**CRITIRCAL AND CREATIVE THINKING ITEMS**

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

**INDEX**

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| --- | --- |
| **S.No.** | **Theme of the item** |
|  | Data transfer |
|  | Sports Club |
|  | Number Game |
|  | Decoding |
|  | Bananas |
|  | Number Puzzle |
|  | Number of Solutions |
|  | Ratio of Ages |
|  | Test Scores |
|  | Mints in the Bowl |
|  | Average age of family |

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| --- | --- | --- |
| 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:  **1. DATA TRANSFER**  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 : **S=10t+5**  Complete the following:  Q1. When the transfer began, the drive had \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ GB of files  in it.  Q2. 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. |

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|  |  |  |
| --- | --- | --- |
| 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:  **2. SPORTS CLUB**  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.  Q1. 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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| --- | --- | --- |
| 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:  **3. NUMBER GAME**  1. 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  2. If you half the number obtained in question1, will the relation mentioned in question1 still exist? Justify your answer.  Ans: ----------------------------------------------------------------------------------------  3. What minimum positive integral value must be added to the number obtained in question1to make it a perfect cube.  (a) 15 (b) 4 (c) 3 (d) 13  4. 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.  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 | 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)-22(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 ⇒x=18=12+6  Partial Credit: Yes No Credit: Any other response. |

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| --- | --- | --- |
| 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 7th. 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, 5g – 3=12, 4n=20, 12a+3=27, 8+‘o’=14   1. What are the solutions of equationsasked by the teacher? 2. Name the thing that the teacher awarded to the students.   Taking the game to next level, Amit askedSunil 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 (ii) 2(y+1)=(y+3) (iii) 6z+4=52 (iv) = (v) 2r- 3=9   1. Find thecontact 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:

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

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|  |  |  |
| --- | --- | --- |
| 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:  **5. BANANAS**  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: 2sPartial Credit: No Credit: Any other response  Q2. Full credit: which gives 900Partial credit:  No Credit: Any other response  Q3. Full credit: 4No Credit: Any other response  Q4.Full credit: No Credit: Any other response |

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|  |  |  |
| --- | --- | --- |
| 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:  **6. NUMBER PUZZLE**  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.  **Down 1:**I spent one third of my sleeping time while dreaming. If I dreamt for 3 hour,  then how long did I sleep?  **Down 2:**I ran around three sides of a square park whose perimeter is 200 m. How far  Iam from starting point?  **Down4:** I purchased three pants and was left with Rs1000 out of my saving of  Rs10000.How much is each pant worth?  **Down 8:**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?  **Down 9:**The unequal angle of an isosceles triangle measures 12. How much is each  of the remaining angles?  **Down 11:**For what value of y is 3(y-1) + 7=40?  **Across 3:** Out of 40 chocolates, Ram and I shared in the ratio 1: 3. How many  chocolates did Ram get?  **Across 5:**  Sum of two consecutive numbers is 111. What is smaller number of the two?  **Across 7:** 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?  **Across 10:** If 2x + 7 = 1573, then x =?  **Across 12:** Cube of 5   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 1 |  |  | 10 |  | 4 | |  | 5 | 2 |  |  |  | | 8 | 3 |  | 9 |  |  | |  |  |  | 7 |  |  | |  |  | 11 |  |  |  | |  | 12 |  |  |  |  | | | |

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 |  |  | |

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| --- | --- | --- |
| 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:  **7. NUMBER OF SOLUTIONS**  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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|  |  |  |
| --- | --- | --- |
| 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:  **8. RATIO OF AGES**  **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?** | | | |

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 |

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|  |  |  |
| --- | --- | --- |
| 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:  **9. TEST SCORES**  **A test has 50 questions. A student scores 1 mark for a correct answer, −1/3 for a wrong answer, and −1/6 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**  **(a) 6 (b) 12 (c) 3 (d) 9** | | |

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 – – = 32 ⇒6x – 2y – z = 192 --- (2) (1) + (2) = 7x - y = 242 ⇒7x = 242 + y Multiple of 7 > 242 is 245 So minimum value of 242 + y is 245 ⇒ y = 3 |

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| --- | --- | --- |
| 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:  **10. MINTS IN THE BOWL**  **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 1/3 of the mints, but returned four because she had a momentary pang of guilt. Fatima then took 1/4 of what was left but returned three for similar reasons. Eswari then took half of the 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:

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

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|  |  |  |
| --- | --- | --- |
| 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:  **11. AVERAGE AGE OF FAMILY**  **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 x 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 x 8 = 32 years. So sum of all ages after 4 more years = 159 + 32 = 191 Average = 191/8 (~ 24 years) |

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