



Hunt for
Young Talents



SCIENCE APTITUDE TEST CLASS - 7 SOLUTIONS

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Physics

Q.1 Total distance = $8 + 6 + 8 = 22$ m

The student walks 8 m east and then 8 m west. These movements cancel each other, so the student is finally 6 m north of the starting point.
Therefore, distance = 22 m and displacement = 6 m.

Correct Answer: A

Q.2 Woollen cloth does not allow heat to escape easily. Therefore, the water in the container wrapped with woollen cloth remains hotter for a longer time.

Correct Answer: D

Q.3 A bulb glows when electric current passes through its filament. For this to happen, the circuit must be complete and the connections must be proper.

Correct Answer: A

Q.4 A plane mirror produces lateral inversion. This means the left and right sides appear interchanged. Therefore, the name appears laterally inverted in the mirror.
Not all letters laterally inverted in any of the given options.

Correct Answer: D

Q.5 Heat from a bonfire reaches us mainly through radiation. Radiation can transfer heat without needing a material medium. That is why we can feel the warmth without touching the fire.

Correct Answer: C

Q.6 A bulb glows only when electric current flows through a complete circuit. If the connections are loose, the current may not flow. Therefore, the student should check the connections first.

Correct Answer: A

Q.7 When the torch (light source) moves farther away from the object, the light rays striking the object's edges become more parallel. As a result, the region of blocked light (the shadow) covers a smaller area on the fixed screen.

Correct Answer: B

Q.8 Time taken for 30 oscillations = 60 seconds

Time taken for 1 oscillation = $60 \div 30 = 2$ seconds

3 minutes = 180 seconds

Number of oscillations = $180 \div 2 = 90$

Correct Answer: B

Q.9 Both chairs may be at the same room temperature. Metal takes heat away from our hand faster than wood. Therefore, the metal chair feels colder.

Correct Answer: C

Q.10 During the day, the Sun appears to move across the sky. The direction of sunlight falling on the object changes, so the direction of its shadow also changes.

Correct Answer: D

Chemistry

Q.11 Reactivity with water: Cold water (X) = Most reactive > Hot water

(Y) = Moderate > Steam (Z) = Least reactive. Increasing order: $Z < Y < X$.

Correct Answer: A

Q.12 W (liquid metal) = Mercury. X (liquid non-metal) = Bromine. Y (gaseous non-metal)

= Oxygen. Z (conducting non-metal) = Graphite.

Correct Answer: D

Q.13 Aqua regia is a highly corrosive mixture of concentrated nitric acid and hydrochloric acid used to dissolve noble metals like gold.

Correct Answer: C

Q.14 The common name for sodium bicarbonate (NaHCO_3) is baking soda.

Correct Answer: D

Q.15 Magnetization is a physical change. No matter is added or removed, so the mass of the iron bar stays constant.

Correct Answer: C

Q.16 Bursting of a firecracker is a chemical change, as combustion produces new gases and smoke.

Charging of a battery is also a chemical change, as chemical reactions at the electrodes form new substances. Magnetization of iron is a physical change, as only the magnetic domains align and no new substance forms.

Correct Answer: D

Q.17 Ground water is in aquifers (q). Ocean is surface water (p). Clouds contain dirt and water vapors (s). Precipitation is rain (r).

Correct Answer: B

Q.18 Matter must have mass and occupy space. Heat is a form of energy, not matter.

Correct Answer: B

Q.19 Add water to dissolve salt (ii) → Stir (iii) → Decant to separate sand (i) → Evaporate water to get salt (iv).

Correct Answer: A

Q.20 Burning magnesium (i) forms a new substance (chemical change). Heating iron to glow red (ii) is reversible and forms no new substance (physical change).⁴

Correct Answer: B

Mathematics

Q.21 A brick is a cuboid, and a cuboid has 6 faces.

Correct Answer: B

Q.22 $(-8) \times (-3) = 24$

$$(-12) \div 4 = -3$$

$$24 + (-3) = 21$$

Correct Answer: A

Q.23 $\frac{7}{8} \times \frac{125}{125} = \frac{875}{1000} = 0.875$

Correct Answer: A

Q.24 $SI = \frac{P \times R \times T}{100} = \frac{5000 \times 8 \times 3}{100} = 1200$

Correct Answer: B

Q.25 Let original price = 100

After 25% increase = 125

After 20% decrease = 80% of 125 = $125 \times \frac{80}{100} = 100$

Net change = 0%

Correct Answer: C

Q.26 $2(3)^2 - 5(3) + 7 = 18 - 15 + 7 = 10$

Correct Answer: A

Q.27 $a^2 - b^2 = (a+b)(a-b) = 10 \times 4 = 40$

Correct Answer: A

Q.28 A fraction with a denominator of 100 can be written as a decimal with two decimal

places: $\frac{34}{100} = 0.34$.

Correct Answer: C

Q.29 Let breadth = b, length(l) = 2b

$$\text{Perimeter} = 2(l+b) = 2(2b+b) = 6b = 60 \Rightarrow b=10$$

$$\text{Length} = 20, \text{Area} = 20 \times 10 = 200 \text{ cm}^2$$

Correct Answer: B

Q.30 An angle between 90° and 180° is an obtuse angle.

Correct Answer: C

Q.31 Actual distance = Map distance $\times$ Scale = $6 \times 5 = 30$ km.

Correct Answer: B

Q.32 $256=4^4$, so $(256)^{1/4}=4$

Correct Answer: B

Q.33 Number of girls = $\frac{2}{5} \times 40 = 16$

$$\text{Number of boys} = \text{Total students} - \text{Girls} = 40 - 16 = 24.$$

Correct Answer: B

Q.34 $0.70 + 0.25 = 0.95$.

Correct Answer: B

Q.35 $(-3)^3 = -27$

$$(-2)^2 = 4$$

$$(-1)^0 = 1$$

$$-27+4-1=-24$$

Correct Answer: B

Q.36 Number of books = Blocks $\times$ Books per block = $4 \times 5 = 20$.

Correct Answer: B

Q.37 Let each angle be 2x, 3x, 4x

Then, according to angle sum property of triangle

$$\Rightarrow 2x + 3x + 4x = 9x$$

$$\Rightarrow 9x = 180^\circ$$

$$\Rightarrow x = 20^\circ$$

So, the largest angle = 4x

$$\Rightarrow 4 \times 20^\circ = 80^\circ$$

Correct Answer: C

Q.38 $3x-2x = 7+5$

$$x = 12$$

Correct Answer: C

Q.39 April has 30 days.

$$\text{Total savings} = 4.50 \times 30 = \text{Rs } 135.00.$$

Correct Answer: A

Q.40 Let numbers be $x, x+2, x+4$

$$\Rightarrow x+x+2+x+4=3x+6$$

$$\Rightarrow 3x+6=51$$

$$\Rightarrow 3x=45$$

$$\Rightarrow x=15$$

Correct Answer: B

Q.41 (a) Square = $6 \times 6 = 36 \text{ cm}^2$.

(b) Rectangle = $8 \times 4 = 32 \text{ cm}^2$.

(c) Rectangle = $7 \times 5 = 35 \text{ cm}^2$.

So, $36 > 35 > 32$. So largest is (a) 36 cm^2 .

Correct Answer: A

Q.42 North to West clockwise:

North $\rightarrow$ East $\rightarrow$ South $\rightarrow$ West = 3 right angles ($3 \times 90^\circ = 270^\circ$).

Correct Answer: C

Q.43 Perimeter = $2(l + b) = 24$. So $l + 4 = 12 \rightarrow l = 8 \text{ cm}$

Correct Answer: B

Q.44 Sum of first n odd numbers = n^2 .

First 5 odd numbers: $1+3+5+7+9 = 25 = 5^2$.

Correct Answer: B

Q.45 $\frac{1}{2} \div \frac{1}{8} = \frac{1}{2} \times \frac{8}{1} = 4$

Correct Answer: B

Q.46 Green squares = $100 - 25 - 35 = 40$.

$$\text{Decimal} = \frac{40}{100} = 0.40$$

Correct Answer: A

Q.47 Breadth = $300 \div 20 = 15 \text{ m}$

Perimeter = $2(20+15) = 2 \times 35 = 70 \text{ m}$

Correct Answer: C

Q.48 Let number = x .

$$\frac{2}{3}x = 24 \Rightarrow x = 36$$

$$\frac{5}{6} \times 36 = 30$$

Correct Answer: B

Q.49 5 tiles of side 2 cm in a row

Length = 10 cm, breadth = 2 cm.

Perimeter = $2(10+2) = 24 \text{ cm}$.

Correct Answer: B

- Q.50** Total = 1 m = 100 cm.
First cut = 35 cm.
Second cut = 450 mm = 45 cm.
Remaining = 100 - 35 - 45 = 20 cm.

Correct Answer: A

Biology

- Q.51** * Statement I is incorrect: Starch digestion begins in the mouth (buccal cavity), where the enzyme salivary amylase breaks down starch into simpler sugars. Pepsin is an enzyme secreted in the stomach that specifically digests proteins, not carbohydrates/starch.
* Statement II is correct: Villi are tiny, finger-like folds on the inner lining of the small intestine. They vastly increase the surface area, ensuring efficient absorption of digested food into the bloodstream.

Correct Answer: D

- Q.52** * Statement I is correct: Bryophyllum propagates through vegetative reproduction. Small adventitious buds develop along the notches of its leaf margins, which can drop off and grow into independent new plants.
* Statement II is incorrect: Spore formation in Rhizopus (bread mould) is a method of asexual reproduction, as it involves a single parent and does not require the fusion of gametes.

Correct Answer: C

- Q.53** * Assertion (A) is true: Transpiration creates a continuous upward flow that carries water and dissolved essential minerals from the roots up to the leaves.
* Reason (R) is true: As water evaporates from the stomata during transpiration, it generates a negative pressure gradient or suction pull (transpiration pull) inside the xylem vessels, acting much like drinking through a straw.
* Link: Since this suction pull is the exact mechanism driving the upward transport, Reason (R) directly explains Assertion (A).

Correct Answer: A

- Q.54** * Assertion (A) is true: Herbivorous animals (like cows) possess a significantly longer small intestine compared to carnivorous animals (like tigers).
* Reason (R) is true: Plant matter is rich in cellulose, a tough, complex carbohydrate that requires specialized symbiotic bacteria and a longer processing time to break down. Meat is relatively simpler to break down and absorb.

Correct Answer: A

- Q.55** Assertion is True: Pitcher plants possess green leaves containing chlorophyll, which allows them to synthesize their own food through photosynthesis. However, they usually grow in swampy or boggy soils that lack essential nutrients, particularly nitrogen.
Reason is True: To compensate for this nutrient deficit, they trap and digest insects using specialized enzymes, extracting the nitrogen needed for their growth. Therefore, the reason directly explains why a photosynthetic plant still traps insects.

Correct Answer: A

- Q.56** • The right side of the heart handles oxygen-poor (deoxygenated) blood returning from the body.
• The right ventricle pumps this blood out to the lungs so it can pick up fresh oxygen.
• The blood vessel responsible for this transport is the pulmonary artery. (Note: This is the only artery in the human body that carries deoxygenated blood).

Correct Answer: C

Q.57 • Blood consists of cellular elements suspended in a liquid medium.

- Plasma is the yellowish liquid matrix that makes up about 55% of total blood volume. It is composed mostly of water, along with proteins, nutrients, hormones, and waste products, providing the medium for blood cells to circulate.

Correct Answer: D

Q.58 • In the absence of oxygen, yeast undergoes a process called anaerobic respiration (specifically alcoholic fermentation).

- During this process, glucose is incompletely broken down, yielding ethanol (alcohol), carbon dioxide CO₂, and a small amount of energy (ATP). This reaction is widely utilized in the baking and brewing industries.

Correct Answer: C

Q.59 • Cuscuta is a leafless, yellow, climbing vine that completely lacks chlorophyll, meaning it cannot produce its own food via photosynthesis.

- It survives by wrapping around a host plant and using specialized root-like structures (haustoria) to pierce the host's stems to steal water and nutrients, making it a classic plant parasite.

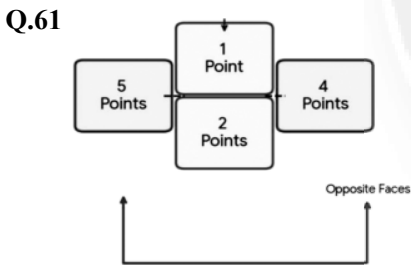
Correct Answer: C

Q.60 • Insects do not have lungs. Instead, they breathe through a specialized respiratory network.

- Air enters their bodies through small external openings on the sides of their abdomen called spiracles.
- From the spiracles, the air travels into a network of interconnected internal tubes called tracheae, which deliver oxygen directly to the body tissues.

Correct Answer: A

Mental Ability



Correct Answer: B

Q.62

1. The minute hand points directly at 12.
2. The hour hand points directly at 5.
3. Count the total hour blocks between 12 and 5: There are exactly 5 blocks.
4. Calculate: 5 blocks × 30° = 150°.

Correct Answer: C

Q.63 3+5=8
8+7=15
15+9=24
24+11=35
So,
35+13= 48

Correct Answer: C

- Q.64** H: Has both vertical and horizontal lines of symmetry in standard block form.
 N: Has neither vertical nor horizontal line symmetry.
 P: Has neither vertical nor horizontal line symmetry.

Correct Answer: B

- Q.65** $B - 2 = Z$ $S - 2 = Q$
 $R - 2 = P$ $H - 2 = F$
 $I - 2 = G$ $A - 2 = Y$
 $C - 2 = A$ $P - 2 = N$
 $K - 2 = I$ $E - 2 = C$

Correct Answer: A

- Q.66** * Rectangle, Square, and Rhombus are all types of parallelograms, meaning they have two pairs of parallel sides.
 * Trapezium is the odd one out because it is not a parallelogram; it only has one pair of parallel sides

Correct Answer: C

- Q.67** Net progress per attempt is $3 - 1 = 2$ steps. On the 3rd attempt, the frog jumps forward 3 steps from step 4 and reaches step 7 exactly.

Correct Answer: A

- Q.68** The directions are shifting 135 degrees counter-clockwise (or -135°). West rotated 135° counter-clockwise is South-East.

Correct Answer: B

- Q.69** Logic: The pattern follows the cube of the number ($x: x^3$).
 $8^3 = 512$
 $6^3 = 216$

Correct Answer: A

- Q.70** Gender Analysis:
 A: Male (Father of B)
 D: Male (Brother of A)
 F: Male (Son of A)
 E: Female (Mother of D and A)
 C: Female (Daughter of B)
 B: Undefined (Can be male or female)
 So, Number of males in the family cannot be determined

Correct Answer: D

- Q.71** $\Rightarrow 1 \times 1$ squares: 9
 $\Rightarrow 2 \times 2$ squares: 4
 $\Rightarrow 3 \times 3$ squares: 1
 Total squares = $9 + 4 + 1 = 14$

Correct Answer: D

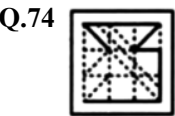
- Q.72** Bus and Train are different from each other but some travelers travel by bus and some travel by train.

Correct Answer: C

Q.73 Total people = (Position from front) + (Position from back) - 1.

Total = 7 + 12 - 1 = 18.

Correct Answer: B



Correct Answer: A

Q.75 As cat has Paw similarly Horse has Hoof.

Correct Answer: D

