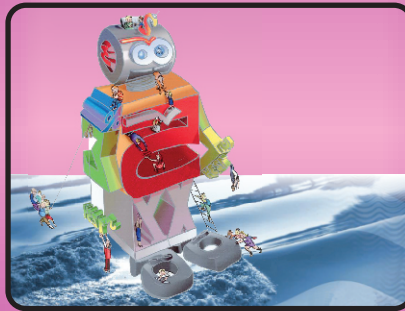


EtG

OLYMPIAD EXPLORER



Workbook for

Nationwide Interactive **MATHS** Olympiad & Other
National/International Olympiads/Talent Search Exams.

Based on CBSE, ICSE, GCSE, State Board Syllabus & NCF (NCERT)

100's of Q's with answers

- Chapterwise Practice Q's
- Revision Q's
- Sample Paper



Class

7

EDUHEAL FOUNDATION

• LEARNING FOR LIFE •

EduHeal Foundation conducts 5 Olympiads annually reaching out to 3,500 + Schools
• 4 Lakh + Students • 50,000 Coordinating Teachers and having 500 Resource persons
in English / Maths / Science / Biotech / Computer & 300 Regional Coordinators.

PRIZES



WORKSHOP • TEACHER TRAINING PROG. • MAGAZINE/LAB GRANT • PRINCIPAL LEADERSHIP AWARD.

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SYLLABUS GUIDELINES

CLASS - VII

Based on CBSE, ICSE & GCSE Syllabus
& NCF guidelines devised by NCERT.

Number System

(i) Knowing our Numbers: Integers

- Multiplication and division of integers (through patterns). Division by zero is meaningless
- Properties of integers (including identities for addition & multiplication, *commutative, associative, distributive*) through patterns. These would include examples from whole numbers as well. Involve expressing commutative and associative properties in a general form. Construction of counter examples, including some by children. Counter examples like subtraction is not commutative.
- Word problems including integers (all operations).

(ii) Fractions and rational numbers:

- Multiplication of fractions
- Fraction as an operator
- Reciprocal of a fraction
- Division of fractions
- Word problems involving mixed fractions
- Introduction to rational numbers (with representation on number line)
- Operations on rational numbers (all operations)
- Representation of rational number as a decimal.
- Word problems on rational numbers (all operations)
- Multiplication and division of decimal fractions
- Conversion of units (lengths & mass)
- Word problems (including all operations)

(iii) Powers:

- Exponents (only natural numbers.)
- Laws of exponents (through observing patterns to arrive at generalization.)
 - $a^m \cdot a^n = a^{m+n}$
 - $(a^m)^n = a^{mn}$
 - $\frac{a^m}{a^n} = a^{m-n}$, where $m - n \in \mathbb{N}$
 - $a^m \cdot b^m = (ab)^m$

Algebra

Algebraic Expressions

- Generate algebraic expressions (simple) involving one or two variables
- Identifying constants, coefficient, powers
- Like and unlike terms, degree of expressions e.g. xy^2 etc. (exponent ≤ 3 number of variables ≤ 2)
- Addition, subtraction of algebraic expressions (coefficients should be integers).
- Simple linear equations in one variable (in contextual problems) with two operations (avoid complicated coefficients).

Ratio and Proportion

- Ratio and proportion (revision)
- Unitary method continued consolidation, general expression.
- Percentagean introduction.
- Understanding percentage as a fraction with denominator 100
- Converting fractions and decimals into percentage and viceversa.
- Application to profit & loss (single transaction only)
- Application to simple interest (time period in complete years)

Geometry

(i) Understanding shapes:

- Pairs of angles (linear, supplementary, complementary, adjacent, vertically opposite) (verification and simple proof of vertically opposite angles)
- Properties of parallel lines with transversal (alternate, corresponding, interior, exterior angles).

(ii) Properties of triangles:

- Angle sum property (with notions of proof & verification through paper folding, proofs using property of parallel lines, difference between proof and verification.)
- Exterior angle property.
- Sum of two sides of a $\Delta >$ it's third side.
- Pythagoras Theorem (Verification only).

(iii) Symmetry

- Recalling reflection symmetry
- Idea of rotational symmetry, observations of rotational symmetry of 2D objects. (90° , 120° , 180°)
- Operation of rotation through 90° & 180° of simple figures.
- Examples of figures with both rotation and reflection symmetry (both operations)
- Examples of figures that have reflection and rotation symmetry and vice versa.

(iv) Representing 3D in 2D:

- Drawing 3D figures in 2D showing hidden faces.
- Identification & counting of vertices edges, faces, nets (for cubes cuboids, & cylinders, cones).
- Matching pictures with objects (Identifying names).
- Mapping the space around approximately through visual estimation.

(v) Congruence

- Congruence through superposition (examples-blades, stamps, etc.).
- Extend congruence to simple geometrical shapes e.g. triangles, circles.
- Criteria of congruence (by verification) SSS, SAS, ASA, RHS.

(vi) Construction (Using scale, protractor, compass)

- Construction of a line parallel to a given line from a point outside it. (Simple proof as remark with the reasoning of alternate angles)
- Construction of simple triangles. Like given three sides, given a side and two angles on it, given two sides and the angle between them.

Mensuration

- Revision of perimeter, Idea of π , Circumference of Circle.

Area

- Concept of measurement using a basic unit area of a square, rectangle, triangle, parallelogram and circle, area between two rectangles and two concentric circles.

Data handling

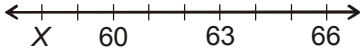
- (i) Collection and organisation of data choosing the data to collect for a hypothesis testing.
- (ii) Mean, median and mode of ungrouped data understanding what they represent.
- (iii) Constructing bargraphs.
- (iv) Feel of probability using data through experiments. Notion of chance in events like tossing coins, dice etc. Tabulating and counting occurrences of 1 through 6 in a number of throws. Comparing the observation with that for a coin. Observing strings of throws, notion of randomness.



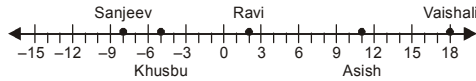
Integers

Q.1. In the product shown, A is a digit. The value of A is

$$\begin{array}{r} A2 \\ \times 7A \\ \hline 6396 \end{array}$$

- (a) 9 (b) 3
(c) 7 (d) 8
- Q.2.** In the sequence of numbers 5, 8, 13, A, 34, 55, 89 the value of A is
(a) 19 (b) 21
(c) 17 (d) None of these
- Q.3.** Which of the following has the same value as $9^{10} \times 9^{-9}$?
(a) 9^9 (b) 9
(c) 9^2 (d) 9^3
- Q.4.** Which one of the following represents the statement “4” times the sum of 3 and 5?
(a) $4 + (3 \times 5)$ (b) $4 \times 3 + 5$
(c) $4 \times 5 + 3$ (d) $4 \times (3 + 5)$
- Q.5.** Which one of the following is equivalent to the expression given below?
(a) 4^{12} (b) 4^9
(c) 4^{11} (d) 4^{30}
- Q.6.** The letter X represents which number?
- 
- (a) 58 (b) 59
(c) 61 (d) 62
- Q.7.** Which of the following statement is **correct**?
(a) The sum of two negative integers is always a negative integer.
(b) The difference between two negative integers is always a positive integer.
(c) The difference between two positive integers is always a positive integer.
(d) None of these

- Q.8.** The given number line shows the marks obtained by five students in a competitive exam. Some students even scored negative marks due to the system of negative marking in the test for each incorrect answer.



How many marks did Vaishali score over Khushbu?

- (a) 24 (b) 23
(c) 18 (d) None of these
- Q.9.** What is the value of the expression $\{(-10) \div (2)\} \times (-4)$?
- (a) 20 (b) 5
(c) 6 (d) 7
- Q.10.** Which alternative correctly shows the associative property of integers under addition?
- (a) $\{(-10) \times 6\} + 2 = (-10) + 2 \times 6 + 2$
(b) $\{(-10) + 6\} + 2 = (-10) + \{6 + 2\}$
(c) $(-10) \times 6 = 6 \times (-10)$
(d) None of these
- Q.11.** Which of the following relation is **correct**?
- (a) $(-20) \div (-5) = -4$ (b) $(-10) \div (-2) = 12$
(c) $(-30) \div (-3) = -33$ (d) $(-15) \div (-5) = 3$
- Q.12.** What is the value of the expression $[(-18 + 4)] \div [(-2 + (-5))]$?
- (a) 3 (b) 2
(c) 4 (d) -3
- Q.13.** If the expression $[(-43) \times 109]$ can also be written as $[a + (-387)]$, then what is the value of a ?
- (a) -4600 (b) -4300
(c) -4350 (d) -3600
- Q.14.** Plastics are known to contract and expand with a decrease and increase in temperature (respectively). With every 5°C decrease in temperature, the length of a plastic rod decreases by 8mm, and with every 5°C increase in temperature, its length increases by 10mm.
- A plastic rod was taken at room temperature. Its temperature was first lowered to 20°C below room temperature and its length was noted down. Its temperature was then increased to 15°C

- above room temperature and its length was again noted down. What was the difference between the lengths of the rod that were noted down in the readings?
- (a) 17mm (b) 55mm
(c) 62mm (d) None of these
- Q.15.** The value of $|9| + |6| - |-9| - |-4|$, where $| |$ is absolute value of an integer is
- (a) 1 (b) 3
(c) 2 (d) None of these
- Q.16.** If $15 \times [x + 5] = 15 \times (-4) + 15 \times 5$, then x is
- (a) -1 (b) -2
(c) -3 (d) -4
- Q.17.** The value of $|-5| \times 7 + 3 \times (|-5|-5)$ is (where $| |$ stands for absolute value of integer)
- (a) 10 (b) 35
(c) 55 (d) None of these
- Q.18.** The value of A in $-19 \times [4 + (-2)] = -19 \times 4 + (-19) \times A$ is
- (a) 2 (b) -19
(c) 4 (d) -2
- Q.19.** Which of the following equation illustrates the identity property of addition?
- (a) $5 - 5 = 0$ (b) $5 + 0 = 5$
(c) $5 \times 1 = 5$ (d) $5 + 1 = 6$
- Q.20.** What is the value of the expression $[(-30) \div \{(-2) + (-1)\}]$?
- (a) -15 (b) -7
(c) 1 (d) 10
- Q.21.** Which of the following relations is **correct**?
- (a) $(-15) \div (-5) = (-5) \div (-15)$
(b) $(15 \div 3) \times 4 = 15 \div (3 \times 4)$
(c) $\{(-20) \div 10\} \div 5 = (-20) \div (10 \div 5)$
(d) $(4 \times (-6)) \times (-7) = 4 \times ((-6) \times (-7))$
- Q.22.** For what values of a and b does the expression $[14 + (-5)] + a = b + [(-5) + (-9)]$ show the associative property of integers under addition?
- (a) 9 and 14 (b) -9 and 14
(c) 14 and 9 (d) -14 and 9

- Q.23.** The expression $[(-98) \times (-21)]$ can be re-written as which of the following expression?
- (a) $2100 - 42$ (b) $-2000 - 84$
 (c) $4200 - 21$ (d) $-4300 - 63$
- Q.24.** Which of the following statements is **correct**?
- (a) The product of 4 negative integers and a positive integer is negative.
 (b) The product of 5 negative integers and 3 positive integers is positive.
 (c) The product of 2 negative integers and 3 positive integers is positive.
 (d) The product of 2 negative integers and 2 positive integers is negative.
- Q.25.** Which of the following equations is **correct**?
- (a) $(-6) \times (-8) \times (-1) = -48$
 (b) $6 \times 8 \times (-1) = 48$
 (c) $(-2) \times (-4) \times 9 = -72$
 (d) $(-2) \times (-4) \times (-9) = 72$
- Q.26.** Which of the following expression is equivalent to the expression $(-436) \times 289 + (-211) \times 436$?
- (a) 289×500 (b) -436×500
 (c) $(-436) \times 211$ (d) None of these



ANSWERS

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



- Q.1.** Which of the following statements is *incorrect*?
- (a) A rational number is of the form $\frac{x}{y}$, where x and y are integers and $y \neq 0$.
 - (b) The product of two negative rational number is negative rational number.
 - (c) There are infinite rational numbers between any two rational numbers.
 - (d) All integers and fractions are rational numbers.
- Q.2.** Which of the following pairs of numbers is *not* a pair of equivalent rational numbers?
- (a) $\frac{3}{2}$ and $\frac{9}{6}$
 - (b) $\frac{25}{36}$ and $\frac{10}{12}$
 - (c) $\frac{4}{5}$ and $\frac{20}{25}$
 - (d) None of these

- Q.3.** Which row is *incorrectly* matched?

Row	Rational Number	Standard Form
A.	$\frac{21}{-42}$	$\frac{1}{2}$
B.	$\frac{-12}{-21}$	$\frac{4}{7}$
C.	$\frac{27}{30}$	$\frac{9}{10}$
D.	$\frac{-32}{56}$	$\frac{-4}{7}$

- (a) The information in row **A** completes the given statement
 - (b) The information in row **B** completes the given statement
 - (c) The information in row **C** completes the given statement
 - (d) The information in row **D** completes the given statement
- Q.4.** How can the rational numbers $\frac{2}{3}, \frac{-5}{6}, \frac{-4}{9}$ and $\frac{7}{12}$ be written in *ascending order*?
- (a) $\frac{-5}{6} < \frac{-4}{9} < \frac{2}{3} < \frac{7}{12}$
 - (b) $\frac{-5}{6} < \frac{-4}{9} < \frac{7}{12} < \frac{2}{3}$
 - (c) $\frac{-4}{9} < \frac{-5}{6} < \frac{7}{12} < \frac{2}{3}$
 - (d) $\frac{-4}{9} < \frac{-5}{6} < \frac{2}{3} < \frac{7}{12}$

Q.5. Which of the following statements is **incorrect**?

- (a) The number $\frac{3}{2}$ lies between 1 and 2
 (b) The number $\frac{2}{3}$ lies between $\frac{7}{12}$ and $\frac{5}{6}$
 (c) The number $\frac{3}{4}$ lies between $\frac{2}{3}$ and $\frac{5}{6}$
 (d) The number $\frac{5}{16}$ lies between $\frac{3}{8}$ and $\frac{1}{2}$

Q.6. What is the value of the expression $\left(2\frac{1}{4} - 1\frac{5}{7}\right)$?

- (a) $\frac{13}{27}$ (b) $\frac{15}{28}$
 (c) $\frac{15}{21}$ (d) $\frac{16}{29}$

Q.7. What is the value of the expression $\left[-\frac{8}{9} \times (-7) \times \frac{27}{70}\right]$?

- (a) $\frac{11}{15}$ (b) $\frac{17}{21}$
 (c) $\frac{12}{5}$ (d) $\frac{19}{37}$

Q.8. Rita's height is $5\frac{1}{4}$ feet. If her sister Gita is $5\frac{1}{3}$ feet tall, then what is the difference between their heights?

- (a) $\frac{1}{11}$ feet (b) $\frac{1}{6}$ feet
 (c) $\frac{1}{7}$ feet (d) $\frac{1}{12}$ feet

Q.9. Puja purchases $2\frac{1}{2}$ kg of watermelons, $1\frac{3}{4}$ kg of apples and $\frac{1}{2}$ kg guavas from a fruit seller.

What is the total quantity of fruits purchased by Puja?

- (a) $4\frac{5}{7}$ kg (b) $4\frac{1}{2}$ kg
 (c) $4\frac{5}{4}$ kg (d) $4\frac{3}{4}$ kg

Q.10. A rational number equivalent to $\frac{-5}{-3}$ is

- (a) $\frac{10}{15}$ (b) $\frac{15}{23}$
 (c) $\frac{25}{15}$ (d) None of these

Q.11. For any two rational numbers a and b which of the following properties are **correct**?

1. $a < b$ 2. $a = b$ 3. $a > b$
 (a) Only 1 and 2 are correct
 (b) Only 2 and 3 are correct
 (c) Only 2 is correct
 (d) All 1, 2 and 3 are correct

Q.12. Out of the rational numbers $\frac{7}{-13}$, $\frac{-5}{13}$, $\frac{-11}{13}$ which is the smallest?

- (a) $\frac{-5}{13}$ (b) $\frac{7}{-13}$
 (c) $\frac{-11}{13}$ (d) None of these

Q.13. $1 + \frac{1}{2 + \frac{1}{3}} =$

- (a) $\frac{5}{6}$ (b) $\frac{7}{9}$
 (c) $\frac{7}{10}$ (d) None of these

Q.14. The value of A such that $-\frac{3}{8}$ and $\frac{A}{-24}$ are equivalent rational numbers is

- (a) 12 (b) -36
 (c) 4 (d) 9

Q.15. If a , b , c be rational numbers such that $a > b$ and $c < b$ then

- (a) $c > a$ (b) $c < a$
 (c) $b < c$ (d) $b > a$

Q.16. What number should be added to $\frac{-5}{6}$ so as to get $\frac{3}{2}$?

- (a) $\frac{7}{3}$ (b) $\frac{1}{2}$
 (c) $\frac{3}{4}$ (d) None of these

Q.17. The product of two rational numbers is $\frac{-9}{16}$. If one of the numbers is $\frac{-4}{3}$, then the other number is

- (a) $\frac{27}{63}$ (b) $\frac{29}{60}$
 (c) $\frac{17}{23}$ (d) $\frac{27}{64}$

Q.18. The value of $1 + \frac{1}{1 + \frac{1}{1 - \frac{1}{6}}}$ is.....

- (a) $\frac{16}{13}$ (b) $\frac{16}{11}$
 (c) $\frac{17}{7}$ (d) none of these

Q.19. What is the value of the expression $\left[\frac{1}{2} + \left(\frac{-7}{15}\right) + 3\right]$?

- (a) $3\frac{1}{15}$ (b) $3\frac{1}{20}$
 (c) $3\frac{1}{30}$ (d) $3\frac{1}{10}$

Q.20. Which row is correctly matched?

Row	Number	Additive Inverse
A.	$\frac{-1}{2}$	$\frac{1}{-2}$
B.	$\frac{-4}{-7}$	$\frac{4}{7}$
C.	$\frac{6}{5}$	$\frac{-6}{5}$
D.	$\frac{9}{-4}$	$\frac{-9}{4}$

- (a) The information in row **A** completes the given statement
 (b) The information in row **B** completes the given statement
 (c) The information in row **C** completes the given statement
 (d) The information in row **D** completes the given statement

Q.21. What is the value of the expression $\left[3\frac{4}{7} \times 1\frac{13}{15}\right]$?

- (a) $\frac{1}{10}$ (b) $\frac{1}{7}$
 (c) $6\frac{2}{3}$ (d) $\frac{1}{6}$

Q.22. Rita is travelling from her village to another village. The distance between the villages is $35\frac{3}{4}$ km. She stops to rest after covering a distance of $24\frac{1}{3}$ km. How much distance does she need to cover to reach the other village?

- (a) 10 km (b) $10\frac{1}{2}$ km
 (c) $11\frac{1}{2}$ km (d) $11\frac{5}{12}$ km

Q.23. What is the value of the expression $\left(\frac{5}{12} \div 1\frac{17}{18}\right)$?

- (a) $\frac{3}{14}$ (b) $\frac{3}{10}$
 (c) $\frac{9}{17}$ (d) None of these

Q.24. What is the value of the expression $\left\{\left(-2 \div 1\frac{7}{9}\right) + 2\frac{1}{4}\right\}$?

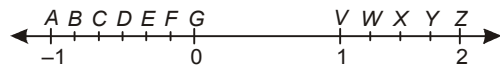
- (a) $1\frac{1}{8}$ (b) $1\frac{3}{8}$
 (c) $\frac{13}{8}$ (d) $\frac{17}{8}$

Q.25. Ramesh, Suraj and Rajesh participated in a long jump competition on their school's sports day. Ramesh jumped $4\frac{1}{2}$ m, while Suraj jumped $\frac{3}{4}$ m less than Ramesh. On the other hand, Rajesh jumped $1\frac{1}{4}$ m more than Suraj.

How long was Rajesh jump?

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

Q.26. The given figure shows a number line such that
 $AB = BC = CD = DE = EF = FG$ and $VW = WX = XY = YZ$.



What is the sum of the rational numbers denoted by points D and Y ?

- (a) $1\frac{1}{5}$ (b) $2\frac{1}{3}$
(c) $7\frac{1}{5}$ (d) $1\frac{1}{4}$



ANSWERS

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



NATIONWIDE INTERACTIVE MATHS OLYMPIAD (NIMO) SAMPLE PAPER

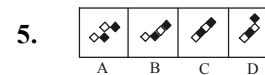
Total duration : 60 Minutes

Total Marks : 50




SECTION - A

MENTAL ABILITY

1. *Condolence* is related to *Loss* in the same way as *Congratulation* is related to?
 (a) Praise (b) Achievement
 (c) Accusation (d) None of these
2. In a certain code, SUBSTITUTION is ITSBUSNOITUT. How is DISTRIBUTION written in that code?
 (a) IRTSIDNOITUB (b) IRTSIDNOIBIT
 (c) IRTDISNOITUB (d) None of these
3. Deepa moved a distance of 75 metres towards the north. She then turned to the left and walking for about 25 metres, turned left again and walked 80 metres. Finally, she turned to the right at an angle of 45° . In which direction was she moving finally?
 (a) North-east (b) North-west
 (c) South-west (d) None of these
4. Ajay left home for the bus stop 15 minutes earlier than usual. It takes 10 minutes to reach the stop. He reached the stop at 8.40 a.m. What time does he usually leave home for the bus stop?
 (a) 8:30 a.m. (b) 8:45 p.m. (c) 8:55 a.m. (d) None of these



Which of the following figure will continue the pattern in the series given above?

- (a)  (b)  (c)  (d) None of these

6. How many triangles does the following figure have?



- (a) Between 10 – 15 (b) Between 40 – 50
 (c) Between 30 – 40 (d) None of these

7. Direction : In the question given below, you are given a figure (X) followed by three figures (a), (b), and (c) such that (X) is embedded in one of them. Trace out the correct alternative.



(x)

- (a) (b) (c) (d) None of these

8. In a chess tournament each of six players will play with every other player exactly once. How many matches will be played during the tournament?
 (a) 12 (b) 15 (c) 30 (d) None of these
9. If the letters in PRABA are coded as 27595, and THILAK are coded as 368451 how can BHARATHI be coded?
 (a) 37536689 (b) 96855368
 (c) 96575368 (d) None of these
10. Select the lettered pair which has the same relationship as that in **Spider : Web**
 (a) Ink : Pen (b) Poet : Poetry
 (c) Teacher : Student (d) None of these

SECTION - B**MATHEMATICS**

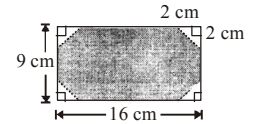
11. Deepa made a snack mix using the ingredients listed below.
 $\frac{1}{4}$ cups milk, $\frac{3}{4}$ cup peanuts
 $\frac{1}{2}$ cup raisins, $\frac{1}{4}$ cup chocolate chips
 What is the total amount of all four ingredients?
 (a) $1\frac{3}{4}$ cups (b) $2\frac{3}{4}$ cups
 (c) $2\frac{1}{2}$ (d) None of these
12. Which is an irrational number?
 (a) $\sqrt{5}$ (b) $\sqrt{9}$ (c) -1 (d) None of these
13. The percentage discount at a store is determined using the table below.

Sale Discounts

Total Purchases	Discount
Less than Rs.50	25%
Rs.50 to Rs.100	30%
Over Rs.100	35%

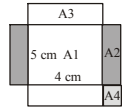
- Shalini bought 3 skirts that cost Rs.25 each before the discount. What was her total after the discount?
 (a) Rs. 45.00 (b) Rs. 48.75 (c) Rs. 52.50 (d)None of these

14. $(jk)^{-5} (jk)^3 =$
 (a) $(jk)^{-2}$ (b) $(jk)^{-8}$ (c) $(2jk)^{-2}$ (d)None of these
15. Which of the following shows the next step using the least common denominator to simplify $\frac{7}{8} - \frac{5}{6}$?
 (a) $\left(\frac{7}{8} \times \frac{3}{3}\right) - \left(\frac{5}{6} \times \frac{4}{4}\right)$ (b) $\left(\frac{7}{8} \times \frac{4}{4}\right) - \left(\frac{5}{6} \times \frac{3}{3}\right)$
 (c) $\left(\frac{7}{8} \times \frac{5}{5}\right) - \left(\frac{5}{6} \times \frac{7}{7}\right)$ (d) None of these
16. What equation shows the distributive property?
 (a) $4(3 + 6) = 12 + 24$ (b) $(4 + 3) + 6 = 6 + (4 + 3)$
 (c) $(12 + 4) + 0 = 12 + 4$ (d) None of these
17. Charlie cut four congruent triangles off the corners of a rectangle to make an octagon, as shown below.
 What is the area of the shaded octagon?
 (a) 144 cm^2 (b) 136 cm^2
 (c) 140 cm^2 (d) None of these



18. A man sells 320 mangoes at the cost of price of 400 mangoes. His gain percent
 (a) 10% (b) 15% (c) 20% (d) None of these
19. A certain sum of money at simple interest amounts to Rs. 1260 in 2 years and to Rs. 1350 in 5 years. The rate percent per annum is
 (a) 2.5% (b) 3.75% (c) 5% (d) None of these
20. If A is $\frac{1}{3}$ of B and B is $\frac{1}{2}$ of C , then $A : B : C$ is
 (a) $1 : 3 : 6$ (b) $2 : 3 : 6$ (c) $3 : 1 : 2$ (d) None of these
21. If a exceeds b by $x\%$, then which one of the following equation is correct?
 (a) $a - b = \frac{x}{100}$ (b) $a = b + \frac{bx}{100}$
 (c) $a = \frac{bx}{100 + x}$ (d) None of these
22. The sum of three numbers is 174. The ratio of second number to the third number is $9 : 16$ and the ratio of first number to the third one is $1 : 4$. The second number is
 (a) 24 (b) 54 (c) 96 (d)Cannot be determined
23. Which expression is equivalent to $\frac{3a^2 - 12a}{6a}$?
 (a) $a - \frac{1}{2}$ (b) $\frac{a}{2} - 2$ (c) $2a - \frac{1}{2}$ (d) None of these

24. A rectangular sheet of wood has four small squares removed. It is then cut to make a box that is 5 cm by 4 cm with a volume of 60 cm^3 . Find the original area of the sheet of wood.



- (a) 100 cm^2 (b) 110 cm^2 (c) 120 cm^2 (d) None of these
25. Shalu bought a car for Rs. 5600.00. He sold it to Rachel for $\frac{5}{6}$ th the price he paid for it. Rachel sold it to Rihana for $\frac{1}{5}$ th less than she paid. Rihana sold it to Ritesh for $\frac{3}{4}$ what she paid. What did Ritesh pay for the car?
- (a) Rs. 3000 (b) Rs. 2500 (c) Rs. 2800 (d) None of these
26. The average distance from Pluto to the Sun is 3.65×10^9 miles. What is this number written in standard form.
- (a) 365,000,000 (b) 3,650,000,000
(c) 36,500,000,000 (d) None of these
27. Ritesh's tent is a triangular prism, as shown below.



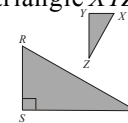
Which combination of shapes make up the bases and faces of Ritesh's tent.

- (a) 2 triangles and 2 rectangles
(b) 2 triangles and 3 rectangles
(c) 3 triangles and 2 rectangles
(d) None of these
28. Mohit wrote the four numbers given below in scientific notation 5.5×10^5 , 1.2×10^3 , 2.8×10^6 , 7.4×10^2 . Which number is the greatest value?
- (a) 5.5×10^5 (b) 1.2×10^3 (c) 2.8×10^6 (d) 7.4×10^2
29. A bag contains 50 cards numbered from 1 to 50. Without looking what is the chances of drawing out a card that is numbered with a multiple of 5?
- (a) $\frac{1}{50}$ (b) $\frac{1}{10}$ (c) $\frac{10}{50}$ (d) None of these
30. An algebraic expression which is obtained on addition of following algebraic expression is $2x, \frac{2x}{3} - \frac{5x^2}{3} + \frac{5x^3}{2}, \frac{2x^2}{3} - \frac{x^3}{2} - \frac{x}{3}, x^3 - 2x^2 - \frac{x}{3}$
- (a) $2y$ (b) 0
(c) $y^3 - y^2 + y + 4$ (d) None of these
31. Which event has a probability of zero
- (i) Choosing a letter from the alphabet that has line symmetry
(ii) Choosing a number which is greater than six and is even
(iii) Choosing a pair of parallel lines that have unequal slopes
(iv) Choosing a triangle that is both isosceles and right

- (a) both (ii) and (iii) (b) Only (iii)
(c) both (iii) and (iv) (d) None of these
32. What is the product of $-3x^2y$ and $(5xy^2 + xy)$?
- (a) $-15x^3y^3 - 3x^3y^3$ (b) $-15x^2y^2 - 3x^2y$
(c) $-15x^3y^3 + xy$ (d) None of these
33. **Statement 1** : The total measure of the three angles of a triangle is 180° .
Statement 2 : Sum of the length of any two sides of a triangle is more than the length of the third side then
- (a) Both statement I and II are true
(b) Statement I is true and statement II is false
(c) Statement II is true and statement I is false
(d) None of these
34. Which of the following statements is true with regard to a circle?
- (a) The area is sometimes numerically larger than the circumference.
(b) The area is always numerically larger than the circumference.
(c) When the circumference of a circle doubles then the area also doubles.
(d) None of these

35. $1 - \frac{1 - \frac{1}{2}}{1 + \frac{1}{2}}$ equals $1 + \frac{1 + \frac{1}{2}}{1 - \frac{1}{2}}$

- (a) $\frac{7}{9}$ (b) $\frac{5}{6}$ (c) $\frac{1}{2}$ (d) None of these
36. If $n = 5$, then the value of $(7n - 5)(n - 5)(3n + 5)$ is
- (a) 0 (b) 50 (c) 500 (d) None of these
37. Madan buys three notebooks for school. Each notebook is the same price. Madan uses a coupon that is worth Rs. 2 off his total purchase. He pays a total of Rs. 7 with the coupon. Which equation can be used to find the cost of one notebook, n ?
- (a) $3n - 2 = 7$ (b) $3n + 2 = 7$
(c) $3(n - 2) = 7$ (d) None of these
38. Triangle RST is similar to triangle XYZ .



\overline{RS} corresponds to which side of triangle XYZ ?

- (a) \overline{XZ} (b) \overline{YZ} (c) \overline{XY} (d) None of these

39. The table below shows paint's pattern between the number of squares made and the number of toothpicks used.

Number of Squares	Number of Toothpicks	Picture
1	4	
2	7	
3	10	
4	13	
n	?	

Which expression can Jan use to determine the number of toothpicks used to make n squares?

- (a) $3n - 1$ (b) $4n - 1$ (c) $3n + 1$ (d) None of these

40. The chart below lists the exam scores for five students. All exam scores have a possible 100 points. What minimum score does Kavita need on a 5th exam to obtain an average score of exactly 90?

EXAM SCORES					TOTAL
Anu	75	85	80	92	332
Parul	67	80	75	82	304
Kavita	83	88	95	90	356
Jerry	94	82	87	77	340
Gita	83	70	78	85	316

- (a) 90 (b) 92 (c) 94 (d) None of these

41. Below are Mitali's test scores for 1st and 2nd terminals. Which statement is true about the data?

1st terminal	83	86	88	97	92	88	77	88	90	95
2nd terminal	77	84	83	89	93	96	99	96	87	86

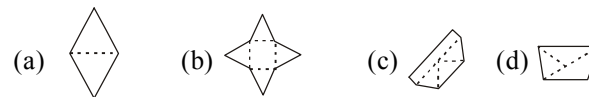
- A. The 1st terminal mean score is higher than the 2nd.
 B. The 1st terminal mode score is higher than the 2nd.
 C. The modes of each terminal's scores are equal.
 D. The means of each terminal's scores are equal.
 E. The 2nd terminal mean score is higher than the 1st.
 (a) A, B and D (b) C and D (c) Only E (d) None of these

42. Rohit plans to put ribbon around the rim of a pot and attach a bow onto the ribbon. The bow itself will take 18cm of the ribbon. What is the least amount of ribbon needed for one pot if the pot is 8 cm in diameter?

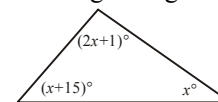


- (a) About 18 cm (b) About 44 cm
 (c) About 56 cm (d) None of these

43. Which piece of paper can be folded into a pyramid?

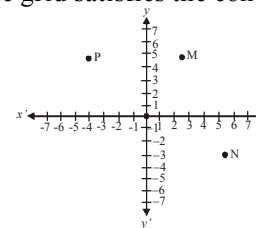


44. What is the measure of the largest angle in the accompanying triangle?



- (a) 41 (b) 83 (c) 46.5 (d) None of these

45. Which point on the grid satisfies the condition $x > 4$ and $y < -2$?



- (a) L (b) M (c) N (d) P

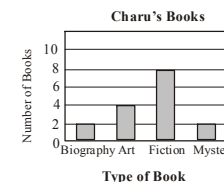
46. If $\frac{x}{y} = \frac{4}{5}$, then the value of $\frac{4}{7} + \frac{2y-x}{2y+x}$ is

- (a) $\frac{3}{7}$ (b) 1 (c) $1\frac{1}{7}$ (d) None of these

SECTION - C

INTERACTIVE SECTION

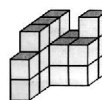
47. Charu has 16 books in his bookcase. This bar graph shows the number of each type of book.



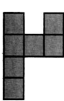

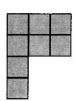
Which circle graph best shows the types of books Charu has in her bookcase?

- (a) (b) (c) (d) None of these

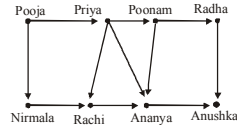
- 48.



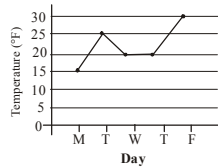
Which drawing represents the top view of this solid?

- (a)  (b)  (c)  (d) None of these

49. How many different ways are there to travel from Pooja to Anushka if travel is allowed only in the direction of the arrows shown in the drawing?



- (a) 3 ways (b) 5 ways (c) 12 ways (d) None of these
50. The accompanying graph shows the high temperature in a city for a 5-day period in January.



Which statement describes the data?

- (a) median = mode (b) mean < mode
(c) median = mean (d) None of these

☺ END OF THE EXAM ☺

ANSWERS

1. (b) 2. (a) 3. (c) 4. (d) 5. (c)
6. (b) 7. (c) 8. (b) 9. (c) 10. (b)
11. (b) 12. (a) 13. (c) 14. (a) 15. (a)
16. (a) 17. (b) 18. (d) 19. (a) 20. (a)
21. (b) 22. (b) 23. (b) 24. (b) 25. (c)
26. (b) 27. (b) 28. (c) 29. (c) 30. (d)
31. (b) 32. (d) 33. (a) 34. (a) 35. (b)
36. (a) 37. (a) 38. (c) 39. (c) 40. (c)
41. (c) 42. (b) 43. (b) 44. (b) 45. (c)
46. (b) 47. (b) 48. (c) 49. (b) 50. (a)

☺☺☺