SCIENCE OLYMPIAD FOUNDATION

SAMPLE PAPER
2013-14

SOF NCO
NATIONAL CYBER OLYMPIAD

The actual test paper has 50 questions. Time allowed : 60 minutes. There are 3 sections: 10 questions in section I, 10 in section II and 30 in section III.

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 (Logical and Analytical Reasoning) : Problems Based on Figures, Odd One Out, Series Completion, Coding-Decoding, Mathematical Reasoning, Analytical Reasoning, Mirror Images, Embedded Figures, Direction Sense Test, Cubes and Dice.

Section – III (Computers and IT) : Fundamentals of Computer, Evolution of Computers, Hardware, Software, Input & Output Devices, Memory & Storage Devices, Using Windows, MS-Word, MS-PowerPoint, MS-Excel, Programming in QBasic, Internet & Viruses, Latest Developments in the field of IT.

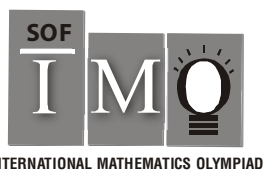**Questions are based on Windows 7 and MS-Office 2010.**

SOF NSO
NATIONAL SCIENCE OLYMPIAD

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) : 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, Logical Reasoning, Conversions, Simple Probability.

Section – II (Science) : Heat, Motion and Time, Electric Current and its Effect, Winds, Storms and Cyclones, Light, Acids, Bases and Salts, Physical and Chemical Changes, Weather, Climate and Adaptations of Animals, Fibres to Fabrics, Nutrition in Plants and Animals, Respiration in Organisms, Transportation in Plants and Animals, Reproduction in Plants, Natural Resources and Their Conservation.

SOF IMO
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, Fractions and Decimals, Exponents and Powers, Algebraic Expressions, Simple Linear Equations, Lines and Angles, Concept of Percentage, Profit and Loss, Simple Interest, Probability, Properties of Triangle, Symmetry, Congruence of Triangles, Rational Numbers, Perimeter and Area, Data Handling, Arithmetical Ability, Visualising Solid Shapes.

Problems Based on Figures, Odd One Out, Series Completion, Coding-Decoding, Mathematical Reasoning, Mirror Images, Embedded Figures, Patterns, Direction Sense, Number Ranking and Alphabetical Test.

SOF IEO
INTERNATIONAL ENGLISH OLYMPIAD

IN ASSOCIATION WITH
BRITISH COUNCIL

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

SYLLABUS

Section-I : Word and Structure Knowledge : Perfect tenses, Prepositions, Modals, Adjectives, and Adverbs, Conjunctions, Direct indirect speech, Word order, Phrasal verbs, etc.
Spellings, Collocations, Phrasal verbs, Idioms, and Words related to Travel, Locations, Activities, Homonyms and Homophones, etc.

Section-II: Reading : Search for and retrieve information from various text types like News stories, Brochures and advertisements. Understand information given in news reports, Brochures, Itinerary, etc., Acquire broad understanding of and look for specific information in short narratives, Advertisements, Biographies, etc.
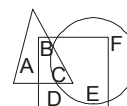
Section-III: Spoken and Written Expression : Ability to understand situation-based variations in functions like requesting and refusing, Apologies and stating of preferences and expression of intent, etc.

National Cyber Olympiad

MENTAL ABILITY

1. 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

2. 40% of ? + 180 = 564. What is the value of (?)?
(A) 960   (B) 860   (C) 950   (D) 850

3. When $a = 1$ and $b = -2$, then find the value of $2a^2b + 2ab^2 + 3ab$.
(A) -12 (B) -2
(C) -4 (D) -14

4. A triangle has _____ medians.
(A) 1   (B) 2   (C) 3   (D) 4

LOGICAL AND ANALYTICAL REASONING

5. Complete the series:

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

6. Rectangle : Square : : Ellipse : ?
(A) Centre   (B) Diameter   (C) Circle   (D) Radius

7. 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

8. 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

COMPUTERS AND INFORMATION TECHNOLOGY

9. In Ms PowerPoint, 'Rehearse timings' is present on the _____ tab.
(A) Animations   (B) Transitions   (C) Slide Show   (D) All of these

10. The function of 'Wrap Text' icon in MS Excel is used to _____.
(A) Join selected cells into one larger cell   (B) Rotate text to a diagonal angle
(C) Make all content visible within a cell by displaying it on multiple lines
(D) Highlight interesting cells

11. Match the following terms with what they stand for

Term	Stands for
(i) .com	(a) Education
(ii) .edu	(b) India
(iii) .in	(c) Australia
(iv) .au	(d) Commerce

(A) (i)-(a), (ii)-(b), (iii)-(c), (iv)-(d)
(B) (i)-(b), (ii)-(c), (iii)-(d), (iv)-(a)
(C) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)
(D) (i)-(d), (ii)-(a), (iii)-(b), (iv)-(c)

12. 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.

13. Modern Computers compared to earlier computers are _____.
(A) Faster and larger
(B) Less reliable
(C) Larger and stronger
(D) Faster and smaller

14. In MS Word, which shortcut key is used to change the font?
(A) Ctrl + F
(B) Ctrl + Alt + F
(C) Ctrl + Shift + >
(D) Ctrl + Shift + X

15. In QBasic, what will the given command do?
$$LET\ C = A + B$$
(A) The string variable C receives the value of A + B.
(B) The numerical variable C is assigned the value of A + B.
(C) The string variable C is assigned the expression A + B.
(D) An error message is displayed.

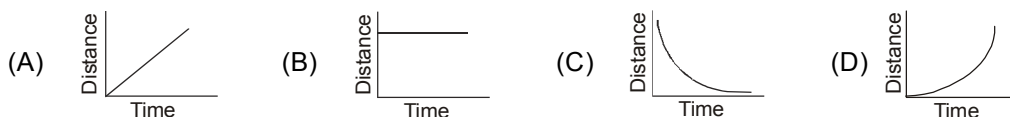# SOF NSO National Science Olympiad

MENTAL ABILITY

1. Jennifer wants to run 3 km. The track she runs on is $\frac{1}{4}$ of a km in length. How many times does Jennifer have to run the length of the track to run a total of 3 km?
(A) $\frac{3}{4}$
(B) $3\frac{1}{4}$
(C) 7
(D) 12

2. 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

3. 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

4. In the product shown here, B is a digit. The value of B is _____.
(A) 3
(B) 5
(C) 6
(D) 8

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  B 2
× 7 B
6396
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5. 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
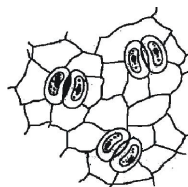

(A) Z
(B) U
(C) V
(D) Y

6. 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)

7. X is present in the stomach. However, presence of excess of it causes indigestion, which requires the intake of milk of magnesia to undo the effect of X. What is X?
(A) HCl   (B) H_2SO_4 (C) NaOH   (D) KOH.

8. The given parts of the plant help out in
(A) Photosynthesis
(B) Respiration
(C) Transpiration
(D) All of the above.

9. The increase in area of the solid on heating is called
(A) Superficial expansion   (B) Linear expansion
(C) Cubical expansion   (D) Quadra expansion

10. The temperature at which no more energy can be removed from matter is called
(A) Absolute zero   (B) Boiling point   (C) 32º F   (D) 32°C

11. 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.
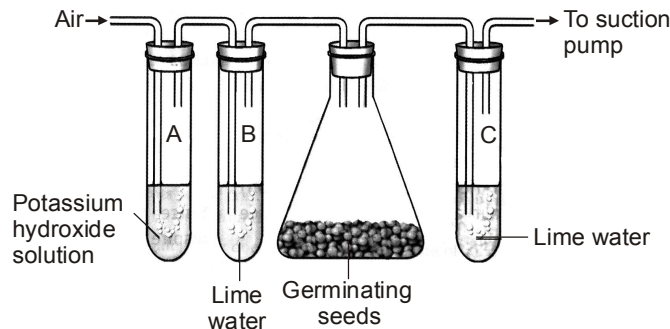
12. Which one of the following is true for all chemical reactions?
(A) There is a change in volume   (B) Heat is evolved
(C) Chemical bonds are broken or formed   (D) There is a change in mass

13. 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

14. Study the given set up of an experiment. You will observe that

(A) Lime water in test tube B turns milky   (B) Lime water in test tube C turns milky
(C) Potassium hydroxide solution in test tube A turns red
(D) Temperature in the flask will go down.

15. Which metal is present in the human body in greater percentage ?
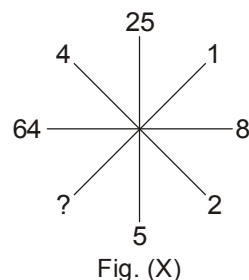(A) Calcium   (B) Sodium   (C) Potassium   (D) Iron

SOF

International Mathematics Olympiad

1. Which will come next in the series?

az, by, cx, ___?___

(A) ef   (B) gh   (C) ij   (D) dw

2. Which number will replace the ? in Fig. (X)?

(A) 1

(B) 2

(C) 3

(D) 4

$$25 \quad 4 \quad 1 \quad 64 \quad 8 \quad ? \quad 2 \quad 5$$
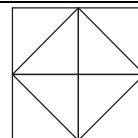
Fig. (X)

3. Which most closely resembles the mirror image of the given word, if the mirror is placed vertically to the left

STROKE

(A) ƎʞOᴚTꙄ   (B) EKORTS   (C) ROKETS   (D) ƎʞOᴚTꙄ

4. Count the number of triangles in the following figure.
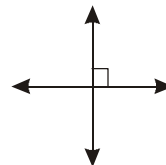
(A) 8   (B) 10

(C) 12   (D) 14

MATHEMATICAL REASONING
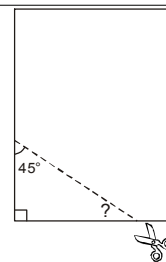
5. Which of the following is best described in the given figure?

(A) Acute angles   (B) Obtuse angles

(C) Parallel lines   (D) Perpendicular lines

6. 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?

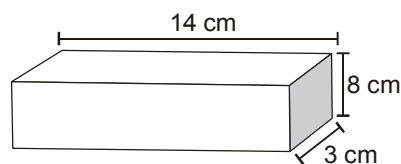(A) 30°   (B) 45°

(C) 55°   (D) 60°

7. The value of $4\frac{3}{4} - 2\frac{1}{2} =$

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

8. 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

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

(A) $25n$ (B) $25 - n$ (C) $25 + n$ (D) $25 \div n$

10. What is the prime factorization of 45?

(A) $2^3 \times 5$ (B) $3^2 \times 5$ (C) $5^2 \times 3$ (D) $5^2 \times 9$

11. The value of 11.3 × 2.7 =

(A) 29.31   (B) 29.51   (C) 30.31   (D) 30.51

12. Mohit gains 60 paise on ₹ 60. His gain percent is _____.

(A) 1%   (B) 0.1%   (C) 2%   (D) 1.1%

EVERYDAY MATHEMATICS

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

(A) $2\frac{2}{15}$ m   (B) $2\frac{4}{15}$ m   (C) $2\frac{3}{5}$ m   (D) $2\frac{4}{5}$ m

14. 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%

15. 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? $\left(\text{Speed} = \dfrac{\text{Distance}}{\text{Time}}\right)$

(A) 69 km   (B) 75 km   (C) 81 km   (D) 84 km

SOF IEO International English Olympiad

WORD AND STRUCTURE KNOWLEDGE

Direction (Q. No. 1 and 2) : Choose one suitable word for each blank.

1. Someone who interprets is _____.
(A) An interpretist   (B) An interpreter   (C) An interprecian   (D) An interpretor

2. Many diamond mines are _____ in South Africa.
(A) Situation   (B) Situate   (C) Situated   (D) Situating

3. Choose the odd one out.
(A) Disappear   (B) Dissolve   (C) Dissatisfy   (D) Disallow

4. Find the correct phrase.
(A) Slow and study   (B) Slow and steady   (C) Slow and fast   (D) Slow and heady

5. All children did well in the marathon but Rahul was _____.
(A) The faster   (B) Fast   (C) Fastest   (D) The fastest

6. Find the incorrect part and mark it in your answer sheet.
"The prisoner/ never told me, Sir," / Watson complains. No Error
(A)   (B)   (C)   (D)

7. Complete the conversation with the correct word.
Ravi: Did you invite her to the party?
Rahul: Well! Being invited is one thing _____ inviting oneself is another.
(A) However   (B) Whereas   (C) Compared to   (D) Besides

8. In which sentence is the word 'to' correctly used?

(A) This watermelon is to heavy.　　　(B) Hold it with to hands.

(C) It's very slippery to.　　　(D) Well, hand it to me.

Direction (Q. No. 9 to 11) : Read the passage and answer the following questions.

"There is always someone worse off than you."

Once upon a time, the rabbits of Jim Corbett were so terrorized by the other animals, they did not know where to go. As soon as they saw a single animal approach them, off they used to run. One day, they saw a troop of wild horses stampeding about and in quite a panic all the rabbits scuttled off to a lake close by, determined to drown themselves rather than live in a continual state of fear. But just as they got near the bank of the lake, a troop of frogs frightened in their turn by the approach of the rabbits, scuttled off and jumped into the water. "Truly", said one of the rabbits, "things are not so bad as they seem." There is always someone worse off than you.

9. Rabbits wanted to drown themselves because

(A) They were scared of the horses.　　　(B) They did not like living under fear.

(C) They were chasing the frogs.　　　(D) They had nowhere to go.

10. Rabbits ran away from other animals because _____.

(A) They wanted to drown themselves.　　　(B) They were shy.

(C) They were scared of being stepped on.　(D) They were arrogant.

11. Which of the following words would you use to describe the feeling of the rabbits on seeing the troop of wild horses?

(A) Frightened　　　(B) Unfriendly　　　(C) Worried　　　(D) Hostile

Direction (Q. No. 12 and 13) : Find one sentence to complete the dialogue.

12. Dimpy : Shahid is always bullying me. Do you think I should complain to the teacher?

Radha :_____.

(A) Don't. Talk to Shahid first.　　　(B) I think you should tell Shahid.

(C) Write him a letter.　　　(D) Don't let him yell at you.

13. Manasa : I hear that you are going to a new school.

Minu : Oh, you heard about it! _____.

(A) I should have told you earlier.　　　(B) I'm sure you are happy.

(C) I'm happy I did not tell you earlier.　(D) Why are you asking?

Direction (Q. No. 14 and 15) : Find one sentence to complete the paragraph.

14. Sentence 1. God wanted the people he had created to have a happy life.

Sentence 2. _____

Sentence 3. Water, air and sunlight were, therefore, given in abundance.

(A) That's why he decided to bless the earth with riches.

(B) People had to live with water, air, and sun.

(C) Earth could have them in abundance.

(D) Therefore, he created the earth.

15. Sentence 1. From ancient times Indians have worshipped plants and trees.

Sentence 2. _____-

Sentence 3. While modern man often works to 'conquer' Nature, ancient Indians worshipped her.

(A) They regarded all flora and fauna as sacred.

(B) These plants give us food and oxygen.

(C) They lend beauty to our surroundings.

(D) These plants sacrifice themselves to serve us.

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

National Cyber Olympiad

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

National Science Olympiad

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

International Mathematics Olympiad

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

International English Olympiad

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

ANSWERS

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