**CRITIRCAL AND CREATIVE THINKING ITEMS**

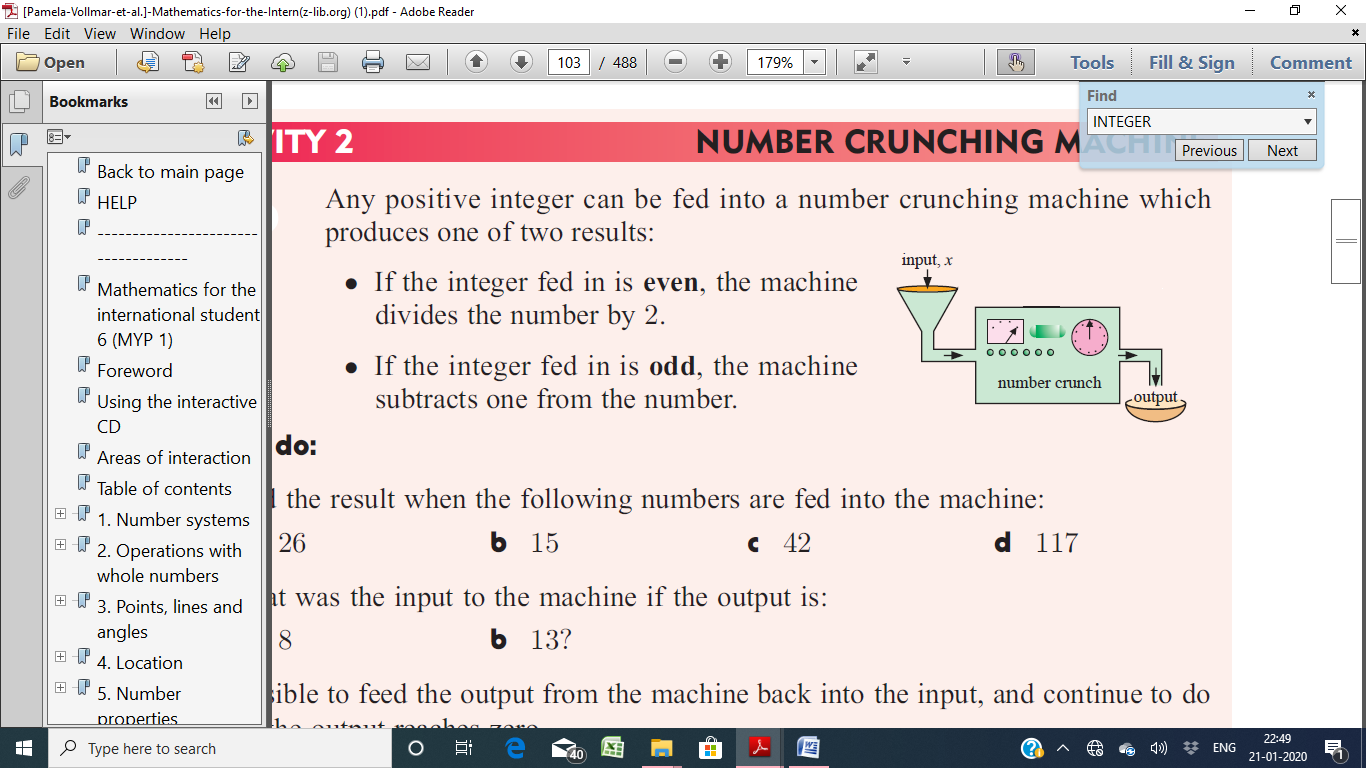
**CLASS VII : CHAPTER I : INTEGERS**

**INDEX**

|  |  |
| --- | --- |
| **S.No.** | **Theme of the item** |
|  | Number Crunching Machine |
|  | Pocket Money |
|  | Number & Shapes |
|  | Grocery Shopping |
|  | World of Titan |
|  | Board Game – Who will win? |
|  | Stack of cards |
|  | GROCERY |
|  | LIBRARY CHARGES |
|  | TEMPERATURE |
|  | GAME OF DICE |
|  | Social studies |
|  | Integer Product |
|  | Property Addition& Subtraction |
|  | Basic Operations |
|  | Magic Square |
|  | Temperature |
|  | Equinoxes` |
|  | Sea Level |
|  | Sign Rules |
|  | Absolute value of integer |
|  | Patterns |
|  | Body Mass Index |
|  | Scientific Experiment |
|  | Water Tank |
|  | Playing with Stairs |
|  | Water Level |
|  | Class Room Problem |
|  | Flipping of coin |

|  |  |  |
| --- | --- | --- |
| **Domain**:  Mathematical Literacy | **Theme 1**:  Number Crunching Machine | **Class(es)**: VII  **Expected time: 15 minutes**  **Total Credit: 6** |
| **Description of Item:**   |  |  | | --- | --- | | ✓ | Text | | ✓ | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Students will be able to apply the properties of addition and multiplication of integers. | |

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:

1. 123 (ii) -72

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

1. 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  63  2  1 0

No Credit: Any other or missing response

|  |  |  |
| --- | --- | --- |
| **Domain**:  Mathematical Literacy | **Theme 2**:  Pocket Money | **Class(es)**: VII  **Expected time: 12 minutes**  **Total Credit: 6** |
| **Description of Item:**   |  |  | | --- | --- | | ✓ | Text | |  | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Students will be able to interpret the problem and apply basic operation on integers | |

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

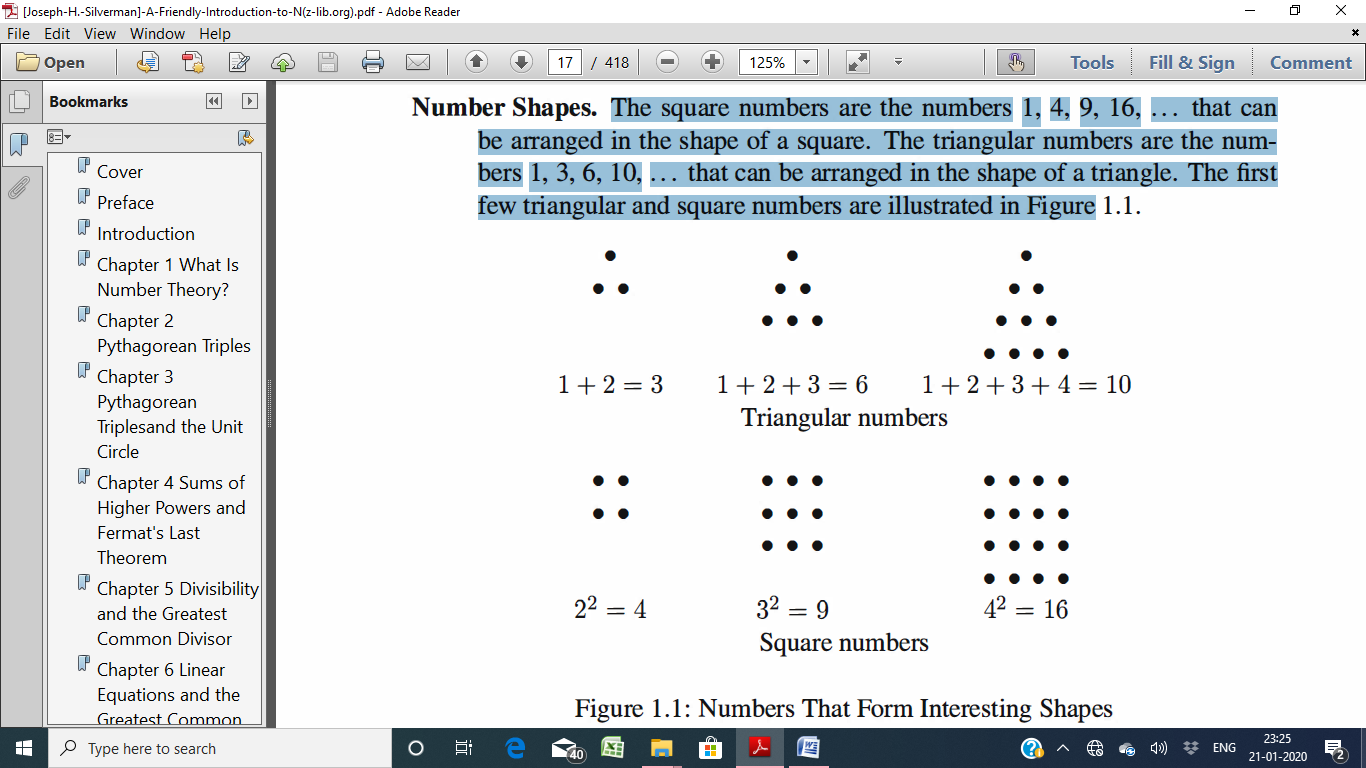
**Question 3**

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

No Credit: Any other or missing response

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

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:**

**Question 1**

Full Credit: Yes, 36

No Credit: Any other or missing response

**Question 2**

Full Credit: Infinite

No Credit: Any other or missing response

|  |  |  |
| --- | --- | --- |
| **Domain**:  Mathematical Literacy | **Theme 4**:  Grocery Shopping | **Class(es)**: VII  **Expected time: 15 minutes**  **Total Credit: 4** |
| **Description of Item:**   |  |  | | --- | --- | | ✓ | Text | | ✓ | Image | | ✓ | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Students will be able to interpret the problem and apply basic operations on integers | |

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) | amazon.png | flip.jfif | bb.png |
| amul cow.jfif | 254 | 250 | 262 |
| patanjali.jfif | 285 | 280 | 276 |
| amul.jfif | 246 | 250 | 244 |
| mother.jfif | 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~~ muchshe 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 | Uncertainity 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:**

Question 1

Full Credit: Amazon, Rs. 556

No Credit: Any other or missing response

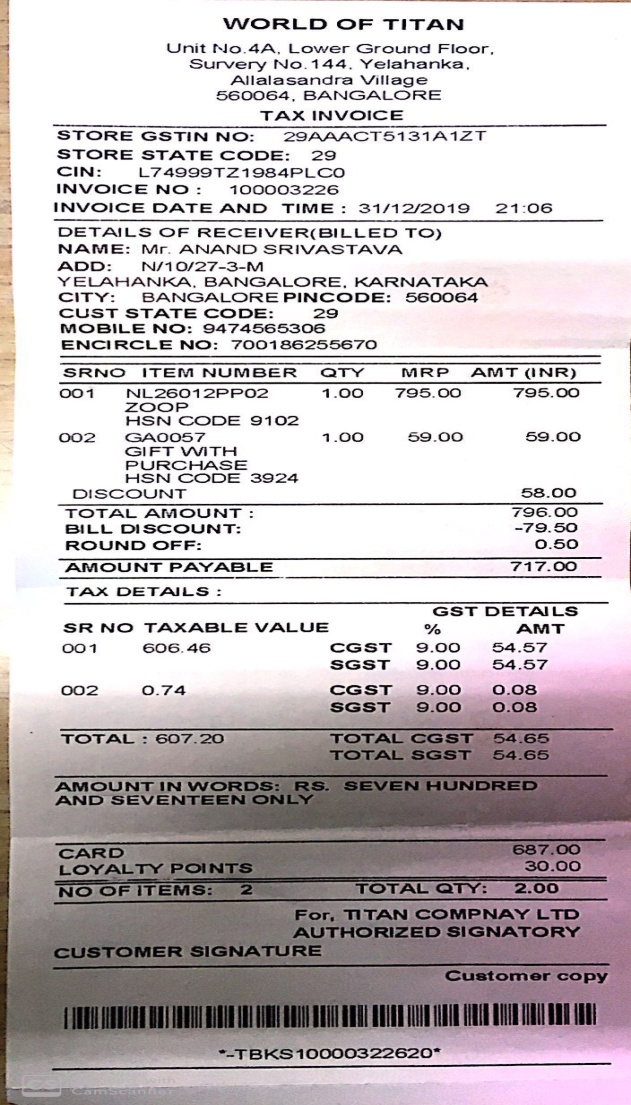
Question 2

Full Credit: Big Basket

No Credit: Any other or missing response

|  |  |  |
| --- | --- | --- |
| **Domain:**  Mathematical Literacy | **Theme 5:**  World of Titan | **Class: VII**  **Expected Time: 10 minutes**  **Total credits: 4** |
| **Description of item:**   |  |  | | --- | --- | | ✓ | Text | | ✓ | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning outcomes:** Students will learn about integers, its use in daily life situation etc. | |

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



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

1. Rs 796.00
2. Rs 717.00
3. Rs 687.00
4. Rs 79.00

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

1. Rs 79.00
2. Rs 0.50
3. Rs 109.00
4. Rs 110.00

**Mathematical Literacy**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARATERISTICS** |
| Competency Cluster | Mathematical Thinking |
| Overarching Ideas | Uncertainity 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. |

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

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.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Board Game | | | | | 50 | 49 | 48 | 47 | 46 |
| 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| 35 | 34 | 33 | 32 | 31 | 30 | 29 | 28 | 27 | 26 |
| 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** | **CHARATERISTICS** |
| 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

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

**MATHEMATICAL LITERACY**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARACTERISTICS** |
| Competency Cluster | Connection |
| Overarching Idea | Data |
| Context | scientific |
| Item format | MCQ |
| Cognitive Process | Problem solving |
| Proficiency Level | **7** |

**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.

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

Stack A

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R | B | B | R | R | R | B | R |

Stack B

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 |

|  |  |  |
| --- | --- | --- |
| **Domain**:  Mathematical Literacy | **Theme**:7  (Integers) **GROCERY** | **Class(es)**: VII  **Expected time:**  **Total Credit:8** |
| **Description of Item:**   |  |  | | --- | --- | | **\*** | Text | | **\*** | Table | |  | Image | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  **(As per NCERT)** Students will be able to solve question | |

**MATHEMATICAL LITERACY**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARACTERISTICS** |
| Competency Cluster | Connection |
| Overarching Idea | Data |
| Context | **S**CIENTIFIC |
| 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=Rupees 30  2.Ans. 75x5=375 rupees  3.Ans.350rupee  4.Ans. Rs.410  **Credit Pattern:**  Full Credit: 2 marks  Partial Credit: 0  No Credit:0 |

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

**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. |

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

**MATHEMATICAL LITERACY**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARACTERISTICS** |
| Competency Cluster | Connection |
| Overarching Idea | Data |
| Context | scientific |
| Item format | MCQ |
| Cognitive Process | Problem solving |
| Proficiency Level | **7** |

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

Total charge = 4 × fixed charge + 3 × 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 |

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

**MATHEMATICAL LITERACY**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARACTERISTICS** |
| Competency Cluster | Connection |
| Overarching Idea | Data |
| Context | scientific |
| Item format | MCQ |
| Cognitive Process | Problem solving |
| Proficiency Level | **7** |

In Mumbai, Temperature is +15 ˚c at 8:00AM . Temperature increased by 2 ˚c every hour till 12:00 noon. After 12:00 noon temperature decreased by 1˚c every hour.

In Kochi, Temperature is +18 ˚c at 8:00AM . Temperature increased by 1 ˚c every hour till 12:00 noon. After 12:00 noon temperature decreased by 0.5˚c every hour.

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

(a) 2 °C (b) 3°C (c) 1° C (d) 4°C

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

(a) 1.5°C (b) -1.5°C (c) 2° C (d) 1°C

|  |
| --- |
| 1.Ans.23-22=1oC  2.Ans.18-19.5=-1.50C  **Credit Pattern:**  Full Credit: 2 marks  Partial Credit: 0  No Credit:0 |

|  |  |  |
| --- | --- | --- |
| **Domain**:  Mathematical Literacy | **Theme**:11  Integers  **GAME OF DICE** | **Class(es)**: VII  **Expected time: 10 M**  **Total Credit:6** |
| **Description of Item:**   |  |  | | --- | --- | | **\*** | **Text** | |  | Image | |  | **Table** | |  | **Graph** | |  | **Map** | |  | **Poem** | | **Learning Outcome:**  **(As per NCERT)** Student will be able to learn dice operation | |

**MATHEMATICAL LITERACY**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARACTERISTICS** |
| Competency Cluster | Connection |
| Overarching Idea | DICE |
| Context | scientific |
| Item format | MCQ |
| Cognitive Process | Problem solving |
| Proficiency Level | **7** |

The faces of two dice are marked +1, +2, +3, +4, +5, +6and –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 keepadding 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.  Max = 5 Min = -5.  2. Ans. No. (why ?)  **Credit Pattern:**  Full Credit: 2 marks  Partial Credit: 0  No Credit:0 | | |
| **Domain**:  Mathematical Literacy | **Theme**:12  Integers  **Social studies** | **Class(es)**: VII  **Expected time: 10 M**  **Total Credit:8** |
| **Description of Item:**   |  |  | | --- | --- | | **\*** | **Text** | |  | Image | |  | **Table** | |  | **Graph** | |  | **Map** | |  | **Poem** | | **Learning Outcome:**  **(As per NCERT)** Student will be able to learn to solve this question | |

**MATHEMATICAL LITERACY**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARACTERISTICS** |
| Competency Cluster | Connection |
| Overarching Idea | Data |
| Context | Scientific |
| Item format |  |
| Cognitive Process | Problem solving |
| Proficiency Level | **7** |

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 2900years 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: 

**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:

|  |
| --- |
| 1. Positive – if the No. of integers is even  Negative - if the No. of Integers is Odd.  2. Positive – if the No. of integers is Odd.  Negative - if the No. of Integers is Even. |

|  |  |  |
| --- | --- | --- |
| 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 tominus-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:

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

|  |  |  |
| --- | --- | --- |
| Domain: Mathematical Literacy | Theme:13  INTEGERS  Basic Operations | Class: VII  Expected Time: 10 MIN  Total credit: 2 |
| Description of Items: Text | Learning Outcome: Basic operation on Integers | |

**Who is the Mathematician?**

If *a \* b* means *a × b* + 2 and

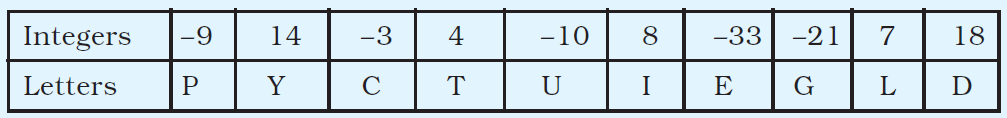
*a* # *b* means – *a* + *b* –(–3),

then find the value of the following:

(i) 7 \* (–5) (ii) – 4 \* 3

(iii) 2 # (–4) (iv) (–7) # (–3)

(v) (–3) \* (–2) (vi) (–7 \* 2) # 3

Next, match these answers with suitable letters by looking at the table below and arrange them in increasing order of integers to decode the name of the mathematician: 

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 |

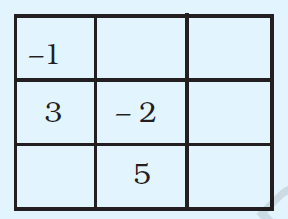
Description of Answer Key and credits:

|  |
| --- |
| 1. Euclid ( -33, -10, -3, 7, 8, 18) |

|  |  |  |
| --- | --- | --- |
| 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 | |

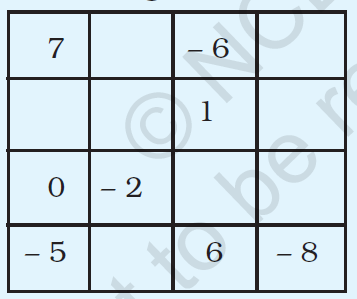
**Magic Square**

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.

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

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



**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 |

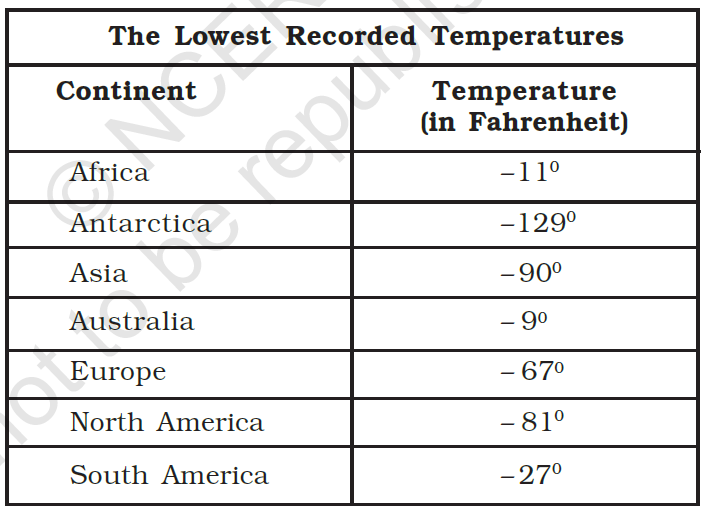
Description of Answer Key and credits:

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

|  |  |  |
| --- | --- | --- |
| 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.



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

|  |  |
| --- | --- |
| **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:

|  |
| --- |
| 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 | |

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

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)X(-2)X(-3)X(-4)X(-5)

ii) 18946 X 99 – (-18946)

iii) (-1) +(-2) +(-3) +(-9) +(-8)

iv) 15 X (-99)

v) (-143) + 600 -257 + 400

vi) 0 ÷ (−12)

vii) (-125) X 9 -125

viii) (-1) X (-1) X \_\_ (-1) [20 times]

ix) (-4 )+ 4 +(-4)+ 4 -\_\_+ 4 [21 times]

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

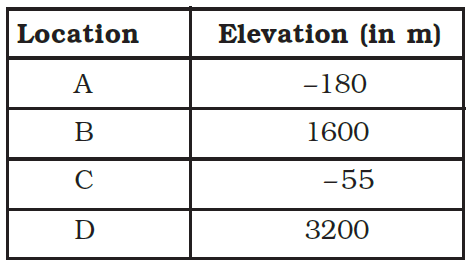
Description of Answer Key and credits:

|  |
| --- |
| 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.



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:

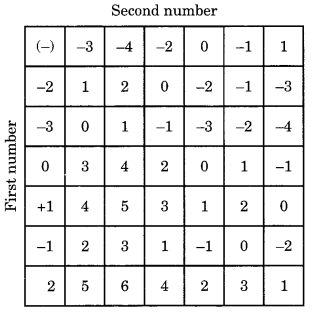
|  |
| --- |
| Ans) (a) place A  (b) Place D  (c) D,B,C,A |

|  |  |  |
| --- | --- | --- |
| 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:

..................................................................................................................................

**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 DISCUS THE SIGN OF THE ANSWEROBTAINED .

**Ans:………………………………..**

**Credit Pattern:**

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

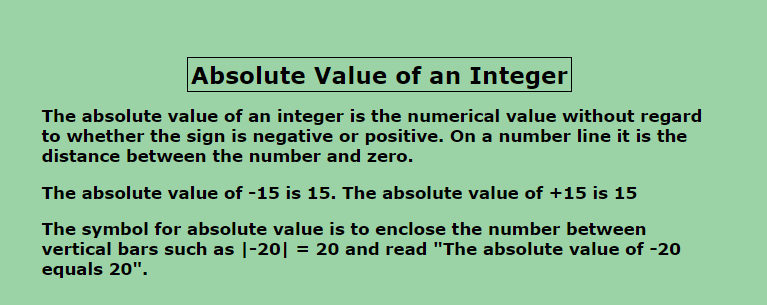
Mathematical Literacy

|  |  |
| --- | --- |
| **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:

|  |
| --- |
| 1. Positive – if the No. of integers is even  Negative - if the No. of Integers is Odd.  2. Positive – -3  Negative - NEGATIVE |

|  |  |  |
| --- | --- | --- |
| Domain: Mathematical Literacy | Theme: 19**Absolute Value of Integer** | Class: VII  Expected Time: 02 min  Total credit: 04 |
| Description of Items: Text | Learning Outcome: understanding about absolute value os integers | |



**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) |

**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) |

**Question 3.In the Sahara Desert, one daythe 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) |

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 Literay | 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 dailylife 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

BMI = 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?

1. 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 x 1.6 x 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 the1ST day she cools one sample of bacteria to a temperature of -51°C and another to -76°C but she is unable to succeed. 2ND day she cools one sample of bacteria to a temperature of - 40 0C and another sample to - 320C . 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 |

|  |  |  |
| --- | --- | --- |
| **Domain: Mathematics Literacy** | **Theme :23 Water Tank** | **Class: VII**  **Expected time: 5min to 10 min**  **Total Credit: 10** |
| **Description of items:**   |  |  | | --- | --- | |  | **Text** | |  | **Image** | |  | **Table** | |  | **Graph** | |  | **Map** | |  | **Poem** | | **Learning Outcome( As per NCERT):**  **Students are able to apply the propertiesofaddition and subtraction along with the concept of additive inverse.** | |

**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 – ....................... = – 8

**Answer :** ……………………………………………………………………………………………………………………………….

**(b)** 4 – 2 + ............................ = 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 21th 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 reachingthe 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 |

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:

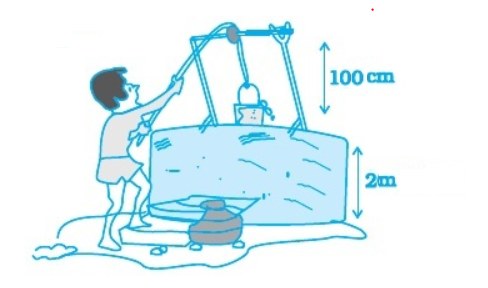
|  |  |  |  |
| --- | --- | --- | --- |
| Ans) (c) 19 | | | |
| Domain: Mathematical Literacy | Theme:25  Addition of integers  Water Level | Class: VII  Expected Time: 3 min  Total credit: 02 | |
| Description of Items:  Text, Image | Learning Outcome: Learning the basic operations on integers | | |

**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?



1. 27 m
2. 28 m
3. 32 m
4. 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) |

|  |  |  |
| --- | --- | --- |
| **Domain:**  Mathematical literacy | **Theme:28**  **Flip a Coin, Take a Step (Integers)** | **Class: VII**  **Expected Time: 10 minutes**  **Total credits: 4** |
| **Description of item:**   |  |  | | --- | --- | | √ | Text | |  | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning outcomes:** Students will learn about integers and use of integers in daily life.. | |

**Mathematical Literacy**

|  |  |
| --- | --- |
| **FRAMEWORK** | **CHARATERISTICS** |
| 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 tosses10 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?

1. H-6, T-4
2. H-8, T-2
3. H-2, T-8
4. 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?

1. 6
2. 5
3. 7
4. 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. |