

KH

Exam for
Young Scientists..!



J-2023

SCIENCE APTITUDE TEST

CLASS 7

ANSWER KEY WITH SOLUTION

DATE : 15.10.23

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PART - I : MENTAL ABILITY

1.

Sol. (c) Position from end = $35 - 15 + 1 = 21^{\text{st}}$

2.

Sol. (b) 6

3.

Sol. (b) The four boxes are changing position in the following way : At first, middle boxes change position (diagonally) and extreme boxes remain stationary, then extreme boxes change position and middle boxes remain stationary and so on.

4.

Sol. (b) As sheet is divided into four parts with two circle placed opposite in each part. When the transparent sheet is folded at the dotted line the circles at two opposite corners of each part of sheet will overlap and folded part appears as shown in option(D)

5.

Sol. (a) When the paper is unfolded, it will have 2 holes on the top and two holes down. Therefore, it will look like Option A.

6.

Sol. (c) Clearly, figure (c) will complete the pattern when placed in the blank space of figure (X) as shown below.

7.

Sol. (b) Pattern is $20 - 1 = 19$, $19 - 2 = 17$, $17 - 3 = 14$, $14 - 4 = 10$, $10 - 5 = 5$.

8.

Sol. (b) AP, CN, EK, GG, IB
A, C, E, G, I
P, N, K, G, B

9.

Sol. (b) $2 \times 4 + 3 \times 5 = 23$
 $3 \times 5 + 4 \times 6 = 39$
 $5 \times 7 + 4 \times 6 = 59$

10.

Sol. (b) Sadhana, Shurendra, Sindhu, Surendra.

11.

Sol. (b) 2, 5, 4, 1, 6, 3
P O L I C E
2 5 4 1 6 3

12.

Sol. (c) Ans is ear and ear is called nose.

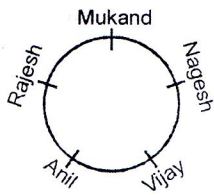
13.

Sol. (c)

F O R G E T		D O C T O R
C ↑ ↓ ↑ Q ↓ ↑ D ↓	⇒	C ↑ ↓ ↑ B ↓ ↑ N ↓
D P P H C U		B P A U M S

14.

Sol. (d)



15.

Sol. (d) By counting

PART - II : MATHEMATICS

1.

Sol. (c) The temperature of the second day = $8^{\circ}\text{C} - 11^{\circ}\text{C} = -3^{\circ}\text{C}$

2.

Sol. (c) Eat rice = $\frac{1}{5} \times 40 = 8$

$$\text{Eat chapati} = \frac{2}{5} \times 40 = 16$$

∴ Eat Both = 16

$$\text{Fraction of} = \frac{\text{eat both}}{\text{Total Students}} = \frac{16}{40} = \frac{2}{5}$$

3.

Sol. (a) Amount he get back = $100 - 4.25 - 26.45 - 27.75 = 41.55$

4.

Sol. (c) $\left(\frac{3}{55} \times \frac{-33}{18}\right) - \left(\frac{39}{125} \times \frac{-15}{78}\right) = -\frac{1}{10} - \left[-\frac{3}{50}\right] = -\frac{1}{10} + \frac{3}{50} \Rightarrow \frac{-5+3}{50} = \frac{-2}{50}$

5.

Sol. (a) 65483 (use divisibility rule of 11)

6.

Sol. (c) (23, 29)

7.

Sol. (d) $1101010 - 764596 = 336414$

8.

Sol. (c) $(-12) \times 7 + (-12) \times (-4) \Rightarrow (-12) \times [7 + (-4)] = (-36)$

9.

Sol. (c) $\frac{56}{70} = \frac{56 \div 14}{70 \div 14} = \frac{4}{5}$

10.

Sol. (c) $2 \text{ kg } 57 \text{ g} = 2.057 \text{ kg}$

11.

Sol. (b) Weight of 65 magazines = 13

$$\therefore \text{Weight of 80 magazines} = \frac{16}{65} \times 80 = 16$$

12.

Sol. (a) perimeter of regular hexagon = $6 \times \text{side} = 6 \times 6.5 = 39 \text{ cm}$

13.

Sol. (c) A line has no end points.

14.

Sol. (d) 75, 75, 80, 94, 96, 98, 100, 102, 180, 200, 270, 610 Median = $\frac{98 + 100}{2} = 99$

15.

Sol. (a) $3x + 4 : 5x + 4 = 2 : 3$

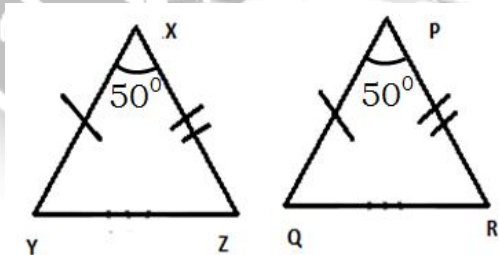
Ans 12 : 20

16.

Sol. (d) $x + (x + 2) + (x + 4) = 90$
 $x = 28$

17.

Sol. (a) S.A.S. property



18.

Sol. (c) By SAS congruency

$$\triangle ABD \cong \triangle ACD$$

$$\therefore \angle B = \angle C \text{ [CPCT]}$$

19.

Sol. (c) AC is the longest side

20.

Sol. (b) Obtuse isosceles triangle

21.

Sol. (b) $\angle ACB = 180 - 60 - 65 = 55^\circ$

22.

Sol. (c) line segment has a definite length.

23.

Sol. (c) Angles are measured in degrees.

24.

Sol. (c) $350 \text{ g} : 3 \text{ kg}$
 $7 : 60$

25.

Sol. (c) $7 : 9$
Girls : Boys
 $1400 : 180$
 $7 : 9$

26.

Sol. (c) Middle terms of proportion are called extremes.

27.

Sol. (c) Red Apple : Total Apple
 $84 : 138$
 $14 : 23$

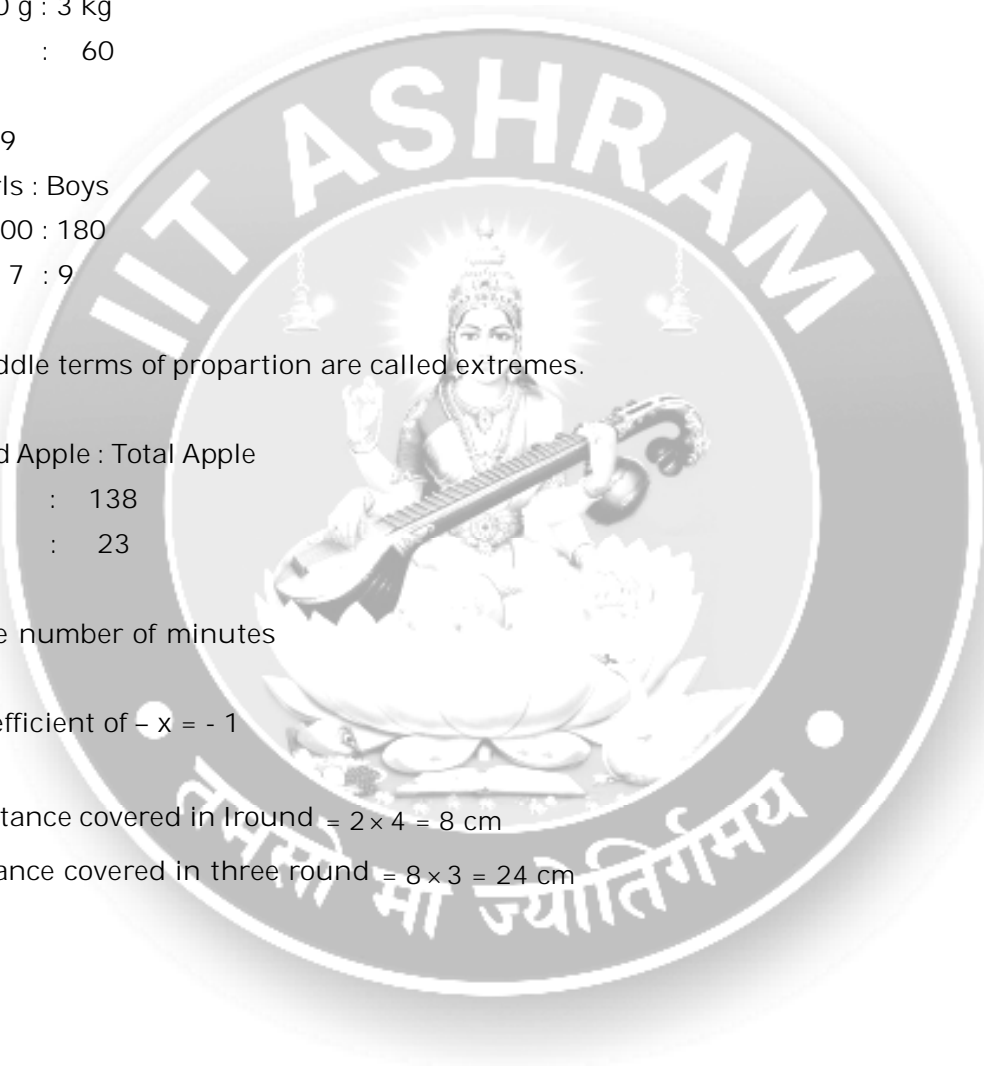
28.

Sol. (b) The number of minutes

29.

Sol. (c) coefficient of $-x = -1$

30.

Sol. (d) distance covered in 1 round = $2 \times 4 = 8 \text{ cm}$
istance covered in three round = $8 \times 3 = 24 \text{ cm}$ 

PART - III : PHYSICS & CHEMISTRY

1.
Sol. (d) As clear from the distance - time graph, B be was already covered 20 m ahead of A, when A was at origin. So, A will always be behind B by 20 m as both A and B are moving with constant velocity (slopes of both A & B are equal).
2.
Sol. (b) Since the angle of incidence is equal to the angle of reflection, the angle of incidence is also 50 degrees. The angle between the incident ray and reflected ray is the sum of the angle of incidence and the angle of reflection which is (50+50) degrees i.e. 100 degrees.
3.
Sol. (c) A shadow is a dark area where light from a light source is blocked by an opaque object. It occupies all of the three-dimensional volume behind an object with light in front of it.
4.
Sol. (d) Magnetic substances are substances that get attracted to magnets. A few of the magnetic substances are - iron, steel, cobalt, and nickel.
5.
Sol. (d) Mass is the amount of matter contained inside an object. Thus it does not change when force is applied.
6.
Sol. (b) MCB (miniature circuit breaker) is an automatically operated electromechanical switch that is specially designed to protect an electrical circuit from damage caused by the excess current in case of an overload or short circuit condition. The basic function of MCB is to interrupt current flow in the circuit when a fault causes the current to rise above the rated value.
7.
Sol. (c) Black bulb absorbs more heat in comparison to white bulb. So air in black bulb expands more. Hence the level of alcohol in limb X falls while that in limb Y rises.
8.
Sol. (b) An electrolyte is a substance that dissociates in water into charged particles called ions. Positively charged ions are called cations. Negatively charged ions are called anions. Simply, an electrolyte is a substance that can conduct an electric current when melted or dissolved in water.
9.
Sol. (a) The graph in option (A) is the correct representation of the variation of temperature as the time passes. The temperature keeps on increasing till the boiling point, afterwards it remains constant till all the water changes into steam. Hence, option (A) is correct.
10.
Sol. (c) The motion of a pendulum repeats itself after regular time intervals. Hence, motion of a pendulum is an example of periodic motion.
11.
Sol. (b) (Explanation: Pure water is neutral and has a pH of 7.)
12.
Sol. (b) Base (Explanation: Bases turn red litmus paper blue.)

13.

Sol. (d) Acetic acid (Explanation: Vinegar contains acetic acid.)

14.

Sol. (c) NaOH (Explanation: The chemical formula of sodium hydroxide is NaOH.)

15.

Sol. (b) Removing large debris and solid particles (Explanation: Primary treatment

16.

Sol. (b) To remove colour and suspended impurities (Explanation: Alum is added to water to coagulate and settle impurities.)

17.

Sol. (b) Carbon dioxide (Explanation: Carbon dioxide is a greenhouse gas.)

18.

Sol. (c) Magnesium hydroxide (Explanation: Magnesium hydroxide is often used as an antacid.)

19.

Sol. (b) NaHCO_3 (Explanation: Common baking soda contains sodium bicarbonate.)

20.

Sol. (b) Oxygen (Explanation: Oxygen is released during photosynthesis by green plants.)



PART - IV : BIOLOGY

1.

Sol. (c) It is a carbohydrate to be precise monomers of glucose linking through α -1, 4 bond linkages to form polysaccharides.

2.

Sol. (b) Cuscuta (dodder), also known as Amarbel in India, is a genus with over 201 species of yellow, orange, and (occasionally) green dodder.

Amarbel (Cuscuta) is an example of a parasite. There is no chlorophyll in it. The plant it's climbing provides it with ready-to-eat nourishment.

Amarbel communicates with its host plants using haustoria.

3.

Sol. (c) Intestinal juices include maltase, lactase, lipase, etc. The enzymes present in intestinal juice convert proteins into amino acids, complex carbohydrates into glucose, and fats into fatty acids and glycerol.

4.

Sol. (c) The oesophagus is part of the alimentary canal where no digestion occurs. It shows rhythmic contraction and relaxation called peristalsis which takes the food in the downward direction.

5.

Sol. (a) Salivary glands make saliva, which aids in digestion, keeps your mouth moist, and supports healthy teeth. You have three pairs of major salivary glands under and behind your jaw - parotid, sublingual, and submandibular.

The stomach releases hydrochloric acid and digestive juices which act on food. The stomach is the widest part of the alimentary canal. It is a thick-walled bag and has a flattened U shape. It secretes mucous, hydrochloric acid, and digestive juices.

Bile is a physiological aqueous solution produced and secreted by the liver. It consists mainly of bile salts, phospholipids, cholesterol, conjugated bilirubin, electrolytes, and water.

Your rectum is at the end of your colon and on the other side of your anal canal. This is where your poop collects just before it's ready to come out. Your rectum absorbs the excess water and holds it until it's full when nerves trigger the urge to defecate.

The small intestine (also referred to as the small bowel) is the specialized tubular structure between the stomach and the large intestine (also called the colon or large bowel) that absorbs the nutrition from your food. It is approximately 20-25 feet in length and is about as big around as your middle finger.

The large intestine is responsible for processing indigestible food material (chyme) after most nutrients are absorbed in the small intestine.

The large intestine is composed of 4 parts. It includes the cecum and ascending colon, transverse colon, descending colon, and sigmoid colon.

6.

Sol. (a) Cellular respiration is carried out by mitochondria. The term cellular respiration refers to the biochemical pathway by which cells release energy from the chemical bonds of food molecules and provide energy for the essential processes of life. It has three steps i.e. glycolysis, TCA cycle, and Electron Transport Chain (ETC). Glycolysis takes place in the cytoplasm; TCA cycle and ETC takes place in the mitochondria.

7.

Sol. (b) Anaerobic respiration releases less energy than aerobic respiration but it does this more quickly. The product of this reaction is lactic acid. This builds up in muscles causing pain and tiredness, which can lead to cramps.

8.

Sol. (b) In cockroaches, respiration occurs through spiracles -small openings on the sides of the body. When air through external openings, enters into its respiratory system, spiracles serve as muscular valves paving the way to the internal respiratory system. The respiratory organ of the cockroach is referred to as tracheae.

9.

Sol. (a) Arteries bring oxygen-rich blood to the body

10.

Sol. (b) Yeast is a single-celled organism that reproduces mostly by budding. In yeast, asexual reproduction occurs through budding; however, certain yeast species also reproduce through binary fission. A bud is a tiny protrusion from the parent cell that pinches off and produces a new individual when it reaches maturity.

