



Hunt for
Young Talents



SCIENCE APTITUDE TEST CLASS - 7 SOLUTIONS

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PART - I : MENTAL ABILITY

1.

Sol: (b) EV

First letters move forward (+1), second letters move backward (-1).

2.

Sol: (b) L

Alternate letters (+2 sequence)

3.

Sol: (a) DIBJS

Each letter shifts forward by one position (+1).

4.

Sol: (a) 32

$$\begin{aligned}\text{Total Students} &= (7 + 26) - 1 \\ &= 33 - 1 = 32\end{aligned}$$

5.

Sol: (b) 29

Pattern:- +5.

6.

Sol: (a) It turns upside down but looks exactly the same.

Horizontal symmetry leaves 'E' unchanged in water.

7.

Sol: (b) Gaurav

Ranking structure layout results in: Gaurav > Raj > Mohit > Ashish > Sanchit.

8.

Sol: (c) Circle

It is a curved line figure, while others are straight-line polygons.

9.

Sol: (c) N

Moving backward by skipping 2 letters (-3).

10.

Sol: (c) 96

Each number doubles the previous term ($\times 2$).

11.

Sol: (b) East

A 90° clockwise turn from North points East.

12.

Sol: (c) M

'M' possesses perfect vertical line symmetry.

13.

Sol: (c) Fire

Analogy based on source. Sun produces light; fire produces heat.

14.

Sol: (c) 25

Constant difference of -5.

15.

Sol: (b) 7

Total = $4+4-1=7$.



PART - II : MATHEMATICS

1.

Sol: (a) 6,993

Place value of 7 in 3,27,458 = 7,000. Face value of 7 = 7. Difference = 7000 - 7 = 6993.

2.

Sol: (b) 2

$$1 + \frac{1}{\left(1 + \frac{1}{x}\right)} = \frac{5}{3}$$

$$\Rightarrow \frac{1}{\left(\frac{x+1}{x}\right)} = \frac{2}{3} \quad \Rightarrow \frac{x}{x+1} = \frac{5}{3} \quad \Rightarrow 3x = 2x + 2 \quad \Rightarrow x = 2$$

3.

Sol: (d) 78 cmFolded along length: new sides 15 and 18, Perimeter = $2(15 + 18) = 66$ cm.Folded along width: new sides 30 and 9, Perimeter = $2(30 + 9) = 78$ cm (Maximum).

4.

Sol: (b) 11:00 AM

LCM of 12, 15, and 18 is 180 minutes = 3 hours.

Next toll = 8 : 00 AM + 3 hours = 11 : 00 AM.

5.

Sol: (c) 48Let red be $4x$ and blue be $5x$.

$$\frac{4x+12}{5x+12} = \frac{5}{6}$$

$$\Rightarrow 24x + 72 = 25x + 60 \Rightarrow x = 12.$$

Original red marbles = $4(12) = 48$.

6.

Sol: (b) 72

$$2^3 \times 2^0 \times 3^2 = 8 \times 1 \times 9 = 72$$

7.

Sol: (a) 72° Let angle be x . Other is $\frac{2}{3}x$

$$\text{Sum} = 180^\circ \Rightarrow x + \frac{2x}{3} = 180^\circ$$

$$\Rightarrow \frac{5x}{3} = 180^\circ \Rightarrow x = 108^\circ$$

$$\text{Smaller angle} = 180^\circ - 108^\circ = 72^\circ.$$

8.

Sol: (d) 115°

$$AB = AC \Rightarrow \angle B = \angle C$$

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\angle A + 2\angle C = 180^\circ$$

$$\Rightarrow 50^\circ + 2\angle C = 180^\circ$$

$$\Rightarrow \angle C = 65^\circ$$

$$\text{Exterior } \angle ACD = 180^\circ - 65^\circ = 115^\circ.$$

9.

Sol: (b) 9 minutes

$$\text{Net gain in 2 mins} = 3\text{m.}$$

$$\text{In 8 mins, height} = 12\text{m.}$$

$$\text{In the 9th min, monkey climbs 5 m. Total height} = 12 + 5 = 17\text{m}$$

$$\text{Total time} = 9 \text{ mins.}$$

10.

Sol: (a) 300

$$\text{Let CP} = x$$

$$1.05x - 0.90x = 45 \Rightarrow 0.15x = 45$$

$$\Rightarrow x = \frac{45}{0.15} = 300$$

11.

Sol: (a) $4x^2 + 6x - 10$

$$(A+B) = 8x^2 - x - 7.$$

$$\text{Subtracting C: } (8x^2 - x - 7) - (4x^2 - 7x + 3)$$

$$= 4x^2 + 6x - 10.$$

12.

Sol: (b) $-\frac{1}{4}$

$$-\frac{1}{2} = -0.5 \text{ and } \frac{1}{3} \approx 0.333 \dots\dots$$

$$-\frac{1}{4} = -0.25 \text{ which clearly lies between them.}$$

13.

Sol: (c) 13

$$\text{Sum} = 5x + 20.$$

$$\text{Mean} = \frac{\text{sum of observation}}{\text{total number of observation}}$$

$$11 = \frac{5x + 20}{5} \Rightarrow x = 7$$

Last three are 11, 13, 15.

$$\text{Mean} = \frac{11+13+15}{3} = 13$$

14.

Sol: (d) 27

$$3^{x-1}(3-1) = 18$$

$$\Rightarrow 3^{x-1}(2) = 18$$

$$\Rightarrow x-1 = 2$$

$$x^x = 3^3 = 27.$$

$$\Rightarrow 3^{x-1} = 9 = 3^2$$

$$\Rightarrow x = 3.$$

15.

Sol: (b) 60 cmLet the length and breadth of rectangle are $6y$ and $5y$

Circumference of circle

$$= 2 \times \frac{22}{7} \times 42 = 264 \text{ cm.}$$

$$\text{Rectangle perimeter} = 2(6y+5y) = 22y = 264$$

$$\Rightarrow y = 12.$$

$$\text{Smaller side} = 5(12) = 60 \text{ cm.}$$

16.

Sol: (a) 0.75

$$\text{Multiply as whole numbers: } 25 \times 3 = 75$$

Place the decimal two places from the right: 0.75.

17.

Sol: (b) -150Using the distributive property: $(a \times b) + (a \times c) = a \times (b + c)$.

$$(-15) \times 8 + (-15) \times 2 = (-15) \times (8 + 2) = (-15) \times 10 = -150.$$

18.

Sol: (a) 7

$$3y - 5 = 16 \Rightarrow 3y = 21 \Rightarrow y = 7.$$

19.

Sol: (b) 30

$$25\% \text{ of } 120 = \frac{25}{100} \times 120 = \frac{1}{4} \times 120 = 30$$

20.

Sol: (c) Both a and b

$-\frac{6}{8}$ simplifies to $-\frac{3}{4}$ by dividing numerator and denominator by 2

$-\frac{6}{8}$ is equivalent to $-\frac{6}{8}$ which also simplifies to $-\frac{3}{4}$.

21.

Sol: (b) 40 cm²

$$\text{Area of parallelogram} = \text{base} \times \text{height} = 8 \times 5 = 40 \text{ cm}^2$$

22.

Sol: (b) 5

Arrange data in ascending order: 1, 3, 5, 7, 9.

The middle value is 5. So, the median is 5.

23.

Sol: (b) 50°

$$\text{Complement} = 90^\circ - 40^\circ = 50^\circ$$

24.

Sol: (a) 55°

In a right triangle, the acute angles sum to 90°.

$$90^\circ - 35^\circ = 55^\circ$$

25.

Sol: (b) 4

$$\text{Numerator: } 2^3 \times 2^4 = 2^7.$$

$$\text{Divide: } \frac{2^7}{2^5} = 2^{7-5} = 2^2 = 4$$

26.

Sol: (a) 5x + 2y

$$\text{Group like terms: } (7x - 2x) + (-3y + 5y) = 5x + 2y.$$

27.

Sol: (b) 20%

$$\text{Profit} = 240 - 200 = 40$$

$$\text{Profit \%} = \frac{40}{200} \times 100 = 20\%$$

28.

Sol: (c) $\frac{5}{9}$

The additive inverse of a number is what you add to it to get zero. $-\frac{5}{9} + \frac{5}{9} = 0$.

29.

Sol: (a) 44 cm

Circumference

$$= \pi \times d = \frac{22}{7} \times 14 = 22 \times 2 = 44 \text{ cm}$$

30.

Sol: (a) 113.75 km

Distance in 2.5 litres = $45.5 \times 2.5 = 113.75$ km.



PART - III : PHYSICS & CHEMISTRY

1.

Sol: (b) Mirror

Mirrors have a smooth, highly polished surface that reflects most of the light falling on it, giving a clear reflection. Rough surfaces scatter light.

2.

Sol: (b) Cell

A torch uses a cell (battery) to provide electrical energy to light the bulb.

3.

Sol: (c) Ruler

A ruler is used to measure length. A thermometer measures temperature, a clock measures time, and a compass shows direction.

4.

Sol: (c) Moving bicycle wheel

A moving bicycle wheel rotates (rotational motion) and also moves forward (translational motion). A spinning top has rotational motion only, and a ceiling fan rotates only. Swing has oscillatory motion.

5.

Sol: (b) Copper

Copper is a good conductor of electricity but is non-magnetic (not attracted to a magnet). Iron, steel, and nickel are magnetic.

6.

Sol: (c) 0.000036 km

We know: 1km = 1000m = 1000000mm

Therefore,

$$36\text{mm} = 36 \div 1000000 \text{ km} = 0.000036 \text{ km}$$

7.

Sol: (b) Current cannot flow

In a broken circuit, the path is incomplete, so electric current cannot flow through the bulb, and it does not glow.

8.

Sol: (a) Iron nail becomes temporarily magnetic

When a magnet touches an iron nail, the nail becomes a temporary magnet (by magnetic induction), which then attracts other nails.

9.

Sol: (c) Candela

SI unit of luminous intensity is candela

10.

Sol: (c) Convex mirror

A convex mirror gives a wider field of view (larger area), so it is used in shops for security. It produces a smaller but upright image.

11.

Sol: (d) A new substance called iron oxide is formed during rusting

Rusting is a chemical change because iron reacts with oxygen and moisture to form a new substance called iron oxide (rust).

12.

Sol: (c) Evaporation

When sea water is kept under sunlight, the water changes into vapour and leaves the salt behind. This process is called evaporation.

13.

Sol: (c) Acidic

A red ant injects formic acid when it bites, which causes pain and irritation. So, the substance is acidic.

14.

Sol: (d) Both physical changes and chemical changes

Breaking rocks into smaller pieces is a physical change, while formation of soil and rusting of iron are chemical changes. So both changes take place.

15.

Sol: (a) The lake water would become neither acidic nor basic and fish survival would improve

Neutralisation makes the water safe by reducing acidity. Neutral water helps fish survive better.

16.

Sol: (a) Higher temperature and greater air movement increase the rate of evaporation

Heat gives energy to water particles, and wind carries away water vapour. Both make clothes dry faster.

17.

Sol: (c) Making popcorn from corn

Once corn changes into popcorn, it cannot become corn again. So it is an irreversible change.

18.

Sol: (b) A physical change and a chemical change

Melting wax is a physical change because only the state changes. Burning wax vapour is a chemical change because new substances are formed.

19.

Sol: (a) Sponge < Eraser < Stone

Sponge is the softest and gets scratched easily. Stone is the hardest and is difficult to scratch.

20.

Sol: (b) Baking soda

NaHCO_3 is the chemical formula of baking soda.

PART - IV : BIOLOGY

1.

Sol: (b) Small fish and insects from water

2.

Sol: (c) Produces lactic acid and less ATP

3.

Sol: (b) It will live longer because KOH removes CO_2

4.

Sol: (b) Nitrogen

5.

Sol: (c) Fried samosa

6.

Sol: (c) Mouth

7.

Sol: (a) More insect larvae ? more food for fish

8.

Sol: (b) Food vacuole forms first, then digestive enzymes are secreted into it

9.

Sol: (d) Plasma

10.

Sol: (c) The grafted stem will continue to photosynthesize but *Cuscuta* will still draw nutrients from the host