



National Cyber Olympiad

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 3 sections, 15 questions in section I, 15 in section II and 20 in section III.

SYLLABUS

Section – I (Mental ability) : Natural numbers and whole numbers, Integers, Factors and multiples, Ratio, Proportion and unitary method, Percentage and its applications, Algebraic expressions, Linear equations in one variable, Basic geometrical concepts, Line segments, Angles, Triangles, Pairs of lines and transversal, Construction, Perimeter and area, Rational numbers, Decimal representation of rational numbers, Exponents.

Section – II (Logical and analytical reasoning) : Problems based on figures, Find odd numeral out, Series completion, Coding-decoding, Mathematical reasoning, Analytical reasoning, Mirror images, Embedded figures, Direction sense test, Cubes and dice.

Section – III (Computers and IT) : Evolution of computer, Fundamentals of computer, Elements of computer system, What is programming, LOGO, Basic introduction, Work more in MS-DOS, More about windows 95/98, Working with word processor, Work with word star, Work with MS-Word, Multimedia, Internet, World wide web.



National Science Olympiad

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 2 sections, 20 questions in section I and 30 in section II.

SYLLABUS

Section – I (Mental ability) : Integers, Fractions and Decimals, Data Handling, Simple Equations, Lines and Angles, The Triangle and its Properties, Congruence of Triangles, Comparing Quantities, Rational Numbers, Practical Geometry, Perimeter and Area, Algebraic Expressions, Exponents and Powers, Symmetry, Visualising Solid Shapes.

Section – II (Science) : Heat, Motion and Time, Electric Current, Light, Water, Acids, Bases and Salts, Physical and Chemical Changes, Life Processes, Earth and Environment, Fibres to Fabrics



International Mathematics Olympiad

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 3 sections, 20 questions in section I, 20 in section II and 10 in section III.

Section I : Logical Reasoning, **Section II :** Mathematical Reasoning &

Section III : Everyday Mathematics

SYLLABUS

Integers, Properties of integers, Fractions, Multiplication and division of fractions, Representation of rational numbers on number line, Operations of rational numbers, Multiplication and Division of decimals, Conversion of units, Powers and Exponents, Algebraic Expressions, Simple linear equations, Concept of percentage, Profit and Loss, Simple interest, Understanding shapes, Properties of triangle, Symmetry congruence of triangles, Perimeter and Area, Circles, Bar Graphs, Simple probability.






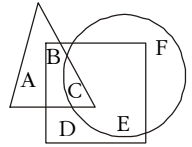


National Cyber Olympiad

MENTAL ABILITY

- A circular park of 20 metre diameter has a circular path just inside the boundary of width 1 metre. The area of the path is (in sq.m)
 (A) 15π (B) 17π (C) 19π (D) 25π
- In a triangle ABC , $\angle A = 90^\circ$ and D is the mid-point of AC . The value of $BC^2 - BD^2$ is equal to
 (A) AD^2 (B) $2AD^2$ (C) $3AD^2$ (D) $4AD^2$
- 40% of ? + $180 = 564$.
 (A) 960 (B) 860 (C) 950 (D) 850
- Any cyclic parallelogram having unequal adjacent sides is necessarily a
 (A) Square (B) Rectangle (C) Rhombus (D) Trapezium
- The factorization of $25 - p^2 - q^2 - 2pq$ is
 (A) $(5 + p + q)(5 - p + q)$ (B) $(5 + p + q)(5 - p - q)$
 (C) $(5 + p + q)(5 + p - q)$ (D) $(5 + p - q)(5 - p + q)$
- The value of $\frac{6.98 \times 6.98 - 2.02 \times 2.02}{4.96}$ is
 (A) 9 (B) 4.96 (C) 3.72 (D) 6.76
- The value of $9x^2 + 49y^2 - 42xy$ when $x = 15$ and $y = 3$ is
 (A) 636 (B) 576 (C) 386 (D) 456
- If $\left(x - \frac{1}{x}\right) = 5$, the value of $x^2 + \frac{1}{x^2}$ is
 (A) 23 (B) 27 (C) 25 (D) 29

LOGICAL & ANALYTICAL REASONING

- Complete the series:  ?
 (A)  (B)  (C)  (D) 
- Rectangle : Square :: Ellipse : ?
 (A) Centre (B) Diameter (C) Circle (D) Radius
- In the given figure, the triangle represents girls, square represents sportspersons and circle represents coaches. Which portion of the figure represents girls who are sportspersons but not coaches?
 (A) A (B) B
 (C) C (D) D
 
- Five boys A, B, C, D and E are standing in a row. A is between C and D and B is between D and E. Which of the following pairs represents the boys standing at both the ends?
 (A) C, B (B) E, C (C) E, A (D) A, C
- Arrange the following words in a meaningful order.
 1. Frog 2. Eagle 3. Grasshopper 4. Snake 5. Grass
 (A) 3, 4, 2, 5, 1 (B) 1, 3, 5, 2, 4 (C) 5, 3, 1, 4, 2 (D) 5, 3, 4, 2, 1.

14. Match the following

Term	Stands For
1. COBOL	A. Formula Translation
2. DOS	B. Common Business Oriented Language
3. FORTRAN	C. Beginner's All Purpose Symbolic Instruction Code
4. BASIC	D. Disc operating system
(A) 1D, 2B, 3C, 4A	(B) 1A, 2C, 3D, 4B
(C) 1B, 2D, 3A, 4C	(D) 1C, 2A, 3B, 4D.

15. Virus is a program written using one of the computer languages to cause damage to the data, the information stored in the computer, or the hardware of the computer. The most common damage done by virus is

- (A) Erase or corrupt useful data from the hard disk
 - (B) Increase the file size of command file by several 1000 bytes
 - (C) Affect hardware components
 - (D) Slow down the computer.
-

16. Match the following terms with what they stand for

Term	Stands for
1. .Com	A. Education
2. .Edu	B. India
3. .In	C. Australia
4. .Au	D. Commerce
(A) 1A, 2B, 3C, 4D	(B) 1B, 2C, 3D, 4A
(C) 1C, 2D, 3A, 4B	(D) 1D, 2A, 3B, 4C.

17. A browser is an interactive program that permits a user to view information from the computer. The browser performs which of the following services?

- (A) Connecting to the source computer whose address is specified
 - (B) Requesting new page from the source
 - (C) Receiving new page
 - (D) All of these.
-

18. Modern Computers compared to earlier computers are

- (A) Faster and larger
 - (B) Less reliable
 - (C) Larger and stronger
 - (D) Faster and smaller.
-

19. Who is regarded as the Father of computers ?

- (A) Abacus
 - (B) John Napier
 - (C) Pascal
 - (D) Charles Babbage
-

20. The five basic parts of a computer system are

- (A) Hardware, Software, Memory, VDU and Printer
 - (B) Store, Arithmetic and logical unit, Control unit, Input device and Output device
 - (C) CPU, ALU, Software, Firmware and Operating system
 - (D) Data bus, Control lines, Address bus, Memory and CPU.
-



National Science Olympiad

MENTAL ABILITY

- A merchant buys goods at 25% off the list price. He desires to mark the goods so that he can give a discount of 20% on the marked price and still clear a profit of 25% on the selling price. What percent of the list price must he mark the goods?

(A) 125% (B) 100% (C) 120% (D) 80%.

- The bottom, side, and front areas of a rectangular box are known. The product of these areas is equal to

(A) The volume of the box (B) The square root of the volume
 (C) Twice the volume (D) The square of the volume.

- P can do a piece of work in 9 days. Q is 50% more efficient than P. The number of days it takes Q to do the same piece of work is

(A) $13\frac{1}{2}$ (B) $4\frac{1}{2}$ (C) 6 (D) 3.

- $$\begin{array}{r} B\ 2 \\ \times 7\ B \\ \hline 6396 \end{array}$$
 In the product shown above, B is a digit. The value of B is
 (A) 3 (B) 5 (C) 6 (D) 8

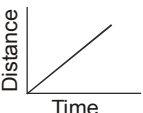
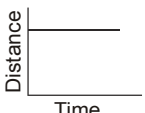
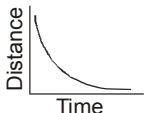
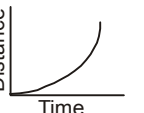
- A piece of paper containing six joined squares labelled as shown in the diagram is folded along the edges of the squares to form a cube. The label of the face opposite the face labeled X is



- (A) Z (B) U (C) V (D) Y

SCIENCE

- A body moves with uniform velocity. Which of the graphs shown here is a graph of distance against time for this motion?

(A)  (B)  (C)  (D) 

- What causes light to become dimmer with distance?

(A) Diffraction and scattering (B) Refraction and scattering
 (C) Absorption and scattering (D) Reflection and scattering

- Which of the following is a non-metal?

(A) Mercury (B) Magnesium
 (C) Manganese (D) None of these.

- Which of the following statements about the Jurassic period are correct?

 - Many large dinosaurs lived during this period.
 - Evidence of first birds and mammals have been found in fossils of this period.
 - It saw the emergence of many forms of primates.
 - This period related to what the Earth was 180 million years ago.

Select the correct answer using the codes given below.

(A) 2, 3 and 4 (B) 1, 2 and 4
 (C) 1, 3 and 4 (D) 1, 2 and 3

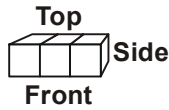
10. Rainbow is produced when sunlight falls on drops of rain. Which of the physical phenomena are responsible for this ?
1. Diffusion, 2. Refraction, 3. Internal reflection
(A) 1 and 2 (B) 2 and 3
(C) 1, 2 and 3 (D) 1 and 3
-
11. Which of the following is not a unit of time ?
(A) Light year (B) Nano second
(C) Micro second (D) Second
-
12. The increase in area of the solid on heating is called
(A) Superficial expansion (B) Linear expansion
(C) Cubical expansion (D) Quadra expansion
-
13. The temperature at which no more energy can be removed from matter is called
(A) Absolute zero (B) Boiling point (C) 32° F (D) 32°C
-
14. A lightning conductor is a
(A) Piece of metallic wire with spikes through which current can flow
(B) Substance that can be charged by clouds
(C) Carbon rod (D) Plastic rod.
-
15. Which one of the following is true for all chemical reactions?
(A) There is a change in volume (B) Heat is evolved
(C) Chemical bonds are broken or formed (D) There is a change in mass
-
16. The movement of oxygenated blood from the left auricle to left ventricle and then to aorta to all parts of the body is called
(A) Extracellular circulation (B) Pulmonary circulation
(C) Systemic circulation (D) Intracellular circulation
-
17. The process of crossing two varieties with different characters to obtain new variety is called
(A) Introduction (B) Selection
(C) Hybridization (D) Conservation
-
18. Chipko movement is concerned with
(A) Conservation of natural resources (B) Plant/forest conservation
(C) Plant hybridization (D) Environmental pollution.
-
19. Match List I with List II and select the correct answer using the codes given below the lists :
- | List I | | | | List II |
|---------------|--|---|---|----------------|
| a. | Melting of ice | | | 1. Radiation |
| b. | Heat coming from the Sun | | | 2. Convection |
| c. | Air circulation from sea level to higher altitudes | | | 3. Latent heat |
| d. | Heating of a metal rod by keeping one end of it in a flame | | | 4. Conduction |
| | a | b | c | d |
| (A) | 1 | 2 | 3 | 4 |
| (B) | 3 | 4 | 1 | 2 |
| (C) | 4 | 1 | 3 | 2 |
| (D) | 3 | 1 | 2 | 4 |
-
20. Which metal is present in the human body in greater percentage ?
(A) Calcium (B) Sodium (C) Potassium (D) Iron
-



International Mathematics Olympiad

LOGICAL REASONING

1. The figure given below is made of 3 small cubes.



Which best shows the side view of the figure?

- (A) (B) (C) (D)

2. Which will come next in the series?

- (A) ef (B) gh (C) ij (D) dw
- az, by, cx, ?

3. A and B are a married couple. X and Y are brothers, X is brother of A. How is Y related to B?

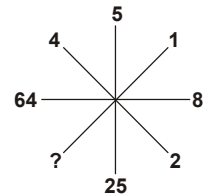
- (A) Brother-in-law (B) Brother (C) Son-in-law (D) Cousin

4. Three of the following are alike in a certain way and form a group. Find the odd one out.

- (A) Bird (B) Insect
(C) Aeroplane (D) Kite

5. Insert the missing character.

- (A) 1 (B) 2
(C) 3 (D) 4



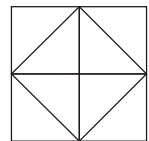
6. Which most closely resembles the mirror image of the given word.

STROKE

- (A) $\Sigma T R O K E$ (B) EKORTS (C) ROKETS (D) EKORT Σ

7. Count the number of triangles in the following figure.

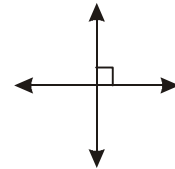
- (A) 8 (B) 10
(C) 12 (D) 14



MATHEMATICAL REASONING

8. Which of the following is best described in the given figure?

- (A) Acute angles (B) Obtuse angles
(C) Parallel lines (D) Perpendicular lines

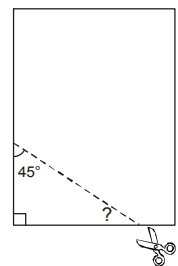


9. Which shows 833,000 written in scientific notation?

- (A) 8.33×10^3 (B) 8.33×10^4
(C) 8.33×10^5 (D) 8.33×10^6

10. Nina made a triangle by cutting the corner of a sheet of paper. One angle is 45° . What is the measure of the third angle of Nina's triangle?

- (A) 30° (B) 45°
(C) 55° (D) 60°



11. $4\frac{3}{4} - 2\frac{1}{2} =$

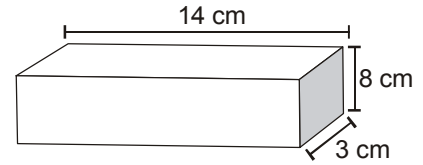
(A) $1\frac{1}{4}$

(B) $1\frac{3}{4}$

(C) $2\frac{1}{4}$

(D) $2\frac{3}{4}$

12. This rectangular prism has a length of 14 cm, a height of 8 cm, and a width of 3 cm. What is the volume?



(A) 25 cu cm

(B) 42 cu cm

(C) 112 cu cm

(D) 336 cu cm

13. Which expression represents the product of n and 25?

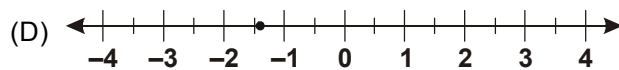
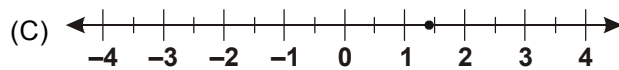
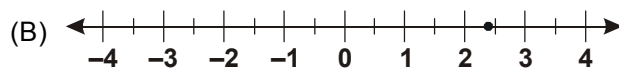
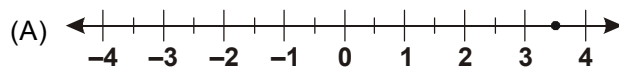
(A) $25n$

(B) $25 - n$

(C) $25 + n$

(D) $25 \div n$

14. Which point on the number line best represents 1.35?



15. What is the prime factorization of 45?

(A) $2^3 \times 5$

(B) $3^2 \times 5$

(C) $5^2 \times 3$

(D) $5^2 \times 9$

16. $11.3 \times 2.7 =$

(A) 29.31

(B) 29.51

(C) 30.31

(D) 30.51

17. 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) $\left(\frac{7}{8} \times \frac{7}{7}\right) - \left(\frac{5}{6} \times \frac{5}{5}\right)$

EVERYDAY MATHEMATICS

18. Ram can throw a ball $50\frac{3}{5}$ metres high. Shyam can throw the same ball $48\frac{1}{3}$ metres high. How much farther can Ram throw the ball than Shyam?

(A) $2\frac{2}{15}$ m

(B) $2\frac{4}{15}$ m

(C) $2\frac{3}{5}$ m

(D) $2\frac{4}{5}$ m

19. In a parking lot, 1 out of every 8 cars is blue. What percent of the cars in this lot are blue?

(A) 1.25%

(B) 7%

(C) 9%

(D) 12.5%

20. A duck flew at 18 km per hour for 3 hours, then at 15 km per hour for 2 hours. How far did the duck fly in all?

(A) 69 km

(B) 75 km

(C) 81 km

(D) 84 km

SAMPLE ANSWER SHEET

1. NAME : If your name is SACHIT AIYER, then you should write as follows :

SACHIT AIYER

2. FATHER'S NAME : If your father's name is SATISH KUMAR SHARMA, then you should write as follows :

SATISH KUMAR SHARMA

SCHOOL CODE

Grid for School Code with letters A-Z and digits 0-9.

3. SCHOOL CODE Write your school code i.e. if your school code is MH0547 darken as follows :

Darken the circle

6. GENDER If you are a boy, then darken Male circle

GENDER Males and Females circles.

4. CLASS If you are in Class 10, then you should darken as follows :

5. ROLL NO. If your roll no. is 587, then you should write and darken the circles as follows :

Grids for Class (10) and Roll No. (587).

Darken the circle

CORRECT way to darken the circle

WRONG way to darken the circle

7. If your choice for Answer 1 is C, then you should darken the circle as follows :

1. (A) (B) (C) (D)

Darken the circle

MARK YOUR ANSWERS WITH HB PENCIL/BALL POINT PEN (BLUE/BLACK)

National Cyber Olympiad

- 1. (A) (B) (C) (D) ... 20. (A) (B) (C) (D)

National Science Olympiad

- 1. (A) (B) (C) (D) ... 20. (A) (B) (C) (D)

International Mathematics Olympiad

- 1. (A) (B) (C) (D) ... 20. (A) (B) (C) (D)

ANSWERS

National Cyber Olympiad

- 1. (C) 2. (C) 3. (A) 4. (B) 5. (B) 6. (A) 7. (B) 8. (B) 9. (A) 10. (C) 11. (B) 12. (B) 13. (C) 14. (C) 15. (A) 16. (D) 17. (D) 18. (D) 19. (D) 20. (B)

National Science Olympiad

- 1. (A) 2. (D) 3. (C) 4. (D) 5. (D) 6. (A) 7. (C) 8. (D) 9. (B) 10. (B) 11. (A) 12. (A) 13. (A) 14. (A) 15. (C) 16. (C) 17. (C) 18. (B) 19. (D) 20. (A)

International Mathematics Olympiad

- 1. (A) 2. (D) 3. (A) 4. (B) 5. (A) 6. (D) 7. (C) 8. (D) 9. (C) 10. (B) 11. (C) 12. (D) 13. (A) 14. (C) 15. (B) 16. (D) 17. (A) 18. (B) 19. (D) 20. (D)