



**SOF NATIONAL  
SCIENCE OLYMPIAD**

**SYLLABUS**

**Section – 1 :** Verbal and Non-Verbal Reasoning.

**Section – 2 :** Chemical Reactions and Equations, Acids, Bases and Salts, Metals and Non-metals, Carbon and Its Compounds, Periodic Classification of Elements, Life Processes, Control and Coordination, Reproduction in Organisms, Heredity and Evolution, Light-Reflection and Refraction, Human Eye and Colourful World, Electricity, Magnetic Effects of Electric Current, Sources of Energy, Our Environment and Its Management.

**Section – 3 :** Higher Order Thinking Questions - Syllabus as per Section – 2.

Total Questions : 50

Time : 1 hr.

PATTERN & MARKING SCHEME			
Section	(1) Logical Reasoning	(2) Science	(3) Achievers Section
No. of Questions	10	35	5
Marks per Ques.	1	1	3

**LOGICAL REASONING**

1. Vinay starts walking towards East. After walking 35 km, he turns to his right and walks another 40 km. He then turns right and walks another 35 km. Finally, he turns right and walks 20 km. How far is he now from the starting point and in which direction?

- (A) 20 km, North      (B) 35 km, South  
(C) 20 km, South      (D) 35 km, North

2. Eight friends P, Q, R, S, T, U, V and W are sitting around a circle facing the centre. V is third to the right of Q and is second to the left of R. Q is second to the left of T and on the immediate right of S. U is between Q and T. P is not on the immediate left of R.

Which of the following is the correct position of W?

- (A) On the immediate left of V  
(B) On the immediate right of V  
(C) Between U and V  
(D) On the immediate right of R





3. Pointing to a photograph, a woman says, "He is the only son of the wife of my husband's father." How is the man related to the woman?

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

4. Find the correct mirror image of Fig. (X), if the mirror is placed vertically to the right.



Fig.(X)

- (A)       (B)   
(C)       (D) 

5. The given question is based on 5 three-digit numbers given below:

**517 394 823 976 465**

If the position of the first and the second digits in each of the above numbers are interchanged, then which of the following will be the third digit of the highest number?

- (A) 7      (B) 4  
(C) 3      (D) 6

**SCIENCE**

6. Read the given statements and select the correct option.

**Statement 1 :** A concave mirror and a convex lens both have the same focal length in air. When they are submerged in water, they will still have the same focal length.

**Statement 2 :** The refractive index of water is greater than the refractive index of air.

- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.  
(B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.  
(C) Statement 1 is true but statement 2 is false.  
(D) Statement 1 is false but statement 2 is true.

7. Heat loss occurs during flow of current in a conducting wire because  
 (A) Speed of charge is slow in it  
 (B) It is a bad conductor of heat  
 (C) It offers some resistance  
 (D) It generates very small voltage.

8. How do we know that fission isn't responsible for the Sun's energy ?  
 (A) Fission doesn't produce enough energy per gram of fuel.  
 (B) If fission were going on in the Sun, the Sun would explode.  
 (C) If fission were going on in the Sun, the Sun's mass would increase.  
 (D) There isn't very much fissionable material in the Sun.

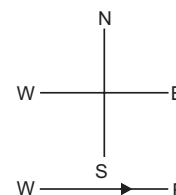
9. Which of the following statements is true with respect to diamond ?  
 (A) The carbon atoms are connected to each other by metallic bonds.  
 (B) In the diamond crystal, the carbon atoms are very loosely packed.  
 (C) Each carbon atom in the crystal is surrounded by four other carbon atoms forming a rigid 3-D structure.  
 (D) Diamond can be synthesised by subjecting pure carbon to very low pressure and temperature.

10. The genotype for the height of an organism is Tt. What conclusion may be drawn from this?  
 (A) The allele for height has at least two different genes.  
 (B) There are at least two different alleles for the gene for height.

- (C) There are two different genes for height, each having a single allele.  
 (D) There is one allele for height with two different forms.

11. An ore on heating in air produces sulphur dioxide. The process which is used for its concentration and the two steps involved in the conversion of this ore into related metal are respectively  
 (A) Hydraulic washing, chemical separation and refining.  
 (B) Baeyer's process, electrorefining and reduction  
 (C) Froth floatation process, conversion to metal oxide and reduction of metal oxide  
 (D) None of these.

12. A constant current flows in a horizontal wire in the plane of the paper from west to east as shown in the given figure. The direction of magnetic field will be north to south, at a point



- \_\_\_\_\_.  
 (A) Directly above the wire  
 (B) Directly below the wire  
 (C) Located in the plane of the paper, on the north side of the wire  
 (D) Located in the plane of the paper, on the south side of the wire

13. Ovaries perform the function of  
 (A) Progesterone secretion  
 (B) Estrogen secretion  
 (C) Ovum formation  
 (D) All of these.

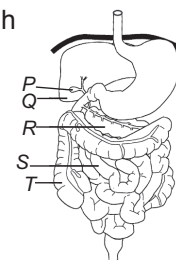
### ACHIEVERS SECTION

14. Which of the following statements are incorrect?  
 I. Reactivity of Al decreases if it is dipped in nitric acid.  
 II. Carbon can reduce the oxides of Na and Mg.  
 III. NaCl is a good conductor of electricity in solid state.  
 IV. Metals like K, Ca and Mg are always found in free state in nature.  
 (A) I, II and III only      (B) II, III and IV only  
 (C) I and III only      (D) II and III only

15. Refer to the diagram of the human digestive

system. What would be the likely consequence of swapping S and T, i.e., from the stomach, food will pass through T to S?

- (A) The digestive enzymes would be denatured.  
 (B) The intestinal contents would be highly alkaline and would damage the wall of T.  
 (C) The intestinal contents would be too dry and unable to pass through S properly.  
 (D) Water absorption would be highly reduced.



### ANSWERS

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