



SCIENCE APTITUDE TEST CLASS - 8 SOLUTIONS

EXAM DATE : 11.10.26

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PART - I : MENTAL ABILITY

1.

Sol. (c) Ritu

Ranked layout points directly to Ritu: Ritu > Kavita > Priya > Divya

2.

Sol. (b) 42Add consecutive even numbers: +4, +6, +8, +10, +12. Next is $30 + 12 = 42$

3.

Sol. (c) 9:00

Horizontal inversion transforms a 3 o'clock hand layout directly to 9 o'clock.

4.

Sol. (c) Large : Big

These are synonyms; all other pairs are antonyms.

5.

Sol. (b) RUR

First letter +2; center sequence maps standard vowels (A, E, I, O, U); third letter shifts -2.

6.

Sol. (b) 17

The sequence of consecutive prime numbers.

7.

Sol. (c) V

Counting 5 units inward from Z yields V

8.

Sol. (c) 5 kmNet distance is 4 km South and 3 km East. Distance = $\sqrt{4^2 + 3^2} = 5$ km.

9.

Sol. (c) CODE

Every letter in 'CODE' shares identical horizontal structural reflection line properties.

10.

Sol. (b) 24thRight Rank = $(35-12)+1 = 24$.

11.

Sol. (b) 29Expression becomes $6 \times 4 + 5 = 24 + 5 = 29$ using BODMAS rules.

12.

Sol. (c) 36The sequence follows perfect consecutive base squares: $1^2, 2^2, 3^2, 4^2, 5^2, 6^2$.

13.

Sol. (c) Mother

“Only daughter of my father” refers directly to the speaker herself.

14.

Sol. (b) 2, 1, 4, 3

Chronological path: Kindergarten → Primary → High School → College.

15.

Sol. (a) NKNA

Every character advances by exactly two positions (+2).



PART - II : MATHEMATICS

1.

Sol. (b) -1

The power of a negative number is negative if the exponent is odd, and positive if the exponent is even.

$$\Rightarrow (-1)^{2025} = -1 \text{ (Odd exponent)}$$

$$\Rightarrow (-1)^{2026} = 1 \text{ (Even exponent)}$$

$$\Rightarrow (-1)^{2027} = -1 \text{ (Odd exponent)}$$

$$\Rightarrow \text{Sum} = (-1) + 1 + (-1) = -1.$$

2.

Sol. (a) 28

$$\text{Given } 3^x = 81 \Rightarrow 3^x = 3^4 \Rightarrow x = 4.$$

$$\text{Given } 5^{y-x} = 125 \Rightarrow 5^{y-x} = 5^3$$

$$\Rightarrow y - x = 3. \text{ Substitute } x = 4 \text{ into the equation:}$$

$$y - 4 = 3 \Rightarrow y = 7. \text{ Therefore, } x \times y = 4 \times 7 = 28.$$

3.

Sol. (c) 112

Let the three consecutive multiples of 7 be $7x$, $7(x + 1)$, and $7(x + 2)$.

Their sum is 357:

$$\Rightarrow 7x + 7x + 7 + 7x + 14 = 357$$

$$\Rightarrow 21x + 21 = 357$$

$$\Rightarrow 21x = 336$$

$$\Rightarrow x = 16.$$

$$\Rightarrow \text{The smallest multiple is } 7x = 7 \times 16 = 112.$$

4.

Sol. (a) 330

Selling Price (SP) = 240, Loss = 20%.

$$\Rightarrow \text{Cost Price (CP)} = \frac{100}{100 - \text{Loss}\%} \times \text{SP} = \frac{100}{80} \times 240 = \text{Rs } 300.$$

To gain 10%,

$$= \frac{100 + \text{Profit}\%}{100} \times \text{CP} = \frac{110}{100} \times 300 = \text{Rs } 330.$$

5.

Sol. (c) 260 mArea of square park = side² = 60×60 = 3600 m².

Area of rectangular park = Length × Breadth = 90×Breadth.

Given the areas are equal: 90 ×Breadth = 3600

 $\Rightarrow$ Breadth = 40 m. $\Rightarrow$ Perimeter of rectangular park = 2(Length + Breadth) = 2(90 + 40) = 2(130) = 260 m.

6.

Sol. (b) 50The number of non-square natural numbers strictly between the squares of two consecutive natural numbers n and $(n + 1)$ is $2n$. Here, $n = 25$.Number of natural numbers = $2 \times 25 = 50$.

7.

Sol. (a) $\frac{9}{25}$

First, evaluate the expression:

$$\left(\frac{-3}{5}\right)^{-2} = \left(\frac{5}{-3}\right)^2 = \frac{25}{9}$$

The multiplicative inverse (reciprocal) of $\frac{25}{9}$ is $\frac{9}{25}$

8.

Sol. (d) 32 yearsLet the present ages of A and B be $4x$ and $5x$ respectively.After 8 years, their ages will be $4x + 8$ and $5x + 8$.According to the problem: $\frac{4x+8}{5x+8} = \frac{5}{6}$

Cross-multiplying:

$$6(4x + 8) = 5(5x + 8)$$

$$\Rightarrow 24x + 48 = 25x + 40 \quad \Rightarrow 25x - 24x = 48 - 40 \Rightarrow x = 8. \quad \Rightarrow A's \text{ present age} = 4x = 4(8) = 32 \text{ years.}$$

9.

Sol. (b) 10The sum of the interior angles of a regular polygon with n sides = $(n - 2) \times 180^\circ$

10.

Sol. (c) 6

$$(3x - 5)(2x + 7) = 3x(2x + 7) - 5(2x + 7) = 6x^2 + 21x - 10x - 35 = 6x^2 + 11x - 35.$$

The coefficient of x^2 in this expansion is 6.

11.

Sol. (d) 5

Find the prime factorization of 53, 240

$$\Rightarrow 5324 \times 10$$

$$\Rightarrow 4 \times 1331 \times 2 \times 5$$

$$\Rightarrow 2^2 \times 11^3 \times 2 \times 5$$

$$\Rightarrow 2^3 \times 11^3 \times 5.$$

For a number to be a perfect cube, the powers of its prime factors must be multiples of 3.

The factors 2^3 and 11^3 are already perfect cubes.

The factor 5 is left over.

To make the quotient a perfect cube, we must divide the number by 5.

12.

Sol. (a) 748 cm²Total Surface Area (TSA) of a cylinder = $2\pi r(r + h)$. $r = 7$ cm, $h = 10$ cm.

$$\text{TSA} = 2 \times \frac{22}{7} \times 7 \times (7 + 10) = 44 \times 17 = 748 \text{ cm}^2.$$

13.

Sol. (c) 2Rewrite the equation using powers of 5: $5^{2x+1} \div 5^2 = 5^3$

$$\Rightarrow \text{Using the law of exponents } (a^m \div a^n = a^{m-n}): 5^{(2x+1)-2} = 5^3$$

$$\Rightarrow 5^{2x-1} = 5^3$$

$$\Rightarrow \text{Equating the exponents:}$$

$$2x - 1 = 3 \Rightarrow 2x = 4 \Rightarrow x = 2.$$

14.

Sol. (b) 1,83,456

$$\text{Population after 3 years} = P \times \left(1 + \frac{R_1}{100}\right) \times \left(1 + \frac{R_2}{100}\right) \times \left(1 + \frac{R_3}{100}\right)$$

$$= 160000 \times \left(1 + \frac{5}{100}\right) \times \left(1 + \frac{5}{100}\right) \times \left(1 + \frac{4}{100}\right) = 160000 \times \frac{105}{100} \times \frac{105}{100} \times \frac{104}{100}$$

$$= 160000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{26}{25} = 160000 \times \frac{11466}{10000} = 16 \times 11466 = 1,83,456.$$

15.

Sol. (a) 527

Given $x + \frac{1}{x} = 5$.

Squaring both sides:

$$\left(x + \frac{1}{x}\right)^2 = 5^2$$

$$\Rightarrow x^2 + \frac{1}{x^2} + 2 = 25 \quad \Rightarrow x^2 + \frac{1}{x^2} = 23$$

Squaring both sides again: $\left(x^2 + \frac{1}{x^2}\right)^2 = 23^2$

$$\Rightarrow x^4 + \frac{1}{x^4} + 2 = 529 \quad \Rightarrow x^4 + \frac{1}{x^4} = 529 - 2 = 527$$

16.

Sol. (b) $\frac{7}{19}$

The additive inverse of a rational number $\frac{a}{b}$ is $-\frac{a}{b}$, such that their sum is zero.

Therefore, the additive inverse of $\frac{-7}{19}$ is $-\left(\frac{-7}{19}\right) = \frac{7}{19}$

17.

Sol. (a) 8

The square root function $\sqrt{x}$ strictly refers to the principal (non-negative) square root of a number.

It does not yield negative values. Therefore, $\sqrt{64} = 8$.

18.

Sol. (a) $\frac{3}{2}$

Given the linear equation: $4z + 3 = 6 + 2z$.

Transpose variables to one side and constants to the other:

$$4z - 2z = 6 - 3 \quad \Rightarrow 2z = 3 \quad \Rightarrow z = \frac{3}{2}$$

19.

Sol. (b) 120°

Adjacent angles in a parallelogram are supplementary.

$$\angle P + \angle Q = 180^\circ$$

$$60^\circ + \angle Q = 180^\circ \quad \Rightarrow \quad \angle Q = 180^\circ - 60^\circ = 120^\circ$$

20.

Sol. (c) $\frac{1}{2}$ The possible outcomes when rolling a fair die are $\{1, 2, 3, 4, 5, 6\}$.The prime numbers in this set are $\{2, 3, 5\}$.

Number of favorable outcomes = 3.

Total outcomes = 6.

$$\text{Probability} = \frac{3}{6} = \frac{1}{2}$$

21.

Sol. (c) 8 cmVolume of a cube = side³Given Volume = 512 cm³

$$\text{side}^3 = 512$$

$$\Rightarrow \text{side} = \sqrt[3]{512} = 8$$

The side length is 8 cm.

22.

Sol. (a) 10

Total students = 40.

Percentage of students good in mathematics = 75%.

Percentage NOT good in mathematics = $(100 - 75)\% = 25\%$.

$$\text{Number of students not good in maths} = 25\% \text{ of } 40 = \frac{25}{100} \times 40 = 10.$$

23.

Sol. (a) $-p^2q + 5pq^2$

First, expand both expressions:

$$\text{Expression to subtract: } 3pq(p - q) = 3p^2q - 3pq^2.$$

$$\text{Expression to subtract from: } 2pq(p + q) = 2p^2q + 2pq^2.$$

Now perform the subtraction:

$$(2p^2q + 2pq^2) - (3p^2q - 3pq^2)$$

$$= 2p^2q + 2pq^2 - 3p^2q + 3pq^2$$

$$= -p^2q + 5pq^2.$$

24.

Sol. (a) 45 cm^2

$$\text{Area of a rhombus} = \frac{1}{2} \times d_1 \times d_2$$

(where d_1 and d_2 are the lengths of the diagonals).

$$\text{Area} = \frac{1}{2} \times 7.5 \times 12$$

$$\text{Area} = 7.5 \times 6 = 45 \text{ cm}^2$$

25.

Sol. (b) 8.5×10^{-12}

To express 0.0000000000085 in standard form ($a \times 10^n$, where $1 \leq a < 10$), move the decimal point 12 places to the right.

Because we are moving the decimal to the right (for a number smaller than 1), the exponent is negative. Result: 8.5×10^{-12} .

26.

Sol. (a) 700

This is a case of direct proportion. Let the number of bottles filled in 5 hours be x .

$$\frac{840}{6} = \frac{x}{5}$$

$$140 = \frac{x}{5} \Rightarrow x = 140 \times 5 = 700.$$

27.

Sol. (c) $(x+4)(x+4)$

Use the algebraic identity $(a + b)^2 = a^2 + 2ab + b^2$.

$x^2 + 8x + 16$ can be rewritten as $(x)^2 + 2(x)(4) + (4)^2$.

This perfectly matches the identity where $a = x$ and $b = 4$.

Therefore, it factorises to $(x + 4)^2 = (x + 4)(x + 4)$

28.

Sol. (b) (0, 4)

Any point that lies on the y -axis has an x -coordinate of 0.

Among the given options, only (0, 4) meets this condition.

29.

Sol. (a) 3

For a number to be divisible by 9, the sum of its digits must be a multiple of 9.

Sum of digits of $24x = 2+4+x = 6+x$.

For $6+x$ to be a multiple of 9 (since x is a single digit from 0-9), the only valid sum is 9.

$$6+x=9 \Rightarrow x=3.$$

30.

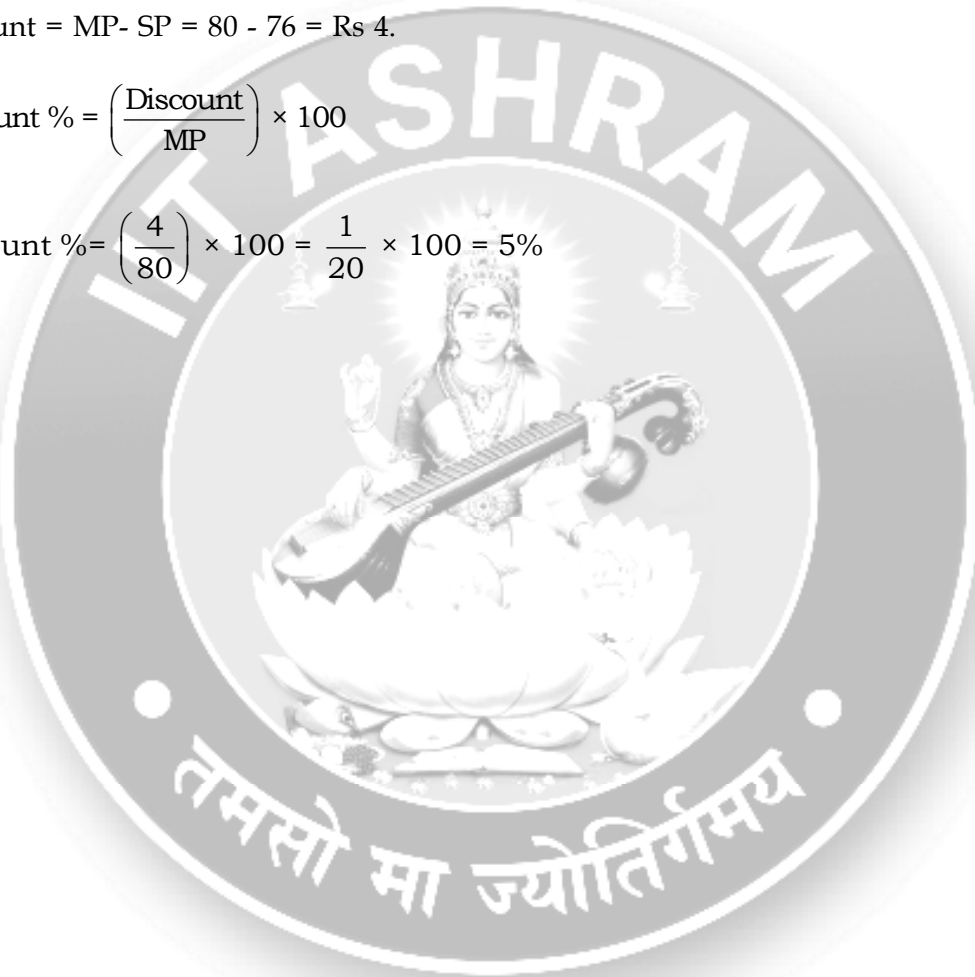
Sol. (a) 5%

Marked Price (MP) = Rs 80, Selling Price (SP) = Rs 76.

Discount = MP- SP = 80 - 76 = Rs 4.

$$\text{Discount \%} = \left(\frac{\text{Discount}}{\text{MP}} \right) \times 100$$

$$\text{Discount \%} = \left(\frac{4}{80} \right) \times 100 = \frac{1}{20} \times 100 = 5\%$$



PART - III : PHYSICS & CHEMISTRY

1.

Sol. (c) 5 hr

Given:

Distance between P and Q = 400 km

Speed of train from P = 50 km/h

Speed of train from Q = 30 km/h

They move towards each other

Concept: When two objects move towards each other, their relative speed = sum of their speeds.

Relative speed = $50 + 30 = 80$ km/h

Time to meet = Distance / Relative speed

 $= 400 / 80$ $= 5$ hours

2.

Sol. (d) To establish efficient natural convection currents: cold air sinks and hot air rises.

Cold air is denser than warm air, so it sinks. Hot air is less dense than cold air, so it rises.

Air Conditioner near ceiling: The AC cools the air near the ceiling.

This cold, dense air sinks naturally, cooling the entire room by setting up a convection current.

Heater near floor:

The heater warms the air near the floor.

This warm, less dense air rises naturally, warming the entire room by setting up a convection current.

This placement ensures efficient natural convection currents for uniform heating/cooling.

3.

Sol. (b) A city bus navigating through a highly crowded market street.

Non-uniform motion occurs when an object covers unequal distances in equal intervals of time. A bus in a crowded market will constantly accelerate, decelerate, and stop, making its motion highly non-uniform.

4.

Sol. (c) It decreases as the altitude increases.

Atmospheric pressure is generated by the weight of the air column pressing down from above. As you gain altitude, there is less air above you, leading to a corresponding decrease in atmospheric pressure.

5.

Sol. (b) The thin nichrome wire

The heat produced by an electrical current depends on electrical resistance. When the current flowing through the different elements remain the same and for the same time. A thin nichrome wire is an alloy with significantly higher resistance than a highly conductive, thick copper wire, thus producing much more heat.

6.

Sol. (c) Colors recombine to form white light

Concept: Dispersion and Recombination of White Light (Newton's Experiment)

When a beam of white light passes through a prism, it undergoes dispersion – splitting into its constituent colors (VIBGYOR).

The second prism bends the colors in the opposite direction. The diverging colors are bent back towards each other. The colors recombine and emerge as white light.

This is the classic experiment demonstrating that white light is a mixture of seven colors.

7.

Sol. (a) 50 N

Given: Force 1 = 40 N, Force 2 = 30 N

Forces are mutually perpendicular (angle = 90°)

Concept: For two perpendicular forces, the net force is found using the Pythagorean theorem (parallelogram law of vectors):

$$F_{\text{net}} = \sqrt{F_1^2 + F_2^2}$$

Calculation:

$$F_{\text{net}} = \sqrt{40^2 + 30^2}$$

$$F_{\text{net}} = \sqrt{2500}$$

$$F_{\text{net}} = 50 \text{ N}$$

8.

Sol. (c) Exactly equal to the angle of reflection.

The law of reflection universally states that the angle at which an incident ray strikes a surface then (the angle of incidence) is mathematically identical to the angle at which it bounces off the reflecting surface (angle of reflection).

9.

Sol. (c) A dry wooden stick

An electromagnet requires a core made of a ferromagnetic material (like iron, steel, or cobalt) that can be easily magnetized to amplify the magnetic field. Wood is non-magnetic and cannot form a strong electromagnet.

10.

Sol. (b) A large number of rods and very few cones.

In the eye, rod cells are highly sensitive to light. A large number of rod cells is desirable for night vision, while cone cells are responsible for color vision in bright light. Owls have an abundance of rods, giving them incredible night vision but poor daylight tolerance.

11.

Sol. (b) The substance that dissolves in the solvent

The solute is simply the thing that dissolves – like sugar or salt when you mix them in water. The liquid it dissolves in is called the solvent, not the solute.

12.

Sol. (d) Melting of wax in a candle

Digestion, rusting and burning are chemical changes. Only melting of wax is a physical change, as wax changes into its liquid form, no new substance is formed.

13.

Sol. (b) X = Turmeric, Y = Phenolphthalein

Turmeric is a natural indicator that is yellow in acidic/neutral solutions and turns red in basic solutions. Phenolphthalein is a synthetic indicator that remains colorless in acids but turns bright pink in bases.

14.

Sol. (c) Deposition

The direct transition from a gas to a solid is termed deposition (or desublimation). Sublimation is the reverse process (solid to gas).

15.

Sol. (c) Particles in a solid possess the maximum kinetic energy compared to liquids and gases.

The statement is incorrect because particles in a solid are held tightly in fixed positions and only vibrate, meaning they have the minimum kinetic energy. Gases possess the maximum kinetic energy.

16.

Sol. (a) Inflammable

Inflammable substances are those which catch fire easily and burn quickly when they come near a flame or spark – cotton cloth is a good example.

17.

Sol. (c) Much stronger interparticle forces of attraction

Iron doesn't bend because its particles are held together by very strong forces of attraction. Wax bends more easily since its particles aren't held as tightly.

18.

Sol. (b) Two times as much

Water is made of hydrogen and oxygen in a 2:1 ratio, so twice as much hydrogen gas is formed compared to oxygen. That's why the gas with the pop sound (hydrogen) is collected in double the volume.

19.

Sol. (d) Chemical bonds are formed, restructuring the electron arrangements to create a new substance.

When elements react to form a compound, their valence electrons interact to form chemical bonds, creating molecules or ionic lattices that behave completely differently than the unbonded elemental atoms in a simple mixture.

20.

Sol. (a) It would form a basic solution, because magnesium oxide is a metal oxide, and metal oxides are generally basic in nature.

Sulfur is a non-metal, so burning it gives an acidic gas (SO_2) – that's why we get acid rain. Magnesium is a metal, so burning it gives magnesium oxide (MgO), and metal oxides are basic, not acidic. So dissolved in water, MgO would turn the solution basic (turns red litmus blue) – the opposite effect of acid rain.

PART - IV : BIOLOGY

1.

Sol. (b) Excretory system

The image typically shows kidneys, ureters, urinary bladder, and urethra, which together form the excretory system (also called the urinary system). This system removes waste products like urea from the body.

2.

Sol. (d) Plant

A large central vacuole, chloroplasts, and a cell wall are all characteristic features of a plant cell. Chloroplasts are absent in animal, fungal, and bacterial cells.

3.

Sol. (a) Microscopic and acellular

Viruses are microscopic (too small to be seen with the naked eye) and acellular (they are not made of cells; they are simply genetic material enclosed in a protein coat).

4.

Sol. (a) Budding

Yeast is a unicellular fungus that reproduces asexually by budding. A small bud grows out from the parent cell, matures, and detaches to become a new individual.

5.

Sol. (b) Oxygen-rich blood from the lungs enters the left side of the heart and is pumped to the body, while oxygen-poor blood returns to the right side of the heart and is pumped to the lungs.

In double circulation:

Pulmonary circulation: Right ventricle → lungs (oxygen-poor blood) → left atrium (oxygen-rich blood).

Systemic circulation: Left ventricle → body (oxygen-rich blood) → right atrium (oxygen-poor blood).

Option (b) correctly describes this.

6.

Sol. (b) Antibiotic resistance is a phenomena where bacteria that were killed earlier by a given antibiotic dose are found to survive and multiply despite treatment with the same antibiotic dose

This correctly defines antibiotic resistance. Option (a) is wrong because antibiotics treat bacterial, not viral, infections. Option (c) is wrong because antibiotics are medicines, not proteins made by the body (those are antibodies).

7.

Sol. (c) Parasite

Cuscuta (also called dodder) is a parasitic plant. It lacks chlorophyll and cannot photosynthesize. It absorbs nutrients from the host plant using specialized structures called haustoria.

8.

Sol. (b) Edward Jenner

Edward Jenner discovered the smallpox vaccine in 1796. Louis Pasteur developed vaccines for other diseases (like rabies), but not smallpox.

9.

Sol. (b) 72 and 80

The normal resting pulse (heart rate) for a healthy adult is 72–80 beats per minute. Some textbooks also accept 72–80 as the standard range for Class 8 level.

10.

Sol. (a) CO_2 & H_2O are the main requirement

Photosynthesis requires carbon dioxide (CO_2) and water (H_2O) in the presence of sunlight and chlorophyll to produce glucose and oxygen. Option (a) is correct.

(b) is wrong: Presence of starch indicates photosynthesis has occurred.

(c) is wrong: Stomata control gas exchange, not water transport.

(d) is wrong: Photosynthesis converts light energy into chemical energy.

