Based on Central Board of Secondary Education (CBSE) and NCTE

CTET/All TET

Teacher Eligibility Test

MATHS

Class (I-V) Paper-I

Solved Papers

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SYLLABUS

For Classes 1 to V : Primary Stage

S.No.	Subject	Question No.	Marks
1.	Child Development and Pedagogy	30	30
2.	Language I	30	30
3.	Language II	30	30
4.	Math	30	30
5.	Environmental Studies.	30	30
	Total	150	150

I. Child Development and Pedagogy 30 Questions

(A) Child Development (Primary School Child) 15 Questions

- Concept of development and its relationship with learning.
- Principles of the development of Children
- Influence of Heredity & Environment
- Socialization processes : Social world & children (Teacher, Parents, Peers)
- Piaget, Kohlberg and Vygotsky: constructs and critical perspectives
- Concepts of child-centered and progressive education
- Critical perspective of the construct of intelligence
- Multi-Dimensional Intelligence
- Language & thought
- Gender as a social construct; gender roles, gender-bias and educational practice
- Individual differences among learners, understanding differences based on diversity of language, caste, gender, community, religion etc.
- Distinction between Assessment for learning and assessment of learning; School-Based Assessment, Continuous & Comprehensive Evaluation: perspective and practice.
- Formulating appropriate questions for assessing readiness levels for learners; for enhancing learning and critical thinking in the classroom and for assessing learner achievement.

(B) Concept of inclusive education and understanding children with special needs. 5 Questions

- Addressing learners from diverse backgrounds including disadvantaged and deprived.
- Addressing the needs of children with learning difficulties, 'impairment' etc.
- Addressing the Talented, Creative, Specially abled learners.

(C) Learning and Pedagogy 10 Questions

- How children think and learn; how and why children 'fail' to achieve success in school performance.
- Basic processes of teaching and learning; children's strategies of learning; learning as a social activity; social context of learning.
- Child as a problem solver and a 'scientific investigator'
- Alternative conceptions of learning in children, understanding children's 'errors' as significant steps in the learning process.
- Cognition & Emotions
- Motivation and learning
- Factors contributing to learning-personal & environmental

II. Language I 30 Questions

(a) Language comprehension 15 Questions

Reading unseen passages- two passages one prose or drama and one poem with questions on comprehension, inference, grammar and verbal ability (Prose passage may be literary, scientific narrative or discursive)

(b) Pedagogy of language Development 15 Question

- Learning and acquisition
- Principles of language Teaching
- Role of listening and speaking; function of language and how children use it as a tool
- Critical perspective on the role of grammar in learning a language for communicating ideas verbally and in written form.
- Challenges of teaching language in a diverse classroom; language difficulties, errors and disorders.
- Language Skills
- Evaluating language comprehension and proficiency; speaking, listening, reading and writing.
- Remedial Teaching.

III. Language - II 30 Questions

(a) Comprehension 15 Questions

Two unseen prose passages (discursive or literary or narrative or scientific) with question on comprehension, grammar and verbal ability.

(b) Pedagogy of language Development 15 Questions

- Learning and acquisition
- Principles of language Teaching
- Role of listening and speaking; function of language and how children use it as a tool.
- Critical perspective on the role of grammar in learning a language for communicating ideas verbally and in written form;
- Challenges of teaching language in a diverse classroom; language difficulties, errors and disorders
- Language Skills
- Evaluating language comprehension and proficiency: speaking, listening, reading and writing
- Teaching– learning materials: Textbook, multi-media materials, multilingual resource of the classroom.
- Remedial Teaching.

IV. Mathematics 30 Questions

(a) Content 15 Questions

- Geometry
- Shapes & spatial Understanding
- Solids around Us
- Addition and Subtraction
- Division
- Weight
- Volume
- Patterns
- Numbers
- Multiplication
- Measurement
- Time
- Data Handling
- Money

(B) Pedagogical issues 15 Questions

- Nature of Mathematics/Logical thinking; understanding children's thinking and reasoning patterns and strategies of making meaning and learning.
- Place of Mathematics in Curriculum
- Language of mathematics
- Community Mathematics
- Evaluation through formal and informal methods.
- Problems of Teaching
- Error analysis and related aspects of learning and teaching.
- Diagnostic and Remedial Teaching.

V. Environmental Studies. 30 Questions

(a) Content 15 Questions

i. Family and Friends: Relationships, Work and Play, Animals, Plants
ii. Food, iii. Shelter, vi. Water, v. Travel
vi. Things We Make and Do

(b) Pedagogical Issues 15 Questions

- Concept and scope of EVS
- Significance of EVS, integrated EVS
- Environmental studies & Environmental Education.
- Learning Principles
- Scope & relation to science & Social Science
- Approaches of presenting concepts.
- Activities, ■ Experimentation/practical work
- Discussion, ■ CCE, ■ Teaching material/Aids
- Problems

Central Teacher Eligibility Test (CTET) July 2024
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 07.07.2024)

MATHEMATICS

1. 12 thousand + 13 hundred + 2 tens is equal to :

(a) 121320 (b) 12132 (c) 130132 (d) 13320

Ans. (d) : According to the question,

Given, 12 Thousand + 13 Hundred + 2 Ten

$12 \times 1000 + 13 \times 100 + 2 \times 10$

$= 12000 + 1300 + 20$

$= 13,320$

Hence option (d) is correct

2. One crore is :

(a) hundred million (b) ten million

(c) one million (d) one billion

Ans. (b) : A crore is a natural number that is expressed as 100,00,000 according to the Indian numbering system. As per the International number it is equal to 10 million. It's expressed as 107 in scientific notation, which means 10,000,000.

1 crore = 1,00,00,000

& 10 million = 10,000,000

Hence, 1 crore = 10 million

3. Which of the following resourced is best suited to explain the concept of decimals?

(1) Number Chart (2) Dienes Blocks

(3) Taylor's Abacus (4) Graph Paper

Choose the correct option :

(a) (1) and (2) (b) Only (2)

(c) (2) and (4) (d) (1) and (3)

Ans. (c) : The concept behind decimal multiplication can be easily explained by the use of graph paper with the help of blocks.

Dienes Block- It is a mathematical manipulating tool that helps children to learn basic mathematics like, addition, subtraction, place value, counting and simple multiplication.

Graph paper- It is a very versatile and useful device for learning mathematics graph for multiple and division extends to fractions and decimals and should be used.

Hence, option (c) is correct.

4. Which of the following letters has no line of symmetry?

(a) X (b) L

(c) A (d) M

Ans. (b) : L letter has no line of symmetry.

5. In a certain week, the number of patients in a dental clinic was as follows:

Day	Number of patients
Monday	**25**
Tuesday	**38**
Wednesday	**45**
Thursday	**18**
Friday	**36**
Saturday	**39**

Based on above table, choose the wrong statement :

(a) Total number of patients was 200

(b) Range of the data is 27

(c) On most of the days, number of patients was more than 30

(d) Difference between the number of patients on Monday and Wednesday is 20

Ans. (a) : According to the option

(a) Total number of patient = 201

(b) Range of data = 45 – 18

= 27

(d) Monday - Number of patient = 25

Wednesday - Number of patient = 45

Difference = 20

Hence option (a) is correct.

6. If x : y = q, then which of the following is true?

1. x + y : y = p + q : q

2. x – y : y = p – q : q

3. x : p = y : q

4. x + y : x – y = p – q : p + q

(a) 1, 2 and 3 (b) 1 and 2

(c) only 3 (d) 1 and 4

Ans. (a) : According to the question,

Let x = 3 and p = 6

y = 4 q = 8

From option (a)

= x + y : y = p + q : q

$\Rightarrow$ 7 : 4 = 14 : 8

$\Rightarrow$ 7 : 4 = 7 : 4

From option (b)

$x - y : y = p - q : q$

$-1 : 4 = -2 : 8$

$-1 : 4 = -1 : 4$

From option (c)

$x : p = y : q$

$3 : 6 = 4 : 8$

$1 : 2 = 1 : 2$

From option (d)

$x + y : x - y = p - q : p + q$

$7 : -1 = -2 : 14$

$7 : -1 = -1 : 7$

Hence 1,2 and 3 will be correct

Hence option (a) is correct.

7. Which of the following Indian mathematicians are known as founders of numerical analysis?

(i) Ramanujan (ii) Bhaskaracharya

(iii) Varahmihir (iv) Aryabhatta

Choose the correct option

(a) (i) and (iv) (b) (i) and (iii)

(c) (ii) and (iv) (d) (ii) and (iii)

Ans. (b) : Srinivasa Ramanujan's Contribution of Mathematical theories such as analytical theory of numbers elliptic functions, continued fractions and infinite series is considered remarkable in the world of mathematics. His theories have contributed to changing the mathematics of the 21st century. Varahamihira developed the algebraic properties of zero and trinegative numbers under numerical analysis.He was one of the first mathematicians to discover a different form of pascal's triangle. It was used to calculate binomial coefficients.

8. Which of the following statement (s) is/are true about numbers?

1. All positive integers are whole numbers.

2. All whole numbers are integers.

3. All rational numbers are real numbers.

4. All irrational numbers are real numbers.

Choose the correct option :

(a) 1 and 4 (b) only 2

(c) only 3 (d) 2, 3 and 4

Ans. (*) : Whole number are the set of real numbers that includes zero and all positive counting numbers whereas, fraction includes negative integers, fraction and decimals. The following statement are true about numbers.

- All positive integers are whole numbers.
- All whole numbers are integers.
- All rational numbers are real numbers.
- All irrational numbers are real numbers.

Hence all options are correct.

9. The main approach suggested by National Curriculum Framework (NCF) 2005 in teaching learning of mathematics is :

(a) Constructivism (b) Instructivism

(c) Pragmatism (d) Behaviourism

Ans. (a) : The main approach suggested by National curriculum framework (NCF) 2005 in teaching learning of mathematic is constructivism.

Jean Piaget is known as one of the first theorists in constructivism. His theories indicates that humans create knowledge through the interaction between their experiences and ideas.

Hence option (a) is correct.

10. Students in a class are solving questions based on percentage discounts. One question requires the students to calculate the cost of two bikes, with a 8% discount on each bike. One of the groups calculates the total cost of the bikes and then deducts 16% from the total cost. The method used by this group is:

(a) False, since they have deducted 16% from the total instead of 16% from the average of the total

(b) Correct and is the only way to calculate the discount and cost.

(c) An alternate strategy to solve the question.

(d) False, since they have deducted 16% discount from the total instead of 8%

Ans. (d) : Students in a class are solving questions based on percentage discounts. One question requires the students to calculate the cost of two bikes, with a 8% discount on each bike. One of the groups calculates the total cost of the bikes and then deducts 16% from the total cost. The method used by this group is false, since they have deducted 16% discount from the total instead of 8%.

Hence option (d) is corret.

11. While teaching equations a teacher explains the concept of a linear equation having unique solution. She further asks, "If a solution is given then how many equations you can create"?

Choose the correct option :

(a) Two equations (b) One equation

(c) No equation (d) Many equations

Ans. (d) : A linear equation has a unique solution when both equations refer to the same line, suggesting that there are an infinite number of solutions. In most cases, a system of linear equations has only one solution, but it may have no solutions (parallel lines) or infinite solutions (same line).

Therefore, the answer to the question asked by the teacher will be many infinite equations.

Hence, option (d) is correct.

12. Two columns are given as shown below :

Column-I	Column-II
(a) face of a black-board	**(i) two end points**
(b) a line has	**(ii) one end point**
(c) a ray has	**(iii) represents a part of a plane**
(d) a line segment has	**(iv) no definite length**

Column- I and II are matched as :

(a) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

(b) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)

(c) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)

(d) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

Ans. (d) : The correct match of given column I and column II .

Column - I	Column - II
(a) face of a black - board	(iii) represent a part of a plane
(b) a line has	(iv) no definite length
(c) a ray has	(ii) one end point
(d) a line segment has	(i) two end points

Hence, option (d) is the correct matching sequence.

13. If (7 * 2) × (123) = 92496, then value of * is:

(a) 5 (b) 2

(c) 1 (d) 4

Ans. (a) : Given

(7 * 2) × (123) = 92496

from option (a)

752 × 123 = 92496

92496 = 92496

Hence option (a) is correct.

14. Saumya joined her job on 13-01-1992 and she took retirement on 31-03-2023. Duration of her service was :

(a) 31 years 2 months and 18 days

(b) 30 years 10 months and 19 days

(c) 30 years 9 months and 18 days

(d) 31 years 2 months and 19 days

Ans. (a) : Starting day of saumya's job = 13-01-1992

Retirement day of saumya = 31-03-2023

Job period = Retirement day – Joining day

D	M	Y
31	03	2023
–13	01	1992
18	02	0031

When we count ending point of both days + 1

= 18 + 1 = 19 days

or

Simply –

13,	14,	15,	16,	17
18,	19,	20,	21,	22
23,	24,	25,	26,	27
28,	29,	30,	31	

= 19 days

Hence 31 years 2 months and 19 days of her service was.

15. In order to identify individual differences of students in the mathematics class, which of the following assessment technique will not be appropriate?

(a) Peer assessment

(b) Summative assessment

(c) Formative assessment

(d) Diagnostic assessment

Ans. (b) : Summative assessment technique will not be suitable for identifying individual differences among students is mathematics class. The goal of summative assessment is to evaluate student learning by comparing it to some standard at the end of an instructional unit.

Hence, option (b) is correct.

16. Which among the following is/are true about the computation in basic operations for Grade-II learners?

(1) It involves child's ability to develop informal strategies.

(2) It involves child's ability to estimate.

(3) It involves child's ability to do calculations with large numbers.

Choose the correct option :

(a) (1) and (2) (b) Only (3)

(c) (2) and (3) (d) (1) and (3)

Ans. (a) : Computation is one of the basic operations used to calculate values. Operational computations include addition, subtraction, multiplication and division.

- Basic operations for computations for Grade - II learners :

(a) It involves child's ability to develop informal strategies.

(b) It involves child's ability to estimate.

Hence, option (a) is correct.

17. In a mathematics class a teacher explains the concept of different angles. He/she realizes that scissors is a best example to explain_____.

(1) Vertically opposite angles

(2) Linear pair of angles

(3) Corresponding angles

(4) Alternate angles

Choose the correct option

(a) (2) and (3) (b) (1) and (2)

(c) (1) and (3) (d) (3) and (4)

Ans. (b) : Scissors have two blades which rotate around a point. When the blades are opened, they form an angle at the pivot point. The angles formed by the blades represent vertical angles. The angles formed on opposite sides of the intersection of the blades represent a 'linear pair of angles.'

Hence, option (b) is correct.

18. 1233210 ÷ 5555 – 222 is equal to:

(a) 3 (b) 1

(c) 0 (d) 2

Ans. (c) :

1233210 ÷ 5555 – 222

222 – 222 = 0

Hence option (c) is correct

19. Arrangement of fractions $\frac{1}{9},\frac{1}{21},\frac{3}{7},\frac{12}{63}$ in decreasing order is :

(a) $\frac{1}{9},\frac{12}{63},\frac{3}{7},\frac{1}{9}$ (b) $\frac{3}{7},\frac{1}{9},\frac{12}{63},\frac{1}{21}$

(c) $\frac{3}{7},\frac{12}{63},\frac{1}{9},\frac{1}{21}$ (d) $\frac{12}{63},\frac{3}{7},\frac{1}{21},\frac{1}{9}$

Ans. (c) : Given fraction

$\frac{1}{9},\frac{1}{21},\frac{3}{7},\frac{12}{63}$

Making denominator equal

$\frac{7}{63},\frac{3}{63},\frac{27}{63},\frac{12}{63}$

Decreasing order $\frac{27}{63}>\frac{12}{63}>\frac{7}{63}>\frac{3}{63}$

$=\frac{3}{7}>\frac{12}{63}>\frac{1}{9}>\frac{1}{21}$

Hence option (c) correct

20. One egg has a mass of about 65g, what is the mass of 2 dozen eggs?

(a) 1 kg 544g (b) 1.56 kg

(c) 1 kg 56g (d) 1.304 kg

Ans. (b) : According to question,

Given,

mass of 1 egg = 65g.

mass of 24 egg = 65g × 24

= 1560g.

= 1.56 kg.

Hence option (b) is correct.

21. Which of the following represents the features of a mathematics laboratory?

(1) It is a place to enjoy mathematics through informal exploration.

(2) It provides opportunities to prove mathematical theorems through experiments.

(3) It provides opportunity to make conjectures, test them and to generalise observed patterns.

(4) It is used to assess students' knowledge of mathematics and grade them accordingly.

Choose the correct option.

(a) (2) and (3) (b) (1) and (4)

(c) (1) and (3) (d) (2) and (4)

Ans. (c) : Mathmatics laboratory refers to place where students can perform experiments and explore structures and ideas.

* These provide opportunities of learners to experiment and exlore mathematics.
* This is a place to enjoy mathematics through informal exploration.
* It provides opportunities to formulate conjectures, test them and to generalize observed patterns.

22. National Curriculum Framework For Foundational Stage (NCFFS), 2022 highlighted the importance of the following components while teaching an abstract mathematical concept :

(1) Written Symbols (2) Experience

(3) Spoken Language (4) Picture

Which of the following is the appropriate sequence of these components while teaching an abstract mathematical concept?

(a) (2), (3), (4), (1) (b) (3), (1), (4), (2)

(c) (2), (3), (1), (4) (d) (3), (4), (1), (2)

Ans. (a) : National curriculum framework for foundational stage (NCF FS) 2022 highlighted the importance of the following components while teaching an abstract mathematical concepts-

(2) E → Experience (3) L → Spoken Language

(4) P → Pictures (1) S → Written symbols

Hence option (a) is in the correct order.

23. Raju has turpentine oil in 5 containers each of 20 L size. He fills them in 10 cans of 5L, 10 cans of 2 L and rest in 1 L cans. Number of 1 L cans filled is :

(a) 28 (b) 25 (c) 30 (d) 22

Ans. (c) :

Total quantity of Turpentine Raju have = 20L × 5

= 100L

Total Turpentine in 10 container of 5L = 50L

Total Turpentine in 10 container of 2L $= 2 \times 10 = 20L$

Total remaining turpentine $= 100L - 70L = 30L$

1L container $= \frac{30}{1} = 30$ container

Hence option (c) is correct.

24. Which of the following learning experiences for children does not reflect the contribution of mathematics to everyday life and society?

(a) Play samll group games that draw on mathematical skills and concepts.

(b) Communication of mathematical ideas in writing using both formal and informal languages.

(c) Meeting people from different areas of employement and exploring how they use mathematics in their work.

(d) Collecting, organising, representing and interpreting data in day-today life.

Ans. (*) : According to final answer key of board, bonus mark given to all. Because it translation form of answers will not match or appropriate to accurate answer.

25. 22 hm 8 dam is equal to :

(a) 22080 m (b) 22800 m

(c) 2208 m (d) 2280 m

Ans. (d) : Given,

22 hm 8 dam

1 hm = 100m

1 dm = 10m

$22 \times 100m + 8 \times 10m$

$= 2280$ m

26. A mathematics teacher discusses the concept of open and closed curve in class. For better understanding of students she gave an example with four points. If the curve is open then nature of four points is :

(a) Three of them must be non-colinear

(b) All are collinear

(c) Two of them must be collinear

(d) Three of them must be collinear

Ans. (b) : A mathematics teacher discusses the concept of open and closed curve in the class. She gives an example with four points for better understanding of the students. If the curve is open then the positions of the four points should all be collinear.

Hence, option (b) is correct.

27. Two angles of a triangle are 50° and 30°. Then the third angle of the triangle is :

(a) 80° (b) 100° (c) 40° (d) 60°

Ans. (b) : Given, Two angles 50°, 30°

Sum of three angles of triangles = 180°

Third angle $= 180° - (50 + 30) = 100°$

Hence option (b) is correct.

28. Which of the following are correct example of the statement "mathematics is hierarchical in levels that are logically structured".

(1) The concept of integers needs to be developed before the concept of multiplication and division of numbers.

(2) Multiplication follows and builds on the concept of addition.

(3) Number sense needs to be developed before the concepts of addition and subtraction

Choose the correct option :

(a) Only (2) (b) (1) and (2)

(c) (2) and (3) (d) (1) and (3)

Ans. (c) : Mathematical concepts are hierarchical, meaning they build on practical and conceptual knowledge from one grade to the next they are taught in a predetermined order like arithmetic first, then algebra, trigonometry and calculus.

Multiplication follows and develop on the concept of addition.

- Number sense needs to be developed before the concepts of addition and subtraction.

Hence, option (c) is correct.

29. The difference between the greatest and smallest 6 digit numbers formed by using the digits 5, 1, 0, 3, 9 and 6 is :

(a) 851731 (b) 861741 (c) 862731 (d) 951741

Ans. (b): According to question,,

Greatest 6 digit number formed by given number = 965310

Smallest 6 digit number formed by given number = 103569

difference = 861741

Hence option (b) is correct.

30. The missing number (?) in the following :

43, 47, 53, 59, ? , 67, 71, 73 is :

(a) 65 (b) 61 (c) 60 (d) 63

Ans. (b) : Given series

43, 47, 53, 59, 61, 67, 71, 73

All are prime numbers.

Central Teacher Eligibility Test (CTET) Jan 2024
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 21.01.2024)

MATHEMATICS

1. Which of the following should be the characteristics of mathematical language at primary level.

(A) It should be precise.
(B) It must be ambiguous as it can add openness in the subject.
(C) It should be reinforced through child's language used in everyday life.
(D) It must be highly technical as it will help students to communicate accurately in mathematics.

(a) (a) and (d) (b) (a), (b) and (c)
(c) (a) and (c) (d) (a), (c) and (d)

Ans. (c) : Mathematical language at the primary stage should have the following characteristics -
(1) It should be precise.
(2) It should be reinforced through the child's language used in everyday life.
(3) Should be simple, clear and accurate.
(4) It should not be too dense and large.
(5) Concepts, relationships and procedures should be expressed in a clear and unambiguous manner.

2. A student of class III solved 26 × 5 as :

$$\begin{array}{r} 26 \\ \times 5 \\ \hline 1030 \end{array}$$

Revisiting which of the following will best remediate this misconception?

(a) Multiplication of one digit by one digit
(b) Concept of regrouping
(c) Recalling multiplication tables
(d) One to one correspondence

Ans. (b) : Misconception refers to the gap in children's knowledge. If they are not addressed properly, can build over time. Here in the given question, concept of regrouping will be best remediate this misconception.

3. A number becomes double if it is increased by 8. What is the number?

(a) 6 (b) 8
(c) 12 (d) 16

Ans. (b) : Let the number be = x
According to the question-
$x + 8 = 2x$
$2x - x = 8$
$x = 8$
Hence the number is 8.

4. One millimeter is the same as :

(a) 0.01 cm (b) 0.1 cm
(c) 0.01 m (d) 0.1 m

Ans. (b) : 1 millimeter $= \frac{1}{10}$ cm
$= 0.1$ cm

5. A_____is always a regular polygon.

(a) Isosceles triangle
(b) Square
(c) Pentagon
(d) Circle

Ans. (b) : A square is always a regular Polygon.

6. The sum of all angles of a triangle is :

(a) 60^0 (b) 90^0
(c) 180^0 (d) 360^0

Ans. (c) : The sum of all the angles of a triangle is 180º.

7. Which of the following is/are related to early number concept formation?

(A) One to one correspondence
(B) Hierarchical inclusion
(C) Basic operations

Choose the correct option :

(a) Only (a) (b) (a) and (c)
(c) (a) and (b) (d) (b) and (c)

Ans. (c) : One to one correspondence and hierarchical inclusion are related to early number concept formation. Early numeracy provides an essential foundation for learning basic arithmetic. It includes the following.
(1) Classroom Inclusion (2) Mental arithmetic
(3) Learning early numbers (4) Number acquisition
(5) Place counting

8. Which of the following statements is/are most appropriate for the idea of cognitive conflict in teaching mathematics?

(A) Thoughtful efforts of a teacher to expose children to cognitive conflict can enhance their mathematical understanding.
(B) It is not useful for promoting mathematical understanding in children.
(C) Children get confused so cognitive conflict must be avoided.

Choose the correct option :

(a) (b) and (c) (b) (a) and (c)
(c) Only (a) (d) Only (c)

Ans. (c) : During Mathematics learning, cognitive conflict occurs when students have a preconceived idea about how a mathematical problem should be solved which differs from the way it is being solved.

Thoughtful efforts of a teacher to expose children to cognitive conflict can exhance their mathematical understanding is most appropriate for the idea of cognitive conflict in teaching mathematics.

9. Which aspect of evaluation is used when a teacher ensures that test made by her fulfils the objectives and criteria of that test?

(a) Validity (b) Practicality
(c) Reliability (d) Consistency

Ans. (a) : Validity of evaluation is used when a teacher enswers that test made by her fulfils the objectives and criteria of that test. Validity is the accuracy with which a method measures what it is intended to measure is referred to as its validity. Thus validity aspect is used when a teacher ensures that the learner completes an exercise of mathematics.

10. What should be subtracted from the sum of 9909, 9099 and 9009 to obtain 25454?

(a) 2356 (b) 2365
(c) 2536 (d) 2563

Ans. (d) : Sum = 9909 + 9099 + 9009
= 28017
The number to be subtracted to get 25454
= 28017 – 25454
= 2563

11. Which of the following statements is correct?

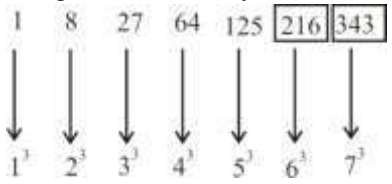
(a) 1 is a prime number
(b) 1 is a composite number
(c) 1 is both, a prime and a composite number
(d) 1 is neither prime nor a composite number

Ans. (d) : 1 is Neither prime nor a compasite Number.

12. See the number pattern given below :
1, 8, 27, 64, 125, _____, _____
What will be the next two terms?

(a) 256 and 289 (b) 216 and 289
(c) 256 and 343 (d) 216 and 343

Ans. (d) : The given series is as yellows-



Hence the next two terms will be 216 and 343.

13. Which of the following statement is least appropriate for encouraging mathematical learning?

(a) Failure does not imply that students cannot do mathematics.
(b) Everyone can learn mathematics.
(c) Mathematics learning is not gender specific.
(d) Discourage intuition as it hampers the development of mathematical ideas.

Ans. (d) : Discourage intuition as it hampers the development of mathematical ideas is least appropriate for encouraging mathematical learning.

There are some following points to encourage mathematical communication in the classroom.
* Enhancing mathematical understanding.
* Making learners able to assimilate mathematical terms.
* Developing the ability to recognize the patterns of mathematical thought.

Enabling learners to express mathematical thoughts and ideas.

14. The value of 25.3 × 5 - 35 ÷ 5 - 3 × 18.5 is :

(a) 283.05 (b) 64.0
(c) 95.0 (d) -26.5

Ans. (b) :
25.3×5 – 35 ÷ 5 – 3 × 18.5
= 126.5 – 7 – 55.5
= 64

15. According to National Education Policy (NEP) 2020, assessment of learners include :

(a) Cognitive and physical domains
(b) Cognitive, affective and psychomotor domains.
(c) Cognitive, social and spiritual domains.
(d) Physical and psychological domains.

Ans. (b) : According to the National Education Policy 2020 learners assessment include cognitive, affective and psychomotor domain.
According to the National Education Policy 2020.
1. It emphasizes on overall development of students.
2. Emphasizes conceptual understanding instead of rote learning.
3. Promotes self-assessment and peer assessment.

16. A frog jumps 3 steps and a rabbit jumps 7 steps at a time starting from a place O. At which of the following steps, they both will be jumping together?

(a) 343 (b) 371
(c) 378 (d) 354

Ans. (c) : Frog jumpes = 3 steps
Rabbit jumps = 7 steps
LCM = 3 × 7 = 21
378 which is divisible by 21.
Hence both of them will jump together at the 378 step.

17. The number of degrees in $2\frac{2}{3}$ right angles is :

(a) 210 (b) 285
(c) 240 (d) 330

Ans. (c) : The number of degrees in $2\frac{2}{3}$ eight angles.

$= \frac{8}{3} \times 90^{o} = 8 \times 30^{o} = 240^{o}$

18. Which one of the following costs least?

(a) 75 packets of ₹750 each
(b) 750 packets of ₹7.50 each
(c) 7.5 dozen items of ₹750 each item.
(d) 75 dozen items of ₹7.50 each item.

Ans. (b): From option (a)-
cost = 750 ×75 = 56250
from option (b),
cost = 7.50 ×750 = 5625
from option (c)
cost = 750 × 7.5 ×12 = 67500
from option (d)
cost = 7.50 × 75 × 12
= 6750
Hence option (b) has the least cost.

19. National Education Policy (NEP) - 2020 talks about "Knowledge of India". Which of the following are not included in it?

(a) Knowledge from ancient India and its contributions to modern India.
(b) Tribal knowledge, indigenous and traditional ways of learning as part of various subjects like Mathematics, Astronomy, Medicine, Agriculture etc.
(c) Field visits to different states as part of cultural exchange programmers.
(d) Formal examination to assess the knowledge gained by the students.

Ans. (d) : Formal examinations to assess the growth in knowledge of students are not included in the NEP 2020, while the knowledge of ancient India and its contribution towards modern India is included in the learning of tribal knowledge as a part of various subjects like mathematics, astronomy, medicine, agriculture etc. Visiting various states as part of indigenous and traditional methods exchange programs are included in NEP 2020.

20. Which of the following model is least appropriate to develop the conceptual understanding regarding the relationships of ones, tens and hundreds in early grade learners?

(a) Dienes blocks (b) Money
(c) Abacus (d) Place value chart

Ans. (d) : The place value chart model is least suitable for developing conceptual understanding of the relationship between units, tens and hundreds in early grade learners. One of the many materials used in teaching mathematics to young children is units, tens and hundreds and deans blocks, currency and counting models are suitable for developing conceptual understanding about the relationship of hundreds.

21. Brij had a wire of length 100 metres to cover the land of his choice. He wanted to take the bigtgest land. Which of the following measurements should he choose to take the biggest area?

(a) 15 m × 35 m (b) 30 m × 20 m
(c) 25 m × 25 m (d) 5 m × 45 m

Ans. (c) : Length of wire to cover the land = 100 meter
If the fence is square,
4 × side = 100
side = 25
Area of land = 25m × 25m

22. Which of the following is not true about 'multiplicity of approaches' in teaching mathematics?

(a) Very often, there are many ways of solving a problem.
(b) It hampers the learning of child as it leads to confusion.
(c) Offering such a choice allows children to explore and use the approach that is most natural and easy for them.
(d) It is crucial for liberating school mathematics from the tyranny of the one correct answer.

Ans. (b) : The following statements are true for different types of methods in teaching mathematics :
1. It often happens that there are many way to solve a problem.
2. It enhances childrens learning as it does not to confusions.
3. Have the opportunity to explore and use approaches that are natural and easy for them.
4. To break free from the tradition of there being only one right answer.
5. This develops children's understanding.

23. Which of the following statement is most appropriate?

(a) Mathematics lab is essential as it provides opportunities for hands on activities for students.
(b) Charts are used in mathematics class as an effective teaching-learning material.
(c) Use of teaching-learning material in mathematics class consume students' time for practice.
(d) Students do not enjoy riddles in mathematics class.

Ans. (a) : Mathematics labs are necessary because the provde opportunities for hands-on activities to the students. The statements are most appropriate. Activity based learning : processes like making observations, collecting data, classifying, analyzing, formulating hypothesis, interpreting and reaching conclusion to establish objective truth are suitable for teaching and learning mathematics.

24. How many packets of $\frac{1}{12}$ kg salt can be made from $7\frac{1}{2}$ kg of salt?

(a) 45 (b) 60
(c) 72 (d) 90

Ans. (d) : Total salt $= 7\frac{1}{2}\text{kg} = \frac{15}{2}\text{kg}$

1 packet salt $= \frac{1}{12}\text{kg}$

$$\text{Number of packets} = \frac{\text{Total salt}}{\text{One packet salt}}$$

$$= \frac{15}{2} \times \frac{12}{1} = 90$$

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25. While solving $\begin{array}{r} 67 \\ -\underline{} \\ \underline{} \end{array}$ in class II, a teacher explained that we have to subtract 7 from 2 and 2 is smaller than 7. So we will borrow one from 8 and then we can subtract 7 from 12. One student told teacher: Man! why we are borrowing from eight, as borrowing is not good. What a teacher should do in such as situation?

(a) Teacher should scold the student and make him sit.
(b) Teacher should change the word 'borrowing' to 'regrouping' and then show the process of regrouping.
(c) Teacher should tell the student to focus on learning the algorithm of subtraction
(d) Teacher should ignore the student's question and continue with her work.

Ans. (b) : In the above situation the teacher should replace the word 'borrow' with 'regrouping' and show the process of regrouping.
Regrouping - Regrouping is known as carryover. Regrouping is a method of addition and subtraction that combines numbers in to group of tens. This makes solving problems more understandable and easir for young children.

26. Yamina threw a die 10 times and got the following results :
5, 3, 6, 6, 1, 4, 5, 3, 3, 2
Which of the following numbers she got the maximum number of times?
(a) 6 (b) 3
(c) 1 (d) 5

Ans. (b) : Result = 5, 3, 6, 6, 1, 4, 5, 3, 3, 2
The number, she get the maximum number of times = 3

27. Which of the following is true for word problems in school mathematics?
(a) Word problems refer to exercies where the child formalises the situation into a form where a specific mathematical technique can be applied.
(b) Word problems are not examples of mathematical modelling.
(c) Word problems are important in secondary classes only.
(d) Word problems focus more on procedural knowldege in mathematics.

Ans. (a) : Statement with reference to word problems in school mathematics, word problems refer to those exercises where the child gives a formal form to the situation in which mathematical. The technology can be implemented correctly. Word questions are verbal descriptions of a problem situation in which one or more questions are abet, the answers to which can be obtained using mathematical operations using numerical data information available in the text.

28. The parcel sending rates are given below :
Parcel weighing (50 grams or less) : ₹15.00 parcel weighing (for every additional 50 grams) : ₹7.00 Meena wants to sent a parcel to her friend Charu in Delhi. The parcel weighs 350 g. Look at the charges and select the correct cost of sending the parcel :
(a) ₹42 (b) ₹50
(c) ₹55 (d) ₹57

Ans. (d) : Weight of parcel (50 grames or less) = ₹15
For additional 50 grames = ₹ 7
Amount for 350 gm parcel
= 50 + 300
= (50 × 50 ×6) ग्राम
= (15 + 7 ×6)
= ₹57

29. Which of the following is most appropriate to introduce 'Data Handling' at primary stage?
(a) Asking the students to read time tables of bus and train timings.
(b) Within classroom, collecting statistics of students' height; favourite food; colour; cartoon etc. and asking questions related to data.
(c) Showing population census of a city for five years and asking students to compare population growth.
(d) Drawing a bar graph on the blackboard and asking students to read the data from it.

Ans. (b) : To introduce 'data management' at the primary level, it is most appropriate to collect data in the class on the height of the students, their favorite food, colours. Cartoons etc and ask questions based on the data. Some specific questions related to data are addressed in data management. It involves presenting a systematic collection of data and interpreting it with a view to find the answer.

30. According to National Curriculum Framework, 2005, which of the following processes are least relevant in a primary mathematics classroom?
(a) Memorising formulae
(b) Use of patterns
(c) Visualization
(d) Making connections and representations

Ans. (a) : According to the National curriculum frame work 2005, the process of memorizing formulas is the least relevant in a primary mathematics class.
According to the National curriculum frame work 2005 the following processes are relevant in a primary mathematics classroom -
1. Using patterns
2. Visualization
3. Establishing and formulating relationships.
4. Teaching through tangible objects and visual process.
5. Mathematics should be made relevant with the help of examples from daily life.

Central Teacher Eligibility Test (CTET) 2023
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 20.08.2023)

MATHEMATICS

1. Which one of the following groups have all 3-dimensional shapes?
(a) Cube, Cuboid, Sphere, Cylinder
(b) Cube, Cuboid, Semi-circle, Cone
(c) Cube, Cuboid, Circle, Cone
(d) Cube, Cuboid, Circle, Triangle

Ans. (a) : Cube, Cuboid, Sphere and Cylinder are all three dimensional figure, whereas Semi Circle, Cone, Triangle, these are two dimensional figure.

2. Which of the following statements is not true?
(a) A parallelogram becomes a rectangle if all its angles are equal
(b) A kite becomes a rectangle if its opposite angles are equal
(c) A rectangle becomes a square if all its sides are equal
(d) A rhombus becomes a square if all its angles are equal

Ans. (b) : We know that if all the angle of a parallellogram are equal then it becomes a rectangle. If all the side of ractangles are equal then it becomes a square.
If all the angles of a rhombus are equal, then it becomes a square. but is the opposite angle of kite are equal, then it does not become a rectangle. hence statement (b) is not correct.

3. Read the following table:

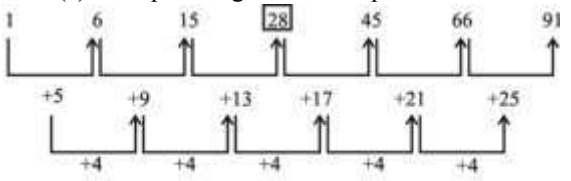
Blood Group		Number of students
A	-	9
B	-	6
O	-	12
AB	-	3
Total	-	30

What is the ratio of the most common and rarest blood groups?
(a) 3:1 (b) 1:4
(c) 1:3 (d) 4:1

Ans. (d) : Most common blood group (O) = 12
Most rarest blood group (AB) = 3
Hence required ratio = $\frac{\cancel{12}}{\cancel{3}}$
= 4:1

4. What is the missing number in the pattern given below?
1, 6, 15, _____, 45, 66, 91
(a) 25 (b) 36
(c) 28 (d) 32

Ans. (c): The pattern given in the question is as follows-



Hence, '28' will be the required answer.

5. Ammini is arranging 36 identical squares in the form of different rectangles. How many different types of rectangles can she make these there squares?
(a) Six (b) Eight
(c) Four (d) Five

Ans. (d) : Total number of identical squares = 36
hence the rectangles that can be made will be as follow.
1 × 36, 2 × 18, 3 ×12, 4 × 9, 6 × 6
hence it is clear that different type of five rectangles can be made.

6. A whole number is added to 100 and the same number is subtracted from 100. The sum of the two resulting numbers so obtained is:
(a) 100 (b) 200
(c) 0 (d) 50

Ans. (b) : Let the whole number be 'x'
Required sum
= (100 + x) + (100 – x)
= 100 + x + 100 – x
= 200

7. The sum of 5 – 5 + 5 – 5 + 5 – 5 ....., to odd number of terms is :
(a) 5 (b) 15
(c) 0 (d) –5

Ans. (a) : As per question, let the number of terms is 9 (odd)
5 – 5 + 5 – 5 + 5 – 5 + 5 – 5 + 5
= 5 – 5 + 5 – 5 + 5 – 5 + 5 – 5 + 5
= 5

8. Which of the following arrangements represents a descending order of numbers?
(a) 10.5, 1.50, 1.05, 1.055, 1.005, 0.155
(b) 10.5, 1.50, 1.055, 1.05, 1.055, 0.155
(c) 1.05, 1.005, 1.50, 1.055, 10.5, 0.155
(d) 10.5, 1.05, 1.055, 1.50, 1.005, 0.155

Ans. (b) : 10.5 > 1.50 > 1.055 > 1.05 > 1.055 > 0.155
Hence, option (b) respresents decending order of the numbers.

9. Which of the following is not a factor of 3630?

(a) 9 (b) 11
(c) 3 (d) 5

Ans. (a) :

2	3630
3	1815
5	605
11	121
11	11
	1

Factors of 3630 = 2 × 3 × 5 × 11 × 11
hence it is clear from the above that option (a), '9' is not a factor of 3630.

10. 'One hundred lakh' is also known as:

(a) One million (b) One billion
(c) Ten crore (d) One crore

Ans. (d) : One hundred lakh = 10000000
hence, one hundred lakh is also known as one crore.

11. Priyadarshini mixed 4.8kg of almonds, 2500 g of raisin and 3.5 kg of cashews and packed the mixture equally into three dozen packets. What is the weight of each packet?

(a) 500g (b) 650g
(c) 250g (d) 300g

Ans. (d) : Weight of almonds 4.8 kg = 4800g
Weight of raisin = 2500g
Weight of cashews = 3.5kg = 3500g
Weight of mixture obtained by mixing all three
= 4800g + 2500g + 3500g
= 10800 g
number of packets = 3 × 12 = 36
hence weight of each packet = $\frac{10800}{36}$
= 300g

12. The side of a square is 5cm. How many times will the new area become, if the side of the square is doubled?

(a) 4 times (b) 8 times
(c) 2 times (d) 3 times

Ans. (a) : given that-
side of square = 5 cm
Then area of square = (side)2
$= (5)^2$
$= 25\ cm^2$
According to question, The side of square is doubled
then, New side = 5 × 2 = 10 cm
Area of new square $= (10)^2$
$= 100\ cm^2$
$\frac{\text{area of new square}}{\text{area of old square}} = \frac{100}{25} = 4$
hence new area will increase by 4 times.

13. Select the group of fractions in an ascending order:

(a) $\frac{1}{3} < \frac{1}{4} < \frac{1}{2}$ (b) $\frac{1}{4} < \frac{1}{3} < \frac{1}{2}$
(c) $\frac{1}{2} < \frac{1}{4} < \frac{1}{3}$ (d) $\frac{1}{2} < \frac{1}{3} < \frac{1}{4}$

Ans. (b): $\frac{1}{3} = 0.34$

$\frac{1}{2} = 0.5$

$\frac{1}{4} = 0.25$

the increasing order of fractions will be as follows-

$\frac{1}{4} < \frac{1}{3} < \frac{1}{2}$

14. Sangeeta wants to buy a soap that costs ₹10. She has a five-rupee coin, 2 one-rupee coins and 5 fifty-paise coins. How much more money does she need to buy the soap?

(a) ₹2.00 (b) ₹2.50
(c) ₹0.50 (d) ₹1.50

Ans. (c) : Cost price of soap = ₹10
Total amount of money available with Sangeeta
= 5 + 2 × 1 + 5 × 0.50
= 5 + 2 + 2.5
= 7 + 2.5
= ₹ 9.5
Hence, amount required to buy soap = 10 – 9.5
= ₹ 0.50

15. Rubina started her journey by car at 16:50 hours and finished at 24:15 hours on the same day. The time taken in completing the journey is:

(a) 3 hours 35 minutes
(b) 4 hours 35 minutes
(c) 3 hours 25 minutes
(d) 4 hours 25 minutes

Ans. (d) : The time to start journey = 16 : 50
The time to end the journey = 21: 15
Time taken to complete the journey
= 16:50 ~ 21: 15
= 4 : 25
or 4 hours 25 minutes

16. To develop appreciation for mathematics among children, a teacher performs the following activities in the class. Choose the one which is not effective to achieve her objective.

(a) She establishes a mathematics corner in her class where-students can perform various mathematical activities
(b) She always praises the student who achieves highest marks in the class in the term-end examination
(c) She shows to children the videos on Indian mathematicians and their contributions
(d) She gives mathematical puzzles and magic squares to be solved in the class

Ans. (b) : Math is one of those subjects that students seem to love or hate. To develop appreciation for mathematics among children, a teacher performs the following activities in the class. She should not always praise the student who achieves highest marks in the class in the term- end examination, because it is not effective to achieve her objective.

17. Which of the following statements about nature of mathematics are most appropriate?

(A) It helps the child to be creative
(B) It helps in nurturing the child's imagination
(C) It is based on deductive reasoning
(D) It is always convergent

Choose the correct option :

(a) A and B (b) A, B and C
(c) B and C (d) A and C

Ans. (b) : The study of patterns, numbers, geometrical objects, data and chance is known as mathematics. Mathematics deals with the quantitative facts and relationships as well as with problems involving space and form. Following statements about nature of mathematics are most appropriate.

- It helps the child to be creative.
- It helps in nurturing the child's imagination.
- It is based on deductive reasoning.

18. Who among the following has worked in the field of mathematical astronomy?

(a) Mahavira (b) Aryabhatta
(c) Bhaskara I (d) Ramanujan

Ans. (c) : Bhaskar-I has worked in the field of mathematical system as well as astronomy. He worked on the decimal system also made important contributions to the study of astronomy, including the calculation of the length of a year.

19. Which of the following depicts a situation where children are constructing knowledge on their own?

(a) Teacher has written incomplete multiplication tables on blackboard and children are completing the tables by writing them on blackboard
(b) The best student in class reads aloud the multiplication tables and rest of the students repeat after him/her
(c) Children are reciting multiplication tables in a chorus
(d) Children are given manipulative like number grids, tokens arranged in rectangular arrays and they are exploring multiplication patterns using them

Ans. (d) : Constructivism is the theory that says learners construct knowledge rather than just passively take in information. A situation where children are constructing knowledge on their own depicts that children are given manipulatives like number grids, tokens arranged in rectangular arrays and they are exploring multiplication patterns using them.

20. A vegetable seller was selling spinach for ₹ 60 per kg. Sonu purchased 350g of spinach for which the vegetable seller took ₹21 (₹6+₹6+₹6+₹3) from Sonu. Which of the following statements is/are true regarding the mathematical skills used by the vegetable seller?

(A) This mathematical skill is ambiguous
(B) The skill is not useful to solve mathematical problems in class
(C) Such skills help indeveloping alternate strategies for solving mathematical problems

Chosse the correct option :

(a) Only C (b) A and B
(c) Only A (d) Only B

Ans. (a) : A vegetable seller was selling spinach for ₹60 per kg. Sonu purchased 350 gm of spinach for which the vegetable seller took ₹21 (₹6 + ₹6 + ₹6 + ₹3) from Sonu. Such skills help in developing alternate strategies for solving mathematical problems is true regarding the mathematical skills used by the vegetable seller. Problem-solving in mathematics helps students to experience on how to solve daily life problems by applying their mathematical knowledge and skill.

21. Which of the following statements is not correct?

(a) Errors of the students should be overlooked as pointing errors will demotivate them
(b) Errors of the students given information about their thought process
(c) Errors in mathematics are part of learning
(d) Errors in mathematics help teachers in planning their lessons

Ans. (a) : Errors in students' work, including their mathematical work, can provide valuable insights into their thought processes and understanding.

- Addressing errors is an essential part of the learning process. Ignoring errors could hinder the student's learning and growth, as they might continue to repeat the same mistakes without realizing them.
- Thus, it is concluded that errors of the students should be overlooked as pointing errors will demotivate them statement is not correct.

22. Which of the following statements is not correct about assessment?

(a) Norm-referenced assessment tells us where a student stands as compared to other students in his/her performance
(b) Norm-referenced assessment is useful in diagnostic testing and remedial teaching
(c) Criterion-referenced assessment is to evaluate the mastery learning of the students
(d) Criterion-referenced assessment is useful in diagnostic testing and remedial teaching

Ans. (b) : Norm- referenced assessment is used to compare one student's performance to others in a predetermined peer group.

- It is determined by comparing scores against the performance results of are selected peer group of the same age or grade level.
- It is useful for comparing individuals in terms of their relative position.

Hence, we conclude that the statement that is not correct is that norm-referenced assessment is useful in diagnostic testing and remedial teaching as it involves comparing the position of two students.

23. Concepts like more-less, long-short, far-near, big-small, etc. are:

(a) Important pre-number concepts
(b) Vague terms for comparison
(c) Antonyms, not necessary for learning mathematics
(d) Simply English language adjectives

Ans. (a): Children learn to compare at a very young age. Work on pre-number concepts big and small, hot and cold, heavy or light, thick or thin, etc. to make it easy for them to compare. Start by pre-number concept big and small and later enhance the activity to more and less, tall and short by keeping minor differences.

24. Mathematical learning material:

(A) Helps teachers in demonstrating the formulae
(B) Helps students in self-learining
(C) Helps teachers in providing instructions
(D) Develops learning environment in the class

(a) B and C (b) C and D
(c) A and B (d) B and D

Ans. (d) : Teaching Learning Materials (TLMs) are tools, which are used by teachers to help learners to learn concepts with ease and efficiency. Teachers use TLMs to illustrate or rainforce a skill, fact or idea.
Mathematical learning material :
- helps students in self-learning
- develops learning environment in the class.

Hence, option (d) will be correct.

25. Which of the following is the most appropriate way to help a primary school learner visualize the equivalence between the fractions 2/3 and 4/6?

(a) Using Calculators
(b) Using Division method
(c) Using LCM (Least Common Multiple method)
(d) Using Fraction Discs

Ans. (d) : Using fraction discs is the most appropriate way to help a primary school learner visualize the equivalence between the fractions $\frac{2}{3}$ and $\frac{4}{6}$. With fraction discs your students can explore equivalences by finding a piece that represents $\frac{1}{2}$ and then finding 2 pieces that represent $\frac{1}{4}$. This helps them see that $\frac{1}{4}$ and $\frac{2}{4}$ are euivalent. Once they understand that initial concept, they can find additional pieces that are equivalent to $\frac{1}{2}$.

26. A teacher uses role play method in mathematics class. Her aim is:

(a) Maintaining discipline
(b) Keeping children busy
(c) Projecting children busy
(d) Entertaining children

Ans. (c) : As role play can help teachers to gain a more in-depth idea of a child's knowledge of mathematical concepts. As example of this could be creating a shop to check children's understanding of classroom environment and change it into a creative learning space. Hence, we can say that a teacher uses role play method in mathematics class. Her aim is projecting ideas.

27. Subitizing plays an important role in developing the number sense. Which of the following is an example of a student demonstrating the skill of subitizing?

(a) Student recognizes the number 5 as the successor of 4
(b) Student recognizes the number 6 as 1 added to 5
(c) Student rolls a die and is able to say it is four without actually counting the dots
(d) Student recognizes the number 4 as the number with 1 taken away from 5

Ans. (c) : Subitizing plays an important role in developing the number sense. Subitizing is the ability to instantly recognize the number of objects without actually counting them. Students rolls a dice and is able to say it is four without actually counting the dots is an example of a student demostrating the skill of subitizing.

28. According to the National Curriculum Framework, 2005, Classroom researches have indicated a fairly systematic devaluation of girls as incapable of mastering mathematics even when they perform well in mathematics. What is the most appropriate reason for this?

(a) The mathematical abilities in boys are innate
(b) Poor performance of girls in mathematics is due to the fear of mathematics prevalent in them
(c) Mathematics, by its nature, is a male-dominated subject.
(d) Gendered constructs of society have led to the belief that boys use more innovative strategies for problem-sowing and thus have better conceptual understanding.

Ans. (d) : According to the National Curriculum Framework, 2005 classroom researches have indicated a fairly systematic devaluation of girls as incapable of mastering mathematics even when they perform well in mathematics. Gendered constructs of society have led to the belief that boys use more innovative strategies for problem-solving and thus have better conceptual understanding is the most appropriate reason for this.

29. Classroom researches have shown that most of the students find mathematics more difficult than the other subject they study in the same class. Which of the following aspects of the nature of mathematics adds to this fear?

(a) The abstract nature of primary concepts in mathematics
(b) The vast knowledge base of mathematics
(c) The scope multiple answers to a given question in mathematics
(d) The scope of a number of different methods to solve a problem in mathematics

Ans. (a) : The teaching of mathematics proceeds from the concrete to abstract concepts of mathematics. Classroom researches have shown that most of the students find mathematics more difficult than the other subjects they study in the same class. The abstract nature of primary concepts in mathematics aspects of the nature of mathematics adds to this fear.

30. According to the National Education Policy (NEP) 2020, olympiads and competitions in various subjects will be____ across the country.

(a) Reduced (b) Made easier
(c) Strengthened (d) Discouraged

Ans. (c) : According to the National Education Policy (NEP) 2020, Olympiads and competitions in various subjects will be strengthened across the country, with clear coordination and progression from school to local to state to national levels, with the necessary funding to ensure that all students may participate at all levels for which they qualify.

Central Teacher Eligibility Test (CTET) 2021
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 01.01.2022)

1. In a school there are 96 teacher, out of which $\frac{3}{8}^{th}$ teaches High school classes. If $\frac{2}{9}^{th}$ of the High school teachers are Mathematics teachers, then the number of High school teachers who don't teach Mathematics are :

(a) 36 (b) 30

(c) 28 (d) 60

Ans. (c): Total number of teacher = 96

Number of teacher who teaches High school classes

$$= \frac{3}{8} \times 96$$

$$= 36$$

Number of teacher who teaches mathematics in High school classes $= \frac{2}{9} \times 36$

$$= 8$$

Number of teacher who don't teach Mathematics in High school classes $= 36 - 8 = 28$.

2. $\frac{1}{2} - \left(\frac{2}{3} - \frac{4}{5}\right)$ is :

(a) $\frac{13}{20}$ (b) $\frac{3}{10}$

(c) $\frac{39}{30}$ (d) $\frac{19}{30}$

Ans. (d) :

$$\frac{1}{2} - \left(\frac{2}{3} - \frac{4}{5}\right) = \frac{1}{2} - \frac{10-12}{15}$$

$$= \frac{1}{2} - \frac{(-2)}{15}$$

$$= \frac{1}{2} + \frac{2}{15}$$

$$= \frac{15+4}{30}$$

$$= \frac{19}{30}$$

3. What is the difference between the face value of the number 7 in the numbers 4782 and 32170.

(a) 630 (b) 712

(c) 0 (d) 770

Ans. (c) : Face value of 7 in 4782 = 7

Face value of 7 in 32170 = 7

Difference = 7 – 7 = 0

4. Which of the following statements is not true for he set of whole numbers?

(a) $a + b = b + a$

(b) $a - b = b - a$

(c) $a \times b = b \times a$

(d) $(a + b) + c = a + (b + c)$

Ans. (b):
- Commutativity of addition of whole numbers
  $a + b = b + a$
- Associativity of addition of whole numbers
  $(a + b) + c = a + (b + c)$
- Commutativity of multiplication of whole numbers
  $a \times b = b \times a$
- $a - b \neq b - a$

5. When asked to divide a number by 6, Rani has divided it by 9 and she got the quotient as 21 and remainder as 3. Realizing her mistake, later she divided it by 6. What will be the quotient and remainder?

(a) Quotient - 31, Remainder

(b) Quotient - 31, Remainder

(c) Quotient - 32, Remainder

(d) Quotient - 32, Remainder

Ans. (d) :

Dividend = Divisor × Quotient + Remainder

Given

$$\text{Dividend} = 9 \times 21 + 3$$

$$= 192$$

Now,

$$\frac{192}{6} = 32$$

Quotient = 32, Remainder = 0

6. Which of the following is a pair of 'like fraction'?

(a) $\frac{2}{3}$ and $\frac{3}{2}$ (b) $\frac{1}{2}$ and $\frac{3}{8}$

(c) $\frac{3}{4}$ and $\frac{3}{7}$ (d) $\frac{1}{4}$ and $\frac{3}{4}$

Ans. (d) : Like fractions are the group of two or more fractions having the same denominator. In these fractions, the whole is divided into a fixed number of equal portions.

For example : $\frac{1}{4}$ and $\frac{3}{4}$ are like fractions. Here, we have divided the whole into 4 equal parts.

7. Which of the following are not perfect cubes?

(a) 729 (b) 1000

(c) 333 (d) 216

Ans. (c) :

$9^3 = 729$

$10^3 = 1000$

$7^3 = 343$

$6^3 = 216$

333 is not perfect cubes.

8. Shikha went to a brick kiln to buy bricks. The rate of the bricks was 2500 rupees per one thousand bricks. How many bricks can she buy if she has only 4000 rupees?

(a) 10000 (b) 1600

(c) 16000 (d) 4000

Ans. (b) : Given that

Price of 1000 bricks = 2500 Rs.

So, price of 1 bricks = $\frac{2500}{1000}$ Rs.

So, Sikha buy bricks from 4000 Rs. = $\frac{1000 \times 4000}{2500}$

= 1600 bricks

9. Mini told her teacher 'I made a rectangle whose each side is 4 cm'. Which of the following statements is correct :

(a) A rectangle cannot have all sides equal

(b) All squares are rectangle

(c) All rectangles are square

(d) There is no link between a square and a rectangle.

Ans. (b) :

Property		Rectangle	Square
Sides	All sides are equal	✗	✓
	Opposite sides are equal	✓	✓
	Opposite sides are parallel	✓	✓
Angles	All angles are equal	✓	✓
	Opposite angles are equal	✓	✓
	Sum of two adjacent angles is 180	✓	✓
Diagonals	Bisect each other	✓	✓
	Bisect perpendicularly	✗	✓

From the comparison drawn above for the common properties shared between a square and a rectangle, we observe that square has all the properties that defined a rectangle, which makes them alike in a certain manner.

10. The angle of triangle are in the ratio 4 : 5 : 6. What will be the measure of the angles of the triangle

(a) 50º, 60º, 70º (b) 45º, 60º, 75º

(c) 48º, 60º, 72º (d) 52º, 60º, 68º

Ans. (c): Let angle of the triangle is = 4x, 5x, 6x

As we know,

Summation of the angle in triangle 180º

$4x + 5x + 6x = 180º$

$15x = 180º$

$x = 12$

So, angles are

$4 \times 12, 5 \times 12, 6 \times 12$

48º, 60º, 72º

11. Ragini reaches the station at 2:00 in the afternoon. She has to take a train to Aligarh. There are four trains. Train A, Train B, Train C, Train D scheduled for departure at 17 : 05, 4 : 32, 18 : 30 an 19 : 15 respectively. Which train must she take so that she spends minimum amount of time waiting for the train?

(a) Train A (b) Train B

(c) Train C (d) Train D

Ans. (a) : 2:00 can be written as 14:00.

Train	Time	Difference (14–Train Time)
A	17:05	3.05 hr.
B	04:32	9.28 hr.
C	18:30	4.30 hr.
D	19:05	5.05 hr.

She has to take train A so that she spends minimum amount of time waiting for the train.

12. Rita is a ward-member of her area; she wishes to create a community room of size 11 feet × 16 feet. to lay tiles on the floor she has four option : 1.5 feet × 1.5 feet, 2 feet × 2 feet, 2.5 feet × 2.5 feet, 3 feet × 3 feet.

Which size of tile should she buy for the community room, so that she can lay the tiles without cutting?

(a) 1.5 feet × 1.5 feet (b) 2 feet × 2 feet

(c) 2.5 feet × 2.5 feet (d) 3 feet × 3 feet

Ans. (*) : Question is wrong.

13. Ms Renu divided her students into groups of 8 each and asked them to record their weight. She further asked the groups to calculate the mean weight of their respective group. Group A (which consist of 8 students) measured their weights and calculated the mean weights as 38.2 kg. Later on they realized that the weight of one of the student they recorded is incorrect. Instead of 25.9 kg, they recorded it as 29.5 kg. What will be the correct mean for the group?

(a) 37.75 kg (b) 38.65 kg
(c) 37.2 kg (d) 38.9 kg

Ans. (a) : Let us assume that weight of student is, $x_1, x_2, x_3, x_4, x_5, x_6, x_7$ and x_8

Initially, $x_8 = 29.9$ kg

Given

$$\bar{x} = \frac{x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8}{8}$$

$\bar{x} = 38.2$,

$38.2 \times 8 = (x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + 29.5)$

$305.6 - 29.5 = (x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7)$

$276.1 = x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7$

But Renu correct her mistake and change the value of x_8.

$x_8 = 25.9$ kg

Corrected mean

$$\bar{x} = \frac{x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8}{8}$$

$$= \frac{276.1 + 25.9}{8}$$

$$\boxed{\bar{x} = 37.75 \text{ kg}}$$

14. Observe the following pattern and select the next term :

$(9 - 1) \div 8 = 1$

$(98 - 2) \div 8 = 12$

$(987 - 3) \div 8 = 123$

$(9876 - 4) \div 8 = 1234$]

_____ = _____

Option :

(a) $(98765 - 5) \div 8 = 123456$

(b) $(9876 - 4) \div 8 = 12345$

(c) $(98765 - 4) \div 8 = 12345$

(d) $(98765 - 5) \div 8 = 12345$

Ans. (d) : The next term of the pattern will be,

$(98765 - 5) \div 8 = 12345$.

15. Priyanshu has currency notes of ₹ 10 and ₹ 20. She use 2 notes of ₹ 20 and 1 note of ₹ 10 to form ₹ 50. How many other combinations are possible to form the same amount using both the currency notes? You can ignore the spatial arrangements of the currency notes.

(a) 0 (b) 1
(c) 2 (d) 6

Ans. (b) : Let us assume that the number of currency notes of ₹ 10 and ₹ 20 is x and y respectively.

$10x + 20y = 50$

The another combination to form the same amount using both currency notes will be,

$x = 3, y = 1$

$10 \times 3 + 20 \times 1 = 50$

16. Following are four questions posed by a mathematics teacher. Which of the following is an open-ended question?

(a) If sum of two numbers is 15 and one of them is 7, what will be the other number

(b) If the age of Anil is 7 years and his father's age is 5 times more than that of Anil's age. What will be the age of father

(c) if sum of two numbers is 17, then what are the number

(d) What should be added to 17 to get 23

Ans. (c) : Option 'C' is open ended question. Open ended math problems are problems that have more than possible answer.

• If the sum of two numbers is 17, then what are the numbers.

Solution : It has several or many correct answers and several ways to correct answers. Therefore this problem is open ended question.

17. A teacher used the following riddle in the class while developing the concept of place value 'I am less than 5 tens and 4 ones'.

The objective of this riddle is to

(a) Do a summative assessment.

(b) Break the monotony of a mathematics class.

(c) Ask close ended questions on place value.

(d) Reinforce the concept of base 10 and place value

Ans. (d) : A teacher uses the following riddle in the class while developing the concepts of place value 'I am less than 5 tens and 5 ones'. The objective of this riddle is to reinforce the concept of base 10 and place value.

18. Which among the following is/are the objective/objectives of teaching 'shapes' at Primary class.

(A) To develop visualization skill

(B) To memorise the names of geometrical shapes

(C) To enhance spatial reasoning ability

Option :

(a) (A) and (B) (b) (A) and (C)
(c) (B) and (C) (d) Only (b)

Ans. (b) : The objectives of teaching 'shapes' at Primary class :

(a) To develop visualization skill.

(c) To enhance spatial reasoning ability.

19. Which of the following teaching-learning resources in mathematics can be used for visually challenged student

(A) Geoboard (B) Geogebra
(C) Abacus (D) Graphic calculator

Option :

(a) (A) and (D) (b) (A) and (C)
(c) (B) and (D) (d) (A), (B) and (D)

Ans. (b) : Taylor's abacus, computer, geoboard can be used as learning resources for visually challenged in a Mathematics classroom, and the other resources like fraction Kit and number chart are used for normal students.

20. Which teaching 'geometrical shapes' a teacher thinks of planning a trip to historical places. It reflects :

(a) Field trips have been recommended by CBSE, so they must be done

(b) A good break from routine mathematics class and an opportunity to visit the historical places.

(c) Shapes are an integral part of any architecture and such trips encourage mathematics beyond classroom.

(d) Teacher has completed most of the syllabus well in time and now needs to provide leisure.

Ans. (c): While teaching 'geometrical shapes' a teacher thinks of planning a trip to historical places. It reflects that shapes are an integral part of any architecture and such trips encourage mathematics beyond classroom.

21. A primary class mathematics teacher poses the following question to his students:

"Reena and Shama went to a shop to buy a bag. There were many bags with different price tags. They got confused by looking at so many price tags. Can you help them by arranging the price tags either in ascending or descending order"?

BAG-A → ₹ 4732

BAG-B → ₹ 2364

BAG-C → ₹ 1934

BAG-D → ₹ 3475

BAG-E → ₹ 2937

BAG-F → ₹ 3004

In the given context, which of the following statements is true?

(a) Only the concepts of ascending and descending order can be strengthened using the question.

(b) The teacher can use the question to go beyond comparison of numbers and introduce the concept of data handling and sorting of data.

(c) It is not a mathematical question as it does not involve basic operations on numbers.

(d) The teacher should avoid bringing contextual question into the classroom.

Ans. (b) : Arranging price tags either in ascending or descending order, the teacher can use the question to go beyond comparison of numbers and introduce the concept of data handling and sorting of data.

22. According to National Curriculum Framework 2005, which of the following represents the vision of a mathematics classroom?

(a) Students memorizing the formulae

(b) Teacher as the only narrator in the class

(c) Students copying solved example from the textbook

(d) Children posing and solving meaningful in the classroom

Ans. (d) : NCF - 2005 has envisioned that the main goal of mathematics education in classroom or schools is one where students engage in meaningful mathematics experiences through the use of concrete materials and manipulative, visuals, technology and other resources.

23. Which of the following statements is true for 'Anecdotal Records' as an assessment tool in mathematics?

(a) It includes the project and field work done by the child

(b) It use to record and judge the quality of a child's work against a specified criteria

(c) It records the presence or absence of a particular skill or process

(d) It includes written description of a child's progress on a day to day basis and provides observational narrative records

Ans. (d) : Anecdotal records are brief notes teachers take as they observe children. The notes document a range of behaviours in areas such as literacy, mathematics, social studies, science, arts, social and emotional development and physical development.

24. A class III teacher introduces the multiplication in her class using repeated addition and rectangular arrays. She is

(a) Introducing multiplication through informal strategies by utilizing the previous knowledge and experiences of students

(b) Teaching multiple formal algorithms of multiplication

(c) Wasting a lot of time and should focus on teaching formal algorithm only.

(d) Finding leisure time for herself by keeping the students engaged.

Ans. (a) : A class teacher introduces the multiplication in her class using repeated addition and rectangular arrays. She is introducing multiplication through informal strategies by utilizing the previous knowledge and experiences of students.

25. A child is counting the number of balls by putting a finger on the balls one by one and saying number names in order. She has counted some balls twice. Which pre number concept is yet to be strengthened in the child?

(a) One-to-one correspondence

(b) Seriation

(c) Classification

(d) Cardinality

Ans. (a) : Seriation is arranging objects in order by size, location or position.

Note : Ordering requires the ability to see differences and compare multiple objects.

One to One correspondence: One to one correspondence is the counting and quantity principle referring to the understanding that each object in a group can be counted once and only once. It is useful in the early stages for children to actually tag or touch each item being counted and move it out of the way as it is counted.

26. Misconceptions in mathematics can be removed by

(a) Engaging children with examples and non-examples

(b) Framing similar questions and repeating them many times

(c) Lot of practice and drill of questions

(d) Demonstrating the algorithm again

Ans. (a) : Misconceptions in mathematics can be removed by Engaging children with examples and non-examples. Math misconceptions are important to deal with in the math classroom because a math misconception can hold a student back from learning more math and excelling in our class.

27. Ms. Romi in her mathematics class asks her students to create appropriate situations for following computations:

(i) 10 + 2 (ii) 10 × 2 (iii) 10 – 2 (iv) 10 ÷ 2

Which of the following statements is correct about the pedagogy used by Ms. Romi?

(a) She is testing the problem solving skills of student by giving mixed set of problems

(b) She is testing the language proficiency of students

(c) She is trying to help students to develop mathematical statements and problem solving skills

(d) She is trying to maintain discipline in her class by giving some task o the students

Ans. (c) : Ms. Romi asks her students mixed set of problems, she is trying to help students to develop mathematical statement and problem solving skills.

28. Which of the following statements are indicative of higher aims of teaching mathematics?

(A) Mathematics education should turn out employable adults who contribute to economic and social development.

(B) Mathematics education should develop child's inner resources like abstract thinking and drawing logical conclusions.

(C) Children should see mathematics as a way of life like communicating, discussing and developing attitude for problem solving

(D) Mathematics education should focus on factual knowledge and procedural fluency

Option :

(a) (A) and (C) (b) (B) and (C)

(c) (C) and (D) (d) (B) and (D)

Ans. (b) : Comprehend, analyze, synthesis, evaluate and make generalizations so as to solve mathematical problem. Collect, organize represent, analysis, interpret data and makes conclusion and predictions from its results apply mathematical knowledge and skills to familiar and unfamiliar situations.

29. According to Newman, there are five levels to be undertaken before a student is able to solve a word problem. They are listed below in a random order.

(A) Comprehend what the task is asking

(B) Must be able to read the question.

(C) Undertake the necessary mathematical demands.

(D) Need to translate the problems into mathematical demands.

(E) Represent the answer as a meaningful construct.

Which of the following represents the correct order of levels?

Option :

(a) (A), (B), (C), (D), (E)

(b) (B), (D), (A), (C), (E)

(c) (A), (B), (E), (C), (D)

(d) (B), (A), (D), (C), (E)

Ans. (d) : The Newman identified that students may have difficulty in

- Reading the words
- Understanding what they have read,
- Transforming what they have read so as to be able to form a course, or
- following through on procedures, or
- encoding the result of a procedure to answer the questions.

30. Which of the following is NOT desirable for the professional development of mathematics teachers?

(a) Attending workshops and seminars on mathematics

(b) Developing teaching-learning resources

(c) Minimum interaction with other mathematics teachers working in same school or in neighbourhood schools.

(d) Participating in faculty development programmes.

Ans. (c) : Minimum interaction with other mathematics teachers working in same school or in neighbourhood schools.

This option, is not desirable for the professional development of mathematics teacher.

Other 3 options are desirable for the professional development of mathematics teacher.

Central Teacher Eligibility Test (CTET) 2021
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 03.01.2022)

1. The table shows the marks obtained of three students before and after studying mathematics in a group.

Name	Marks obtained before studying in group (out of 100)	Marks obtained after studying in group (out of 100)
Mansi	67	79
Harman	54	60
Faisal	63	74

Which is the approximate average marks obtained by all the three students together in each type of study?

(a) 73.2,64.77 (b) 71,61.33
(c) 64.77,73.2 (d) 61.33,71

Ans. (d) : Given that marks obtained before studying in group by mansi, harman &Faisal = 67+54+63
= 184

So, Average of all three = $\frac{184}{3}$

= 61.33

Here, marks obtained after studying in group by mansi, Harman & Faisal = 213

Average of all three = $\frac{213}{3}$ =71

2. Which of the following groups of letters have both horizontal and vertical lines of symmetry?

(a) C,X,T (b) X,H,O
(c) X, Y, Z (d) A, B, C

Ans. (b) : Here, symmetry has a simple meaning :- when any vertical or horizontal line pass through the letter, it should cut into two equal parts.

So Here, according to options, only option (b) will be appropriate, because if you cut X,H,O Horizontally or vertically it will be cut into two equal parts.

3. Rakesh and Sania are discussing with each other. Rakesh says 'The radius is double of the diameter' and Sania says 'It is half of the diameter'.

Which of the following is the correct option?

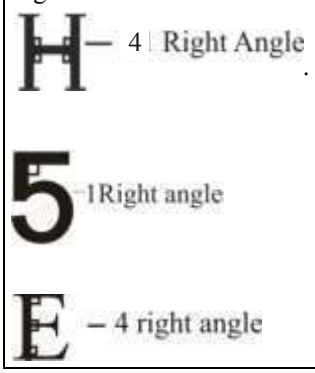
(a) Rakesh is correct and Sania is wrong
(b) Sania is correct and Rakesh is wrong
(c) Both are wrong because radius and diameter are equal
(d) Both are wrong because there is no relationship between radius and diameter

Ans. (b) : According to rule of circle, radius is half of the diameter. So, in this case Sania is right. So option (b) will be correct answer.

4. Areeba finds angles in various English letters and numerical digits. In which of the following groups she will only find right angles?

(a) K, 7, T (b) X, 4, N
(c) H, 5, E (d) M, 3, L

Ans. (c) : According to option if you see only in option c where alphabet and numeric digit are making right angle As.



5. The factors of any numbers are _____ the number.

(a) Equal to or less than
(b) Equal to or greater than
(c) Equal to
(d) Less than

Ans. (a) : The factors of any number are equal to or less than the number.
e.g. Factor of 6 = 1, 2, 3, 6

6. Venu found his birth certificate while cleaning the home on 25th September 2021. He noted that the date of birth in the certificate was written as 5th December 1995. What was Venu's approximate age when he found the certificate?

(a) 24 years 11 months.
(b) 25 years $9\frac{1}{2}$ months

(c) $25\text{ years }3\frac{1}{2}\text{ months}$

(d) 26 years 3 months

Ans. (b) : The date of birth is mentioned on the certificate = 5^{th} dec.1995

Certificate finding date = 25^{th} sep.2021

So from 5^{th} Dec.1995 to 5^{th} Dec.2021 total age will be = 26 years

But birth date month and finding month are different

So, difference between months = 2 months 10 days

So, Age = 26 years – 2 months 10 days

= 25 years 9 months 20 days

So venu's approximate age is 25 years $9\frac{1}{2}$ months.

7. The height of five persons is given below: 163 cm, 161 cm, 156 cm, 159 cm, 162 cm, What is the sum of height in meters?

(a) 7 m 10 cm (b) 8 m 1 cm

(c) 8 m 10 cm (d) 9 m 1 cm

Ans. (b**) :** We already know, 100 cm =1meter

So if we change height from cm to meter.

=1.63 m +1.61 m +1.56 m + 1.59 m +1.62 m

=8.01 m

=8m+1 cm $\Rightarrow$ 8m 1 cm

8. 1729 is called the Ramanujan number because it is the smallest number expressible as the sum of two cubes in two different ways. Which of the following pairs of numbers will give cubes of this numbers?

(a) (1, 12) and (9,8) (b) (1, 12) and (10,9)

(c) (2, 11) and (10,9) (d) (2, 11) and (9,8)

Ans. (b**) :** Given, sum of two cubes in two different ways so in option (b). By adding cubes of the numbers, we will get 1729.

As, (1,12) and (10, 9)

$(1,12) = 1^3 = 1, 12^3 = 1728$

=1+1728

=1729

$= (10,9) = 10^3 = 1000,\ 9^3 = 729$

=1000+729

=1729

9. Three friends receive message on their phones at an interval of 20 minutes, 30 minutes and 45 minutes respectively. They start receiving message together at a particular time. After how much time will they receive message again on their mobile phone altogether?

(a) 1.5 hours (b) 2 hours

(c) 2.5 hours (d) 3 hours

Ans. (d) **:** LCM of time interval of friends. 20,30,45

5	20, 30, 45,
2	4, 6, 9
2	2, 3, 9
3	1 3 9
3	1, 1, 3

LCM =5× 2× 2 ×3 × 3

=180 minutes or 3 hours

So again they will receive after 3 hours.

10. Amongst the following fractions, the largest and the smallest fractions, respectively are

$\frac{3}{4}, \frac{6}{7}, \frac{1}{2}, \frac{2}{3}, \frac{4}{5}, \frac{5}{6},$

(a) $\frac{6}{7}\text{ and }\frac{1}{2}$ (b) $\frac{2}{3}\text{ and }\frac{3}{4}$

(c) $\frac{4}{5}\text{ and }\frac{3}{4}$ (d) $\frac{1}{2}\text{ and }\frac{6}{7}$

Ans. (a) : $\frac{3}{4}, \frac{6}{7}, \frac{1}{2}, \frac{2}{3}, \frac{4}{5}, \frac{5}{6}$

Here we will multiply each fraction with its LCM

So, LCM of – 4, 7, 2, 3, 5, 6

= 420

$\frac{3}{4}\times 420 = 315,\ \frac{6}{7}\times 420 = 360,\ \frac{1}{2}\times 420 = 210$

$\frac{2}{3}\times 420 = 280,\ \frac{4}{5}\times 420 = 336,\ \frac{5}{6}\times 420 = 350$

Now, It will be easy to compare.

315, 360, 210, 280, 336, 350

So, largest and smallest fraction in the following

=360 and 210

$= \frac{6}{7}\text{ and }\frac{1}{2}$

11. Observe the pattern and write the numbers at

$1+3 = 4$

$1+3+5 = 9$

$1+3+5+7 = 16$

$1+3+5+7+9 = 25$

$1+3+5+7+9+11+13+15+17 =$ _____

(a) 36 (b) 64

(c) 81 (d) 100

Ans. (c) : Sum of all the numbers.

$= \underline{1+3+5+7+9} + \underline{11+13+15+17}$

=25+56

=81

12. The rates of various Stationery items are given below:

Stationery items	Price
A packet of pencils	₹22.00
A packet of pen	₹37.50
One eraser	₹3.50
One sharpener	₹4.50
A packet of pastel sheets	₹48.00
One ruler	₹10.00

Harpreet buys one packet of pencil, two packets of pens, three erasers, one sharpener, two packets of pastel sheets and one ruler. How much would he be required to pay?

(a) ₹218.00 (b) ₹236.50
(c) ₹185.00 (d) ₹193.50

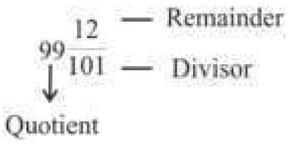
Ans. (a) : Harpreet buys one packet pencil + 2 packets of pens + Three erasers + one sharpener
+ two packets of pastel sheets and one ruler
= 22+ 2×37.5+3 ×3.5+4.5+2× 48+10
=22+75+10.5+4.5+96+10
=₹218

13. What will be the remainder when 10011 is divided by 101?

(a) 9 (b) 11
(c) 12 (d) 13

Ans. (c) : Remainder of 10011 when number is divided by 101

So, = $\frac{10011}{101}$



14. Select the least number which is a perfect square and divisible by each of the numbers 16, 20 and 24

(a) 1600 (b) 3600
(c) 6400 (d) 14400

Ans. (b) : LCM of 16, 20, 24,

4	16, 20, 24
2	4, 5, 6
2	2, 5, 3
	1, 5, 3

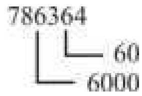
= 4 × 2 × 2 × 3 × 5
= 240

To make number perfect square multiply by 3 and 5 in 240, then, 240 × 3 × 5 = 3600.
The least number which is a perfect square and is divisible by each of the numbers 16, 20 and 24 is 3600.

15. The product of the place values of two sixes in 786364 is

(a) 36 (b) 36000
(c) 360000 (d) 6060

Ans. (c) : Place values of two sixes in



So, product of both the place values = 60 × 6000
= 360000

16. A mathematics teacher posed the following question to her class:
"Take four digits 7,8,4,6, Make the smallest and the largest four-digit number such that no digit is repeated in them.
"After the various responses of the students, she asked the students, "Think about the arrangement of the digits in both the numbers you have formed. Can you say how the largest and the smallest number is formed? Write down your procedure."
Which of the following statements is most appropriate in the above context?

(a) The teacher is saving her time of assessing the students by asking the students to assess their answers themselves.
(b) The teacher is keeping the students engaged to maintain discipline in the class.
(c) The teacher wants to understand the students 'thinking process involved in the answers given by them.
(d) The teacher is confusing the students who have given the correct answer so that they check their answers again.

Ans. (c) : Teacher wants to know the thinking process of students that how different they can think because there is one particular arrangement works. As for largest numbers we write numbers in descending orders and for smallest number we write numbers in ascending orders.

17. Which of the following is NOT used for Formative Assessment?

(a) Student Portfolios
(b) Anecdotal Records
(c) Term-End Examination
(d) Field Trips

Ans. (c) : Formative assessment is a planed, ongoing process used by all students and teachers during learning and teaching to elicit and use evidence of student learing to improve student understanding of intended disciplinary learning outcome and support students to become self-directed learners.
Term end examination is not used for formative assessment.

18. A mathematics teacher posed the following word problem to his students;
"One copy of a newspaper has 12 pages. Everyday 10,500 copies are printed. How many total pages are printed every day?
A student responded that the answer would be between 1,25,000-1,30,000. Which of the following statements is correct in the above context?
(a) The teacher should discourage the student from giving inaccurate answers
(b) Estimation is used in daily life mathematics hence the teacher should appreciate the student's estimation of answer to near accuracy
(c) The teacher should ignore the response of the student and focus on teaching the algorithm of multiplication
(d) Mathematics require exact answers so estimation has no relevance in mathematics

Ans. (b) : In above context the correct statement is – Estimation is used in daily life mathematics hence the teacher should appreciate the student's estimation of answer to near accuracy.

19. According to National Curriculum Framework, NCF (2005), which of the following represents a vision of 'classroom environment for doing mathematics'?
(a) Students working in groups and looking for different stretegies to solve a problem while making connections with real-life situations
(b) Students solving textbook exercises based on example solved by teacher
(c) Teacher reflecting on the process of learning and seeing mistakes as opportunities for learning
(d) Students copying the solution of questions from the backboard.
Choose the coorect option.
(a) (a) and (b) (b) (b) and (d)
(c) (a) and (c) (d) (c) and (d)

Ans. (c) : According to National Curriculum Framework, NCF (2005), the vision of 'classroom environment for doing mathematics' are –
• Students working in groups and looking for different stretegies to solve a problem while making connections with real-life situations.
• Teacher reflecting on the process of learning and seeing mistakes as opportunities for learning.

20. A Primary school mathmatics teacher wants her students to appreciate the use of Data Handling in daily life for organising, representing and interpreting the information. Which of the following would help the teacher to achieve the learning outcome?
(a) Discussing solved examples from the textbooks
(b) Using various railway time-tables, surveys published in newspapers etc.
(c) Explanining various ways of data representation
(d) Teaching them various formal ways of representing the data.

Ans. (b) : Using various railway time-tables, surveys published in newspapers etc help the teacher to teach the use of data handing in daily life for organising, representing and interpreting the information.

21. Which of the following strategies is most appropriate to introduce the concept of fractions in primary classes?
(a) Writing the fraction in the form of p/q where $q \neq 0$ on the blackboard and explaining the symbols
(b) Writing an example of fraction and then marking a point on the number line to represent the fraction
(c) Using paper folding activities with symmetrical cut outs of circles and rectangular strips to represent fractions
(d) Giving two examples of a fraction and asking the students to write ten similar examples of fractions in their notebooks

Ans. (c) : The most appropriate strategy to introduce the concept of fractions in primary classes is using paper folding activities with symmetrical cut outs of circles and rectangular strips to represent fractions.

22. "Mathematics has its own language of words and symbols which is far removed from the everyday speech of the students." Which of the following is most appropriate in the context of given statement?
(a) Teacher should help students memorise the vocabulary and symbols used in mathematics.
(b) Teacher should contextualise the mathematics problems and make mathematics a part of student's life experiences.
(c) Teacher should focus only on solving word problems in mathematics to help students learn the language of mathematics.
(d) Teacher should display the chart of important mathematical symbols and formula in the classroom

Ans. (b) : The most appropriate in the context of given statement is teacher should contextualise the mathematics problems and make mathematics a part of student's life experiences.

23. A class V student is able to classify two-dimensional shapes into categories based on their properties. According to Van-Hieles theory of geometrical development, she is at _____ level of geometrical reasoning.
(a) Analysis (b) Axiomatic
(c) Recognition (d) Deduction

Ans. (a) : According to Van-Hieles theory of geometrical development, she is at analysis level of geometrical reasoning.

24. A primary class mathematics teacher poses the following word problem to his students:
"Samina goes to bed at 10 minutes to 9. Kirti goes to bed 20 minutes later than Samina. What time does Kirti go to bed?"
One of the students gave 20 as the answer. He explains, "It says Kirti goes to bed 20 minutes later, so the answer must be 20."
According to Newman, the answer given by the student is an example of:
(a) Comprehension Error
(b) Reading Error
(c) Process Skill Frror
(d) Careless Error

Ans. (a) : According to Newman, the answer given by the student is an example of Comprehension Error.
• Comprehension error occurs when the students are able to read the questions but fail to understand the wants and needs.

25. National Curriculum Framework (2005) emphasizes that school mathematics must be activity-oriented. This is because:
(a) It helps students to develop skills to earn livelihood.
(b) It motivates students to solve meaningful problems in mathematics.
(c) It provides concrete experiences to understand abstract concepts in mathematics.
(d) It provides recreation time to children in primary classes.
Choose the correct option.
(a) (b) and (c) (b) (a) and (c)
(c) Only (d) (d) (a) and (d)

Ans. (a) : National Curriculum Framework (2005) emphasizes that school mathematics must be activity-oriented. This is because it motivates students to solve meaningful problems in mathematics and it provides concrete experiences to understand abstract concepts in mathematics.
National Curriculum Framework (NCF) 2005 provide a guideline with which teachers and schools can choose and plan experiences that they think children should have. It seek to reform the curriculum and to bring learning experiences in and outside the classroom.

26. Which of the following tool/tools of assessment is/are appropriate for students facing mathematics anxiety?
(a) Norm Referenced Assessments
(b) Cooperative Learning Projects
(c) Summative Assessments
(d) Formative Assessments
Choose the correct option.
(a) (a) and (c) (b) (b) and (d)
(c) Only (c) (d) (b) and (c)

Ans. (b) : Appropriate tool/tools of assessment for students facing mathematics anxiety are –
• **Cooperative Learning Projects –** Cooperative learning is an instructional method in which students work in small groups to accomplish a common learning goal under the guidance of the teacher.
• **Formative Assessments –** Formative assessment is a planed, ongoing process used by all students and teachers during learning and teaching to elicit and use evidence of student learing to improve student understanding of intended disciplinary learning outcome and support students to become self-directed learners.

27. In a mathematics classroom, a student counts on his fingers to solve the problems on addition in following ways:
3+9=4, 5,6,7,8,9,10,11,12
9+3=10, 11,12
Which of the following statements is most appropriate regarding the above process used by the student?
(a) This process should be ignored as it is not algorithmic
(b) The student is unable to use the commutative law of addition in solving problems on addition.
(c) The student should be discouraged to count on fingers as it is not a formal method to solve a problem
(d) It is an appropriate algorithm to solve the questions based on addition.

Ans. (b) : The most appropriate statement regarding the above process used by the student is –
The student is unable to use the commutative law of addition in solving problems on addition.

28. Which one of the following is NOT a problem-solving strategy in mathematics?
(a) Solving Backwards
(b) Graphic representation
(c) Rote-Memorisation
(d) Trial and error

Ans. (c) : Rote-Memorisation is not a problem-solving strategy in mathematics.
Rote memorization requires the use of repetition to keep information in the brain. Two simple example of rote learning include memorizing the alphabet and numbers.

29. A mathematics teacher posed the following question to his students "Write a pair of Integers whose sum gives negative integers." The above question is an example of:-
(a) Open-ended question
(b) Closed-ended question
(c) Recall based question
(d) Multiple choice question

Ans. (a) : The above question is an example of open ended question.
Open-ended question are questions that cannot be answered with a simple 'yes' or 'no' and instead require the respondent to elaborate on their points.

30. Read the following statement:
"In mathematics, from concrete objects we abstract set of Natural Numbers. In this set we include zero and get a set of Whole Numbers. We include negative numbers in this set to get a set of Integers. To Integers, we add positive and negative fractions to get a set of Rational Numbers"
The above statements reflects this:
(a) Linear arrangement of concepts in mathematics.
(b) Hierarchical nature of mathematics.
(c) Concrete nature of concepts in mathematics.
(d) Concepts in mathematics move from from abstract to concrete.

Ans. (b) : The above statement reflects Hierarchical nature of mathematics.
The mathematical concepts are hierarchical in nature which add on the practical and conceptual knowledge from one class to the next class i.e., the mathematical concepts are taught in a pre-defined order like first the teaching of arithmetic and then the algebra, trigonometry, and calculus are taught.

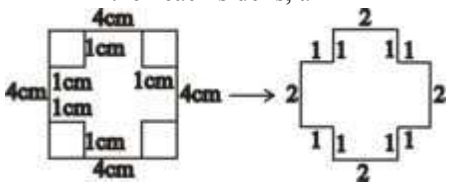
Central Teacher Eligibility Test (CTET) 2021
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 04.01.2022)

1. A square has a bounding of 16 cm. From each of the four corners of this square, a small square of side 1 cm is cut off. What will be the length of the boundary of the remaining figure?

(a) 12 cm (b) 14 cm
(c) 16 cm (d) 18 cm

Ans. (c) : Given that
the perimeter of square 4a = 16
then each side is, a = 4



The length of the boundary of the resulting shape is
2 + 2 + 2 + 2 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 16 cm

2. What will come in the blank? 2 thirds + _____ = 11 twelfths

(a) 9 thirds (b) 1 third
(c) 3 twelfths (d) 13 twelfths

Ans. (c) :

$$\frac{2}{3}+\boxed{x}=\frac{11}{12}$$

$$\therefore \text{ then } x=\frac{11}{12}-\frac{2}{3}$$

$$=\frac{11-8}{12}$$

$$\boxed{x=\frac{3}{12}} \text{ or 3 twelfths}$$

3. On her birthday Merlin's mother gave her a packet of toffees to share her friends. Merlin gave, $\frac{2}{7}$ th of toffees to Aditi, $\frac{1}{6}$ th to Amol, $\frac{2}{5}$ th to Farhan, and $\frac{1}{7}$ th to Jery. If she is left with only 2 toffees, then how many toffees were there in the packet

(a) 105 (b) 210
(c) 315 (d) 420

Ans. (d) : Let, total toffees in the packet = x
From the question–

Merlin gave $\frac{2}{7}$ th of toffees to Aditi = $\frac{2x}{7}$

Merlin gave $\frac{1}{6}$ th of toffees to Amol = $\frac{x}{6}$

Merlin gave $\frac{2}{5}$ th of toffees to Farhan = $\frac{2x}{5}$

Merline gave $\frac{1}{7}$ th of toffees to Jerry = $\frac{x}{7}$

So, $\frac{2x}{7}+\frac{x}{6}+\frac{2x}{5}+\frac{x}{7}+2=x$

$$x\left[\frac{2}{7}+\frac{1}{6}+\frac{2}{5}+\frac{1}{7}\right]+2=x$$

$$x\left[\frac{60+35+84+30}{210}\right]+2=x$$

$$x\left(\frac{209}{210}\right)+2=x$$

$$209x + 420 = 210x$$

$$\boxed{x = 420}$$

4. A shopkeeper has some eggs. He wants to put them in trays which can have exactly 12 eggs. He filled 9 trays with eggs and left with 5 eggs. How many more number of eggs does he need so that no egg is left out after completing the 10^{th} tray?

(a) 5 (b) 6
(c) 7 (d) 8

Ans. (c) : 12 – 5 = 7
According to the question, at least 12 eggs come in a tray, after placing eggs in 9 trays. It has 5 eggs are left with him, in this way he will need at least (12 – 5 = 7) eggs to fill 10 trays.
So, option (c) will be the right answer.

5. Savita went to ATM to withdraw some money. She got five notes of ₹2000, four notes of ₹500 and nine notes of ₹100. On counting she found that 1 note of ₹2000 and 1 note of ₹100 are less in the whole amount. How much amount did she enter for withdrawal?

(a) 14000 (b) 14500
(c) 15000 (d) 16500

Ans. (c) : Five notes of 2000 = 5 × 2000 = 10,000
Four notes of 500 = 4 × 500 = 2000
Nine notes of 100 = 9 × 100 = 900
10,000 + 2000 + 900 = 12,900
∵ 1 note of 2000 and 1 note of 100 are less
∴ Total amount, she enter for withdrawal
= 2000 + 100 + 12900 = 15000
So, option (c) will be the right answer.

6. Anu brought 2 kg 500 g Laddu, 3 kg 250 g Jalebi and 4 kg Rasgullas from a sweet shop. The shopkeeper packed everything together in boxes with a maximum capacity of 750 g. How many boxes required to pack all the items?

(a) 15 (b) 13
(c) 14 (d) 12

Ans. (b) : Laddu = 2.500 kg
Jalebi = 3.250 kg
Rasgullas = 4.000 kg
Total = 9.750 kg
Given, the maximum capacity of one box is 750 gm

$\therefore$ Number of boxes are required = $\frac{9750\,\text{gm}}{750\,\text{gm}}$

$= 13$

So, option (b) will be the right answer.

7. The four traffic lights of a cross road change after 30s, 45s, 1 minute and 75s, respectively. If these lights changed simultaneously at 1:35 pm, then they will change simultaneously again at.

(a) 2:05 pm (b) 1:50 pm
(c) 2:10 pm (d) 1:55 pm

Ans. (b) :

2	30, 45, 60, 75
2	15, 45, 30, 75
15	15, 45, 15, 75
3	1, 3, 1, 5
5	1, 1, 1, 5
	1, 1, 1, 1

LCM = $2 \times 2 \times 3 \times 5 \times 15$
$= 900$ sec.
$= \frac{900}{60}$ min.
$= 15$ minute

$\therefore$ They will change simultaneously again at
$= (1\text{ hr} + 35\text{ min}) + 15\text{ min}$
$= 1\text{ hr} + 50\text{ min} = 1{:}50$ pm

So, option (b) will be the right answer.

8. Rae and Reena have arranged the bricks horizontally one above the other. If the length, width and height of each brick are 6 inches, 3 inches and 3 inches, respectively then how many rows of the bricks will be required to create a 3.5 meter wall?

(a) 46 (b) 58
(c) 42 (d) 64

Ans. (a) : Let the length breadth and height is l, b & h
Given $l = 6$ inch
b = 3 inch
h = 3 inch
To find the number of rows of the bricks required to make a 3.5 m wall,
1 m = 39.37 inches
So, 3.5 m = 137.795 inches

No. of bricks required = $\frac{\text{total height}}{\text{one brick height}}$

$= \frac{137.795}{3} = 45.931 \cong 46$

9. Rama reads the following details on a packet before throwing it on 3rd July 2021. Date of packing: 10th Jan 2021
Best before 180 days from the date of packing
Which of the following statement, is correct?

(a) She should throw the packet as the date of expiry has been already crossed.
(b) She can still use the packet for almost one more week
(c) She can wait for another six months as it will get expired after 180 days
(d) The packet got expired on 10th June 2021 so she should throw it.

Ans. (b) : Given that,
Date of packing = 10 January 2021
The total number of days from packing date to 3 July 2021 = 21 (Jan.) + 28 (Feb.) + 31 (March) + 30 (April) + 31 (May) + 30 (June) + 2 (July)
= 173 days
In this way she can still use the goods for next seven days.
So, Rama can still use the packet for almost one more week.

10. Teacher gave some objects to children that include a matchbox, a ball, a book, a steel glass and a rope. She asked them to identify the objects which have the most numbers of corners. Which of the following statements is correct for the above situation?

(a) Rope should be selected as it is the longest among all the given objects
(b) Book should be selected as it has more number of corners than the matchbox
(c) Matchbox and book should be related as both of them can be classified in the same category of objects having edge, faces and corners
(d) Ball should be selected as it has infinite corners

Ans. (c) : Matchbox and book should be related as both of them can be classified in the same category of objects having edge, faces and corners.
So, option (c) will be the right answer.

11. A closed shape made up of three or more than three line segments is called

(a) Triangle (b) Quadrilateral
(c) Polygon (d) Polyhedrons

Ans. (c) : A closed shape made up of three or more than three line segments is called polygon.
Note- In geometry, a triangle is closed, two-dimensional shape with three straight sides. Thus a triangle is also a polygon.

12. The temperature of a city is 23.5°C at 9 pm. If the temperature drops by 0.7°C every hour after that, then at what time the temperature will be 17.2°C?

(a) 2:00 am (b) 3:00 am
(c) 5:00 am (d) 6:00 am

Ans. (d) : Temperature difference = 23.5°C – 17.2°C
= 6.3°C

$\because$ 9 pm – 10 pm $\Rightarrow$ 0.7
10 pm – 11 pm $\Rightarrow$ 1.4
11 pm – 12 am $\Rightarrow$ 2.1

12 am – 1 am $\Rightarrow$ 2.8
1 am – 2 am $\Rightarrow$ 3.5
2 am – 3 am $\Rightarrow$ 4.2
3 am – 4 am $\Rightarrow$ 4.9
4 am – 5 am $\Rightarrow$ 5.6
5 am – 6 am = 6.3

Alternate –

$$6.3°C = \frac{6.3}{0.7} = 9\,hr$$

Time = 9 pm + 9 hr = 6 am

Thus at 6 am the temperature will drop to 6.3°C.

So, option (d) will be right answer.

13. Which of the following statements is true for the mean and median of the scores 15, 8, 13, 1, 23, 15, 20, 1

(a) Mean is greater than the median
(b) Median is greater than the mean
(c) Both mean and median are equal
(d) Median cannot be determined as there are even number of scores

Ans. (b) : $\text{mean} = \frac{\text{Sum of Total Number}}{\text{Total Number}}$

$$\text{mean} = \frac{15+8+13+1+23+15+20+1}{8}$$

$$\text{mean} = \frac{96}{8}$$

mean = 12

Now,

Median: The median is the middle number in a sorted, ascending or descending list of numbers.

Ascending orders- 1, 1, 8, 13, 15, 15, 20, 23

If the data set is even, then the mean value for the middle two numbers is called median and the given data set.

$$\text{median} = \frac{13+15}{2}$$

median = 14

$\therefore$ median > mean

So, the right option will be (b)

14. The angles of rotations (rotational symmetry) of an equilateral triangle are:

(a) 90°, 180°, 270°, 360°
(b) 60°, 120°, 180°
(c) 120°, 240°, 360°
(d) 60°, 120°, 180°, 240°, 300°, 360°

Ans.(c): • The angles of rotations (rotational symmetry) of an equilateral triangle are 120^0, 240^0, 360^0.

• Angle of Rotation of a figure is the angle by which the figure should be rotated about a centre of rotation such that it retains its original outlines.

• The number of times for the figure to retain its original outlines during a full 360^o rotation is called the order of rotational symmetry.

• For an equilateral triangle the centre of rotation is the point of intersection of its medians.

15. Identify the next term of the given pattern
1ZA, 4YB, 9XC, 16WD _____

(a) 81 VE (b) 25 VE
(c) 25 EV (d) 81 EV

Ans. (b) : 1ZA, 4YB, 9XC, 16WD _____

$1^2 = 1$	Z	A
$2^2 = 4$	Y	B
$3^2 = 9$	X	C
$4^2 = 16$	W	D
$5^2 = 25$	V	E

$\therefore$ Last term = 25VE

16. Which of the following is NOT a stage/level of Van Hiele theory of geometrical reasoning

(a) Visualization (b) Concrete operation
(c) Analysis (d) Axiomatic

Ans. (b) : The Van Hiele theory describes how young people learn geometry. It postulates five levels of geometric thinking which are labeled Visualization, Analysis, Abstraction, Formal, Rigor and Deduction.

17. "Continuous and comprehensive" evaluation in mathematics would include:

A. Detailed feedback on the students conceptual understanding
B. Only the collective progress of the class in terms of percentage of students failed or passed
C. Progress of the students throughout the year
D. Minimum levels of learning in mathematics

Choose the correct options

(a) B and D (b) A, B and D
(c) A and C (d) Only B

Ans. (c) : Continuous and Comprehensive Evaluation (CCE) was a procedure of assessment, directed by the Right to Education Act, of India in 2009. This assessment proposal was introduced by state government of India, as well as by CBSE in India, for students of sixth to tenth class and twelfth in some schools.

• A continuous and comprehensive evaluation is needed in mathematics because the teacher should know that the students are getting the problems of any particular chapter which can be done through formative type of evaluation.

18. Which of the following statements is NOT true about mapping in mathematics

(a) Mapping forms the basis for many topics in higher mathematics
(b) Mapping strengthens spatial thinking
(c) Mapping promotes proportional thinking
(d) Mapping only includes drawing of a map of one's surroundings

Ans. (d) : Use of concept maps in mathematics teaching have been analyse and the result carried out indicates that the use of graphical tool helps better understanding of mathematics and improves skills and other cognitive processes.

1. Mapping forms the basis for many topics in higher mathematics.
2. Mapping strengthens spatial thinking.
3. Mapping promotes proportional thinking.

19. Which of the following is a closed ended question?

(a) List five 3-digit numbers that have digit 5 at the tens place
(b) Draw, a shape where the sum of all sides is 36 cm

(c) Write five whole numbers between 178 and 184
(d) List two sets of five numbers that have a sum of 50

Ans. (c) : Close-ended questions:-
• These questions are also known as the convergent question where the respondents answer in limited ways, like responding in 'yes' or 'no' underlining the replied among the predefined responses, putting the sign 'correct' or 'incorrect'.
• They provide limited insight but can be easily used to analyze quantitative data so 'Write five whole numbers between 178 and 184' is an example of colsed ended question.

20. Which of the following is NOT a type and utility of number?
(a) Cardinal Numbers (b) Ordinal Numbers
(c) Aesthetic Numbers (d) Nominal Numbers

Ans. (c) : Cardinal Number:- A cardinal number is a number that says how many of something there are, such as one, two, three etc.
Ordinal Number:- An ordinal number is a number that tells the position of something in a list such as 1^{st}, 2^{nd}, 3^{rd} etc.
Nominal Number:- A nominal number are numbers used as labels to identify items uniquely. Such as social security number, zip code etc.

21. While teaching about measurement of length, a teacher asks the students to measure their table using hand spans and paper clips instead of measuring directly by a scale. What is the most appropriate reason for during this activity?
(a) She wants to engage the children in hands-on activity because it is interesting for students
(b) She wants her students to learn how to measure length correctly using paper clips
(c) She wants her students to practice old ways of measurement using objects
(d) She wants the students to understand the need for standard units for measurement

Ans. (d) : While teaching about measurement of length, a teacher asks the students to measure their table using hand spans and paper clips instead of measuring directly by a scale she wants the students to understand the need for standard units for measurement. Because every student's result may vary from each other. To measure something which doesn't vary whether you are in any part of world is called standard units for measurement.

22. A primary school mathematics teacher asked the students to take out 'Ruler' as she was going to teach the topic on length measurement. Students got confused how can they take out a king or queen. Such words are called Homonyms. How can teachers address this challenge in classroom?
(a) By asking the English language teacher to teach the word meanings of such words in English class
(b) Teacher should draw the attentions of students to the specific meaning being used in mathematical context whenever such words appear in teaching
(c) Teacher should prepare a list of such words with their meaning and ask students to memorise them
(d) Teacher should ignore this as students eventually would learn many such words when they would practice more questions

Ans. (b) : A primary school mathematics teacher asked the students to take out 'Ruler' as she was going to teach the topic on length measurement. Students got confused how can they take out a king or queen. Such words are called Homonyms.
Homonyms are two or more words with the same spelling or pronunciation, but with different meanings. These words can sometimes be confusing, especially for children learning to spell them. The teacher address this challenge by drawing the attentions of students to the specific meaning being used in mathematical context whenever such words appear in teaching.

23. A class III teacher reads out the following problem to her students
"It I subtract '2 ones' from '2 tens' what will be the answer"
One of the students responded the answer is zero.
Which of the following statement is correct for the above context?
(a) The answer given by the student is correct
(b) Teacher should use concrete materials to strengthen the concept of place value in student
(c) Teacher should give 10 similar problems to practice
(d) Teacher should ignore the response of the student and should herself give the right answer and move to next problem to solve

Ans. (b) : Concrete resoures also known as manipulatives, are physical objects that children can pick up and manipulat to imporve their maths knowledge. Concrete materials allow them to visualise and understand the maths which also allows them to make sense of what is actually happening.

24. While planning a lesson on the concept of addition of fractions a teacher is using the activity of rectangular strip folding. The above activity is a-
(a) Content activity
(b) Post Content activity
(c) Pre Content activity
(d) Wastage of time

Ans. (c) : Pre class activities are an excellent way to get students to engage with content before they engage with it in class. Students get knowledge of the topic prior to engaging in class discussion. They are prepared in advance to ask questions and think at a higher level during class.

25. Which one of the following is the most important characteristic of a good mathematics text book at primary level?

(a) Concepts should be introduced through contexts
(b) It should only contain numerous questions for practice
(c) It should be attractive and colorful
(d) Concepts should be introduced through formal algorithm

Ans. (a) : Textbooks play an important role in mathematics education because of their close relation with classroom instruction. They identify the topics and order them in a way students should explore them.
The following are the qualities of a good math textbook.
- It should provide sufficient materials to motivate the students to solve problems in the classroom as well as in daily life.
- It should be well illustrated and there should be a diagram and figures wherever needed.
- It should only contain numerous questions for practice.

26. The National curriculum framework (2005) considers that mathematics involves 'a certain way of thinking and reasoning'. The vision can be realized by

(a) Giving special coaching to students
(b) Adopting exploratory approach, use of manipulatives connecting concepts to real life, involving students in discussions
(c) Rewriting all the text book of mathematics
(d) Emphasizing on solving problems given in text book

Ans. (b) : According to NCF 2005, the main goal of Mathematics education at the primary level is the development of children's ability in mathematization. Basically, it means that children should learn to think about any situation using the language of mathematics.
- In mathematics there is a certain way of thinking people connect the mathematical concepts with real-life which help them think more logically and practically.

27. As a mathematics educator what advice will you give to prospective teachers to improve children's performance in mathematics

(a) Get children as many books as possible for practice work
(b) Advice parents for tutoring children at home
(c) Help children make connections between conceptual and procedural knowledge
(d) Plan remedial classes for children at the end of the year

Ans. (c) : A teacher must interpret students, written work, analyze their reasoning, and respond to the different methods they might use in solving a problem. He should help children make connections between conceptual and procedural knowledge.

28. The statement 'Teacher acts as a Facilitator, helps students to discover relationships and seek pattern for themselves' is most suited with

(a) Role play
(b) Inductive method
(c) Analytical Method
(d) Demonstration

Ans. (b) : The given situation is most suited with Inductive method. The inductive method of teaching means that the teacher presents the rule through situations and sentences and does guided practice, then the learners do practice.

29. A primary class teacher asks his students to collect data on number of boys and girls studying in class V in their neighborhood (including least five households). Which of the following most appropriately describes the purpose of this activity?

(a) To make students aware of gender differences in their neighbourhood
(b) To introduce the topic of data handling
(c) To make children familiar with their community
(d) To give holiday have work to students

Ans. (b) : A primary class teacher asks his students to collect data on number of boys and girls studying in class V in their neighbourhood because teacher wants to introduce the topic of data handling.
Data handling refers to the process of gathering, recording & presenting information in a way that is helpful to other for instance graph or charts.

30. Which of the following is <u>NOT</u> one of the steps of problem solving given by Polya.

(a) Understanding the problem
(b) Devise a Plan
(c) Recreate the plan
(d) Carry out the plan

Ans. (c) : George Polya was a mathematician in the 1940. He devised a systematic process for solving problems that is now referred to by his name:
The Polya 4-step problem-solving process.
(i) Understanding the problem
(ii) Devise a Plan
(iii) Carry out the plan
(iv) Look back
So, Recreate the plan is not one of the steps of problem solving.

Central Teacher Eligibility Test (CTET) 2021
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 05.01.2022)

1. What should be subtracted from the sum of 9599, 5995 and 9995 to obtain 19995?

(a) 5495 (b) 5594
(c) 5954 (d) 5945

Ans. (b) : Given,
The given numbers are 9599, 5995 and 9995. Let the required number which is subtracted be x
Sum of the given numbers = 9599 + 5995 + 9995
= 25,589
Now, 25, 589 – x = 19995
x = 25589 – 19995
x = 5594
Hence, the required number is 5594

2. Which one of the following represents the number 'Fifty five lakh fifty five thousand five hundred fifty five?

(a) 5555555 (b) 550550555
(c) 555555 (d) 55005500555

Ans. (a) : The place value table for given number is :

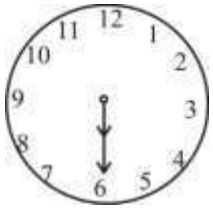
Ten lakhs	Lakh	Ten Thousands
10,00,000	1,00,000	10,000

∴ Fifty five lakh five thousand five hundred fifty five is written as 55,55,555.

3. Kusum plays with her friends in the evening, when both the hands of the clock are at 6. This time on a 24 hours clock can be read as :

(a) 16 : 45 (b) 20 : 15
(c) 18 : 30 (d) 6 : 30

Ans. (c) : Given that Kusum plays with her friend in the evening when both the hands of the clock are at 6.



It means the time is 6 : 30 PM.
As we know that time on a 24 hour clock can be read as
6 : 30 PM
+ 12 : 00
= 18 : 30 PM.

4. Sum of the fractions $\frac{3}{15}$ and $\frac{7}{12}$ is

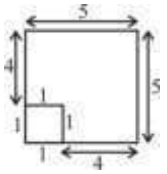
(a) $\frac{10}{27}$ (b) $\frac{47}{60}$
(c) $\frac{35}{27}$ (d) $\frac{43}{60}$

Ans. (b) : Given,
fractions are $\frac{3}{15}$ and $\frac{7}{12}$
Sum of the fractions = $\frac{3}{15} + \frac{7}{12}$
$= \frac{12+35}{60} = \frac{47}{60}$

5. A square has a boundary of 20 cm. From the corners of this square, a small square of side 1 cm is cut off. What will be change in the boundary of the new shape?

(a) The boundary of new shape will be 2cm less than that of the square.
(b) The boundary of new shape will be 4cm less than that of square.
(c) The boundary of the new shape will be equal to the boundary of square.
(d) The boundary of new shape will be 2cm more than the boundary of the square.

Ans. (c) : Let side of square is a
A square has perimeter = 20 cm,
4a = 20
a = 5 cm



Boundary of new shape = 5 + 5 + 4 + 1 + 4 +1 = 20
So the boundary of new shape will be equal to boundary of square.

6. Five students measured the lengths of their pencils using a scale and the results were as follows : 15.5 cm, 12cm, 11.8cm, 9.7cm, 7cm What is the average length of all pencils?

(a) 10.6 cm (b) 11.4 cm
(c) 10.9 cm (d) 11.2 cm

Ans. (d) : Sum of the lengths of pencils are in cm.
15.5 + 12 + 11.8 + 9.7 + 7 = 56
Average length of pencil
$= \frac{\text{sum of the length of pencils}}{\text{no. of pencils}}$
average length of all pencils = $\frac{56}{5}$ = 11.2

7. 18 squares of side 2cm each can cover a currency note. How many squares are required to cover 3 such notes?

(a) 49 (b) 64
(c) 72 (d) 54

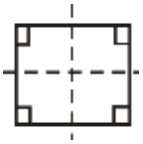
Ans. (d) : Area of square = side^2 = $(2)^2$ = 4
18 squares cover a currency note. Total area of currency = 18 × 4 cm^2
= 72 cm^2

For covering 3 notes, no. of squares required = $\frac{72 \times 3}{4}$ = 54

8. Identify the quadrilateral.
I have two lines of symmetry.
All my angles are of 90º.

(a) Square (b) Rhombus
(c) Rectangle (d) Parallelogram

Ans. (c) : The quadrilateral is a Rectangle.



- A rectangle has two lines of symmetry.
- It has rotational symmetry of order two.
- It has four right angles (90º).
- The opposite sides are parallel.
- The diagonals bisect each other.

Square–

- A square has four lines of symmetry.
- It has four right angles (90º).
- The opposite sides are parallel.

Parallelogram–

- A parallelogram has no lines of symmetry.
- The opposite angles are equal.
- The opposite sides are parallel.

Rhombus–

- A rhombus has two lines of symmetry.
- The opposite angles are equal.
- The diagonals bisect each other at right angles.

9. Shirts in four colours blue, yellow, black and white are available in packets of 5, 10, 12 and 15 respectively. If a shopkeeper wants to buy equal number of shirts of each colour, what is the minimum number of packets of different colours he should buy?

(a) Blue = 4, Yellow = 5, Black = 6, White = 12
(b) Blue = 6, Yellow = 12, Black = 5, White = 4
(c) Blue = 12, Yellow = 6, Black = 5, White = 4
(d) Blue = 5, Yellow = 4, Black = 12, White = 6

Ans. (c) : L.C.M. of 5, 10, 12, 15 is 60

2	5, 10, 12, 15
2	5, 5, 6, 15
3	5, 5, 3, 15
5	5, 5, 1, 5
	1, 1, 1, 1

2 × 2 × 3 × 5 = 60

For blue = $\frac{60}{5} = 12$

For yellow = $\frac{60}{10} = 6$

For Black = $\frac{60}{12} = 5$

For white = $\frac{60}{15} = 4$

The minimum no. of packets of different colour he should buy are Blue = 12, Yellow = 6, Black = 5, White = 4

10. Renuka decided to use nails and a rope to make a circle on the ground. She took a thin rope and tied nails on both ends of the rope. Then, she made a circle with the help of her friend. Which of the following statements is correct in the given situation?

(a) The length of rope used is equal to the length of the chord of the circle.
(b) The length of rope used is equal to the length of the diameter of the circle.
(c) The length of rope used is equal to the length of the radius of the circle.
(d) The length of rope used is equal to the circumference of the circle.

Ans. (c) : According to the given situation the correct statement is the length of rope used is equal to the length of the radius of the circle.

11. How many total (complete) packets of $\frac{3}{4}$ kg can be made from the $51\frac{2}{3}$ kg amount of sugar?

(a) 91 (b) 68
(c) 56 (d) 39

Ans. (b) : Change Mixed fraction into proper fraction.

$$51\frac{2}{3} = \frac{155}{3}$$

The required number of packets = $\frac{155/3}{3/4}$

$$\frac{155}{3} \times \frac{4}{3} = \frac{620}{9} = 68.8$$

Hence, total (complete) packets of sugar will be = 68

12. Which of the following statements is correct?

(a) 1 is a prime number.
(b) 1 is a composite number.
(c) 1 is a both a prime and a composite number.
(d) 1 is neither prime nor a composite number.

Ans. (d) : 1 is neither prime nor a composite number.
For a number to be called as a prime number, it must have only two positive factors. Now for 1, the number of positive divisors or factors is only one i.e. 1 itself.
Composite Number are number that have more than two factors. 1 is not a composite number because the divisor of 1 is 1.

13. The angle of a triangle are in the ratio 5 : 6 : 7. What is the measure of the smallest angle?

(a) 45º (b) 50º
(c) 60º (d) 70º

Ans. (b) : The angles of triangle are in the ratio 5 : 6 : 7
Let the angles be 5x, 6x and 7x
∵Sum of the angles of a triangle = 180^0
∴ 5x + 6x + 7x = 180
18x = 180
x = 10
So, the smallest angle of triangle = 5x
= 5 × 10
= 50^0

14. Bimal brought a packet of candies on his birthday. he gave one-third to John, one-fourth to Radha, one-fifth to Sushmita and one-sixth to Miku. He ate remaining 6 candies. How many candies were there in the packet?

(a) 100 (b) 120
(c) 128 (d) 142

Ans. (b) : Let the total number of candies in the packet be 12x
According to the question,
Candies given to John = 4x
Candies given to Radha = 3x
Candies given to Sushmita = 2.4x
Candies given to Miku = 2x
Total distributed candies = 4x + 3x + 2.4x+ 2x = 11.4x
Remaining candies = 12x – 11.4x = 0.6x
According to question,
0.6x = 6
x = 10
So, total number of candies in the packet
= 12x = 12 × 10
= 120

15. The sum of seven consecutive even number, arranged in an increasing order, is 98. What is the third number in this order?

(a) 12 (b) 14
(c) 16 (d) 18

Ans. (a) : Let seven consecutive even numbers be x, x + 2, x + 4, x + 6, x + 8, x + 10, x + 12
According to question,
x + x + 2 + x + 4 + x + 6 + x + 8 + x + 10 + x + 12 = 98
⇒ 7x + 42 = 98
⇒ 7x = 98 – 42
⇒ 7x = 56
⇒ x = 8
So, third number = x + 4 = 8 + 4 = 12

16. Following three statements have been given in the context of teaching numbers to student of early primary classes.

(A) Encourage students to think about number and quantities of objects when these are meaningful to them
(B) Encourage students to learn counting by recalling number names
(C) Encourage students to make sets with movable objects?

What of the above statement (s) is/are correct?

(a) (A) and (C) (b) Only (B)
(c) (B) and (C) (d) (A) and (B)

Ans. (a) : From the given question following context of teaching number to students of early primary classes are –
• Encourage student to think about number and quantities of objects when these are meaningful to them.
• Encourage students to make sets with movable object.

17. Which of the following represents the correct sequence of geometrical reasoning levels according to Van Hieles theory?

(a) Visualization → Relationships → Deduction → Analysis → Axiomatic
(b) Relationships → Visualization → Analysis → Axiomatic → Deduction
(c) Visualization → Analysis → Relationships Deduction → Axiomatic
(d) Analysis → Relationships → Visualization → Deduction → Axiomatic

Ans. (c) : According to van Hieles theory, the correct sequence of geometrical reasoning levels are visualization, Analysis, Relationships, Deduction and Axiomatic.

18. Which of the following statements is <u>NOT</u> appropriate for mathematical tasks?

(a) When students are challenged with appropriate mathematical tasks, there is a probability that they become confident in their ability to handle difficult problems
(b) if a mathematical task is difficult, it cannot be engaging for students.
(c) Mathematical tasks should encourage students to become autonomous learners.
(d) Mathematical tasks should provide flexibility for exploring alternative paths to solve the problem

Ans. (b) : 'If mathematical task is difficult, it cannot be engaging for students'. This statement is not appropriate for mathematical task.

19. Which skill is expressed in following statement that will help a child to understand the quantification of the objects?

"The child mentally includes one in two, two in three, three in four, four in five so on and so forth"

(a) Equality
(b) Hierarchical inclusion
(c) Reverse conservation
(d) Normalization

Ans. (b) : Hierarchical inclusion will expressed that will help a child to understand the quantification of the objects.

20. Which of the following is the most appropriate strategy to introduce the concept of Fractions in primary mathematics class?

(a) Posing a word problem on fractions.
(b) Showing a picture chart representing $\frac{1}{2}$ and $\frac{1}{4}$.
(c) Representing a fraction on a number line.
(d) Doing paper folding activities with symmetrical rectangular strips and circular cut-outs.

Ans. (d) : The most appropriate strategy to introduce the concept of fractions in primary mathematics class is to 'doing paper folding activities with symmetrical rectangular strips and circular cut-outs'.

21. Given below, are two statements marked as Assertion (A) and Reason (R).

(A) : Mathematics curriculum in primary school must progress from concrete to abstract.

(R) : Primary class students start doing mathematics without thinking.

Choose the correct option :

(a) Both (A) and (R) are true and (R) is the correct reason of (A).
(b) Both (A) and (R) are true but (R) is not the correct reason of (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.

Ans. (c) : (A) is true but (R) is false.

22. According to National Curriculum Framework 2005, which is the most appropriate statement about classroom based assessment in mathematics?

(a) It should not merely be done for evaluating the student, rather should be done for providing feedback and improving teaching-learning process.
(b) It must be done to rank the students in classroom which will help the students to progress
(c) It should not be part of mathematical instructions but should be done separately
(d) Self-assessment is not possible in primary classes

Ans. (a): According to National Curriculum Framework 2005, the most appropriate statement about classroom based assessment in mathematics is "It should not merely be done for evaluating the students, rather should be done for providing feedback and improving teaching-learning process".

23. Which of the following statements is/are true about mathematics learning among primary grade learners?

(a) Children come to school with some ideas about mathematics.
(b) Children's ideas about mathematics before coming to school are irrelevant for school mathematics.
(c) Children develop spatial understanding only while studying geometry
(d) Children in primary classes are able to identify shapes in their surroundings.

Choose the correct option.

(a) (a) and (d)
(b) Only (b)
(c) (b) and (c)
(d) (a), (c) and (d)

Ans. (a) : Following statement are true about mathematics learning among primary grade learners –

- Children come to school with some ideas about mathematics.
- Children in primary classes are able to identify shapes in their surrounding.

24. According to National curriculum Framework 2005, important feature/features of mathematics curriculum is/are:

(a) It should be ambitious and coherent.
(b) It should be activity - oriented
(c) It should include more number of summative assessments
(d) It should emphasise on procedures and knowledge of formulae over understanding.

Choose the correct option.

(a) (a) and (c) (b) Only (b)
(c) (a) and (b) (d) (c) and (d)

Ans. (c): According to National Curriculum Framework 2005, important features of mathematics curriculum are–

- It should be ambitious and coherent.
- Children pose and solve meaning problem.
- Children see mathematics as something to talk about, to communicate through, to discuss among themselves, to work together on.
- Teacher are expected to engage every child in class with the conviction that everyone can learn mathematics.

25. The most appropriate example of a student-centered classroom in mathematics is :

(a) Providing multiple question to every student in the class for practice.
(b) Teacher is asking every student to solve the problem on blackboard.
(c) Teacher in engaging with students in the classroom to build their mathematical understanding from their personal experiences.
(d) Teacher is solving the problem on the blackboard and explaining the algorithm to the students.

Ans. (c) : Learner-Centered teaching is an approach to mathematics instruction that places heavy emphasis on the students taking responsibility for problem solving and inquiry.
The most appropriate example of a student centred classroom in mathematics is 'Teacher is engaging with student in the classroom to build their mathematical understanding from their experiences'.

26. Which of the following is/are most appropriate about the mathematics textbook of primary classes?

(a) The problems given in textbook should reduce solutions to knowledge of specific tricks.
(b) The language used in textbook must not be far removed from everyday speech of the students.
(c) The books should not include stories and other narratives rather should include a lot of questions to practice.

Option :

(a) (a) and (b) (b) (b) and (c)
(c) Only (b) (d) Only (c)

Ans. (c) : The most appropriate about the mathematics textbook of primary classes is 'the language used in textbook must not be far removed from everyday speech of the students.'

27. Which of the following is NOT related with the process of mathematics teaching and learning?

(a) Abstraction (b) Investigation
(c) Optimization (d) Rote-Memorization

Ans. (d) : 'Rote Memorization' is not related with the process of mathematics teaching and learning.
Rote memorization is a learning tool that entails constant repeating information until it's remembered word to word. Memorization refers to remembering something by heart which is not a mathematical process. Memorization has no relation to mathematical process.

28. Which of the following is NOT a step of Polya's problem-solving model?

(a) Understanding the problem
(b) Memorizing the algorithm
(c) Devise a plan
(d) Look back

Ans. (b): 'Memorizing the algorithm' is not a step of Polya's problem-solving model.
George Polya designed a four-step method to solve all kinds of problems: (i) understand the problem (ii) make a plan (iii) execute the plan (iv) look back and reflect.

29. While adding three numbers given as 73 + 35 + 27, a student calculates in the following manner:

(73 + 35) + 27 = (35 + 73) + 27 = 35 + (73 + 27) = 35 + 100 = 135

Which of the following properties of addition of numbers the student has used?

(a) Commutative and Associative
(b) Commutative and Distributive
(c) Distributive and Identity
(d) Identity and Associative

Ans. (a) : While adding three no. given as 73 + 35 + 27, in following manner:
(73 + 35) + 27 = (35 + 73) + 27 = 35 + (73 + 27) = 35 + 100 = 135
The student has used commutative and associative property of addition of numbers
Commutative Property – This law say we can swap numbers over and still get the same answer.

$$a + b = b + a$$

Associative property – Say that it doesn't matter how we group the numbers (i.e. which we calculate first)

$$(a + b) + c = a + (b + c)$$

30. Student solves the problem on multiplication in the following way:

35
23
75

What could be the most probable reason for the error made by the student?

(a) The student is unable to recall the multiplication tables upto 10.
(b) The students has extended the algorithm of addition to multiplication.
(c) The student does not know the algorithm of addition.
(d) The students is unable to do regrouping of numbers while multiplying the numbers.

Ans. (b) : When the student solve the problem on multiplication in the following way :

35
23
75

The most probable reason for the error made by the student that 'the student has extended the algorithm to multiplication'.

Central Teacher Eligibility Test (CTET) 2021
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 06.01.2022)

1. How many hundreds are there in 25347?
(a) 300 (b) 253
(c) 2534 (d) 25300

Ans. (b) : 25347 →
⇒ 253 × 100
⇒ 25300
So, in 25347 there are 253 hundreds.

2. I am a 2- digit odd number and greater than 24×4. My ones and tens digits are equal. What number am I?
(a) 87 (b) 88
(c) 97 (d) 99

Ans. (d) : As per given conditions 99 will be correct answer because it fulfils all the given conditions –
- 99 is a two digit odd number
- 99 is greater than 24 × 4 = 96
- In 99, ones and tens digits are equal.

3. What is the difference of the place values of two 7s in the number 276875?
(a) 69993 (b) 699730
(c) 699970 (d) 69930

Ans. (d) : The difference of the place value of two 7s in 276875 is 70000 - 70= 69930.

4. The product of 0.013 and 0.07 is equal to
(a) 0.00091 (b) 0.0091
(c) 0.000091 (d) 0.091

Ans. (a) : The product of 0.013 and 0.07 = 0.013 × 0.07 = 0.00091.

5. Read the data given in following table and select the correct statement:

The drink liked by children	Number of children
Milk	30
Coffee	25
Tea	35
Lemonade	10

(a) Children who like lemonade are $\frac{1}{5}$ of the total number of children.
(b) Children who like coffee are one-fourth of the total number of children.
(c) The number of children who like tea is less than the number of children who like milk.
(d) The number of children who like coffee is more than the number of children who like milk.

Ans. (b) : Total number of children is = 100
Coffee like by children is 25 which is $\frac{100}{4}$ or $\frac{\text{Total}}{4}$
Hence, Children who like coffee are one-fourth of the total number of children

6. What is the measure of the angle formed by the hands of the clock at 2'o clock?
(a) 30^0 (b) 45^0
(c) 60^0 (d) 90^0

Ans. (c) : At 2' o clock the minute hand is on the 12 and the hour hand is on the 2. The angle formed is 2/12 of the total number of degrees in a circle, 360°.
$\left(\frac{2}{12}\right) \times 360° = 60°$

7. Bincy wants to spend least amount on purchasing decorative items. Which of the following she should select to spend the least amount?
(a) 16 dozen items at ₹ 18.50 each
(b) 170 packets at ₹ 21.50 each
(c) 12 dozen items at ₹ 25.00 each
(d) 220 packets at ₹ 16.50 each

Ans. (a) : 16 dozen items at ₹ 18.50 each so the total amount–
⇒ 16 × 12 × 18.50 = ₹3552
170 packets at ₹21.50 each so the total amount –
⇒ 170 × 21.50 = ₹3655
12 dozen items at ₹25.00 each so the total amount–
⇒ 12 × 12 × 25.00 = ₹3600
220 packets at Rs. 16.50 each so the total amount–
⇒ 220 × 16.50 = ₹3630
Least amount is ₹3552
She should select "16 dozen items at ₹18.50 each" to spend the least amount.

8. The table shows the change in the length of a plant (in cm) during different weeks:

Week	Length of the plant (in cm)
Week 1	0.5
Week 2	2.7
Week 3	5.8
Week 4	8.6
Week 5	11.5

The length of the plant change the most form _____.
(a) Week 1 to week 2 (b) Week 2 to week 3
(c) Week 3 to week 4 (d) Week 4 to week 5

Ans. (b) : According to the question.

Week	Length of the plant (in cm)	**Difference in consecutive Week**
Week 1	0.5	
Week 2	2.7	2.7–0.5 = 2.2
Week 3	5.8	5.8–2.7 = 3.1
Week 4	8.6	8.6 –5.8 = 2.8
Week 5	11.5	11.5 – 8.6 = 2.9

In week 2 to week 3 the length of the plant change the most.

9. Meeta and Bunty were counting the faces (surfaces) of various shapes. The number of faces in a cube, cylinder, cuboid and sphere respectively are:

(a) 8,3,8,1 (b) 6,4,6,1
(c) 8,4,8,1 (d) 6,3,6,1

Ans. (d) : The number of faces in a cube is 6, in cylinder-3, in Cuboid -6 and in Sphere -1.

10. Which of the following fractions is less than $\frac{7}{8}$ and greater than $\frac{1}{3}$?

(a) $\frac{9}{10}$ (b) $\frac{3}{11}$
(c) $\frac{17}{24}$ (d) $\frac{26}{29}$

Ans. (c) :

$\frac{7}{8} = 0.875$ and $\frac{1}{3} = 0.333$

From options-

$(a)\frac{9}{10} = 0.9, (b)\ \frac{3}{11} = 0.27, (c)\ \frac{26}{29} = 0.896, (d)\frac{17}{24} = 0.708$

The fraction is less than $\frac{7}{8}$ and greater than $\frac{1}{3}$ is $\frac{17}{24}$

11. The average heights of five friends is 150 cm. If the heights of 4 of these friends are 153cm, 150 cm, 151 cm and 147 cm, then the height of the fifth friend is

(a) 148 cm (b) 149 cm
(c) 150 cm (d) 151 cm

Ans. (b) : We know that

$$\text{Average} = \frac{\text{Sum of observation (heights of persons)}}{\text{no. of observations (person)}}$$

Here given no. of person = 5

Average $\bar{x} = 150$

$x_1 = 153, x_2 = 150, x_3 = 151, x_4 = 157, x_5 = ?$

$$\text{Average} = \frac{x_1 + x_2 + x_3 + x_4 + x_5}{5}$$

$$150 = \frac{153 + 150 + 151 + 147 + x_5}{5}$$

$153 + 150 + 151 + 147 + x_5 = 150 \times 5$

$601 + x_5 = 750$

$x_5 = 750 - 601 = 149$

Hence, $x_5 = 149$ cm

12. Team A scored 368 runs in first innings and 458 runs in second innings. Team B scored 395 runs in first innings and 439 runs in second innings. Which team won the match and by how many runs?

(a) Team A, 18 runs (b) Team B, 18 runs
(c) Team A, 8 runs (d) Team B, 8 runs

Ans. (d) : Total score of Team A = 368 + 458
= 826
Total score of Team B = 395 + 439 = 834
Difference = 834 – 826 = 8
Hence, Team B won the match by 8 run.

13. A train departs from New Delhi Railway station at 5:30 on 28 September 2021 and reaches Chennai at 21:50 the next day. What is the travel time taken by the train?

(a) 40 hours 20 minutes
(b) 45 hours 10 minutes
(c) 42 hours 20 minutes
(d) 41 hours 30 minutes

Ans. (a) : Departs time from New Delhi at 5:30 on 28 September and reaches Chennai at 21:50 next day.
So, travel time from 28 September 5:30 to next day at 5:30 is 24 hours
And travel time 5:30 to 21:50 is 16:20 minute next day at
Total time taken by train = 24 + 16:20
= 40 hours 20 minute

14. Identify a number, which is a multiple of 5 and 7 but not of 6, from the given options:

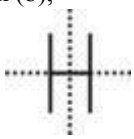
(a) 210 (b) 280
(c) 630 (d) 420

Ans. (b) : From options-
(a) Factor of 210 are 1, 2, 3, 5, 6, 7, 10, 14, 15, 21, 30, 35, 42, 70, 105 and 210.
Hence, 210 is multiple of 5, 6 and 7.
(b) Factors of 280 are 1, 2, 4, 5, 7, 8, 10, 14, 20, 28, 35, 40, 56, 70, 140 and 280.
Hence, 280 is multiple of 5 and 7 but not of 6.
(c) Factors of 630 are 1, 2, 3, 5, 6, 7, 9, 10, 14, 15, 18, 21, 30, 35, 42, 45, 63, 70, 90, 105, 126, 210, 315 and 630.
Hence, 630 is multiple of 5, 6 and 7.
(d) Factors of 420 are 1, 2, 3, 4, 5, 6, 7, 10, 12, 14, 15, 20, 21, 28, 30, 35, 42, 60, 70, 84, 105, 140, 210 and 420.
Hence, 420 is multiple of 5, 6 and 7.
Therefore, we conclude that 210, 630 and 420 are multiple of 5, 6 and 7 where as 280 is multiple of 5 and 7 but not of 6. So option (b) will be correct answer.

15. Which of the following letters have both horizontal and vertical lines of symmetry?

(a) E (b) T
(c) H (d) Y

Ans. (c) : From option (b),



Letter H has both horizontal and vertical lines of symmetry

16. Given below are two statements marked as Assertion (A) and Reason (R).
(A): A mathematics curriculum should be coherent.
(R): Students can see how the one mathematical idea connects with other, thus enabling them to develop new understandings and skills.
Choose the correct option.
(a) Both (A) and (R) are true and (R) is the correct reason of (A).
(b) Both (A) and (R) are true but (R) is not correct reason of (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.

Ans. (a) : A mathematics curriculum should be coherent because students can see how the one mathematical idea connects with other, thus enabling them to develop new understandings and skills.
So, Both (A) and (R) are true and (R) is the correct reason of (A).

17. Which of the following is an important feature of a constructivist classroom?
(a) Students solving problems given in the textbook based on the example solved.
(b) Teacher giving instructions to do an activity and students are repeating procedures explained by the teacher.
(c) Students are asked to sort the different objects given to them according to their attributes like colour, shape, size, weight etc.
(d) Students are busy copying questions that are solved on the blackboard in their notebooks.

Ans. (c) : The constructivist classroom is related to the constructivist approach of education which gives primacy to collaborative learning by involving learners in discussions and project.
• The important feature of a constructivist classroom is the students are asked to sort the different objects given to them according to their attributes like colour, shape, size, weight etc.

18. Which of the following is/are important feature/features of a primary class textbook?
(a) Concepts should be linked to the daily life experiences of children.
(b) Concepts should be explained using only mathematical language and symbols.
(c) Focus should be on solving problems using formal algorithms.
(d) The concepts should be introduced with concrete examples wherever possible.
Choose the correct option.
(a) (a) and (c) (b) only (c)
(c) (b) and (d) (d) (a) and (d)

Ans. (d) : The important features of a primary class textbook is–
(a) Concepts should be linked to the daily life experiences of children.
(d) The concepts should be introduced with concrete examples wherever possible.

19. Which of the following is <u>NOT</u> a part of primary school curriculum?
(a) Tessellations
(b) Fractions
(c) Linear equations
(d) Regular 2-D shapes

Ans. (c) : At the primary level children learn from concrete objects and visualization processes.
In the primary school curriculum, the following topics have been included tessellation, fractions and regular 2-D shapes.
Hence, linear equations are not a part of primary school curriculum.

20. Which of the following is <u>NOT</u> true about the Nature of Mathematics?
(a) Mathematical concepts are arranged in a hierarchical manner
(b) Mathematics is based on Inductive Reasoning
(c) Mathematical concepts are abstract in nature
(d) Mathematics has its own set of symbols, words and language

Ans. (b) : Mathematics is based on inductive reasoning is not true about the nature of mathematics.
Nature of Mathematics –
• Mathematical concepts are arranged in a hierarchical manner.
• Mathematical concepts are abstract in nature.
• Mathematics has its own sets of symbols, words and language.
• At the primary level, the teaching of concrete concepts helps in developing the basic mathematical skills that are required to handle abstractions in the later level of learning.
• Mathematics plays a very important role in education because it has universal applicability.

21. When asked to write 'six thousand and fifty' in numerals, a student wrote the answer as '650'. Which of the following statements is most appropriate for the given context?
(a) Student should be given 10 similar type of problems to solve.
(b) The concept of base 10 and place value should be strengthened using concrete materials.

(c) The teacher should give the right answer and move to the next question.
(d) It's a careless mistake, hence the teacher should not waste her time on such mistakes.

Ans. (b) : The most appropriate for the given context is the concept of base 10 and place value should be strengthened using concrete materials.

22. Which of the following will enhance problem-solving abilities among learners?
(a) Solving problems based on a solved examples given in the textbook.
(b) Solving problems by representing mathematical situations/problems through pictures, symbols, drawings etc.
(c) Solving problems given in a mental-math workbook.
(d) Emphasizing on solving problems using formal algorithms.

Ans. (b) : The teacher promotes problem-solving skills in the student by –
- Provides an opportunity with diverse materials for every learners.
- Solving problems by representing mathematical problems through pictures, symbols drawings etc.
- Allow learners to explore, observe and experiments.
- Help learners to develop their skills and abilities.

23. Which of the following concepts can be taught using Dienes Blocks?
(a) Addition, Place Value, Subtraction
(b) Addition, Place Value, Fractions
(c) Addition, Subtraction, Volume
(d) Place Value, Fractions, Shapes

Ans. (a) : Dienes blocks are used by students when learning mathematical concepts such as additions, subtraction, number sense and place value.
Dienes are wooden or plasticcubes, rods and flats used to support children basic maths.

24. Raj Lakshmi was playing a game of marbles. She lost 6 marbles in the game and is now left with 8 marbles. With how many marbles did she start the game?
(a) A contextual question on addition
(b) A contextual question on subtraction
(c) A contextual question on division
(d) Not a contextual question

Ans. (a) : Raj Lakshmi was playing a game of marbles.
She lost 6 marbles in game
Now left with 8 marbles
She start the game with 14 marbles.
So this is an "A contextual question on addition".

25. The purpose of mathematical puzzles is to promote:
(a) Drill and Practice
(b) Interest in Mathematics
(c) Problem solving skills
(d) Rigour in algorithms
(a) (a) and (d) (b) only (d)
(c) (b) and (c) (d) (a) and (c)

Ans. (c) : The following purpose of mathematical puzzles is to promote –
- Developing a positive attitude towards mathematics.
- Interest in mathematics.
- Problem solving skills.
- Making connection between mathematics and everyday thinking.
- Making mathematics enjoyable.

26. There are five rules of Newman's Error Analysis. They are given in random order.
(a) Comprehending the question
(b) Transformation to mathematical symbols
(c) Reading the question
(d) Interpreting the answer
(e) Performing mathematical procedures
Choose the option with the correct sequence.
(a) (a), (c), (e), (b), (d)
(b) (c), (a), (b), (e), (d)
(c) (c), (a), (e), (d), (b)
(d) (b), (c), (a), (e), (d)

Ans. (b): The Correct sequence of five rules of Newman's error analysis is–
- Reading the question
- Comprehending the question
- Transformation to mathematical symbols
- Performing mathematical procedures
- Interpreting the answer

27. Which of the following is an example of an open-ended question?
(a) List five whole numbers between 136 and 142
(b) Sum of two numbers is 35. If one of the numbers is 16, what will be the other number?
(c) The length and breadth of a rectangle are in the ration 3:5. If the perimeter of the rectangle is 64 cm, find its length and breadth?
(d) List four numbers which are greater than the number formed by 7 tens and ones

Ans. (d) : Open-ended question – Open-ended questions are questions that cannot be answered with a simple "yes" or "no", and instead require the respondent to elaborate on their points.
- List four numbers which are greater than the number formed by 7 tens and 8 ones is an example of an open-ended question.

28. Which of the following can be included in a Summative Assessment?
(a) Field trips
(b) Peer Assessment
(c) Term-End examination
(d) Anecdotal Records

Ans. (c) : Term-End examination can be included in a summative assessment.
The goal of summative assessment is to evaluate student learning at the end of an instructional unit by comparing it against some standard.

29. "When asked to multiply 45 by 5, a student adds 45 five times". Which of the following statements is most appropriate with respect to the given context?

(a) The student does not have conceptual understanding of multiplication.
(b) The Strategy used by student reflects her creativity as she is able to extend the knowledge of addition in multiplication
(c) The strategy used by student connot be used in written examination.
(d) The use of formal algorithm for multiplication needs to be emphasized over the use of informal strategies.

Ans. (b) : Asked to student multiply 45 by 5 and student added 45 five time. The most appropriate statements will respect to the given context is the strategy used by student reflect her creativity as she is able to extend the knowledge of addition in multiplication.

30. The National Curriculum Framework 2005 Position paper on Teaching Mathematics states, "Crude methods of assessment encourage perception of mathematics as mechanical computation". Which of the following most appropriately explains the meaning of the given statement?

(a) The nature of assessment in mathematics has led to mathematics being referred to as comprising of only procedures and computational skills required to solve a problem.
(b) Only formative assessment methods should be a part of assessment in mathematics.
(c) Computational skills are important part of mathematics education hence should be taught through activities using concrete material.
(d) Computational skills in mathematics are not required at primary level hence should be focused upon in higher classes.

Ans. (a) : The National Curriculum Framework 2005 Position paper on Teaching Mathematics states, "Crude methods of assessment encourage perception of mathematics as mechanical computation". The most appropriately explains the meaning of the given statement is the nature of assessment in mathematics has led to mathematics being referred to as comprising of only procedures and computational skills required to solve a problem.

31. The distance between Madgaon and Nagarcoil is nearly 1134 kilometers. If this distance is covered by train in 21 hours, the average speed of the train between the railway stations of these two cities in metre per second is

(a) 15 (b) 27
(c) 30 (d) 54

Ans. (a) : Given, Distance = 1134 Km.
Time = 21 hr.
We know that, Distance = Speed × Time

$$1134 = \text{Speed} \times 21$$

$$\text{Speed} = \frac{1134}{21}$$

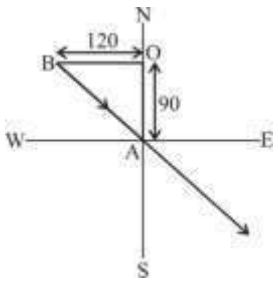
$$\text{Speed} = 54 \text{ km/hr.}$$

$$\text{Speed} = 54 \times \frac{5}{18} \text{ m/sec} = 15 \text{ m/sec}$$

32. A student is at A and wants to reach at B. For this he first goes to O which is 90m due north of A and then he goes from O to B by covering a distance of 120m in due west direction. The minimum distance of A from B and the direction A with respect to B respectively are

(a) 210m; South-West
(b) 210 m; South-East
(c) 150 m; South-East
(d) 150 m; South-West

Ans. (c) :



Pythagoras theorem

$$H^2 = (90)^2 + (120)^2$$

$$H^2 = 8100 + 14400$$

$$H = \sqrt{22500}$$

$$H = 150$$

The direction of A with respect to B is 150m, South-East.

Central Teacher Eligibility Test (CTET) 2021
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 07.01.2022)

1. Dinu starts his spice business. He buys 10 kg turmeric powder, 8 kg red chilli powder and 15 kg coriander powder. He makes small packets of 20 g of each of the spices. How many small packets of spices he prepares to sell?

(a) 2100 (b) 1850
(c) 1650 (d) 1975

Ans. (c) : Packet of 20 g of each spices is to be made —
Turmeric powder = 10 kg

$$= \frac{10,000g}{20g} = 500 \text{ packets}$$

Red chilli powder = 8 kg

$$= \frac{8,000g}{20g} = 400 \text{ packets}$$

Coriander powder = 15 kg

$$= \frac{15,000g}{20g} = 750 \text{ packets}$$

Total packets = 500 + 400 + 750
= 1650 packets of spices.

2. The chart shows the height and weight of five teachers of a school:

Name	Height	Weight
Radhika	**5 feet 4 inches**	**55.5 kg**
Aman	**5 feet 10 inches**	**67 kg**
Vineet	**6 feet 1 inches**	**72.5 kg**
Kavita	**5 feet 2 inches**	**60 kg**
Rohini	**4 feet 10 inches**	**45 kg**

Which of the following statements is correct?

(a) Vineet is longest but his weight is less than Aman
(b) Rohini's height is 6 inches less than Kavita's height
(c) The sum of Radhika and Vineet's weights is less than the sum of Aman and Kavita's weights.
(d) Rohini's weight is $\left(\frac{3}{4}\right)^{th}$ of Kavita's weight

Ans. (d) : According to the statement of option (d).
Rohini's weight = 45 kg
Kavita's weight = 60

Rohini's weight = $60 \times \frac{3}{4} = 45$ kg

Hence, Rohini's weight is $\left(\frac{3}{4}\right)^{th}$ of Kavita's weight

3. The perimeters of two equilateral ΔABC and Δ PQR are 15 cm and 30 cm respectively. Which of the following statements is correct about their interior angles?

(a) Each interior angle of Δ ABC is less than each interior angle of Δ PQR.
(b) Each interior angle of Δ PQR is half the each interior than angle of Δ ABC.
(c) The interior angles of Δ ABC and Δ PQR are equal
(d) Each interior angle of Δ PQR is double the each interior angle of Δ ABC

Ans. (c) : The interior angles of Δ ABC and Δ PQR are equal because they are equilateral triangles and interior angles in equilateral triangle are congruent to each and are each of 60°.

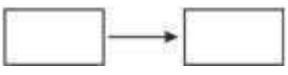
4. Amongst the following shapes, the shape (s) that will look exactly the same on a half turn is (are): Equilateral Triangle, Square, Rectangle, Parallelogram

(a) Only Square
(b) Square and Rectangle
(c) All Shapes except equilateral triangle
(d) Only Equilateral Triangle

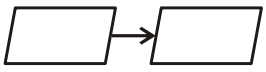
Ans. (c) : Half turn mean 180° degree turn clockwise or anticlockwise.
Equilateral Triangles-

Square-

Rectangle-



Parallelogram-



Hence, all shapes except equilateral triangle look exactly same on a half turn.

5. The average of five consecutive natural number is 15. What is the sum of the first and last numbers

(a) 27 (b) 30

(c) 31 (d) 33

Ans. (b) : Let us take the first number be x.

According to the question,

$$\frac{x+(x+1)+(x+2)+(x+3)+(x+4)}{5}=15$$

$5x + 10 = 75$

$5x = 65$

$x = 13$

Hence First number is 13 and last number is x + 4

= 13+4 = 17

The Sum of first & last number = 13 + 17 = 30

6. Bishal uses 30mL of cooking oil at a time. He cooks three times a day. How much oil he will use if he cooks for $4\frac{1}{2}$ months? (Take 1 month = 30 days)

(a) 10 L 250 mL (b) 12 L 250 mL

(c) 10 L 150 mL (d) 12 L 150 mL

Ans. (d) : According to question,

Bishal Uses 30 ml of cooking oil at a time

He cooks 3 times a day

So, in a day he will use a total of = 30 × 3 = 90 ml of oil

Oil used in 1 month = 30 × 90 = 2700 ml

Oil used in 1/2 month = $\frac{2700}{2}$ = 1350 ml

Oil used in 4 months = 4 × 2700 = 10,800 ml

Oil used in $4\frac{1}{2}$ months = 10,800 + 1350

= 12,150 ml

= 12 L 150 ml

7. On a holiday, Mary wakes up at 9:00 am and eats lunch at 2:00 pm. Which of the following angles are made by the hands of her clock respectively at the above two times?

(a) Acute Angle, Right Angle

(b) Right Angle, Straight Angle

(c) Obtuse Angle, Right Angle

(d) Right Angle, Acute Angle

Ans. (d) :

12 hours $\rightarrow 360^o$

1 hour $\rightarrow 30^o$

The angle made by hands of clock are

- At 9:00 am = 90° (i,e, Right angle)
- At 2:00 pm = 60° (i,e, Acute angle)

8. Rekha learns to make a cube using paper folding. She makes 12 cubes each of a side 10 cm. Now she needs a big box to keep all these cubes. What should be the volume of the big box so that all small cubes can be kept in it without leaving any empty space?

(a) 7200 cm^3 (b) 10000 cm^3

(c) 12000 cm^3 (d) 14500 cm^3

Ans. (c) : Rekha made 12 cubes of Side 10 cm.

Volume of 1 cubical boxe = 10 × 10 × 10 = 1000 cm^3

Volume of 12 cubical boxes = 12 × 1000

= 12000 cm^3

Volume of big box so that 12 small cubes

Can be kept = 12000 cm^3

9. Kerla Sampark kranti Train departs from New Delhi Railway station on 30th October 2021 at 13:10 and reaches Kochuveli on 1st November 2021 at 3:20. The total travel time of the journey is:

(a) 41 hours 20 minutes (b) 39 hours 40 minutes

(c) 38 hours 10 minutes (d) 36 hours 10 minutes

Ans. (c) : According to question:—

From 30th October at 13:10 to 31st October at 13:10

Total time is 24 hours.

From 31st October at 13:10 to 1st November at 3:20

Total time is 14 hours 10 minutes

Total travel time of journey

= 24 hours + 14 hours 10 minutes

= 38 hours 10 minutes.

10. What is the difference between the largest and smallest of the following numbers?

1010, 1101, 1001, 1011

(a) 111 (b) 110

(c) 101 (d) 100

Ans. (d) : From the Given number 1010, 1101, 1001, 1011. The greatest number is 1101 and smallest numbers is 1001

Therefore difference between largest and smallest number

= 1101 – 1001

= 100

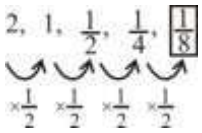
11. What is the next number:

$2, 1, \frac{1}{2}, \frac{1}{4}, ...$

(a) $\frac{1}{5}$ (b) $\frac{2}{6}$

(c) $\frac{1}{8}$ (d) $\frac{1}{16}$

Ans. (c) :



12. The rate list of fruits is given below:

Fruit	**Price per kg**
Apple	**135**
Banana	**60**
Mango	**75**
Orange	**50**
Guava	**45**

Which of the following is NOT correct?

(a) Price (per kg) of banana and guava together is more than the price (per kg) of mango.
(b) Orange's price (per kg) is three fourth of mango's price (per kg)
(c) Price (per kg) of banana and mango together is equal to the price (per kg) of apples
(d) Apples are three times costlier than guava's

Ans. (b): From option (b)
Orange Price = ₹ 50
Mango Price = ₹75
$\frac{3}{4}$ of Mango Price $= 75 \times \frac{3}{4} = ₹56.25$
Which is not equal to Orange Price.
Hence, option (b) is not correct.

13. The value of
$24.4 \times 5 - 90 \div 5 - 25.5 \times 4$ is

(a) 20
(b) 12.5
(c) 2
(d) 18.8

Ans. (c) : The value of —
$\Rightarrow 24.4 \times 5 - 90 \div 5 - 25.5 \times 4$
$\Rightarrow 24.4 \times 5 - 18 - 25.5 \times 4$
$\Rightarrow 122 - 18 - 102$
$\Rightarrow 122 - 120$
$\Rightarrow 2$

14. What should be subtracted from the sum of 99090, 90990 and 90099 so that the result will be 250,000?

(a) 28179 (b) 280179
(c) 30179 (d) 301790

Ans. (c) : Let the number to be subtracted is x,
So, (99090 + 90990 + 90099) – x = 250,000
$\Rightarrow$ 280,179 – x = 250,000
$\Rightarrow$ x = 280,179 – 250,000
$\Rightarrow$ x = 30,179

15. 25 millions can be written in Indian Number System as-

(a) 25 crores (b) 2 crores 50 lakh
(c) 25 lakh (d) 2 lakh 50 thousand

Ans. (b) : 25 millions can be written in Indian Number system as —
One million = Ten Lakhs (1000000)
Ten million = One Crore (10000000)
Therefore 25 million = 2.5 Crore Or 2 Crore 50 Lakhs.

16. Which of the following could NOT be a contributing factor towards underachievement in Mathematics?

(a) Socio-cultural background
(b) Teacher's beliefs about the students
(c) Language of instruction
(d) Gender differences

Ans. (d): Gender differences could not be contributing factor towards Underachievement in Mathematics. A study through a meta-analysis reveals that males tend to do better on mathematics test that involve problem-solving. Females tend to do better in computation, and there is no significant gender difference in understanding math Concepts.

17. As per NCERT which of the following is NOT one of the expected learning outcomes from grade III learner?

(a) Prove that 1/3 is the same as 2/6
(b) Identify the next letter in the sequence A, D, G
(c) If a bus can carry 40 children then how many children can 3 buses carry?
(d) Show that 2×3 is the same as 3×2

Ans. (a) : As per NCERT, prove that 1/3 is the same as 2/6 is not one of the expected learning outcomes from grade III learner.
Grade III learners acquired a wide range of Skills in their previous classrooms and are ready to build on the foundations they have laid. They work to deepen their Understanding of the basics and add more complex multiplication and division but the concept of fraction LCM and HCF is to be properly taught is upcoming grades after grade III. Concept of fraction is not a part of grade III learning outcome.

18. Which of the following is the most appropriate strategy for a teacher to use an introductory class on division?

(a) What is the meaning of '10 divided by 2'?
(b) If I try to divide 100 books among 3 people, how many books will be left with me?
(c) How much work will be completed in a single day if a person takes 10 days to complete a task?
(d) Your mother has nine pencils, She wants to distribute them equally among you, your brother and your sister. How many pencils will you get

Ans. (d) : The option (d) is real-life situations which is the most appropriate strategy for a teacher to use in an introductory class on division. The division is one of basic arithmetic operations in maths in which a large number is broken down into smaller groups having the same number of items. It is an operation used for equal grouping and equal sharing in maths.

19. One of the major reasons for student's failure in Mathematics at school level is that our assessment process.

(a) gives more weightage to formative assessment than summative assessment
(b) includes more subjective questions than objective type questions
(c) emphasizes on testing procedural knowledge and facts than mathematisation of thinking and abilities of a child
(d) emphasizes on problem solving than on recall based questions

Ans. (c): One of the major reason for student's failure in mathematics at school level is that our assessment process emphasizes on testing procedural knowledge and facts than Mathematisation of thinking and abilities of a child. Procedural knowledge and facts are helpful for only some type of problem that may led to self doubt and it binds the mind of children to think on a single pattern always. Hence mathematisation of thinking is important to train mind to work according to the given situation.

20. Mr. Raju wanted to build 'number sense' in his Grade 3 students. Which of the following activities can BEST help?

(a) Taking a jar of marbles and asking students to guess how many marbles are there.
(b) Asking students of climb up a set of stairs counting one number for each stair.
(c) Asking students to estimate how many students are there in their whole school based on the number of classes.
(d) Giving building blocks and asking students to construct a number as hundreds, tens and ones.

Ans. (a) : Taking a jar of marbles and asking students to guess how many marbles are there is the best way to build 'number sense' in grade 3 students. Children who have good number sense are able to use and understand an array of numerical strategies and concepts in conjunction with the ability to use these skills in a number of different ways.

21. Which of these exercises will be most appropriate to show if your students have built the skill of estimating unknown quantities'?

(a) Add two given numbers mentally and give an approximate answer
(b) Measure the length of the table using an inch tape.
(c) Guess the approximate distance from the earth to the sun.
(d) Come up with the likely number of children in your colony

Ans. (d) : Come up with the likely number of children in your colony will be most appropriate to show if your students have built the skill of 'estimating unknown quantities' since it is a real life aspect that students can touch without knowing the exact quantities. Estimation is an important aspect of quantitative thinking and a critical life skill in a world in which we often need to make decision on the basis of inexact or undefined information.

22. Which of the following is NOT a mathematical process?

(a) Optimization (b) Rote memorisation
(c) Visulisation (d) Comparison

Ans. (b) : Rote memorisation is not a mathematical process. Rote memorisation is a learning technique which focuses on memorisation. The major practice involved in rote learning is learning by repetition by which students commit information to memory in a highly structured way.

23. Mr. Javed is introducing the concept of multiples. He has planned three learning activities:

I. Write multiples of 2 on the blackboard and relate them to a real life example.
II. Explain that multiples are formed by skip counting of a number
III. Take a lot of 2 rupee coins and make stacks of 1 coin, 2 coins, 3 coins, etc.

Help him order these activities in the most appropriate sequence to build the concept well.

(a) I, II, III (b) III, I, II
(c) II, I, III (d) III, II, I

Ans. (d) : The most appropriate sequence to build the concept well is first take a lot of 2 rupee coins and make stacks of 1 coin, 2 coins, 3 coins etc by which student get the basics of calculation, then explain that multiples are formed by skip counting of a number and finally write multiples of 2 on the blackboard and relate them to a real life example.

24. Which of the following preparatory activities is MOST suitable, BEFORE teaching the concept of area?

(a) Asking students to superimpose 2-D Shapes and compare the sizes
(b) Asking students to find the perimeter of various shapes
(c) Asking students to divide a 2-D shape into smaller equal pieces
(d) Asking students to count the number of unit squares in a 2-D shape

Ans. (a) : Asking students to superimpose 2-D shapes and compare the sizes is the most suitable activities before teaching the concept of area. By superimposing different figures student get the primary idea about the size of different figures i.e. which is smaller or greater. This superimposing of figures helps them in getting the concept of area easily.

25. "The sum of any two numbers is a whole number". This property of whole numbers is referred to as:

(a) Closure property
(b) Distributive property
(c) Commutative property
(d) Associative property

Ans. (a) : The closure property of a whole number says that when we add two whole number, the result will always be a whole number.

For example $4 + 2 = 6$

- Distributive Property $\Rightarrow a \times (b + c) = a \times b + a \times c$
  $a \times (b - c) = a \times b - a \times c$
- Commutative property $\Rightarrow a + b = b + a$
  $a + b \neq b - a$
  $a \times b = b \times a$
  $a \div b \neq b \div a$
- Associative Property $\Rightarrow a + (b + c) = (a + b) + c$
  $a - (b - c) \neq (a - b) - c$
  $a \times (b \times c) = (a \times b) \times c$
  $a \div (b \div c) \neq (a \div b) \div c$

26. According to National Curriculum Framework (NCF) 2005;

(a) Narrow aim of teaching mathematics is to teach numbers and number concepts and higher aim is to teach measurements.
(b) Narrow aim of teaching mathematics is to teach precise calculation and higher aim to teach calculus.
(c) Narrow aim of teaching mathematics is to develop numeracy related skill and higher aim is to develop problem solving skills
(d) Narrow aim of teaching mathematics is to develop mathematical language and higher aim is to solve word problems

Ans. (c) : According to National Curriculum Framework (2005), narrow aim of teaching mathematics is to develop numeracy related skill and higher aim is to develop problem solving skills. Clarity of thought and pursing assumptions to logical conclusion is central to the mathematical enterprise. Mathematics is an ability to handle abstractions and an approach to problem-solving.

27. In a Mathematics classroom, emphasis should be on

(a) Only mathematical content
(b) Mathematical processes and reasoning
(c) Solving mathematical problems
(d) Formal mathematical algorithms and processes

Ans. (b) : In a Mathematics Classroom, emphasis should be on mathematical processes, content and reasoning. It enables children to arrive at solutions/Judgments/Conclusion after manipulating the facts involved in the problems Mathematical reasoning plays an important role both in solving problems and conveying ideas when learning mathematics.

28. Majority of students in a class says 360 + 55 is equal to

360
+55
3115

Revisiting which of the following concepts will BEST remediate the misconception?

(a) Addition with regrouping
(b) Forward counting
(c) 3-digit addition
(d) One to one correspondence

Ans. (a) : Addition with regrouping will best remediate the misconception. Addition with regrouping also known as carrying over. It is a technique used in maths when adding together two or more number of any size. It is used with the column method of addition, where sums are arranged vertically and numbers are added, one column at a time.

29. Which of the following statements is NOT true?

(a) Mathematics is a discipline with mostly abstract concepts
(b) There is just one correct way of approaching the solution to mathematical problems
(c) People who cannot read or write also have mathematical knowledge
(d) Most of the sub-branches or mathematics are inter-connected

Ans. (b) : From the given statements the option (b) is not true. There isn't always one best way to solve a given problem. Mathematics is a very vast field that provide opportunity to generate multiple ways to a single problem. It is the ability of the student to think logically and apply his reasoning skills in order to generate multiple solutions.

30. Which among the following names is associated with a model of geometrical development that describes the levels of geometric reasoning in children?

(a) Jean Piaget (b) Michael Cole
(c) Van Hieles (d) B F Skinner

Ans. (c) : In mathematics education, the Van Hieles model is a theory that describes how students learn geometry. It postulates five levels of geometric thinking which are labeled as visualization, analysis, abstraction , formal deduction and rigour. Each levels uses its own language and symbols.

Central Teacher Eligibility Test (CTET) 2021
Primary Level (Class I-V)
Solved Paper with Explanation

(Exam Date : 08.01.2022)

1. Which of the following is not used to represent the data graphically?

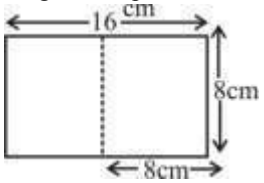
(a) Pictograph (b) Pie Chart
(c) Average (d) Histogram

Ans. (c) : Average means in particular set of data, finding the median or mean, which is calculated by dividing the sum of values in the set by their number.
Graphical presentation of data:-
- Histogram
- Pie chart
- Bar graph
- Pictographs
- Spaghetti plot
- Box and whisker plot

2. Shyama had a rectangular sheet of paper of length 16 cm and breadth 8 cm. Then she converted this sheet into a square sheet by folding the paper. What will be the change in the number of lines of symmetry after folding?

(a) Number of lines of symmetry increases by 1
(b) Number of lines of symmetry decreases by 1
(c) Number of lines of symmetry increases by 2
(d) Number of lines of symmetry decreases by 2

Ans. (c) : According to the question,



As Shown in the diagram there is two line increases in the lines of symmetry which is represented by dotted line.

3. Radha has a rectangular card whose length is 20 cm and breadth is 10 cm. Renu has a square shaped card with its side 15 cm. What is the difference between the perimeters of two cards?

(a) 0 cm (b) 5 cm
(c) 10 cm (d) 15 cm

Ans. (a) : Perimeter of Rectangle = 2(length + breadth)
= 2(20 + 10)
= 60 cm
Perimeter of square = 4 × side
= 4 × 15
= 60 cm
Difference between both the perimeters is (60 – 60) cm = 0cm

4. Select the components of circle from the options given below:

(a) Radius, Angle, Centre, Diameter
(b) Circumference, Side, Radius, Area
(c) Radius, Chord, Perimeter, Side
(d) Circumference, Centre, Radius, Diameter

Ans. (d) : Components of circle
- Circumference → Perimeter of circle $=2\pi r$
- Center → Middle point of circle = O
- Radius → Distant between center to its perimeter = r

- Diameter → Any straight line segment that passes through the center of Circle ⇒ d = 2r

5. If Meeta walks 16 km in one hour, How much distance will she travel in 210 minutes?

(a) 52 km (b) 56 km
(c) 60 km (d) 65 km

Ans. (b) : Given Meeta walks 16km in 1 hour or 60 minutes.

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{16}{1} = 16\text{km/hr}$$

$$210 \text{ min} = \frac{210}{60} \text{ hour}$$

= 3.5 hour
As we know,
Distance = speed × time
Distance = 16 × 3.5
Distance = 56 km

6. Amrita takes a square sheet and divides the sheet into 10 equal rectangular strips by drawing vertical lines. Then, she colours 3 strips with red colour. Now, she draws 10 horizontal lines on the same sheet which divides the paper equal into 100 parts. Which of the following fraction shows the part that in Not coloured?

(a) $\frac{3}{10}$ (b) $\frac{7}{10}$
(c) $\frac{7}{100}$ (d) $\frac{3}{100}$