

**PRATIYOGITA  
SAHITYA**

# CTET

Conducted by  
Central Board of Secondary Education  
Central Teacher Eligibility Test

# SOLVED PAPERS

## **PAPER-II**

**Mathematics & Science**  
(For Teaching in Classes VI-VIII)

**संस्कृत भाषा सहित**

- **Solved Papers of Previous Examinations**  
(With Explanatory Solutions)

Conducted by  
Central Board of Secondary Education

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# **SOLVED PAPERS**

**Paper-II**

Mathematics & Science  
For Teaching in Classes VI-VIII

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Solved Papers of Previous Examinations (December 2019, July 2019, December 2018,  
September & February 2016, 2015, 2014, 2013, 2012 & 2011)

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*By*  
**Editorial Board**

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# IMPORTANT INFORMATION ABOUT TEST

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## • ELIGIBILITY

The following persons are eligible for appearing in the CTET.

### **Minimum Qualifications for becoming Teacher for Classes VI-VIII : Elementary Stage :**

Graduation and passed or appearing in final year of 2-year Diploma in Elementary Education (by whatever name known).

OR

Graduation with at least 50% marks and passed or appearing in 1-year Bachelor in Education (B.Ed).

OR

Graduation with at least 45% marks and passed or appearing in 1-year Bachelor in Education (B.Ed), in accordance with the NCTE (Recognition Norms and Procedure) Regulations issued from time to time in this regard.

OR

Senior Secondary (or its equivalent) with at least 50% marks and passed or appearing in final year of 4-year Bachelor in Elementary Education (B.El.Ed).

OR

Senior Secondary (or its equivalent) with at least 50% marks and passed or appearing in final year of 4-year B.A./B.Sc.Ed or B.A.Ed/B.Sc.Ed.

OR

Graduation with at least 50% marks and passed or appearing in 1-year B.Ed. (Special Education)\*.

OR

Any candidate having qualified B.Ed. Programme recognized by the NCTE is eligible to appear in TET/CTET. Moreover, as per the existing TET guidelines circulated vide NCTE letter dated 11-02-2011, a person who is pursuing an of the teacher education courses dated 23 August 2010 is also qualified to appear in the TET/CTET.

**Note : (i) Relaxation up to 5% in the qualifying marks in the minimum Educational Qualification for eligibility shall be allowed to the candidates belonging to reserved categories, such as SC/ST/OBC/Differently abled.**

(ii) Diploma/Degree Course in Teacher Education : For the purposes of this Notification, a Diploma/Degree course in teacher education recognized by the National Council for Teacher Education (NCTE) only shall be considered. However, in case of Diploma in Education (Special Education) and B.ED (Special Education), a course recognized by the Rehabilitation Council of India (RCI) only shall be considered.

(iii) Training to be undergone : A person with D.Ed. (Special Education) or qualification shall undergo, after appointment, an NCTE recognized 6-month Special Programme in Elementary Education.

(iv) The minimum qualifications referred above apply to teachers of Languages, Social Studies/Social Science, Mathematics, Science etc. In respect of teachers for Physical Education the minimum qualification norms for Physical Education teachers referred to in NCTE Regulation, dated 3rd November, 2001 (as amended from time to time) shall be applicable. For teachers of Art Education, Craft Education, Home Science, Work Education, etc. the existing eligibility norms prescribed by the State Governments and other school managements shall be applicable till such time the NCTE lays down the minimum qualifications in respect of such teachers.

(v) **A person who is pursuing any of the teacher education courses (recognized by the NCTE or the RCI, as the case may be) specified in the NCTE Notification dated 29th July, 2011 shall be eligible for appearing in the CTET.**

(vi) **The candidate should satisfy his/her eligibility before applying and shall be personally responsible in case he/she is not eligible to apply as per the given eligibility criteria. It is to be noted that if a candidate has been allowed to appear in the Central Teacher Eligibility Test it does not imply that the candidate's eligibility has been verified. It does not vest any right with the candidate for appointment. The eligibility shall be finally verified, by the concerned recruiting agency/appointing authority.**

## • STRUCTURE AND CONTENT OF CTET

All questions in CTET will be Multiple Choice Questions (MCQs) with four alternatives out of which one answer will be correct. Each carrying one mark and there will be no negative marking.

There will be two papers of CTET.

(i) **Paper I** will be for a person who intends to be a teacher for classes I to V.

(ii) **Paper II** will be for a person who intends to be a teacher for classes VI to VIII.

**Note :** A person who intends to be a teacher for both levels (classes I to V and classes VI to VIII) will have to appear in both the papers (Paper I and Paper II).

● **Paper II (for Classes VI to VIII) Elementary Stage :**  
**Duration of examination - Two-and-a-half hours**  
**Structure and Content (All Compulsory) : (Appendix I)**

(i) Child Development & Pedagogy (compulsory)	30 MCQs	30 Marks
(ii) Language I (compulsory)	30 MCQs	30 Marks
(iii) Language II (compulsory)	30 MCQs	30 Marks
(iv) Mathematics and Science (for Mathematics and Science teacher)	60 MCQs	60 Marks
(v) Social Studies/Social Science (for Social Studies/Social Science teacher) For any other teacher-either (IV) or (V)	60 MCQs	60 Marks
<b>Total</b>	<b>150 MCQs</b>	<b>150 Marks</b>

**Nature and standard of questions :**

- The test items on Child Development and Pedagogy will focus on educational psychology of teaching and learning, relevant to the age group of 11-14 years. They will focus on understanding the characteristics, needs and psychology of diverse learners, interaction with learners and the attributes and qualities of a good facilitator of learning.
- The Test items in Language I will focus on the proficiencies related to the medium of instruction.
- The Test items in Language II will focus on the elements of language, communication and comprehension abilities.
- Language II will be a language other than Language I. A candidate may choose any one language as Language I and other as Language II from the available language options and will be required to specify the same in the Confirmation Page.
- Opt two languages in which you to appear for CTET : List of languages and code are as follows :

Language	Code No.	Language	Code No.	Language	Code No.	Language	Code No.
English	01	Gujarati	06	Marathi	11	Sanskrit	16
Hindi	02	Kannada	07	Mizo	12	Tamil	17
Assamese	03	Khasi	08	Nepali	13	Telugu	18
Bangali	04	Malayalam	09	Oriya	14	Tibetan	19
Garo	05	Manipuri	10	Punjabi	15	Urdu	20

- The Test items in Mathematics and Science and Social Studies/Social Science will focus on the concepts, problem solving abilities and pedagogical understanding of the subjects. The test items of Mathematics and Science will be of 30 marks each. The test items will be evenly distributed over different divisions of the syllabus of that subject as prescribed for classes VI-VIII by the NCERT.
- The questions in the test for Paper II will be based on the topics prescribed in syllabus of the NCERT for classes VI-VIII but their difficulty standard as well as linkages, could be up to the Senior Secondary stage.

● **SYLLABUS Paper II (for classes VI to VIII) Elementary Stage**

**I. Child Development and Pedagogy**

**30 Questions**

**(a) Child Development (Elementary 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 of 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 disadvantages 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 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

**III. Language-II 30 Questions****(a) Comprehension 15 Questions**

Two unseen prose passages (discursive or literary or narrative or scientific) with questions 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 and Science : 60 Questions****(i) Mathematics 30 Questions****(a) Content 20 Questions**

- **Number System**

- Knowing our Numbers
- Playing with Numbers
- Whole Numbers
- Negative Numbers and Integers
- Fractions

- **Algebra**

- Introduction to Algebra
- Ratio and Proportion

- **Geometry**

- Basic geometrical ideas (2-D)
- Understanding Elementary Shapes (2-D and 3-D)
- Symmetry : (reflection)
- Constructions (using Straight edge Scale, protractor, compasses)

- **Mensuration**

- **Data handling**

- (b) **Pedagogical issues**

**10 Questions**

- Nature of Mathematics/Logical thinking
- Place of Mathematics in Curriculum
- Language of Mathematics
- Community Mathematics
- Evaluation
- Remedial Teaching
- Problems of Teaching

- (ii) **Science**

**30 Questions**

- (a) **Content**

**20 Questions**

- **Food**

- Sources of food
- Components of food
- Cleaning food

- **Materials**

- Materials of daily use

- **The World of the Living**

- **Moving Things People and Ideas**

- **How things work**

- Electric current and circuits
- Magnets

- **Natural Phenomena**

- **Natural Resources**

- (b) **Pedagogical issues**

**10 Questions**

- Nature and Structure of Sciences
- Natural Science/Aims and Objectives
- Understanding & Appreciating Science
- Approaches/Integrated Approach
- Observation/Experiment/Discovery (Method of Science)
- Innovation
- Text Material/Aids
- Evaluation-cognitive/psychomotor/affective
- Problems
- Remedial Teaching.

# Central Teacher Eligibility Test (CTET), 2019

(Held on 08-12-2019)

Paper-II (For Teaching Mathematics and Science in Classes VI-VIII)

## SOLVED PAPER

### PART I : CHILD DEVELOPMENT AND PEDAGOGY

**Directions :** Answer the following questions (Q. Nos. 1 to 30) by selecting the **correct/most appropriate** options.

1. Which of the following statements about the role of heredity and environment in human development is correct?
  - (A) Environmental influences totally shape the development of a human
  - (B) Neither heredity nor environment influence human development
  - (C) Heredity and environment both influence human development in a complex interplay
  - (D) The only reason for individual differences is heredity
2. In a progressive classroom :
  - (A) knowledge is received passively by the learner
  - (B) knowledge is reproduced by the learner as it is
  - (C) knowledge is recalled by the learner as per instructions of the teacher
  - (D) knowledge is constructed by the learner
3. Continuous and comprehensive evaluation includes :
  - (A) only summative assessment
  - (B) neither formative nor summative assessment
  - (C) both formative and summative assessments using a wide variety of strategies
  - (D) only formative assessment
4. The process by which children develop habits, skills, values and motives that make them responsible, productive members of society is called :
  - (A) inclusion
  - (B) mainstreaming
  - (C) differentiation
  - (D) socialization
5. In an inclusive classroom, a teacher should :
  - (A) show an attitude of pity and sympathy towards disabled learners
  - (B) use labels such as 'handicapped child', 'retarded child' to categorize children
  - (C) pay attention only to the gifted and talented children
  - (D) believe that every child has a potential to learn as per their abilities and strength
6. A student shows the following signs in the classroom :
  - Anxiety around reading
  - Difficulty in recognizing words or letters
  - Poor vocabulary skills
  - Difficulty with understanding or remembering what was readThese are an indication of :
  - (A) a creative student
  - (B) a student with learning disability
  - (C) a student with 'mental impairment'
  - (D) an autistic student
7. A student in your class has been told again and again from different sources that people from his social group typically perform poorly in academics. To reduce the impact of this stereotype and resultant stereotype threat, a teacher's initial step can be :
  - (A) organizing competition between students from different social groups
  - (B) suggesting the student to leave academics and join some other domain
  - (C) presenting stories and examples of role models from different social groups
  - (D) ignoring such concerns
8. A teacher can encourage creative learners in her classroom by :
  - (A) discouraging divergent thinking
  - (B) encouraging multiple perspectives and appreciating original ideas
  - (C) discouraging the students from taking risks and undertaking challenges
  - (D) emphasizing convergent thinkings
9. Which of the following factors supports meaningful learning in the classroom?
  - (A) Increasing rewards to motivate children to learn
  - (B) Following only the lecture mode of instruction
  - (C) Showing genuine interest in the content matter and having concern for children's overall well-being and learning
  - (D) Increasing number of tests to motivate children to learn
10. An example of effective problem solving strategy is :
  - (A) Functional fixedness - focusing on only the conventional function of an object
  - (B) Response set - getting stuck on one way of representing a problem
  - (C) Means-end analysis-dividing the problem into number of sub-goals
  - (D) Not paying any attention to evaluating the solution
11. A teacher can address needs of specially abled learners in an inclusive classroom by :
  - (A) following uniform ways of instructing the students
  - (B) giving a lot of written homework and stressing on copying of answers from other 'bright students'
  - (C) developing specific learning objectives based on an analysis of each student's learning strengths and weaknesses
  - (D) emphasizing upon practice and drill and using paper-pencil tests for assessment



12. How can teachers deal with children who are non-attentive in the classroom?  
 (A) Scold them frequently in front of the entire class  
 (B) Talk to them and find out reasons for their disinterest  
 (C) Give them a lot of worksheets as homework  
 (D) Ask the children to go out of the class
13. Constructivist approach suggests that ..... is crucial for constructing knowledge.  
 (A) conditioning  
 (B) punishment  
 (C) rote memorization  
 (D) prior knowledge of the learner
14. Children construct 'naive theories' about various phenomenon. In this background a teacher should :  
 (A) dismiss these ideas that children have  
 (B) ignore children's ideas and theories  
 (C) scold the children for having these ideas that interfere with her teaching  
 (D) challenge these conceptions of the children through dialogue
15. Which of the following is NOT an effective strategy for teaching-learning?  
 (A) Experimentation and exploration  
 (B) Dialogue and discussion  
 (C) Focusing on reproduction of knowledge as given  
 (D) Encouraging children to make intuitive guesses
16. Which of the following factors affect learning?  
 (i) Interest of the student  
 (ii) Emotional health of the student  
 (iii) Pedagogical strategies  
 (iv) Social and cultural context of the student  
 (A) (ii), (iii) (B) (i), (ii), (iii)  
 (C) (i), (ii), (iii), (iv) (D) (i), (ii)
17. .... are an important aspect of the process of meaningful construction of knowledge.  
 (A) Drill and repetitive recall  
 (B) Rewards and punishment  
 (C) Stimulus-response associations  
 (D) Social interactions
18. When students repeatedly engage in an activity (such as design and conduct an experiment) to earn a reward that is not directly related to that activity (such as earn a 'star' or 'badge') they are likely to :  
 (A) enjoy learning for the sake of understanding  
 (B) persist in doing the activity even without the reward  
 (C) set mastery goals for themselves rather than work to please others  
 (D) develop materialistic attitude towards learning
19. The relationship between cognition and emotions is :  
 (A) uni-directional – emotions influence cognition  
 (B) uni-directional – cognition influences emotions  
 (C) bi-directional – a dynamic interplay between both  
 (D) independent of each other
20. Which of the following characterize the period of 'middle childhood'?  
 (A) Ability to think abstractly and use of scientific reasoning develops  
 (B) Children begin to think logically but concretely  
 (C) Learning occurs primarily through sensory and motor activities  
 (D) Physical growth and development occur at a very rapid pace
21. Family and neighbourhood are :  
 (A) primary socializing agencies  
 (B) middle socializing agencies  
 (C) secondary socializing agencies  
 (D) psychological agencies for children
22. The concept of childhood is :  
 (A) a social construction according to contemporary socio-constructivist theorists  
 (B) that children are born evil and have to be civilized  
 (C) that children begin with nothing at all and their characteristics are shaped entirely by environment  
 (D) universally the same across different cultural contexts
23. Widely held beliefs about typified characteristics deemed appropriate for different sexes in the society are referred to as :  
 (A) gender roles  
 (B) gender identity  
 (C) gender stereotypes  
 (D) gender discrimination
24. Recently there have been conscious efforts to include stories in curriculum where father is involved in household works and mother is doing adventure activities. This move is important because :  
 (A) it aims to eliminate gender stereotyping  
 (B) it aims to encourage gender constancy  
 (C) it aims to increase gender discrimination  
 (D) it aims to strengthen gender bias
25. According to Vygotsky, when adults adjust the support to extend the child's current level of performance, it is called :  
 (A) zone of proximal development  
 (B) scaffolding  
 (C) inter-subjectivity  
 (D) discovery learning
26. Noor forgot to bring her tiffin to school and asked Tanya to share her tiffin saying "You should share your tiffin with me today because I shared my tiffin with you yesterday". According to Lawrence Kohlberg's theory of moral development, Noor's statements represents ..... orientation typical at ..... stage.  
 (A) obedience ; pre-conventional  
 (B) being nice ; conventional  
 (C) exchange ; conventional  
 (D) law and order ; post-conventional

27. According to ..... , it is important to understand the social processes and influence of the cultural context on children's thinking.  
 (A) Jean Piaget  
 (B) Lev Vygotsky  
 (C) Albert Bandura  
 (D) Lawrence Kohlberg
28. Drawing implications from Piaget's theory of cognitive development, a teacher of grade 6-8 in his classroom should :  
 (A) present problems that require reasoning based solutions  
 (B) use only concrete materials to teach a concept  
 (C) rely solely on prescribed syllabus  
 (D) discourage use of logical arguments
29. As per Howard Gardner's theory of multiple intelligence, what would be the characteristics of a person with 'Logico-mathematical' intelligence?  
 (A) Ability to perceive visual-spatial world accurately  
 (B) Ability to produce and appreciate pitch, rhythm and aesthetic quality of musical expressiveness  
 (C) Sensitivity to and capacity to detect patterns, handle long chains of reasoning  
 (D) Sensitivity to the sounds, rhythms and meaning of words
30. According to Jean Piaget's theory of cognitive development, hypothetico-deductive reasoning develops during :  
 (A) pre-operational stage  
 (B) concrete operational stage  
 (C) formal operational stage  
 (D) sensori-motor stage

## PART-II : MATHEMATICS AND SCIENCE

**IMPORTANT :** Candidates have to do questions 31 to 90 from part-II (Mathematics and Science)

**Directions :** Answer the following questions by selecting the **correct/most appropriate** options :

31. A godown is in the shape of a cuboid whose length, breadth and height are 56 m, 42 m and 10 m respectively. How many (maximum) cuboidal boxes each measuring  $2.8 \text{ m} \times 2.5 \text{ m} \times 70 \text{ cm}$  can be stored into the godown?  
 (A) 3600 (B) 4800  
 (C) 5400 (D) 2400
32. The circumference of the base of a right circular cylinder is 528 cm and its height is 2 m. What is the volume of the cylinder?  
 (A)  $3.3264 \text{ m}^3$  (B)  $4.4352 \text{ m}^3$   
 (C)  $6.6528 \text{ m}^3$  (D)  $2.2176 \text{ m}^3$
33. The area of a quadrilateral is  $227.2 \text{ cm}^2$  and the length of the perpendiculars from the opposite vertices to a diagonal are 7.2 cm and 8.8 cm. What is the length of the diagonal?  
 (A) 28.4 cm (B) 30.2 cm  
 (C) 32.6 cm (D) 26.8 cm
34. If  $5(3x + 4) - 8(6x + 7) = 9x - 8$ , then what is the value of  $(x^2 - 2x + 1)$ ?  
 (A)  $\frac{4}{9}$  (B)  $\frac{5}{3}$  (C)  $\frac{25}{9}$  (D)  $\frac{2}{3}$
35. What is the value of :  
 $a(a + b^2 + c) + b^2(a^2 + b^2 + c^2) - c(a + b^2)$ , when  $a = 1$ ,  
 $b = -3$  and  $c = -2$ ?  
 (A) 154 (B) 162  
 (C) 176 (D) 138
36. The expression :  
 $(x - y)(x^2 + xy + y^2) + (x + y)(x^2 - xy + y^2) - (x + y)(x^2 - y^2)$  is equal to :  
 (A)  $y^3 - x^3 + xy(y + x)$  (B)  $x^3 + y^3 + xy(y - x)$   
 (C)  $x^3 + y^3 + xy(x - y)$  (D)  $x^3 - y^3 + xy(x + y)$
37. What is the mean of the median, mode and range for the data given below?  
 11, 25, 0, 8, 25, 30, 44, 50, 30, 18, 20, 17, 11, 9, 24, 25, 29  
 (A) 32 (B) 33  
 (C) 34 (D) 31
38. A mathematical theorem is :  
 (A) a statement which is always true and doesn't need proof.  
 (B) a statement whose truth or falsity is not known.  
 (C) is a statement without sufficient evidence for proof.  
 (D) a statement that has been proven by logical arguments based on axioms.
39. "Things which are equal to the same thing are equal to one another." This axiom which is basis to arithmetic and algebra is given by :  
 (A) Pythagoras (B) Descartes  
 (C) Euler (D) Euclid
40. Which of the following can be used as assessment strategy to encourage interdisciplinary in Mathematics?  
 (a) Projects (b) Field trips  
 (c) Anecdotal records (d) Olympiad  
 (A) (a) and (c) (B) (b) and (c)  
 (C) (c) and (d) (D) (a) and (b)
41. Which method can be used to prove "The sum of two even integers is always even"?  
 (A) Direct proof (B) Proof by contradiction  
 (C) Counter positive proof  
 (D) Proof by induction
42. Which of the following skills are promoted by mathematics at upper primary stage?  
 (a) Visualisation (b) Transposition  
 (c) Memorisation (d) Generalisation  
 (e) Estimation  
 (A) (a), (b), (c), (d) (B) (b), (c), (d), (e)  
 (C) (a), (c), (d), (e) (D) (a), (b), (d), (e)

43. Which of the following tasks is least likely to develop critical thinking among students?
- (A) Formulate any two situations to represent the equation  $7x + 3 = 24$ .
- (B) A student calculated the volume of a right circular cylinder of radius 3.5 cm and height 10 cm as  $38.5 \text{ cm}^3$ . Where did she go wrong?
- (C) Calculate the volume of a right circular cylinder of radius 3.5 cm and height 10 cm
- (D) Evaluate  $72 \times 73$  in three different ways and compare the result.
44. Which of the following aligns with the overall objective of achieving 'Mathematics for All' as per NCF-2005?
- (A) Textbooks should only include problems of average difficulty
- (B) Contributions of mathematicians from different regions and different social groups should be highlighted
- (C) Mathematically talented students should be groomed in isolation
- (D) It should be acknowledged that mathematics is meant for selected few students
45. Which of the following is considered as a characteristic of an effective mathematics classroom?
- (A) It is emphasized that mathematics is essentially a concrete subject.
- (B) Multiple ways of approaching a problem are encouraged.
- (C) Steps for solving a new problem are neatly demonstrated on the board by the teacher.
- (D) Group work and group problem-solving is discouraged.
46. Which of the following is a desirable practice in the context of teaching and learning of measurement of volume?
- (A) Encourage precise calculation right from the beginning.
- (B) Begin by introducing students to the volume of 2-D figures.
- (C) Encourage students to figure out ways to calculate the volume of different objects.
- (D) Begin by writing the formula of volume of a cube
47. Which of the following is NOT true according to Piaget's view of children's understanding of space?
- (A) Progression of Geometric ideas follows a historical rather than a logical order.
- (B) Early understanding of space is formed by child's sensory motor experiences.
- (C) Co-ordination of different visual and tactile experiences is required for understanding projective space.
- (D) Progression of geometric ideas follows a definite order.
48. If  $-12 \times (-3) + [20 \div (-4) - (-24) \div 8] - [16 \div (-2)] = (-28 \div 7) + x$ , then the value of  $x$  is :
- (A) 39 (B) 46
- (C) 47 (D) 29
49. If an 8-digit number  $30x0867y$  is divisible by 88, then what is the value of  $(3x + y)$ ?
- (A) 5 (B) 6
- (C) 7 (D) 4
50. The value of  $6\frac{2}{3} \div 2\frac{1}{2} \times 3\frac{3}{4} - 5\frac{1}{2} \times 4\frac{1}{4} + 1\frac{2}{3} \left( \frac{7}{8} + \frac{3}{4} \times \frac{2}{3} \right)$  is :
- (A)  $11\frac{1}{12}$  (B)  $6\frac{1}{2}$
- (C)  $-6\frac{1}{2}$  (D)  $-11\frac{1}{12}$
51. How many pairs of twin primes are there between the integers 1 to 100?
- (A) 6 (B) 7
- (C) 8 (D) 5
52. If  $21168 = 2^a \times 3^b \times 7^c$ , where  $a, b$ , and  $c$  are natural numbers, then what is the value of  $(4a - 5b + c)$ ?
- (A) 1 (B) 2
- (C) 3 (D) 0
53. Let  $x$  be the least number which when divided by 8, 12, 20, 28, 35 leaves a remainder 5 in each case. What is the sum of digits of  $x$ ?
- (A) 14 (B) 15
- (C) 17 (D) 11
54. What number should be subtracted from each of 50, 61, 92, 117 so that the numbers, so obtained in this order, are in proportion?
- (A) 17 (B) 19
- (C) 23 (D) 14
55. A sum of ₹ 1,710 is divided in A, B and C such that 4 times of A, 6 times of B and 9 times of C are equal. What is the difference between A and C?
- (A) ₹ 450 (B) ₹ 480
- (C) ₹ 540 (D) ₹ 360
56. The number of fruits in baskets A and B are in the ratio 7 : 9. If six fruits are taken out from A and put in B, then this ratio becomes 1 : 3. The total number of fruits in A and B is :
- (A) 32 (B) 36
- (C) 40 (D) 28
57.  $\triangle ABC$  and  $\triangle ADB$  are on the common base AB and on the same side of AB.  $DA \perp AB$ ,  $CB \perp AB$  and  $AC = BD$ . Which of the following is true?
- (A)  $\triangle ABC \cong \triangle ADB$  (B)  $\triangle ABC \cong \triangle BAD$
- (C)  $\triangle ABC \cong \triangle BDA$  (D)  $\triangle ABC \cong \triangle ABD$
58. The sides of four triangles are given below :
- (i) 20 cm, 22 cm, 24 cm (ii) 15 cm, 32 cm, 37 cm
- (iii) 11 cm, 60 cm, 61 cm (iv) 19 cm, 40 cm, 41 cm
- Which of them forms a right triangle?
- (A) (ii) (B) (iii)
- (C) (iv) (D) (i)



59. The angles of a quadrilateral are in the ratio 3 : 5 : 7 : 9. What is the difference between the least and the greatest angles of the quadrilateral?  
(A)  $60^\circ$  (B)  $72^\circ$   
(C)  $90^\circ$  (D)  $50^\circ$

60. The perimeter of a triangle is 12 cm. If all the three sides have lengths (in cm), in integers, then how many such different triangles are possible?  
(A) 3 (B) 4  
(C) 5 (D) 2

**Directions :** Answer the following questions by selecting the **correct/most appropriate** options.

61. Identify the incorrect statement :

- (A) Friction between two surfaces in contact can never be eliminated on earth  
(B) Rolling friction is less than sliding friction  
(C) The friction force on an object moving through a fluid depends upon its shape  
(D) Ball bearings are used to increase friction between parts of a machine

62. Which of the following statements is/are correct?

- (a) Iron can replace zinc from zinc sulphate solution.  
(b) Zinc can replace copper from copper sulphate solution.  
(c) Copper can replace Iron from Iron sulphate solution.  
(A) Only (b) (B) (a) and (b)  
(C) (b) and (c) (D) Only (a)

63. Identify the correct statement from among the following :

- (A) Room thermometers have a range from  $30^\circ\text{C}$  to  $100^\circ\text{C}$   
(B) Laboratory thermometers have a range from  $35^\circ\text{C}$  to  $42^\circ\text{C}$   
(C) The range of a laboratory thermometer is greater than that of a clinical thermometer  
(D) Clinical Thermometer can be used to measure the temperature of boiling liquids

64. Identify the incorrect statements :

- (A) The calorific value of coal is more than that of Wood  
(B) The calorific value of Biogas is more than that of LPG  
(C) The calorific value of CNG is more than that of Diesel  
(D) The calorific value of Kerosene is more than that of Coal

65. A bus travels at a speed of 50 km/h for 12 minutes and then at a speed of 40 km/h for the next 18 minutes. Total distance covered by the bus during this time is :

- (A) 22 km (B) 24 km  
(C) 28 km (D) 20 km

66. Identify the incorrect statement from among the following :

- (A) The motion of light is rectilinear motion  
(B) The motion of plucked string of a sitar is oscillatory motion  
(C) All periodic motions are circular motions  
(D) The motion of earth around its axis is periodic motion

67. Which of the following statements is/are correct regarding image formation in plane mirror?

- (a) Image is erect.  
(b) Image is real.  
(c) Image is laterally inverted.  
(d) The image size is same that of object.  
(A) (a), (b), (d) (B) (b), (c), (d)  
(C) (a), (b), (d) (D) (a), (b), (c)

68. Which of the following is a NOT true w.r.t. the nature of Science?

- (A) Science is always tentative  
(B) Science promotes scepticism  
(C) Science is equivalent to a set of facts  
(D) Science is an interdisciplinary area of learning

69. As per NCF 2005, good Science education should be the :

- (A) true to the child  
(B) true to the environment of the school  
(C) true to the classroom culture  
(D) true to science teacher

70. Which of the following validities of a good science education curriculum is satisfied by Activity and Experiment?

- (A) Historical (B) Environmental  
(C) Process (D) Cognitive

71. Anu took her class VIII children to field trip. Which of the following could be the most appropriate objective/s for this activity?

- (a) It encourages interaction among children.  
(b) It promotes process skills through concrete experiences.  
(c) It enhances observation skills among the children.  
(d) It breaks the monotony of class as well as of teacher.

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

72. Which of the following should NOT be an objective of science education at the upper primary level?

- (A) Inculcating the values of co-operation and concern for life  
(B) Cultivating scientific temper  
(C) Emphasising the textbook definitions of concepts  
(D) Nurturing the natural curiosity of children

73. Which of the following can enhance critical thinking among children?

- (A) Asking children to read the extended learning given at the end of the textbook

- (B) Asking children to discuss among themselves in groups followed by sharing in large group  
(C) Demonstration of experiments by the teacher  
(D) Asking children to read science textbook in the class
74. A teacher begins the class by demonstrating the chemical test of starch in a given sample of food. The cognitive process associated with the underlined word in the above statement is :  
(A) Analysing (B) Applying  
(C) Understanding (D) Creating
75. Which of the following activities will NOT provide for active learning among children?  
(A) Organisation of field trip  
(B) Developing a science corner  
(C) Listening to a lecture in class  
(D) Establishing science club
76. Which of the following is used for finding the learning gaps of learners in Science?  
(a) Concept map  
(b) Anecdotal record  
(c) Portfolio  
(d) Term end achievement test  
(A) (a) and (d) (B) (a), (b) and (c)  
(C) (b), (c) and (d) (D) (d) only
77. Which of the following tools is based on the technique of observation?  
(A) Written test (B) Paper-pencil test  
(C) Anecdotal record (D) Oral test
78. Which of the following statements are correct?  
(a) Pashmina shawl is made from hair of goats.  
(b) Angora is a type of wool obtained from Rabbits.  
(c) Camel wool is used to make carpets.  
(d) Pashmina wool is obtained from rabbits.  
(A) (a) and (b) (B) (b) and (c)  
(C) (c) and (d) (D) (a) and (c)
79. Identify the animal on the basis of features listed below :  
(a) Long back bone  
(b) Many muscles  
(c) Body curves into many loops for moving forward  
(A) Earthworm (B) Snail  
(C) Hook worm (D) Snake
80. Which of the following statement is NOT true?  
(A) All arteries carry oxygen from heart to other parts  
(B) Arteries have thick walls  
(C) Arteries have elastic walls  
(D) All arteries carry oxygen rich blood
81. Which of the following represents correct matching order?  
(a) Acetic acid (i) Curd  
(b) Lactic acid (ii) Spinach  
(c) Oxalic acid (iii) Citrus fruits  
(d) Ascorbic acid (iv) Vinegar
- |     |      |       |       |       |
|-----|------|-------|-------|-------|
|     | (a)  | (b)   | (c)   | (d)   |
| (A) | (i)  | (ii)  | (iii) | (iv)  |
| (B) | (iv) | (i)   | (ii)  | (iii) |
| (C) | (ii) | (iv)  | (i)   | (iii) |
| (D) | (ii) | (iii) | (iv)  | (i)   |
82. 'X' is a chemical present in our stomach and is necessary for digestion of food. When 'X' is secreted in excess, it causes health problems like indigestion. 'Y' is a chemical used to treat this condition. What could be 'X' and 'Y'?  
(A) X is milk of magnesia and Y is hydrochloric acid  
(B) X is hydrochloric acid and Y is milk of magnesia  
(C) X is milk of magnesia and Y is ascorbic acid  
(D) X is hydrochloric acid and Y is sodium carbonate
83. In which of the following processes, Bacteria is NOT used?  
(A) Baking of bread  
(B) Fermentation of Sugarcane juice  
(C) Nitrogen fixation  
(D) Formation of curd
84. Which of the following is different from the rest?  
(A) Desertification (B) Erosion  
(C) Conservation (D) Deforestation
85. Which of the following statements is NOT correct?  
(A) Photosynthesis is a chemical change.  
(B) Respiration is a chemical change.  
(C) Crystallisation is a chemical change.  
(D) Digestion is a chemical change.
86. Which of the following represents an ascending order as per the size of particles?  
(A) Clay, Silt, Sand, Gravel, Rock  
(B) Silt, Clay, Sand, Gravel, Rock  
(C) Rock, Gravel, Sand, Silt, Clay  
(D) Rock, Clay, Sand, Gravel, Silt
87. The function of gills in the fish is to :  
(A) absorb nutrients present in water  
(B) absorb dissolved oxygen from water  
(C) excrete waste into water  
(D) take in oxygen from air
88. Which of the following can be used to complete an electric circuit if one runs out of connecting wire?  
(A) A rubber belt (B) A wooden stick  
(C) A blade (D) A paper strip
89. Manjula is observing her image in a plane mirror. The distance between herself and the mirror is 5 m. She moves 1 m towards the mirror. The distance between herself and her image now is :  
(A) 4 m (B) 8 m  
(C) 10 m (D) 1 m
90. A pendulum oscillates 30 times in 3 seconds. Choose the correct statement from among the following :  
(A) It's time period is 0.1 s and frequency is 10 Hz  
(B) It's time period is 10 s and frequency is 0.3 Hz  
(C) It's time period is 0.3 s and frequency is 0.3 Hz  
(D) It's time period is 10 s and frequency 3 Hz



## PART-IV : LANGUAGE-I : ENGLISH

**IMPORTANT :** Candidates should attempt questions from **Part—IV (Q. Nos. 91 to 120)**, if they have opted for **ENGLISH** as **LANGUAGE—I** only.

**Directions (91-99) :** Read the passage given below and answer the questions that follow by selecting the correct/most appropriate options :

Learning a language under any circumstances requires hard work and concentration. However, the circumstances can make a difference in both quality and quantity. Most foreign language students learn in a classroom, from a text-book. In a classroom, language learning can be controlled so that all the necessary structures are taught. Highly motivated students can thus learn the language efficiently and quickly. Learning on the streets and in the markets from experience and need can be effective although the student learns only what he happens to need, in a haphazard way.

Some language students find this real-life situation more meaningful because the students success in fulfilling their needs depends on their language ability. However, shop-keepers are more likely to be tolerant of incorrect grammar than classroom teachers, so mispronunciations and errors will not matter much. Nevertheless, the rewards are different for the type of language learning situations. They are immediate (goods, bought in a store) in the real-life but delayed until a quiz or oral recital for the classroom learner.

The kind of language learnt in each setting differs too. In the classroom, the student is more likely to learn the grammatical language of educated people. The language learnt out of necessity often lacks the fine details of the classroom variety and might include informal expressions such as slang. The people learning on the street must be easily understood. Therefore, they might actually sound more like native speakers—although not necessarily educated people. So a combination of classroom instruction and the experience of using language in the street will result in the best language learning of all.

**91.** Study the following statements :

- (a) At school one learns the language of educated people.
- (b) Language learnt on the street includes the use of slang.
- (A) (a) is wrong and (b) is right
- (B) Both (a) and (b) are right
- (C) Both (a) and (b) are wrong
- (D) (a) is right and (b) is wrong

**92.** Which part of speech is the underlined word in the following sentence?

The kind of language learnt in each setting differs too :

- (A) Determiner
- (B) Conjunction
- (C) Preposition
- (D) Pronoun

**93.** Study the following phrase. Which part of speech is the underlined word?

'but delayed until a quiz....'

- (A) Determiner
- (B) Conjunction
- (C) Preposition
- (D) Pronoun

**94.** What does the word 'motivated' mean in the following phrase?

'Highly motivated students can thus .....

- (A) resourceful
- (B) muddled
- (C) interested
- (D) intelligent

**95.** '.....in a haphazard way'.

The word 'haphazard' means

- (A) unorganized
- (B) safe
- (C) proper
- (D) dangerous

**96.** The best place to correctly and quickly learn a foreign language is :

- (A) only the market place
- (B) both the classroom and the market place
- (C) home
- (D) only the classroom

**97.** A text-book :

- (A) motivates the students
- (B) teaches what a student needs
- (C) is an inexpensive tool of learning
- (D) controls languages learning

**98.** Language needs of real-life situations are fulfilled by :

- (A) learning the language structures
- (B) learning on the streets
- (C) learning proper pronunciation
- (D) studying text-books carefully

**99.** Which of the following statements is NOT true?

- (A) Real-life situations are more meaningful for language learning
- (B) Classroom learning can be tested in an oral recital
- (C) Foreign students learn language mostly from text-books
- (D) Shopkeepers are intolerant of incorrect pronunciation

**Directions (100-105) :** Read the extract given below and answer the questions that follow by selecting the correct/most appropriate options :

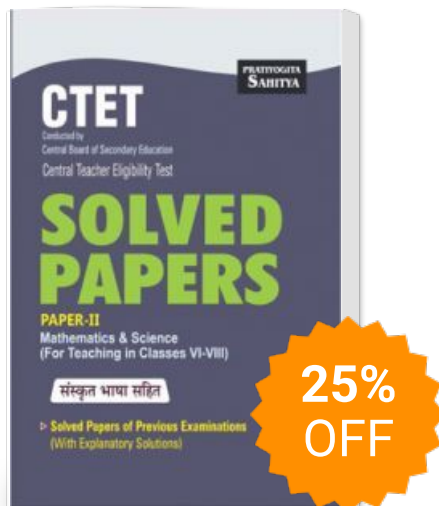
Great, wide, beautiful, wonderful world,  
With the wonderful water around you curled,  
And the wonderful grass upon your breast  
World, you are beautifully drest.

The wonderfull air is over me,  
And the wonderful wind is shaking the tree,  
It walks on the water, and whirls the mills,  
And talks to itself on the tops of the hills.  
You friendly Earth, how far do you go,  
With the wheat - fields that nod and the rivers that flow  
With cities and gardens, and cliffs and isles,

And people upon you for thousands of miles?  
 Ah ! You are so great and I am so small,  
 I tremble to think of you, world, at all;  
 And yet when I said my prayers today,  
 A whisper inside me seemed to say,  
 'You are more than the Earth, though you are such  
 a dot,  
 You can love and think, and the Earth cannot !'

- 100.** In the extract the poet has compared :  
 (A) World with the Earth  
 (B) World with the air  
 (C) the Earth with the air  
 (D) Man with the Earth
- 101.** Mood of the speaker in all of these lines is :  
 (A) joyous (B) sad  
 (C) introspective (D) serious
- 102.** The figure of speech used in the first stanza of the extract is :  
 (A) Synecdoche (B) Onomatopoeia  
 (C) Personification (D) Simile
- 103.** The figure of speech used in the phrase 'and whirls the mills' is :  
 (A) Synecdoche (B) Onomatopoeia  
 (C) Personification (D) Simile
- 104.** The beautiful dress worn by the Earth is made of :  
 (A) gardens and wheat-fields  
 (B) water and grass  
 (C) mountains and forests  
 (D) mills and the hills
- 105.** The cities, gardens, cliffs and isles show that the Earth is :  
 (A) friendly (B) small  
 (C) well populated (D) huge
- 106.** A teacher divides her class into groups of four and reads out a text of about six sentences. Learners listen to and jot down important words and phrases. The teacher reads out the text the second time. Then learners discuss in groups the jotted down words and recreate the text nearer to the one read out by the teacher. What is this task known as?  
 (A) Mutual Dictation  
 (B) Punctuation Dictation  
 (C) Real Dictation  
 (D) Composition Dictation
- 107.** Intensive reading refers to :  
 (A) reading a text for pleasure  
 (B) reading a text for editing  
 (C) reading a text for someone else  
 (D) reading a text for detailed information
- 108.** Knowing a word means :  
 (A) how the word is spelt  
 (B) who speaks the word  
 (C) to know to write the word  
 (D) how, where and when it is used
- 109.** Which typology of question does the following question belong to?  
 Imagine you are the narrator of the story. Write an entry in your diary about your experiences in about 100 words :  
 (A) Inferential question (B) Cloze question  
 (C) Extrapolative question (D) Informative question
- 110.** Poetry teaching is .....  
 (A) to learn poetic devices  
 (B) for enjoyment and appreciation  
 (C) to write a critical commentary  
 (D) to learn words and phrases
- 111.** Learning outcomes aim at :  
 (A) achieving maximum levels of learning  
 (B) achieving minimum levels of learning  
 (C) ensuring all the competencies are acquired by learners  
 (D) output oriented learning
- 112.** A teacher brings a newspaper to her class VIII students and asks them to find some advertisements. She then asks them to list out how advertisements are designed and what an advertisement contains. What is the newspaper here?  
 (A) An instrument of language learning  
 (B) A technique of language learning  
 (C) Materials for language learning  
 (D) For reading
- 113.** National Curriculum Framework 2005 assigns 'supplementary' and 'complimentary' roles to English language. This means that :  
 (A) English language teaching has nothing to do with teaching-learning of other languages  
 (B) English language teaching is a hindrance to learning of other languages  
 (C) English language teaching violates the mother tongue based language education  
 (D) English language teaching should support learning of other languages and subjects
- 114.** A reader uses her prior knowledge, makes semantic cues and syntactic cues then moves to other more specific information. What model of reading the reader here adopts?  
 (A) Top down model (B) Interactive model  
 (C) Whole language model  
 (D) Bottom up model
- 115.** Drilling is a teaching-learning technique or a strategy in .....  
 (A) Structuralism  
 (B) Communicative learning teaching  
 (C) Lexical approach  
 (D) Constructivist language teaching
- 116.** Which of the following statements is TRUE of language learning?  
 (A) First language supports the learning of second language  
 (B) Language learning has nothing to do with content learning  
 (C) Every language is different and learning of languages is also discreet  
 (D) First language interferes in the learning of second language

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