S O F
SCIENCE OLYMPIAD FOUNDATION

SAMPLE PAPER
2014-15

NCO
NATIONAL CYBER OLYMPIAD

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 4 sections: 10 questions in section I, 10 in section II, 25 in section III and 5 in section IV.

SYLLABUS

Section – I (Mental Ability) : Rational Numbers, Linear Equations in One Variable, Understanding Quadrilaterals, Practical Geometry, Data Handling, Squares and Square Roots, Cubes and Cube Roots, Comparing Quantities, Algebraic Expressions and Identities, Visualising Solid Shapes, Mensuration, Exponents and Powers, Direct and Inverse Properties, Factorisation, Introduction to Graphs, Playing with Numbers.

Section – II (Logical and Analytical Reasoning) : Problem Based on Figures, Odd One Out, Series Completion, Coding-Decoding, Mathematical Reasoning, Analytical Reasoning, Mirror Images, Embedded Figures.

Section – III (Computers and IT) : Internet & Viruses, HTML, Flash, MS-Access, Networking, MS-Word, MS-PowerPoint, MS-Excel, Hardware, Software, Input & Output Devices, Memory & Storage Devices, Latest Developments in the field of IT.

Section – IV (Achievers Section) : Syllabus as per Section III.

Questions are based on Windows 7 and MS-Office 2010.

NSO
NATIONAL SCIENCE OLYMPIAD

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 3 sections: 15 questions in section I, 30 in section II and 5 in section III.

SYLLABUS

Section – I (Mental Ability) : Rational Numbers, Exponents and Powers, Direct and Inverse Variations, Comparing Quantities, Algebraic Expressions and Identities, Factorization of Algebraic Expressions, Linear Equations in One Variable, More About Triangles, Congruent Triangles, Understanding Quadrilaterals, Mensuration, Data Handling, Visualising Solid Shapes, Introduction to Graphs, Playing with Numbers, Squares and Square Roots, Cubes and Cube Roots, Problem Based on Figures, Odd One Out, Series Completion, Coding-Decoding, Mathematical Reasoning, Analytical Reasoning, Mirror Images, Embedded Figures.

Section – II (Science) : Crop Production and Management, Microorganisms, Synthetic Fibres and Plastics, Metals and Non-metals, Coal and Petroleum, Combustion and Flame, Conservation of Plants and Animals, Cell, Reproduction in Animals, Force and Pressure, Friction, Sound, Chemical Effects of Electric Current, Some Natural Phenomena, Light, Stars and Solar System, Pollution of Air and Water.

Section – III (Achievers Section) : Syllabus as per Section II.

IMO
INTERNATIONAL MATHEMATICS OLYMPIAD

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 4 sections: 20 questions in section I, 15 in section II, 10 in section III and 5 in section IV.

SYLLABUS

Section – I (Logical Reasoning) : Mathematical Operations, Series Completion, Direction Sense Test, Analytical Reasoning, Problems on Cubes and Dice, Number Ranking & Time Sequence Test and General Reasoning Based on Prescribed Syllabus.

Section – II (Mathematical Reasoning) : Rational Numbers, Squares and Square Roots, Cubes and Cube Roots, Exponents and Powers, Comparing Quantities, Algebraic Expressions and Identities, Linear Equations in One Variable, Understanding Quadrilaterals, Constructions, Mensuration, Visualising Solid Shapes, Data Handling, Direct and Inverse Variations, Factorisation, Introduction to Graphs, Playing with Numbers.

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

Section – IV (Achievers Section) : Syllabus as per Section II.

IEO
INTERNATIONAL ENGLISH OLYMPIAD

IN ASSOCIATION WITH
BRITISH COUNCIL

The actual test paper consists of 50 questions. Time Allowed : 60 minutes. There are 4 sections.

SYLLABUS

Section – I (Word and Structure Knowledge) : Prepositional phrases, Participle phrases, Tenses, Question tags, Conditionals, Reported speech. Spellings, Collocations, Phrasal verbs, Idioms, Homonyms and homophones, Words related to leisure, Household items/issues, Social causes, Outdoor locations and activities, etc.

Section – II (Reading) : Search for and retrieve information from various text types like News reports, Blurb, 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 requesting, Giving information, Expressing surprise, etc.
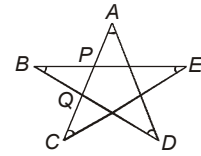
Section – IV (Achievers Section) : Syllabus as per Sections I, II and III.

National Cyber Olympiad

MENTAL ABILITY

1. In the star shape shown in figure, the sum of the angles marked at the corners
   A, *B*, *C*, *D*, *E* is _____.

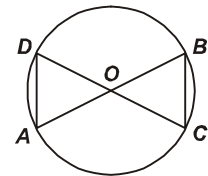   (A) 90º (B) 135º
   (C) 180º (D) 140º

2. The age of a man is same as his wife's age with the digits reversed. Then sum of their ages is 99 and the man is 9 years older than his wife. How old is the man?
   (A) 50 years (B) 49 years (C) 54 years (D) 44 years

3. In the adjoining figure, *AOB* and *COD* are the diameters of a circle.
   If $\angle ADO = 55^\circ$ then $\angle OCB$ is _____.

   (A) $27\frac{1}{2}^\circ$ (B) $62\frac{1}{2}^\circ$
   (C) 55° (D) 35°

4. A godown is in the form of cuboid of measures 60 m × 40 m × 30 m. How many cuboidal boxes can be stored in it if the volume of one box is 0.12 m³?
   (A) 900000 (B) 1200000 (C) 600000 (D) 3500000
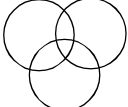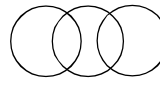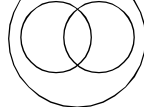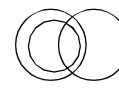
LOGICAL AND ANALYTICAL REASONING

5. If in a certain code SAND is VDQG and BIRD is ELUG, then what is the code for LOVE?
   (A) PRYG (B) ORTG (C) NPUH (D) ORYH

6. The number of times in a day the hour-hand and the minute-hand of a clock are at right angles is _____.
   (A) 44 (B) 48 (C) 24 (D) 12

7. Which one of the following diagrams correctly represents the relationship among tennis fans, cricket players and students?

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

8. A, B, C, D, E and F, not necessarily in that order, are sitting on six chairs regularly placed around a round table. It is observed that A is between D and F, C is opposite D, D and E are not on neighbouring chairs. The person sitting opposite B is
   (A) A (B) D (C) E (D) F

COMPUTERS AND INFORMATION TECHNOLOGY

9. Which of the following is CORRECT?
   (A) <hr> (B) <HR>
   (C) <B> Bold Text </B> (D) All of these

10. Computers use the seven digit code called ASCII. What does ASCII stand for?
    (A) American Standard Code for Information Interchange
    (B) Association of Software Coding and Information Institute
    (C) American Standard Computing and Information Institute
    (D) American Scientists Convention for Information Interchange.

11. How many sheets are there in an Excel Workbook by default?
    (A) 2 (B) 3 (C) 4 (D) 5

12. In Flash CS6, is called ____ tool.

    (A) Fill color   (B) Paint bucket   (C) Ink bottle   (D) Lasso

13. In MS-PowerPoint, Format Painter is used to _____.
    (A) Copy formatting from one place and apply it to another
    (B) Reset the position, size and formatting of the slide
    (C) Format text to the left
    (D) Increase the indent level

14. What are the columns in a Microsoft Access table called?
    (A) Rows   (B) Records   (C) Fields   (D) Columns

15. Debug is a term denoting _____.
    (A) Error correction process   (B) Writing of instructions in developing a new program
    (C) Fault detection in equipment   (D) Determining useful life

N S ☀ National Science Olympiad

MENTAL ABILITY

1. A contest began at noon one day and ended 1000 minutes later. At what time did the contest end?
    (A) 10:00 p.m.   (B) Midnight   (C) 2:30 a.m.   (D) 4:40 a.m.

2. Which of the following sets of whole numbers has the largest average?
    (A) Multiples of 2 between 1 and 101   (B) Multiples of 3 between 1 and 101
    (C) Multiples of 4 between 1 and 101   (D) Multiples of 5 between 1 and 101

3. Beena used a calculator to find the product 0.075 × 2.56. She forgot to enter the decimal points. The calculator showed 19200. If Beena had entered the decimal points correctly, the answer would have been
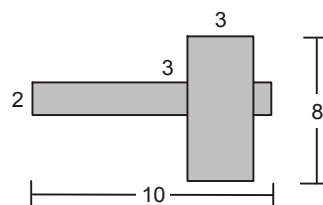   (A) 0.0192   (B) 0.192   (C) 1.92   (D) 19.2

4. If $x = 1 + \sqrt{2}$ and $y = 1 - \sqrt{2}$, find the value of $(x^2 + y^2)$.

    (A) 6   (B) 3   (C) $4\sqrt{2}$ (D) 0

5. The shaded area formed by the two intersecting perpendicular rectangles, in square units is _____.
    (A) 23
    (B) 38
    (C) 44
    (D) 46
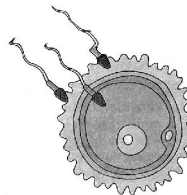

SCIENCE

6. What is one likely function of a centriole?
    (A) To hold the fibres of spindle   (B) To send messages to the nucleus to divide
    (C) To divide the cytoplasm
    (D) To cause the chromosomes to become shorter and thicker.

7. Which of the following can produce a virtual image ?
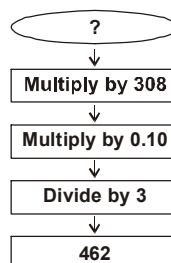   (A) Plane mirror   (B) Concave lens   (C) Convex lens   (D) All of these

8. When a glass rod is rubbed with a piece of silk cloth
(A) Both cloth and the rod acquire positive charge
(B) Rod becomes positively charged while the cloth has a negative charge
(C) Rod becomes negatively charged while the cloth has a positive charge
(D) Both cloth and the rod acquire negative charge.

9. A body immersed in a fluid experiencs an upward thrust which depends on
(A) The weight of the fluid displaced by it   (B) The volume of the body
(C) The mass of the body   (D) All of these.

10. When Cu is exposed to moist air for a long time, which of the following is formed?
(A) $Cu(OH)_2$ (B) $CuCO_3$ (C) Both (A) and (B)   (D) Cu_2O

11. Which of the following materials is the best for making garments and jackets that can be used in wet or damp environments?
(A) Polyester
(B) Wool
(C) Cotton
(D) None of these.

12. Which of the following is an acute infection of the small intestine caused by a bacterium?
(A) Cholera   (B) Tuberculosis   (C) Polio   (D) Night blindness

13. Some basic steps are needed in agricultural practice. Which of the following given as A, B, C, D is the right sequence?
(1) Preparation of the soil   (2) Harvesting   (3) Irrigation
(4) Broadcasting   (5) Tilling   (6) Weeding
(7) Manuring.
(A) 1, 5, 4, 7, 3, 6, 2   (B) 1, 3, 5, 6, 4, 2, 7   (C) 1, 3, 5, 2, 4, 6, 7   (D) 1, 5, 6, 2, 4, 7, 3

14. The process shown in the given figure is
(A) Cleavage
(B) Fertilization
(C) Assimilation
(D) Budding.

15. Which of the following is not true?
(A) Burning of coal relases SO_2.   (B) Acid rain is harmful to crops.
(C) CNG is a clean fuel.   (D) Incomplete combustion of coal relases O_2.

IMO International Mathematics Olympiad

LOGICAL REASONING

1. What is the number you started with?
(A) 5
(B) 45
(C) 56
(D) 25

?
↓
Multiply by 308
↓
Multiply by 0.10
↓
Divide by 3
↓
462

2. Find out the wrong term in the given series.

24, 27, 31, 33, 36

(A) 24   (B) 27   (C) 31   (D) 33

3. Rohit is 40 m South-West of Aarav. Ansh is 40 m South-East of Aarav. Then Ansh is in which direction of Rohit?

(A) East   (B) West   (C) North-east   (D) South

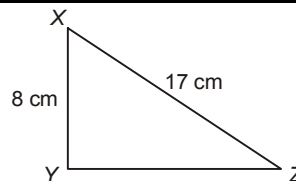**4.** Count the number of cubes in the figure given here.

(A) 14   (B) 15

(C) 12   (D) 20

MATHEMATICAL REASONING

5. What is the length of *YZ*?

(A) 9 cm   (B) 15 cm
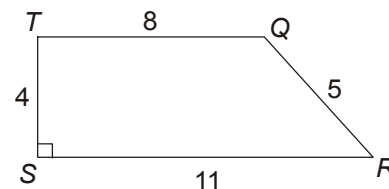
(C) 19 cm   (D) 25 cm

6. 200 kg of sugar was purchased at the rate of ₹ 15 per kg and sold at a profit of 5%. Compute the selling price per kg.

(A) ₹ 18.25   (B) ₹ 13.85   (C) ₹ 15.75   (D) ₹ 31.50

7. What is the area of trapezoid *QRST* in square units?
(A) 22
(B) 27
(C) 38
(D) 48

8. Which property is used in the equation given below?

$$12(x + 4) = 12x + 48$$

(A) Associative Property of Addition   (B) Commutative Property of Addition
(C) Distributive Property   (D) Reflexive Property

9. Which of the following equations illustrates the inverse property of multiplication?

(A) $5 \times \dfrac{1}{5} = 1$ (B) $5 \times 1 = 5$ (C) $5 \times 0 = 0$ (D) $5 \times 5 = 25$

10. Simplify : $\dfrac{25 \times a^{-4}}{5^{-3} \times 10 \times a^{-8}}$

(A) $625a^{-4}$ (B) $\dfrac{625}{2}a^{4}$ (C) $\dfrac{625}{4}a^{8}$ (D) $25a^{8}$

11. Three numbers are in the ratio 2 : 3 : 4. The sum of their cubes is 33957. Find the largest number.

(A) 28   (B) 21   (C) 32   (D) 14

12. Find the value of *x*

$$\frac{9x + 7}{2} - \left[x - \left(\frac{x - 2}{7} \right) \right] = 36$$

(A) 9   (B) 18   (C) 5   (D) 4

EVERYDAY MATHEMATICS

13. Mohit is thinking of two numbers. Their greatest common factor is 6. Their least common multiple is 36. One of the numbers is 12. What is the other number?

(A) 18   (B) 16   (C) 6   (D) 24

14. Ramu put a square fence around his vegetable garden to keep the deer from eating his corn. One side was 10 m in length. If the posts were placed 2 m apart, how many posts did he use?
(A) 16   (B) 20   (C) 10   (D) 15

15. Find the number of coins, 1.5 cm in diameter and 0.2 cm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.
(A) 450   (B) 250   (C) 350   (D) 400

I E O International English Olympiad

WORD AND STRUCTURE KNOWLEDGE

1. Choose the odd pair.
(A) Annoy : Irritate   (B) Comprehend : Understand
(C) Spectator : Onlooker   (D) Reserve : Supply

2. The thief walked away with the diamond crown on display. No one stopped him because he was ……………………………. the director of the museum.
(A) Contacting   (B) Impersonating   (C) Implanting   (D) Contradicting

3. The transmission of the President's speech remained _____ interrupted.
(A) Mis   (B) Dis   (C) Un   (D) Non

4. **Given below are pairs of sentences, marked 'P' and 'Q'. In each case, one or both sentences could be right or wrong. Use the following code to indicate your answer.**
If both P and Q are right, tick A (+ +)
If P is right and Q is wrong, tick B (+ –)
If P is wrong and Q is right, tick C (– +)
If both P and Q are wrong, tick D (– –)
P : The old abandoned building was being burnt to the ground last night.
Q : The police suspect that the fire was caused due to short circuit.
(A) (+ +)   (B) (+ –)   (C) (– +)   (D) (– –)

Directions (Q. No. 5 & 6) : Find the incorrect part and mark it in your answer sheet.

5. The papers are increasing/ full of stories /of mindless violence./No error.
(A)   (B)   (C)   (D)

6. The Taj Residency/ is not as expensive than/ the Four Seasons Hotel./ No error.
(A)   (B)   (C)   (D)

7. Maya and Anand ……………………………………… for five years.
(A) Has been married   (B) Have been married
(C) Are married   (D) Is married

READING

Direction (Q. No. 8 to 10) : Read the following passage and answer the questions that follow.
The greatest threat to life on Earth today comes from global warming. This is caused due to multiple factors including human activity. It happens when greenhouse gases (carbon dioxide, water vapour, nitrous oxide, and methane) trap heat and light from the sun in the earth's atmosphere, which increases the overall temperature on Earth. This impacts people, animals, and plants. Many who cannot take the change, die. Global warming is affecting many parts of the world, particularly sea coasts. People living on islands and in coastal areas are therefore at risk as the polar ice caps and sea levels rise.

8. Select the statement that is false, according to the passage.
(A) Life on Earth is threatened only by global warming.
(B) Global warming threatens human beings who live on islands.
(C) When the overall temperature on Earth rises the sea level will also increase.
(D) Creatures which cannot adapt to higher temperatures will become extinct.

9. "Many cannot take the change." Here "change" refers to changes in

(A) Lifestyle   (B) Food habits   (C) Temperature   (D) Health issues

10. People living in coastal areas are affected by

(A) Green house gases   (B) Human actions

(C) Rise in sea levels   (D) Rise in temperature

SPOKEN AND WRITTEN EXPRESSION

Direction (Q. No. 11 to 13) : Sentences 1 and 3 are given. Sentence 2 is missing. Find the right sentence for sentence 2.

11. Sona : Hema, I notice your tennis serve is much better these days.

Hema : ………………………………………………………………

Sona: Your efforts have not been wasted. There is a remarkable improvement in your game.

(A) Yes, I think I've finally mastered the technique, though it took months of practice.

(B) Serving well is an art that can be mastered.

(C) I saw a doctor because I was suffering from tennis elbow.

(D) In tennis one has to focus on one's serving action.

12. Mala : I was looking for a birthday present for my nephew but I didn't have much luck. Do you have any bright ideas?

Jhansi : ……………………………………………………….

Mala : I did think about it, but I felt I should take some trouble and choose something useful.

(A) Some music, maybe?   (B) One need not buy a present for everyone.

(C) You could just give him some money.

(D) Buying a present is something that only the young enjoy.

13. Sentence 1 : A trained memory is an immense asset, particularly in public life.

Sentence 2 : ……………………………………………………………

Sentence 3 : Many of these systems, still used today were perfected by the Greeks.

(A) The basic principle is to concentrate the mind on whatever you want to memorize.

(B) Ancient Greeks encouraged students to cultivate their memory.

(C) Memory training systems are not very difficult to master.

(D) A good memory is an advantage.

Direction (Q.No. 14 and 15) : Sentences 1 and 4 are given. Sentence 2 and 3 are missing. Select two sentences that will complete the paragraph.

14. Sentence 1 : Today's world is full of gizmos and gadgets unimaginable to people thirty years ago.

Sentence 2 : ……………………………………………………

Sentence 3 : ……………………………………………………

Sentence 4 : However, keeping abreast of technology seems a difficult job by itself considering the pace at which new gadgets appear on the market.

(D) The markets cater to this section and keep bringing out products that cater to their taste.

(E) Students and the youth like to keep abreast of technology.

(F) Who would have imagined a world of cell phones and ipods?

(A) DF   (B) ED   (C) EF   (D) FD

15. Sentence 1 : Disposal of household waste is a daunting task for local authorities.

Sentence 2 : …………………………………………………………

Sentence 3 : …………………………………………………………..

Sentence 4 : One way to reduce waste therefore is to segregate degradable and non biodegradable waste at its source.

(D) Efforts should be made to recycle household waste.

(E) They cannot just dump waste in landfills.

(F) This is because household waste contains many materials and substances which are extremely harmful to the environment.

(A) EF   (B) DE   (C) FE   (D) DF

SAMPLE ANSWER SHEET

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

| S | A | C | H | I | T | | A | | I | Y | E | R | | | | | | | | | | | |

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

| S | A | T | I | S | H | | K | U | M | A | R | | I | Y | E | R | | | | | | | |

SCHOOL CODE

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

Darken the circle

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 :

Darken the circle

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

GENDER
MALE ●   FEMALE ○

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.** Ⓐ Ⓑ ● Ⓓ

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

National Cyber Olympiad

1.–15. Ⓐ Ⓑ Ⓒ Ⓓ

National Science Olympiad

1.–15. Ⓐ Ⓑ Ⓒ Ⓓ

International Mathematics Olympiad

1.–15. Ⓐ Ⓑ Ⓒ Ⓓ

International English Olympiad

1.–15. Ⓐ Ⓑ Ⓒ Ⓓ

ANSWERS

National Cyber Olympiad		
1. (C)	2. (C)	3. (C)
4. (C)	5. (D)	6. (A)
7. (A)	8. (D)	9. (D)
10. (A)	11. (B)	12. (B)
13. (A)	14. (C)	15. (C)

National Science Olympiad		
1. (D)	2. (C)	3. (B)
4. (A)	5. (B)	6. (A)
7. (D)	8. (B)	9. (A)
10. (C)	11. (A)	12. (A)
13. (A)	14. (B)	15. (D)

International Mathematics Olympiad		
1. (B)	2. (C)	3. (A)
4. (B)	5. (B)	6. (C)
7. (C)	8. (C)	9. (A)
10. (B)	11. (A)	12. (A)
13. (A)	14. (B)	15. (A)

International English Olympiad		
1. (D)	2. (B)	3. (C)
4. (C)	5. (A)	6. (B)
7. (B)	8. (A)	9. (C)
10. (C)	11. (A)	12. (C)
13. (B)	14. (B)	15. (A)

8

Class 8