

### SAMPLE PAPER

CLASS

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):** Number Systems, Polynomials, Coordinate Geometry, Linear Equations in Two Variables, Introduction to Euclid's Geometry, Lines and Angles, Triangles, Quadrilaterals, Areas of Parallelograms and Triangles, Circles, Constructions, Heron's Formula, Surface Areas and Volumes, Statistics, Probability.

**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):** Algorithms and Flowcharts in Programming, Visual Basic, Animations, HTML, Internet and Viruses, MS-Word, MS-Excel, MS-Power Point, Hardware, Software, Input & Output Devices, Memory & Storage Devices, Flash, Networking.



The actual test paper has 50 questions. Time allowed: 60 minutes. There are 2 sections: 15 questions in section I and 35 in section II.

#### **SYLLABUS**

**Section – I (Mental Ability):** Number Systems, Polynomials, Coordinate Geometry, Linear Equations in Two Variables, Introduction to Euclid's Geometry, Lines and Angles, Triangles, Quadrilaterals, Areas of Parallelograms and Triangles, Circles, Constructions, Heron's Formula, Surface Areas and Volumes, Statistics, Probability, Logical (Verbal and Non-verbal) and Analytical Reasoning.

**Section – II (Science):** Motion, Force and Laws of Motion, Gravitation, Work and Energy, Sound, Matter in Our Surroundings, Is Matter Around Us Pure, Atoms and Molecules, Structure of Atom, Cell - The Fundamental Unit of Life, Tissues, Diversity in Living Organisms, Why Do We Fall III, Natural Resources, Improvement in Food Resources.

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.



International Mathematics Olympiad

#### **SYLLABUS**

**Section – I (Logical Reasoning) :** Mathematical Operations, Series Completion, Arithmetical Reasoning, Problems on Cubes and Dice, Number Ranking & Time Sequence Test, Inserting Missing Character and General Reasoning Based on Prescribed Syllabus.

**Section – II (Mathematical Reasoning) :** Number Systems, Polynomials, Coordinate Geometry, Linear Equations in Two Variables, Introduction to Euclid's Geometry, Lines and Angles, Triangles, Quadrilaterals, Areas of Parallelograms and Triangles, Circles, Constructions, Heron's Formula, Surface Areas and Volumes, Statistics, Probability.

**Section – III (Everyday Mathematics) :** The Syllabus of this section will be based on the syllabus of Mathematical Reasoning.



International English Olympiad

The actual test paper has 50 questions. Time allowed: 60 minutes. There are 3 sections.

#### **SYLLABUS**

**Section-I: Word and Structure Knowledge :** Concord, Question forms, Tenses, Conditionals, Modals, Reported speech. Collocations, Phrasal verbs, Idioms, Homonyms and homophones, Words related to social cause, Travel, Workplace, etc.

**Section-II: Reading :** Search for and retrieve information from various text types like flyers, Classifieds, Dictionaries, etc., Understand information presented in instruction manual format, Message format and others. Acquire broad understanding of and look for specific information in longer texts like editorials, Essays, etc.

**Section-III: Spoken and Written Expression**: Ability to understand situation-based variations in functions like Giving advice, Stating preferences, Discussing probability, Making an offer, etc.



# National Cyber Olympiad

		MENIA	ALABILITY											
1.	in 24 hours. In how much ti			s and other to lose 50 seconds ninutes? (D) 10 hours.										
<b>2</b> .	Students of the psychology of	class in a college eaching but beca – c) (x – d)(	were getting ready to came dumb-founded wh	challenge and out-wit their new en she asked them to find the										
3.	•	In the given figure if $PQR$ is an isosceles triangle and $PSR$ is an equilateral triangle and $X = 26^{\circ}$ then the value of Y (in degrees) will be												
	(A) 17°		(B) 27°	\s\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\										
	(C) 37°		(D) 47°	P										
4.			he diagonals is 8 cm. (	Calculate the length of another										
	diagonal and the area of the (A) 8 cm, 32 cm <sup>2</sup> (B) 6	e rnombus. 5 cm, 24 cm²	(C) 4 cm, 16 cm <sup>2</sup>	(D) 7 cm, 28 cm <sup>2</sup> .										
	l l	OGICAL & ANAL	YTICAL REASONING											
	Step 3: If less than 15, jump Step 4: Add 3 Step 5: If greater than 18, If you start with a value of 1 (A) 11 (B) 1	subtract 2 and then apply												
6.	respectively. If someone is thi			re light, air, earth, sky and water  (D) Light.										
<b>7</b> .	Consider the given Venn diag The numbers in the Venn d newspapers. The diagram is In a population of 10,000 how (A) 5000 (B) 6	iagram indicate s drawn after sur many can be expe	veying 50 persons.	s reading the 3 12 14 8 2 5										
8.	Hari, Pinto, Oliver, Chris, and a hexagon, and an octagon. drawing. Chris, Pinto, and T sides. Oliver's drawing has	d Tony drew differ No persons's na ony drew figures	ent geometric figures: a ame begins with the sa with more than 4 side	a circle,a pentagon, a trapezoid, ame first letter as that person's es. Chris drawing has the most did Chris draw? (D) Pentagon										
	COMF	PUTERS & INFO	RMATION TECHNOLO	GY										
9.	In Visual Basic, Hour() func (A) An Integer specifying a													

	(A) An Integer specifying a whole number											
	(B) A whole number between 0 and 23											
	(C) The hour of the day	(D) All of these										
10.	Which of the statements about HTML is incorre	rect?										
	(A) Attribute names are not case sensitive	(B) LINK defines the color of the unvisited link	(									
	(C) The line break element is a container element											
	(D) The default colouring of VLINK attribute is purple											

11. What does a disc fragmentor do? (A) It is a utility program that facilitates compression of files so that they occupy less storage space (B) It is a utility program that minimizes the time taken by the hard disk optical reader to read up 'split' files. It does so by rearranging the files and free space on your computer so that files are stored in contiguous memory. (C) It is a utility program that facilitates the backing up of the disk (D) It is a utility program used for creating and editing text file. 12. What does OCR stand for? (A) Optical Character Reader (B) Optical Character Recognition (C) Operational Character Reader (D) Only Character Reader. 13. Match the following 1. Scanner A. Input Device 2. **OCR** B. Output Device 3. Light pen 4. Plotter 5. Printer (A) 1A, 2B, 3A, 4B, 5A (B) 1A, 2A, 3A, 4B, 5B (C) 1A, 2A, 3B, 4B, 5B (D) 1A, 2B, 3A, 4B, 5B **14.** The smallest unit of memory is (C) 1 kilobyte (B) 8 bits (A) 16 bytes (D) 1 GB. 15. Which of the following symbols will be used to end the flowchart? (B) (A) /



## National Science Olympiad

		MEN	TAL ABILITY		
1.	up 9 steps, and dow	vn 2 steps. Where is he	e standing in relation	p 3 steps, down 6 steps, up 2 ste n to the step on which he starte ace (D) 1 step below.	
2.	Find the median of	this data.	149, 150, 147, 152,		
	(A) 145 cm	(B) 150 cm	(C) 160 cm	(D) 149 cm	
3.				If a farmer wishes to treat a crop of with 300 litres of the liquid fertilize (D) 16.	
4.				of the remainder on other expensuch was her income in January? (D) ₹ 1,600.	
5.	area available to the	motorcyclist for riding.		stunts has a diameter of 7 m. Find	the
	(A) 154 m <sup>2</sup>	(B) 160 m <sup>2</sup>	(C) 272 m <sup>2</sup>	(D) 616 m <sup>2</sup> .	

#### **SCIENCE**

- 6. Elements having the same number of valence electrons in their atoms have
  - (A) Similar atomic sizes

- (B) Similar combining capacities
- (C) Similar metallic character

- (D) Similar chemical properties.

- 7. Suppose you are pushing a loaded shopping cart. Which of the following is true?
  - (A) If action force always equals reaction force, you cannot move the cart because the cart pushes you backward just as hard as you push forward on the cart
  - (B) You push the cart slightly harder than the cart pushes you backward, so the cart moves forward
  - (C) You push before the cart has time to react, so the cart moves forward
  - (D) You are in contact with the earth through your high-friction shoes, while the cart is free to roll on its round wheels, so the cart moves.
- 8. The speed c of surface waves of wavelength  $\lambda$  travelling in deep water is given by the equation
  - $c=\sqrt{\frac{\lambda g}{2\pi}}$  where g is the acceleration due to gravity. Which one of the following options would give a straight line graph, given that f is the frequency of the waves ?
  - (A) f against  $\lambda^{-1}$
- (B) f against  $\lambda$
- (C) f against  $\lambda^2$
- (D)  $f^2$  against  $\lambda^{-1}$ .
- **9.** For a particle executing simple harmonic motion, the equilibrium position is at x = 0 and the amplitude at x = A. The kinetic energy of the particle will be equal to the potential energy
  - (A) At x = 0

- (B) At x = A
- (C) At x = A/2

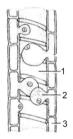
- (D) When x is greater than A/2 but less than A.
- **10.** What happens to the inertia of an object when its velocity is doubled?
  - (A) The object's inertia becomes  $\sqrt{2}$  times greater
  - (B) The object's inertia becomes 2 times greater
  - (C) The object's inertia becomes 4 times greater
  - (D) The object's inertia is unchanged.
- 11. Filtration as a method of separation can be used for mixtures that are
  - (A) homogeneous and liquid-in-gas mixtures
  - (B) heterogeneous and liquid-in-liquid mixtures
  - (C) homogeneous and solid-in-liquid mixtures
  - (D) heterogeneous and solid-in-liquid mixtures.
- 12. Molten sodium chloride conducts electricity due to the presence of
  - (A) Free molecules of NaCl
- (B) Free electrons

(C) Free Na<sup>+</sup> and Cl<sup>-</sup> ions

- (D) Free atoms of sodium and chlorine.
- **13.** The given figure shows the anatomical structure of certain plant tissues. If you are to label the parts marked 1, 2, 3 & 4 you would choose



- (B) 1 Parenchyma, 2 Tracheid, 3 Tyloses,
- (C) 1 Pit, 2 Tracheid, 3 Tyloses,
- (D) None of these



Endoplasmic

Perinuclear space

Heterochromatin

Chromatin net

reticulum

h

- **14.** Species *X* are chlorophyllous plants which are autotrophic in their mode of nutrition & may be green, yellow, orange & red colour etc. Species *X* belongs to *Y* which are non-vascular plants and whose plant body is not differentiated into true roots, stems & leaves and have unicellular and nonjacketed sex organs. In the above passage species *Y* is
  - (A) Bryophyta
- (B) Thallophyta
- (C) Pteridophyta
- (D) Gymnosperms.
- **15.** Refer the figure and identify from the marked alphabets (a, b, c, d) which is responsible for the following functions.
  - (I) Means of localization of the chromosomes within the cell
  - (II) Selective barrier, allowing certain substances in or out of the nucleus
  - (III) Means of sequestering many of the mRNA processing activities from the cytosol and separating nuclear and cytoplasmic constituents



(B) b

(C) c

(D) a and d.

Chromocentre





### International Mathematics Olympiad

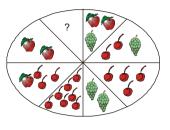
#### LOGICAL REASONING

1. Apples, cherries and grapes are arranged on a platter in the following fashion: opposite sectors contain fruit which is of equal value. To equal the value of two bunches of grapes, how much fruit must be placed in the empty sector?









2. If L denotes ÷, M denotes ×, P denotes + and Q denotes –, then which of the following statements is true?

(A) 32 P 8 L 16 Q 4 =  $-\frac{3}{2}$ 

(B) 6 M 18 Q 26 L 13 P 7 =  $\frac{173}{13}$ 

(C) 11 M 34 L 17 Q 8 L 3 =  $\frac{38}{3}$ 

(D) 9 P 9 L 9 Q 9 M 9 = -71

3. Find the missing number :







(A) 937

(B) 824

(C) 769

(D) 678

4. Complete the pattern.

6, 11, 21, 36, 56, (....)

(A) 42

(B) 51

(C) 81

(D) 91

#### **MATHEMATICAL REASONING**

In the accompanying diagram, parallel lines I and m are cut by transversal t.

Which statement about angles 1 and 2 must be true?



21

13

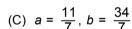
(A) ∠1 ≅ ∠2

- (B)  $\angle 1$  is the complement of  $\angle 2$
- (C)  $\angle 1$  is the supplement of  $\angle 2$
- (D) ∠1 and ∠2 are right angles
- 6. What values of a and b make quadrilateral MNOP a parallelogram?

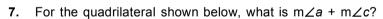
(A) 
$$a = 1, b = 5$$

(B) 
$$a = 5, b = 1$$





(D) 
$$a = \frac{34}{7}$$
,  $b = \frac{11}{7}$ 

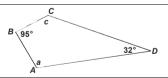


(A) 53°

(B) 137°

(C) 180°

(D) 233°



- 3. If a cylindrical barrel measures 22 cm in diameter, how many cm will it roll in 8 revolutions along a smooth surface?
  - (A)  $121\pi$  cm
- (B)  $168\pi \text{ cm}$
- (C)  $176\pi \text{ cm}$
- (D)  $228\pi \text{ cm}$
- **9.** A right circular cone has radius 5 cm and height 8 cm. What is the lateral surface area of the cone?
  - (A)  $40\pi$  sq cm

(B)  $445\pi$  sq cm

(C)  $5\pi \sqrt{39}$  sq cm

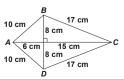
(D)  $5\pi \sqrt{89}$  sq cm



**10.** Figure *ABCD* is a kite.

What is the area of figure ABCD, in square centimetres?

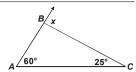
- (A) 120
- (B) 154
- (C) 168
- (D) 336



- **11.** The four sides of this figure will be folded up and taped to make an open box. What will be the volume of the box?
  - (A) 50 cm<sup>3</sup>
- (B) 75 cm<sup>3</sup>
- (C) 100 cm<sup>3</sup>
- (D) 125 cm<sup>3</sup>



- **12.** What is value of x?
  - (A) 35°
- (B) 60°
- (C) 85°
- (D) 95°



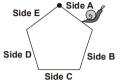
#### **EVERYDAY MATHEMATICS**

- **13.** One snail started from the dot. What side will it be on when it has crawled 13/20 of the distance around the regular pentagon of equal sides?
  - (A) A

(B) C

(C) D

(D) E

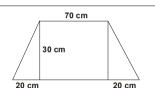


- **14.** A rectangular kitchen table is three times as long as it is wide. If it was 3 m shorter and 3 m wider it would be a square. What are the dimensions of the rectangular table?
  - (A)  $9 \times 3$

(B)  $4 \times 2$ 

(C)  $12 \times 6$ 

(D) 16 × 4



- **15.** Two carpenters decided to design desks for students at the Junior High School. The dimensions of the desk are as shown. How much wood (in cm²) would they need for 30 desks?
  - (A) 2700 cm<sup>2</sup>
- (B) 80000 cm<sup>2</sup>
- (C) 21000 cm<sup>2</sup>
- (D) 81000 cm<sup>2</sup>



### International English Olympiad

#### **WORD AND STRUCTURE KNOWLEDGE**

Direction (Q. No. 1 and 2): Choose one suitable word/phrase for each blank. Make sure that you choose the correct form of the word/phrase.

- 1. I am happy you are helping me with the assignment. This kind of work is not really my \_\_\_\_\_\_
  - (A) Cup and sauce
- (B) Cup of tea
- (C) Cup of coffee
- (D) Tea cup

- 2. The discussion was by no means
- \_\_\_\_. It went on for more than four hours!

(A) Cut and dried

(B) Chopped and dried

- (C) Cut and shredded
- (D) Dried and cut
- 3. Choose the correct spelling of the word.
  - (A) Believe
- (B) Beleive
- (C) Believ
- (D) Beleev

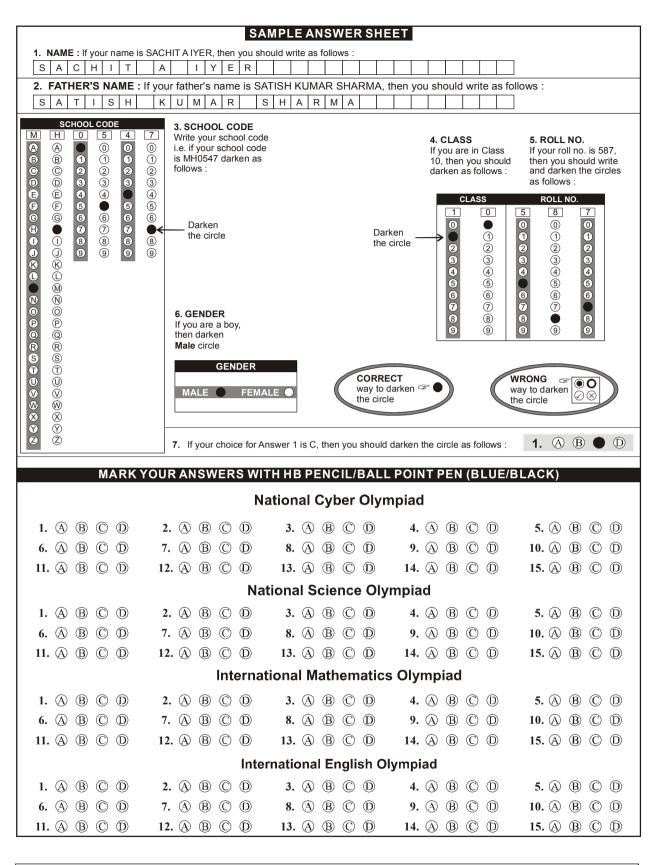
- 4. Choose the correct phrase.
  - (A) Down and up
- (B) Down and out
- (C) Down and town
- (D) Out and down

Direction (Q. No. 5 and 6): Fill in the blanks using the correct word/phrase.

- **5.** A class full of very good students means failures for the teachers to worry about.
  - (A) Lesser
- (B) Less
- (C) Fewer
- (D) Less than
- **6.** He seems to know a lot about you! How long have you
  - (A) Known
- (B) Knew
- (C) Been knowing
- (D) Know

him?

7.	Spot the error in the sentence.  Becoming a monitor / often means / to lose friends. No error (A) (B) (C) (D)									
8.	Complete the conversation with the correct Ravi: I think it's really exciting to go to new pl Teacher: What keep in mind it (A) Do you have to (B) Can you		ew place. (D) Must you have to							
9.	Change the given direct sentence to indirect "Drive carefully!" Ram said to me.  (A) Ram said to me drive carefully.  (C) Ram told me to drive carefully.	(B) Ram ordered me (D) None of the abov								
		ADING								
	The fly was finally hers. It had taken Mini hour hopelessly around inside a pickle jar. Kneeling layer of butter, wiping the knife clean against savored her victory. She was again in control. The event of trapping the fly is compared with	s to trap it, but now, ex on a chair, she took a c the edge of the dish, t	chausted, it buzzed and crashed hapatti and spread it with a thick							
10.	<ul><li>(A) The taste of chapati and butter</li><li>(C) A celebration by the victor</li></ul>	(B) A war followed by (D) The defeat of the	,							
11.	Which of the following expressions would you (A) On cloud ten (C) On cloud nine	use to describe Mini's (B) Under a cloud (D) Every dark cloud								
	SPOKEN AND WR	RITTEN EXPRESSION								
	Direction (Q. No. 12 and 13): Find one ser	ntence to complete th	e dialogue.							
12.	Teacher to student : I thought you had been doin with your work?	g your homework regula	_							
	<ul><li>(A) I will let your parents know that you have</li><li>(B) I'm afraid, at this rate, I'll have to give you</li><li>(C) I'm expecting you to earn a 'D' grade.</li></ul>		well this year.							
13.	Manasa: Vinu, it's the Maths class now! I for (A) Could you share your book with me today (B) Look here! Give me that book of yours! (C) Can I buy a Maths book? (D) Could I borrow your Maths notebook, please.	i.								
14.	Direction (Q. No. 14 and 15): You need to select Look at the choices given below and select Sentence 1: The blackbucks are mainly graze Sentence 2:	t the best option.  ers and prefer to eat gr								
	Sentence 3 :	eas that are close to cuy so they do not live far hundreds of them are	ultivation. r from the source of water. being killed.							
15.	Sentence 1 : The Pageant's Handbook of Firs Sentence 2 : Sentence 3 : Sentence 4 : Then seal and send this post-pa P. All you have to do is write the names of Q. And you can get it free, with no contest of	id cover back to us. 14 friends who enjoy re	· -							
	R. And we will rush you the booklet free of o	-								
	(A) PQ (B) QP		(D) QR							



#### **ANSWERS**

National Cyber Olympiad Natio						National Science Olympiad						International Mathematics						International English					
1.	(B)	2.	(A)	3.	(A)	1.	(A)	2.	(D)	3.	(A)	Olympiad							<b>(D)</b>	Oly	mpiad	I	(4)
4.	(B)	5.	(B)	6.	(C)	4.	(B)	5.	(A)	6.	(D)	1. 4.	(C) (C)	2. 5.	(D) (C)	3. 6.	(D) (B)	1. 4.	(B) (B)	2. 5.	(A) (C)	3. 6	(A) (A)
/.  10	(D) . (C)	8. 11	(B) (B)	9. 12.	(D) (B)	7. 10.	(D) (D)	8. 11.	(D) (D)	9. 12.	(D) (C)	7.	(D)	8.	(C)	9.	(D)	7.	(C)	8.	(B)	9.	(C)
13	( - )	14.	` '		` '	13.	(A)		` '		(A)	10.	(C)	11.	(A)	12.	` '	10.	(C)	11.	(C)	12.	(B)
	` '		` ,		` '		` '		( )		( )	13.	(C)	14.	(A)	15.	(D)	13.	(A)	14.	(A)	15.	(B)