CG TET Mathematics Pedagogy

Q1. Following are four questions posed by a mathematics teacher. Which of the following is an open- ended questions?
(a) If sum of two numbers is 15 and one of them is 7, what will be the other number?
(b) If the age of Anil is 7 years and his father's age is 5 times more than that of Anil's age. What will be the age of father?
(c) If sum of two numbers is 17, then what are the numbers?
(d) What should be added to 17 get 23?

Q2. A teacher uses the following riddle in the class while developing the concept of place value 'l am less than 5 tens and 4 ones'.
The objective of this riddle is to
(a) Do a summative assessment.
(b) Break the monotony of mathematics class.
(c) Ask close ended questions on place value.
(d) Reinforce the concept of base 10 and place value.

Q3. Which among the following is/are the objective/objectives of teaching 'shapes' at Primary class.
A. To develop visualization skill
B. To memories the names of geometrical shapes
C. To enhance spatial reasoning ability
(a) A and B
(b) A and C
(c) B and C
(d) Only B

Q4. Which of the following teaching-learning resources in mathematics can be used for visually challenged students?
A. Geoboard
B. Geogebra
C. Abacus
D. Graphic calculator
Choose the correct option.
(a) A and D
(b) A and C
(c) B and D
(d) A, B and D

Q5. While teaching 'geometrical shapes' a teacher thinks of planning a trip to historical places. It reflects:
(a) Field trips have been recommended by CBSE, so they must be done
(b) A good break from routine mathematics class and an opportunity to visit the historical places.
(c) Shapes are an integral part of any architecture and such trips encourage mathematics beyond classroom.
(d) Teacher has completed most of the syllabus well in time and now needs to provide leisure.

Q6. A primary class mathematics teacher poses the following question to his students:
"Reena and Shama went to shop to buy bag. There were m any bags with different price tags. They got confused by looking at so many price tags. Can you help them by arranging the price tags either in ascending or descending order"?
BAG -A → Rs. 4732,
BAG -B → Rs. 2364,
BAG -C → Rs. 1934,
BAG -D → Rs. 3475,
BAG -E → Rs. 2937,
BAG -F → Rs. 3004,
In the given context, which of the following statements is true?
(a) Only the concepts of ascending and descending order can be strengthened using the question.
(b) The teacher can use the question to go beyond comparison of numbers and introduce the concept of data handling and sorting of data.
(c) It is not a mathematical question as it does not involve basic operations on numbers.
(d) The teacher should avoid bringing contextual questions into the classroom.

Q7. According to National Curriculum Framework 2005, which of the following represents the vision of a mathematics classroom?
(a) Students memorizing the formulae
(b) Teacher as the only narrator in the class
(c) Students coping solved examples from the textbook
(d) Children posing and solving meaningful problems in the classroom

Q8. Which of the following statements is true for 'Anecdotal Records' as an assessment tool in mathematics?
(a) It includes the project and field work done by the child
(b) It is use to record and judge the quality of a child's work against a specified criteria
(c) It records the presence or absence of a particular skill or process
(d) It includes written description of child's progress on a day to day basis and provides observational narrative records

Q9. A class III teacher introduces the multiplication in her class using repeated addition and rectangular arrays. She is
(a) Introducing multiplication through informal strategies by utilizing the previous knowledge and experiences of students.
(b) Teacher multiple formal algorithms of multiplication.
(c) Wasting a lot of time and should focus on teaching formal algorithm only.
(d) Finding leisure time for herself be keeping the students engaged.

Q10. A child is counting the number of balls by putting a finger on the balls one by and saying numbers in order.
She has counted some balls twice. Which pre number concept is yet to be strengthened in the child?
(a) One-to-one correspondence
(b) Seriation
(c) Classification
(d) Cardinality

Q11. Misconceptions in mathematics can be removed by
(a) Engaging children with examples and non-examples
(b) Framing similar questions and repeating them many times
(c) Lot of practice and drill of questions
(d) Demonstrating the algorithm again

Q12. Ms. Romi in her mathematics class asks her students to create appropriate situations for following computations:
i. $10 + 2$, ii. 10×2, iii. $10 - 2$, iv. $10 \div 2$
which of the following statements is correct about the pedagogy used by Ms. Romi?
(a) She is testing the problem solving skills of students by giving mixed set of problems
(b) She is testing the language proficiency of students
(c) She is trying to help students to develop mathematical statements and problems solving skills.
(d) She is trying to maintain discipline in her class by giving some task to the students

Q13. Which of the following statements are indicative of higher aims of teaching mathematics?
A. Mathematics education should turn out employable adults who contribute to economic and social development.
B. Mathematics education should develop child's inner resources like abstract thinking and drawing logical conclusions
C. Children should see mathematics as a way of life like communicating, discussing and developing attitude for problem solving
D. Mathematics education should focus on factual knowledge and procedural fluency
(a) A and C
(b) B and C
(c) C and D
(d) B and D

Q14. According to Newman, there are five levels to be undertaken before a students is able to solve a word problem. they are listed below in a random order.
A. Comprehend what the task is asking.
B. Must be able to read the question.
C. Undertake the necessary mathematical operations.
D. Need to translate the problems into mathematical demands.
E. Represent the answer as a meaningful construct.
What of the following represents the correct order of levels?
(a) B, A, C, D, E
(b) B, D, A, C, E
(c) A, B, E, C, D
(d) B, A, D, C, E

Q15. Which of the following is **NOT** desirable for the professional development of mathematics teachers?
(a) Attending workshops and seminars on mathematics
(b) Developing teaching-learning resources
(c) Minimum interaction with other mathematics teachers working in same school or in neighborhood schools.
(d) Participating in faculty development programmes.

Q16. Choose the most appropriate option from the following.
Development and behavior of individuals is by and large influenced by:
(a) Genetics
(b) Circumstances
(c) Genetics and circumstances
(d) Interplay of genetics and circumstances

Q17. One of the distinctive features of distance education is that it:
(a) Is non-contiguous
(b) Has no curriculum
(c) Uses only the printed media
(d) Selective about enrolments

Q18. Motivational levels and abilities can be identified by awareness of which of the following?
(a) Clinical psychology
(b) Educational psychology
(c) Social psychology
(d) Experimental psychology

Q19. The study of mathematics and logic is categorized under which of the following?
(a) Computer science
(b) Natural science
(c) Formal science
(d) Physical science

Q20. Complete the sentence with the most appropriate option from the following.
In the Devadasi system young girls are:
(a) Dedicated to the temples in the name of their families.
(b) Offered to fire in name of Gods and Goddesses
(c) Offered to fire in the name of their families
(d) Dedicated to temples in the name of Gods and Goddesses

Q21. Which of the following is not a part of Pedagogical Content Knowledge?
(a) Knowledge of leaners and their characteristic
(b) Knowledge of teachers' competencies
(c) Knowledge of educational contexts
(d) Knowledge of educational purposes

Q22. When a mathematics teacher reads aloud and discusses the meaning of an equation, what is he/she helping the students do?
(a) Remember mathematical symbols
(b) Write mathematical equations
(c) Speak in the mathematical language
(d) Read and comprehend mathematical language

Q23. Choose the best option from the following.
A unique feature of including art in education is that it develops in children the ability to:
(a) Communicate symbolically
(b) Read and comprehend texts
(c) Follow instructions
(d) Guide their peers

Q24. Choose the best response from the options below:
Experimentation can be defined as:
(a) Process of observation of demonstrations
(b) Process of observation without control
(c) Process of observation under controlled conditions
(d) Process of observation of nature

Q25. Choose the most appropriate option to complete the sentence.
Inclusive environment stems from:
(a) Student participation
(b) Appropriate infrastructure
(c) Commitment from teachers
(d) Pairing of philosophy and pedagogical practices

Q26. Which among the following is/are characteristics(s) of reasoning in mathematics ?
(A) Looking for patterns
(B) Solving a problem using a formula
(C) Making and testing conjectures
Choose the correct option :
(a) (A) and (B)
(b) (A) and (C)
(c)(B) and (C)
(d) Only (C)

Q27. According to National Curriculum Framework 2005, the higher aim of mathematics education is :
(a) To help students to understand mathematical concepts
(b) To develop useful capabilities for employment
(c) To develop children's ability for mathematisation
(d) To formulate theorems and their proofs

Q28. Which of the following can be considered as an activity based method to teach the concept of probability in middle school ?
(a) Drawing a picture of a dice on the blackboard and talk about the possible outcomes
(b) Giving the definition of probability followed by solving textbook questions
(c) Asking students to throw a dice or flip a coin and note down the number of times each possibility occurs
(d) Asking students to find out information about probability from the internet

Q29. A mathematics teacher wants to explain to her students how to write a geometrical proof. The most appropriate method for this could be :
(a) To draw a table of axioms
(b) To explain the steps of drawing figures
(c) To give an argument or justification of statements
(d) To use observation

Q30. Which of the following devices can be made by students to learn the trigonometric ratios ?
(a) Clinometer
(b) Manometer
(c) Spherometer
(d) Vernier Callipers

Solutions

S1. Ans.(c)
Sol. An open-ended question is a question that cannot be answered with a "yes" or "no" response, or with a static response.
So, among the given options option (c) is an open-ended question.

S2. Ans.(d)
Sol. A teacher uses the following riddle in the class while developing the concept of place value 'I am less than 5 tens and 4 ones'.
The objective of this riddle is to reinforce the concept of base 10 and place value.

S3. Ans.(b)
Sol. The objectives of teaching 'shapes' at primary class are as follow:
- To develop visualization skill
- To enhance spatial reasoning ability

S4. Ans.(b)
Sol. "Geoboard and Abacus" these teaching-learning resources in mathematics can be used for visually challenged students.

S5. Ans.(c)
Sol. While teaching 'geometrical shapes' a teacher thinks of planning a trip to historical places. It reflects shapes are an integral part of any architecture and such trips encourage mathematics beyond classroom.

S6. Ans.(b)
Sol. In the given context, option (b) which is "The teacher can use the question to go beyond comparison of numbers and introduce the concept of data handling and sorting of data" is true.

S7. Ans.(d)
Sol. According to National Curriculum Framework 2005, the vision of a mathematics classroom is "Children posing and solving meaningful problems in the classroom".

S8. Ans.(d)
Sol. Anecdotal Records: It includes written description of child's progress on a day to day basis and provides observational narrative records.

S9. Ans.(a)
Sol. A class III teacher introduces the multiplication in her class using repeated addition and rectangular arrays. She is Introducing multiplication through informal strategies by utilizing the previous knowledge and experiences of students.

S10. Ans.(a)
Sol. One-to-one correspondence

S11. Ans.(a)
Sol. Misconceptions in mathematics can be removed by engaging children with examples and non-examples

S12. Ans.(c)
Sol. Ms. Romi in her mathematics class asks her students to create appropriate situations for following computations:
i. $10 + 2$, ii. 10×2, iii. $10 - 2$, iv. $10 \div 2$
By using this pedagogy she is trying to help students to develop mathematical statements and problems solving skills.

S13. Ans.(b)
Sol. B and C

S14. Ans.(d)
Sol. B, A, D, C, E

S15. Ans.(c)
Sol. Among the given options option(c) which is "Minimum interaction with other mathematics teachers working in same school or in neighborhood schools." Is not desirable for the professional development of mathematics teachers.

S16. Ans.(d)

S17. Ans.(a)

S18. Ans.(b)

S19. Ans.(c)

S20. Ans.(d)

S21. Ans.(b)

S22. Ans.(d)

S23. Ans.(a)

S24. Ans.(c)

S25. Ans.(d)

S26. Ans.(b)
Sol. All three of the listed options are characteristics of reasoning in mathematics.
Looking for patterns is a key aspect of mathematical discovery. By identifying patterns in data or relationships between concepts, mathematicians are able to make conjectures and develop new theories.
Solving a problem using a formula is a common task in mathematics. Formulas provide a concise and efficient way to represent mathematical relationships, and they can be used to solve a wide variety of problems.
Making and testing conjectures is a fundamental part of mathematical reasoning. Conjectures are tentative statements that are based on observation or intuition, and testing conjectures involves trying to prove or disprove them using rigorous mathematical methods.

S27. Ans.(c)
Sol. The National Curriculum Framework 2005 (NCF 2005) emphasizes the importance of developing children's ability for mathematisation. Mathematisation is the process of representing real-world situations using mathematical concepts and techniques. It is a fundamental skill for problem-solving and critical thinking.
Option (a), To help students to understand mathematical concepts, is incorrect because understanding mathematical concepts is a prerequisite for mathematisation.
Option (b), To develop useful capabilities for employment, is incorrect because mathematics education should have a higher purpose than simply preparing students for the workforce.
Option (d), To formulate theorems and their proofs, is incorrect because formulating theorems and proofs is a more advanced skill that is not relevant for all students.
Therefore, the higher aim of mathematics education according to NCF 2005 is to develop children's ability for mathematisation. This means that mathematics education should focus on helping students to develop the skills they need to mathematise real-world situations.

S28. Ans.(c)
Sol. Activity-based methods involve students in hands-on activities to learn concepts. Option (c) is an example of an activity-based method because it involves students actively participating in an experiment and collecting data. This helps students to develop a deeper understanding of the concept of probability.
Option (a), Drawing a picture of a dice on the blackboard and talk about the possible outcomes, is not an activity-based method because it only involves passive listening and does not allow students to actively participate in the learning process.

Option (b), Giving the definition of probability followed by solving textbook questions, is not an activity-based method because it only involves rote memorization and does not allow students to explore the concept in a hands-on way.
Option (d), Asking students to find out information about probability from the internet, is not an activity-based method because it does not involve students in any hands-on activities. While students may learn about probability by researching it online, this is not the same as actively participating in an experiment or simulation.
Therefore, the only activity-based method is option (c).

S29. Ans.(c)
Sol. (a), To draw a table of axioms, is not as appropriate because axioms are the basic assumptions of mathematics that are not proven. While it is important for students to be aware of axioms, they do not need to know how to draw a table of them in order to write a geometrical proof.

(b), To explain the steps of drawing figures, is not as appropriate because while figures are important for illustrating geometrical proofs, they are not the focus of the proof itself. The focus of the proof is on the logical argument that is used to prove the statement.
(d), To use observation, is not as appropriate because while observation can be used to make conjectures about geometric relationships, it is not sufficient for proving geometric statements. A geometrical proof must be based on a rigorous logical argument.
Therefore, the most appropriate method for explaining how to write a geometrical proof is to give an argument or justification of statements.

S30. Ans.(a)
Sol. A clinometer is a device used to measure angles of elevation or inclination. It can be used to measure the height of objects, such as trees or buildings, by applying trigonometric ratios.