

CLASS
10

SAMPLE PAPER

**Science
Olympiad
Foundation**
For Excellence in Science, Maths & IT

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) : Real Numbers, Polynomials, Pair of Linear Equations in Two Variables, Quadratic Equations, Arithmetic Progressions, Triangles, Coordinate Geometry, Introduction to Trigonometry, Some Applications of Trigonometry, Circles, Constructions, Areas Related to Circles, Surface Areas and Volumes, Statistics, Probability.

Section – II (Science) : Light, Eye and Colourful World, Electricity & Magnetism, Sources of Energy, Chemical Reactions, Acid, Bases and Salts, Metals and Non-Metals, Carbon and its Compounds, Periodic Classification of Elements, Physiology and Reproduction, Genetics and Evolution, Ecology and Environment.

MENTAL ABILITY

1. In an office with 21 staff members, $\frac{1}{3}$ are men and $\frac{2}{3}$ are women. To obtain a staff in which $\frac{1}{4}$ are men, how many women should be hired?
 (A) 7 (B) 5 (C) 3 (D) 2 (E) None of these.

2. A jogger desires to run a certain course in $\frac{1}{4}$ less time than she usually takes; by what percent must she increase her average running speed to accomplish this goal?
 (A) 20% (B) 25% (C) $33\frac{1}{3}\%$ (D) 50%. (E) None of these.

3. A salesman makes a commission of x percent on the first Rs. 2,000 worth of sale in any given month and y percent on all further sales during that month. If he makes Rs. 700 from Rs. 4,000 of sales in October and he makes Rs. 900 from Rs. 5,000 of sales in November, what is the value of x ?
 (A) 2% (B) 5% (C) 10% (D) 15%. (E) None of these.

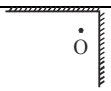
4. A magician wants to ship a magic wand to the location of his next show. The rectangular box he has available for his purpose measures 6 inches wide by 8 inches long by 10 inches high. What is the longest cylindrical wand of negligible diameter that can be shipped in this box?
 (A) 10 inches (B) $8\sqrt{2}$ inches (C) $8\sqrt{3}$ inches (D) $10\sqrt{2}$ inches (E) None of these.

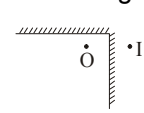
5. The price of sugar increased 20 percent in 2000 and 10 percent in 2001. By approximately what percent would the price at the end of 2001 have to be decreased to restore the price of the sugar to its pre-2000 price?
 (A) 40% (B) 35% (C) 30% (D) 24%. (E) None of these.

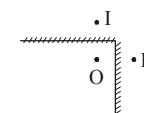
SCIENCE

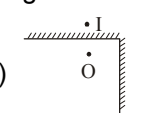
6. If the Moon were twice as massive as it is now, and it has stayed in the same orbital radius about the Earth as it has now, its new orbital period (in terms of its current orbital period T) would be,
 (A) T (B) $\frac{T}{2}$ (C) $\frac{T}{4}$ (D) $2T$ (E) None of these.

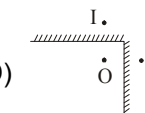
7. If the object is placed between two mirrors as shown in given figure, which one is correct image formation from the following choices.









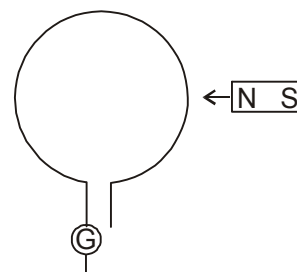


8. No heat loss occurs during flow of charge in super conductors because
 (A) Speed of charge is slow in it (B) It is bad conductor of heat
 (C) It offer zero resistance (D) It generate very small voltage (E) None of these.

9. How do we know that fission isn't responsible for the sun 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. (E) None of these.

10. Which of the following groups of instruments is required to have communication line between two television relay centres ?
 (A) Microwave link, booster relay, satellite
 (B) Radio telescope, microwave link, booster relay, telephone
 (C) Microwave link, telephone, booster relay, satellite
 (D) All of these (E) None of these.

11. In a circular coil of wire if the current is flowing in the anticlockwise direction, the face will be north pole. When there is no current in the coil, if the north-pole is brought near the coil, during that time, the current induced in the coil will be



- (A) Clockwise (B) Anticlockwise
 (C) The current will be in the same direction whether the north pole is brought near or taken away
 (D) (A) and (C) are correct (E) None of these.

12. During calcination of the ore

- (A) The lower oxides are converted into higher oxides (C) Volatile impurities are expelled
 (B) The metal gets oxidised to its highest oxide (D) Sulphur present in the ore is converted into SO_2 (E) None of these.

13. Which of the following statements is NOT true regarding iron?

- (A) It is hard and brittle. (B) It can be tempered.
 (C) It cannot be welded. (D) It contains 4 - 5% of carbon (E) None of these.

14. Heating of rubber with sulphur is known as

- (A) Galvanisation (B) Sulphonation
 (C) Vulcanisation (D) Bessemerisation (E) None of these.

15. The gas evolved in Bhopal tragedy was

- (A) CO (B) CO_2 (C) Methyl isocyanate (D) N_2
 (E) None of these.

16. Haemoglobin of the human blood forms a stable complex compound with which of the following gas leading to death?

- (A) Oxygen (B) Carbon dioxide
 (C) Carbon monoxide (D) Nitrogen (E) None of these.

17. When copper is heated with concentrated H_2SO_4 the products obtained are

- (A) $\text{CuSO}_4 + \text{H}_2$ (B) $\text{CuSO}_4 + \text{SO}_2 + \text{H}_2$
 (C) $\text{CuSO}_4 + \text{SO}_2 + \text{H}_2\text{O}$ (D) $\text{CuO} + \text{SO}_3 + \text{H}_2$ (E) None of these.

18. Lathyrism due to consumption of kesri dal is characterised by

- (A) Skeletal deformation and thinning of collagen fibres
 (B) Skeletal deformities, diabetes mellitus and reproductive failure
 (C) Retarded growth, precocious puberty and renal dysfunction
 (D) Cardiovascular abnormalities, mental retardation and delayed puberty. (E) None of these

19. Which one yields more energy?

- (A) Direct burning of cowdung (B) Burning of biogas derived from cowdung
 (C) Burning of manure derived from cowdung
 (D) Burning of semidecayed cowdung (E) None of these.

20. Mark the incorrect match.

Nutrient	Deficiency	Symptom
(A) Iron	Anaemia	Deficiency of haemoglobin in R.B.C.
(B) Vitamin B_1	Beri Beri	Water logging of the tissue, paralysis
(C) Vitamin B_4	Pellagra	Pigeon chest, loss of teeth
(D) Vitamin C	Scurvy	Loosening of teeth, swelling and bleeding of gums
(E) None of these.		

ANSWER KEY

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