

PREVIOUS YEAR PAPER

CTET Paper II — 14 December 2024 (Set D) — Mathematics and Science

CTET · 14 December 2024

128 of the paper's 150 questions · +1 for a correct answer, -0 for a wrong one · 150 minutes

Left out of the original paper: 22 (any question that needs a figure, a symbol or formatting we cannot show, or whose text did not read back cleanly from the booklet).

Questions from the Central Board of Secondary Education's paper of 14 December 2024. Each question is followed by its answer, and the answer key is repeated on the last page.

Take it as a timed practice test: exambharo.com/ctet/previous-year-papers/ctet-2024-paper-2-14-dec-set-d-maths-science/

Child Development and Pedagogy

1. Which of these statements would advocates of progressive education agree with ?

- (a) Children are a distinct life-stage that hold importance because of 'what they would become as adults' rather than 'what they are as children'.
- (b) Children are naturally 'good' and society corrupts them.
- (c) Children are naturally 'uncivilized' and socialization is necessary to make them moral human beings.
- (d) Children are born in a social, cultural, economic context and this background influences their development.

Answer: (d)

2. Changes in emotion, self-perception and personal relationships with families, peers and friends are studied under _____ domain of development.

- (a) Psycho-social
- (b) Physical
- (c) Cognitive
- (d) Linguistic

Answer: (a)

3. The behaviours, interests, attitudes, skills and personality traits that a culture considers appropriate for specific gender are referred to as _____ and are _____.

- (a) Gender identity; genetically determined
- (b) Gender roles; culturally defined
- (c) Gender roles; genetically determined
- (d) Gender identity; culturally defined

Answer: (b)

4. Assertion (A) : In an inclusive classroom, all curriculum adaptations should be directed to lower the educational standards for 'Special children'. Reason (R) : 'Special children' do not have any potential for learning in mainstream classroom. Choose the correct option.

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

Answer: (a)

5. As per Jean Piaget's theory of Cognitive Development :

- (a) Previous knowledge doesn't play any role in the process of learning.
- (b) Biological factors such as maturation don't play any role in cognitive development.
- (c) Learning experiences depend on children's current level of cognitive functioning.
- (d) Memorization should be prioritized over learning through experience.

Answer: (c)

6. Lev Vygotsky views cognitive development as :

- (a) effective adoption to the environment process
- (b) a collaborative process
- (c) an individual activity
- (d) a unified process

Answer: (b)

7. While proposing the relationship between language and thinking process, Lev Vygotsky conceptualized language as a/an :

- (a) Independent domain which is not related to cognition.
- (b) cultural tool which facilitates cognition in multiple ways.
- (c) form of egocentric speech used to only fulfill basic needs.
- (d) hinderance to the development of cognitive abilities.

Answer: (b)

8. Which of the following is an example of a performance goal orientation ?

- (a) A student studies hard to further her own growth.
- (b) A student studies hard to achieve a deep understanding of a topic.
- (c) A student studies hard to get a good grade and be better than others.
- (d) A student studies hard to learn as much as possible from the teacher.

Answer: (c)

9. Following Lev Vygotsky's ideas, a teacher should :

- (a) practice reciprocal teaching with her students.
- (b) discourage the use of cultural tools by students.
- (c) disseminate the knowledge to be memorized by the students.
- (d) encourage students to compete with each other.

Answer: (a)

10. Which of the following are effective strategies to teach new concepts ? (i) Presenting examples (ii) Presenting non-examples (iii) Promoting thinking about relationships amongst concepts. (iv) Giving a definition and encouraging students to rote memorize it.

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

Answer: (d)

11. In which of the following method teacher and student interchange their roles ?

- (a) Reciprocal teaching
- (b) Conditioned learning
- (c) Receptive learning
- (d) Expository teaching

Answer: (a)

12. Fiza analyzes that she has more problems in learning topic X than in learning topic Z because she is interested in topic Z and is paying focused attention to it. Which of the following construct describes Fiza's abilities to analyze her thinking ?

- (a) Cognitive conflict
- (b) Metacognition
- (c) Memory
- (d) Cognition

Answer: (b)

13. Howard Gardner's theory of multiple intelligences proposes that :

- (a) Intelligence can successfully predict academic success.
- (b) Intelligences change over time.
- (c) Intelligence is primarily inherited.
- (d) Intelligence can be measured accurately and predicated precisely.

Answer: (b)

14. While there exists a possibility of intra-group individual differences, yet most students with Autism :

- (a) perform superior skills of imaginative play.
- (b) acquire advanced socio-emotional reciprocity.
- (c) demonstrate advanced communication skills.
- (d) express strict adherence to routine or steps.

Answer: (d)

15. Assertion (A) : Creating an environment of fear and stress keeps students 'on their' toes and facilitates meaningful learning. Reason (R) : Learning is governed only by extrinsic factors. Choose the correct option.

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

Answer: (a)

16. An example of 'class inclusion' : Assertion (A) : Lokesh has trouble with classifying one concept (Delhi) as a subset of another (India). Reason (R) : Understanding how emotions affect memory and learning can lead to self-regulated learning. Choose the correct option.

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

Answer: (c)

17. Which of the following statement aptly describes the purpose of a diagnostic assessment ?

- (a) To identify the areas where students may need additional support or instruction.
- (b) To give students the opportunity to critically assess the work of their peers.
- (c) To identify the attitude patterns of students and design a career guidance programme as per their needs.
- (d) To provide feedback to the teacher about the teaching methods.

Answer: (a)

18. Ten year old Kakuli is struggling with a difficult math problem. What can her teacher do to enhance her problem-solving skills ?

- (a) Give severe punishment so that it is not repeated in future
- (b) Give her the solution to the problem
- (c) Tell her to skip the problem and move on to the next one
- (d) Encourage her to keep trying and offer scaffolding when needed

Answer: (d)

19. Jean Piaget perceives _____ to be _____. Lev-Vygotsky believes _____ to be _____.

- (a) Private speech, effective in self-regulation; egocentric speech, a sign of cognitive immaturity
- (b) Egocentric speech, a sign of cognitive immaturity; private speech, effective in self-regulation
- (c) Egocentric speech, effective in self-regulation; private speech, a sign of cognitive immaturity
- (d) Private speech, a sign of cognitive immaturity; egocentric speech, effective in self-regulation

Answer: (b)

20. Universal design for learning does NOT involve :

- (a) Practicing forms of labelling and categorization of learners.
- (b) Giving all learners various ways of acquiring information and knowledge.
- (c) Providing all learners alternatives for demonstrating what the learners know.
- (d) Tapping into all learners' interests and offering challenges accordingly.

Answer: (a)

21. Which of the following statements about Lawrence Kohlberg's theory is correct ?

- (a) It takes into account effects of culture and gender on moral reasoning.
- (b) It does not specify exact stages for progression of moral development in children.
- (c) It is based on the study done through experimental methods.
- (d) It presents conflicting situations to children.

Answer: (d)

22. Assertion (A) : Each child finds opportunities to play, experiment and discover their world.

Reason (R) : Childhood is a universal construct. Choose the correct option.

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

Answer: (a)

23. Which of the following is an example of a question that promotes analytical thinking ?

- (a) Who was the leader of Germany during World War II ?
- (b) In which year did World War II end ?
- (c) Which countries were directly involved in World War II ?
- (d) Which factors contributed to the outbreak of World War II ?

Answer: (d)

24. While engaging students who are visually challenged, teachers should use _____ which _____.

- (a) Frequency modulated transmission devices; are an auditory system.
- (b) Braille, is a tactile system.
- (c) Braille, is an auditory system.
- (d) Frequency modulated transmission devices; are a tactile system.

Answer: (b)

25. You are a teacher who wants to encourage your students to think critically and creatively. Which of the following strategies is most likely to foster this type of thinking ?

- (a) Lecturing on the topic and providing students with detailed notes.
- (b) Assigning a project in which students must memorize and present information on a topic.
- (c) Providing students with open-ended questions to come up with their own solutions.
- (d) Giving students multiple-choice tests to assess their knowledge.

Answer: (c)

26. Which of the following is an example of assessment for student's learning ?

- (a) A rubric given to students at the beginning of a project, outlining what they need to do to achieve a certain grade.
- (b) A final exam that covers all the material learned throughout the term.
- (c) A quiz and brainstorming at the beginning of class to check for prior knowledge.
- (d) A standardized test used to compare students across the country.

Answer: (a)

27. Assertion (A) : As compared to boys, girls have an innate tendency to be affected more by social and cultural factors. Reason (R) : Girls are genetically more sensitive and emotionally weaker than boys, making it more likely for them to conform to societal expectations. Choose the correct option.

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

Answer: (a)

28. Assertion (A) : 12-year Amana gets scared every time the teacher asks her to answer or solve the maths problem on the blackboard because she fears that the teacher will scold her and she would be embarrassed. Reason (R) : When students feel unsafe and anxious their learning is adversely affected. Choose the correct option.

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

Answer: (b)

29. A teacher wants to enable meaningful and analytical learning in her class by providing opportunities for students to connect their prior knowledge to new concepts. Which of the following teaching strategies would be most effective ?

- (a) Providing students with a step-by-step guide on how to complete a task related to the new material.
- (b) Lecturing on new material and providing students with a list of key terms to memorize.
- (c) Assign students to read the textbook chapter and answer questions at the end.
- (d) Ask students to share their own experiences related to the new material and then connect them to the topic.

Answer: (d)

30. In an inclusive classroom the teacher :

- (a) Tries to encourage children to do better by promoting competitive spirit.
- (b) Identifies 'deficits' in children and correctly labels them.
- (c) Segregates children based on differing academic capabilities.
- (d) Modifies the curriculum and pedagogical strategies to suit varied needs of children.

Answer: (d)

Mathematics and Science

33. Which one of the following is the most appropriate feature of mathematics textbooks at elementary level ?

- (a) Concepts should be presented from concrete to abstract
- (b) The language of the book must be highly precise and technical
- (c) Books must contain a lot of similar questions to practice
- (d) Concepts should be presented from complex to simple

Answer: (a)

36. Which of the following is used to record students' problem solving ability, measurement ability and experimentation ability ?

- (a) Teacher Diary
- (b) Cumulative Record
- (c) Report Card
- (d) Anecdotal Record

Answer: (d)

37. The distance between the parallel sides AB and CD of a trapezium ABCD is 12 cm. If $AB < CD$, $CD = 24$ cm and $AD = BC = 13$ cm, then area of the trapezium (in cm^2) is :

- (a) 228
- (b) 123.5
- (c) 114
- (d) 247

Answer: (a)

38. Following data shows the number of wickets taken by a player in last 11 matches played by him/her : 1, 0, 2, 4, 0, 3, 1, 1, 2, 4, 1 What is the difference between the mean and mode of the above data ?

- (a) $8/9$
- (b) $7/11$
- (c) $8/11$
- (d) $10/9$

Answer: (c)

39. A nine-digit number $565 \times 9274y$ is divisible by number 88. Then, the value of $(2x+3y)$ is :

- (a) 22
- (b) 26
- (c) 25
- (d) 24

Answer: (b)

40. Many occupations such as accountancy, banking, shop-keeping, tailoring etc. requires mathematics directly or indirectly. This is an explanation of _____ value of Mathematics.

- (a) Professional
- (b) Disciplinary
- (c) Cultural
- (d) Utilitarian

Answer: (d)

42. For teaching addition of integers at the upper primary stage which of the following is least useful ?

- (a) use of chart paper
- (b) use of stairs
- (c) use of lift
- (d) use of number line

Answer: (a)

45. Which of the following represents the most important capabilities of learners to be assessed in mathematics ? (a) Ability to use abstractions to perceive relationships (b) Ability to memorize all the formulae given in textbook (c) Ability to apply mathematical concepts to solve problems related to daily life situations (d) Ability to score full marks in mathematics Choose the correct option.

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

Answer: (b)

47. The value of $31096 \div (2704 \div 2) + 0.6738 + 0.63 + 0.059 - 0.79$ is equal to :

- (a) 24.5728
- (b) 23.6728
- (c) 23.5728
- (d) 24.6728

Answer: (c)

48. Cards bearing numbers 12, 13, 14, ... , 70, 71 (one number on one card) are kept in a box and then a card is drawn from the box without looking into it. What is the probability that the card drawn has the number which is not a prime ?

- (a) 45/59
- (b) 1/4
- (c) 15/59
- (d) 3/4

Answer: (d)

49. Which one of the following is a teacher-centred method of teaching mathematics ?

- (a) Group Discussion Method
- (b) Problem solving Method
- (c) Lecture Method
- (d) Heuristic Method

Answer: (c)

52. Which of the following statement is correct about assessment ?

- (a) Formative Assessment is used after the course completion to assign the grades.
- (b) Assessment as learning generates opportunities for self-assessment and peer assessment.
- (c) Summative Assessment helps to know to what extent the instructional objectives have been achieved while teaching a concept.
- (d) 'Assessment for learning' is a process with no scope of giving feedback.

Answer: (b)

53. On the basis of the information given in the statement, which of the suggested course of action logically follows ? Statement : Anamika does conceptual error while solving problems on mensuration. Course of Action : (I) Teacher gives a lot of hands-on and visual practice to Anamika. (II) Teacher provides the scope of discussion while giving open-ended questions. Choose the correct option.

- (a) Both course of action (I) and (II)
- (b) Only course of action (I)
- (c) Only course of action (II)
- (d) Neither course of action (I) nor course of action (II)

Answer: (a)

56. If x is the smallest number which is to be subtracted from 2605 to make it a perfect square, then the value of $(4x+7)$ is :

- (a) 31
- (b) 11
- (c) 23
- (d) 27

Answer: (c)

58. Nitu is always confused in identifying the transformations. Her mathematics teacher helped her by giving one simple word for each transformation namely : Reflection, Rotation, Translation and Enlargement. Which of the following represents the correct sequence of meaning of each transformation as given above ?

- (a) Flip, Slide, Turn and Bigger Figure
- (b) Turn, Slide, Flip and Bigger Figure
- (c) Flip, Turn, Slide and Bigger Figure
- (d) Slide, Flip, Turn and Bigger Figure

Answer: (c)

61. Assertion (A) : Achievement in STEM related courses is influenced by gender. Reason (R) : Problem solving strategies used by boys and girls are different.

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

Answer: (a)

62. (A) is a technique of vegetative propagation in which a part of the stem or a young branch of a plant is pulled and buried in moist soil, such that the branch is still attached to the Parent Plant. After some time, roots develop in the buried part and it grows into a new plant. (B) is an example of plant usually grown through this technique. (A) and (B) respectively are :

- (a) Layering, Jasmine
- (b) Cutting, Potato
- (c) Grafting, Rose
- (d) Budding, Hydra

Answer: (a)

63. Which of the following statements are true ? (A) Crystallisation is a chemical change. (B) Photosynthesis is a chemical change. (C) Ripening of fruit is a physical change. (D) Formation of curd from milk is a chemical change.

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

Answer: (c)

64. Which of the following strategies would support inquiry oriented science teaching ?

- (a) Explaining the difference between real and apparent weight
- (b) Define and explain Archimede's principle
- (c) Demonstrating the loss in weight of an object when immersed in water
- (d) Engaging students in floating and sinking activities

Answer: (d)

65. (A) hormone regulator Carbohydrate, protein and fat metabolism in our body. It is secreted by (B) gland and (C) in our diet impacts the functioning of this gland. (A), (B), (C) respectively are :

- (a) Growth hormone, Pitutary, Proteins
- (b) Insulin, Pancreas, Sugar
- (c) Adrenaline, Adrenal, Salts
- (d) Thyroxine, Thyroid, Iodine

Answer: (d)

66. Which of the following statements is/are true regarding relative reactivity of metals ? (A) Zinc is more reactive than Iron but less reactive than Aluminium. (B) Sodium is more reactive than Potassium and Calcium. (C) Aluminium is more reactive than Magnesium.

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

Answer: (c)

67. Which of the following represents correct matching set in the context of aquatic plants ?
Adaptation Purpose (a) Large circular leaves (i) helpful in protecting against decay (b) Waxy coating (ii) helpful in offering resistance to water currents (c) Stems have large tunnels (iii) helpful in providing buoyancy and holes (d) Ribbon like leaves (iv) helpful in staying afloat

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

Answer: (a)

68. The following activity is done in the class VII : Students are given four iron bars out of which two are bar magnets. They are asked to identify the bar magnets. Which of the following process skills can be promoted through this activity ?

- (a) Observation, Estimation, Experimentation, Controlling variables.
- (b) Observation, Formulating hypothesis, Measurement
- (c) Observation, Classification, Inferring
- (d) Observation, Classification, Communication, Measurement

Answer: (c)

69. Which of the following should not be the purpose of open book assessment in Science ?

- (a) To give opportunity to explore the book
- (b) To reduce the fear of assessment in learners
- (c) To gauge conceptual understanding of learners
- (d) To score more marks in tests

Answer: (d)

70. The density of medium A is more than medium B but less than medium C. In which medium does the sound travels fastest ?

- (a) Can't be inferred from this information
- (b) A
- (c) B
- (d) C

Answer: (d)

72. Assertion (A) : Convex mirrors are used as rearview-mirrors in vehicles. Reason (R1): They form erect and enlarged image. Reason (R2): They have wider field of view.

- (a) (A) is true but neither (R1) nor (R2) are correct explanation for (A).
- (b) (A) is true and both (R1) and (R2) are correct explanations for (A).
- (c) (A) is true and only (R1) is correct explanation for (A).
- (d) (A) is true and only (R2) is correct explanation for (A).

Answer: (d)

73. S1 - Self pollination can take place only in bisexual flowers. S2 - Cross pollination can take place only in Unisexual flowers.

- (a) S1 is false and S2 is true
- (b) Both S1 and S2 are true
- (c) Both S1 and S2 are false
- (d) S1 is true and S2 is false

Answer: (d)

74. Which of the following statements is true ?

- (a) Soil with low water holding capacity has good aeration and high percolation rate.
- (b) Soil with low water holding capacity has poor aeration and high percolation rate.
- (c) Soil with low water holding capacity has good aeration and low percolation rate.
- (d) Soil with low water holding capacity has poor aeration and low percolation rate.

Answer: (a)

75. Which of the following statements are not true regarding compounds ? (A) Compounds show the properties of constituent substances. (B) Compounds can react to form compounds. (C) The composition of each compound is always fixed. (D) Compounds can be separated by physical and chemical methods.

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

Answer: (d)

76. Which of the following statements are true in the context of respiration in whales and dolphins ?

(A) They cannot use dissolved Oxygen. (B) They have gills. (C) They have large nostrils. (D) They often come up to the water surface to breathe.

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

Answer: (c)

77. Which of the following have the most scope for promoting Art integrated learning in Science ?

- (a) Journal writing, Field trips
- (b) Portfolios, Anecdotal records
- (c) Projects, Portfolios
- (d) Anecdotal records, Journal writing

Answer: (c)

78. Assertion (A) : Nichrome is used as a heating element in devices like electric toaster and electric geyser. Reason (R) : Nichrome has high melting point and low resistivity.

- (a) Both (A) and (R) are false
- (b) Both (A) and (R) are true and (R) is correct explanation for (A)
- (c) Both (A) and (R) are true but (R) is not correct explanation for (A)
- (d) (A) is true and (R) is false

Answer: (d)

79. Which of the following statements is/are true regarding the function of bile juice in human digestive system ? (A) It makes the partly digested food coming from stomach alkaline. (B) It helps in digestion of fats.

- (a) Both (A) and (B) are false
- (b) (A) is true and (B) is false
- (c) (A) is false and (B) is true
- (d) Both (A) and (B) are true

Answer: (d)

80. On the basis of the following information, identify the substances which give flame on burning :
Substance State Vapourises on burning A Solid No B Solid Yes C Liquid Yes D Liquid No

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

Answer: (d)

81. Assertion (A) : Arteries have thick and elastic walls as compared to veins. Reason (R) : The pressure of blood flow in arteries is low as compared to veins.

- (a) Both (A) and (R) are false.
- (b) Both (A) and (R) are true and (R) is correct explanation for (A).
- (c) Both (A) and (R) are true but (R) is not correct explanation for (A).
- (d) (A) is true and (R) is false.

Answer: (d)

82. The buoyant force on an object immersed in liquid acts in :

- (a) Parallel to liquid surface
- (b) Upward direction
- (c) Downward direction
- (d) All direction

Answer: (b)

83. Which of the following questions is a divergent question ?

- (a) What would happen to gravity if the size of earth is reduced to half ?
- (b) Why does a ball thrown up comes down ?
- (c) What if there was no gravity on the earth ?
- (d) How does gravity vary with the altitude ?

Answer: (c)

84. When a ray of light enters from medium A to medium B, its speed decreases and on further entering into medium C, its speed increases. Which of the following conclusions can be drawn from this ?

- (a) Refractive index of A, B, C cannot be compared from above information
- (b) Refractive index of A is more than B and C
- (c) Refractive index of A is less than B but equal to C
- (d) Refractive index of A and C are less than B

Answer: (d)

86. (A) Sunita takes 0.5 g of Sodium Carbonate in a test-tube and adds 5 ml of Dilute Hydrochloric acid. (B) She passes the gas produced in the above reaction through Lime water. Which of the following represents the chemical reactions taking place in (A) and (B) ?

- (a) (A) - $\text{NaHCO}_3 + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ (B) - $\text{CaCO}_3 + \text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{Ca}(\text{HCO}_3)_2$
- (b) (A) - $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ (B) - $\text{CaCO}_3 + \text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{Ca}(\text{HCO}_3)_2$
- (c) (A) - $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ (B) - $\text{Ca}(\text{OH})_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$
- (d) (A) - $\text{NaHCO}_3 + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ (B) - $\text{Ca}(\text{OH})_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$

Answer: (c)

87. Which of the following statements is/are true regarding nature of science ? (A) Scientific ideas are not affected by cultural context. (B) There is no single scientific method.

- (a) Both (A) and (B) are false
- (b) Both (A) and (B) are true
- (c) (A) is true and (B) is false
- (d) (A) is false and (B) is true

Answer: (d)

88. While ice melts at 0°C, its temperature :
- (a) first decreases and then remains same
 - (b) increases
 - (c) decreases
 - (d) remains same

Answer: (d)

89. Children of all age groups have various ideas which may be different from science concepts. Which of the following statements are true regarding these ideas ? (A) These ideas are usually stable (B) They are formed due to observable phenomenon (C) They tend to follow similar developmental pattern (D) They are easy to modify (E) They are often domain specific

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

Answer: (a)

90. Read the following statements in the context of Laws and theories in Science : S1 : Laws are generalisation statement whereas theories are explanations. S2 : Laws are very old and theories are contemporary. S3 : Laws can't be changed whereas theories are subject to change.

- (a) S3 is true whereas S1 and S2 are false
- (b) S1 is true; S2 and S3 are false
- (c) S1 and S2 are true whereas S3 is false
- (d) S1 and S3 are true whereas S2 is false

Answer: (b)

| Language I (English)

Passage — for questions 93–99

Colours have a deeper significance for a home than one can imagine. For if used right, they can give a perfect look. In today's time, when there is an abundance of everything but space, colour plays an important role in creating the right ambience and perhaps the space that you crave for. Besides having a tremendous potential to create mood through sheer appeal to the senses, right use of colours actually helps you create the spacious feeling.

For instance, instead of using a plain monotonous colour on all four walls, if you get a little imaginative, perhaps a little bold, you can create a sense of space within those four walls. One of the ways would be to blend light and dark colours. Or to paint two opposite sides in a lighter shade than the other two. Colour can add height to your room too. For instance, if the room is painted white and the upholstery of your furniture is in deep blue tone, the false ceilings could be painted in a light blue shade. Think out of the box to give even more interesting effects to your room.

Whatever your choice is, there are options in the market to help you realise your needs. These days you get special patterned stencils to decorate walls with interesting patterns like flowers, leaves, birds etc. Some people draw an entire scenery on one side of the wall to give the feeling of bringing the outdoors inside. The choices are many, so are the creative ways. Just let your imagination flow. Every room reflects the personality of the occupant, hence it is important to pay attention to every detail. Your walls are your canvases, freshly painted and all bare. Go ahead, splash colours and watch the effect unfold.

93. As mentioned by the writer in para 2, some ways by which you can break the monotony of the room is :

- (a) by blending light and dark shades
- (b) painting all the 4 walls in plain colours
- (c) both (1) and (2)
- (d) (1) is correct, but not (2)

Answer: (d)

94. 'To think out of the box' does not mean to think :

- (a) traditionally
- (b) creatively and imaginatively
- (c) about novel ideas
- (d) in unusual ways

Answer: (a)

95. According to the writer, it is important to pay attention to the colour scheme of your home because :

- (a) the monotonous shades add life to the rooms
- (b) the ambience created makes it look boring
- (c) it reflects the personality of the owner
- (d) the walls reveal the secrets of your life

Answer: (c)

96. Read the following statements : (A) Colours if used creatively can give the perfect look to a room. (B) Space is abundant nowadays. (C) The right colour combination on walls and the roof creates a spacious feeling.

- (a) (A) and (C) are incorrect, (B) is correct
- (b) (A) and (C) are correct, (B) is incorrect
- (c) (B) and (C) are correct, (A) is incorrect
- (d) (A), (B) and (C) are all correct

Answer: (b)

97. Complete the given word analogy : monotonous : dull :: ambience : ? .

- (a) weather
- (b) room
- (c) temperature
- (d) aura

Answer: (d)

98. Some people draw colourful sceneries on their home walls to :

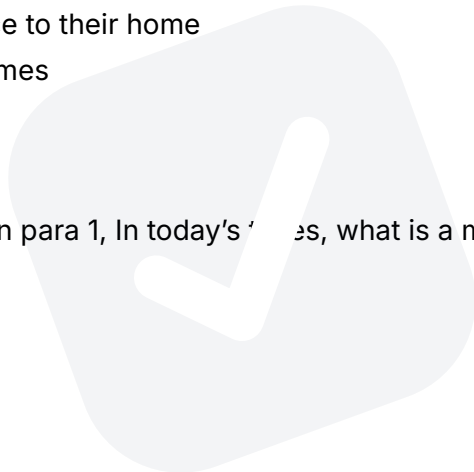
- (a) blend dark and light colours
- (b) give a deeper significance to their home
- (c) bring nature into their homes
- (d) create a sense of space

Answer: (c)

99. As mentioned by the writer in para 1, In today's 'times', what is a modern day home owner longing for ?

- (a) Imagination
- (b) Colours
- (c) Space
- (d) Sheer appeal

Answer: (c)



Passage — for questions 100–105

Between my finger and my thumb
The squat pen rests: snug as a gun.
Under my window, a clean rasping sound
When the spade sings into gravelly ground.
My father, digging, I look down
Till his straining rump among the flowerbeds
Bends low, comes up twenty years away
Stooping in rhythm through potato drills,
Where he was digging
The coarse boot nestled on the lug, the shaft
Against the inside knee was levered firmly.
He rooted out tall tops, buried the bright edge deep.
To scatter new potatoes that we picked,
Loving their cool hardness in our hands.

100. The poetic devices in line 2 and line 4 are :

- (a) metaphor and simile
- (b) metaphor and personification
- (c) hyperbole and metaphor
- (d) simile and alliteration

Answer: (d)

101. What is the overall tone of the poem ?

- (a) nostalgic and admiration
- (b) annoyance and anger
- (c) pitiful and sympathetic
- (d) disgust and animosity

Answer: (a)

102. Complete the word analogy : coarse : rough :: snug : ? .

- (a) comfortable
- (b) lazy
- (c) perfect
- (d) lethal

Answer: (a)

103. How does the speaker's father feel about his son's choice of career ?

- (a) He is ambivalent towards the choice.
- (b) The poem doesn't make it clear.
- (c) He wishes, his son choose a more practical path.
- (d) He is glad his son is not a farmer.

Answer: (b)

104. In the second stanza, the poet is observing :

- (a) potato growers in the countryside
- (b) a gardener tending flower beds
- (c) his father digging potatoes
- (d) farmers in the fields

Answer: (c)

105. ' loving their cool hardness in our hands'. What is the speaker referring to the given line ?

- (a) the potato drills
- (b) the gun
- (c) the handles of the spade
- (d) the potatoes

Answer: (d)

106. 'Authenticity of materials' refers to :

- (a) materials which children bring from home.
- (b) materials written by the teacher for her class.
- (c) materials written or developed by people in authority.
- (d) materials written or developed in real life content.

Answer: (d)

107. Aparna, a learner of class V understands that listening involves listening to each sound, words, then sentences to get the meaning of the speech or audio. Which approach/strategy she believes in for learning to listen ?

- (a) It is neither top-down nor bottom-up approach
- (b) Top-down approach
- (c) Bottom-up approach
- (d) Both top-down and bottom-up approach

Answer: (c)

108. What is 'systemic competence' in language learning ?

- (a) Understanding that all human have a systems of many languages.
- (b) Understanding and applying that language works as a system.
- (c) Understanding and applying that languages have a grammatical system.
- (d) Understanding that all languages have a common structural system.

Answer: (b)

109. Here is text or some statements. Find out which language register does this text represent ?
The Indian Constitution recognises every person as equal. This means that every individual in the country, including male and female, person from all castes, religions, tribes, educational and economic background are recognised as equal. This is not to say that inequity ceases to exist. It doesn't. But at least, in democratic India, the principle of the equality of all persons is recognised.

- (a) Scientific register
- (b) Politic register
- (c) Social Science register
- (d) Legal register

Answer: (c)

110. A teacher of class VI does a warm up activity to connect their previous knowledge and experience with the text they would read. She asks her learners to look at the illustrations of the reading text (the story) before she begin to teach the text. What does she want her learners to do ?

- (a) Make them understand the illustrations.
- (b) Visualize the story through the illustrations.
- (c) Appreciate the illustrations.
- (d) Make prediction about the reading text.

Answer: (d)

111. A continuous record of instances of learning by the learners is known as :

- (a) Diagnostic test
- (b) Portfolio
- (c) Continuous Comprehensive Assessment
- (d) Proficiency assessment

Answer: (b)

112. Which of the following are known as receptive skills ?

- (a) Listening and reading
- (b) Listening and writing
- (c) Reading and speaking
- (d) Speaking and writing

Answer: (a)

113. Many Indians who go abroad for jobs learn the language of the place. What is this motivation known as ?

- (a) It is neither instrumental nor integrative motivation.
- (b) Both integrative and instrumental motivation.
- (c) Integrative motivation.
- (d) Instrumental motivation.

Answer: (d)

114. Which of the following language is NOT a classical language ?

- (a) Hindi
- (b) Tamil
- (c) Sanskrit
- (d) Telugu

Answer: (a)

115. Which of the following is NOT true of the National Education Policy (NEP) 2020 on the study of foreign languages ?

- (a) French is one of the language recommended to be studied as an additional option.
- (b) Study of foreign languages as an additional option during the secondary stage.
- (c) Study of foreign languages included as one of the languages under the three language formula.
- (d) Foreign language does not include in the three languages studied under three language formula.

Answer: (c)

116. Which of the following refers to 'Knowing about language'?

- (a) Strategic competence
- (b) Declarative knowledge
- (c) Procedural knowledge
- (d) Grammatical knowledge

Answer: (b)

117. A teacher of class VI develops the following task for a speaking activity. Speak five sentences about desert and its climatic conditions. Is it a good task or not a good task ? Select from option your response and reason for the same.

- (a) It is not a good task because it lacks context as there is no input for speaking about desert and its conditions.
- (b) It is a good task because the learners may have studied about desert in their geography class and will have inputs to speak.
- (c) It is a good task because it makes the learner to talk about something i.e the desert.
- (d) It is not a good task because some of the learners may not know about desert.

Answer: (a)

118. Which of the following statements is true of a dialect of a language ?

- (a) Sometime different social group may speak different dialects of the same language.
- (b) Dialects of language vary from region to region.
- (c) Speakers of different dialects of one language can understand the other dialect speaker.
- (d) A dialect is a bigger category and language is a smaller category.

Answer: —

119. Which of the following tasks promotes integrated learning skills ?

- (a) Writing an article
- (b) Role play
- (c) Assignment
- (d) Project work

Answer: (d)

120. What is the following strategy in the context grammar teaching known as ? Introducing language item in contexts, making learners notice the language items, enabling them to use in real life contexts and drawing the attention of learner to the form by discovering it.

- (a) Consciousness Raising
- (b) Creating a Schema
- (c) Deductive method
- (d) Discovery methods

Answer: (a)

Language II (English)

Passage — for questions 121–128

Surrounded by verdant forests, natural springs, and blue hills, Netarhat is Jharkhand's best-kept secret, located in the district of Latehar, at a distance of about 151 km from the capital city of Ranchi. This quaint hill station brings solace and gives visitors a much-deserved refuge from the hustle and bustle of cities. It is located at an altitude of 3696 feet, allowing people to enjoy magnificent views. Fabulous sunrises and stunning sunsets leave the visitors awestruck. Explore the surreal beauty of this beautiful place, also known as "Queen of Chota Nagpur", and return refreshed and rejuvenated.

With its shimmering waters, sparkling reflection in the air, and breathtaking scenery, Netarhat lake offers serenity to its visitors. It is an ideal spot for picnics, and the lake's tranquil waters tempt you to go boating as well. Get closer to nature with the most beautiful forests in Jharkhand, and the pine forests. Netarhat, with its pretty lakes, shady valleys, mountain villages and thick evergreen forests filled with gorgeous pine trees, provides a panoramic scene to the visitors. The pine forests surrounded by mists in winter, make any traveller feel as though they have been transported to another world entirely.

The most well-known location is the Sunrise Point which offers a spectacular view of the sunrising that resembles an oil painting. Visitors cannot help but be struck by the sun's rays as they emerge from valleys covered in lush vegetation and cluster of tall trees. The most picturesque view of the sunrise is visible from Hotel Prabhat Vihar, situated 17 km from Bazaar Haat. Netarhat certainly is a perfect getaway in the heart of nature. Guest houses provide cosy accommodations and a heavenly dining palette to its visitors.

121. Read the following statements : (A) Netarhat is located at a height of 3696 feet. (B) It is referred to as the 'Queen of Chota Nagpur'. (C) Netarhat is blessed with verdant banyan forests.

- (a) (A), (B) and (C) are all correct
- (b) (A) and (C) are correct, (B) is incorrect
- (c) (B) and (C) are correct, (A) is incorrect
- (d) (A) and (B) are correct, (C) is incorrect

Answer: (d)

123. As mentioned in para 1, the quaint hill station, Netarhat gives peace and calm to visitors because :

- (a) they can go paragliding from hill tops
- (b) they can be away from hectic city life
- (c) they can go fishing in the lake waters
- (d) they can enjoy train rides

Answer: (b)

124. Complete the given word analogy : gorgeous : beautiful :: tranquil : ? .

- (a) blue-green
- (b) misty
- (c) peaceful
- (d) choppy

Answer: (c)

125. The Sunrise Point offers visitors a breathtaking view of :

- (a) the sunrise
- (b) an oil painting
- (c) lush vegetation
- (d) Both (1) and (3)

Answer: (a)

127. Which one of the following scenic views is not found in Netarhat ?

- (a) scintillating views of sunrises
- (b) refugee camps
- (c) beautiful sunrises and sunsets
- (d) clusters of tall pine trees

Answer: (b)

128. The phrase 'hustle and bustle of cities' implies :

- (a) busy and noisy cities
- (b) beauty and eye catching views of cities
- (c) stunning sights and scenes of cities
- (d) peace and calm of cities

Answer: (a)

Passage — for questions 130–135

It was Somi's idea that we meet at the pool in ten years time. "When we are men, we must come back to this place, ten years from today," he said. "Rusty, at midday on 5 April 1964, we must return to the pool, no matter where we are, or what we are doing. Promise?" It was a school boy's pledge, and made in deadly earnest. As boys, we usually mean the things we say. . And so we shook hands on it and dived back into the water.

The pool had been discovered by me a few months earlier. I remember that it was going to rain... I could see the rain moving across the foothills, and I could smell it on the breeze. But instead of turning homewards, I pushed my way through the leaves and brambles that grew across the forest path. I had heard the murmur of water and I wanted to see and touch it. Sliding down the rockface into a small ravine, I found a stream running over a bed of shingle. Water trickled down from the hillside, from amongst ferns and grasses and wild primroses. The rocks beside the stream were smooth, and some of them were grey and some yellow. A small waterfall came down the rocks and formed a deep pool of apple-green water.

When I saw the pool, I ran back to town to tell the others. Anil and Somi were my closest friends. Anil lived in a crowded lane of the Dilaram Bazaar. He was wild and a little dangerous, subject to moods and impulses. Somi was sensitive and gentle in his ways, but common with Anil he had a sense of fun and an instinct for adventure. The pool was my own discovery, and I was proud of it. "We'll call it Rusty pool", said Somi.

130. Who among the three friends proposed the idea of meeting at the pool ten years hence ?

- (a) Somi and Rusty
- (b) Anil
- (c) Somi
- (d) Rusty

Answer: (c)

131. Which one of the following options does . describe the pool in the stream ?

- (a) water trickling among fern and grasses
- (b) rough rocks on the bed
- (c) trickling waterfall down the rocks
- (d) apple-green colour of the water

Answer: (b)

132. Which word can be the nearest synonym for the word 'instinct' ?

- (a) hatred
- (b) affinity
- (c) premonition
- (d) inclination

Answer: (d)

133. What brought the three boys together ?

- (a) their spirit of adventure
- (b) their swimming talents
- (c) their earnest attitudes
- (d) their childhood mischiefs

Answer: (a)

134. ' a pledge made in deadly earnest' implies :

- (a) a promise not to be kept
- (b) being suspicious about someone's intention
- (c) to wish for the death of someone
- (d) a promise in complete seriousness

Answer: (d)

135. Complete the word analogy given below : crowded : deserted :: vigour : ? .

- (a) lethargy
- (b) heaviness
- (c) strength
- (d) weakness

Answer: (d)

136. Ashwin knows Odia from his birth and he studies English and Hindi. Based on this statement, find which of the following statement is NOT true ?

- (a) His English learning is language acquisition.
- (b) His Odia learning is language acquisition.
- (c) His Hindi learning is language learning.
- (d) His English learning is language learning.

Answer: (a)

137. Instrumental motivation is when :

- (a) a person learns the language for writing a book .
- (b) a person learns the language for utilitarian reason like employment.
- (c) a person learns the language for being closer to the native speakers of the language.
- (d) a person learns the language for their communities religious and social functions.

Answer: (b)

138. Kripa and Karan are twins and speak a particular dialect of Manipuri. However they differ in their speech. What is their individual special way of speaking the dialect known as ?

- (a) Manipuri
- (b) Idiolect
- (c) Dialect
- (d) Speech act

Answer: (b)

139. What is the status given to the English language in the Indian Constitution ?

- (a) Language of statutory bodies
- (b) Official language
- (c) Associate Official language
- (d) Foreign language

Answer: (c)

140. A test which aims to identify an individual student's specific areas of weakness and strength is known as :

- (a) Formative test
- (b) Objective test
- (c) Validity test
- (d) Diagnostic test

Answer: (d)

141. Aditi knows the rules of past perfect tense. But can't use in a context. What knowledge does she possess ?

- (a) Application of knowledge
- (b) Language acquisition device
- (c) Procedural knowledge
- (d) Declarative knowledge

Answer: (d)

142. Which of the following is NOT true of language ?

- (a) Some languages can only convey science and engineering better
- (b) Language expresses identity
- (c) Language is a repository of history
- (d) Language contributes to the sum of human knowledge

Answer: (a)

143. What are the stages involved in designing and doing a Project Work in language classroom ?

- (a) Teacher and learners can design and do the project work any way they want to.
- (b) Forming groups, planning, collection of data, interpretation of data, writing the draft, identifying the topic, and finalization of the report.
- (c) Forming groups, identifying the topic, planning, collection of data, interpretation of data, writing the draft and finalization of the report.
- (d) Forming groups, identifying the topic, planning, collection of data, writing the draft, interpretation of data, and finalization of the report.

Answer: (c)

144. Top-down approach to listening involves :

- (a) Listening to each sound, words, phrases, clauses and sentences.
- (b) Paying attention to the specific details.
- (c) Listening to the gist of the speech, text or the audio.
- (d) Listening to overall message of the text, speech or the audio.

Answer: (d)

145. A teacher of Class VII wanted to give a writing task of writing a description of a person. She went out of the classroom and brought a Hawker to her classroom with his basket. She requested him to be there for about seven minutes and then asked her learners to work in pair and write a description of the person. What do you think the hawker in this activity known as ?

- (a) Materials
- (b) Teaching Assistant
- (c) A Hawker
- (d) A participant in the activity

Answer: (a)

146. A teacher of class VII wants her learners to read the short text with an understanding of power and identity of the people and community presented in the text. What does the teacher aim to promote among learners ?

- (a) Literary skills
- (b) Language literacy
- (c) Critical literacy
- (d) Analytical reading

Answer: (c)

147. Which of the following is TRUE of the study of classical language as advocated by National Education Policy (NEP) 2020 ?

- (a) Study of classical language as a core language at the secondary stage.
- (b) Study of classical language as an additional option during secondary stage.
- (c) Study of classical language as an option under three language formula.
- (d) Study of classical language during preparatory stage.

Answer: (b)

148. Here is a text. Read and find out which language register does the text belong to ? Suddenly, after the revolution, it seemed possible to change this. In many parts of the world including Europe and Asia, new ideas about individual rights and who controlled social power began to be discussed. In India, Raja Rammohan Roy and Derozio talked of the significance of the French Revolution. The developments in the colonies, in turn, reshaped these ideas of societal change.

- (a) Revolution register
- (b) Science register
- (c) Political register
- (d) Social Science register

Answer: (d)

149. Subash, a teacher of class VIII regrets, "Language assessment generally does not give importance to receptive skills." What does he mean by 'receptive skills'?

- (a) Speaking and writing
- (b) Listening and writing
- (c) Speaking and reading
- (d) Listening and reading

Answer: (d)

150. Learner understands and applies that language works as a system.

- (a) Strategic competence
- (b) Communicative competence
- (c) Systemic competence
- (d) Sociolinguistic competence

Answer: (c)



Answer key

Answer key from the Central Board of Secondary Education's official answer key for this sitting. "—" means the key gave none.

Child Development and Pedagogy

1	(d)	2	(a)	3	(b)	4	(a)	5	(c)	6	(b)	7	(b)	8	(c)
9	(a)	10	(d)	11	(a)	12	(b)	13	(b)	14	(d)	15	(a)	16	(c)
17	(a)	18	(d)	19	(b)	20	(a)	21	(d)	22	(a)	23	(d)	24	(b)
25	(c)	26	(a)	27	(a)	28	(b)	29	(d)	30	(d)				

Mathematics and Science

33	(a)	36	(d)	37	(a)	38	(c)	39	(b)	40	(d)	42	(a)	45	(b)
47	(c)	48	(d)	49	(c)	52	(b)	53	(a)	56	(c)	58	(c)	61	(a)
62	(a)	63	(c)	64	(d)	65	(d)	66	(c)	67	(a)	68	(c)	69	(d)
70	(d)	72	(d)	73	(d)	74	(a)	75	(d)	76	(c)	77	(c)	78	(d)
79	(d)	80	(d)	81	(d)	82	(b)	83	(c)	84	(d)	86	(c)	87	(d)
88	(d)	89	(a)	90	(b)										

Language I (English)

93	(d)	94	(a)	95	(c)	96	(b)	97	(d)	98	(c)	99	(c)	100	(d)
101	(a)	102	(a)	103	(b)	104	(c)	105	(d)	106	(d)	107	(c)	108	(b)
109	(c)	110	(d)	111	(b)	112	(a)	113	(d)	114	(a)	115	(c)	116	(b)
117	(a)	118	—	119	(d)	120	(a)								

Language II (English)

121	(d)	123	(b)	124	(c)	125	(a)	127	(b)	128	(a)	130	(c)	131	(b)
132	(d)	133	(a)	134	(d)	135	(d)	136	(a)	137	(b)	138	(b)	139	(c)
140	(d)	141	(d)	142	(a)	143	(c)	144	(d)	145	(a)	146	(c)	147	(b)
148	(d)	149	(d)	150	(c)										