : \\ 313 \times 3.001 = 939.313 : 939.313 \times 0.912 = 856.653456$$



### CCT PRACTICE ITEM-18

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> LINES	<b>Class:</b> VII <b>Expected Time:</b> 20 minutes <b>Total Credit:</b> 10 points
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**Description of item:** The image given below is a magnified one. The middle line is a scale. In all there are 6 lines three to the left and three to the right.



**Learning Outcome: (As per NCERT)**

- Interprets Multiplication and division of two fractions/ decimals.
- Solves problems related to daily life involving Fractions / Decimals.

Question:

18.1. The given picture is a magnified one. If the length of the line in the middle(Line A) is

2. cm, what is the sum of lengths of all the lines?

---

---

The given picture is a magnified one. If the length of the line in the middle (Line A) is FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding

Answers:

18.1 Full credit(2): 7.6 cm any other response Nil Credit.

Explanation:

18.1  $2 \text{ cm} \div 5 = 0.4 \text{ cm}$

There are 4 lines of size 3 units total length =  $3 \times 4 = 12$  units

Two lines of length 3.5 each =  $2 \times 3.5 = 7$  units

Total length =  $19 \text{ units} \times 0.4 = 7.6 \text{ cm}$

Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points Nil

Credit: 0 points

18.2 If the length of the line in the middle is 2.25 cm what is the length of each unit marked?

---

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ

Answers:

18.2 Full credit(2): 0.45 cm any other response Nil Credit

Explanation:

18.2:  $2.25 \div 5 = 0.45$  cm.

Cognitive Process	Knowledge, exploration
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

18.3 Is it possible to make a square using lines from the above picture? If yes, what is its area if the line in the middle is of 1 cm length?

---

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ

Answers:

18.3 Full credit(2): 0.36 Sq cm any other response Nil Credit.

Explanation:

18.3 Yes using 4 equal lines of length 3 units. Each unit =  $1 \div 5 = 0.2$  cm

Area =  $0.6 \times 0.6 = 0.36$  Sq Cm.

Cognitive Process	Knowledge, exploration
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

18.3 Is it possible to make a rectangle using lines from the above picture? If yes,

What is the maximum possible area if the line in the middle is of 1 cm length?

---

---

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2.5 points

**Explanation:**

18.4 Yes using 2 equal lines out of 4 equal lines of length 3 units and 2 equal lines of size 3.5 units each. Each unit =  $1 \div 5 = 0.2$  cm

Length =  $3 \times 0.2 = 0.6$  cm

Breadth =  $3.5 \times 0.2 = 0.7$  cm

Area =  $0.6 \times 0.7 = 0.42$  sq cm

Partial Credit: 1 points Nil

Credit: 0 points

**Answers:**

18.4 Full credit (2): 0.42 Sq cm any other response Nil Credit.

18.5 If the image is compared with the original (non-magnified) one it was found that the Image is magnified by 5X (5 times). If measured with non-magnified scale what will be the length of the middle line given here?

A] 2 units

B] 1 unit

C] 5 units

D] 10 units

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	1

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points Nil

Credit: 0 points

**Answers:**

18.5 Full credit(2):C Explanation:

18.5 Each unit of magnified line is equal to 1 cm and hence the length of line is 5 cm.

### CCT PRACTICE ITEM-19

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Train Fare Hike	<b>Class:</b> VII <b>Expected Time:</b> 15 m <b>Total Credit:</b> 10
---	----------------------------------	--

**Description of item :**

## **Railway fare hike: Your train ride may be costlier today. Details here**

*The railways announced a two paise/km hike in fares of mail/express non-AC trains and four paise/km hike in the fares of AC classes.*

**O**n the New Year's eve, the railways announced fare hike across its network, excluding suburban trains, effective from January 1, 2020, according to an order issued on Tuesday.

While suburban fares remain unchanged, ordinary non-AC, non-suburban fares were increased by 1 paise per km of journey.

The railways also announced a two paise/km hike in fares of mail/express non-AC trains and four paise/km hike in the fares of AC classes.

The fare hike is also applicable to premium trains such as Shatabdi, Rajdhani and Duronto, according to the order.

In the Delhi-Kolkata Rajdhani, which covers a distance of 1,447 km, the hike at the rate of 4 paise per km will be around Rs 58.

According to the order, there will not be any change in the reservation fee and superfast charge and the hike in fares will not be applicable to tickets already booked.

**Image Source: indiatoday.in**

**Learning Outcome: (As per NCERT)**

- **Interprets Multiplication and division of two fractions/ decimals.**
- **Solves problems related to daily life involving Fractions / Decimals.**

Ticket 1

Ticket 2

M-TICKET		
	PNR:6636727202	
QUOTA	GENERAL	
CLASS	SLEEPER	
FROM	GUWAHATI [GHY]	
TO	RANGIYA JN. [RNY]	
DEP:	10-11-2019	06:20
ARR:	10-11-2019	07:16
TRAIN NO:	GHY-BNC EXPRESS 12510	
Mr KUMAR	33/M	CNF S8/22
Distance	48 KM	
TICKET FARE	RS. 160.00	
CONVINENCE FEE	RS. 17.00	
INSURANCE	RS. 0.49	
TOTAL FARE	RS. 177.49	

M-TICKET		
	PNR:2742616891	
QUOTA	GENERAL	
CLASS	SECOND AC	
FROM	DANAPUR [DNR]	
TO	GUWAHATI [GHY]	
DEP:	18-06-2019	04:02
ARR:	18-06-2019	19:50
TRAIN NO:	12424/DBRT RAJDHANI	
KUMAR	33/M	CNF A3/40
HARVINDER	27/M	RLWL 1
Distance	886 KM	
TICKET FARE	RS. 5980.00	
SERVICE CHARGE	RS. 0.00	
INSURANCE	RS. 0.98	
TOTAL FARE	RS. 5980.98	

Questions: Tickets given above were of journeys performed before fare-hike.

19.1 In which of the above journeys the increase in fares is more?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

Credits

19.1 Full Credit(2) : Ticket two costs more as it is AC Class any other answer Nil Credit.Explanation:

19.1 Fare 2 as it is ac class and hike is 4 paise per km : as all the trains are mail/ express whose fares are hiked.

**19.2 What will be the ticket fare for the journey in ticket 1 after the hike?**

---

---

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

Credits

19.2 Full Credit(2) 160.96 any other answer Nil Credit Explanation:

19.2 Distance : 48 kilometres hike per km in express in

Sleeper class:0.02 paise per KM.

hike in fare =  $48 \times 0.02 = 0.96$

New Fare = old fare + hike =  $160 + 0.96 = 160.96$

**19.3 What will be the ticket fare for the journey in ticket 2 after the hike?**



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FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points Nil

Credit: 0 points

<p>Credits</p> <p>19.3 Full Credit(2): 6050.88 any other answer Nil Credit. Explanation:</p> <p>19.3 Distance : 886 kilometres hike per km in express in AC class:0.04 paise per KM.</p> <p>hike in fare = <math>886 \times 0.04 = 35.44</math> per seat for two people = <math>35.44 \times 2 = 70.88</math></p> <p>New Fare = old fare + hike = <math>5980 + 70.88 = 6050.88</math></p>
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**19.4 What will be the ticket fare if five people have to travel in the route of ticket 2 after the hike?**

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FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)

Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

Credits

19.4 Full Credit (2):15127.2 any other answer Nil Credit. Explanation:

19.4 Fare per passenger =  $6050.88 / 2 = 3025.44$

Fare for 5 passengers =  $3025.44 \times 5 = 15127.2$

**19.5 There are 5 Second AC Coaches in DBRT Rajdhani each containing 54 seats. Which of the expressions below gives the increase in the ticket fare collection in DBRT Rajdhani Express in Second AC classes? (assuming that all seats are sold and for the sector Danapur to DBRT)**

A]  $54 \times 5 \times 5980$

C]  $54 \times 5 \times 35.44$

B]  $54 \times 2 \times 2990$

D]  $54 \times 5 \times 2 \times 35.44$

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response/MCQ
Cognitive Process	Knowledge, exploration
Proficiency Level	2

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

Credits

19.5 Full credit(2):C Explanation:

19.5: 54 seats 5 coaches 35.44 per seat.

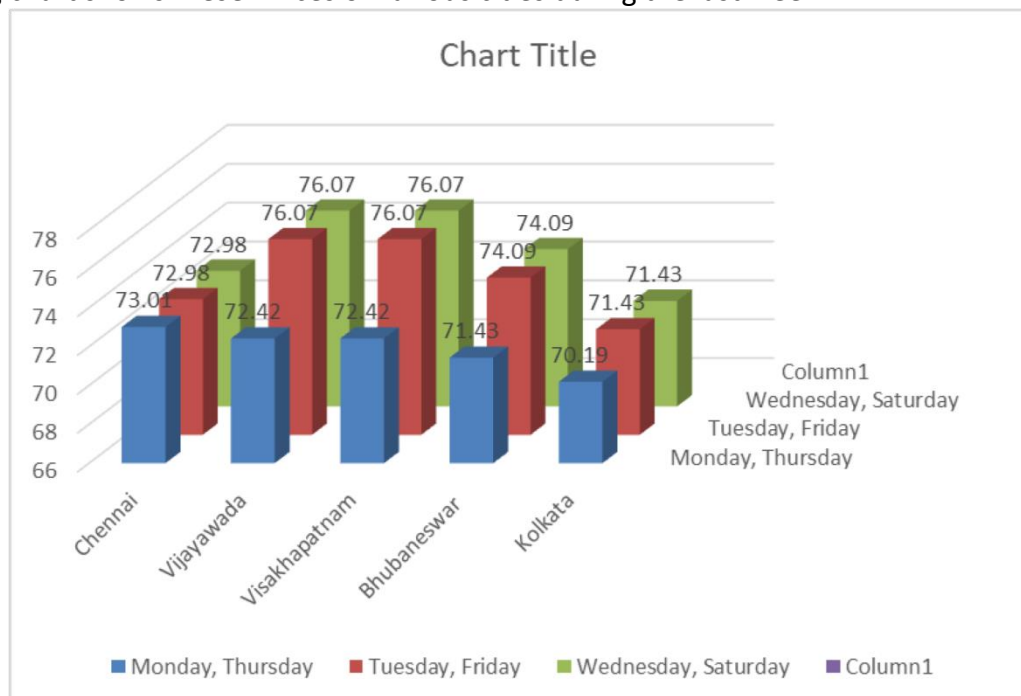


## CCT PRACTICE ITEM-20

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Logistics	<b>Class:</b> VII <b>Expected Time:</b> 30 minutes <b>Total Credit:</b> 10 minutes
<p><b>Description of item:</b> ABCD Logistics is a company that transports various industrial products across various destinations. Mr Tom is in charge for one of their routes Chennai To Kolkata. In this route their trucks ply between four major hubs (cities) viz. Vijayawada, Visakhapatnam, Bhubaneswar and Kolkata carrying various loads. The fleet of company consists of lorries and trucks which use diesel as main fuel. The company records show their trucks give a mileage (kilometres travelled for every 1 litre of fuel used) of 4 Km per litre. Their trucks run at an average speed of 50 km per hour. A truck's fuel tank capacity is 350 litres of diesel plus they carry a 100 litre spare tank.</p>		
<p><b>Learning Outcome: (As per NCERT)</b></p> <p>Interprets Multiplication and division of two fractions/ decimals.</p> <p>Uses algorithm to multiply / divide two fractions / decimals</p> <p>Solves problems related to daily life involving Fractions / Decimals.</p>		

Question:

The following chart shows Diesel Prices of various cities during the last week.



The distance between the cities of the route can be found by the following chart.

DISTANCE(KM)	CHENNAI	VIJAYAWADA	VISAKHAPATNAM	BHUBANESWAR	KOLKATA
CHENNAI	0	452	802	1250	1690
VIJAYAWADA	452	0	350	798	1238
VISAKHAPATNAM	802	350	0	448	888
BHUBANESWAR	1250	798	448	0	440
KOLKATA	1690	1238	888	440	0

20.1 A truck starts from Kolkata at 6 a.m in the Monday morning. Imagine that it travels non-stop between the hubs and stops at each hub for 4 hours (for loading/unloading/rest-maintenance). How many Days will it take to cover the distance between Kolkata to Chennai.? Express your answer in decimals.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points Nil

Credit: 0 points

**Answers:**

20.1: Full Credit: 33.8 hours i.e. 1 day 21 hours 10 min.: Any other response Nil Credit

**Explanation:**

20.1 Journey time :1690 kms at speed of 50 Km per hour time = distance /speed =  
 $1690/50 = 33.8$  hours

Waiting time:  $4 \times 3 = 12$  hours Total time for journey = 45.8 hours.

No of days =  $45.8 / 24 = 1.90$  days =1 day 21 hours 10 minutes.

20.2 How much Fuel will it use for the trip?

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FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)
Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

Answers:

20.2 Full Credit: 422.5 Litres:: Any other response Nil Credit. Explanation:

20.2 Mileage = 4 km per litre Distance = 1690 km

Fuel burned =  $1690 / 4 = 422.5$  litres.

20.3 The company fills diesel at hubs and fills only the amount of fuel that is necessary to reach the other hub only. Based on the policy how much will be the cost of fuel for the trip mentioned above?

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FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)

Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points

Nil Credit: 0 points

Answers:

20.3 Full Credit: Rs.31011.13 :: Any other response Nil Credit.

Explanation:

20.3 Fuel usage between hubs

	Section	Distance	Fuel	Per litre	Cost
	Kolkata-Bhubaneswar	440	$440 \div 4 = 110$	70.19	7720.9
	Bhubaneswar-Visakhapatnam	448	$448 \div 4 = 112$	71.43	8000.16
	Visakhapatnam-Vijayawada	352	$352 \div 4 = 88$	76.07	6694.16
	Vijayawada-Chennai	452	$452 \div 4 = 113$	76.07	8595.91
	Total				31011.13

20.5 Every Month, a truck makes 5 such trips in the route to and fro. The average fuel price is Rs. 73.01. The company operates 300 trucks. Is the total cost of fuel a decimal number? Why?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Excerpt ,Evaluate & Result Finding
Overarching Idea	Change & Relationships/ Multiplication and division of fraction
Context	Fractions/Decimals( in Nature)

Item Format	Closed Constructed Response/Short Response
Cognitive Process	Knowledge, exploration
Proficiency Level	3

**Credit Pattern:**

Full Credit: 2.5 points

Partial Credit: 1 points Nil

Credit: 0 points

Answers:

20.5 Full Credit: No :: Any other response Nil Credit

Explanation:

20.5 No.  $[300 \times 5 \times 2 \times 422.5 \times 73.01 = 92540175]$  As there are 3 places after decimals and three tens (two in 300 and one in  $5 \times 2$ ) there won't be any decimal in answer.

**Name of the teacher/ Item Writer:**

**V N SASIDHAR VALLURI**

**Designation:**

**PGT MATHEMATICS**

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**Phone No:**

**9494184541**

**Name of the Kendriya Vidyalaya: Kimin, Arunachal Pradesh KVS Region:  
Tinsuka**




**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VII : CHAPTER 3 : DATA HANDLING**

**INDEX**

<b>S.No.</b>	<b>Theme of the item</b>
1.	MEDALS TALLY
2.	CAREER OPTIONS
3.	DROPOUT RATE
4.	MARKS COMPARISON
5.	INDIAN SALT INDUSTRY
6.	GENDER DISTRIBUTION
7.	MODE OF TRANSPORT
8.	PLAYING CARDS
9.	VIRAT VS LEGSPIN
10.	SEX RATIO AT BIRTH
11.	CLIMATE & RAINFALL
12.	GAMBLING PROBABILITY
13.	GOAL COMPARISON
14.	INFANT MORTALITY RATE
15.	RESULT ANALYSIS

## ITEM 1 : MEDALS TALLY

<p><b>Domain:</b></p> <p><b>Mathematical Literacy</b></p>	<p><b>Theme</b> <b>DATA HANDALING</b></p> <p><b>Learning Outcome: Read, analysis and interpret (As per NCERT)</b></p>	<p><b>Class(es): VII</b></p> <p><b>Expected Time: 15-20 min</b></p> <p><b>Total Credit: 8</b></p>																																								
<p><b>Description of Item:</b></p>	<p>Medal tally in South Asian Games  <b>Source :Asian News International</b>                  Kathmandu                  December 10, 2019                  UPDATED: December 10, 2019 19:26 IST                  The South Asian Games (SAF Games, SAG, or SA games, and formerly known as South Asian Federation Games) are a biennial multi-sport event held among the athletes from South Asia. The governing body of these games is South Asia Olympic Council (SAOC), was formed in 1983.                  Last event: 1-10 December 2019 Kathmandu, ...                  First event: September 1984 Kathmandu, Nepal                  Abbreviation: SAG                  Occur every: 2 years  <a href="#">Motto</a>: Peace, Prosperity and Progress</p> <div style="text-align: right;">  </div> <p style="text-align: center;"><b>South Asian Games Medals Tally 2019</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>COUNTRY</th> <th>GOLD</th> <th>SILVER</th> <th>BRONZE</th> <th>TOTAL MEDALS</th> </tr> </thead> <tbody> <tr> <td>INDIA</td> <td>174</td> <td>93</td> <td>45</td> <td>312</td> </tr> <tr> <td>NEPAL</td> <td>51</td> <td>60</td> <td>95</td> <td>206</td> </tr> <tr> <td>SRILANKA</td> <td>40</td> <td>83</td> <td>128</td> <td>251</td> </tr> <tr> <td>PAKISTAN</td> <td>31</td> <td>41</td> <td>59</td> <td>131</td> </tr> <tr> <td>BANGLADESH</td> <td>19</td> <td>32</td> <td>87</td> <td>138</td> </tr> <tr> <td>MALDIVES</td> <td>1</td> <td>0</td> <td>4</td> <td>5</td> </tr> <tr> <td>BHUTAN</td> <td>0</td> <td>7</td> <td>13</td> <td>20</td> </tr> </tbody> </table> <p>India concluded the South Asian Games with their highest medal tally in the history of the tournament. Indian contingent was able to win 312 medals, which includes 174 gold, 93 silver, and 45 bronze medals. India had claimed 309 medals in the 2016 edition of the South Asian Games. Next it will be conducted in 2022 in Lahore, Pakistan.</p>		COUNTRY	GOLD	SILVER	BRONZE	TOTAL MEDALS	INDIA	174	93	45	312	NEPAL	51	60	95	206	SRILANKA	40	83	128	251	PAKISTAN	31	41	59	131	BANGLADESH	19	32	87	138	MALDIVES	1	0	4	5	BHUTAN	0	7	13	20
COUNTRY	GOLD	SILVER	BRONZE	TOTAL MEDALS																																						
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BHUTAN	0	7	13	20																																						

Q1. A daily show channel in southern Asia wants to interview a winner of the South Asian games 2019. Unable to decide which player to interview they decide to select a gold medallist randomly. What is the probability that the player happens to be an Indian?

Q2. If the range of number of gold medals is A, the median of number of silver medals is B and the mean of number of bronze medals is C. Find the value of  $A - B + C$ .

Q3. Identify one of the countries whose total number of medals is a prime number

- (a) India (b) Nepal (c) Pakistan (d) Bhutan

Q4. Which one of the following could never have been a previous medal tally of India?

- (A) 104 Gold 104 Silver and 22 Bronze  
(B) 80 Gold 142 Silver and 73 Bronze  
(C) 163 Gold 102 Silver and 43 Bronze  
(D) 111 Gold 91 Silver and 118 Bronze

**ITEM 2: CAREER OPTIONS**

<p><b>Domain:</b> <b>Mathematical Literacy</b></p>	<p><b>Theme</b> <b>DATA HANDLING</b></p> <p><b>Learning Outcome: Read, analysis and interpret (As per NCERT)</b></p>	<p><b>Class(es): VII</b></p> <p><b>Expected Time: 5-8 min</b></p> <p><b>Total Credit: 8</b></p>																																
<p><b>Description of Item:</b></p>	<p><b>CAREER</b></p> <p>Under the career counselling session, a counsellor was called to school to talk to the students of class XI and XII so that it helps them to choose their career and to get the knowledge of what they should study to pursue that career. 300 students were asked to name a career they want to pursue. The results are shown in the table below.</p> <p align="center"><b>CAREER CHOICE</b></p> <table border="1" data-bbox="595 891 1281 1294"> <thead> <tr> <th>Career</th> <th>No. of students</th> </tr> </thead> <tbody> <tr> <td>Actor/actresses</td> <td>10</td> </tr> <tr> <td>Athlete</td> <td>30</td> </tr> <tr> <td>Business</td> <td>50</td> </tr> <tr> <td>Executive</td> <td>80</td> </tr> <tr> <td>Pilot</td> <td>28</td> </tr> <tr> <td>Politician</td> <td>7</td> </tr> <tr> <td>Defence</td> <td>50</td> </tr> <tr> <td>Musician</td> <td>20</td> </tr> <tr> <td>Teacher</td> <td>25</td> </tr> </tbody> </table> <p align="center"><b>Which of the following is supported by the data in the table?</b></p> <table border="1" data-bbox="408 1335 1382 1713"> <tr> <td><b>Q1</b></td> <td><b>The most preferred career among the students is executive.</b></td> <td><b>YES /NO</b></td> </tr> <tr> <td><b>Q2</b></td> <td><b>The mode of the data is 80.</b></td> <td><b>YES /NO</b></td> </tr> <tr> <td><b>Q3</b></td> <td><b>More than 15% of the students would like to pursue a career in acting or Music</b></td> <td><b>YES /NO</b></td> </tr> <tr> <td><b>Q4</b></td> <td><b>Exactly 7% of the students would like to pursue a career in politics.</b></td> <td><b>YES /NO</b></td> </tr> </table>		Career	No. of students	Actor/actresses	10	Athlete	30	Business	50	Executive	80	Pilot	28	Politician	7	Defence	50	Musician	20	Teacher	25	<b>Q1</b>	<b>The most preferred career among the students is executive.</b>	<b>YES /NO</b>	<b>Q2</b>	<b>The mode of the data is 80.</b>	<b>YES /NO</b>	<b>Q3</b>	<b>More than 15% of the students would like to pursue a career in acting or Music</b>	<b>YES /NO</b>	<b>Q4</b>	<b>Exactly 7% of the students would like to pursue a career in politics.</b>	<b>YES /NO</b>
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### ITEM 3: DROPOUT RATE

<b>Domain:</b>  <b>Mathematical Literacy</b>	<b>Theme</b> <b>DATA HANDLING</b>  <b>Learning Outcome: Read, analysis and interpret (As per NCERT)</b>	<b>Class(es): VII</b>  <b>Expected Time: 10-15 min</b>  <b>Total Credit: 8</b>
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**Description of Item:**

### **Dropout rate among schoolchildren in India.**

With its high tribal population, Jharkhand has the highest dropout rate for schoolchildren in India (only 30 out of 100 finish school).

Dropout rates among Adivasis are the highest among all communities. Of an initial enrolment of 100 students, on an average, only 70 finish school in India. While the number of students in the elementary education level is high (94), many drop out during the secondary level (with 75 left).

There is no gender disparity in dropouts. Boys and girls quit school in equal measure



In sharp contrast to Jharkhand the States which has the lowest dropout rates are Tamil Nadu, Kerala, Himachal Pradesh and Maharashtra having minimal dropout rates

State	Initial	Elementary	Secondary	Senior
Jharkand	100	83	53	30
Arunachal	100	80	56	38
Nagaland	100	80	55	44
Bihar	100	89	54	46
Meghalaya	100	82	59	48
Mizoram	100	86	60	54.8
Telangana	100	93	72	54.8
West Bengal	100	92	67	55.1
Sikkim	100	94	71	56
J & K	100	87	66	56.6
Manipur	100	84	67	57.3
Tripura	100	95	67	58
Assam	100	95	69	60
Odisha	100	95	68	67.9
Gujarat	100	97	74	68.3
Chhattisgarh	100	96	72.5	71
M.P.	100	94	71.9	72
U.P.	100	91	79	74.2
Goa	100	99	83	74.3
Delhi	100	100	89	79
Rajasthan	100	94	80	80
Punjab	100	97	89	84
Haryana	100	100	88	85.2
Uttarkhand	100	95	87	85.3
Kerala	100	100	87	85.6

Maharashtra	100	99	88	85.6
Himachal	100	99	92	85.8
Tamil Nadu	100	99	89	86.2

*Data sourced from udise.in*

The above dropout rate is calculated by subtracting the sum of promotion and repetition rate from 100 in a year. Elementary school refers to Grades 1 to 8; Secondary refers to Grades 9 and 10; and Senior refers to Grades 11 and 12.

Q 1. How many states have no Drop outs at all in elementary level ?

**(A) 0                      (B) 1                      (C) 2                      (D) 3**

Q2 In Gujarat , more dropouts are from elementary to secondary or secondary to senior ?

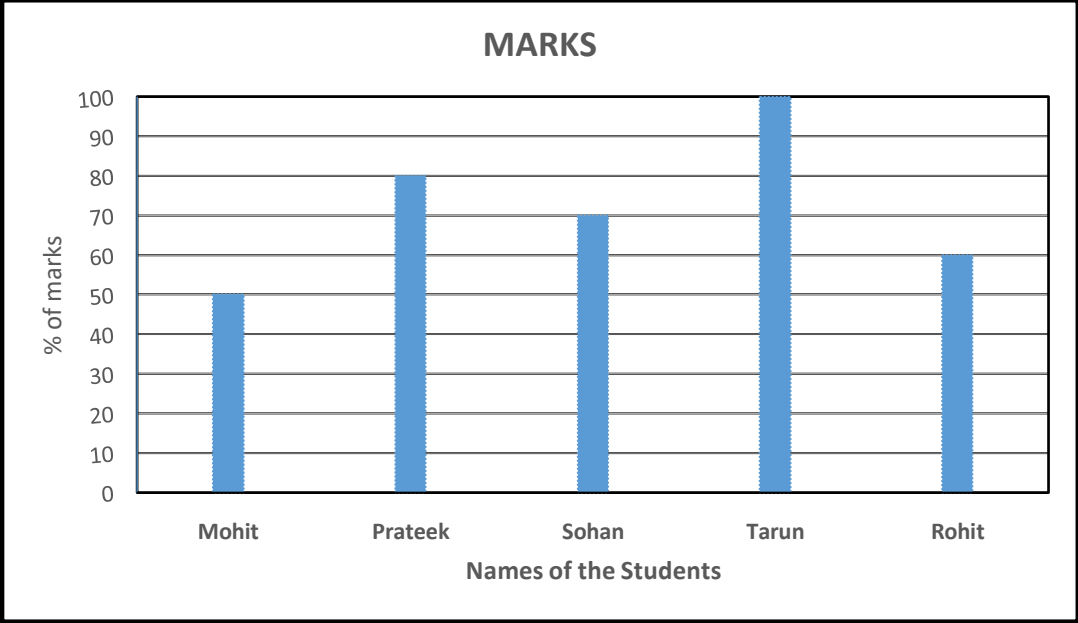
Q 3 .How many states have a dropout rate greater than 10% in elementary school

**A) 2                      (B) 8                      (C) 5                      (D) 6**


Q4. Name the states which has a dropout rate of 20% in elementary school .

---

### ITEM 4 : MARKS COMPARISON

<b>Domain:</b>  <b>Mathematical Literacy</b>	<b>Theme</b> <b>DATA HANDALING</b>  <b>Learning Outcome: Read, analysis and interpret</b>  <b>(As per NCERT)</b>	<b>Class(es): VII</b>  <b>Expected Time: 5-8 min</b>  <b>Total Credit: 08</b>												
<b>Description of Item:</b>	<p><b><u>HIGH SCHOOL</u></b> Given below is a bar graph representing the percentage of marks obtained by five students in a test studying in Zedland high school.</p> <p style="text-align: right;">Scale :1 unit =10% of marks</p> <div style="text-align: center;"><table border="1" style="margin-left: auto; margin-right: auto;"><caption>MARKS</caption><thead><tr><th>Student Name</th><th>Percentage of Marks</th></tr></thead><tbody><tr><td>Mohit</td><td>50%</td></tr><tr><td>Prateek</td><td>80%</td></tr><tr><td>Sohan</td><td>70%</td></tr><tr><td>Tarun</td><td>100%</td></tr><tr><td>Rohit</td><td>60%</td></tr></tbody></table></div> <p><b>Answer the following questions based on the graph.</b></p> <ol style="list-style-type: none"><li><b>1. What is the average percentage of marks obtained by the 5 pupils in the test?</b>  (A) 75%                      (B) 80%                      (C) 72%                      (D) 85%</li><li><b>2. Name the pupil whose marks are <math>\frac{3}{4}</math> of Prateek's Marks?</b>  (A) Mohit                      (B) Sohan                      (C) Rohit                      (D) Tarun</li><li><b>3. Who got higher marks amongst the two students whose names rhyme ?</b></li><li><b>4. If the test was for a total of 360 marks in Zedland high then what is the sum of marks obtained by all 5 students?</b></li></ol>		Student Name	Percentage of Marks	Mohit	50%	Prateek	80%	Sohan	70%	Tarun	100%	Rohit	60%
Student Name	Percentage of Marks													
Mohit	50%													
Prateek	80%													
Sohan	70%													
Tarun	100%													
Rohit	60%													

## ITEM 5 : INDIAN SALT INDUSTRY

<b>Domain:</b>  <b>Mathematical Literacy</b>	<b>Theme</b> <b>DATA HANDALING</b>  <b>Learning Outcome: Read, analysis and interpret (As per NCERT)</b>	<b>Class(es): VII</b>  <b>Expected Time:15-20min</b>  <b>Total Credit: 10</b>
<b>Description of Item:</b>	<h1 style="text-align: center;">INDIAN SALT INDUSTRY</h1> <p style="text-align: center;"><b>January 10, 2019 @ 04:12 PM</b></p> <p>India ranks third in the production of salt in the world next to USA and China. The Average annual production is about 20.31 million tones against the average annual world production of 240-250 million tones. Worldwide about 25 million tones of salt are used for edible purposes and rest is used for non-edible and industrial purpose.</p> <p><u>Top Brands of Salt in India</u></p> <ul style="list-style-type: none"><li>▪ Tata salt</li><li>▪ Captain cook</li><li>▪ i-shakthi</li><li>▪ Aashirvadh</li><li>▪ Annapurna</li><li>▪ Surya salt</li><li>▪ Sambhar salt</li><li>▪ Nirmashudh and many more</li></ul> <p>Salt production in Sambhar Lake in years of 19th, 20th and 21st century (Production in 1000 tonnes) is shown in the table below</p> 	



<b>Year</b>	<b>Production</b>	<b>Year</b>	<b>Production</b>
<b>1870</b>	42.3	<b>2000</b>	99.9
<b>1900</b>	51.1	<b>2005</b>	97.3
<b>1950</b>	346	<b>2008</b>	183
<b>1970</b>	306.3	<b>2009</b>	201.1
<b>1999</b>	129	<b>2010</b>	109.7

Source: Agrawal, 1976, SCO annual reports 1999-2010

Annual reports says, more than 70 percent of Sambhar salt is used in industries and Sambhar salt is about 8 percent of total Rajasthan salt production (Annual reports 1999,2000,2010) In independent India salt manufacturing at Sambhar Lake is under the control of Sambhar salts Limited and Hindustan Salts Limited, Indian government initiatives and also some private companies. Salt production in Sambhar Lake during years 1950 and 1970 was above 3 lakh tones and this has dropped down to 1 to 2 lakh tones in the present time. This decreased salt production is due to the decline in the volume of inflow of water from the river Mendha and its tributaries. This is due to the constructions of dams 40 upstream (Mathur, L. N., 2007).

Q1. In which year is the production of salt maximum in Sambhar lake?

- (A) 1970    (B) 2009    (C) 1950    (D) 2010

Q2 How much salt is produced in Sambhar lake in year 1999?

- (A) 129 tonnes                      (B) 1290 tonnes  
(C) 12900 tonnes                      (D) 129000 tonnes

Q3 How many tonnes of salt was produced in Rajasthan in 1999?

Q4. What is the percentage of decrease in the production of salt between 1970 and 2010?

Q5 What may be the reason for the decline in the production of salt in Sambhar Lake?

## ITEM 6 : GENDER DISTRIBUTION

<b>Domain:</b>  <b>Mathematical Literacy</b>	<b>Theme</b> <b>DATA HANDALING</b>  <b>Learning Outcome: Read, analysis and interpret (As per NCERT)</b>	<b>Class(es): VII</b>  <b>Expected Time: 5-7 min</b>  <b>Total Credit: 08</b>																		
<b>Description of Item:</b>	<p><b><u>GENDER DISTRIBUTION</u></b></p> <p><b>Study the given graph showing the gender distribution in a few colleges in Zedland .Answer the questions given below according to the graph :</b></p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Total No. of Boys and Girls in Various Colleges</p> <div style="text-align: center; margin-bottom: 10px;"> <span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; background-color: white; margin-right: 5px;"></span> GIRLS              <span style="display: inline-block; width: 15px; height: 15px; background-color: black; margin-right: 5px;"></span> BOYS         </div> <table border="1" style="width: 100%; text-align: center; margin-top: 10px;"> <thead> <tr> <th>College</th> <th>Girls (Thousands)</th> <th>Boys (Thousands)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>25</td> <td>23</td> </tr> <tr> <td>B</td> <td>30</td> <td>25</td> </tr> <tr> <td>C</td> <td>20</td> <td>30</td> </tr> <tr> <td>D</td> <td>30</td> <td>20</td> </tr> <tr> <td>E</td> <td>35</td> <td>20</td> </tr> </tbody> </table> </div> <p>1. The total number of girls in colleges D and E together are approximately what percent of the total number of girls in colleges A, B and C together?        (A) 87%                      (B) 75%                      (C) 70%                      (D) 88%</p> <p>2. What is the respective ratio of the number of boys in college D to the number of boys in college B?        (A) 5:4                      (B) 8:9                      (C) 4:5                      (D) 9:8</p> <p>3. What is the ratio of total number of boys in all the colleges to that of total number of girls:        (A) 59:70    (B) 70:59                      (C) 4:5                      (D) 5:4</p> <p>4. Among the college which college has the best gender equality        (A) A                      (B) B    (C) C    (D) D</p>		College	Girls (Thousands)	Boys (Thousands)	A	25	23	B	30	25	C	20	30	D	30	20	E	35	20
College	Girls (Thousands)	Boys (Thousands)																		
A	25	23																		
B	30	25																		
C	20	30																		
D	30	20																		
E	35	20																		


## ITEM 7 : MODE OF TRANSPORT

<b>Domain:</b>  <b>Mathematical Literacy</b>	<b>Theme</b> <b>DATA HANDALING</b>  <b>Learning Outcome: Read, calculate and interpret (As per NCERT)</b>	<b>Class(es): VII</b>  <b>Expected Time: 5-8 min</b>  <b>Total Credit: 08</b>															
<b>Description of Item:</b>	<b>Mode of Transport</b> A survey was conducted for the students studying in class VII of Zedland New school for the different modes of transport available for them to travel. Sanju and Manju started from their house to go to school .They had four different options of Mode of transport available for them to travel <table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th>Mode of Transport</th><th>Distance Covered (in Km)</th><th>Time Taken (in hours)</th></tr></thead><tbody><tr><td>Walking</td><td>40</td><td>10</td></tr><tr><td>Cycle</td><td>100</td><td>20</td></tr><tr><td>Car</td><td>600</td><td>10</td></tr><tr><td>Bus</td><td>500</td><td>25</td></tr></tbody></table> <p>Read the table and answer the questions:</p> <ol style="list-style-type: none"><li>1. The Speed of the bus in Km/h is <p style="text-align: center;">(A) 4      (B) 5      (C) 60      (D) 20</p></li><li>2. What is the ratio of speed of the car and the cycle? <p style="text-align: center;">(A) 1:12    (B) 12:1    (C) 5:2      (D) 2:5</p></li><li>3. In the above given information, which mode of the transport has the fastest speed? <p style="text-align: center;">(A) Bus    (B) Car      (C) Walking    (D) Cycle</p></li><li>4. How much longer will the person have to walk to cover the same distance in the cycle? <hr/><hr/><hr/></li></ol>		Mode of Transport	Distance Covered (in Km)	Time Taken (in hours)	Walking	40	10	Cycle	100	20	Car	600	10	Bus	500	25
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Walking	40	10															
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## ITEM 8 : PLAYING CARDS

<p><b>Domain:</b></p> <p><b>Mathematical Literacy</b></p>	<p><b>Theme</b>  <b>DATA HANDLING PROBABILITY</b></p> <p><b>Learning Outcome: Reading and Calculating (As per NCERT)</b></p>	<p><b>Class(es): VII</b></p> <p><b>Expected Time: 10-15 min</b></p> <p><b>Total Credit: 10</b></p>
<p><b>Description of Item:</b></p>	<p><b>PLAYING CARDS</b></p> <p>In a famous Zedland Game zone different games are played .One of the game is of playing Cards .Ram and Rama are playing with well shuffled pack of 52 cards .It has 4 suites Diamond, Spade ,Clubs, Hearts as shown below.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="width: 45%;"> <p>Q1 A card is drawn at random from a deck of cards. What is the probability of getting a black card ?</p> <p>(A) <math>\frac{1}{2}</math>            (B) <math>\frac{1}{4}</math>            (C) <math>\frac{1}{13}</math>            (D) <math>\frac{1}{52}</math></p> <p>Q2 A card is drawn at random from a deck of cards. Find the probability of getting a queen.</p> <p>(A) <math>\frac{1}{2}</math>      (B) <math>\frac{1}{4}</math>      (C) <math>\frac{1}{13}</math>      (D) <math>\frac{1}{52}</math></p> <p>Q3 A card is drawn at random from a deck of cards. Find the probability of getting a Spade.</p> <p>(A) <math>\frac{1}{2}</math>      (B) <math>\frac{1}{4}</math>      (C) <math>\frac{1}{13}</math>      (D) <math>\frac{1}{52}</math></p> <p>Q4 A card is drawn at random from a deck of cards. Find the probability of getting a King of spade.</p> <p>(A) <math>\frac{1}{2}</math>      (B) <math>\frac{1}{4}</math>      (C) <math>\frac{1}{13}</math>      (D) <math>\frac{1}{52}</math></p> <p>Q5 A card is drawn at random from a deck of cards. What is the probability of getting a red ace card ?</p> <p>(A) <math>\frac{1}{2}</math>      (B) <math>\frac{1}{4}</math>      (C) <math>\frac{1}{13}</math>      (D) <math>\frac{1}{26}</math></p> </div> <div style="width: 50%; text-align: center;"> </div> </div>	

## ITEM 9 : VIRAT VS LEGSPIN

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome : Reading and interpreting (As perNCERT)	Class: VII Expected Time :10 min Total Credit :8																																																
Description of item:	<p>Virat Kohli is an Indian cricketer who currently captains the India national team. A right-handed top-order batsman, Kohli is regarded as one of the best batsmen in the world. He plays for Royal Challengers Bangalore in the Indian Premier League, and has been the team's captain since 2013.</p> <p>The following data of 16<sup>th</sup> January 2020 shows Virat Kohli's dismissal against leg spin in One day International since January 2012.</p> <div style="text-align: center;">  <table border="1" style="margin: auto; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #333; color: white;"> <th style="padding: 5px;">RUNS (BF)</th> <th style="padding: 5px;">BOWLER</th> <th style="padding: 5px;">VENUE</th> <th style="padding: 5px;">YEAR</th> </tr> </thead> <tbody> <tr><td style="padding: 5px;">49 (44)</td><td style="padding: 5px;">S Prasanna</td><td style="padding: 5px;">Ahmedabad</td><td style="padding: 5px;">2014</td></tr> <tr><td style="padding: 5px;">46 (60)</td><td style="padding: 5px;">I Tahir</td><td style="padding: 5px;">MCG</td><td style="padding: 5px;">2015</td></tr> <tr><td style="padding: 5px;">45 (51)</td><td style="padding: 5px;">I Sodhi</td><td style="padding: 5px;">Ranchi</td><td style="padding: 5px;">2016</td></tr> <tr><td style="padding: 5px;">65 (76)</td><td style="padding: 5px;">I Sodhi</td><td style="padding: 5px;">Vizag</td><td style="padding: 5px;">2016</td></tr> <tr><td style="padding: 5px;">39 (55)</td><td style="padding: 5px;">A Zampa</td><td style="padding: 5px;">Nagpur</td><td style="padding: 5px;">2017</td></tr> <tr><td style="padding: 5px;">75 (82)</td><td style="padding: 5px;">A Rashid</td><td style="padding: 5px;">Trent Bridge</td><td style="padding: 5px;">2018</td></tr> <tr><td style="padding: 5px;">71 (72)</td><td style="padding: 5px;">A Rashid</td><td style="padding: 5px;">Leeds</td><td style="padding: 5px;">2018</td></tr> <tr><td style="padding: 5px;">140 (107)</td><td style="padding: 5px;">D Bishoo</td><td style="padding: 5px;">Guwahati</td><td style="padding: 5px;">2018</td></tr> <tr><td style="padding: 5px;">44 (45)</td><td style="padding: 5px;">A Zampa</td><td style="padding: 5px;">Hyderabad</td><td style="padding: 5px;">2019</td></tr> <tr><td style="padding: 5px;">123 (95)</td><td style="padding: 5px;">A Zampa</td><td style="padding: 5px;">Ranchi</td><td style="padding: 5px;">2019</td></tr> <tr><td style="padding: 5px;">16 (14)</td><td style="padding: 5px;">A Zampa</td><td style="padding: 5px;">Mumbai</td><td style="padding: 5px;">2020</td></tr> </tbody> </table> </div> <p style="text-align: right; margin-top: 10px;">(Source: Cricbuzz&amp;Wikipedia)</p>		RUNS (BF)	BOWLER	VENUE	YEAR	49 (44)	S Prasanna	Ahmedabad	2014	46 (60)	I Tahir	MCG	2015	45 (51)	I Sodhi	Ranchi	2016	65 (76)	I Sodhi	Vizag	2016	39 (55)	A Zampa	Nagpur	2017	75 (82)	A Rashid	Trent Bridge	2018	71 (72)	A Rashid	Leeds	2018	140 (107)	D Bishoo	Guwahati	2018	44 (45)	A Zampa	Hyderabad	2019	123 (95)	A Zampa	Ranchi	2019	16 (14)	A Zampa	Mumbai	2020
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	<p>1 ) Which bowler has dismissed Virat Kohli most number of times as per the above data ?</p> <p>2) Since January 2012 which are the years in which Kohli has not been dismissed by leg spin bowler in ODIs ?</p> <p>3) Out of the following leg spin bowlers who has dismissed Virat Kohli the least ?                      a) I Sodhi      b) A Rashid      c) I Tahir      d) A Zampa</p> <p>4) Whether from the above data can we conclude that Virat Kohli is dismissed by leg spinner the most in ODIs ? Justify ?</p>																																																	

### ITEM 10 : SEX RATIO AT BIRTH

<p><b>Domain :</b> Mathematical Literacy</p>	<p><b>Topic:</b> Data Handling</p> <p><b>Learning Outcome :</b> Reading and calculating (As per NCERT)</p>	<p><b>Class:</b> VII</p> <p><b>Expected Time :</b> 8 min</p> <p><b>Total Credit :</b> 6</p>																																	
<p><b>Description of item:</b></p>	<p>In anthropology and demography, the human sex ratio is the ratio of males to females in a population. More data are available for humans than for any other species, and the human sex ratio is more studied than that of any other species, but interpreting these statistics can be difficult. Human sex ratios, either at birth or in the population as a whole, are reported in any of four ways: the ratio of males to females, the ratio of females to males, the proportion of males, or the proportion of females. The following bar graph shows sex ratio at birth of 10 places in India during 2015-16 &amp; 2018-19. The data given is number of females per 1000 males.</p> <div style="text-align: center;"> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Place</th> <th>2015-16</th> <th>2018-19</th> </tr> </thead> <tbody> <tr><td>A &amp; N ISLANDS</td><td>890</td><td>948</td></tr> <tr><td>LAKSHWADEEP</td><td>832</td><td>891</td></tr> <tr><td>NAGALAND</td><td>904</td><td>936</td></tr> <tr><td>GOA</td><td>918</td><td>954</td></tr> <tr><td>ARUNACHAL PRADESH</td><td>951</td><td>914</td></tr> <tr><td>SIKKIM</td><td>998</td><td>948</td></tr> <tr><td>DAMAN &amp; DIU</td><td>906</td><td>889</td></tr> <tr><td>BIHAR</td><td>928</td><td>915</td></tr> <tr><td>UTTHARAKHAND</td><td>906</td><td>938</td></tr> <tr><td>DADRA &amp; NAGAR HAVELI</td><td>951</td><td>938</td></tr> </tbody> </table> </div> <p style="text-align: right;"><b>(Source : Loksabha Website)</b></p>		Place	2015-16	2018-19	A & N ISLANDS	890	948	LAKSHWADEEP	832	891	NAGALAND	904	936	GOA	918	954	ARUNACHAL PRADESH	951	914	SIKKIM	998	948	DAMAN & DIU	906	889	BIHAR	928	915	UTTHARAKHAND	906	938	DADRA & NAGAR HAVELI	951	938
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	<p>1) How Many places show decline in sex ratio at birth of these 10 places ?</p> <p>2) Which of the following shows rise in sex ratio at birth during 2018-19 in comparison with 2015-16</p> <p>i) Lakshwadeep    ii) Bihar    iii) Goa    iv) Nagaland</p> <p>a) i) &amp; ii)    b) ii) &amp; iii)    c) i) ,ii) &amp; iii)    d) i) , iii) &amp; iv)</p> <p>3) Out of A &amp; N Islands, Nagaland &amp; Goa which place has the highest rise in sex ratio at birth ?</p>																																		

## ITEM 11 : CLIMATE & RAINFALL

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome : Reading & Interpreting Data (As perNCERT)	Class: VII Expected Time :6 min Total Credit:6																																				
Description of item:	<p>Cherrapunjee, also known as Sohra, is a high-altitude town in the northeast Indian state of Meghalaya. It's known for its living root bridges, made from rubber trees.</p> <p>Mawsynram is a village in the East Khasi Hills district of Meghalaya state in north eastern India, 65 kilometres from Shillong.</p> <p>The following table shows the comparison of annual rainfall in both cherrapunjee&amp;mawsynram from 2000 -2010</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Year</th> <th style="padding: 5px;">Cherapunji Rainfall(mm)</th> <th style="padding: 5px;">Mawsynram Rainfall(mm)</th> </tr> </thead> <tbody> <tr><td style="padding: 5px;">2010</td><td style="padding: 5px;">13,472</td><td style="padding: 5px;">14,234</td></tr> <tr><td style="padding: 5px;">2009</td><td style="padding: 5px;">9,070</td><td style="padding: 5px;">12,459</td></tr> <tr><td style="padding: 5px;">2008</td><td style="padding: 5px;">11,415</td><td style="padding: 5px;">12,670</td></tr> <tr><td style="padding: 5px;">2007</td><td style="padding: 5px;">12,647</td><td style="padding: 5px;">13,302</td></tr> <tr><td style="padding: 5px;">2006</td><td style="padding: 5px;">8,734</td><td style="padding: 5px;">8,082</td></tr> <tr><td style="padding: 5px;">2005</td><td style="padding: 5px;">9,758</td><td style="padding: 5px;">10,072</td></tr> <tr><td style="padding: 5px;">2004</td><td style="padding: 5px;">14,791</td><td style="padding: 5px;">14,026</td></tr> <tr><td style="padding: 5px;">2003</td><td style="padding: 5px;">10,499</td><td style="padding: 5px;">11,767</td></tr> <tr><td style="padding: 5px;">2002</td><td style="padding: 5px;">12,262</td><td style="padding: 5px;">11,118</td></tr> <tr><td style="padding: 5px;">2001</td><td style="padding: 5px;">9,070</td><td style="padding: 5px;">10,765</td></tr> <tr><td style="padding: 5px;">2000</td><td style="padding: 5px;">11,221</td><td style="padding: 5px;">13,561</td></tr> </tbody> </table> <p style="text-align: right; margin-top: 10px;"><b>(Source: Wikipedia)</b></p>		Year	Cherapunji Rainfall(mm)	Mawsynram Rainfall(mm)	2010	13,472	14,234	2009	9,070	12,459	2008	11,415	12,670	2007	12,647	13,302	2006	8,734	8,082	2005	9,758	10,072	2004	14,791	14,026	2003	10,499	11,767	2002	12,262	11,118	2001	9,070	10,765	2000	11,221	13,561
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- |  |   |
|--|---|
|  | <ol style="list-style-type: none"><li>1) In which year the difference between the rainfall in mawsynram is the highest than in cherrapunjee</li><li>2) Find the mode of the data of rainfall in cherrapunjee during these years</li><li>3) Whether in any of the years given above cherapunjee got more rainfall than mawsynram ? If yes which of the years ?</li></ol> |
|--|---|



ITEM 12 : GAMBLING PROBABILITY

<p>Domain : Mathematical Literacy</p>	<p>Topic: Data Handling</p> <p>Learning Outcome : Analysing and evaluating (As perNCERT)</p>	<p>Class: VII</p> <p>Expected Time : 10 min</p> <p>Total Credit :8</p>
<p>Description of item:</p>	<p>The <b>American roulette wheel has 38 divisions, where numbers from 1 to 36, 0 and 00 can be found.</b> Numbers from 1 to 36 are alternately colored in red and black, while the single zero and the double zero are marked in green. The main objective, which any player pursuits, is to predict, which numbered pocket the roulette ball is going to settle into. In order to do that, all players make bets on a particular number, after which the dealer turns the roulette wheel in one direction and spins the roulette ball in the opposite. Once the ball finds its way into the pocket with that particular number, the respective players get paid. <b>All 38 numbers are identically arranged on the wheel, thus, the ball has an equal probability to settle in any of the divisions.</b></p> <div data-bbox="592 1003 1198 1608" data-label="Image"> </div> <p>(Source : Google)</p> <ol style="list-style-type: none"> <li>1) What is the probability of the ball settling in an even prime number ?</li> <li>2) What is the probability of the ball settling in to 00 of red colour ?</li> <li>a) 0.5      b) 0.25      c) 0      d) 1</li> <li>3) What is the probability that the ball will settle in to either red or black colour ?</li> <li>4) What is the probability of the ball settling into an even natural number less than 30 ?</li> <li>a) <math>\frac{2}{5}</math>      b) <math>\frac{7}{10}</math>      c) <math>\frac{7}{19}</math>      d) <math>\frac{15}{38}</math></li> </ol>	

### ITEM 13 :GOAL COMPARISON

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Reading ,Interpreting & Evaluating Data (As perNCERT)	Class: VII Expected Time :10min Total Credit :8																																																							
Description of item:	<p>The Premier League, often referred to as the English Premier League or the EPL outside England, is the top level of the English football league system. Contested by 20 clubs, it operates on a system of promotion and relegation with the English Football League (EFL).</p> <p>The Premier League is a corporation in which the member clubs act as shareholders. Seasons run from August to May with each team playing 38 matches (playing all 19 other teams both home and away).</p> <p>The Following table shows the top goal scorers during 2018-2019 Premier league season .</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="width: 10%;">Rank</th> <th style="width: 30%;">Player Name</th> <th style="width: 20%;">Club</th> <th style="width: 20%;">Nationality</th> <th style="width: 10%;">No of Goals Scored</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Pierre Emerick Aubameyang</td> <td style="text-align: center;">Arsenal</td> <td style="text-align: center;">Gabbon</td> <td style="text-align: center;">22</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Sadio Mane</td> <td style="text-align: center;">Liverpool</td> <td style="text-align: center;">Senegal</td> <td style="text-align: center;">22</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Mohamed Salah</td> <td style="text-align: center;">Liverpool</td> <td style="text-align: center;">Egypt</td> <td style="text-align: center;">22</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Sergio Aguero</td> <td style="text-align: center;">Manchester City</td> <td style="text-align: center;">Argentina</td> <td style="text-align: center;">21</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">Jamie Vardy</td> <td style="text-align: center;">Leicester City</td> <td style="text-align: center;">England</td> <td style="text-align: center;">18</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">Harry Kane</td> <td style="text-align: center;">Tottenham Hotspur</td> <td style="text-align: center;">England</td> <td style="text-align: center;">17</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">Raheem Sterling</td> <td style="text-align: center;">Manchester City</td> <td style="text-align: center;">England</td> <td style="text-align: center;">17</td> </tr> <tr> <td style="text-align: center;">8</td> <td style="text-align: center;">Eden Hazard</td> <td style="text-align: center;">Chelsea</td> <td style="text-align: center;">Belgium</td> <td style="text-align: center;">16</td> </tr> <tr> <td style="text-align: center;">9</td> <td style="text-align: center;">Callum Wilson</td> <td style="text-align: center;">AFC Bournemouth</td> <td style="text-align: center;">England</td> <td style="text-align: center;">14</td> </tr> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">Richarlison</td> <td style="text-align: center;">Everton</td> <td style="text-align: center;">Brazil</td> <td style="text-align: center;">13</td> </tr> </tbody> </table> <p style="text-align: right; margin-top: 10px;"><b>(Source: Wikipedia &amp; Premier league.com)</b></p>		Rank	Player Name	Club	Nationality	No of Goals Scored	1	Pierre Emerick Aubameyang	Arsenal	Gabbon	22	1	Sadio Mane	Liverpool	Senegal	22	1	Mohamed Salah	Liverpool	Egypt	22	4	Sergio Aguero	Manchester City	Argentina	21	5	Jamie Vardy	Leicester City	England	18	6	Harry Kane	Tottenham Hotspur	England	17	6	Raheem Sterling	Manchester City	England	17	8	Eden Hazard	Chelsea	Belgium	16	9	Callum Wilson	AFC Bournemouth	England	14	10	Richarlison	Everton	Brazil	13
Rank	Player Name	Club	Nationality	No of Goals Scored																																																					
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	<p>1) What is the range of goal scored in this data ?</p> <p>2) If the nationality of players are considered , what will be the mode of the data ?</p> <p>a) Senegal b) England c) Egypt d) Brazil</p> <p>3) “ If Jamie Vardy has scored <math>\frac{1}{3}</math><sup>rd</sup> more goals of what he actually scored then he would have become the top scorer” . State whether this statement is true or false and justify your answer ?</p> <p>4) What is the median of the goal scored in this data ?</p> <p>a) 22 b) 17 c) 17.5 d) 18</p>
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## ITEM 14 :INFANT MORTALITY RATE

<p><b>Domain :</b> Mathematical Literacy</p>	<p><b>Topic:</b> Data Handling</p> <p><b>Learning Outcome :</b>Reading ,Analyzing&amp; Interpreting (As perNCERT)</p>	<p><b>Class:</b> VII</p> <p><b>Expected Time :</b>10</p> <p><b>Total Credit:</b>8</p>																					
<p><b>Description of item:</b></p>	<p><b>Infant mortality</b> is the death of young children under the age of 1. This death toll is measured by the <b>infant mortality rate (IMR)</b>, which is the number of deaths of children under one year of age per 1000 live births. The under-five mortality rate, which is referred to as the <i>child mortality rate</i>, is also an important statistic, considering the infant mortality rate focuses only on children under one year of age.</p> <p>Premature birth is the biggest contributor to the IMR. Other leading causes of infant mortality are birth asphyxia, pneumonia, congenital malformations, term birth complications such as abnormal presentation of the fetus umbilical cord prolapse, or prolonged labor, neonatal infection, diarrhea, malaria, measles and malnutrition. One of the most common preventable causes of infant mortality is smoking during pregnancy. Many factors contribute to infant mortality, such as the mother's level of education, environmental conditions, and political and medical infrastructure. Improving sanitation, access to clean drinking water, immunization against infectious diseases, and other public health measures can help reduce high rates of infant mortality.</p> <p>The following bar graph shows the infant mortality gender wise of five states and India as on 2017</p> <div style="text-align: center;"> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <caption>INFANT MORTALITY RATE (2017)</caption> <thead> <tr> <th>State/Country</th> <th>Male</th> <th>Female</th> </tr> </thead> <tbody> <tr> <td>Andhra Pradesh</td> <td>31</td> <td>33</td> </tr> <tr> <td>Kerala</td> <td>9</td> <td>10</td> </tr> <tr> <td>Odisha</td> <td>40</td> <td>41</td> </tr> <tr> <td>Madhya Pradesh</td> <td>48</td> <td>45</td> </tr> <tr> <td>Uttar Pradesh</td> <td>39</td> <td>43</td> </tr> <tr> <td>India</td> <td>32</td> <td>34</td> </tr> </tbody> </table> </div> <p style="text-align: right;"><b>(Source: Wikipedia&amp; SRS bulletin 2017)</b></p>		State/Country	Male	Female	Andhra Pradesh	31	33	Kerala	9	10	Odisha	40	41	Madhya Pradesh	48	45	Uttar Pradesh	39	43	India	32	34
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- |  |   |
|--|---|
|  | <ol style="list-style-type: none"><li>1) Which is the only state where the rate for male is higher than that of female ?</li><li>2) What is the mode for the infant mortality of the data ?</li><li>3) How many states are below the rate of the country for female infant death rate ?<br/>a) 3            b) 2            c) 4            d) 1</li><li>4) By how much percent is the female infant death rate of Madhya Pradesh is high when compared to Kerala ?</li></ol> |
|--|---|

## ITEM 15 :RESULT ANALYSIS

<b>Domain :</b> <b>Mathematical Literacy</b>	<b>Topic:</b> Data Handling  <b>Learning Outcome :</b> Reading ,Analyzing& Interpreting (As perNCERT)	<b>Class:</b> VII <b>Expected Time :</b> 10 <b>Total Credit:</b> 8																																																																				
<b>Description of item:</b>	<p>The Central Board of Secondary Education (CBSE) is a national level board of education in India for public and private schools, controlled and managed by Union Government of India. CBSE has asked all schools affiliated to follow only NCERT curriculum. There are approximately 20,299 schools in India and 220 schools in 28 foreign countries affiliated to the CBSE.</p> <p>The following is the result analysis of class XII for the year 2019</p> <p><b>SENIOR SCHOOL CERTIFICATE EXAMINATION (CLASS XII) RESULT 2019</b></p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th colspan="3">TOTAL NUMBER OF SCHOOLS AND EXAM CENTERS (FULL SUBJECTS )</th> </tr> <tr> <th>YEAR</th> <th>NUMBER OF SCHOOLS</th> <th>NUMBER OF EXAM CENTERS</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td style="text-align: center;">11510</td> <td style="text-align: center;">4145</td> </tr> <tr> <td>2019</td> <td style="text-align: center;">12441</td> <td style="text-align: center;">4627</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th colspan="5">OVERALL PASS PERCENTAGE (FULL SUBJECTS )</th> </tr> <tr> <th>YEAR</th> <th>REGISTERED</th> <th>APPEARED</th> <th>PASSED</th> <th>PASS%</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td style="text-align: center;">1119248</td> <td style="text-align: center;">1106772</td> <td style="text-align: center;">918763</td> <td style="text-align: center;">83.01</td> </tr> <tr> <td>2019</td> <td style="text-align: center;">1218393</td> <td style="text-align: center;">1205484</td> <td style="text-align: center;">1005427</td> <td style="text-align: center;">83.40</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th colspan="3">INSTITUTION-WISE COMPARATIVE PERFORMANCE 2019 (FULL SUBJECTS)</th> </tr> <tr> <th></th> <th>INSTITUTIONS</th> <th>PASS%</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GOVT AIDED</td> <td style="text-align: center;">88.49</td> </tr> <tr> <td>2</td> <td>GOVT</td> <td style="text-align: center;">87.17</td> </tr> <tr> <td>3</td> <td>INDEPENDENT</td> <td style="text-align: center;">82.59</td> </tr> <tr> <td>4</td> <td>JNV</td> <td style="text-align: center;">96.62</td> </tr> <tr> <td>5</td> <td>KV</td> <td style="text-align: center;">98.54</td> </tr> <tr> <td>6</td> <td>CTSA</td> <td style="text-align: center;">96.06</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">GENDER WISE PASS % (FULL SUBJECTS)</th> </tr> <tr> <th>GENDER</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>GIRLS</td> <td style="text-align: center;">88.31</td> <td style="text-align: center;">88.70</td> </tr> <tr> <td>BOYS</td> <td style="text-align: center;">78.99</td> <td style="text-align: center;">79.40</td> </tr> </tbody> </table> <p style="text-align: right; margin-top: 10px;"><b>(Source : cbse.nic.in)</b></p>		TOTAL NUMBER OF SCHOOLS AND EXAM CENTERS (FULL SUBJECTS )			YEAR	NUMBER OF SCHOOLS	NUMBER OF EXAM CENTERS	2018	11510	4145	2019	12441	4627	OVERALL PASS PERCENTAGE (FULL SUBJECTS )					YEAR	REGISTERED	APPEARED	PASSED	PASS%	2018	1119248	1106772	918763	83.01	2019	1218393	1205484	1005427	83.40	INSTITUTION-WISE COMPARATIVE PERFORMANCE 2019 (FULL SUBJECTS)				INSTITUTIONS	PASS%	1	GOVT AIDED	88.49	2	GOVT	87.17	3	INDEPENDENT	82.59	4	JNV	96.62	5	KV	98.54	6	CTSA	96.06	GENDER WISE PASS % (FULL SUBJECTS)			GENDER	2018	2019	GIRLS	88.31	88.70	BOYS	78.99	79.40
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<p>1) What is the increase in number of schools and number of exam centers for the year 2019 ?</p> <p>2) In comparison with JNV, by how much percentage is KV better in overall performance ?</p> <p>3) In comparison to 2018, whether girls performed better than boys in 2019 ?</p> <p>4) What is the range for institution wise comparative performance ?</p>																																																																						

**Prepared By :**

Items 1 to 8

Name of the Teacher / Item Writer: P S KAVITHA

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Name of the Vidyalaya: Kendriya Vidyalaya DRDO, Bengaluru

Items 9 to 15

Name of the Teacher: Jaseer K P

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Phone No:8486986749

Name of the Vidyalaya:Kendriya Vidyalaya IISc Bengaluru

**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VII : CHAPTER 4 : SIMPLE EQUATIONS**

**INDEX**

<b>S.No.</b>	<b>Theme of the item</b>
<b>16.</b>	Data transfer
<b>17.</b>	Sports Club
<b>18.</b>	Number Game
<b>19.</b>	Decoding
<b>20.</b>	Bananas
<b>21.</b>	Number Puzzle
<b>22.</b>	Number of Solutions
<b>23.</b>	Ratio of Ages
<b>24.</b>	Test Scores
<b>25.</b>	Mints in the Bowl
<b>26.</b>	Average age of family



Domain: Mathematical Literacy	Theme:1, Data transfer Chapter :Simple Equations	Class: VII Expected Time: 2 Minutes Total Credit:4
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:  <b>1. DATA TRANSFER</b> Smith is transferring some files of PISA from his computer to his flash drive. The relationship between the size (S) of files (in GB) and time of transfer (t, in seconds) is given as : <b><math>S=10t+5</math></b>  Complete the following: Q1. When the transfer began, the drive had _____ GB of files in it. Every 5 seconds, an additional _____ GB data is transferred in the drive.		

Mathematical Literacy:

Competency Cluster	Evaluate
Over reaching Ideas	Change and relationship
Context	Personal
Item Format	Short response item
Cognitive Process	Problem solving
Proficiency Level	1

Credit Pattern:

Full Credit: 02

Partial Credit:01

No Credit: 00

Description of Answer Key and Credits:

1.	Full Credit: 5 Partial Credit: No Credit: Any other response
2.	Full Credit: 50 Partial Credit: No No Credit: Any other response.

Name Of Teacher: Ashwani Kumar

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Phone Number: 9797425985

Name of Vidyalaya: K V Samba (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme:2, Sports Club Chapter: Simple Equations	Class: VII Expected Time: 4 Minutes Total Credit:6
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:  <b><u>2. SPORTS CLUB</u></b>  Rajeev pays Rs225 in advance on his account at a sports club. Each time, he visits the club, Rs 9 is deducted from the account.  Which of the following equations represent the balance “x” left in his account after “t” number of days?  (a) $t=225+9x$ (b) $x=9+225t$ (c) $x=225-9t$ (d) $t= 225-9x$  Q2. How much balance (in Rs) is left in Rajeev’s account after 20 visits? (a) 54 (b) 45 (c) 36 (d) 60  Q3. After how many days, Rajeev have to recharge his account? Ans: _____.		

Mathematical Literacy:

Competency Cluster	Evaluate and inference
Over reaching Ideas	Change and Relationship
Context	Personal
Item Format	MCQ, Short response item
Cognitive Process	Interpretation and Problem solving
Proficiency Level	2

Credit Pattern:

Full Credit: 02

Partial Credit:01

No Credit: 00

Description of Answer Key and Credits:

1.	Full Credit: (c)	No Credit: Any other response
2.	Full Credit: (b)	No Credit: Any other response.
3.	Full Credit: After 25 days Partial Credit:25	No Credit: Any other response

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Name of Vidyalaya: K V Kishtwar (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme:3, Number Game Chapter: Simple Equations	Class: VII Expected Time: 10 Minutes Total Credit: 8
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item: <p style="text-align: center;"><b><u>3. NUMBER GAME</u></b></p> <p>I am a number. If you multiply me by 3 and subtract 2 from me, I become 10 more than my double. What is my value? (a) 4                      (b) 8                      (c) 10                      (d) 12</p> <p>If you half the number obtained in question1, will the relation mentioned in question1 still exist? Justify your answer.</p> <p>-----</p> <p>What minimum positive integral value must be added to the number obtained in question1to make it a perfect cube. (b) 4                      (c) 3                      (d) 13</p> <p>If 6 is added, only to the right hand side of the equation obtained in question 1, will the value of the number also increase by 6. Justify your answer.</p> <p>-----</p>		

Mathematical Literacy:

Competency Cluster	Evaluate and inference
Over reaching Ideas	Change and Relationship
Context	Personal
Item Format	MCQ, Short response item
Cognitive Process	Interpretation and Problem solving
Proficiency Level	3

Credit Pattern:

Full Credit: 02

Partial Credit:01

No Credit: 00

Description of Answer Key and Credits:

1.	Full Credit: (d) 12	No Credit: Any other response
2.	Full Credit: No, Justification: $3(6)-2\neq 2(6)+10$	No Credit: Any other response.
3.	Full Credit: (a) 15	No Credit: Any other response
4.	Full Credit: Yes, Justification: $3x-2=2x+10+6 \Rightarrow x=18=12+6$	Partial Credit: Yes No Credit: Any other response.

Name Of Teacher: SkinderKumar

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Phone Number:9086037381

Name of Vidyalaya: K V Miran Sahib (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme:4, Decoding Chapter: Simple Equations	Class: VII Expected Time: 10 Minutes Total Credit: 6
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		

Description of Item:

#### **4. DECODING**

Sunil and Amit are students of class 7<sup>th</sup>. They are solving problems on simple equations. For developing the interest among students, teacher had a new idea. He asked the students to solve the following equations and promised them to give the thing they make out by arranging all the variables of the given family of equations:

$$2m+5=13, \quad 5g - 3=12, \quad 4n=20, \quad 12a+3=27, \quad 8+'o'=14$$

1. What are the solutions of equations asked by the teacher?
2. Name the thing that the teacher awarded to the students.

Taking the game to next level, Amit asked Sunil for his contact number. Sunil told Amit that his number is '9xyz01q2r1'. To decode his number, Sunil further asked Amit to solve the following set of equations.

$$(i) 3x=15 \quad (ii) 2(y+1)=(y+3) \quad (iii) 6z+4=52 \quad (iv) \frac{q-2}{q} = \frac{1}{2} \quad (v) 2r-3=9$$

3. Find the contact number of SUNIL?

Mathematical Literacy:

Competency Cluster	Solving a mathematical Problem
Over reaching Ideas	Change and Relationship
Context	Societal
Item Format	Closed constructed response
Cognitive Process	Interpretation and Problem solving
Proficiency Level	4

Credit Pattern:

Full Credit: 02

Partial Credit: 01

No Credit: 00

Description of Answer Key and Credits:

<p>1. Full credit: <math>m=4, g=3, n=5, a=2, o=6</math> Partial credit: values of any two variables are right. No credit: none of the answers is right.</p> <p>2. Full credit: mango      No credit: any other response</p> <p>3. Full credit : 9518014261 Partial credit: <math>x=5, y=1, z=8, q=4, r=6</math> No credit: any other response.</p>
--

Name Of Teacher: Ashwani Kumar

Designation: PGT (Maths)

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Phone Number: 9797425985

Name of Vidyalaya: K V Samba (Jammu and Kashmir)

Domain: Mathematical Literacy	Theme:5, Bananas Simple Equations	Class: VII Expected Time: 10 Minutes Total Credit: 8
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:		
<b><u>5. BANANAS</u></b>		
A school was celebrating Republic day. On that day, school decided to give some refreshment to the students after all the events. They decided to give 2 bananas per student of school. But, on the celebration day, 300 students were absent. As a result, each student got 1 extra banana.		
Q1. Find the minimum number of bananas school has to bring for total 's' number of students.		
Q2. Find total number of students in the school.		
Q3. Suppose on that day 600 students were absent then how many extra bananas will each student get?		
Q4. School funded Rs3000 for the bananas. The cost of one banana is Rs2. After some discount, seller got ready to give the minimum number of bananas required by the school for Rs 3000. The cost of one banana is _____.		

Mathematical Literacy:

Competency Cluster	Solving a mathematical Problem
Over reaching Ideas	Change and Relationship
Context	Societal
Item Format	Closed constructed response
Cognitive Process	Interpretation and Problem solving
Proficiency Level	5

Credit Pattern:

Full Credit: 02

Partial Credit: 01

No Credit: 00

Description of Answer Key and Credits:

Q1. Full credit: 2s	Partial Credit:	No Credit: Any other response
Q2. Full credit: $\frac{2s}{s-300} = 2 + 1$ which gives 900	Partial credit: $\frac{2s}{s-300}$	No Credit: Any other response
Q3. Full credit: 4	No Credit: Any other response	
Q4. Full credit: $\frac{3000}{1800} = 1.66$ (approx)	No Credit: Any other response	

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Name of Vidyalaya: K V Kishtwar (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme:6, Number Puzzle Chapter :Simple Equations	Class: VII Expected Time: 15 Minutes Total Credit: 22																																				
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it																																						
Description of Item: <p style="text-align: center;"><b><u>6. NUMBER PUZZLE</u></b></p> <p>Get cracking on the following questions to fill the crossword as per mentioned clues of down and across. Clue number is written at the corner of boxes. Answer of clue has to be filled up in their respective boxes.</p> <p><b>Down 1:</b>I spent one third of my sleeping time while dreaming. If I dreamt for 3 hour, then how long did I sleep?</p> <p><b>Down 2:</b>I ran around three sides of a square park whose perimeter is 200 m. How far am I from starting point?</p> <p><b>Down 4:</b> I purchased three pants and was left with Rs1000 out of my saving of Rs10000.How much is each pant worth?</p> <p><b>Down 8:</b>I have 40 coins worth 50 paise each and a few coins of Re1 each .if I have Rs450in total, how many coins of Re 1 do I possess?</p> <p><b>Down 9:</b>The unequal angle of an isosceles triangle measures <math>12^\circ</math>. How much is each of the remaining angles?</p> <p><b>Down 11:</b>For what value of y is <math>3(y-1) + 7=40</math>?</p> <p><b>Across 3:</b> Out of 40 chocolates, Ram and I shared in the ratio 1: 3. How many chocolates did Ram get?</p> <p><b>Across 5:</b> Sum of two consecutive numbers is 111. What is smaller number of the two?</p> <p><b>Across 7:</b> Out of flock of birds sitting on a tree, half flew away while one got injured, if 244 still remain on the tree,then how many birds were there on the tree in the beginning?</p> <p><b>Across 10:</b> If <math>2x + 7 = 1573</math>, then <math>x = ?</math></p> <p><b>Across 12:</b> Cube of 5</p>																																						
<table border="1"><tr><td>1</td><td></td><td></td><td>10</td><td></td><td>4</td></tr><tr><td></td><td>5</td><td>2</td><td></td><td></td><td></td></tr><tr><td>8</td><td>3</td><td></td><td>9</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>7</td><td></td><td></td></tr><tr><td></td><td></td><td>11</td><td></td><td></td><td></td></tr><tr><td></td><td>12</td><td></td><td></td><td></td><td></td></tr></table>			1			10		4		5	2				8	3		9						7					11					12				
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Mathematical Literacy:

Competency Cluster	Posing a mathematical Problem
Over reaching Ideas	Change and relationship
Context	Scientific
Item Format	Short response item
Cognitive Process	Interpretation and Problem solving
Proficiency Level	6

Credit Pattern:

Full Credit: 02 (for each clue)

Partial Credit: 01

No Credit: 00

Description of Answer Key and Credits:

FULL CREDIT: Down1: 9, down2: 50, down4: 3000, down8: 430, down9: 84, down 11: 12. Across3: 10, across5: 55, across 7: 490, across 10: 783, across12: 125					
Partial credit: if only few response right.					
No credit: none of response right.					
9			7	8	3
	5	5			0
4	1	0	8		0
3			4	9	0
0		1			
	1	2	5		

Name Of Teacher: Skinder Kumar

Designation: PGT (Maths)

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Name of Vidyalaya: K V Miran Sahib (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme: Number of Solutions Chapter :Simple Equations	Class: VII Expected Time: 5 Minutes Total Credit:2
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:  <b><u>7. NUMBER OF SOLUTIONS</u></b>		

What is the total number of natural number solutions to  $3X+2Y = 50$  if  $X < Y$ ?

a)10 b) 6 c) 4

d) 2

Mathematical Literacy:

Competency Cluster	Evaluate
Over reaching Ideas	Change and Relationship
Context	Scientific
Item Format	MCQ
Cognitive Process	Problem solving
Proficiency Level	3

Credit Pattern:

Full Credit: 02

Partial Credit:01

No Credit: 00

Description of Answer Key and Credits:

Full Credit: (c) 4

No Credit: Any other response

Explanation: The only solutions for the equation are (2,22); (4,19);(6,16) and (8,13).

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Name of Vidyalaya: K V Samba (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme:8, Ratio of Ages Chapter :Simple Equations	Class: VII Expected Time: 2 Minutes Total Credit:2
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:  <b><u>8. RATIO OF AGES</u></b>  <b>The ratio of the present ages of A to B is 5:3. The ratio of A's age 4 years ago to B's age 4 years hence is 1:1. What is the ratio of A's age 4 years hence to B's age 4 years ago?</b>		

Mathematical Literacy:

Competency Cluster	Evaluate and inference
Over reaching Ideas	Change and Relationship
Context	Personal
Item Format	Short response item
Cognitive Process	Interpretation and Problem solving
Proficiency Level	3

Credit Pattern:

Full Credit: 02

Partial Credit:01

No Credit: 00

Description of Answer Key and Credits:

1. Full Credit: 3:1      Partial Credit: x=4      No Credit: Any other response
Explanation: $(5x - 4) / (3x + 4) = 1/1$ , Solving it we get, $x = 4$
Hence, A's present age is 20 and B's present age is 12
Now putting this value in $(5x + 4) : (3x - 4)$
We get, $24:8 = 3:1$

Name Of Teacher:      Rajeev Bajaj

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Phone Number: 6005502678

Name of Vidyalaya: K V Kishtwar (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme: Test Scores Chapter :Simple Equations	Class: VII Expected Time: 5 Minutes Total Credit: 2
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:  <b><u>9. TEST SCORES</u></b>  <b>A test has 50 questions. A student scores 1 mark for a correct answer, <math>-1/3</math> for a wrong answer, and <math>-1/6</math> for not attempting a question. If the net score of a student is 32, the number of questions answered wrongly by that student cannot be less than</b>  <b>(a) 6                      (b) 12                      (c) 3                      (d) 9</b>		

Mathematical Literacy:

Competency Cluster	Evaluate and inference
Over reaching Ideas	Change and Relationship
Context	Personal
Item Format	MCQ
Cognitive Process	Interpretation and Problem solving
Proficiency Level	4

Credit Pattern:

Full Credit: 02

Partial Credit:01

No Credit: 00

Description of Answer Key and Credits:

Full Credit: (c)	Partial Credit:	No Credit: Any other response
Explanation: Let x be the correct answers, y be the wrong answers and z be the Unattempted questions. So		
$x + y + z = 50$ --- (1)		
$x \frac{y}{3} - \frac{z}{6} = 32 \Rightarrow 6x - 2y - z = 192$ --- (2)		
$(1) + (2) = 7x - y = 242 \Rightarrow 7x = 242 + y$		
Multiple of 7 > 242 is 245		
So minimum value of $242 + y$ is $245 \Rightarrow y = 3$		

Name Of Teacher: Skinder Kumar

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Name of Vidyalaya: K V Miran Sahib (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme: Mints in the Bowl Chapter : Simple Equations	Class: VII Expected Time: 5 Minutes Total Credit: 2
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:  <b><u>10. MINTS IN THE BOWL</u></b>  <b>Three friends, returning from a movie, stopped to eat at a restaurant. After dinner, they paid their bill and noticed a bowl of mints at the front counter. Sita took <math>\frac{1}{3}</math> of the mints, but returned four because she had a momentary pang of guilt. Fatima then took <math>\frac{1}{4}</math> of what was left but returned three for similar reasons. Eswari then took half of the</b>		

remainder but threw two back into the bowl. The bowl had only 17 mints left when the raid was over. How many mints were originally in the bowl?

a. 38b. 31c. 41d. None of these

Mathematical Literacy:

Competency Cluster	Solving a mathematical Problem
Over reaching Ideas	Change and Relationship
Context	Societal
Item Format	MCQ
Cognitive Process	Interpretation and Problem solving
Proficiency Level	5

Credit Pattern:

Full Credit: 02

Partial Credit:01

No Credit: 00

Description of Answer Key and Credits:

<p>Full credit: (d)                      No credit: Any other response          Explanation: Let's the initial count be X          Sita took 1/3 and returned four =&gt; Current count is <math>X - X/3 + 4 = 2X/3 + 4</math>          Fatima took 1/4 and returned three          =&gt; Current count is <math>3/4 * (2X/3 + 4) + 3 = X/2 + 3 + 3 = X/2 + 6</math>          Eshwari took half of remaining and returned two          =&gt; <math>1/2 (X/2 + 6) + 2 = X/4 + 3 + 2 = X/4 + 5</math>          It is given that <math>X/4 + 5 = 17X/4 = 12X = 48</math></p>
--

Name Of Teacher: Ashwani Kumar

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Name of Vidyalaya: K V Samba (Jammu and Kashmir)

KVS Region: Jammu

Domain: Mathematical Literacy	Theme: Average age of family Chapter :Simple Equations	Class: VII Expected Time: 10 Minutes Total Credit: 2
Learning Outcomes: Represents daily life situations in the form of a simple equation and solves it		
Description of Item:  <b><u>11. AVERAGE AGE OF FAMILY</u></b>		

Ten years ago, the ages of the members of a joint family of eight people added up to 231 years. Three years later, one member died at the age of 60 years and a child was born during the same year. After another three years, one more member died, again at 60, and a child was born during the same year. The current average age of this eight member joint family is nearest to:

(a) 24 years

(b) 22 years

(c) 21 years

(d) 25 years

Mathematical Literacy:

Competency Cluster	Solving a mathematical Problem
Over reaching Ideas	Change and Relationship
Context	Personal
Item Format	MCQ
Cognitive Process	Interpretation and Problem solving
Proficiency Level	6

Credit Pattern:

Full Credit: 02

Partial Credit: 01

No Credit: 00

Description of Answer Key and Credits:

Full credit: (a) No Credit: Any other response

Sum of all the ages 10 years ago = 231

Three years later Sum of all the ages =  $231 - 57 + 0 + 7 \times 3 = 195$  ( the person who died was 57 years old 3 years back and all other 7 members would have added 3 more years to the sum. New born child is of 0 age)

Similarly, Another three years later, Sum of all the ages =  $195 - 57 + 0 + 21 = 159$

Current age is again after 4 years (as we started 10 years ago) and every 8 members will add 4 more years to the sum. So total  $4 \times 8 = 32$  years.

So sum of all ages after 4 more years =  $159 + 32 = 191$

Average =  $191/8$  (~ 24 years)

Name Of Teacher: Rajeev Bajaj

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KVS Region: Jammu

**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VII : CHAPTER 5 : LINES AND ANGLES**

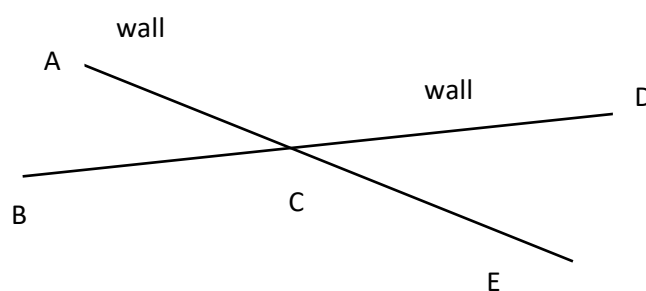
**INDEX**

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<b>29.</b>	<b>YOGA</b>
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<b>32.</b>	<b>ROAD MAP</b>
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## 1.ANGLE BETWEEN WALLS

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class : VII	Expected time : 6min.
Description of item : Image, Text	Learning outcome : understanding and use of linear pair and vertically opposite angles



In order to figure out the angle ACD at which the two walls meet Raj keeps two straight canes AE and BD against the walls. He discovers that angle DCE is only four-fifth of angle BCE.

- What is the measurement of angle ACD?
- What is the measurement of angle DCE?

### Credit pattern :

Full credit : 02  
Partial credit : 01  
No credit : 0

### Answers :

- Angle ACD = Angle BCE  
Angle BCE + angle DCE = 180  
Angle DCE =  $\frac{4}{5}$  angle BCE  
Angle BCE +  $\frac{4}{5}$  angle BCE = 180 [1]  
Angle BCE = 100  
 $\therefore$  angle ACD = 100 [1]

b) Angle DCE =  $\frac{4}{5} \times 100 = 80$  [2]

Frame work	Characteristics
Competency	Connecting
Overarching idea	change and relationship
Context	life related
Item format	short response item
Cognitive process	interpreting, problem solving

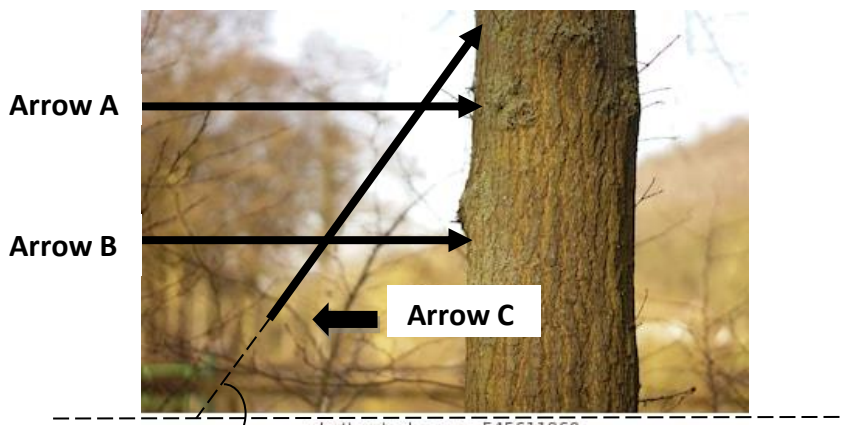
## 2. ARCHERY

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class : VII	Expected time : 6min.
Description of item : Image, Text	Learning outcome : understanding and use of parallel lines property

Archery is the art, sport, practice, or skill of using a bow to shoot arrows. The word comes from the Latin arcus. Historically, archery has been used for hunting and combat. In modern times, it is mainly a competitive sport and recreational activity. A person who participates in archery is typically called an archer or a *bowman*.



Pranav, Nivedya and Sam were practicing archery. They were shooting arrows from different positions. After first round the arrows shot by them hit the target as shown below



arrows A and B are in parallel to the ground and arrow C cuts across the other two arrows. If the larger angle made by arrows A and C are  $150^\circ$ .

- What is the angle at which the third archer launched arrow C
- What is the smaller angle made by the arrows B and C

**Credit pattern :**

Full credit :02

Partial credit : 01

No credit : 0

**Answers:**

Since larger angle made by arrows A and C are  $150^\circ$ , smaller angle made by the arrows A and C are  $30^\circ$ .

∴ smaller angle made by the arrows B and C =  $30^\circ$  [answer of (b)] [2]

∴ the angle at which the third archer launched arrow =  $30^\circ$  (corresponding angle) [2]

<b>Frame work</b>	<b>Characteristics</b>
Competency	Connecting
Overarching idea	Quantity
Context	Sports
Item format	problem solving
Cognitive process	Analysis
Proficiency level	2

### 3. YOGA

Yoga is an old form of discipline from India. It is both spiritual and physical. Yoga uses

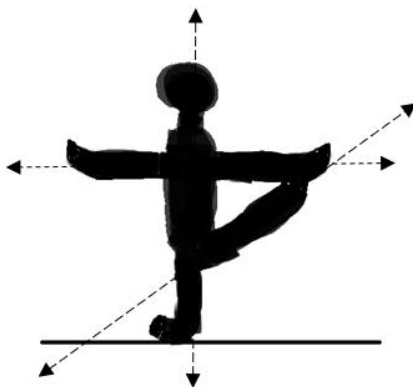
<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class : VII	Expected time : 6min.
Description of item : Image, Text	Learning outcome : understanding and use of angle sum property and linear pair

breathing techniques, exercise and meditation. It helps to improve health and happiness. Yoga is the Sanskrit word for union. Patanjali was a pioneer of classical yoga.

A person doing yoga will move from one posture (called asana) to another. eg. "sun – salutation" contains 12 poses of asanas, one after the other, and is said to help balance body and soul. The "sun – salutation" is popularly known as "Suryanamaskar".



Krithika will do Yoga daily in morning. Following figure shows one of the asana done by her. In this asana her arms are parallel to the floor. Her supporting leg makes a  $90^\circ$  with the floor and legs form an angle of  $130^\circ$ .



Determine the angle formed by Krithika's

- (a) Left arm and body
- (b) Leg and arm

**Credit pattern :**

Full credit :02

Partial credit : 01

No credit : 0

**Answers :**

a)  $90^{\circ}$

b)  $40^{\circ}$

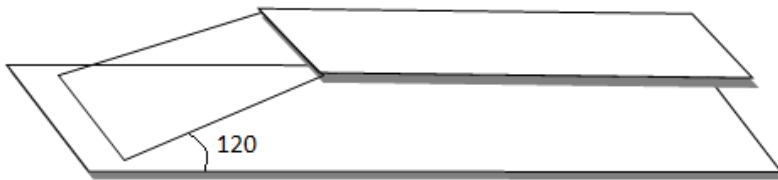
<b>Frame work</b>	<b>Characteristics</b>
Competency	Connection
Overarching idea	change and relationship
Context	Exercise
Item format	problem solving
Cognitive process	Application
Proficiency level	4

#### 4. PARKING AREA

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class : VII	Expected time : 6min.
Description of item : Image, Text	Learning outcome : understanding and use of parallel lines and properties

There are two levels of parking lot in a mall. A ramp rises to connect the two horizontal levels of parking i.e, level 1 to level 2. The ramp makes an angle of  $12^\circ$  with the horizontal of level 1. What is the measure of

- A) Angle 1
- B) If the ramp makes an angle of  $30^\circ$  with the horizontal what will be the measurement of angle 1



**Credit pattern :**

- Full credit :02
- Partial credit : 01
- No credit : 0

**Answers:**

- a) Angle 1=  $168^\circ$
- b) Angle 1 =  $150^\circ$

Frame work	Characteristics
Competency	Connections
Overarching idea	Space and shapes
Context	Real life situations
Item format	Short response
Cognitive process	Interpreting
Proficiency level	3

#### 5. TANGRAM- A GEOMETRICAL PUZZLE

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class : VII	Expected time : 5min.
Description of item : Image, Text	Learning outcomes: understanding parallel lines and transversal.

Tangram is a Chinese geometrical puzzle consisting of a square cut into seven pieces which can be arranged to make various other shapes. There are many benefits to play with tangram. They can also be used to develop problem solving and logical thinking skills.

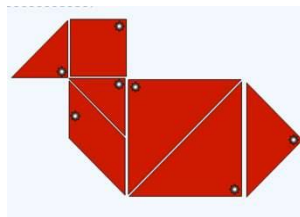
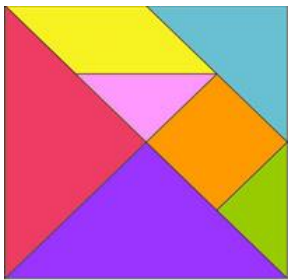


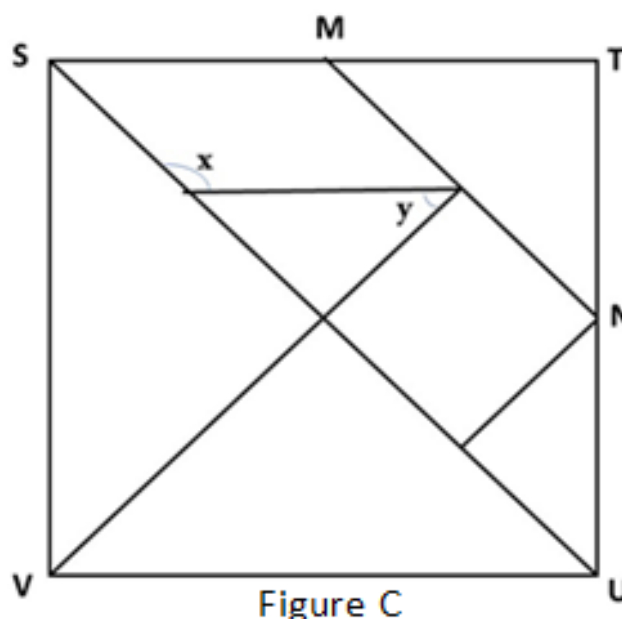
Figure A – Tangram Figure B

i) How many triangular pieces are there in a Tangram ?

- a) 6                      b) 5                      c) 4                      d) 3

ii) Find the measure of  $x$  and  $y$  in figure C?

- a)  $x=65^\circ, y=90^\circ$   
b)  $x=107^\circ, y=30^\circ$   
c)  $x=90^\circ, y=72^\circ$   
d)  $x=135^\circ, y=45^\circ$



iii) Which are the other shapes in a Tangram other than triangles?



iv) In figure C, is MN parallel to SU? If yes, justify your answer.

**Credit pattern :**

Full credit : 02

Partial credit : 01

No credit : 0

**Ans:**

i) 5

ii)  $x=135^\circ$ ,  $y=45^\circ$  1 mark each

iii) Parallelogram and square, 1 mark each

vi)  $SU \parallel MN$ , any correct justification, 1 mark each

Frame work	Characteristics
Competency	Connections
Overarching idea	Space and shapes
Context	Real life situations
Item format	Short response
Cognitive process	Interpreting
Proficiency level	3

## 6. ROAD MAP

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class : VII	Expected time : 5min.
Description of item : Image, Text	Learning outcome : understanding and use of parallel lines and properties

Road maps show people how they can travel from one place to another. They also show some physical features, such as mountains and rivers and political features, such as cities and towns. Engineers are using road map to construct new roads in cities, towns and villages.



Figure (a)

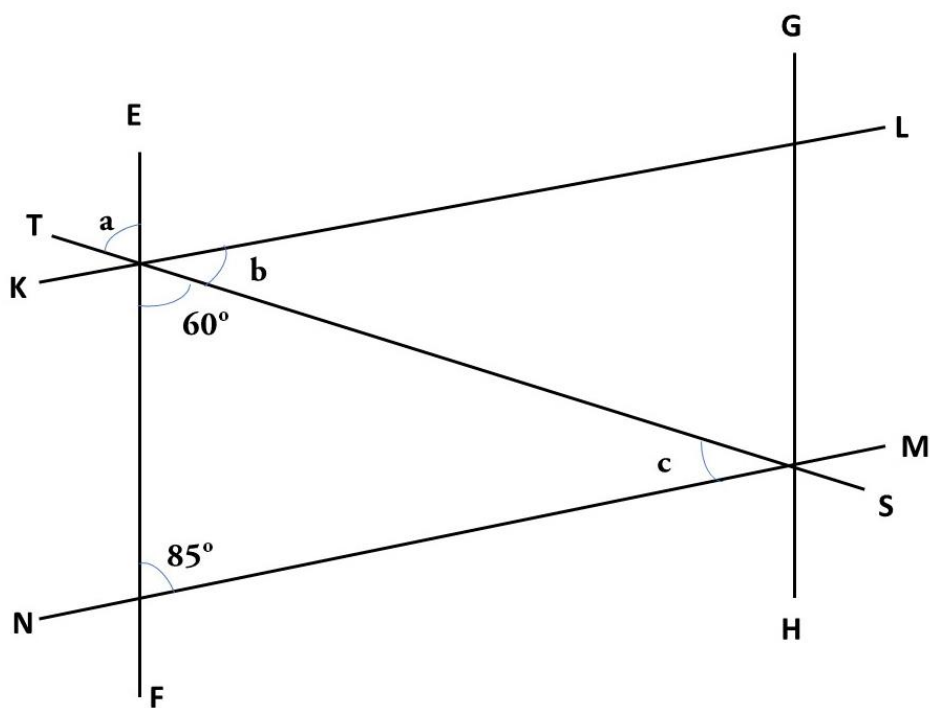


Figure (b)

Figure (b) is a part of figure (a), in which line segments EF, GH, KL, NM & TS represent roads. Here  $KL \parallel NM$ . Can you find any other pair of parallel roads?

- Find the angle measure of  $a$  and  $b$ . Justify your answer.
- Find the measure of  $c$ . Explain a method to draw a line parallel to a given line.

**Credit pattern :**

Full credit : 02

Partial credit : 01

No credit : 0

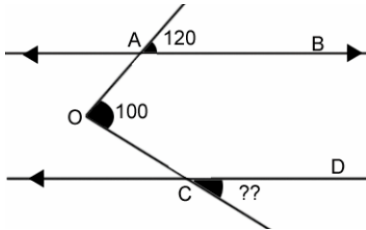
**Answers:**

- 1 pair,  $EF \parallel GH$ , Full credit
- $a = 60^\circ$ ,  $b = 35^\circ$ , 1 mark each
- $c = 35^\circ$  any correct method. 1 mark each

Frame work	Characteristics
Competency	Connections
Overarching idea	Space and shapes
Context	Real life situations
Item format	Short response
Cognitive process	Interpreting
Proficiency level	3

## 7. QUIZ IN QUICK ROUND

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class :VII	Expected time : 5min.
Description of item : Image, Text	Learning outcome : Property of parallel lines.



On the birthday of the great mathematician Srinivasa Ramanuja, a mathematics quiz was organized by Ramanuja Maths foundation in the district level. One round was “QUICK round” and two students were selected from each team, prizes were given to the students who solved the question first. The problem is given in the figure. If  $AB \parallel CD$ , calculate the value of  $x$ ?

**Credit pattern :**

- Full credit :02
- Partial credit : 01
- No credit : 0

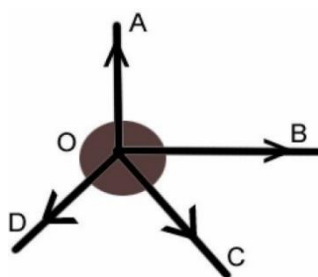
**Answers:**

- a)  $40^\circ$ : full credit
- b) No credit: other responses & missing.

Framework	Characteristics
Competency	Understanding basic concepts
Overarching idea	Pair of angles/Two lines cut by another line
Context	Scientific
Item format	Individual
Cognitive process	Problem solving
Proficiency level	Level 3

## 8. SELLING BOOKS

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class :VII	Expected time : 5min.
Description of item : Image, Text	Learning outcome : Property of parallel lines.Vertically opposite angles



In figure, O is the BOOK STORE which supplies text books to 4 neighboring Govt. Schools A, B, C and D .The angle made by schools A and B with the store is  $90^\circ$  .The ratio of the angles between Band C, C and D and D and A is 1:2:3. Find the angles?

**Credit pattern :**

Full credit :02

Partial credit : 01

No credit : 0

**Answers:**

- a)  $45^\circ, 90^\circ, 135^\circ$  Full credit
- b) Partial credit: any correct answer(1mark)
- c) No credit: other responses & missing.

Framework	Characteristics
Competency	Understanding basic concepts
Overarching idea	Pair of angles/Two lines cut by another line
Context	Scientific
Item format	Individual
Cognitive process	Problem solving
Proficiency level	Level 3

## 9. PIZZA

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class :VII	Expected time : 5min.
Description of item : Image, Text	Learning outcome : Angles around a point

5 friends bought pizza by contributing their pocket money. They want to divide it equally among themselves. But one of them was given double piece as he was very hungry. Find the angle of the piece of pizza that each one received?

**Credit pattern :**

Full credit :02

Partial credit : 01

No credit : 0

**Answers:**

- a) 4 friends:  $60^\circ$ , 1 friend  $60 \times 2 = 120^\circ$ . full credit  
b) No Credit. Other responses and missing.

Framework	Characteristics
Competency	Understanding basic concepts
Overarching idea	Angle sum property and pair of angles
Context	Scientific
Item format	Individual, MCQ
Cognitive process	Problem solving
Proficiency level	Level 3

## 10. GOAL POST AND GOLI

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class :VII	Expected time : 5min.
Description of item : Image, Text	Learning outcome : Relation between greatest angle and longest side

The drawings below show the angles formed by the goal post at different positions of a football player. The greater the angle, the better chance the player has of scoring a goal. For example, the player has a better chance of scoring a goal from position A than from position B.



- (a) 7 football players are practicing their kicks. They are lined up in a straight line in front of the goal post, which player has the best (the greatest) kicking angle?



(b) Now 8 players are lined up as shown in the figure (ii). Which player(s) has the best kicking?



(c) Estimate at least 2 situations such that the angle formed by different positions of two players are complement to each other

**Credit pattern :**

Full credit :02

Partial credit : 01

No credit : 0

**Answers:**

- a) The player no.4 (Since the position is midway between all players)
- b) The player No.4 and 5
- c)  $30^\circ, 60^\circ, 0^\circ, 90^\circ$  Full credit
- d) Partial credit: each situation(1mark)
- e) No credit, other responses & missing.

Frame work	Characteristics
Competency	Understanding basic concepts
Overarching idea	Relation between greater angle and the longest side
Context	Scientific
Item Format	Individual MCQ
Cognitive process	Problem Solving
Proficiency level	Level 3



## 11. ECO-FRIENDLY HOUSE

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class :VII	Expected time : 5min.
Description of item : Image, Text	Learning outcome : Angle sum property, vertically opposite angles

In order to maintain the health and comfort of a human being, body must be capable of cooling down when it is hot, heat up when it is cool and disposal of waste. In order to maintain equilibrium of the system we need energy so is the case with the buildings where we live. All the activities performed by human body are required for a building like breathing means circulation of air in a building, and as well as heating and cooling of the building (either natural or artificial). So, Tanuj constructed an eco-friendly home



Fig 1

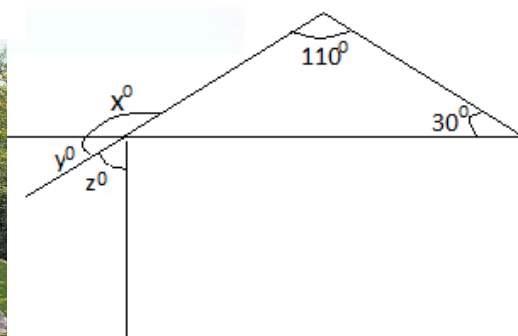


Fig 2

- How many obtuse angles can you see in Fig 2 ?
- In Fig. 2 Count the number of right angles
- While constructing a house angles play an important role. Here in this part of layout find the measure of the angles  $x$ ,  $y$  and  $z$ .

### **Credit pattern :**

Full credit : 2

Partial credit : 1

No credit :0

**Answers:**

a) 2

b) 5

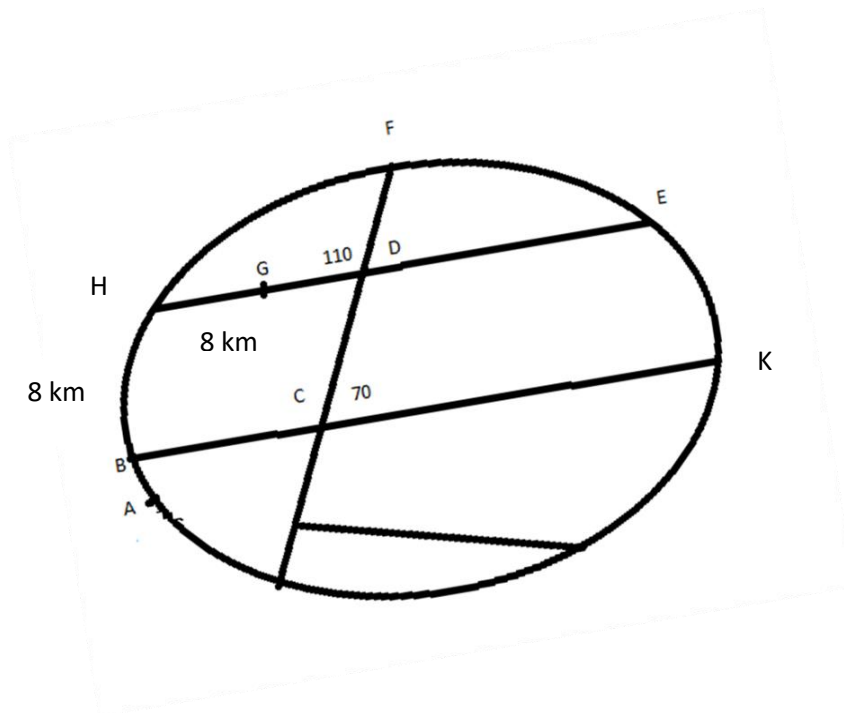
c)  $x = 140^\circ$ ,  $y = 40^\circ$ ,  $z = 50^\circ$

Framework	Characteristics
Competency	Understanding basic concepts
Overarching idea	Angle sum property and pair of angles
Context	Scientific
Item format	Individual, MCQ
Cognitive process	Problem solving
Proficiency level	Level 3

## 12 WAY TO FRIEND'S HOUSE

<b>Domain</b> : Mathematical Literacy	<b>Theme</b> : Lines and angles
Class :VII	Expected time : 5min.
Description of item : Image, Text	Learning outcome : Properties of parallel lines

Raju's father gifted a bicycle on his 15<sup>th</sup> Birthday. He decided to visit his friend's house in the city. For this he has to enter the ring road and catch one of the straight roads to reach his destination. He was little bit confused with the route and started the journey anyway.



He entered the ring road at the point A and travelled 1Km to reach the junction at the point B. From there he took a right turn and travel 8Km to reach the junction C. From there he took left turn travelled 3Km to reach the junction D. Instead of taking left turn he again took a right turn and travelled 4 Km to reach the junction E on the ring road again. He realised his mistake. Now he travelled 3Km from the point E to the point F. From the point F he took a left turn travelled 1Km to reach the junction D again. From there he took a right turn and travelled 3 Km to reach his friend's house close to the point G on the road.

- What is the total distance travelled by Raju
- If he has chosen the shortest route how many Km he would have saved?
- Are the Roads BC and DE are parallel? Give reasons.
- Do you think that Raju planned his journey properly. Justify your answer

### Credit pattern :

Full credit : 2

Partial credit : 1

No credit : 0

**Answers :**

- a) 23km (full credit)
- b) 6km (full credit)
- c) Yes. Reasons (Angle CDE =110°, angle CDE + angle DCK =180°) Pair of interior angles on the same side of the transversal are supplementary

(full credit)

- d) No. He would have decided the route of his travel before he started his journey. If he travels from the point B through the ring road up to the point H and take a right turn he would have reached earlier. (full credit)

Framework	Characteristics
Competency	Understanding basic concepts
Overarching idea	Properties of parallel lines
Context	Scientific
Item format	Individual, MCQ
Cognitive process	Problem solving
Proficiency level	Level 3

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